No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

NOTICE OF MOTION

TAKE NOTICE THAT the Plaintiffs will make an Application to the Court on the 18th day of March, 2014 at 9:30 a.m. or as soon thereafter as the motion can be heard, at the Federal Court of Canada, 700 West Georgia Street, in the City of Vancouver, in the Province of British Columbia.

THE MOTION will be for the following interim or interlocutory relief pursuant to s. 24 (1) of the *Canadian Charter of Rights and Freedoms,* and the *Federal Court Rules* under Part 8 in relation to the "Preservation of Rights in Proceedings", including interlocutory injunctive relief under Rule 373:

a. An Order pursuant to s.24(1) of the *Canadian Charter of Rights and Freedoms*, as the appropriate and just interim or interlocutory remedy, in the nature of:

    i. An interim or interlocutory constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* (*NCR*)

(MMAR) SOR/2001-227 or the *Marihuana for Medical Purposes Regulations (MMPR)*, SOR/2013-119, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action;

And in either case together with,

iii. An Order in the nature of mandamus to compel the Defendant to process all Applications, Renewals or modifications to any licences applied to pursuant to the *MMAR* in accordance with all of its related provisions, notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* that relate to such applications under the *MMAR* that were made before and after September 30, 2013 and a declaratory Order that those medically approved persons are entitled to continue to possess, store and use marihuana for medical purposes both before and after March 31st, 2014 and that they are not required to destroy all product as of that date.

THE MATERIAL FACTS giving rise to the Motion are:

1. The Applicants/Plaintiffs are all medically approved patients ordinarily resident in Canada, as patients approved under the *Narcotic Control Regulations* (***NCR***), the *Marihuana Medical Access Regulations* (***MMAR)*** or under the *Marihuana for Medical Purposes Regulations* (***MMPR),*** or more specifically patients holding either an authorization in writing from a practitioner under the ***NCR***, or an authorization to possess (ATP) together with a personal production licence (PPL) under the ***MMAR*** or having a caregiver person responsible for them designated

as the grower for them (DG) under the ***MMAR*** and seek to be able to continue to personally produce or have a caregiver produce their medicine for them in that regard once they have a "medical document" under the ***MMPR***.

2. The ***Narcotic Control Regulation (NCR)*** pursuant to the former *Narcotic Control Act* but carried forward under the CDS provides in s.53(2) that a practitioner may administer a narcotic to a person or animal or prescribe, sell or provide a narcotic for a person or animal if the person is a patient under his or her professional treatment and the narcotic is required for a condition for which the person is receiving treatment. Subsection (5) has been added by the ***MMPR*** effective March 31st, 2014 to limit the administration by a health care practitioner to "dried marihuana" to a person or to prescribe or transfer it for a person that is a patient under their professional treatment and that the "dried marihuana" is required for the condition for which the person is receiving treatment.

3. The ***MMAR*** Regulations authorize in Part 2 (ss.24-33) the personal production or by a designated person (ss.34-42) a certain number of cannabis (marihuana) plants if the person is ordinarily resident in Canada and has reached the age of 18 years (s.25). The maximum number of plants to be produced is calculated depending upon the daily amount of the dried marihuana authorized in grams and the formula is set out in s.30 of the Regulations. The maximum amount that can be stored depends upon the amount one is authorized to produce and is set out in s.31 of the *Regulations*. There are no limitations on the location of the production facility insofar as a "dwelling house" is concerned as long as it is not adjacent to a school, public playground, daycare facility or other public place frequented mainly by persons under 18 years of age (s.28(g)).

4. The holder of the licence to produce may produce marihuana only at the production site and production area authorized and is not permitted to simultaneously produce marihuana partly indoors and partly outdoors and if the production area for a licence is partly indoors and partly outdoors the holder is not permitted to produce outdoors if the production site is adjacent to a school, public playground, daycare facility or other public place frequented mainly by persons under the age of 18 years (ss.52-53)

5. The ***MMAR*** in s.1 defines "dried marihuana" as harvested marihuana that's been subjected to any drying process and in s.2 the authorization to possess is limited to "dried marihuana" and consequently various other provisions of the Regulations refer to the amounts in storage of "dried marihuana" only. This limitation to "dried marihuana" only in the legislation has been successfully challenged, in British Columbia only, as unreasonable and too restrictive on the constitutional right of reasonable access for medical purposes arising under **s. 7 of the *Canadian Charter of Rights and Freedoms*** and found not to be saved under **section 1** thereof. Consequently that limitation no longer applies to those patients located in British Columbia, but continues to apply elsewhere in Canada. ***R. v. Smith*** **2012** BCSC 544, an appeal is pending and was heard December 6th, 2013 and judgment reserved.

6. The Plaintiffs produce their medicine either indoors in their dwelling house or residence and/or an outbuilding on the same property and some produce outdoors on their property or other property, and some produce both indoors and outdoors, depending upon the time of the year and what is most effective for the production of their plant medicine. Consent of the owner of the property is required if the patient is not "ordinarily resident" at that property (s.27(1)(b)).

7. Some of the Plaintiffs, who are all from British Columbia, use "dried marihuana" in various forms, and including by way of smoking, vaporizing, or edibles and some use other forms that are not from "dried marihuana" that are effective for the actual individual. Some of them find that "raw marihuana", that has not been dried or had heat applied to it and that is "juiced" is more effective treatment for their particular ailment, and yet others find other extracts such as oils, salves, creams and other forms to be most effective and many use combinations of these various forms and at different times, depending upon their situation. They have also developed, after much trial and error, certain strains of Cannabis (marihuana) that they find are more effective for their particular illnesses.

8. Some of the Plaintiffs have been producing their own medicine under the ***MMAR*** for a considerable period of time, and as such invested in and constructed appropriate facilities and equipment to do so, including equipment to limit the impact of such production on others and for security purposes and have gone to considerable lengths to ensure a safe, uncontaminated, production site due to the nature of their illnesses and the need to avoid a negative impact on their weakened immune systems. They have not had any fires, nor suffered from any toxic mold nor been subjected to any attempted thefts. Most if not all of them found that they could not afford to purchase a safe continuous quality supply of their medicine from the black market or illicit market, including the grey market of compassion clubs and dispensaries, nor the government supply through Prairie Plant Systems, and that is why they learned to produce for themselves and to control their production in terms of safety, quality and regularity substantial less cost after the initial setup and made sure that they did so in a safe and healthy place and manner.

9. On June 19, 2013 the Federal government promulgated the ***Marihuana for Medical Purposes Regulations*** (***MMPR***) to run concurrently with the ***MMAR*** until March 31, 2014 at which time the *MMAR* will be repealed (s. 209 (3) of the ***MMPR***).

10. While an ATP under the ***MMAR*** will continue to be valid for purposes of registration with a licensed producer under the ***MMPR*** until March 31, 2015, all PPL's and DG's end on March 31, 2014 by the repeal of Part 2 (ss. 24 through 57) and Part 3 (ss. 58 through 68.1) of the *MMAR*. Also, after September 30th, 2013, no new applications or renewals and modifications were permitted to any licences issued pursuant to the ***MMAR*** and consequently some patients have been unable to continue to produce because they had to move their site or for other reasons and have been compelled to either temporarily resort to the illicit

market or obtain a "medical document" and endeavour to try and obtain from one of the few licenced producers. The Plaintiffs/Applicants seek to have the Defendants compelled to process those patient applications including new applications by medically approved persons endeavoring to exercise their constitutional right , pending a decision of this court on the merits of this action.

11. The ***MMPR*** makes no provision whatsoever for a patient to be able to personally produce for him or herself or to have a caregiver produce for him or her and the sole source of supply under the ***MMPR*** is through a new entity created called a "Licenced Producer" (**Part 1 *MMPR***), who by ss.3 and 6 of the Regulations is limited once again to selling or providing only "dried marihuana" to patients (registered clients) and by s.5 the patient is limited to possessing a quantity of dried marihuana from a licensed producer that is 30 times the daily quantity authorized in grams by the Health care practitioner (section 129) or 150 grams, whichever is the lesser amount regardless of the nature of their illness or individual circumstances at any particular time. The *MMAR* does not contain the 150 gram maximum limitation.

12. Further, the ***MMPR*** prohibits a 'licensed producer' from conducting any activity at a "dwelling place," (s. 13), must only produce indoors at the specified site and outdoors is not authorized even on a temporary basis (s. 14).

The legal basis for the Motion and relief sought is as follows:

13. The Applicants/Plaintiffs are all Canadian citizens, ordinarily resident in British Columbia, Canada, that have been medically approved by their medical practitioner under the provisions of the ***Narcotic Control Regulations,* C.R.C., c.1041** or ***Marihuana Medical Access Regulations* SOR/2001-227** or the ***Marihuana for Medical Purposes Regulations* SOR/2013-119** pursuant to the ***Controlled Drugs and Substances Act* S.C.1996,c.19** to possess and under the ***MMAR*** to produce Cannabis (marihuana) for themselves as their medicine for their particular illnesses or to have the Cannabis (marihuana) grown for them by a designated grower/caregiver;

14. As a result of the decision of the Ontario Court of Appeal in ***R. v. Parker* (2000) 49 O.R. (3d) 481(Ont.C.A.)** (leave to appeal to the Supreme Court of Canada dismissed) recently reaffirmed by that Court in ***Her Majesty the Queen and Matthew Mernagh* (2013) Ont.C.A 67 (February 1st, 2013)(** leave to appeal to the SCC dismissed July 25th, 2013), the Government of Canada was required, in order to ensure that the ***Controlled Drugs and Substances Act* (CDSA)**was in compliance with the Canadian Constitution and in particular **s.7 of the *Canadian Charter of Rights and Freedoms***, to put in place a "constitutionally viable medical exemption" to the prohibition against the possession and cultivation of marihuana, that requires medical oversight. The failure on the part of the government 'to provide reasonable access for medical purposes' as an exemption to the general prohibition violated **s.7 of the *Canadian Charter of Rights and Freedoms*** in that the 'liberty' and 'security of the person' of the

patient was affected in a manner that was inconsistent with the "principles of fundamental justice". This ultimately led at first to exemptions pursuant to s. 56 of the *CDSA* and then to the promulgation of the *MMAR* pursuant to section 55 of the *CDSA*.

15. Thereafter, various successful constitutional challenges took place to the unreasonable restrictions on the **s.7 *Charter*** rights of patients or their designate, in the ***MMAR*,** limiting the number of patients a designated grower could produce for, limiting how many licenses could exist at any one location, and limiting possession to 'dried marihuana'. The ambit and scope of the constitutional right to safe, continuous reasonable access to cannabis (marihuana) as medicine, including the personal production thereof or production by a designate, was continued, notwithstanding the advent of a government supply, as another option, (***Wakeford v. Canada*** [1998] O.J. 3522; [2000] O.J.1479; [2002] O.J. No. 85, Ont.CA ***R. v. Krieger*** 2000 ABQB 1012, 2003 ABCA, 2008 ABCA 394, ***Hitzig v. Canada*** (2003) 177 OAC 321; ***Sfetkopoulos v. AG Canada*** 2008 FC 33 (FCTD) and 2008 FCA 328 (FCA) and ***R v. Smith* 2012 BCSC 544**.)

16. The Applicants/Plaintiffs plead and rely on **ss. 7, 24(1) and 52(1)** of the ***Canadian Charter of Rights and Freedoms* (the "*Charter*"),** Part 1 of the ***Constitution Act*, 1982** being Schedule B to the ***Canada Act*, 1982** (U.K.) 1982, c.11 (the *"Constitution Act 1982"*) and say that the MMPR, only to the extent specifically challenged, are not saved under s. 1 of the Charter as reasonable limits that are demonstrably justified in a free and Democratic society

17. The Applicants/Plaintiffs seek a declaration, pursuant to **s.52 (1) of the *Canadian Charter Of Rights and Freedoms*** that 'a constitutionally viable exemption' from the provisions of the ***Controlled Drugs and Substances Act (CDSA)***, in accordance with the principles and findings underlying the judicial decisions in ***R v. Parker***, (2000), 49 O. R. (3d) 481, ***Hitzig v. Canada*** (2003) 231 D.L.R. (4th) 104 and ***R v. Mernagh***, 2013 ONCA 67,to enable the medical use, by medically approved persons, of Cannabis, in any of its effective forms, includes the right of the patient (or a person designated as responsible for the patient), to not only possess and use Cannabis in any of its forms, but also to cultivate or produce and possess Cannabis in any form, that is effective for the treatment of the patient's medical condition.

18. The Applicant/Plaintiffs seek a declaration under **s.52(1) of the *Charter*** that the ***Marihuana for Medical Purposes Regulations* (*MMPR*)** that came into force on June 19, 2013, and which run together or concurrently with the ***Medical Marihuana Access Regulations* (*MMAR*)** until March 31, 2014, when the ***MMAR*** will be repealed by the ***MMPR***, are unconstitutional only to the extent that the ***MMPR*** unreasonably restricts the **s. 7 *Charter*** constitutional right of a medically approved patient to reasonable access to their medicine by way of a safe and continuous supply, and are inconsistent therewith by failing to provide for the continued personal production of their medicine by the patient or a designated caregiver of the patient, as provided for currently in the ***MMAR***, and

as such violates the constitutional rights of such patients pursuant to **s. 7 of the *Canadian Charter of Rights and Freedoms*** and cannot be saved by s. 1 thereof;

19. The Applicant/Plaintiffs seek a declaration pursuant to **s.52(1) of the *Charter*** that the limits in the ***NCR,*** and ***MMPR,*** as in the ***MMAR***, to possessing, selling or providing only "dried marihuana" are arbitrary, overbroad and result in grossly disproportionate effects and constitute an unreasonable restriction on the **s. 7 *Charter*** rights of these patients and producers and are not saved by s. 1 of the *Charter*, in accordance with the principles and findings underlying the judicial decision in ***R v. Smith***, 2012 BCSC 544;

20. The Applicant/Plaintiffs seek a declaration pursuant to **s. 52 (1) of the *Charter*** that the provisions in the *MMPR* (ss.12 – 15) that specifically limit production by a 'Licenced Producer' of Cannabis to "indoors", prohibiting any, even temporary, outdoor production and prohibiting production in "a dwelling house," are unconstitutional, to the extent that they might be found to be applicable to a patient generally, a patient personal producer or his or her designated caregiver as such limits and restrictions amount to arbitrary, and overbroad limitations and result in grossly disproportionate effects and unreasonable restrictions on the patients s. 7 *Charter* right to possess, produce and store for their medical purposes, and are inconsistent therewith and these limitations are not saved by section 1 of the *Charter*;

21. The Applicant/Plaintiffs seek a declaration pursuant to **s. 52 (1) of the *Charter*** that the provision in the *MMPR* (s.5 and in particular paragraph (c)) that specifically restrict the amounts relating to possession and storage by patients, to the "30 x the daily quantity authorized or 150 gram maximum, whichever is the lesser", and other similar related limitations applicable or imposed upon 'Licenced Producers' in relation to their registered clients / patients are unconstitutional, to the extent that they are applicable to a patient generally, a patient personal producer or his or her designated caregiver as such limits whether in the *Narcotic Control Regulations* (*NCR*) and/or in the *MMPR* amount to arbitrary unreasonable restrictions on the patients s.7 *Charter* right to possess, produce and store for their medical purposes, and are inconsistent therewith and these limitations are not saved by section 1 of the *Charter*.

22. The Applicants/Plaintiffs intend to seek an Order under s.24(1) of the Canadian *Charter of Rights and Freedoms*, as the appropriate and just interim remedy, for a constitutional exemption from s.4,5 and 7 of the *Controlled Drugs and Substances Act* for all medically approved patients/persons, including those holding an authorization to possess and a personal production license and those persons holding an authorization to possess and who have a person designated to produce for them under the *MMAR*, including that designated grower, pending the trial of the merits of the action, AND also together with an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to

the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48 or such further Order of the court as may be necessary.

23. The Applicant/Plaintiffs intend to seek an Order under s.24(1) of the Canadian *Charter of Rights and Freedoms*, as the appropriate and just final remedy, declaring the full ambit and scope of the medically approved patient's constitutional rights to produce, possess and store their medicine, pursuant to **s. 7 of the *Charter***, without any unreasonable and unnecessary restrictions thereon or, in the alternative, a permanent constitutional exemption from s.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons holding an authorization to possess and a personal production license and all persons holding an authorization to possess and who have a person designated to produce for them under the *MMAR*, including the designated producer, until such further Order of the court or in the further alternative, an order in the nature of a permanent exemption / injunction preserving the provisions of the ***MMAR*** relating to personal production, possession, production location and storage by a patient or designated caregiver and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the ***MMPR*** to such patients or designated caregivers, until such time as the Defendants makes appropriate amendments to the ***MMPR*** to comply with any decision of this Court with respect to the unconstitutionality thereof.

THE GROUNDS FOR THE MOTION ARE:

24. The Plaintiffs say that the "material facts" and "legal basis" demonstrate that the "security of the person" of the Plaintiffs and all others similarly situated as medically approved patients, and potentially their "liberty" are engaged in the circumstances, bringing into play s.7 of the *Canadian Charter of Rights and Freedoms* and these rights are being deprived in a manner than is inconsistent with the principles of fundamental justice in that they are arbitrary, overbroad and will result in grossly disproportionate effects by failing to continue to provide the Plaintiffs and other similarly situated medically approved patients with a reasonable safe and continuous supply of their medicine as a viable constitutional exemption under the *Controlled Drugs and Substances Act* in all of the circumstances.

25. The Plaintiffs say that these circumstances raise serious constitutional issues to be tried.

26. The Plaintiffs say that the proposed repeal of the *MMAR* on March 31st, 2014 and the implementation of certain limiting provisions of the *MMPR* will result in irreparable harm to the Plaintiffs and all other similarly situated medically approved patients by taking away their ability to produce their medicine for themselves, or have a designated caregiver do so for them if they are unable to

do so, to ensure a safe, continuous supply of their medicine at a cost that they can afford and impacting upon their ability to access medicine for their health in the absence of which irreparable harm might be caused to their health.

27. The Plaintiffs say that the balance of convenience, taking into account the public interest, favours maintaining the status quo, namely the continuation of their ability to produce for themselves, store and use cannabis as medicine, until the court has determine the constitutional issues arising in all of the circumstances.

THE FOLLOWING DOCUMENTARY EVIDENCE will be used at the hearing of the motion:

1. Affidavit of Neil Allard, sworn January 10, 2014;
2. Affidavit of David Hebert, sworn January 13, 2014;
3. Affidavit of Tanya Beemish, sworn January 13, 2014;
4. Affidavit of Shawn Davey, sworn January 8, 2014;
5. Affidavit of Brian Alexander, sworn January 8, 2014;
6. Affidavit of Dan Nelson, sworn January 9, 2014;
7. Affidavit of Zachary Walsh, sworn January 15, 2014;
8. Affidavit of Susan Boyd, sworn January 15, 2014;
9. Affidavit of David Pate, sworn January 16, 2014; and
10. Affidavit of Danielle Lukiv, sworn January 17, 2014.
11. And such further material as the Applicant may advise and this Honourable Court may permit.

DATED: January 17, 2014

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No. T-2030-13

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AFFIDAVIT OF NEIL ALLARD

I, NEIL ALLARD, Disability pensioner, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am one of the Plaintiffs herein and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. I am 59 years of age, born in 1954 in Winnipeg, Manitoba and reside in Nanaimo, British Columbia. I am 5'11 and only weigh 134 lbs and have been unable to work since 1995. I am recently divorced and have no children or dependents. I have a Bachelor of Social Work degree from the University of Manitoba (1982) and while employed in my career as a social worker I continued to study in evenings at colleges and universities, including the University of Winnipeg and the University of British Columbia, where I had been hoping to complete a Masters degree in social work. Those plans were cut short

when I became ill and could no longer work in 1995. Now produced and marked as Exhibit "A" to this my Affidavit is a copy of my CV comprising 4 pages.

3. I was employed as a counselor with Veteran's Affairs Canada in Vancouver, BC advising veterans on various programs, including disability issues and worked in that capacity for approximately 10.5 years from 1988 when in 1995 I found myself unable to continue working do to my poor health and becoming severely ill. While I made efforts to regain my health unfortunately by 1999 I received a permanent medical retirement on medical grounds through Health Canada. I have been retired and on pension since that time. I currently receive a combination of pensions, including the Canada Pension, a Federal government super annuation pension and a Sun Life Wage Loss Replacement, another Federal government policy. These pensions currently provide me with approximately $2,700.00 per month after taxes and deductions until age 65, in five years time, at which time my Sun Life wage loss replacement income will come to an end and I will be applying for Old Age Pension. At that time my income will drop to approximately $24,000.00 per year or $2,000.00 per month. Now produced and marked as Exhibit "B" to this my affidavit is a copy of the certificate I received thanking me for my 10 years of loyal service to Veterans Affairs Canada, signed on June 19, 1998.

4. In 1995 I was diagnosed by my health care practitioner to have 'Myalgic Encephalomyelitis', a serious neuro-immune disorder affecting every system in my body, as well as clinical depression, which I believe is a life long inherited ailment and while it lifts from time to time it can become disabling particularly in chronically stressful conditions such as having to deal with constant issues over my Authorization to Possess (ATP) Marihuana for medical purposes and my related Personal Production Licence (PPL) with Health Canada.

5. Now produced and marked as Exhibit "C" to this my affidavit is a copy of a one page summary of facts of the nature of my illness.

6. Through trial and error I learned that I had a profound sensitivity to pharmaceutical medications and then on the advice of my health care practitioners, including a specialist, I began using Cannabis (Marihuana) to get some relief from many of the

symptoms I was experiencing. The results were very positive and I was referred to the B.C.Compassion Club Society in Vancouver through a written note of support from my general practitioner in October 1998 at a time when I lived in Vancouver. Now produced and marked as Exhibit "D" to this my affidavit is a copy of the note from Dr. Shintani of October 21st, 1998.

7. By 2001 I found it was costing me about $500 a month to acquire cannabis (marihuana) as medicine from the Compassion Club and I was not getting the strains and the quality I needed so I realized I would have to grow it myself if I were to continue to benefit from it as it was getting too expensive for me to purchase it and to access it was also difficult as I had very little energy to move around and my nervous system is easily disrupted in crowds or situations involving people and noises.

8. Now produced and marked as Exhibit "E" to this my Affidavit is a copy of Letter from Dr. Leon Berzen, neuropsychiatrist, dated May 1, 2001 supporting my continued cannabis use.

9. Now produced and marked as Exhibit "F" to this my Affidavit is a copy of Letter from Dr. Shintani dated November 5, 2001 confirming I have been a patient of his since January 1996 and endorsing my use of cannabis and indicating the support from the specialist Dr. Berzen.

10. I moved from the Lower Mainland to Nanaimo, BC in September of 2002. I purchased a house there and decided I should try and obtain the appropriate licence through the Health Canada program to provide for my own needs by growing the cannabis for myself. I proceeded to do as much research as I could about growing cannabis (marihuana) so that I could keep my cost down. I took a course through the Continuing Education program at Malaspina College in Duncan, BC entitled "Medical Marihuana Course HEMM001" which started October 15 and completed October 22nd, 2003. The course was conducted by Eric Nash and Wendy Little. This course helped me to navigate the extremely difficult process of applying to participate in the Health Canada program to obtain my Authorization to Possess and my Personal Production

Licence. Now produced and marked as Exhibit "G" to this my Affidavit is a copy of the course offering and Exhibit "H" my registration statement.

11. Now produced and marked as Exhibit "I" to this my Affidavit is a copy of Letter of January 15, 2003 from Dr. Bruce Carruthers indicating his continued support for my use of cannabis.

12. Now produced and marked as Exhibit "J" to this my Affidavit is a copy of my BC Compassion Club Society member renewal from October 29th, 2004 confirming my continued membership with the BC Compassion Club Society in that period of time.

13. I received my first Health Canada authorization to produce cannabis for myself, a Personal Production License (PPL) in 2004 at or in my residence in Nanaimo, BC. At that time I made inquiries to Health Canada about safety issues, inspections and help with seeds and basic growing information, but I received no assistance from them and was advised to simply search the internet for my seeds. I purchased books and seeds and spent hours researching various strains and methods of growing and the equipment needed. I put a lot of time and energy into research and planning and developing knowledge of organic cannabis growing and having a production site built. I invested substantial amounts of money to set up the production site.

14. In 2007 I moved into a house in Lantzville, B.C. and paid for the construction of an indoor production facility and partially paid for the construction of a greenhouse. At that time my wife, was also a medically approved cannabis user, so she and I and one other were able to produce our medicine and share the costs at that location. Being able to produce outdoors in the summer and in a greenhouse during part of the year saved substantially on the overall electrical costs that are primarily incurred when growing indoors.

15. In 2012 I separated from my wife and I moved to my current location in Nanaimo, BC and had a third production site built by professional trades people and it is my current site which is in the basement of my dwelling house and I designed this site for indoor gardening. I spent thousands of dollars having my basement insulated, and two

grow rooms built with professional wiring, insulation, venting and painting. I installed new plumbing, two laundry tubs and a new sewer pump to feed and water my indoor cannabis plants. I had all of the work done by certified electricians and contractors and BC Hydro was notified to inspect completion of all of the electrical work. Now produced and marked as Exhibit "K" to this my affidavit is an electrical inspection report.

16. The warm air from my lights is filtered and used to heat my home during cooler months. The humidity in my home and in my growing rooms is quite dry (under 40%) as I use a wood burning stove for heat on the main level which tends to keep the humidity low overall in my home, so there is no risk of any mould problems. In my vegetative room I use only two four hundred watt light bulbs and for the flowering room I use a maximum of two 600 watt light bulbs. Both rooms are fully insulated, including the walls and ceilings, and the floor in my basement is entirely concrete. There are two canister fans in each growing room for fresh air intake and exhaust air, and both rooms are equipped with two oscillating fans to circulate the air. The fans are controlled by a relay switch to maintain constant temperature and humidity. I also had a large insulated room built in my basement for producing clones and seedlings under a small florescent light and storing dried cannabis, oils and tinctures which I grow and prepare for my own personal use only. I have never had a problem with fire or any concerns about electrical safety because of the professional job done by the electricians.

17. As indicated above, I have grown outdoors and in a greenhouse and found the cost of growing outdoors alongside my spinach, kale, carrots and other herbs and fruit to be almost zero since the soil, compost, water, rain and sunshine are all in place. This is what I was planning to do at my current property. With respect to the public safety risk of break and enters and attempts to steal my plants in production or medicine, I live near the end of a short dead-end street with very low car and pedestrian traffic and I can easily hear and see vehicles or persons coming and going from the area inside my home. I am home nearly all of the time and I have motion detectors at the front and back of my house and all outside doors are kept locked. All three cannabis production related rooms in my basement are equipped with doors which lock and I have both CO2 and smoke alarms in place. My backyard has tall wooden privacy fencing on both sides

between my property and my neighbours. The nearest neighbour's property is 13 feet from my house. My lot is 70.5 ' by 150' which is slightly under one quarter of an acre in size. There are mature fruit trees along the perimeter of my home and a large tall hedge at the rear. I have a small green house on my property and I hope to install another larger one. There are several tall wooden structures to stack firewood, which helps additionally to maintain my backyard privacy. I am allowed to keep up to six chickens on my property, which I may do at some point to lower my living costs, but in particular I hope to be able to have sufficient medicine at a reasonable cost with indoor and outdoor growing at different times of the year.

18. My current dosage of cannabis is authorized at 20 grams per day and the cost of production for all of my needs is approximately $200-$300 a month depending upon air conditioning needs, my health and my supply. The costs are mostly for the electrical expenses of running the lights and the air conditioning. I have grown outdoors and in a greenhouse at two of the previous production sites and the cost of growing outdoors is almost zero since the soil, compost, water and sunshine are already in place. I estimate that my total financial cost for all of the equipment and building at the three different sites to be somewhere in the area of $35,000.00

19. I currently have a viable production site and fully equipped basement which I can continue to produce excellent quality medicine for a nominal cost with no impact on anyone else. I am allowed to produce 98 plants indoors to ensure sufficient yield and variety. Sometimes I become too ill to take care of the plants and they end up dying. I grow organically and the yield on one of my indoor plants is often less than an ounce per plant. My current arrangement allows me to grow suitable strains at the right strength that work for me. I am currently working with 13 different strains. I believe that reasonable regulation and inspection can ensure safety, security and prevent abuse of the program.

20. My method of cannabis use is to vapourize the buds and leaves and I sometimes chew the fresh leaves. I use the leaves and buds for making edible oils and topical oils as well. Many cannabis strains do not seem to work for me and actually worsen some

of my symptoms. I have identified a number of strains which I rotate in my garden which are specific to my needs. I have also been breeding plants and trying new strains. Under the new proposed Regulations I will no longer have access to these strains or to fresh leaves and I would no longer have quality control assurance over my organically homegrown cannabis herbs and fear that my safe access to medical cannabis will be essentially compromised.

21. I cannot afford black market prices including Dispensary or Compassion Club prices estimated at between $6 - $12 a gram when I can produce the plant for pennies for my own use. The estimated $8-$10 a gram purchase price through Licenced Producers at my current dosage of 20 grams per day would cost me $200 per day or approximately $6,000.00 a month or $72,000.00 a year. On the other hand I can produce this herbal medicine for myself for a fraction of that cost and I have been able to produce it and use it effectively maintaining my own quality controls at a cost of approximately $200 to $300 per month. Even at five dollars per gram, it would still cost m $100.00 per day or approximately $3,000.00 per month, which is more than my total monthly income.

22. In approximately 6 years from now I will turn 65 years of age and my income will be reduced further as indicated above and I am therefore attempting to ensure my own financial independence and to eliminate all debt and not to incur further debt in having to purchase my medicine. I am unable to receive any imbursement or reimbursement or coverage for cannabis through the Public Service of Canada Extended Health Care plan as it, Cannabis (marihuana) is not considered eligible under that plan. In addition I have learned how to successfully grow cannabis (marihuana) without the use of harmful chemicals and toxicant sprays and control the quality and safety of my medicine and I find the oxygen released by the plants along with the gentle exercise of growing highly therapeutic as well.

23. I have had the continuing support from my attending health care practitioners since 1998 and now attached and marked as Exhibit "L" is a letter dated March 11th, 2008 from Dr. Bruce Carruthers, a specialist in internal medicine indicating his continuing support of my use of medical marihuana since 2003.

24. Now produced and marked as Exhibit "M" to this my Affidavit is a copy of a letter from Dr. Jim Mander, Medical Arts Center dated December 1, 2009 confirming his diagnosis.

25. Now produced and marked as Exhibit "N" to this my Affidavit is a copy of a document describing a Consultation with Dr. K.A. Muendel that occurred on June11th, 2012 and this report further assesses and documents my condition and the effective use of cannabis (marihuana) for my medical condition.

26. I have consulted numerous specialists, including an anesthesiologist at the Pain Clinic at Nanaimo General Hospital, a psychologist at that Pain Clinic and various others about my situation. My current ability to control the quality of my medicine and ensure a continuous safe supply for myself that is effective, and not be dependent on others producing for me that includes the additional stress of worrying about them getting the strains right and the right organic quality, and getting enough product on time as needed, is the best situation for me and has not and should not have any negative impact on anyone else.

27. I live alone and do not have any pets. I spend a lot my time alone due to my sensitive nervous system. My lifestyle is one of quiet, meditation, healthy, non-western diet, nature, gardening and exercise. I found dealing with Health Canada and its regulations very difficult and exhausting and it gave me constant stress. The proposed new changes and my lack of ability to afford the medicine under the current program with the threat of imprisonment if I produce without a permit, has given me even more substantial anxiety and stress and fear about the future. Every day I wonder how I am going to be able to continue to afford to use organic cannabis (marihuana) of the right strength that works effectively for me. I continue to consult doctors and naturopaths about my medical situation.

28. I do not drink alcohol as I cannot tolerate it and I do not smoke anything including cannabis. I use one pharmaceutical pill Clonazepam (a benzodiazepine) in small amounts along with organic cannabis (marihuana) which is either juiced from the raw plant, eaten in baked goods, used topically in oils and vapourized through a vaporizer or

atomizer. I use the fresh leaves for juicing raw cannabis and dried leaves and female flowers for vapourizing, oils and edibles. I use the safer, cleaner, healthier vapourizing method instead of smoking and have done so for years. The cannabis (marihuana) serves as an antidote to the side effects of the pill I am prescribed which gives particularly negative effects in the morning.

29. Given my documented and medically approved need for 20 grams a day I am concerned about the limits on personal possession of a maximum of 150 grams at any one time as I use it in various different formats and would find it difficult to travel far from my storage site for any period of time if I am limited to 150 grams maximum in my possession at any given time. As indicated I use the plant in its raw form by chewing or juicing the fresh leaves as well as vapourizing dried flowers and leaves and I use them in edibles and topical oils. Under the new regime I understand I would no longer have access to some of these homemade products as I will be limited once again to "dried marihuana" only. I also understand that I will have to destroy any cannabis (marihuana) in whatever form that I have on March 31st, 2014 instead of being able to consume it until it is used up before having to access a Licenced Producer, if I could afford one, which I cannot, based on estimated prices and the prices currently advertised.

30. I am very stressed about the plan to take away my ability to produce my medicine for myself and to be able to control the strains and production site to ensure effective medicine for myself and with no contaminates. In conducting my research I came across an excerpt from the "American Herbal Pharmocopeia" which lists the various chemicals people use in producing marihuana and that I scrupulously avoid and I wish to continue to avoid the use of any such chemicals in the production of my medicine. Now produced and marked as Exhibit "O" to this my affidavit is a copy of excerpts from that document comprising 15 pages in total and the list of chemicals is at page 50 (page 14 of the attachment). Further, I am very concerned that if the court does not enable me to continue to produce for myself that I will be at risk of imprisonment if I continue to do so without a Health Canada licence and will be likely forced to go back to the black market to seek out a black market product that is less expensive than that coming from

licenced producers. Once again this concerns me as to what or how the street cannabis is produced and what it contains and how it might impact upon my health.

31. On September 6, 2012 I applied to Health Canada to amend my production site and increase my dosage. Now produced and marked as Exhibit "P" to this my Affidavit is a copy of that letter.

32. Now produced and marked as Exhibit "Q" to this my Affidavit is a copy of Form B completed by Dr. Mander that supports me, also signed by my specialist Dr. Karl Muendel dated September 6, 2012.

33. Now produced and marked as Exhibit "R" is a copy of my Authorization to Possess approved by Health Canada under my client ID number 23 and MMAD number 1792-13 which is valid until March 31st, 2014, having been issued July 15, 2013 and authorizing me to possess up to 600 grams on my person at any time. I have blacked out my address and mailing address for privacy and security reasons and can make them available to the court or others if required to do so.

34. Now produced and marked as Exhibit "S" to this my affidavit is a copy of my Personal Use Production Licence under the same MMAD ID and client ID number issued July 15, 2013 and expiring on March 31, 2014 and authorizing me to produce 98 plants indoors and to store 4,410 grams indoors. Once again I have deleted my address, mailing address, production site and storage site addresses for privacy and security reasons and will make them available if the court so requires.

35. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver

'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Nanaimo, in the Province of British Columbia, this 10th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

NEIL ALLARD

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

C. V.

Neil V. Allard
[redacted],
Nanaimo, B.C.
[redacted]

D.O.B. May 25, 1954

This is Exhibit "A" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of January 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

Education and Training:

- **University of British Columbia**: 1989- 1990

Completed a course in Counselling Psychology

I made a preliminary application to the MSW, graduate school program in 1994 and received notice that my entrance requirements were met. Full application was not made due to illness.

- **University of Winnipeg**: 1985- 1986 evenings

Completed a course in Civil Rights & Liberties (Political Studies); and Social Psychology

- **University of Manitoba**: 1977- 1981

Completed Bachelor of **Social Work Degree** (four year full time study)

- **Vancouver Community College**: 1989, evenings

Completed a course in Counselling Skills;

- **British Columbia Institute of Technology**: 1988 fall evenings

Completed a course in Personnel Management (Administration Dept.)

- **Ministry Of Labour and Consumer Services, Burnaby, British Columbia**: June & July, 1988

Completed an eight session evening series entitled "Substance Abuse Education Program"

- **Alcoholism Foundation of Manitoba**: April, 1981

Completed a full five day program entitled "Prevention and Treatment of Alcoholism"

- **Red River College**: Winnipeg, Manitoba; 1987, 1983, 1976-1977, 1974, 1972

ABC's of Real Estate (winter, 1987)

A/V Media Production Techniques course (fall), 1983

Completed One year full time studies in **Domestic Electronics program; Diploma** received in 1982

Completed Adult basic Education Grade X (1972); XI upgrading courses, 1974

- **Manitoba Department of Education:** June, 1974

Received General Education Development **Grade XII Diploma**

Social Work/ Counselling Employment:

- **Veterans Affairs Canada:** 1985- 1999

Area Counsellor Position: responsible for social, financial, personal, and health related assessments of aging War Veterans in specific geographical areas of metro Vancouver and the Fraser Valley. This involved regular home visits to veterans for assessments, referrals, counselling and necessary follow- up on case planning. As a result of illness, I was off work, on sick leave, as of August 1995, with a subsequent medical retirement in 1999.

- **Ministry of Social Services and Housing:** December, 1987- July, 1988; Auxiliary Position

Social Worker: Maple Ridge, Pitt meadows, Port Coquitlam, and Port Moody areas of Vancouver. Child Protective services and child in care supervision to families and children in and out of care. The position involved child apprehensions, placements, foster home/adoption studies and assessments, juvenile and family court appearances as needed.

- **Child and Family Services of Winnipeg West:** 6 month term position, January - July, 1987

Social Worker: Child Protective services and child in care supervision to families and children in and out of, similar to those mentioned above.

- **North east Winnipeg Family and Child Extended Social Services (N.E.W. F.A.C.E.S.S.)** April 1985- May, 1986

Deployed from the defunct Children's Aid Society.

Social Worker: Child Protective services similar to those above.

- **Children's Aid Society of Winnipeg:** February, 1984- April, 1985,

Social Worker and Supervisor: Authored, developed and implemented an "**Independence Living Program**", aimed at assisting children in care with a smooth transition to after care at age 18. Completed comprehensive assessments and worked creatively with teens in care, ages 14- 18 towards their independence. Became Supervisor to two social workers as the caseloads expanded with the program's popularity.

The Children's Aid Society became defunct as of April, 1985. I was deployed from there as a generic child protection social worker to N.E.W. F.A.C.E.S.

I also completed my **third year social work student placement at C. A. S of Winnipeg in 1980.**

- **City of Winnipeg Social Services:** May, 1981- March, 1983

Social Worker: Assessed financial eligibility for social assistance to singles and families. I provided screening, counselling, intake, referral and liaison services to persons with suspected or known alcohol/ drug dependence. Made regular home visits to clients and assisted in other capacities for the city emergencies as required.

I also worked as a **Social Worker trainee** in the summer of 1980 while attending the University of Manitoba. I was responsible for review assessments or "re- registration" of all clients who had been on financial assistance for over three months. I also, made comprehensive assessments of the city's care homes, and group homes for the elderly, and the physically and mentally challenged and provided recommendations for improvement.

Other employment:

- **University of Manitoba Instructional Media Centre:** part time, Sept, 1979-April, 1981

Projectionist: Involved setting up and operating film projectors and other audio visual equipment in theaters and classrooms throughout the university campus.

- **Manitoba Liquor Control Commission:** part time and casual while attending University

Involved **sales, stock clerk and cashier** duties at various liquor stores throughout Winnipeg

- **Canadian Tire:** part time; August, 1977- December, 1979(Pembina Hwy location, Winnipeg)

Hardware sales clerk

- **Swift Canada (Winnipeg):** Jan, 1974- July, 1976

Involved a variety of general plant duties

Other Activities:

I have been actively involved with ownership, rentals, and management of real estate since 1983. I own my own home and property in Nanaimo, B.C. where I have retired.

Volunteer: 1993- 1995

Vice Chair of Strata Council where I resided at 1045 Haro Street, Vancouver, B.C.

This was a 180 unit, apartment building converted from rentals. The building had a commercial strip mall condominium building attached to it which was part of our Strata Corporation.

The entire building required re-plumbing and extensive renovations and upgrades. This strata corporation was filled with challenges of all types. I worked closely with Vancouver Condominium Services and learned a great deal in the process, including firing and hiring new on-site management and strata corporation management companies, active involvement with financial reports and decisions, report writing; running meetings, and handling complaints and disputes.

As young adult, I was employed in several labour and service jobs, including:

Part time **hospital kitchen work, delivery driving, bartending, truck driving** (3-5 ton), **factory** and **warehouse** work. As a teenager, I was **a carrier** for a **daily newspaper** from ages 11- 14.

Although I lived independently from the age of 15, I am a former permanent ward of the Children's Aid Society of Eastern Manitoba, until the age of 18 when I was suddenly completely on my own in Winnipeg. This life experience provided the personal motivation and incentive to pursue a career in Social Work, particularly, child protection and the welfare of children in care.

This is Exhibit "B" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of January 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

The HUMMINGBIRDS' FOUNDATION for M.E. (HFME)

Fighting for the recognition of Myalgic Encephalomyelitis based on the available scientific evidence, and for patients worldwide to be treated appropriately and accorded the same basic human rights as those with similar disabling and potentially fatal neurological diseases such as Multiple Sclerosis.

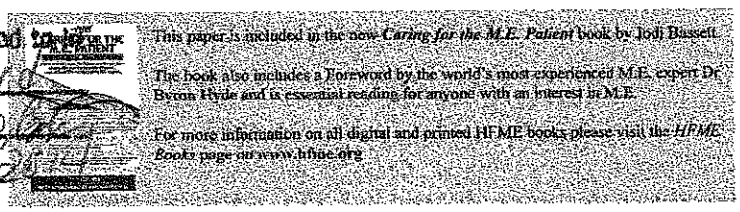
A one-page summary of the facts of M.E.

- Myalgic Encephalomyelitis (M.E.) is a disabling neurological disease that is very similar to Multiple Sclerosis (M.S.) and Poliomyelitis. Earlier names for M.E. were 'atypical Multiple Sclerosis' and 'atypical Polio.'
- M.E. is a neurological disease characterised by scientifically measurable post-encephalitic damage to the brain stem. This damage is an essential part of M.E., hence the name M.E. The term M.E. was coined in 1956 and means: my = muscle, algic = pain, encephalo = brain, mye = spinal cord, tis = inflammation. This neurological damage has been confirmed in autopsies of M.E. patients.
- Myalgic Encephalomyelitis has been recognised by the World Health Organisation's International Classification of Diseases since 1969 as a distinct organic neurological disease. M.E. is classified in the current WHO International Classification of Diseases with the neurological code G.93.3.
- M.E. is primarily neurological, but also involves cognitive, cardiac, cardiovascular, immunological, endocrinological, metabolic, respiratory, hormonal, gastrointestinal and musculo-skeletal dysfunctions and damage. M.E. affects all vital bodily systems and causes an inability to maintain bodily homeostasis. More than 64 individual symptoms of M.E. have been scientifically documented.
- M.E. is an acute (sudden) onset, infectious neurological disease caused by a virus (a virus with a 4-7 day incubation period). M.E. occurs in epidemics as well as sporadically and over 60 M.E. outbreaks have been recorded worldwide since 1934. There is ample evidence that M.E. is caused by the same type of virus that causes Polio; an enterovirus.
- M.E. can be more disabling than M.S. or Polio, and many other serious diseases. M.E. is one of the most disabling diseases that exists. More than 30% of M.E. patients are housebound, wheelchair-reliant and/or bedbound and are severely limited with even basic movement and communication.
- *Why are M.E. patients so severely and uniquely disabled?* For a person to stay alive, the heart must pump a certain base-level amount of blood. Every time a person is active, this increases the amount of blood the heart needs to pump. Every movement made or second spent upright, every word spoken, every thought thought, every word read or noise heard requires that more blood must be pumped by the heart.

  However, the hearts of M.E. patients only pump barely pump enough blood for them to stay alive. Their circulating blood volume is reduced by up to 50%. Thus M.E. patients are severely limited in physical, cognitive and orthostatic (being upright) exertion and sensory input.

  This problem of reduced circulating blood volume, leading to cardiac insufficiency, is why every brief period spent walking or sitting, every conversation and every exposure to light or noise can affect M.E. patients so profoundly. Seemingly minor 'activities' can cause significantly increased symptom severity and/or disability (often with a 48-72 hour delay in onset), prolonged relapse lasting months, years or longer, permanent bodily damage (e.g. heart damage or organ failure), disease progression or death.

  If activity levels exceed cardiac output by even 1%, death occurs. Thus the activity levels of M.E. patients must remain strictly within the limits of their reduced cardiac output just in order for them to stay alive. *M.E. patients who are able to rest appropriately and avoid severe or prolonged overexertion have repeatedly been shown to have the most positive long-term prognosis.*
- M.E. is a testable and scientifically measurable disease with several unique features that is not difficult to diagnose (within just a few weeks of onset) using a series of objective tests (e.g. MRI and SPECT brain scans). Abnormalities are also visible on physical exam in M.E. M.E. is a long-term/lifelong neurological disease that affects more than one million adults and children worldwide. In some cases M.E. is fatal. (Causes of death in M.E. include heart failure.)



This paper is included in the new *Caring for the M.E. Patient* book by Jodi Bassett.

The book also includes a Foreword by the world's most experienced M.E. expert Dr. Byron Hyde and is essential reading for anyone with an interest in M.E.

For more information on all digital and printed HFME books please visit the *HFME Books* page on www.hfme.org

This is Exhibit "D" referred to in
the affidavit of Neil Allard
sworn before me at Nanaimo BC
this 10 day of Jan 2014

A Commissioner for taking Affidavits
for British Columbia

ALBERT E. KING, Q.C.
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155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

Janet Franiek, M.D., C.C.F.P.
Joy Russell, M.D., C.C.F.P.
Jessica Shintani, M.D., C.C.F.P.
213 - 2678 West Broadway
Vancouver, B.C. V6K 2G3

Tel. 736-8151

For NEIL ALLARD

Address

Date OCT. 21/98

℞
TO THE COMPASSION CLUB —

This is to certify that Neil Allard has chronic fatigue syndrome. He was diagnosed to have this condition since approximately three and one half years ago.

Any assistance to support your can provide Neil is greatly appreciated

Yours sincerely,
J. Shintani, MD

DO NOT REPEAT ☐ PRN ____ TIMES AT ____ PLEASE LABEL ☐ DAY INTER... OF

DR. LEON BERZEN
MBBCh, FFPsych(SA), FRCP(C)
Neuropsychiatry

May 1, 2001

To whom it may concern
Re: Mr Neil Allard.

My patient (above named) is currently applying to Health Canada for his legal medical use of marajuana.

I believe that his quality of life is improved by it's use.

DR. LEON BERZEN
2255 WESBROOK MALL
VAN. B.C. V6T 2A1

This is Exhibit "E" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, B.C. this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
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Janet Franiek, B.Sc., M.D., C.C.F.P.
Joy Russell, M.D., C.C.F.P.
Jessica Shintani, B.Sc., M.D., C.C.F.P.

Family Physicians

213 Signature Place
2678 West Broadway
Vancouver, B.C.
V6K 2G3
736-8151

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

This is Exhibit "F" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

November 5, 2001

To: Health Canada
Re: Neil Allard
d.o.b. May 25/1954

Mr. Neil Allard has been my patient since January, 1996. He is a former counsellor and social worker and is permanently medically retired from Veterans Affairs Canada due to a complex set of medical problems as indicated by his specialist, Dr. L. Berzen, neuropsychiatrist at U.B.C. Hospital. There is no known cure for his illness.

Dr. Berzen endorses his use of medical marijuana, as I do. It has been quite beneficial for alleviating symptoms and improving his quality of life. Numerous other medications have been tried, as well as several complementary therapies. With most of these, significant side effects limited their use, and those that were tolerated provided little relief of symptoms.

I believe Mr. Allard is responsible with his use of medicinal marijuana.

I trust this information is helpful.

Dr. J. Shintani, M.D.

Healing Through Energy Psychology

Krisanna Jeffery

Are you overwhelmed? Overworked? Overcharged? Benefit from learning three easy, non-invasive techniques to manage the body's energy and emotions. Learn simple, effective ways to work with your natural ability to heal yourself and to manage chronic pain. This fun, interactive workshop, based on scientific research and energy psychology techniques, teaches ways to de-stress, regenerate, and restore a healthier balance. Counselors and health care providers, as well as the general public, will benefit from this course.

HEEP 001 S04D1 $76 + GST = $81.32
1 session: Sat, Mar 20; 9:30am-3:30pm
(1 hour lunch break)

Helping Families Transition Through Separation And Divorce

Wendy Brooks, RSW, M.Ed.

This workshop is intended to develop an understanding of the effects of separation and loss in the family, and to understand the needs of children during the separation and divorce process. By understanding the process, parents are better able to help their children with the emotional difficulties sometimes encountered by families going through stress and change. Using instruction, discussions, and small group exercises, Wendy will cover grief and loss, anger, parental roles, children's needs, and weathering conflict. The goal of the class is to understand how to maintain balance for children during stressful and difficult times. Intended for parents who are experiencing separation and divorce, and others who are interested in the subject.

HEHF 001 S04D1 $54 + GST = $57.78
1 session: Sat, Apr 3; 9am-4pm

Weather Alert

Should weather conditions cause course cancellations, listen to local radio stations:

- *89.7 SUN FM, Duncan*
- *106.9 CHWS FM (The Wolf), Nanaimo*
- *88.5 CIBH FM (The Beach), Nanaimo*
- *90.5 CBC FM Victoria*

for announcements.

Medical Marijuana

Eric Nash and Wendy Little

Government-licensed marijuana growers will show you how to apply for Health Canada's Medical Marijuana Access Program. Topics include patient and grower application forms and plant strain selection for various medical conditions. *Wendy Little and Eric Nash are the founders of Canada's leading medical marijuana resource website: www.medicalmarihuana.ca. Their website is noted as a national reference for the Canadian AIDS Society, the Multiple Sclerosis Society of Canada, health professionals, patients, and licensed growers from across Canada and around the world.*

HEMM 001 S04D1 $48 + GST = $51.36
1 session: Sat, Mar 27; 10am-3pm (1hour for lunch)

Massage And Relaxation Techniques

Marilyn Swallow

This experiential course will teach you the basic principles of massage and guide you towards confidence in your skills of healing touch. You will learn a variety of techniques, breath work, and tricks of the trade. This hands-on approach guarantees you will be calm and relaxed in no time. Bring 1-2 pillows and a blanket, wear loose clothing and shorts. Couples are encouraged to attend together. *Marilyn Swallow has been a registered massage therapist since 1992 and is co-owner of Wellspring Clinic in Duncan.*

HEMA 001 S04D1 $64 + GST = $68.48
2 sessions: Sat, Apr 3-17; 12noon-4pm
(No class Sat. April 10, 2004)

Angels - We All Have One

Susie Buckley

Through angel directed meditation and focusing practices, discover and enter into a direct dialogue with your "Angels". We all hear what our angels have to tell us, but we don't often recognize the language used in this communication. Here is an opportunity to step out of your usual human confusion, and learn how to ask for reassurance and guidance from your angels.

HEAW 001 S04D1 $46 + GST = $49.22
1 session: Sat, Mar 6; 10am-4pm

Gillian has been a registered clinical herbalist for 25 years and is currently president of the Canadian Herbalists of B.C. She has been selected to sit on the National Expert Advisory committee in Ottawa helping to regulate natural health products.

Menopause: The Natural Way

Gillian Leverkus, Ph.D.R.H.P.

Hot flashes, mood swings, insomnia, and the blues. Does this sound familiar? Is your quality of life being affected? Do you need hormone replacement therapy? What does peri-menopause mean, and what are progesterones and estrogen? Let Gillian answer your menopausal concerns, and take a look at how you can gain the knowledge to manage menopause gracefully with herbal medicine, nutrition, and lifestyle changes.

HEMT 001 S04D1 $30 + GST = $32.10
1 session: Mon, Apr 5; 6:30-8:30pm

Acupressure For Dogs

Michael Lines, D.T.C.M.

Learn a gentle acupressure routine to relax and energize your dog, and acquire the knowledge to keep your animal healthy. The class will be particularly helpful for those of you with older dogs that may have osteoarthritis, hip dysplasia, or spinal problems. Bring your dog and a blanket.

HEAF 001 S04D1 $49 + GST = $52.43
1 session: Sat, Apr 24; 9-12noon

This is Exhibit "C" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

165372

Registration Statement

12-SEP-2003 12:08

ALLARD NEIL V
539-055-681
527D

Program: CES
2003-10-15 to 2003-10-22

MALASPINA UNIVERSITY COLLEGE
PAID
SEP 12 2003
COWICHAN CAMPUS

ALLARD NEIL V
[redacted]
NANAIMO, BC
[redacted]

Home (250)741-0009
Bus. (250)000-0000 L0000

<= Correspondence will be sent to this address.

Changed to Nov 15/03

HEMM 001 F03D1 MEDICAL MARIJUANA $48.00
Starts: 15-OCT-2003 Ends: 22-OCT-2003
Duncan
Wed 19:00-21:00

Malaspina University-College

Paid 2003-09-12 Visa $51.36

	Tuition	$48.00
	Goods and Services Tax +	$3.36
Processed by: NK/51.36 VISA	Paid to Date -	$51.36
Enrolment No: 5390-5568-019 (I) 569085	Net Payable ==>	$0.00

www.mala.ca

This is Exhibit "H" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
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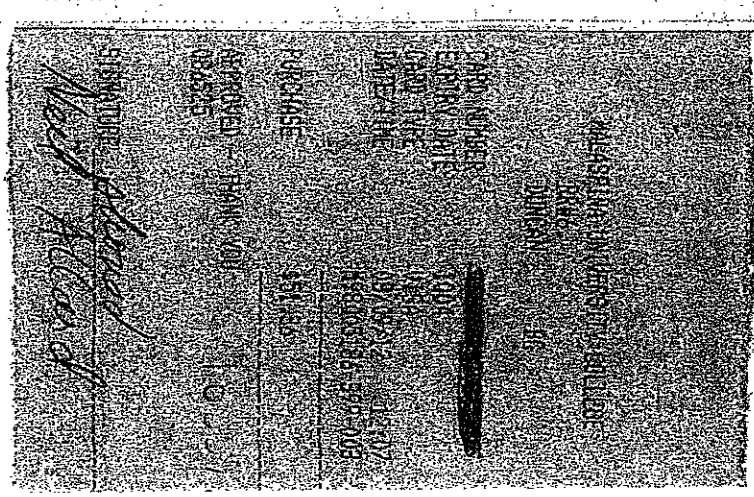

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This is Exhibit "I" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

To Whom It May Concern:

Re: Mr. Neil Allard
[redacted]
Nanaimo, B.C.
[redacted]

After lengthy unsuccessful trials with various prescription medications, along with other therapies for Mr Allard's complex medical condition, I conclude that the use of medical marijuana for this patient is warranted and recommended as part of his overall therapy.

Dr Bruce Carruthers
Internal Medicine

Jan 15/13

BC COMPASSION CLUB SOCIETY

Renewal Date: Oct 29-2004 Member #

Name: Neil Allard

Signature: N Allard

The bearer of this is a member of the Compassion Club of Vancouver, BC. This card entitles members to purchase cannabis and obtain access to other natural therapies. Membership is renewable yearly, and revocable at any time, at the discretion of the Club.

2995 Commercial Drive, Vancouver, BC V5N 4C8 604. 875. 0448

www.thecompassionclub.org

This is Exhibit "J" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

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505 - 6th Street, Suite 200
New Westminster, BC V3L 0E1
Toll Free: 1-866-566-SAFE
Fax: (778) 396 - 2064
www.safetyauthority.ca

ELECTRICAL INSPECTION REQUEST

Electrical Contractor Installation Permit

Inspection Requested : 06 Sep 2012 AREA # 663 Permit/Product Approval # 5238678

Issue Date : 2012/09/06 Expiry Date: 2013/03/05

Installation Name: Neil Allard

Suite/Location:

Installation Address: [redacted], NANAIMO-MAKI RD/10TH ST N

Contact Phone Number: 2507166442

Directions:

I, HEMMERICH, ROLAND (FSR # 34363) a Field Safety Representative for ROLAND HEMMERICH DBA ROLAND ELECTRIC (Contractor # 15692) have physically examined the electrical work completed under the above-mentioned permit, and hereby certify that the electrical installation authorized thereby has been installed to comply with the Safety Standards Act and Regulations of British Columbia.

Rough Wiring Inspection Required
- Rough Wiring as noted below may be covered on : 2012/09/08
- Rough Wiring Progress : Complete
- Partial Rough Wiring Area :

Electrical Service is Ready for Connection
- Main Electrical Service connection is required as follows : Service Change
- Service Change From : 70 To : 100
- Type of Grounding Electrode: Plate,

ALBERT E. KING, Q.C.
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This is Exhibit "K" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Signature of Field Safety Representative

Contractor Phone Number 2507166442 Date SEPT 21/12

Voltage 240 Amps 100 Phase 1 Electric Heat _____kw

March 11, 2008

Dr. Bruce Carruthers
2- 3657 west 16th Ave.
Vancouver, B.C.
V6R 3C3

DR. BRUCE CARRUTHERS
#2 - 3657 West 16th Ave.
Vancouver, B.C. V6R 3C3
604-224-1515 MSC #1316

To Health Canada:

Re: Mr. Neil Allard (DOB, May 25, 1954)
Use of medical marijuana

Further to my letter dated January 15, 2003, I am continuing to recommend ten grams daily of medical marijuana for Mr. Allard's medical condition of myalgic encephalomyelitis. He was diagnosed with this in 1995. There is no known cure for this condition and current therapies are highly individual.
He has had lengthy unsuccessful trials with numerous conventional medications which have caused intolerable side effects and worsened his overall state. His condition has been stable and his quality of life improved with his present therapies, which include medical marijuana in vapor, tea and baked forms.
He grows his own organic marijuana, which provides him an opportunity to exercise gently, obtain warmth and light and the benefits of year round gardening, as well a sense of control over managing his illness, which is critically important to this highly independent man.

I shall be retiring from medical practice shortly and this will leave Mr. Allard in the predicament of not having a specialist's signature required for his Health Canada medical marijuana forms. **I understand that this is not required for all conditions**, and that the general practitioner is allowed to sign the Health Canada medical marijuana forms for certain conditions.

Mr. Allard has been growing legally for almost four years, his case is well documented, he has written support from his Member of Parliament, and this yearly application process clearly causes him a great deal of stress, which tends to worsen his overall chronic condition.
In view of this, **I recommend that his subsequent applications to Health Canada's medical marijuana program be signed by his general practitioner, without the need for a specialist's signature.**
I trust this clarifies the matter.

Sincerely,

Dr. Bruce Carruthers , M. D.
Internal Medicine

This is Exhibit "L" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

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The Medical Arts Centre

PORT PLACE • UNIT 30 - 650 SOUTH TERMINAL AVENUE • NANAIMO, BC • V9R 5E2
TELEPHONE: (250) 753-3431 FAX: (250) 754-6897

FAMILY PHYSICIANS
A.C. Baird Inc., M.B. Ch.B., C.C.F.P.
Anthony P. Lane Inc., M.B., B.Ch., C.C.F.P., F.C.F.P.
Robin R. Love Inc., B.Sc., M.D., C.C.F.P.
D.A. Kazanowski Inc., M.D.
Ian D. Montgomery Inc., B.Sc., M.D.
B.C. Calvin Inc., B.Sc., M.D., C.C.F.P.
R. Keith Phillips, B.Sc., M.D., C.C.F.P., F.C.F.P.

Neil Rogers, B. Sc., M.D.
Renier J. van Rensburg Inc., M.B., Ch.B.
J.A.C. O'Farrell Inc., Hons. B.Sc., M.D., C.C.F.P.
Allan R. Kaban Inc., (PHARM), M.D., C.C.F.P.
J.S. Mander, M.B. Ch.B.
Clive Balfour Inc., M.B. Ch.B., F.C.E.M.
Paul Lanfear, M.B., Ch.B.

ADMINISTRATION
Gregory P. Simmons

ALBERT E. KING, Q.C., Barrister & Solicitor
455 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

This is Exhibit "M" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

December 1, 2009

To Whom It May Concern:

RE: Neil ALLARD
DOB: May 25, 1954

Mr. Allard suffers from myalgic encephalomyelitis. He is an infrequent attender to my practice as he has fluctuating periods of debilitating fatigue and as a result, he struggles with basic activities of daily living. He also tells me that noise in the form of television, stereos, telephones, voices and crowds can sometimes severely affect his condition.

Due to the nature of his condition, he is also unable to perform instrumental activities of daily living and for these, he relies on his wife. When he does have severe attacks, he struggles with his memory and cognition and so help from his wife is a necessity.

Recuperation from severe attacks can take hours to sometimes even days. The pain element of his condition affects his walking requiring numerous rest periods during walks and the need for significant rest upon returning home. His symptoms have now been present for several years.

He has been assessed over the years by several specialists and it has been well documented that his condition is chronic.

Yours sincerely,

Jim Mander, M.D.

JM/wlw

Consultation

Document Name: Anaesthetic Consult
Dictated By: Muendel, Karl Alexis
Result Date/Time: 11-Jun-2012 13:58

Your patient, Neil Allard, was seen today at Nanaimo Regional General Hospital. He is a 58-year-old gentleman who was referred for assessment and treatment of neuropathic left supraclavicular pain. He has a history of nonunion of his left clavicle after a fracture that occurred when he was about 10 years old. He has had this evaluated by a number of surgeons in the past, and has considered having surgery. Recently, the pain seems to have been increasing. He has very significant sensitivity over this area, and has a difficult time having contact even with clothing over it. He had mentioned to Dr. Smith, and I read this from his note, that he had a previous fear of doctors and therefore stayed away from surgery. When he had discussed this with Dr. Smith, they decided to hold off on surgery, and they wanted to deal with the hypersensitivity component.

Today, the patient presents with primarily total body pain. This encompasses his entire trunk, anterior and posterior, his limbs, anterior and posterior, and his head circumferentially. He was diagnosed with what is called myalgic encephalomyelitis by Dr. Carruthers who had written guidelines for this. The symptoms seem to vary greatly, but can involve pain throughout the entire body. The patient presents with some literature on the subject today. Of note, I am not familiar with this pathology, and so spent a great deal of time trying to figure out what his symptoms were. It seems as though he has a very hyperacute nervous system that seems to flare with multiple different stimulations. He has abdominal issues, gastrointestinal issues with food. He is extremely cold. He keeps his house at 85 degrees Fahrenheit. He describes aching pain and sharp pain throughout his body. He describes weakness, numbness, multiple bowel movements per day, 5 or more. He urinates a lot. He mentions any activity seems to flare his pain. He has a considerable amount of thoracic and lumbar back pain which limits him from even supporting his own weight in the sitting position. If he lies back, he can sit there for approximately 20 minutes until he has to stoop forward. He really has not gained much benefit from anything except for organic cannabis. He mentions that he uses 9 different types, and he vaporizes them. He has had a license for 9 years now. When asking him what cannabis does for him, he mentions it helps with muscle and joint pain, headaches, sleep, relaxation, appetite, ringing in his ears, depression, energy level and creativity.

Of note, he has a history according to him of some sort of meningitis as a child which resulted in memory impairment and some sort of brain injury.

Worst level of pain is 8/10, best is 3/10, acceptable is 3/10.

MEDICATION TRIALS:

This is Exhibit "N" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

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Consultation

Document Name: Anaesthetic Consult
Dictated By: Muendel, Karl Alexis
Result Date/Time: 11-Jun-2012 13:58

He mentions a very long list of neuropathic medications, antidepressants, all which resulted in **intolerance**. **Clonidine, ranitidine, baclofen, Imitrex, codeine, Paxil, amitriptyline, nortriptyline, Ativan, Zoloft, Neurontin, topiramate, propranolol, Flexeril, Synthroid, Prozac, Robaxacet, Dicetel, Wellbutrin, Effexor, nabilone, diphenhydramine**.

Current medications include clonazepam and organic cannabis.

ALLERGIES:
He lists almost all these medications as allergies.

PREVIOUS TREATMENTS:
He has not had any injections and does not want any. Acupuncture was somewhat helpful for short-term. Hypnosis – has tried to use it. Relaxation training is very helpful. Counseling is very helpful. Physical therapy is not tried. Massage was helpful.

PAST MEDICAL HISTORY:
Insomnia, and he mentions a bifid left rib as a medical problem.

PAST SURGERIES:
Procedure to enlarge his bladder at age 11. Hydrocele repair in 2011.

SOCIAL HISTORY:
He quit after age 27 and drank moderate alcohol until 1995 when his changes of ME appeared. This was in 1995. History of depression, anxiety, suicidal thoughts. Previously, he worked for Veterans Affairs as a counselor and social worker, but since 1995, has not been able to work due to this quite debilitating problem.

MRI of his brain which shows small white matter changes not indicative of demyelination throughout his superficial cortex.

PHYSICAL EXAMINATION:
He is alert and oriented. He is cooperative. He is very slow in his movements and in his response to certain questions, but is quite pleasant. He appears quite gaunt and is dressed very warmly for the day.
Vital signs: Pulse of 90, blood pressure 130/83, saturating 98% on room air. Weight is 62.4 kg, height is 179 cm, BMI is 19.3.
He is able to heel walk, toe walk and squat, but all these motions produce pain. He is able to support himself in the sitting position for a short period of time until his back pain is exacerbated. Extension exacerbates his thoracic and lumbar pain more than flexion but then flexion does after a short period of time as well. He has good strength in his lower extremities. Neurologically, he appears intact with no long tract signs and no focal deficits. He has got well-perfused extremities, upper and lower. No significant rashes or excoriations. He has got no significant deformities and no step-offs in his spine.

Consultation

Document Name: Anaesthetic Consult
Dictated By: Muendel, Karl Alexis
Result Date/Time: 11-Jun-2012 13:58

ASSESSMENT:
This is a pleasant 58-year-old gentleman with a history since 1995 of total body pain that was diagnosed by Dr. Carruthers as myalgic encephalomyelopathy. This is thought to be due to possible small vascular occlusions that can be body wide. It was noted that this has previously been diagnosed as atypical multiple sclerosis or atypical post-polio syndrome.

PLAN AND RECOMMENDATIONS:
Unfortunately, we do not have any further medication trials since he has been through a number and would like to defer any further medications. We discussed interventions, but obviously due to his widespread pain, he would not be a candidate for many of these and he would like to avoid injections if at all possible.

We discussed physical therapy options. Unfortunately, I would have him work on lumbar stabilization. He is unable to support himself and even the walk in the hospital may flare his pain. Therefore, we decided to avoid this. Aqua therapy was a consideration, but the cold is too much for his body, can actually flare his pain.

We will have him see our social worker and hopefully our psychologist in the future to continue to work with coping strategies. I understand he is seeing a psychologist about 7 times per year which does seem to benefit him.

Hopefully, this is of some benefit to you. If you have any questions or concerns, please do not hesitate to contact me.

THIS DOCUMENT HAS BEEN
DICTATED BUT NOT READ:

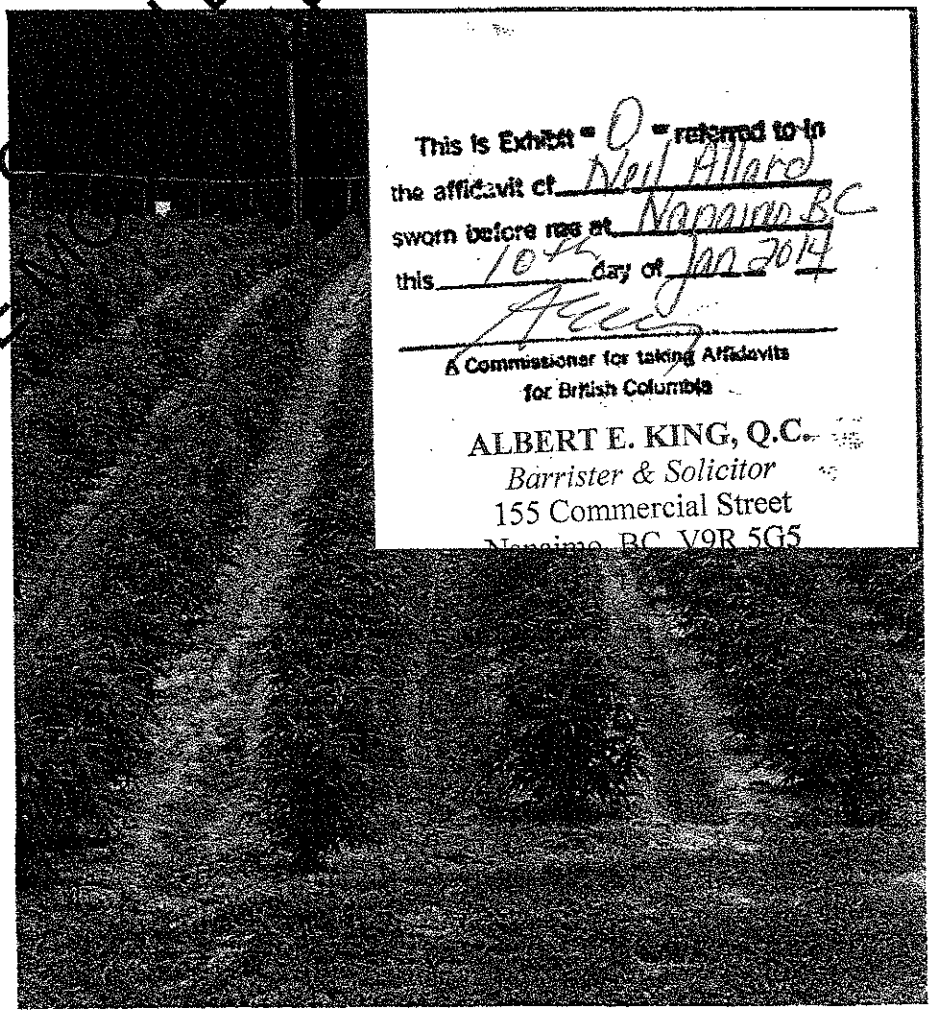
Dr. Muendel, Karl Alexis
D: 11-JUN-2012 13:58 T: 18-JUN-2012 06:25 MW 24741

cc: Dr Mander, Jatinder Singh
cc: Dr Smith, Erasmus J

American Herbal Pharmacopoeia®

Cannabis Inflorescence
Cannabis spp.

Standards of Identity, Analysis, and Quality Control



This is Exhibit "O" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

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A H P

Table of Contents

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The following Standards of Identity, Analysis, and Quality Control of *Cannabis* are intended to provide scientifically valid methods for the analysis of cannabis and its preparations that can be used to comply with state and federal regulations and policies. The analytical methods were obtained from peer reviewed literature, have been used as part of international or federal monitoring programs for cannabis, and have been verified for their scientific validity. Methods other than those presented in this monograph may be scientifically valid and provide reliable results. However, all methods must be verified as being scientifically valid prior to use for regulatory compliance.

In the United States, cannabis is a Schedule I controlled substance under federal law; therefore, any use or possession of cannabis and its preparations is illegal except pursuant to the compassionate use Investigational New Drug exemption. These standards are not intended to support, encourage or promote the illegal cultivation, use, trade, or commerce of cannabis. Individuals, entities and institutions intending to possess or utilize cannabis and its preparations should consult with legal counsel prior to engaging in any such activity.

The citing of any commercial names or products does not and should not be construed as constituting an endorsement by the American Herbal Pharmacopoeia. Additionally, the reliability, and therefore ability to comply with state or federal regulations, of any conclusions drawn from the analysis of a sample is dependent upon the test sample accurately representing the entire batch. Therefore, when performing all analytical tests, a formal sampling program must be employed.

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The information contained in this monograph represents a synthesis of the authoritative scientific and traditional data. All efforts have been made to ensure the accuracy of the information and findings presented. Those seeking to utilize botanicals as part of a health care program should do so under the guidance of a qualified health care professional.

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Reporting on the use of proprietary products reflects studies conducted with them and is not meant to be a product endorsement.

Design & Layout

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Cover Photograph

Cannabis cultivated under the Compassionate Investigational New Drug program at the University of Mississippi administered by the National Institute on Drug Abuse (NIDA). Photograph courtesy of: University of Mississippi.

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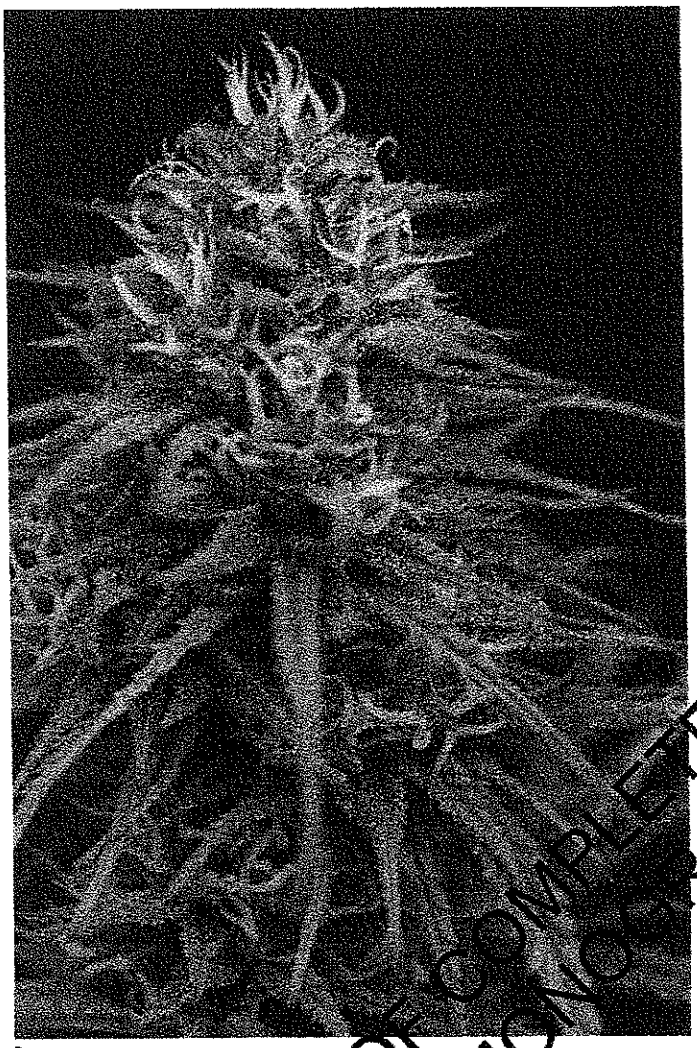

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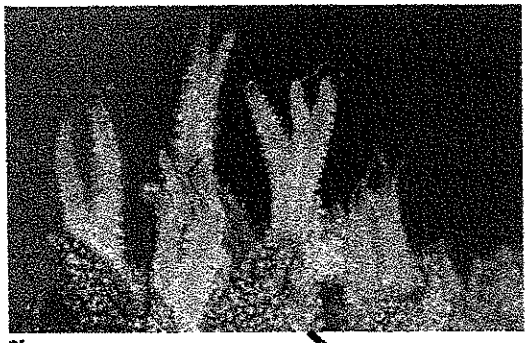


2f.

2g.

2h.

Figure 2 (continued) Botanical characteristics of cannabis inflorescences

2e. Maturing female inflorescence showing young yellow styles and stigmas (often referred to as "pistils").

2f. Close-up of maturing female inflorescence showing young yellow styles and stigmas senescing brown and shriveling and an abundance of glandular trichomes.

2g. Female inflorescence with senesced reddish-brown styles and stigmas, an indicator of inflorescence maturity.

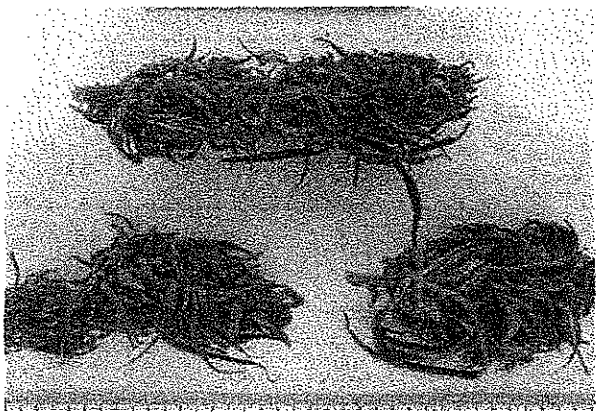
2h. Close-up of female inflorescence with senesced reddish-brown styles and stigmas.

hemp, narrow-leaf drug, etc. to account for the plasticity represented in the genus.

Cannabis is a member of the *Cannabaceae* family, together with another well-known member of the family, hops (*Humulus*). The family has recently been expanded to contain 9 other genera (Stevens 2001). The following describes the published range of morphological diversity within plants recognized as *Cannabis* spp.

Morphological Characterization of *Cannabis* L.

Herbaceous annual, taprooted (taproot not developed on vegetatively propagated/cloned plants). Plants dioecious (male and female flowers occur on separate plants) and rarely monoecious (male and female flowers occur on the same plant). Monoecious plants are often referred to as "hermaphrodites." True hermaphrodites bear bisexual flowers and are less common, whereas monoecious plants bear unisexual male and female flowers at different locations on the plant. Staminate (male) plants tend to be taller but less robust than pistillate (female) plants. Height and degree of branching depends on both genetic and environmental factors (UNODC 2009). **Stem:** Erect, furrowed, often hollow, 0.2–6 m (usually 1–3 m) tall, simple to well branched; branchlets densely pubescent; staminate (male) plants usually taller and less robust, compared with pistillate (female)



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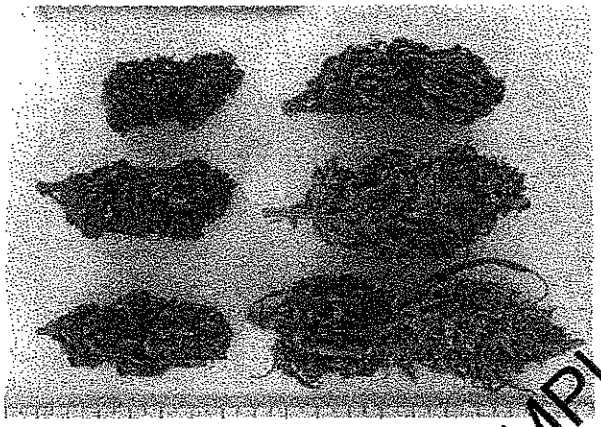

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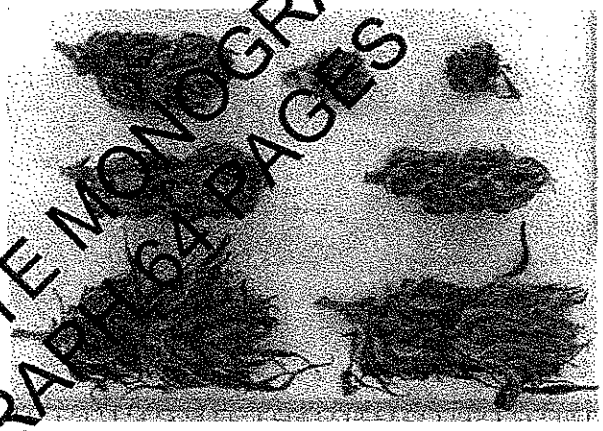

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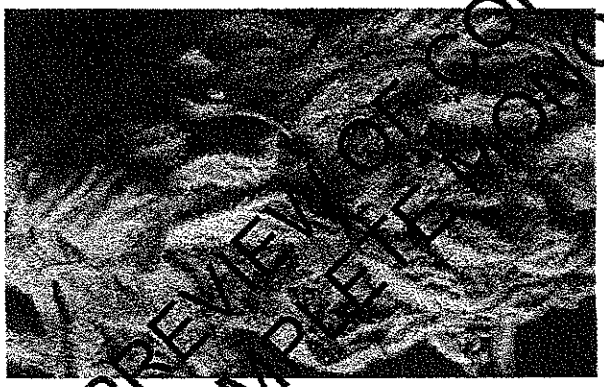
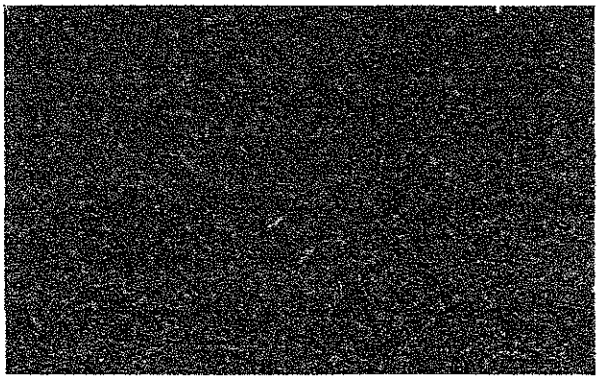


6e.



6f.

Figure 6 Macroscopic characteristics of cannabis inflorescence

6a. Dried, untrimmed pistillate inflorescences of morphological type "sativa."

6b. Dried pistillate inflorescences of morphological type "sativa" (bottom – untrimmed; top – trimmed).

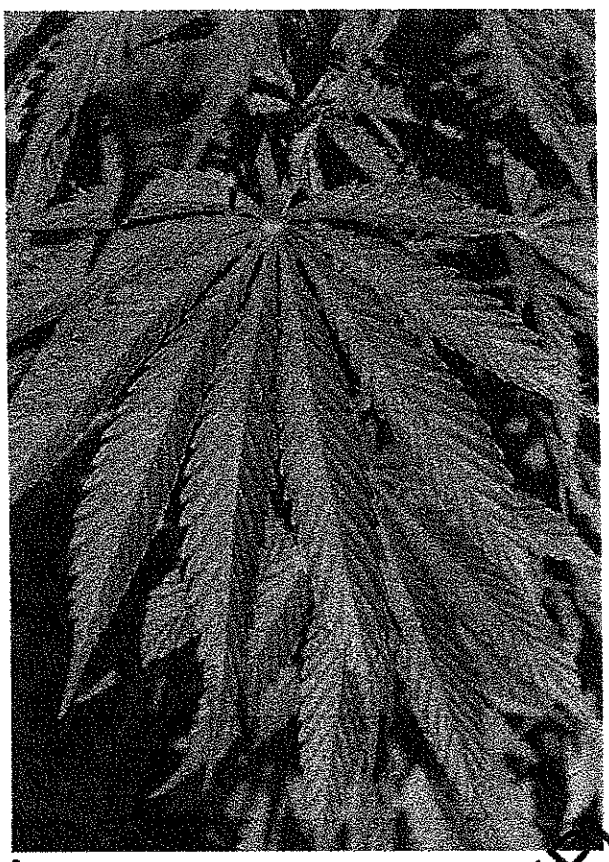
6c. Storage effects on color of cannabis material (left – 1-year-old; right – new harvest).

6d. Dried pistillate inflorescences of morphological type "indica" (bottom – untrimmed; middle and top – trimmed).

6e. Close-up of a dried pistillate inflorescence (note the visible glandular trichomes).

6f. Powdered dry cannabis material (leaves and pistillate inflorescences).

Photographs courtesy of: (6a–e) WAMM, Santa Cruz, CA; (6f) University of Mississippi, University, MS.



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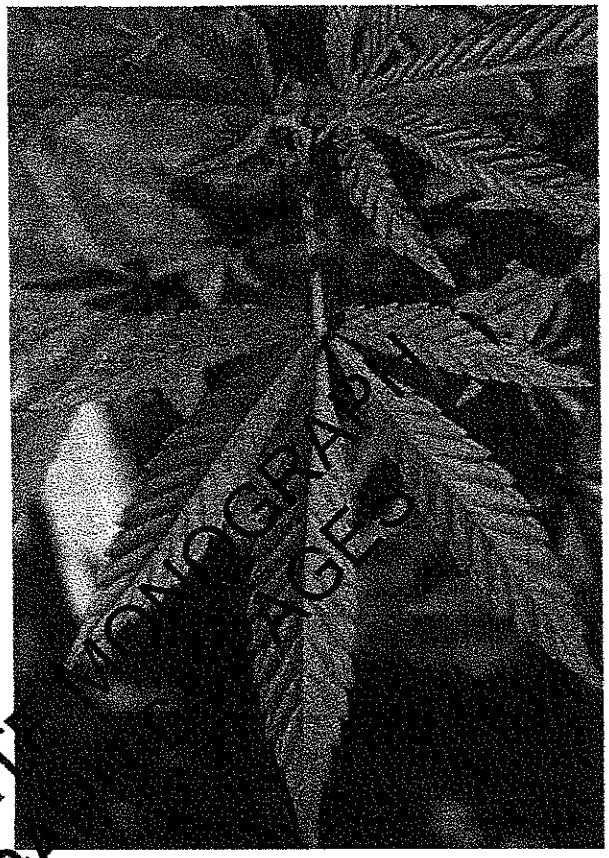

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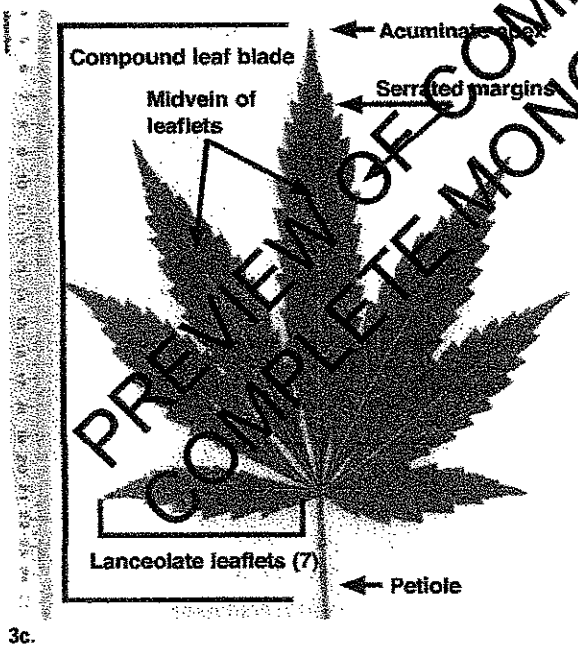


3c.

3d.

Figure 3 Botanical characteristics of cannabis leaf

3a. Adaxial (upper) surface of a typical cannabis leaf (9 leaflets).

3b. Adaxial (upper) surface of a typical cannabis leaf (5 leaflets).

3c. Adaxial (upper) surface of a typical cannabis leaf with morphological characteristics highlighted.

3d. Abaxial (lower) surface of a typical cannabis leaf.

Natural Contaminants and Adulterants

Due to its widespread cultivation, there is little concern for adulteration of the plant itself. However, the large economic potential and illicit aspect of cannabis has given rise to a number of reported potentially hazardous natural contaminants or artificial adulterants in crude cannabis and cannabis preparations.

Natural contaminants: Several plant species have morphological characteristics comparable to *Cannabis sativa*, e.g., *Hibiscus cannabinus* (kenaf), *Acer palmatum* (Japanese maple), *Urtica cannabina* (a Asian species of nettle), *Dizygotheca elegantissima* (false aralia), *Potentilla recta* (sulphur cinquefoil, rough-fruited cinquefoil), and *Datisca cannabina* (false hemp), leading to occasional contamination of cannabis internationally (UNODC 2009). However, these plants can be readily differentiated from cannabis by inspection of their macroscopic and microscopic characteristics. More commonly, natural contaminants consist of degradation products, microbial (fungi and bacteria) contamination, and heavy metals. These contaminants are usually introduced during cultivation and storage (McLaren et al. 2008; McPartland 2002).

Adulterants: Growth enhancers and pest control chemicals, introduced during cultivation and storage, are possible risks to the producer and the consumer. There are anecdotal reports of the use of banned substances such as daminozide (Alar), the degradation product of which is the highly toxic hydrazine. Cannabis can also be contaminated for marketing purposes. This usually entails adding substances, e.g., tiny glass beads, to increase the weight of the cannabis product, or adding psychotropic substances, e.g., tobacco, calamus (*Acorus calamus*), and other cholinergic compounds, to enhance the efficacy of low-quality cannabis or to alleviate the side effects of cannabis (McPartland et al. 2008; McPartland 2008).

In the Netherlands, chalk and sand have been used to make cannabis appear to be of higher quality, the sand giving the appearance of trichomes. In the UK, similar adulterations have been made by adding glass beads with a similar diameter to trichome resin heads to cannabis (Randerson 2007). In Germany, lead has intentionally been added to street cannabis to increase its weight. Lead is readily absorbed upon inhalation and this adulteration resulted in lead intoxication in at least 29 users (Busse et al. 2008). Additionally, in the Netherlands, two chemical analogs of sildenafil (Viagra) were found in cannabis samples. In the UK, other contaminants including turpentine, tranquilizers, boot polish, and henna, among others, have been reported (Newcombe 2006).

In recent years, various products laced with synthetic cannabinoids have appeared on the market. These are believed to mimic the effects of cannabis. These products are known by various names (e.g., "Spice" and "K2") and can be sold as "incense" or "natural smoking blends". Like cannabis, these synthetic cannabinoids are schedule 1 restricted substances. The Spice blend is reported to contain synthetic cannabinoids with a mixture of otherwise legal, safe, and non-psychotropic herbal dietary supplement ingredients including: damina (*Turnera diffusa*), Chinese motherwort (*Leonurus sibirica*), and water lily (*Nymphaea caerulea*). According to the National Institute on Drug Abuse (NIDA 2012), those using some of these various blends have been admitted to Poison Control Centers and report "rapid heart rate, vomiting, agitation, confusion, and hallucinations. Spice can also raise blood pressure and cause reduced blood supply to the heart (myocardial ischemia), and in a few cases it has been associated with heart attacks. Regular users may experience withdrawal and addiction symptoms."

Qualitative Differentiation

Cannabis that is to be used for medicinal purposes should be as free from foreign matter as practically possible (see Limit Tests). Medicinal material should be free of molds and bacteria that have a high likelihood of pathogenicity (e.g., *Aspergillus*, *E. coli* (O157:H7), visible mold should be absent; material should be free of stems greater than 1.5 mm, only subtending leaves should be present, material should be free of metals to the degree allowed by a naturally occurring growing substrate, and free of pesticides and fungicides that can present a health hazard to the consumer. Microbial standards should be adopted based on those required for non-sterile pharmaceutical preparations for use by inhalation (see European Pharmacopoeia 5.1.4). Color should be consistent throughout each sample and should not show signs of grey or black, which are indicators of fungal infection.

For medical users of crude cannabis, there is a balance sought between organoleptic qualities (taste and aroma) and medicinal effect, as well as a balance between THC- and CBD-yielding cultivars. Many cultivators select, breed, and process for these varying qualities. For medicinal purposes an optimal ratio between total THC, Δ^9-THC, and/or CBD has not been definitively determined. Different health conditions may respond differently to plants containing different ratios of the two primary cannabinoids. For example, there is evidence to suggest that CBD is responsible for some of the putative anxiolytic effects (Mechoulam et al. 2002; Zuardi et al. 2002) of the plant, while Δ^9-THC has been associated with appetite stimulation (Dejesus et al. 2007; Nelson et al. 1994). The process of trimming is done both for yielding higher concentrations of Δ^9-THC and for yielding more desirable, organoleptic qualities, since the leaves possess a sharp and bitter organoleptic characteristic. A better organoleptic profile may enhance compliance.

Dispensaries should maintain strict quality control practices to ensure the purity and quality of their material by contracting for testing with independent labs that apply independently verified testing methodologies and transparent testing

standards. Individual growers and care givers producing medical cannabis for personal use should employ good agricultural practices (GAPs) to the extent possible in all aspects of growing, harvesting, drying, and storage.

Sustainability and Environmental Impact

As all cannabis is derived from cultivated sources, there is little risk of the plant becoming environmentally threatened unless aggressive eradication programs are implemented worldwide. However, without development, implementation, and enforcement of Good Agricultural Practices (GAPs), both the indoor and outdoor production of cannabis can have significant negative environmental and social impacts. Environmentally, the illegal diversion of water, clear cutting of trees, dumping of chemicals, misappropriation of state and federal lands, and disruption of sensitive ecosystems are associated with outdoor cultivation, while high carbon emissions are associated with indoor production. In North America, especially with crops grown indoors, part of this environmental impact is driven by the illegality of cannabis cultivation that requires growers to hide crops. Others may choose indoor growing for greater control over crops and higher yields. The high-energy intensive processes associated with controlling all aspects of the indoors growing environment has been estimated to consume 1% of the national electricity use. Whether by regulation or choice, growers should apply GAPs to cannabis cultivation.

In addition to the impacts of cannabis cultivation, the manufacture of butane extracts poses significant risk. A number of explosions and fires associated with butane cannabis extract production have been reported, some that have included injury. Some butane contains compounds that may not be desirable in finished product. Extraction with Co2 (sub- or super-critical) is preferred by some and is one environmentally safe extracting option.

Documentation of Supply

For cannabis that is to be used in medicinal preparations, every aspect of cultivation, harvest, processing, and storage should be documented to the fullest extent possible. Various county and state ordinances require adherence to specific regulations that differ between locations for trade of cannabis among growers, dispensaries, and collectives. The Dutch OMC provides the following guidelines for documentation.

Security (modified from OMC 2003)

a. The buildings in which cannabis is cultivated, processed, packaged and stored must be sufficiently secured, only allowing authorized personnel access to the buildings.
b. Personnel involved in the production process of cannabis must be authorized for that purpose by the employer.
c. Waste must be stored in such a way that the potential for theft is minimized.

Growing and Harvest Conditions (OMC 2003)

a. Location of cultivation and the name of the supervising cultivator
b. Details on crops previously grown at that location
c. Nature, origin and quantity of the herbal starting materials
d. Chemicals and other substances used during cultivation, such as fertilizers, pesticides, and herbicides
e. Standard cultivation conditions, if applicable
f. Particular circumstances which occurred during cultivation, harvesting, and production that may affect the chemical composition, such as plant diseases or temporary departure from standard cultivation conditions, particularly during the harvesting period
g. Nature and quantity of the yield
h. Date or dates and time or times of picking or harvesting occurred
i. Drying conditions
j. Measures taken to control

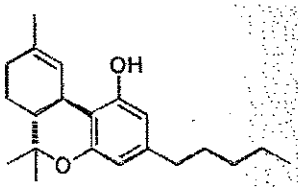
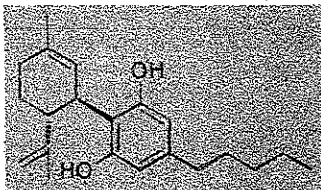
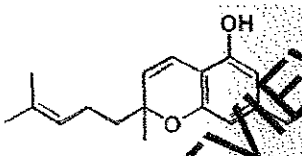
Suppliers and Dispensaries

Cannabis supplied by dispensaries should be as fully characterized as possible with traceability and a verifiable chain of custody as to type of material, whether the plants were cultivated conventionally or organically, or was indoor or outdoor cultivated. Procedures should be implemented to ensure the absence of pesticides and raw material and finished product should be characterized as to its basic chemical profile (e.g., Δ⁹-THC and/or CBD content). This information should be made available to patients upon request. Dispensary personnel should be appropriately trained in how to process and handle cannabis to ensure purity, maintain quality, and to morphologically identify material. The cannabis committee of the American Herbal Products Association (AHPA) has developed a set of draft guidelines outlining recommended practices for dispensaries and cultivators to follow (AHPA 2013a), and Americans for Safe Access (ASA) has developed a industry certification program for dispensaries and cultivators (ASA PFC).

Constituents

To date, more than 750 different secondary metabolites have been identified in cannabis. The diversity of cannabis constituents encompasses numerous phytochemical classes, notably, cannabinoids, and a host of other secondary metabolites. These other compound classes include terpenoids, non-cannabinoid phenols, nitrogenous compounds, as well as other more common plant compounds, all of which are non-psychotropic. Cannabinoids are the most studied

Table 6 Structure and activity of primary phytocannabinoids

Compound	Activity (Mechanism of Action)
 Δ⁹-Tetrahydrocannabinol (Δ⁹-THC)	**Primary psychotropic cannabinoid** Activates PPAR-γ and TRPA1 at nano- and micromolar concentrations, respectively (Pertwee 2008). Analgesic via CB_1 and CB_2 agonism (active at ~20–40 nM) (Rahn and Hohmann 2009). Antiemetic (Haney et al. 2007; Hollister 1971; Machado et al. 2008). Anti-inflammatory, antioxidant (Hampson et al. 1998). Antipruritic, cholestatic jaundice (Neff et al. 2002). Benefits duodenal ulcers (Douthwaite 1947). Bronchodilatory (Williams et al. 1976). Muscle relaxant (Kavia et al. 2010). Reduces Alzheimer symptoms (Eubanks et al. 2006; Volicer et al. 1997).
 Cannabidiol (CBD)	**Non-psychotropic cannabinoid** Anandamide (AEA) reuptake inhibitor (De Petrocellis et al. 2008). Analgesic (Davis and Hatoum 1983). Anticonvulsant (Jones et al. 2010). Antidepressant in rodents (Deyo and Neafsey 2003). Anti-emetic (5HT1A agonist, 6 mg/kg i.p.) (Rock et al. 2010). Antifungal (ElSohly et al. 1982). Anti-inflammatory (Borrelli et al. 2011). Antagonizes effects of THC in humans (Pertwee 2008). Antioxidant (Hampson et al. 1998). Anxiolytic via 5HT1A agonism (Campos and Guimaraes 2008; Resstel et al. 2009; Russo et al. 2005). Decreases keratinocyte/sebaceous proliferation (Biro et al. 2009). Effective against methicillin-resistant *Staphylococcus aureus* (MRSA) (Appendino et al. 2008). Increases anandamide/2-AG signaling (Carrier et al. 2006). Pro-apoptotic against breast cancer cell lines (Ligresti et al. 2006). Treatment of addiction (Xi et al. 2010). Treatment of psychosis (Russo et al. 2007).
 Cannabichromene (CBC)	**Non-psychotropic cannabinoid** Analgesic (weak) (Turner et al. 1980b). Anandamide reuptake inhibitor (weak) (De Petrocellis et al. 2008; Ligresti et al. 2006). Anti-inflammatory (Davis and Hatoum 1983). Antimicrobial (Turner and ElSohly 1981). TRPA1 agonist (De Petrocellis et al. 2008; Ligresti et al. 2006).

Standards Preparations

Cannabinoid standards are dissolved in methanol at a concentration of 1 mg/mL.

Note: All cannabinoid standards utilized in the development of this method were isolated at the University of Mississippi. There is limited availability of commercially prepared cannabinoid standards.

Standards Solution Stability

CBD, CBG, and CBN are stable in methanol, both at room temperature and with freezing. Δ^9-THC, THCV, and CBC methanolic solutions are stable only when frozen and acid compounds are only stable in a freezer. Due to their instability, acid compounds should be prepared cool and stored and shipped frozen.

Reagent Preparation

Fast Blue reagent: Dissolve 0.5 g Fast Blue B salt (MP Biochemicals, LLS) in 100 mL distilled water.

Vanillin/H2SO4: Dissolve 6 g vanillin in 90 mL ethanol (95%). Add 10 mL of 98% H_2SO_4. This reagent is relatively unstable and is best to use fresh each time.

Chromatographic Conditions

Stationary Phase:

C18 (UV 254) TLC plates 150 µm, 10 cm × 10 cm (Sorbent Technologies).

Mobile Phase:

75:25 (v:v) methanol/water with 0.1% glacial acetic acid.

Sample Application

Apply 5 µL of the sample preparations and 2 µL of the standards preparations on the plate as 5 mm bands 2 mm apart from each other. The application position should be 15 mm from the lower edge of the plate and at least 15 mm from the left and right edges of the plate. For visualization using both reagents, separate plates should be prepared.

Development

Line a flat bottom chamber (large, 14 cm x 8 cm) with a filter paper or chromatography paper. Add a sufficient amount (~25 mL) of the Mobile Phase solution to ensure that the filter paper is covered with at least 5 mm of the solution, and let saturate for 15 min. Measure and mark on the plate the developing distance 60 mm from the application position. Introduce the plate into the chamber, and allow the developing solvent to reach the mark. Remove the plate and dry for 2 min at 70 °C in an oven.

Detection

Visualize the plates under UV 254 nm, then spray one set of the plates with the Fast Blue reagent and the other set of plates with the vanillin/H_2SO_4 reagent, followed by visualization under white light. For basic identification of the primary cannabinoids either reagent can be used.

Table 7 R_f values for cannabinoid standards

Chemical Reference	R_f
CBC	0.21
Δ^9-THC	0.26
CBN	0.29
CBG	0.33
CBD	0.40
THCV	0.42
Δ^9-THCA	0.61
CBDA	0.7

Note: Due to its relatively high concentration in drug type samples, Δ^9-THC can overlap with CBN. CBN is a degradation compound of Δ^9-THC.

Results

See Table 7 and refer to the chromatograms provided (Figure 17.6).

High-Performance Liquid Chromatography (HPLC) for the Determination of Major Phytocannabinoids in Cannabis

This LC method was adopted from Swift et al. (2013) and can be used for quantitation of THCA-A, Δ^9-THC, CBDA, CBD, CBGA, CBG, and CBN in cannabis preparations. The method was adapted from an earlier method developed by DeBacker et al. (2009), which also quantified Δ^8-THC. The original method of DeBacker et al. (2009) was validated for cannabis raw material and fully validated using total error approach in accordance with ISO17025 and the guidelines of the French Society of Pharmaceutical Sciences and Techniques (SFSTP). This modified and optimized method of Swift et al. (2013) was subjected to validation for selectivity, linearity, accuracy, precision, and recovery according to the US Food and Drug Administration (FDA) guidance for bioanalytical method validation (FDA 2001).

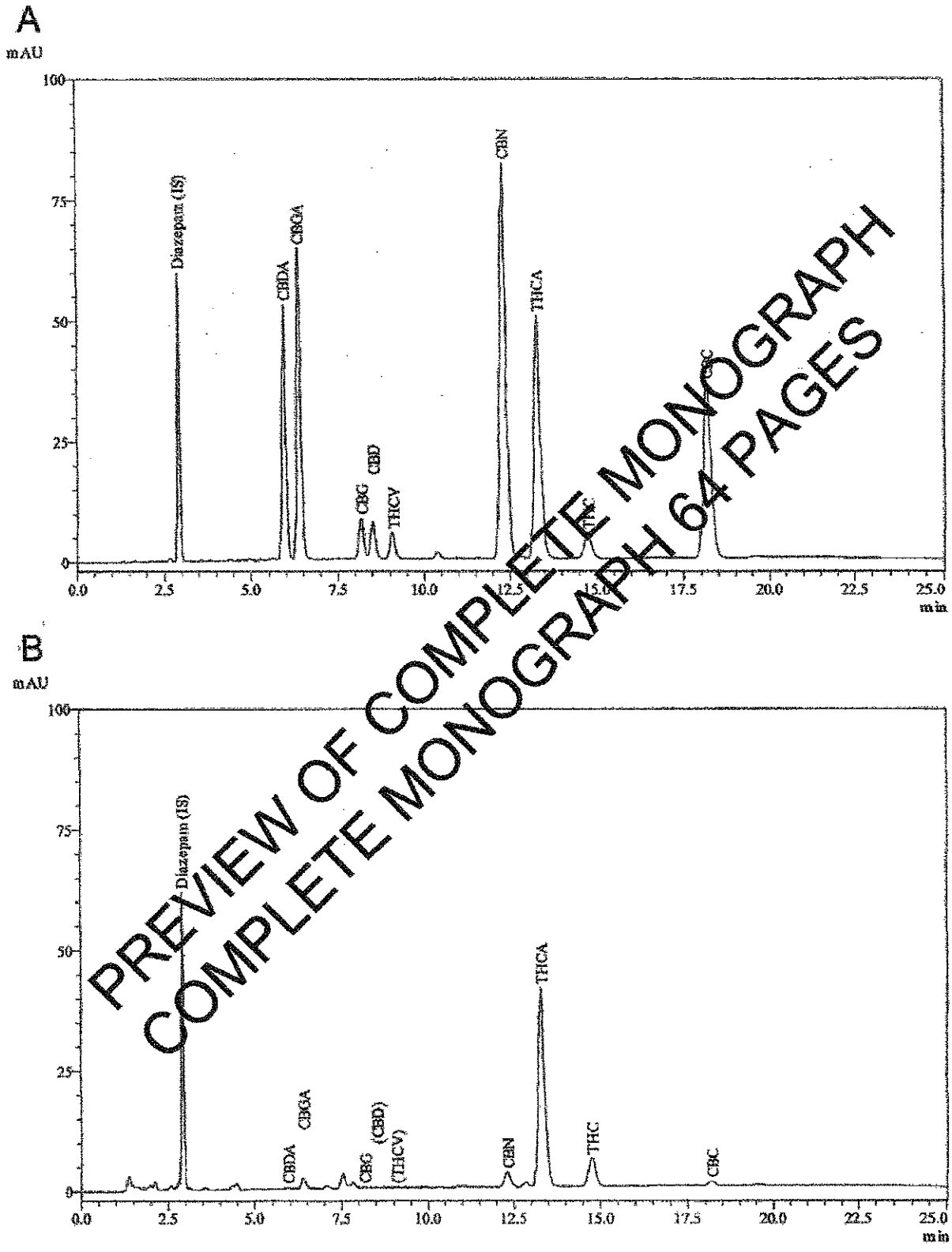
With appropriate modifications in sample preparations, the same chromatography can be used for the analysis of other cannabis materials (i.e. concentrates, extracts, foods). However, the robustness of this chromatography when applied to various matrices requires further validation (e.g., recovery, spiking experiments).

Sample Preparation

Crude Cannabis

Test samples are dried for 24 h in a 35 °C forced ventilation oven. Dried samples are ground to a fine powder. 200 mg of the sample is weighed in a glass vial and extracted with 10 mL of a mixture of methanol/chloroform (v/v: 9:1)

Figure 18 Representative HPLC chromatograms of cannabinoid standards (A at 11 µg/mL) and cannabis raw material (B)



diode array detector. For routine use, a standard UV detector is suitable.

Run time:

30 min.

Post-run time:

6 min.

Note: CBD and CBG peaks may slightly overlap if present in high concentrations (> 10%).

Quantitation

Inject each standard preparation and generate a standard curve based on the peak area vs. concentration, as a ratio of standard to internal standard.

Cannabinoid contents in the sample are quantified using the linear equation based on least squares regression for each cannabinoid compound: (y = mx + c)

where:

x = concentration of the individual cannabinoid in the sample (µg/mL);

y = peak area of the invidivual cannabinoid;

c = calculated y-intercept of the calibration curve;

m = calculated slope of the calibration curve.

Using the concentration from the equation (y = mx + c), total content (C_{CBXT}) in the sample can be calculated as a sum of the concentrations of the neutral (C_{CBX}) and the acidic (C_{CBXA}) components. A conversion factor of 0.877 is used for adjustment of the molar masses of THCA A and CBDA; a conversion factor of 0.878 is used for CBGA; both after decarboxylation. These conversion factors may not apply for other cannabinoids:

$$C_{CBXT} = C_{CBX} + C_{CBXA} \times 0.877$$

The individual cannabinoid content in the material is then calculated according to the following equation:

$$W_{CBX(T)} = \frac{C_{CBX(T)} \times V_{sample} \times D}{m_{sample} \times 10^6} \times 100\%$$

where:

$W_{CBX(T)}$ = (total) cannabinoid content in the material (% weight);

$C_{CBX(T)}$ = (total) cannabinoid content in the sample (µg/mL);

V_{sample} = sample volume (mL);

D = dilution factor;

m_{sample} = sample mass (g).

Calibration Range

Linear from 2 µg/mL to 100 µg/mL. Extrapolations from this curve should not be made; however, cannabinoid concentrations in samples greater than 100 µg/mL can be appropriately diluted, or the curve can be extended out to 1000 µg/mL (with seven or more points in the curve) to ensure the reading is within the calibration range.

Gas Chromatography with Flame Ionization Detection (GC-FID) for the Quantitation of Phytocannabinoids

The following GC-FID method is used for the quantitation of the major phytocannabinoids of confiscated cannabis material submitted to the University of Mississippi by the DEA and other United States law enforcement agencies as part of NIDA's Marijuana Potency Monitoring Program (ElSohly et al. 2000; Mehmedic et al. 2010). Due to the high temperature of the GC injector port, in situ decarboxylation of the acidic cannabinoids occurs upon injection. This method, therefore, quantifies total cannabinoids (acidic and neutral) simultaneously. If quantitation of free (neutral) and acidic compounds is required for a specific cannabinoid, a non-destructive method, e.g., HPLC, or derivatization, e.g., silylation or formation of the alkylboronates, should be employed and validated.

Sample Preparation

Crude cannabis and hashish: To 100 mg of dried, powdered cannabis material with seeds and stems removed, add 3 mL of the internal standard solution (see below on the preparation instructions). Macerate for 1 hour at room temperature. Sonicate for 5 min. Filter the extract into GC vials, and cap the vials.

Hash oil: To 100 mg of hash oil, add 4 mL of hash oil extraction solution (see below). Macerate for a minimum of 2 h at room temperature. Sonicate for 5 min. Add 20 mL of absolute ethanol, and sonicate again for 5 min. Filter the extract into GC vials, and cap the vials.

Internal Standard Preparation (use for extraction of cannabis and hashish)

Dissolve 100 mg of 4-androstene-3,17-dione in 100 mL of 1:9 v/v chloroform/methanol mixture.

Hash Oil Extraction Solution: Dissolve 50 mg of 4-androstene-3,17-dione in 50 mL of absolute ethanol.

Chromatographic Conditions

Column:

DB-1: 15 m x 0.25 mm id x 0.25 µm film (J&W Scientific, Inc, US).

Table 10 Pesticides commonly used in cannabis cultivation

Pesticide	Use	Residue Analysis Techniques (FAO Compendium of Pesticide Residue [PR] or Literature)
Abamectin (Avermectins B1a and B1b)	Insecticide/acaricide	LC-FLD[1]; LC-MS/MS[2]
Acequinocyl	Insecticide/acaricide	LC/MS/MS[1]
Bifenazate	Acaricide	LC[1]; LC-MS/MS[2]
Bifenthrin (synthetic pyrethroid)	Insecticide	GC-ECD[1]; GC-MS/MS[2]
Chlormequat chloride	Plant growth regulator (PGR)	IC; LC-MS/MS[2]
Cyfluthrin (synthetic pyrethroid)	Insecticide	LC[2] (WHO 2004); GC-MS/MS[2]
Daminozide (Alar)	Plant growth regulator (PGR)	UV Spectroscopy[1]; LC-MS/MS[2]
Etoxazole	Acaricide	GC-MS(/MS)[1]
Fenoxycarb	Insecticide	LC/UV[1]; LC-MS/MS[2]
Imazalil	Fungicide	GC-ECD[1]; LC-MS/MS[2]
Imidacloprid	Insecticide	LC-MS/MS[1]
Myclobutanil	Fungicide	GC-ECD; GC-NPD[1]; GC-MS/MS[2]; LC-MS/MS[2]
Paclobutrazol	Plant growth regulator (PGR); fungicide	LC-MS/MS[1]
Pyrethrins*	Insecticide	GC-ECD[1]
Spinosad	Insecticide	LC-MS/MS; immunoassay[2]
Spiromesifen	Insecticide	GC-MS[1]; LC-MS/MS[2]
Spirotetramat	Insecticide	LC/LC-MS/MS[1]
Trifloxystrobin	Fungicide	GC-NPD[1]; GC-MS/MS[2]; LC-MS/MS[2]

ECD = Electron capture detector; FLD = Fluorescence detector; GC = Gas chromatography; HPLC = Liquid chromatography; IR = Infrared spectroscopy; MS = Mass spectrometry; NMR = Nuclear magnetic resonance; NPD = Nitrogen phosphorous detector.

* Natural pyrethrins are tolerance exempt; synthetic pyrethrins are not.

Analytical Methods [RAM]) or those of the Food and Drug Administration (FDA Pesticide Analytical Manual [PAM]), should be employed when appropriate. However, as these tests were developed for commodity food products, the amount of sample needed may be prohibitive to apply to the cannabis industry. Alternatively, the food testing QuEChERS screen uses smaller quantities and may be more applicable to a variety, though not all, of cannabis products (Schoch 2013, personal communication to AHP, unreferenced).

In the cannabis industry today, the most commonly used screening technology for organophosphates, organochlorines, carbamates, and ethylenediaminetetraacetic acid (EDTA) are immunoassays (e.g., enzyme-linked immunosorbent assays [ELISA]) and broad spectrum field tests that may or may not be validated for use on cannabis. Similarly, immunoassays for a broad range of PGRs and fungicides commonly used in cannabis cultivation are not available. Because of their relative inexpense, immunoassays are routinely used by analytical labs specializing in cannabis testing and are at high risk of not detecting pesticide residues and reporting samples to be "pesticide-free" or "non-detected". Before commercial use, any immunoassay should be validated against a standard testing methodology.

Table 10 provides a list of the most common pesticides (including acaricide, insecticides, fungicides, and plant growth regulators) used in cannabis production.

Solvent Residues

Limits on solvents used in the manufacture of botanical products are established by the International Conference on Harmonization (ICH) (ICH 2011), with exceptions made for ethanol and acetic acid in products formulated to contain these substances (e.g., tinctures and vinegars). According to the ICH guideline, solvents are categorized in three classes. Class 1 includes known carcinogens, toxic substances, and environmental hazards such as benzene, carbon tetrachloride, 1,2-dichloroethane, 1,1-dichloroethene, and 1,1,1-trichloroethane. These are to be avoided in the manufacture of herbal and/or pharmaceutical products. Class 2 and 3 solvents (Table 12) are distinguished based on their relative toxicity level. Limits established for permissible daily exposures (PDE) are determined individually for Class 2 solvents. Limits for Class 3 solvents are set at a

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September 6, 2012

Neil Allard

[redacted]

Nanaimo, B.C.

[redacted]

This is Exhibit "P" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

To: Health Canada, (M.M.A.D.)

Dear Sir /Madam,

I am enclosing an amendment for my change of production site, as well as an increase in dosage. I am in my ninth year of licenced growing. The herbs are very effective but the quantity of my production is too low due to the restricted number of plants I am allowed.

I am growing organically with very minimal yields, nowhere near ten grams per day. I have had problems with clones not rooting; plants stressed by heat, cold, and insects, and plant sickness, just to mention a few problems. Unfortunately, I have not always been able to give due care and attention to my plants because of my own health problems, the cramped production site, and a previously unsuitable home and living situation.

However, I have had a new properly built production site and I am in a home modified for a disabled person. The new production site and home will allow me to continue growing for my own needs.

I need an increase in plant numbers to allow for larger yields and to give me the flexibility to take time off and rest in between flowering my the plants. This will allow me to manage my vegetative plants more easily and also allow me to plan and pace myself with the gardening, as I must do in all other aspects of my life.

Sincerely,

Neil Allard

cc: Dr. J. Mander

cc: Jean Crowder, Member of Parliament

- increase in dosage

B2-1 Information on Medical Practitioner

Medical practitioner's full name: DR. JATINDER S. MANDER

Provincial medical licence number: 27166

DR. J.S. MANDER
THE MEDICAL ARTS CENTRE
30-650 SOUTH TERMINAL AVENUE
NANAIMO, BC, V9R 5E2
(250) 753-3431

Medical specialization (if applicable): FAMILY PRACTICE

Business Address: 103 - 650 TERMINAL AVE. Suite Number:

City: NANAIMO Province: B.C. Postal Code: V9R 5E2

Telephone: (250) 741 - 0447

Fax: ( )

E-mail:

B2-2 Medical Condition(s) and Symptom(s)

Applicant's full name: ALLARD NEIL VICTOR

Date of Birth: / /

Please specify the medical condition(s) and symptom(s) that are the basis for the application.

Medical Condition(s): myalgic encephalomyelitis

Symptom(s): Mr. Allard experiences intolerable side effects with most conventional medications. Medical marijuana (cannabis) is an effective treatment for his numerous symptoms. These symptoms include muscle and joint pain, nausea, digestive problems, poor appetite, mood and sleep difficulties, fatigue, headaches, and tinnitus. These symptoms are chronic.

Note: You may wish to provide any information that you might consider useful or pertinent for the review of the application.

This is Exhibit "C" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

B2-3 The Proposed Daily Amount

a. The proposed daily amount of dried marihuana is less than or equal to TWENTY grams. 06/09/11

b. The following method and form of administration (please check appropriate box):

☑ Inhalation ☑ Oral uses a Vaporizer, tea, baked goods

Note to Physicians: For more information on daily amounts, you can refer to the following documents:

- **Information for Health Care Professionals—Marihuana**
- **Daily Amount Fact Sheet**

Both documents can be found on the Health Canada web site at www.hc-sc.gc.ca/hecs-secs/ocma/index.htm or by calling toll free at 1-866-337-7705.

B2-4 Duration

Under the *Marihuana Medical Access Regulations*, an *Authorization to Possess* may be issued for a period of up to 12 months.

If you are signing the authorization for a shorter period, please specify the number of months: ☐

B2-5 Medical Practitioner's Declaration and Signature

Please read, sign and date the document in the space provided on Page 3.

1. a. the applicant's symptom(s) listed in Page 1 of this form falls under Category 2 (symptoms that do not fall under Category 1);

   b. conventional treatment(s) for the Category 2 symptom(s) have been tried or considered, and have been found to be ineffective or medically inappropriate for the treatment of the applicant.

2. I am aware that a *Notice of Compliance* has not been issued under the *Food and Drugs Regulations* concerning the safety and effectiveness of marihuana as a drug.

3. a. If you are a medical specialist that your area of medical specialization is relevant to the treatment of the applicant's medical condition; or

   b. If you are not a medical specialist, please declare:

      i. that the applicant's case has been assessed by a specialist;

      ii. the specialist's area of specialization is relevant to the treatment of the applicant's medical condition;

      iii. that the specialist concurs that conventional treatments for the symptom are ineffective or medically inappropriate for the treatment of the applicant; and

      iv. the specialist is aware that marihuana is being considered as an alternative treatment for the applicant.

(signature required on next page)

Name: NEIL ALLARD

(B2-5 continued)

Please complete the following:

Name of the medical specialist: DR. KARL MUENDEL

The medical specialist's area of specialization: ANESTHESIOLOGY

Date of the specialist's assessment of the applicant's case: JUNE 11, 2012

Note: Under the *Marihuana Medical Access Regulations*, a "practitioner" is a practitioner who is recognized as a practitioner by the medical licencing authority of the province in which the practitioner is authorized to practice medicine and who is not named in a notice given under Section 58 or 59 of the *Narcotic Control Regulations*.

4. I declare that the information contained in this form is correct and complete.

MEDICAL PRACTITIONER'S SIGNATURE

DR. J.G. MANDER
THE MEDICAL ARTS CENTRE
30-650 SOUTH TERMINAL AVENUE
NANAIMO, BC, V9R 5E2
(250) 753-3431

PRINT NAME

06/09/2012

DATE

IMPORTANT:

1. **Please ensure that you have read and understood the declarations.**
2. **Please sign and date the declarations.**
3. **It is important to understand that all mandatory information requested must be provided to avoid unnecessary delays.**
4. **We cannot process the application until *ALL* appropriate forms are received.**
5. **Please retain a photocopy of this form for your files.**
   If you have questions regarding this form, please contact Health Canada toll-free at 1-866-337-7705.

Name: NEIL ALLARD

Health Canada / Santé Canada

Address Locator: 0300A
Ottawa ON K1A 1B9

MMAD-1792-13
Client ID: 23

AUTHORIZATION TO POSSESS DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued an authorization pursuant to section 11 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby authorized to possess dried marihuana for your medical purpose in accordance with your authorization. This document serves as proof of your authority to possess marihuana for medical purpose. You should have this document with you at all times when you are in possession of the substance in case you are required to show proof to the police.

HOLDER OF AUTHORIZATION INFORMATION

NAME: Neil Victor Allard **DATE OF BIRTH:** 25-May-1954

ADDRESS: [redacted] Canada **GENDER:** Male

MAILING ADDRESS: 712 Hamilton Ave., Nanaimo, BC, V9R 4G6, Canada

AUTHORIZATION #: APPL-NVA-05-A00621622-54-13-A

TERMS AND CONDITIONS

The maximum quantity of dried marihuana that you may possess at any time under this *Authorization to Possess* is: **600 grams.**

MEDICAL PRACTITIONER INFORMATION

NAME: Dr. Jatinder Singh Mander

VALIDITY DATE: 15-Jul-2014

The date shown as the validity date represents the last day that you may use this licence to obtain medical marihuana from a licenced producer.

EXPIRY DATE

The expiry date for your licence is March 31, 2014. At that time this no longer provides you with authorization to possess marihuana; however, until the validity date noted above, you may use this licence to register with a Licensed Producer to purchase marihuana for medical purposes. The documents you receive from your licensed producer may be used as proof that you are authorized to possess dried marihuana for medical purposes.

ISSUED BY:

Leslie Rosati
A/Director, Bureau [illegible]
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate
Health Canada / Santé Canada

DATE OF ISSUE:
15-Jul-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:

Information you should know about your *Authorization to Possess* dried marihuana and / or *Licence to Produce*

c.c.: Dr. Jatinder Singh Mander

This is Exhibit "K" referred to in the affidavit of Neil Allard sworn before me at Nanaimo BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

All inquiries regarding this authorization should be directed to the Marihuana Medical Access Program toll-free number: 1-866-337-7705.

Canada

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

Health Canada / Santé Canada

Address Locator: 0300A
Ottawa ON K1A 1B9

MMAD-1792-13
Client ID: 23

PERSONAL - USE PRODUCTION LICENCE
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued a licence pursuant to section 29 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby licenced to produce dried marihuana for your medical purpose in accordance with your licence. This document serves as proof of your authority to produce marihuana for a medical purpose. You should have this document with you at all times in case you are required to show proof to the police.

HOLDER OF LICENCE INFORMATION

NAME: Neil Victor Allard **DATE OF BIRTH:** 25-May-1954

ADDRESS: [redacted], Canada **GENDER:** Male

MAILING ADDRESS: 712 Hamilton Ave., Nanaimo, BC, V9R 4G6, Canada

LICENCE #: APPL-NVA-05-A00621622-54-13-A

TERMS AND CONDITIONS

PRODUCTION SITE: [redacted]

MODE OF PRODUCTION: Indoor

PRODUCTION QUANTITIES: The maximum number of marihuana plants that you may have under production at the production site at any time under this *Personal-Use Production Licence* is **98 PLANTS (indoor)** or **0 PLANTS (outdoor)**.

STORAGE SITE: [redacted]

STORAGE QUANTITIES: The maximum quantity of dried marihuana that you may keep at the storage site at any time under this *Personal-Use Production Licence* is:

4410 grams and it must be stored indoors.

EXPIRY DATE

This *Personal-Use Production Licence* expires on: **31-Mar-2014**

ISSUED BY:

Leslie Pezzak
A/Director, Bureau de cannabis médical / A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate / Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE: 15-Jul-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS: Information you should know about your *Authorization to Possess* dried marihuana and / or *Licence to Produce*

All inquiries regarding this licence should be directed to the Marihuana Medical Access Program toll-free number: 1-866-337-7705.

Canada

This is Exhibit "S" referred to in the affidavit of Neil Allard sworn before me at Nanaimo, BC this 10th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

ALBERT E. KING, Q.C.
Barrister & Solicitor
155 Commercial Street
Nanaimo, BC V9R 5G5
753-6617 FAX 753-6123

No. T-2030-13

FEDERAL COURT

BETWEEN:

COUR FÉDÉRALE
FEDERAL COURT
Copie du document
Copy of Document
Déposé / Filed
Reçu / Received
JAN 31 2014
Other

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

SERVICE OF A TRUE COPY
HEREOF ADMITTED
THIS 31st DAY OF
January 2014
W. Williams for E. Peachey / cs
Solicitor for
A.G.C.

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF DAVID HEBERT

I, DAVID HEBERT, Environmental Protection Officer, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am one of the Plaintiffs herein and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. I am 32 years old, born in 1981 in Surrey, British Columbia, Canada and I am the common law partner and primary caregiver and Health Canada approved designated grower for Tanya Beemish, a patient approved by her health care practitioner and Health Canada to possess and use cannabis (marihuana) for her medical condition. Now produced and marked as Exhibit "A" to this my affidavit is a copy of my designated person production licence issued January 4th, 2013 and expiring January 4th, 2014

authorizing the production of 25 plants indoors and the storage of 1,125 grams. I have deleted the addresses, including that of the production and storage sites for reasons of privacy and security and can provide them if necessary and required to do so.

3. I reside in Surrey, British Columbia with my wife Tanya Beemish who is also a Plaintiff and I do not have a criminal record.

4. It is my understanding that Tanya Beemish has nerve damage in her stomach due to complications from Type 1 diabetes which has resulted in a condition called "gastroparesis" or "delayed gastric emptying". She vomits continuously for days some times and has terrible pain and nausea. She has been on disability leave since June 2012. For most of the last 24 months she has been unable to work due to her disability and has been spending more than 50% of her time in the emergency ward of the Royal Columbian and Surrey Memorial hospitals. For most of 2013 she has been feeding through a tube bypassing her stomach and she is on dozens of medications that do not appear to assist her, including opiates such as Hydromorphone (dilaudid). She is extremely weak and bed ridden most days. If I take her to the emergency department her average stay is a week and is sent home with a bag of food for her tube and a week long prescription for hydromorphone. When she is in hospital they keep her on dozens of medications, including opiates, but after she is sent home no follow up occurs any longer, this is extremely difficult for her with no family doctor.

5. She has found that cannabis marihuana is an effective relief to her nausea and discomfort from bloated stomach and in addition it helps her with anxiety and depression and stimulates her appetite when she has good days. She has also been trying to ingest CBD (cannabidiol) and THC (tetrahydrocannabinol) as extracts having heard that there is some research indicating it may help regeneration of nerves and help with the management of her diabetes.

6. She has cried and pleaded with her doctors to help her deal with her pain as she does not want to use opiates any longer as their side effects often exacerbate her gastroparesis condition (nausea and vomiting) while only temporarily aiding her pain. When she raises the question of cannabis with some doctors they often become

uncomfortable and silent avoiding conversation or become hostile and tell her that cannabis is poison and imply that she is a drug addict or that is causing her condition. This is most definitely not true as Tanya almost never has access to cannabis within hospital and often exhibits worse symptoms. The only physician that continues to support her is her endocrinologist, she currently has no family doctor.

7. Tanya's pain management is primarily through hydromorphone, as she has about 100 grams of dry stored cannabis remaining and has none left for juicing or attempting other extracts. We are concerned financially about her future ability to get the cannabis that helps her. Currently she is looking into other options to reduce or control pain such as the Pain Management Clinic that helps wean people off narcotics and deal with pain but there is a 19 month waiting list to get into that program.

8. I produced cannabis marihuana for her in our dwelling house garage in a secure, safe and healthy environment. The production site was the second last row townhouse on a dead end private street and the house was wired for security although there never once was a security incident. All growing was done in a 8'x4'x6.5' growing tent which was properly ducted to circulate fresh air from outside into the tent and vent humid hot air outside, no different than a clothes dryer. I ensured the use of carbon filters, air scrubbers and dehumidifiers to prevent offensive odours and mold issues. We never experienced any problems. We were directly between two large families on either side of us, with shared walls and never had any complaints, in fact we were quite friendly and even had them over without anyone knowing of our garden. The garage has a securely locked door with a dead bolt to an outside inaccessible backyard patio. The room itself was separate from the garage and had bars across the single small window, the garage door was also locked and disconnected from power as an added security. An additional smoke detector was put above the growing tent as well as a electrical/chemical rated fire extinguisher. All the hot components of the grow system such as the light ballasts were kept cool and away from any potential flammable materials. Once the production facility was constructed I had a certified electrician review it to make sure that I had done everything correctly.

9. I ensured that the cannabis (marihuana) was safe and organic and I lack confidence in others being able to meet my level of standard. I have gardened since childhood and find great joy in growing any plant, I take great care in this as well and for the most part kept my garden tidy like a lab. I have worked as an environmental professional, biologist, lab and agricultural technician over the last 10 years and feel confident in my knowledge of botany how to grow mold free produce. I utilized integrated pest management to deal with mites and other pests. I have two strains that provide Tanya consistent relief to nausea and some pain. One grown from seed and another provided by clone from a compassionate source. As we had to destroy these "mother" plants I fear having to try and find something similar from a licenced producer or the black market as I am unable to continue to provide for her.

10. Tanya consumes 2-10 grams a day of dried cannabis buds via smoking and vapourizing. Since we moved she has no longer been able to juice as we have not had any fresh plant material since. I estimate that, not including the cost of the initial set up equipment, that the electricity and fertilizer we currently use costs an average of about .50c per gram to produce. While I am authorized to produce 25 plants, I have never come near to producing that many, but would like to start doing so to be able to manufacture more edibles and extracts for her. Tanya would like to consume more by way of juicing, oils and other extracts as well as smoking and wishes to continue to do so.

11. If the cost of this medicine from Licenced Producers is between $8-$12 a gram we will simply not be able to afford to purchase the medicine for her. Even at $5 a gram that would be a 10 times increase that we cannot afford. I understand if one continues to produce after one's licence expires that one may be subject to being charged with unlawful production and face the threat of imprisonment and possibly a mandatory minimum if I am doing it for her as they will say I am doing it for distribution. Consequently if I am no longer able to produce for Tanya at a reasonable cost, we will have no alternative but to try and seek out alternative medicine through the black market or illicit market to assist her. This is something we have always tried to avoid

and concerns me insofar as our safety and security is concerned. This could also negatively impact my career.

12. I estimate it cost us approximately $4,225.97 after taxes to build the growing room and I would break down those costs as follows:

a. Tables 8'x4'x6.5' tent $425.00
b. 2 x 600 watt ballast 499.98
c. 2 reflectors 186.98
d. Temp/climate control 680.00
e. Blower fans to outside 169.99
f. Soil over 3 crops 180.00
g. Ducting and y connections 100.00
h. Charcoal filter 131.74
i. Pots and saucers 100.00
j. Seeds 256.00
k. Fertilizers 600.00
l. Additional Fertilizer 200.00
m. CO2 solenoid 144.49
n. CO2 tank fill 99.00
o. 12% tax 452.78

TOTAL: $4,225.97

13. I estimate that after purchase of the equipment and set up as indicated in the paragraph above, the production process costs us about $150 bimonthly in electricity and between $25-$50 a month in miscellaneous purchases such as fertilizer, pH probe buffer solution, CO2 refills, new pots, soil mixes, gloves and other gardening items. We have produced 3 crops so far and we purchased the equipment and built the room expecting to be self sufficient in the future and to not have to go to the illicit market or to anyone else for her medicine. We are both upset about being suddenly criminalized or be forced into purchasing from a private company with vastly inflated prices and losing our anonymity and self sufficiency.

14. Prior to September 30th, 2013, we resided in the townhouse with the garage room production facility, but due to Tanya's health and limited ability to contribute to rent due to reduced income of a disability pension, we simply could not afford to remain there at that rent cost and had to downsize and move to another location. This of course involved moving the production licence as well. Therefore on or about September 27th, 2013 I telephoned Health Canada and told them that were going to have to move but we did not have a place yet and the person who I spoke to on the phone simply advised that they were unable to help until I had a new address at which time I would have to get the new forms in as soon as possible before the September 30th deadline.

15. By the time we found a place, the September 30th, 2013 deadline was passed and on or about October 20th, 2013 I again telephoned Health Canada to see what we could do given Tanya's health and our desire not to go to the black market and there not being any other sources available, but the representative from Health Canada told me that there was simply nothing that could be done, that I had passed the deadline and therefore the production would have to end upon the expiry of the licence, namely January 4th, 2014 and that it had to be at the specified location not elsewhere.

16. We moved to our new premises on October 30th, 2013 and are therefore are no longer producing because we could not move the production site to be lawful at the new premises, but we still have all our equipment and therefore have the ability to set back up if permitted to do so. The amount of cannabis left from production is now very low and I have looked at the cannabis (marihuana) available from the licenced producers online and can simply say that we cannot afford the prices. She has only been using dried and manicured cannabis and has no access to fresh plant material. Consequently I am going to have to go back to try and find some friendly sources on the street to obtain at a price that we can afford.

17. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of ~~Abbotsford~~ Surrey, in the Province of British Columbia, this 13th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

DAVID HEBERT

JOHN W. CONROY, Q.C.
Barrister & Solicitor
Conroy & Company
2459 Pauline Street
Abbotsford, BC V2S 3S1
Telephone: 604-852-5110
Facsimile: 604-859-3361

DESIGNATED PERSON PRODUCTION LICENCE
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued a licence pursuant to section 40 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby licenced to produce dried marihuana. This document and/or ID card will serve as proof of your authority to produce marihuana for a medical purpose. You should have at least one of these documents with you at all times in case you are required to show proof to the police.

HOLDER OF LICENCE INFORMATION		AUTHORIZED PERSON INFORMATION	
NAME:	David Wesley Hebert	**NAME:**	Tanya Louise Beemish
D.O.B:	26-Jul-1981	**D.O.B:**	02-Jul-1986
GENDER:	Male	**GENDER:**	Female
ADDRESS:	[redacted] Canada	**ADDRESS:**	[redacted] Canada
MAILING ADDRESS:	[redacted] Canada	**MAILING ADDRESS:**	[redacted] Canada

TERMS AND CONDITIONS

PRODUCTION SITE: [redacted]

MODE OF PRODUCTION: Indoor

PRODUCTION QUANTITIES: The maximum number of marihuana plants that you may have under production at the production site at any time under this *Designated Person Production Licence* is **25 PLANTS (indoor)** or **0 PLANTS (outdoor).**

STORAGE SITE: [redacted]

STORAGE QUANTITIES: The maximum quantity of dried marihuana that you may keep at the storage site at any time under this *Designated Person Production Licence* is: **1125 grams** and it must be stored indoors.

EXPIRY DATE

Please note this *Designated Person Production Licence* expires on **04-Jan-2014**
Should you wish to renew your *Designated Person Production Licence*, please submit your renewal application at least **8 weeks prior** to your expiry date.

ISSUED BY:

Louis Provik
A Director, Bureau du cannabis médical /
A Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate /
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
04-Jan-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:
Information you should know about your *Designated Person Production Licence*

c.c.: Tanya Louise Beemish

ID CARD AFFIXED HERE

This is Exhibit "A" referred to in the affidavit of David Hebert sworn before me at Abbotsford, B.C. this 13th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

SERVICE OF A TRUE COPY
HEREOF ADMITTED
THIS 31st DAY OF
January 2014
William F. Conroy
Solicitor for A.G.C.

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF TANYA BEEMISH

I, TANYA LOUISE BEEMISH, Disability pensioner, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am one of the Plaintiffs herein and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. I am 27 years old, born in 1986 in Vancouver, British Columbia, Canada and I reside in Surrey, British Columbia with my common law husband David Hebert and we have no children.

3. I have a grade 10 education from New Westminster Secondary School, BC and continued my education at Columbia Square Adult Learning Center when able to do so

and am currently enrolled in grade 11 and 12 courses. My work experience is as a barista and I have no criminal record. I have been on sick leave since June 2012.

4. I am on a Canada Pension Plan disability pension since December 2012 of $596.73 a month due to suffering from type 1 diabetes diagnosed in June 2000 and gastroparesis, diagnosed in 2005 (delayed gastric emptying a complication from type 1 diabetes).

5. I am approved by my health care practitioner and Health Canada to use cannabis (marihuana) to deal with symptoms of extreme nausea, vomiting, pain, lack of appetite and sleep. I use a daily dose of 2-10 grams per day of dried cannabis bud depending upon my health via smoking and vapourizing. I find it difficult to eat so I have not been using edibles as well as we no longer have access to fresh plant material.

6. If the cost of this medicine from licenced producers is between $8-$12 a gram we will simply not be able to afford to purchase the medicine. Even at $5 a gram that would be a 10 times increase that we cannot afford. I understand if one continues to produce after one's licence expires that one may be subject to being charged with unlawful production and face the threat of imprisonment and consequently if David Hebert is no longer able to produce for me at a reasonable cost, we will have no alternative but to try and seek out alternative medicine through the black market or illicit market to assist me. This is something we have always tried to avoid and concerns me insofar as our safety and security is concerned and my health.

7. I am authorized to possess 150 grams on my person at any time and to store 1,125 grams at the production site. I usually store around 300-500 grams. I understand that under the new Regulations I will not be able to store anything and can only possess 150 gms on my person at any time and can only order that amount and no more from Licensed Producer at a time.

8. As a result of my condition I vomit continuously for days sometimes and I have terrible pain and nausea. I have been unable to work for the last 24 months due to my disability and have been spending more than 50% of my time admitted to the Royal

Columbian and Surrey Memorial hospitals. For the most of 2013 I have been using a GJ tube bypassing my stomach and I am on dozens of medications that I find do not assist me. Many of these medications include opiates such as Hydromorphone (dilaudid) and I do not like the side effects. I am extremely weak and bed ridden most days. If I am taken to the Emergency department I am usually sent home within 1 to 2 weeks after being admitted, usually with a bag of food for my tube and a one week prescription for Hydromorphone. I usually return in 1 to weeks this has been ongoing for 2 years now. There is little follow up when I do stay hospital free and I currently due to not have a family physician making this even more difficulty.

9. I found that cannabis marihuana is an effective relief for my nausea and discomfort from gastroparesis and in addition it helps me with my anxiety and depression and stimulates my appetite. I have tried to find ways to ingest CBD (cannabidiol) and THC (tetrahydrocannabinol) as extracts but have difficulties with fats and alcohol (the solvents) due to my condition and have no more access to the necessary fresh cannabis for juicing any longer. I have read and been told that those cannabinoids might help regenerate the nerves in my stomach and help with the management of my diabetes also.

10. I have tried to get doctors approval in the past regarding the use of cannabis and many have become uncomfortable and silent and avoid conversation or become hostile and tell me that cannabis is poison and that I am drug addicted or that is causing my condition. This is most definitely not true as I almost never have access to it within hospital and my symptoms often keep me there longer, although cannabis by no means completely relieves my condition it provides a good deal of help. The only physician that continues to support me is my endocrinologist, I currently have no family doctor.

11. Unfortunately my pain management is primarily through hydromorphone, as I am limited to dry stored cannabis now and have none for juicing or attempting other extracts. Currently other options to reduce or control my pain are also being explored. Unfortunately one of them is a Pain Management Clinic that helps wean people off

narcotics but there is a 19 month waiting list to get into that program and I have not been able to participate as yet.

12. Now produced and marked as Exhibit "A" to this my affidavit is a copy of my Authorization to Possess and I have deleted my addresses for reasons of privacy and security. My licence expired on January 4th, 2014

13. My common law husband David Hebert is my primary caregiver and designated grower under the *MMAR* and now produced and marked as Exhibit "B" to this my affidavit is a copy of his licence with the addresses again deleted or redacted for privacy and security reasons, including the address of the production and storage site. This document authorizes the production of 25 plants indoors and the storage of 1,125 grams indoors and also expired on January 4th, 2014. David Hebert produced two strains for me that I understand are "blueberry strains" that alleviate my pain.

14. Prior to September 30th, 2013, we resided in the townhouse with the garage production facility, but due to my health and the costs involved we simply could not afford to remain there and had to downsize and move to another location. This would of course involve moving the production licence as well. Therefore on or about September 27th, 2013 David Hebert telephoned Health Canada and told them that were going to have to move but we did not have a place yet and the person he spoke to on the phone simply advised that they were unable to help until we had a new address at which time we would have to get the new forms in as soon as possible before the September 30th deadline.

15. By the time we found a place, the September 30th, 2013 deadline was passed and on or about October 20th, 2013 David Hebert again telephoned Health Canada to see what we could do given my and our desire not to go to the black market and there not being any other sources available, but the representative from Health Canada told him that there was simply nothing that could be done, that we had passed the deadline and therefore the production would have to end upon the expiry of the licence, namely January 4th, 2014 and no address change would be provided.

16. We moved to our new premises on October 30th, 2013 and are therefore no longer producing because we could not move the production site to be lawful at the new premises, but we still have all our equipment and therefore have the ability to set back up if permitted to do so. The amount of cannabis left from production is now very low and David Hebert has looked at the cannabis (marihuana) available from the licenced producers online and I can simply say that we cannot afford the prices. Consequently I am going to have to go back to try and find some friendly sources on the street to obtain at a price that we can afford or have David do so for me.

17. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

I. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

II. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

III. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230,

233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of ~~Abbotsford~~ Vancouver, in the Province of British Columbia, this 15th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

Tanya Beemish
TANYA BEEMISH

JOHN W. CONROY, Q.C.
Barrister & Solicitor
Conroy & Company
2459 Pauline Street
Abbotsford, BC V2S 3S1
Telephone: 604-852-5110
Facsimile: 604-859-3361

AUTHORIZATION TO POSSESS
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued an authorization pursuant to section 11 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby authorized to possess dried marihuana for your medical purpose in accordance with your authorization. This document and/or ID card will serve as proof of your authority to possess marihuana for medical purpose. You should have at least one of these documents with you at all times when you are in possession of the substance in case you are required to show proof to the police.

HOLDER OF AUTHORIZATION INFORMATION

NAME: Tanya Louise Beemish **DATE OF BIRTH:** 02-Jul-1986

ADDRESS: [redacted] **GENDER:** Female

MAILING ADDRESS: [redacted]

TERMS AND CONDITIONS

The maximum quantity of dried marihuana that you may possess at any time under this *Authorization to Possess* is: **150 grams.**

MEDICAL PRACTITIONER INFORMATION

NAME: Dr.Clarissa Wallace

EXPIRY DATE

Please note this *Authorization to Possess* expires on **04-Jan-2014**
Should you wish to renew your *Authorization to Possess*, please submit your renewal application at least **8 weeks prior** to your expiry date.

ISSUED BY:

Louis Proulx
A/Director, Bureau du cannabis médical /
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate /
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
04-Jan-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:

Information you should know about your *Authorization to Possess* dried marihuana

c.c.: Dr. Clarissa Wallace

ID CARD AFFIXED HERE

All inquiries regarding this authorization should be directed to the Marihuana Medical Access

This is Exhibit "A" referred to in the affidavit of Tanya Beemish sworn before me at Abbotsford BC this 13th day of January 2014

A Commissioner for taking Affidavits for British Columbia

DESIGNATED PERSON PRODUCTION LICENCE
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued a licence pursuant to section 40 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby licenced to produce dried marihuana. This document and/or ID card will serve as proof of your authority to produce marihuana for a medical purpose. You should have at least one of these documents with you at all times in case you are required to show proof to the police.

HOLDER OF LICENCE INFORMATION		AUTHORIZED PERSON INFORMATION	
NAME:	David Wesley Hebert	**NAME:**	Tanya Louise Beemish
D.O.B:	26-Jul-1981	**D.O.B:**	02-Jul-1986
GENDER:	Male	**GENDER:**	Female
ADDRESS:	[redacted] Canada	**ADDRESS:**	[redacted] Canada
MAILING ADDRESS:	[redacted] Canada	**MAILING ADDRESS:**	[redacted] Canada

TERMS AND CONDITIONS

PRODUCTION SITE: [redacted]

MODE OF PRODUCTION: Indoor

PRODUCTION QUANTITIES: The maximum number of marihuana plants that you may have under production at the production site at any time under this *Designated Person Production Licence* is **25 PLANTS (indoor)** or **0 PLANTS (outdoor)**.

STORAGE SITE: [redacted]

STORAGE QUANTITIES: The maximum quantity of dried marihuana that you may keep at the storage site at any time under this *Designated Person Production Licence* is: **1125 grams** and it must be stored indoors.

EXPIRY DATE

Please note this *Designated Person Production Licence* expires on **04-Jan-2014**
Should you wish to renew your *Designated Person Production Licence*, please submit your renewal application at least **8 weeks prior** to your expiry date.

ISSUED BY:

Louis Provis
A Director, Bureau du cannabis médical /
A Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate /
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
04-Jan-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:
Information you should know about your *Designated Person Production Licence*

c.c.: Tanya Louise Beemish

ID CARD AFFIXED HERE

This is Exhibit "B" referred to in the affidavit of Tanya Beemish sworn before me at Abbotsford BC this 13th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

SERVICE OF A TRUE COPY
HEREOF ADMITTED
THIS 31st DAY OF
January 20 14
William F. Pentney /cs
Solicitor for
A.G.C.

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF SHAWN DAVEY

I, SHAWN DAVEY, Disability pensioner, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am one of the Plaintiffs herein and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. I am 37 years of age born in 1976 in Maple Ridge, British Columbia, Canada.

3. I am currently single with one dependent, my 17 year old son who lives with his mother, from whom I am separated, in Mission, British Columbia.

4. I have a grade 10 education from Maple Ridge Senior Secondary and thereafter obtained certifications based on job experience until my accident. I have no criminal record.

5. Prior to June 16th, 2000 I worked for Commercial Body Builders, Ltd., building custom vehicles in Delta, British Columbia, working some 70 hours per week, but then on June 16th, 2000, I was involved in a motor vehicle accident in which I suffered a substantial brain injury in which the other party was at fault and which resulted in my receiving a substantial settlement from the other party through the Insurance Corporation of British Columbia by way of a monthly payment of $4,500.00 over a 30 year annuity period as well as a Canada Pension Plan Disability Pension in the amount of $530.00 per month, for a total of approximately $5,000.00 a month and I pay $300 a month in maintenance to my former spouse.

6. As a result of the motor vehicle accident, I was in a coma for 3.5 months and I was told by my attending health care practitioners that I would never walk or talk again and would be under 24 hour care for the rest of my life. I suffered a severe brain injury and I am constantly in major pain. For the first six years I relieved the pain through medications prescribed by my physician covered through the ICBC settlement and the BC Medical Plan. These medications were still costing me another approximate $3,000.00 a month and I consumed those medications for approximately 6 years. I then tried Cannabis (marihuana) and found that it not only relieved my pain, but also enabled me to wean myself off all of the other medications and only consume cannabis (marihuana), thereby removing my dependency on the other medications and avoiding their significant side effects.

7. Starting in approximately 2007 I had a person producing cannabis (marihuana) for me as medicine as a Designated Grower, but I found that the supply was unreliable in terms of ensuring me a continuous safe supply and the quality very poor. I was suspicious that this person was maybe abusing the licence so I switched to a different Designated Grower for a couple of years, but once again I found the quality to be not up to what I required in terms of strengths and effectiveness, although the supply was more regular. Consequently I determined to produced my own so that I could control the quality and quantity accordingly.

8. I am currently authorized to use up to 25 grams a day and now produced and marked as Exhibit "A" to this my affidavit is a copy of my Authorization to Possess indicating my MMAD No. 42760-13 and my client ID 45146 and I have deleted the addresses for privacy and security reasons, but assume that Health Canada has access to that and I can provide it if required. This document authorizes me to possess at any time up to 750 grams on my person and while it specifies that the authorization is valid until September 26th, 2014 it also indicates that it will expire on March 31st, 2014 although it can be used to register with a Licenced Producer thereafter.

9. I also have a Personal Use Production Licence issued on September 16th, 2013 which expires March 31st, 2014 and now produced and marked as Exhibit "B" to this my affidavit is a copy of that licence with the same MMAD number and Client ID number and I have similarly deleted the addresses, including the address of the production site for privacy and security reasons, but can make it available if required. This document shows that I am entitled to produce 122 plants indoors and to store 5,490 grams indoors. That licence expires according to its face on March 31st, 2014 , which I understand to be the date of repeal of the *Medical Marihuana Access Regulations* by the *Marihuana for Medical Purposes Regulations*

10. I use the entire Cannabis plant as medicine. Primarily I use it in edibles or baked goods, but I also make tea out of it and juice and also smoke it from time to time.

11. I used to live on a particular street in Mission, BC and my next door neighbor was one Brian Alexander. In speaking with him, I found out that he also had an Authorization to Possess and a Personal Use Production Licence under the *Marihuana Medical Access Regulations* and that he had a leased location in Mission where I could also locate my production and that way we could reduce the costs by sharing them to some extent and he could assist me with his knowledge of how to produce the cannabis as medicine. Consequently, I joined with him in leasing the production site property in Mission, British Columbia, and both of our production licences are effective at that location for purposes of production and storage. The property is in the BC Agricultural Land Reserve which expressly allows the propagation of medicinal plant culture and the

production building on the property is an outbuilding or barn. I moved into the residence on that property and therefore lease or pay rent accordingly. Brian Alexander took care of ensuring that the production facility was properly constructed and vented to ensure no mold problems and that it was safe and secure from the likelihood of any heat or fire problems and he also put in place appropriate alarms and gates and doors to ensure proper security. With respect to the production, Brian assists me while attending to his own by telling me what to do and I simply follow his directions. He also helps me in my daily living such as assisting me in obtaining groceries from the store and things of that nature. The alarm system at the production site is set up so that if the alarm goes off the monitor first calls Brian Alexander and if he does not answer then calls me and I call the police or if he does answer then he calls me and he will call the police. We have never had to do this. The assistance of Brian Alexander enables me to attend to the production myself with his assistance and to keep the cost of production at a reasonable level.

12. I have found that I can produce at a cost that I estimate to be between $1 - $2 a gram and that I use 25 grams a day. While my original medications were costing me approximately $3,000 a month, I was now able to reduce that to approximately $750 - $1500 a month. I am also very concerned about quality and effectiveness because I have determined that I require a 12%-18% THC content to reduce my pain. Compared to the arrangement with the previous designated producers, this arrangement has worked out very well for me and I feel very secure and safe and experience far less stress knowing that I am able to ensure a safe continuous supply of effective medicine for myself.

13. If I am unable to continue to produce for myself with the assistance of Brian Alexander as indicated above, I understand that to continue to produce may result in me being charged with the offence of production for which the penalty includes a threat of imprisonment. I do not want to go back on to the narcotics or other medications originally provided to me because of the side effects and impact they have upon me so I fear that I will have to go to the black market to try and find cannabis (marihuana) that will work for me and that will cost me less than the estimated licenced producer prices

of between $6-$12 a gram. I am concerned about the quality and safety of any product obtained through that means. Based on my past experiences, I simply do not trust others to produce the quality effective medicine that I require for my health. At my rate of use of 25 grams a day, my costs through a Licenced Producer at $8 a gram would be $200 a day or 4 times my current costs and approximately $6,000 a month or every 30 days.

14. It is our understanding that the neighbours on both sides of our production site also have medical marihuana licences but we have not verified that and we have never had any complaints from any neighbours.

15. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any

licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Abbotsford, in the Province of British Columbia, this 8th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

SHAWN DAVEY

JOHN W. CONROY, Q.C.
Barrister & Solicitor
Conroy & Company
2459 Pauline Street
Abbotsford, BC V2S 3S1
Telephone: 604-852-5110
Facscmile: 604-859-3361

Health Canada / Santé Canada

Address Locator: 0300A
Ottawa ON K1A 1B9

MMAD-42760-13
Client ID: 45146

PERSONAL - USE PRODUCTION LICENCE
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued a licence pursuant to section 29 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby licenced to produce dried marihuana for your medical purpose in accordance with your licence. This document serves as proof of your authority to produce marihuana for a medical purpose. You should have this document with you at all times in case you are required to show proof to the police.

HOLDER OF LICENCE INFORMATION

NAME: Shawn Robert Davey
DATE OF BIRTH: 08-Jun-1976
ADDRESS: [redacted]
Canada
GENDER: Male
MAILING ADDRESS: [redacted]
LICENCE #: APPL-SRD-06-D30720800-76-13-A

TERMS AND CONDITIONS

PRODUCTION SITE: [redacted]

MODE OF PRODUCTION: Indoor

PRODUCTION QUANTITIES: The maximum number of marihuana plants that you may have under production at the production site at any time under this *Personal-Use Production Licence* is **122 PLANTS (indoor)** or **0 PLANTS (outdoor)**.

STORAGE SITE: [redacted]

STORAGE QUANTITIES: The maximum quantity of dried marihuana that you may keep at the storage site at any time under this *Personal-Use Production Licence* is: **5490 grams** and it must be stored indoors.

EXPIRY DATE

This *Personal-Use Production Licence* expires on: **31-Mar-2014**

ISSUED BY:

Louis Proulx
A/Director, Bureau du cannabis médical
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE: 26-Sep-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS: Information you should know about your *Authorization to Possess* dried marihuana and / or *Licence to Produce*

All inquiries regarding this licence should be directed to the Marihuana Medical Access Program toll-free number: 1-866-337-7705.

Canada

This is Exhibit "B" referred to in the affidavit of Shawn Davey
sworn before me at Abbotsford BC
this 8th day of Dec 2014

A Commissioner for taking Affidavits for British Columbia

Health Canada / Santé Canada

Address Locator: 0300A
Ottawa ON K1A 1B9

MMAD-42760-13
Client ID: 45146

AUTHORIZATION TO POSSESS DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued an authorization pursuant to section 11 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby authorized to possess dried marihuana for your medical purpose in accordance with your authorization. This document serves as proof of your authority to possess marihuana for medical purpose. You should have this document with you at all times when you are in possession of the substance in case you are required to show proof to the police.

HOLDER OF AUTHORIZATION INFORMATION

NAME: Shawn Robert Davey **DATE OF BIRTH:** 08-Jun-1976

ADDRESS: [redacted] **GENDER:** Male
Canada

MAILING ADDRESS: [redacted] anada

AUTHORIZATION #: APPL-SRD-06-D30720800-76-13-A

TERMS AND CONDITIONS

The maximum quantity of dried marihuana that you may possess at any time under this *Authorization to Possess* is: **750 grams.**

MEDICAL PRACTITIONER INFORMATION

NAME: Dr. Gwyllyn S. Goddard

VALIDITY DATE: 26-Sep-2014

The date shown as the validity date represents the last day that you may use this licence to obtain medical marihuana from a licenced producer.

EXPIRY DATE

The expiry date for your licence is March 31, 2014. At that time this no longer provides you with authorization to possess marihuana; however, until the validity date noted above, you may use this licence to register with a Licensed Producer to purchase marihuana for medical purposes. The documents you receive from your licensed producer may be used as proof that you are authorized to possess dried marihuana for medical purposes.

ISSUED BY:

Louis Proulx
A/Directeur, Bureau du cannabis médical
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
26-Sep-2013

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:

Information you should know about your *Authorization to Possess* dried marihuana and / or *Licence to Produce*

c.c.: Dr. Gwyllyn S. Goddard

This is Exhibit "A" referred to in the affidavit of Shawn Davey sworn before me at Abbotsford, BC this 8th day of January 2014

A Commissioner for taking Affidavits for British Columbia

All inquiries regarding this authorization should be directed to the Marihuana Medical Access Program toll-free number: 1-866-337-7705.

Canada

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF BRIAN ALEXANDER

I, BRIAN ALEXANDER, self employed contractor, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am the holder of an Authorization to Possess and a Personal Production Licence under the *Marihuana Medical Access Regulations (MMAR)* and I am acquainted with and assist the Plaintiff Shawn Davey who also has an Authorization to Possess and a Personal Production Licence and the latter being at the same production site as my licence, and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. I am 43 years of age born in Maple Ridge, British Columbia, Canada. I am married and have three children and am a self employed contractor who does renovations. Now produced and marked as Exhibit "A" to this my affidavit is my Authorization to Possess showing my MMAD number 102108-12 that was issued December 18th, 2012 and

expired on December 18th, 2013 authorizing me to possess 900 grams on my person and now produced and marked as Exhibit "B" to this my affidavit is my Personal Use Production Licence under the same number which authorizes me to produce 146 plants indoors and to store 6,570 grams indoors at the storage site. I have deleted my address as well the production and storage site addresses for reasons of privacy and security on both documents and can make them available if required. I suffer chronic pain from associated traumatic injuries to my joints and fractures of my ankles and hand and suffer from osteoarthritis and sciatica.

3. I live in Mission, British Columbia and discovered through conversations with my neighbour that he had an Authorization to Possess under the *MMAR* but was having difficulty with the persons designated to grow for him and wanted to produce for himself but was concerned about the cost of so doing and consequently we entered into an arrangement whereby he moved in and leases the residence at the production site and we both produce our medicine in an outbuilding/barn at that site thereby sharing the costs and reducing all costs and expenses.

4. Based on my experience as a contractor, I primarily constructed the facility using ½ inch plywood and no drywall and ensuring lots of venting and we also bleach and wash and clean the site constantly and we have never experienced any mold or other significant problems of that nature. Similarly, I ensured that all of the electrical work was reviewed by a certified electrician and installed a "heat kill unit" so that if any power fluctuations of any significance occur or if it gets too hot in the production site, the power will shut down automatically.

5. Similarly to ensure adequate security in the event of attempted break ins or thefts, I ensured that there is a locked gate at the entrance to the property and then as the road divides there is a further steel cable across the road that leads to the shop or outbuilding. There is a steel caged door with double dead bolts on the outside of the shop and then a further steel door with double dead bolts and then a one inch plywood door with double padlocks to go through to get in. Now produced and marked as Exhibit "C" to this my affidavit are six photographs of these doors (3 pages). The

outbuilding is alarmed with a siren alarm upstairs and one downstairs. If there is a breach it rings at the alarm monitoring station and they call my cell phone and I then call Shawn Davey and then either he or I contact the local RCMP.

6. I am also very concerned about the removal of the Personal Production Licence and the estimated cost of obtaining my medicine from a Licenced Producer as based on those estimated prices of $8-$12 a gram I would simply not be able to afford to purchase from them and I know that there is a risk of imprisonment of one continuing to produce without a licence therefore would probably have to explore the black market or illicit market to find medicine at a cost that I can afford.

7. I assisted Shawn Davey in establishing production at the same site as indicated above as mine and I help him by telling him what he has to do in relation to the production and he then carries out those instructions. I now also assist him with aspects of his daily living such as assisting him when he needs to go to the store to obtain groceries or things of that nature. Consequently I am acting as his caregiver to some extent as well as assisting him with his production so that he can obtain his medicine at a reasonable cost.

8. It is our understanding that the neighbours on both sides of our production site also have medical marihuana licences but we have not verified that and we have never had any complaints from any neighbours.

9. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Abbotsford, in the Province of British Columbia, this 8th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

BRIAN ALEXANDER

JOHN W. CONROY, Q.C.
Barrister & Solicitor
Conroy & Company
2459 Pauline Street
Abbotsford, BC V2S 3S1
Telephone: 604-852-5110
Facscmile: 604-859-3361

Health Canada / Santé Canada

Address Locator: 3503B
Ottawa ON K1A 1B9

MMAD-102108-12

AUTHORIZATION TO POSSESS DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued an authorization pursuant to section 11 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby authorized to possess dried marihuana for your medical purpose in accordance with your authorization. This document and/or ID card will serve as proof of your authority to possess marihuana for medical purpose. You should have at least one of these documents with you at all times when you are in possession of the substance in case you are required to show proof to the police.

HOLDER OF AUTHORIZATION INFORMATION

NAME: Brian Dudley Alexander **DATE OF BIRTH:** 31-May-1970

ADDRESS: [redacted] **GENDER:** Male

MAILING ADDRESS: [redacted]

TERMS AND CONDITIONS

The maximum quantity of dried marihuana that you may possess at any time under this *Authorization to Possess* is: **900 grams.**

MEDICAL PRACTITIONER INFORMATION

NAME: Dr. Gerald Owen Mitchell

EXPIRY DATE

Please note this *Authorization to Possess* expires on **18-Dec-2013**
Should you wish to renew your *Authorization to Possess*, please submit your renewal application at least **8 weeks prior** to your expiry date.

ISSUED BY:

Louis Proulx
A/Directeur, Bureau du cannabis médical /
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
18-Dec-2012

PLEASE READ ALL ENCLOSED DOCUMENTS

ENCLOSED DOCUMENTS:

Information you should know about your *Authorization to Possess* dried marihuana

c.c.: Dr. Gerald Owen Mitchell

ID CARD AFFIXED HERE

All inquiries regarding this authorization should be directed to the Marihuana Medical Access Division toll-free number: 1-866-337-7705.

Canada

This is Exhibit "A" referred to in the affidavit of Brian Alexander sworn before me at Abbotsford, BC this 8th day of January 2014

A Commissioner for taking Affidavits for British Columbia

Health Canada Santé Canada

Address Locator: 3503B
Ottawa ON K1A 1B9

MMAD-102108-12

PERSONAL - USE PRODUCTION LICENCE
DRIED MARIHUANA FOR MEDICAL PURPOSES

You have met the requirements to be issued a licence pursuant to section 29 of the *Marihuana Medical Access Regulations* (MMAR). You are hereby licenced to produce dried marihuana for your medical purpose in accordance with your licence. This document and/or ID card will serve as proof of your authority to produce marihuana for a medical purpose. You should have at least one of these documents with you at all times in case you are required to show proof to the police.

HOLDER OF LICENCE INFORMATION

NAME: Brian Dudley Alexander **DATE OF BIRTH:** 31-May-1970

ADDRESS: [redacted] **GENDER:** Male

MAILING ADDRESS: [redacted]

TERMS AND CONDITIONS

PRODUCTION SITE: [redacted]

MODE OF PRODUCTION: Indoor

PRODUCTION QUANTITIES: The maximum number of marihuana plants that you may have under production at the production site at any time under this *Personal-Use Production Licence* is **146 PLANTS (indoor)** or **0 PLANTS (outdoor).**

STORAGE SITE: [redacted]

STORAGE QUANTITIES: The maximum quantity of dried marihuana that you may keep at the storage site at any time under this *Personal-Use Production Licence* is: **6570 grams** and it must be stored indoors.

EXPIRY DATE

Please note this *Personal-Use Production Licence* expires on **18-Dec-2013**
Should you wish to renew your *Personal-Use Production Licence*, please submit your renewal application at least **8 weeks prior** to your expiry date.

ISSUED BY:

Louis Proulx
A/Directeur, Bureau du cannabis médical /
A/Director, Bureau of Medical Cannabis
Controlled Substances & Tobacco Directorate /
Direction des substances contrôlées et de la lutte au tabagisme
Health Canada / Santé Canada

DATE OF ISSUE:
18-Dec-2012

PLEASE READ ALL ENCLOSED DOCUMENTS CAREFULLY

ENCLOSED DOCUMENTS: Information you should know about your *Personal-Use Production Licence*

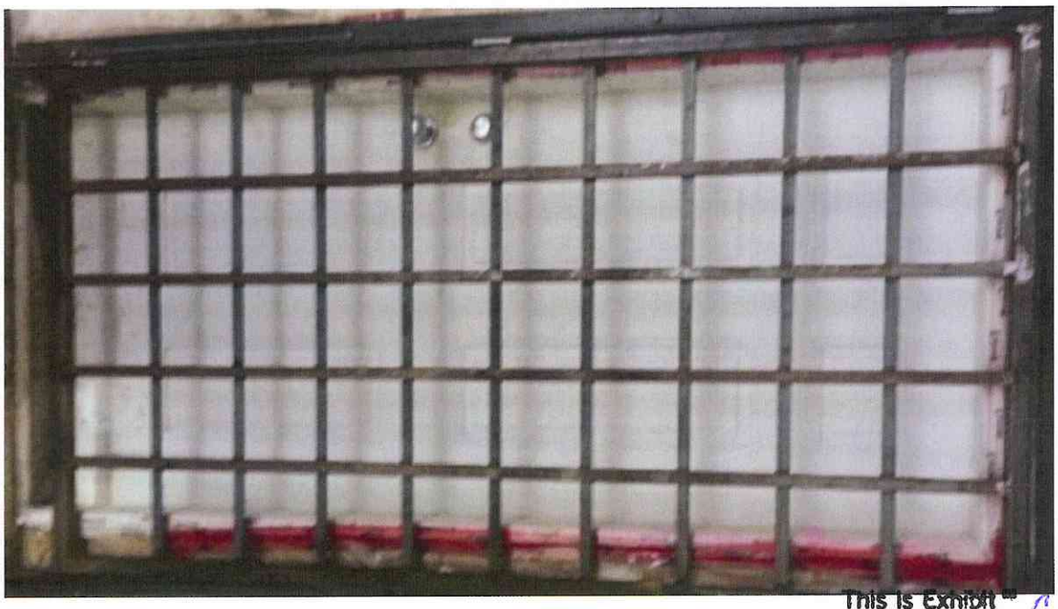
NOTE: Details of this *Personal-Use Production Licence* are summarized on your ID card attached to your *Authorization to Possess.*

All inquiries regarding this authorization should be directed to the Marihuana Medical Access Division toll-free number: 1-866-337-7705.

Canada

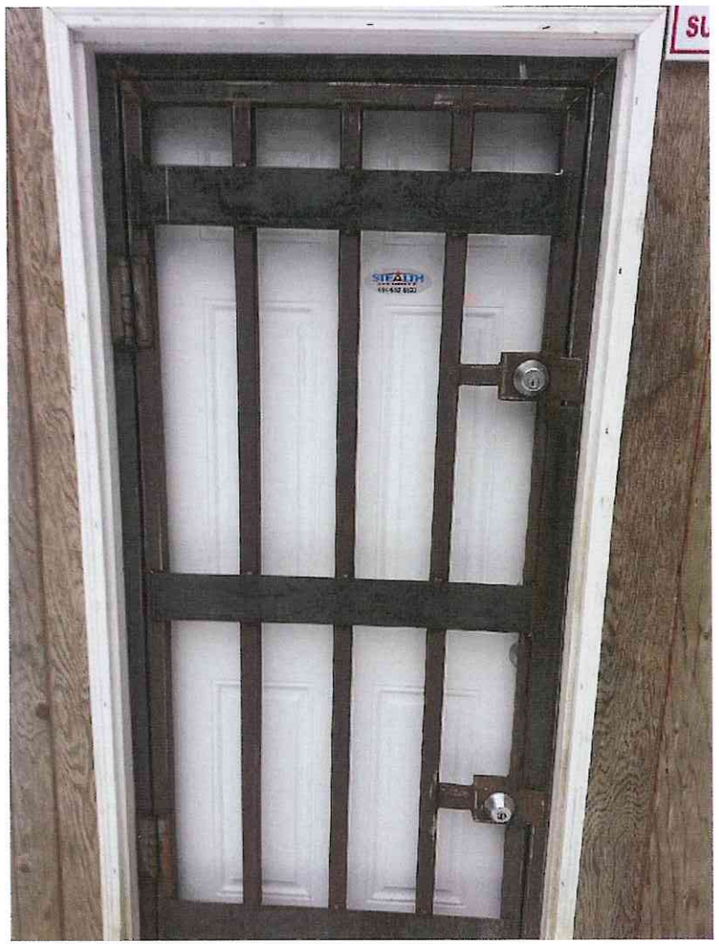
This is Exhibit "B" referred to in the affidavit of Brian Alexander sworn before me at Abbotsford, BC this 8th day of January 2014

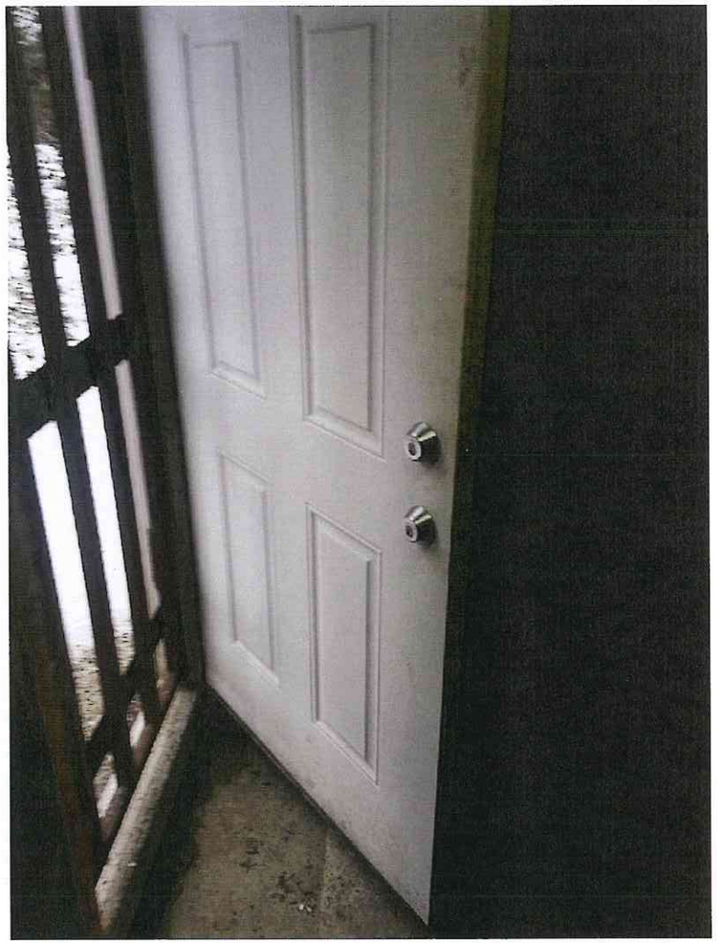
A Commissioner for taking Affidavits for British Columbia



This is Exhibit "C" referred to in
the affidavit of Brian Alexander
sworn before me at Abbotsford BC
this 21st day of Jan. 2014

A Commissioner for taking Affidavits
for British Columbia


STEALTH



No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF DAN NELSON

I, DAN NELSON, Medical Patient, c/o Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am an approved medical patient under the *Medical Marihuana Access Regulations (MMAR)* and have both an Authorization to Possess and a Personal Production Licence through my health care provider and Health Canada and as such I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

2. On November 27th, 2013 I sent an email to Health Canada MMAP-PAMM requesting statitics from their Marihuana Medical Access Program.

3. Now attached and marked as Exhibit "A" to this my affidavit is a copy of the email received from MMAP-PAMM dated December 17th, 2013 in reply to my request and

which sets out the statistics as of December 2, 2013 for the number of Authorizations to Possess (ATPS), Personal Use Prroduction Licences (PUPLS) and Designated Person Production Licences (DPPLS) by province/territory for all of Canada

4. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Oshawa, in the Province of Ontario, this 9th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of Ontario

D. Nelson
DAN NELSON

This is Exhibit "A" referred to in the affidavit of Dan Nelson sworn before me at Oshawa Ont this 9th day of Jan 2014
A Commissioner for taking Affidavits for British Columbia

From: MMAP-PAMM
Sent: Wednesday, December 18, 2013 2:52 PM
To: Aether
Subject: Re: Marihuana Medical Access Program Statistics for 2013 and 2011

Dear Sir,

Thank you for your email of November 27, 2013, in which you request statistics from the Marihuana Medical Access Program (Program). We regret the delay in responding.

The requested Program Statistics are displayed within the tables below. It is important to note that these figures will not sum and the information is reflective of active authorizations on the date that the data was extracted.

At December 2, 2013:

- 38,444 individuals held a valid Authorization to Possess (ATP) in Canada;
- 25,658 individuals held a valid Personal-Use Production Licence (PUPL) in Canada; and
- 4,058 individuals held a valid Designated-Person Production Licence (DPPL) in Canada.

The table below indicates a breakdown of ATPs, PUPLs, and DPPLs by province/territory at December 2, 2013.

Province	Active Authorizations to Possess	Active Personal-Use Production Licences	Active Designated-Person Production Licences
Alberta	2,382	1,233	138
British Columbia	18,890	14,148	2,389
Manitoba	944	642	100
New Brunswick	806	577	50
Newfoundland and Labrador	193	71	-
Northwest Territories, Nunavut, Yukon	61	-	-
Nova Scotia	1,942	1,328	171
Ontario	11,066	6,526	941
Prince Edward Island	84	-	-
Quebec	1,130	711	195
Saskatchewan	949	376	58

Due to privacy considerations, we are unable to disclose certain information related to

authorizations and licences; where those numbers are low enough that disclosure of the information could lead to a privacy violation, those values have been removed and replaced by "-".

If you have any additional questions or concerns, please contact the Program at mmap-pamm@hc-sc.gc.ca or toll-free at 1-866-337-7705.
Sincerely,

Client Services
Bureau of Medical Cannabis

FEDERAL COURT

No. T-2030-13

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
J.M.
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF ZACHARY WALSH

I, ZACHARY WALSH, Ph.D., R. Psych, Assistant Professor, Department of Psychology at the University of British Columbia of 3333 University Way, Kelowna, British Columbia Campus, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am an Assistant Professor with the Department of Psychology at the University of British Columbia, Kelowna Campus, now produced and marked as Exhibit "A" to this my Affidavit is a copy of my Curriculum Vitae.

2. Now produced and marked as Exhibit "B" to this my affidavit is a copy of an article recently published in the *International Journal of Drug Policy* after a blind peer review process, entitled "Cannabis for Therapeutic Purposes: Patient Characteristics, Access and Reasons for Use" that is the culmination of research by myself and the other authors/participants.

3. Now produced and marked as Exhibit "C" to this my affidavit is another paper that I have authored with others that has also been blind peer reviewed and invited for resubmission pending minor revisions with the *International Journal of Drug Policy* and which I expect will be published soon, entitled "Cannabis for Therapeutic Purposes – Survey on Barriers to Access to Cannabis for Therapeutic Purposes in Canada" by myself and the other authors/participants mentioned accordingly.

4. Now produced and marked as Exhibit "D" to this my affidavit is a copy of a PowerPoint presentation entitled "Cannabis Access for Medical Purposes: Patient Characteristics, Patterns of Use and Barriers to Access". This study CAMPS is the largest study to date in Canada of medical cannabis (marihuana) consumers in Canada and was externally funded and reviewed by the UBC Institute for Healthy Living and Chronic Disease Prevention and was carried out between 2011 and 2012.

5. I believe the CAMPS survey is relatively self-explanatory by each slide or page illustrating the methods used, the demographics with respect to the individuals, the medical conditions for which cannabis has been authorized and for which unauthorized use continues, the medical condition systems indicated by the patients, the patterns of use by them, the various modes of access both authorized and unauthorized, obstacles to access including, physicians, affordability, availability and modes of access followed by a summary of the discussion engendered by these findings.

6. On the page dealing with 'affordability' in relation to access you will note that those in the lowest income groups had the most difficulty affording medicine with the graph indicating somewhere between 50% and 70% and also indicating that a large number of that group choose between obtaining their medicine and other necessities. The further graph on that page also demonstrates that those having the greatest difficulty affording their medicine are the most likely to choose between their medicine and other necessities are those in the poorest health.

7. In Exhibit "C" we define "barriers to access" as areas of poor fit between clients and services and used 5 dimensions to examine access to cannabis for therapeutic purposes, namely "accommodation, accessibility, availability, affordability and

acceptability". As indicated in the abstract summary and results, our findings revealed that it was difficult for Canadians to find a physician to support their application, that access from unauthorized sources were common with only 7% of the Respondents accessing cannabis for therapeutic purposes exclusively from authorized sources and accessibility to such therapy was associated with the presence of medical cannabis dispensaries, even though they were excluded from the regulatory regime. Access also varied by medical condition and general quality of health. Most significantly affordability was determined to be a significant barrier to access that we recommended should be addressed under future programs.

8. As indicated in Exhibit "C" an estimated 1,000,000 Canadians or 4% of those age 15 and older reported using cannabis to treat self-defined medical conditions in the previous 12 months. In 2001 the *Marihuana Medical Access Regulations (MMAR)* came into effect and we were advised that as of December 2012 there were 28,115 Canadians who had obtained authorizations under these Regulations to possess cannabis for therapeutic purposes and to obtain it from a legal source. We understood that while the uptake of the federal program has increased in recent years, its enrollment still only represents fewer than 5% of the estimated users of cannabis in Canada. This suggested to us that there were numerous barriers to access in existence which we undertook to analyze.

9. We determined in addition to authorized sources, there are medical cannabis dispensaries known as Compassion Clubs or Dispensaries that represent a parallel source of cannabis providing cannabis and related services apparently to over 40,000 patients in Canada according to the Canadian Association of Medical Cannabis Dispensaries in 2013. These dispensaries arose in Canada in 1997 in response to demand and predate the Regulations and are not officially recognized by them. In addition, apparently many Canadians access cannabis through friends, illicit self-production and the street market. Our analysis drew on the data from the largest survey of Canadians who use cannabis for therapeutic purposes, namely the *Cannabis Access for Medical Purposes Survey (CAMPS)* and we employed a Health Services analytical framework to define the concept of "access" and its relationship to patient satisfaction

and to examine barriers to access under the program. As mentioned above, we focused on five dimensions, which are summarized at page 5 of the paper and focusing on the question of "affordability" we set out that such reflected the relationship between the costs of services and products and the patient's willingness and ability to pay for them and we addressed this dimension by examining associations among income, costs associated with cannabis for therapeutic purposes and the ability to access cannabis.

10. We conducted a literature review on the barriers to access to cannabis therapy in Canada noting few studies touching on this issue and pointing to a 2005 study by the Canadian AIDS Society that found over 1/3 of the patients had applied to participate in the federal program, but with many of them describing significant barriers. Apparently 86% of respondents obtained their cannabis from illegal sources, including friend, dispensaries and unauthorized self-cultivation as well as street dealers. Only 8% had licences to produce their own and 4% had a designated grower with fewer than 2% purchasing from Health Canada. A more recent survey reported similar low levels of obtaining cannabis from Health Canada and high levels via dispensaries and licenced self-cultivation while the Respondents were generally highly satisfied with the overall federal program (page 6).

11. The results of the study commence at page 9 referring to the issue of accommodation (pages 9 and 10); accessibility (pages 10-11); availability (pages 12-14); affordability (pages 14-15); and acceptability (pages 15-16).

12. On the question of "availability" we determined that with regard to sources of cannabis almost 1/3 of the respondents reported self-producing of whom 50% were licenced to produce for personal use. Approximately 1/3 of those who self-produced reported difficulties in learning to produce. Among those who did not self-produce the most prominent reason for not producing was lack of space, expense or legal concerns. However, among self-producers the most important reason for self-producing was quality (39%), followed by price (36%), avoiding the black market (29%), selection of a specific strain of cannabis (24%) and safety (12%). Of those who reported that

someone else produced for them, 67% had designated producers who were licenced to produce for them.

13. On the question of affordability, while many applicants were charged a fee by their physicians for the service of having their application completed, it was determined that it was the actual cost of the cannabis that was the major barrier to access in terms of affordability. Among the participants who reported buying cannabis the median amount reportedly spent was $200 a month.However, 54% of the respondents reported that there were sometimes or never able to afford to buy sufficient quantity of cannabis to relieve their symptoms and approximately 1/3 reported that they often or always choose between cannabis and other necessities (e.g. food, rent, other medicines) because of lack of money. The proportions of respondents who reported that they were sometimes or never able to afford sufficient quantity of cannabis differed according to income such that it was most frequently report by the lower income group (72%) and least frequently by the higher income group (30%). We found that the frequency of reports of choosing between cannabis therapy and other necessities followed a similar pattern with the highest level amongst lower income people and the lowest level amongst higher income people. Approximately two thirds of those experiencing fair to poor general health were sometimes or never able to afford sufficient cannabis compared to half of those with better health. Those with poorer health were also nearly twice as likely to report choosing between cannabis and other necessities.

14. We discuss again the question of "affordability" at page 20 and indicate that we found further obstacles to optimal cannabis use with over ½ the respondents indicating that financial considerations interfered with their ability to treat symptoms with cannabis. Lower income individuals were the most vulnerable with approximately ½ the participants in the lowest income group reporting having to choose between cannabis and other necessities. Even 1/3 of the highest income group reported difficulties affording cannabis. Affordability appeared to disproportionately impact the most seriously ill patients so the group who reported fair to poor health were twice as likely as healthier patients to report having to choose between cannabis and other necessities. While the lowest income group was the most likely to obtain an Authorization to

Possess, it was not the cost of the Authorization but the cost of the cannabis that presented the primary barrier to affordability. Consequently we concluded that this financial strain across all income barriers demonstrated the need for developing approaches to mitigate financial barriers and integrate cannabis therapy within a subsidized medicine framework.

15. We concluded (page 24) that "affordability" of cannabis for therapeutic purposes remains a significant barrier for many Canadians and especially the most seriously ill. We note based on our information with respect to the new *Marihuana for Medical Purposes Regulations* that Canadians who use cannabis for therapeutic purposes will no longer have the cost effective option of producing their own cannabis or designating a producer and that the move to commercial Licenced Producers will increase the price of cannabis as indicated by the government's regulatory impact analysis statement regarding the new *MMPR* (Government of Canada 2012). The background paper in support of the Regulatory Impact Analysis Statement was completed by Delsys Research Group Inc. in December 2012 and is entitled "Cost Benefit Analysis of Regulatory Changes for Access to Marihuana for Medical Purposes". Now produced and marked as Exhibit "E" to this my affidavit is a copy of that final report of December 2012.

16. In summary, the government cost benefit analysis makes it clear that a major change under the new program is a projected significant price increase which will therefore significantly impact upon the patients to an even greater degree as indicated in the CAMPS survey and that data resulting therefrom with respect to "affordability" as the most significant barrier to access for the largest group.

17. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of

i. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*,

including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

ii. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

iii. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Kelowna, in the Province of British Columbia, this 15 day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

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EDUCATION

2008 Ph.D., Clinical Psychology
Rosalind Franklin University/ Chicago Medical School, North Chicago, IL.
Dissertation: *Psychopathy, ethnicity, SES and violence: A further examination.*
Supervisor: David S. Kosson, Ph.D.

2004 M.S., Psychology
Rosalind Franklin University/ Chicago Medical School, North Chicago, IL.
Thesis: *The impact of socioeconomic status, ethnicity, and psychopathy on recidivism in a county jail population.*
Supervisor: David S. Kosson, Ph.D.

2001 B.A. (Honours), Psychology
University of Winnipeg, Winnipeg, MB.
Thesis: *The effects of expectations of reminders and action-state orientation on prospective memory.*
Supervisors: Evelyn Schaefer, Ph.D. & Ross Broughton, Ph.D.

1997 B.Ed., English
University of Winnipeg, Winnipeg, MB.

POSTGRADUATE TRAINING

2008 - 2009 Postdoctoral Research Fellowship, Brown University, Warren Alpert Medical School, Department of Psychiatry & Human Behavior, Providence, RI.

2007 - 2008 Clinical Psychology Internship, Brown University, Clinical Psychology Training Consortium, Providence, RI.

PROFESSIONAL LICENSURE

2012 - College of Psychologists of British Columbia -
Registered Clinical Psychologist #2011

2008 - 2010 Psychological Association of Manitoba - C. Psych (Candidate)
Resigned 07/2010 to pursue licensure with College of Psychologists of British Columbia.

ORIGINAL PUBLICATIONS IN PEER-REVIEWED JOURNALS

Walsh, Z., Callaway, R., Belle-Isle, L., Capler, R., Kay, R., Lucas, P., & Holtzman, S. (*In press*). The Cannabis Access for Medical Purposes Study: Patient characteristics, reasons for use, and modes of access. *International Journal of Drug Policy*

Swogger, M.T., **Walsh, Z.,** Maisto, S.A., Conner, K.R. (*in press*). Reactive and proactive aggression and suicide attempts among criminal offenders. *Criminal Justice & Behavior*

Walsh, Z. (*in press).* Psychopathy and criminal violence: The moderating effect of ethnicity. *Law & Human Behavior*

Walsh, Z., Shea, M.T., Yen, S., Edelen, M.O., Hopwood, C.J.,Markowitz, J.C., Ansell, E.B., Morey, L.C., Grilo, C.M., Sanislow, C.A., Skodol, A.E., Gunderson, J.G., Zanarini, M.C.,McGlashan, T.H. (2012). Socioeconomic-status and mental health in a personality disorder sample: The importance of neighbourhood factors. *Journal of Personality Disorders, 26,* 1-12.

Swogger, M.T., **Walsh, Z.,** Kosson, D.S., Cashman-Brown, S., & Caine, E.D. (2012). Self-reported childhood physical abuse and perpetration of intimate partner violence: The moderating role of psychopathic traits. *Criminal Justice & Behavior, 39,* 910-922.

Swogger, M. T., **Walsh, Z.**, Homaifar, B. Y., Caine, E. D., & Conner, K. R. (2012). Predicting self- and other-directed violence among discharged psychiatric patients: The roles of anger and psychopathic traits. *Psychological Medicine, 42,* 371-379.

Swogger, M. T., Conner, K. R., **Walsh, Z.**, & Maisto, S. A. (2011). Childhood abuse and harmful substance use among male and female criminal offenders. *Addictive Behaviors, 36,* 1205-1212.

Chatav-Schonbrun, Y., **Walsh, Z.**, Stuart, G.L., & Strong, D. (2011). Marital status and treatment seeking for alcohol use disorders. *Addictive Disorders and Their Treatment*, 10, 111-122.

Yen, S., Shea, M. T., **Walsh, Z.**, Edelen, M. O., Hopwood, C. J., Markowitz, J. C., Ansell, E. B., Morey, L. C., Grilo, C. M., Sanislow, C. A., Skodol, A. E., Gunderson, J. G., Zanarini, M. C., McGlashan, T. H. (2011). Self-harm subscale of the Schedule of Nonadaptive and Adaptive Personality (SNAP): Predicting suicide attempts over 8 years of follow-up. *Journal of Clinical Psychiatry, 72,* 1522-1528

Walsh Z., Swogger, M.T., O' Connor, B.P., Stuart, G.L., Shea, M.T., & Chatav, Y. (2010*).* Psychopathy and subtypes of partner violent men and women. *Journal of Abnormal Psychology, 119,* 563-574.

Swogger, M.T., **Walsh, Z.**, Lejuez, C.J., & Kosson, D.S. (2010). Psychopathy and risk-taking among criminal offenders. *Criminal Justice and Behavior, 37,* 439-452.

Swogger, M.T., **Walsh, Z.**, Houston, R.J., Cashman-Brown, S., & Conner, K.R. (2010). Psychopathy and Axis I psychiatric disorders among criminal offenders: Relationships to impulsive and proactive aggression. *Aggressive Behavior, 36,* 45-53.

Walsh, Z., Swogger, M.T., & Kosson, D.S. (2009). Psychopathy and instrumental violence: Facet level relationships. *Journal of Personality Disorders, 23,* 416-424.

Stuart, G.L., O'Farrell, T.J., Leonard, K., Moore, T.M., Temple, J.R., Ramsey, S.E., Stout, R., Kahler, C., Bucossi, M., Andersen, S., Recupero, P., **Walsh, Z.**, Chatav Schonbrun, Y., Strong, D., Rothman, E., Rhatigan, D., & Monti, P. (2009). Examining the interface between substance misuse and intimate partner violence. *Substance Abuse: Research and Treatment, 3,* 25-29.

Swogger, M.T., **Walsh, Z.**, & Kosson, D.S. (2008). Psychopathy subtypes among African American county jail inmates. *Criminal Justice and Behavior, 35,* 1484-1499.

Walsh, Z., & Kosson, D.S. (2008). Psychopathy and violence: The importance of factor level interactions. *Psychological Assessment, 20,* 114-120.

Walsh, Z., Epstein, A.M., Munisamy, G., & King, A.C. (2008). The impact of depressive symptoms on the efficacy of naltrexone in smoking cessation. *Journal of Addictive Diseases, 27,* 65-72.

Swogger, M.T., **Walsh, Z.**, & Kosson, D.S. (2007) Domestic violence and psychopathic traits: Distinguishing the antisocial batterer from other antisocial offenders. *Aggressive Behavior, 33,* 253-260.

Walsh, Z., Allen, L.C., & Kosson, D.S. (2007) Beyond social deviance: Substance-specific relationships with PCL-R facets. *Journal of Personality Disorders, 21,* 273-288.

Walsh, Z., Swogger, M.T., Walsh, T., & Kosson, D.S. (2007). Psychopathy and violence: Increasing specificity. *Netherlands Journal of Psychology, 63,* 136-143.

Walsh, Z., & Kosson, D.S. (2007) Psychopathy and violence: A prospective study of the influence of socioeconomic status and ethnicity. *Law and Human Behavior, 31,* 209 -229.

Walsh, Z., & Walsh, T. (2006) The evidentiary introduction of PCL-R assessed psychopathy in U.S. courts: Extent and appropriateness. *Law and Human Behavior, 30,* 493-507.

Walsh, Z., Swogger, M.T., & Kosson, D.S. (2004) Psychopathy, IQ and violence in European American and African American county jail inmates. *Journal of Consulting and Clinical Psychology, 72,* 1165-1169.

REVIEWED PUBLICATIONS IN EDITED VOLUMES
(underline indicates supervised student authorship)

Hare, R.D., Black, P.J., **& Walsh, Z.** (*in press*). The PCL-R: Forensic applications and limitations In R. P. Archer (Ed.). *Forensic use of clinical assessment instruments.* Mahwah, NJ: Lawrence Erlbaum.

Baker, A., Black, P.J., **& Walsh, Z** (*in press*). Deception. In Arrigo, B.A. & Golson, G. (Eds.). *Encyclopedia of Criminal Justice Ethics*. Thousand Oaks, CA: Sage Publications.

Black, P.J., **& Walsh, Z** (*in press*). Police profiling. In Arrigo, B.A. & Golson, G. (Eds.). *Encyclopedia of Criminal Justice Ethics*. Thousand Oaks, CA: Sage Publications.

Crosby, K., Hiles, M., & **Walsh, Z.** (*in press*). The war on drugs. In Arrigo, B.A. & Golson, G. (Eds.). *Encyclopedia of Criminal Justice Ethics*. Thousand Oaks, CA: Sage Publications.

Langille, J.I., Peters, L. & **Walsh, Z.** (*in press*). Violence against women and girls. In Arrigo, B.A. & Golson, G. (Eds.). *Encyclopedia of Criminal Justice Ethics*. Thousand Oaks, CA: Sage Publications.

Peters, L. & **Walsh, Z.** (*in press*). Drug courts. In Arrigo, B.A. & Golson, G. (Eds.). *Encyclopedia of Criminal Justice Ethics*. Thousand Oaks, CA: Sage Publications.

Stuart, G.L., Chatav Schonbrun, Y., & **Walsh, Z.** (2009). Treatment for substance abuse reduces intimate partner violence. DATA: *The Brown University Digest of Addiction Theory and Application, 28,* 8.

Walsh, Z., & Stuart, G.L. (2009). Antisocial Personality Disorder as a co-occurring disorder with Substance Use Disorder. In G.L. Fisher & N. A.Roget (Eds.). *Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery* (92-95). Thousand Oaks, CA: Sage Publications.

Walsh, Z., & Stuart, G.L. (2009). Experimental substance use. In G.L. Fisher & N.A. Roget (Eds.), *Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery* (pp. 389-391). Thousand Oaks, CA: Sage.

Walsh, Z., & Stuart, G.L. (2009). Moderation in use. In G.L. Fisher & N.A. Roget (Eds.), *Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery* (pp. 554-555). Thousand Oaks, CA: Sage.

Walsh, T., **Walsh, Z.**, & Stuart, G.L. (2009). Decriminalization. In G.L. Fisher & N.A. Roget (Eds.), *Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery* (pp. 263-266). Thousand Oaks, CA: Sage.

Walsh, T., **Walsh, Z.**, & Stuart, G.L. (2009). History of drug use laws. In G.L. Fisher & N.A. Roget (Eds.), *Encyclopedia of Substance Abuse Prevention, Treatment, and Recovery* (pp. 327-330). Thousand Oaks, CA: Sage.

ABSTRACTS & PRESENTATIONS (underline indicates supervised student authorship)

Walsh, Z., Swogger, M.T., & Crosby, K. (2013). *Cannabis use motives across contexts: Differences and similarities between college and correctional samples.* Poster presented at the annual Addiction Health Services Research meeting, Portland, OR.

Swogger, M.T.,Hart, E., Priddy, B., Murray, T., Erowid, F., Erowid, E. & **Walsh, Z.** (2013). *Experiences of kratom users: A qualitative analysis.* Poster presented at the annual Addiction Health Services Research meeting, Portland, OR.

Walsh, Z., Callaway, R., Belle-Isle, L., Capler, R., Kay, B., Lucas, P. & Holtzman, S. (2013). *Cannabis Access for Medical Purposes Survey: Patient Characteristics, Reasonfor Use and Modes of Access* Talk presented at Symposium of the International Cannabinoid Research Society, Vancouver, BC.

Lucas, P., Crosby, K., Hiles, M., Swogger, M. T., & **Walsh, Z.** (2013). Substance use among medical cannabis users: Substituting cannabis for alcohol and other substances. Poster presented at the 75th Annual Scientific Meeting of the College on Problems of Drug Dependence

Hiles, M., Crosby, K., Swogger, M. T., & **Walsh, Z.** (2013). Cannabis use motives and frequency of use: Combined and distinct associations with cannabis use problems. Poster presented at the 75th Annual Scientific Meeting of the College on Problems of Drug Dependence (CPDD). San Diego, CA.

Walsh, Z., Belle-Isle, L., Callaway, R., Capler, R., Kay, B., Lucas, P., Holtzman, S., Crosby, K. & Atkinson, B. (2013). *Use of Cannabis to Treat Symptoms of Anxiety and Depression: Results from a Survey of Medical Cannabis Users.* Poster presented at meeting of Multidisciplinary Association for Psychedelic Studies, Oakland, CA.

Wafler, J. M., **Walsh, Z.**, Woodworth, M., & Porter, S. (2013). *The Okanagan General Remorse Exam (OGRE): Preliminary validation.* Poster presented at the meeting of the American Psychology-Law Society, Portland, OR.

Peters, L. R., Langille, J. I., Blanco Carranza, A., Okano, M., & **Walsh, Z.** (2013). *Bidirectional Versus Unidirectional Violence: The Roles of Psychopathy and Personality.* Poster presented at the meeting of American Psychology-Law Society, Portland, OR.

Belle-Isle, L., **Walsh, Z.**, Callaway, R., Lucas, P., Capler, R., Kay, B., Stratton, T., & Holtzman, S. (2013). *Cannabis Access for Medical Purposes Survey: Preliminary Findings on Barriers to Access.* Invited talk presented at BC Ministry of Health - Health Services and Health Policy Research Priorities Meeting, Victoria, BC.

Walsh, Z., Callaway, R., Belle- Isle, L., Capler, R., Kay, R., Lucas, P., Stratton, T., Swogger, M.T. (2012). *Medical cannabis: Incentives and barriers among a Canadian sample*. Poster presented at Addiction Health Services Research Conference, New York, NY.

Walsh, Z. (2012). *One Size Does Not Fit All: Psychopathy and Subtypes of Partner Violence Perpetrators.* Invited keynote lecture at the Intimate Partner Violence: Innovations in the Field Conference, Department of Psychiatry, University of Rochester, Rochester, NY.

Erickson, K., Langille, J.I. & **Walsh, Z.** (2012). *Who's to Blame? Gender Roles and Victim Blaming in Intimate Partner Violence.* Poster presented at the meeting of Canadian Psychological Association, Halifax, NS.

Roemer, A., Crosby, K. & **Walsh, Z.** (2012). *Psychopathic Traits, Alcohol Use and Female Perpetration of Intimate Partner Violence.* Poster presented at the meeting of American Psychological Society, Chicago, IL.

Roemer, A. & **Walsh, Z.** (2012). *Where You Live Matters: The Role of Living Arrangement on Self-esteem and Hazardous Drinking Behaviors.* Poster presented the meeting of the Research Society on Alcoholism, San Francisco, CA.

Walsh, Z. & Callaway, R. (2012). *Medicine out of joint: Barriers to accessing cannabis among individuals with chronic illness*. Invited talk at UBC Institute for Healthy Living and Chronic Disease Prevention/ Interior Health Authority Partnership in Research Seminar, Kelowna, BC.

Carranza, A.B., **Walsh, Z.** & Swogger. M.T. (2012). *Self-directed Violence and IPV Perpetration: The Roles of Psychopathy and Emotion Dysregulation.* Poster presented at the Intimate Partner Violence: Innovations in the Field Conference, Department of Psychiatry, University of Rochester, Rochester, NY.

Walsh, Z. & Capler, R. (2012). *Medical Cannabis: Standards Engagement, Evaluation and Dissemination (SEED).* Invited talk at the Peter Wall Solutions Initiative Grantee Celebration, Peter Wall Institute of Advanced Studies, University of British Columbia, Vancouver, BC.

Swogger, M.T., **Walsh, Z,** Maisto, S.A. & Connor, K.R. (2011). *Harmful alcohol use moderates the link between proactive aggression and suicide attempts among criminal offenders*. Poster presented at Addiction Health Services Research Conference, Fairfax, VA.

Walsh, Z. (2011). *Psychopathy socio-economic status and criminal violence: Evidence consistent with social push.* Poster presented at the North American Correctional and Criminal Justice Psychology Conference, Toronto, ON.

Urch, G., **Walsh, Z.**, & Roemer, A., (2011). *Individual differences among perpetrators of violence against children: Negative affect and subcomponents of the psychopathic personality.* Poster presented at the conference of the Canadian Psychological Association, Toronto, ON.

Roemer, A., **Walsh, Z.**, Urch, G., & Wallace, G. (2011). *Pathways to college drinking: Gender differences in the association between parental bonds and hazardous alcohol use.* Poster presented at the conference of the Canadian Psychological Association, Toronto, ON.

Edalati, H., & **Walsh, Z.** (2011). *Psychopathy and emotional dot probe: Selective attention to happy faces.* Poster presented at the conference of the Society for the Scientific Study of Psychopathy, Montreal, PQ.

Walsh, Z., & Swogger, M. T. (2011). *Predicting self-directed and other directed violence: The roles of psychopathic traits.* Poster presented at the conference of the Society for the Scientific Study of Psychopathy, Montreal, PQ.

Langille, J. I., & **Walsh, Z.** (2011). *Psychopathy predicts intimate partner violence perpetration across gender.* Poster presented at the conference of the Society for the Scientific Study of Psychopathy, Montreal, PQ.

Urch, G., & **Walsh, Z.** (2010). *Psychopathy and violence against children: Factor level relationships.* Poster presented at the conference of the International Society for Justice Research, Banff, AB.

Walsh, Z. (2010). *Psychopathy and criminal violence – The moderating effects of ethnicity.* Talk presented at the meeting of the American Psychology and Law Society, Vancouver, BC.

Swogger, M.T., & **Walsh, Z.** (2010). *Childhood abuse and substance use consequences among male and female criminal offenders.* Poster presented at the meeting of the American Psychology and Law Society, Vancouver, BC.

Manning, J., **Walsh, Z.,** & Cioe, J. (2010). *Psychopathy, substance use and stress.* Poster presented at the meeting of the American Psychology and Law Society, Vancouver, BC.

Swogger, M. T., Conner, K. R., **Walsh, Z.**, & Caine, E. D. (2010). *Testing traits of personality disorders as moderators of treatment efficacy among criminal offenders.* Abstract published in *Clinical and Translational Science, 3,* A-077.

Swogger, M. T., **Walsh, Z.**, Cashman-Brown, S., Houston, R. J., & Conner, K. R. (2009). *Psychopathy, Axis I Disorders, and Subtypes of Aggression among Criminal Offenders.* Poster presented at the meeting of the American Psychological Association, Toronto, ON.

Walsh, Z. (2009). *The influence of ethnicity and neighborhood factors on the predictive power of psychopathy for violence: Social push or social potentiation?* Talk presented at the meeting of the Society for the Scientific Study of Psychopathy, New Orleans, LA.

Swogger, M. T., **Walsh, Z.**, & Conner, K. R. (2009). *Predicting self-directed versus other-directed violence: The roles of anger and psychopathic traits.* Poster presented at the meeting of the Society for the Scientific Study of Psychopathy, New Orleans, LA.

Walsh, Z., Swogger, M. T., Chatav, Y., & Stuart, G. L. (2009). *Alcohol use and interpersonal violence: The importance of perpetrator subtypes.* Talk presented at the meeting of the Research Society on Alcoholism, San Diego, CA.

Walsh, Z., Swogger, M.T., Chatav, Y., & Stuart, G.L. (2008). *Psychopathy and subtypes of partner violent men and women.* Poster presented at the meeting of the Association for Behavioral and Cognitive Therapy, Orlando, FL.

D'Amore, C., Cashman-Brown, S., **Walsh, Z.**, & Swogger, M. T. (2008). *Anger and psychopathic traits among inpatients at risk for suicide and violence.* Poster presented at the Collier Research Day, University of Rochester Medical Center, Rochester, NY.

King, A. C., **Walsh, Z.**, Munisamy, G., & Epstein, A. M. (2007). *The impact of depressive symptoms on the efficacy of naltrexone in smoking cessation.* Talk presented at the meeting of the American Psychosomatic Society, Budapest, Hungary.

Kosson, D. S., Allen, L., McBride, C. K., **Walsh, Z.**, Tercek, R., & Greco, J. (2007). *Preliminary evidence for negative affectivity and maladaptive emotion regulation strategies in youth with psychopathic traits.* Talk presented at the meeting of the Society for the Scientific Study of Psychopathy, St. Petersburg, FL.

Walsh, Z., & Kosson, D. S. (2007). *Psychopathy and terror management: Impact on perceptions of blue-collar and white-collar criminality.* Talk presented at the meeting of the Society for the Scientific Study of Psychopathy, St. Petersburg, FL.

Kosson, D. S., **Walsh, Z.**, & Swogger, M. T. (2007). *Psychopathy, crime, & violence: What we know and what we don't know.* Invited talk presented to the Department of Criminal Sciences, Pontificia Universidade Catolica do Rio Grande do Sul, Brazil.

Walsh, Z., Stuart, G., & Shea, M. T. (2007). *Psychopathy and intimate partner violence: The moderating effect of substance use treatment.* Poster presented at the meeting of the Association for Behavioral and Cognitive Therapy, Philadelphia, PA.

Walsh, Z., & Kosson, D. S. (2006). *Psychopathy and violence: Two factors are still better than one.* Talk presented at the meeting of the American Psychology and Law Society, St. Petersburg, FL.

Swogger, M., **Walsh, Z.**, & Kosson, D. S. (2006). *Domestic violence and psychopathic traits: Distinguishing the antisocial batterer from other antisocial offenders.* Talk presented at the meeting of American Psychology and Law Society, St. Petersburg, FL.

Walsh, Z., Allen, L. C., & Kosson, D.S. (2005). *Beyond social deviance: Substance-specific relationships with PCL-R facets.* Talk presented at the meeting of the American Psychology and the Law Society, San Diego, CA.

Walsh, Z., & Kosson, D. S. (2005). *Schematic processing in psychopathic and antisocial criminals: Mistrust, grandiosity and criminality.* Talk presented at the meeting of the Society for the Scientific Study of Psychopathy, Vancouver, BC.

Walsh, Z., Brook, M., & Kosson, D. S. (2005). *Psychopathy and violence: Two factors are still better than one.* Poster presented at the meeting of the Society for the Scientific Study of Psychopathy, Vancouver, BC.

Munisamy, G., Epstein, A. M., **Walsh, Z.**, & King, A. C. (2005). *Higher sensation seeking predicts smoking relapse.* Poster presented at the meeting of the Society of Behavioral Medicine, Boston, MA.

Walsh, Z., Swogger, M. T., & Kosson, D. S. (2004). *Psychopathy, depression and violence: The moderating role of rumination.* Poster presented at the meeting of the Society for Research in Psychopathology. St. Louis, MO.

Walsh, Z., Allen, L. C., Sullivan, E. A., & Kosson, D. S. (2004). *Beyond general social deviance: Substance-specific relationships with Psychopathy Checklist-Revised (PCL-R) facets.* Poster presented at the meeting of American Psychological Society, Chicago, IL.

Walsh, Z., & Kosson, D. S. (2004). *Psychopathy and recidivism in a county jail: The impact of ethnicity and socioeconomic status.* Poster presented at the meeting of the American Psychology and the Law Society, Scottsdale, AZ.

Swogger, M., **Walsh, Z.**, & Kosson, D. S. (2004). *Psychopathy and domestic battery: Relationship to the four-facet model.* Poster presented at the meeting of the American Psychology and Law Society, St. Petersburg, FL.

Walsh, Z., Swogger, M. T., & Kosson, D. S. (2003). *Instrumental and reactive violence in psychopathic and nonpsychopathic violent offenders*. Poster presented at the meeting of the Society for Research in Psychopathology, Toronto, ON.

Walsh, Z., Swogger, M. T., & Kosson, D. S. (2003). *Psychopathy, head injury and child abuse: Predicting violent crime.* Poster presented at the meeting of Developmental and Neurosciences Perspectives on Psychopathy, Madison, WI.

Walsh, Z., Kosson, D. S., & Sullivan, E.A. (2002). *Psychopathy, I.Q., and violence.* Poster presented at the meeting of the Society for Research in Psychopathology, San Francisco, CA.

GRANTS

Ongoing:

2013 - **Principal investigator** - *Institute for Healthy Living and Chronic Disease Prevention* (BC Interior Health Authority / University of British Columbia). Research Interest Group Grant "Medical Cannabis and Arthritis - Barriers and Pathways" $10,000. Co-Investigators: Kam Shojania, M.D., Susan Holtzman, Ph.D., Cheryl Koehn.

2013 - **Supervisor** - *Social Sciences and Humanities Research Council.* Joseph-Armand Bombardier Master's Scholarship "Examining Linguistic Cues Regarding Intimate Relationships in Psychopathic Versus Non-Psychopathic Offenders"- $17,500. Co-Supervisor Steven Porter, Student awardee: Lacy Peters.

2012 - **Principal investigator** - *Peter Wall Endowment*
Peter Wall Solutions Initiative "Medical Cannabis – Standards, Engagement, Evaluation & Dissemination (SEED)" - 3-years - $90,000 Co-Investigators: Rielle Capler, MA., Philippe Lucas, MA.

2011 - **Principal investigator** - *Social Sciences and Humanities Research Council.* Standard Operating Grant "One Size Does Not Fit All: A Prospective Multimethod Examination of Subtypes of Women and Men Involved in Intimate Partner Violence" -3-years - $117,150

Supervisor - *Social Sciences and Humanities Research Council.* Doctoral Fellowship Award "Social support needs of women involved in intimate partner violence. -3-years - $60,000. Student awardee: Jennifer I. Langille, MA

2010 - **Co-principal investigator** - *Canadian Foundation for Innovation.* Leaders Opportunity Fund "Centre for the Study of Psychology and Law" $413,285 Co-Principal Investigators: Stephen Porter, Ph.D. & Michael Woodworth, Ph.D.

Completed:

2011 - 2013 **Principal investigator** - *Institute for Healthy Living and Chronic Disease Prevention (BC Interior Health Authority / University of British Columbia).* Research Interest Group Grant "Barriers to Accessing Medical Cannabis Among Individuals with Chronic Illness" $10,000. Co-Investigators: Michael Woodworth, Ph.D., Susan Holtzman, Ph.D., Robert Calloway, Jamie Marshall.

2012 - 2013 **Co-investigator** - *Canadian Institutes of Health Research.* Planning grant "Cannabis for Therapeutic Purposes in Provincial Health Systems: A Priority Setting Workshop" $24,471. Principal investigator: Lynda G Balneaves, Ph.D.

2012 - 2012 **Principal investigator** - *Health Canada.* Drugs and Tobacco Initiatives "Targeted Prevention for Cannabis Use Among Canadian Youth - Environmental Scan and Literature Review" $7,813

2010 - 2012 **Supervisor** - *Social Sciences and Humanities Research Council.* Joseph-Armand Bombardier Master's Scholarship "Subtypes of Male and Female Partner Violence Perpetrators"- $17,500. Student awardee: Alissa Fezatte

2010-2012 **Co-investigator** - *Canadian Institutes of Health Research.* Catalyst grant "Alternative intervention for marijuana use (AIM): Addressing individual risk factors for transitions to initiation and escalation of marijuana use in early adolescence." $87,001. Principal investigator: Marvin Krank, Ph.D.

Co-investigator - *Institute for Healthy Living and Chronic Disease Prevention (BC Interior Health Authority / University of British Columbia).* Research Interest Group grant "Improving the Health and Well-Being of Men Who Have Sex With Men in the Interior of British Columbia" $10,000. Principal investigator: Susan Holtzman, Ph.D.

2008 - 2009 **Principal investigator** - *Canadian Institutes of Health Research.* Fellowship Award in Clinical Research: "Personality disorder as a moderator of treatment outcome for male and female perpetrators of partner violence." $60,00/$120,000 (Declined 2010). Supervisors: Gregory L. Stuart, Ph.D. & M. Tracie Shea, Ph.D.

HONOURS & AWARDS

2008 Internship Research Grant, Brown University

2007 Student Travel Award, Rosalind Franklin University

2006 Dissertation Award, American Academy of Forensic Psychiatry

2006 Dissertation Award, American Psychological Association

2005 Grant-in-Aid for Student Research, American Psychology and Law Society

2004 Award for Research Excellence, Rosalind Franklin University

2001 - 2004 Academic Fellowship, Rosalind Franklin University

2000 - 2001 Millennium Scholarship for Academic Excellence, Government of Canada

ACADEMIC APPOINTMENTS

2009 - Assistant professor, University of British Columbia - Okanagan, Kelowna, BC.

2008 Adjunct professor, Rhode Island College, Providence, RI.

2006 Graduate teaching assistant, Rosalind Franklin University, North Chicago, IL.

2004 - 2005 Group dynamics consultant and trainer - Tavistock Study Group, Northwestern University, Evanston, IL.

2001 Undergraduate teaching assistant, University of Winnipeg, Winnipeg, MB

Courses taught:
Drugs and Behaviour
Introduction to Psychology – Basic Processes
Introduction to Educational Psychology
Research Methods and Statistics

CLINICAL APPOINTMENTS

2008 - 2009 Research therapist - Brief Motivational Intervention for addictions and family violence, Butler Hospital, Providence, RI.

2008 - 2009 Research therapist - Cognitive Behavioral Therapy for anger and trauma, Providence Veterans Affairs Hospital, Providence, RI.

2007 - 2008 Graduate therapy intern - Cognitive Behavioral Therapy and Motivational Enhancement Therapy for addictions, Butler Hospital, Providence, RI.

2007 - 2008 Graduate therapy intern - Dialectical Behavior Therapy for women with emotion regulation difficulties, Butler Hospital, Providence, RI.

2007 - 2008 Graduate therapy intern - Pediatrics psychology, Hasbro Children's Hospital, Providence, RI.

2006 - 2007 Graduate therapy extern - Cognitive Behavioural Therapy for anxiety disorders, Clinics at Rosalind Franklin University, North Chicago, IL.

2005 - 2006 Graduate psychometrics extern - Forensic neuropsychological assessment, Isaac Ray Center, Chicago, IL.

2004 - 2005 Graduate therapy extern - Cognitive Behavioral Therapy and Motivational Enhancement for addictions, University of Chicago Hospital, Chicago, IL.

2004 - 2005 Graduate therapy extern - Dialectical Behavior Therapy for women with emotion regulation difficulties, University of Chicago Hospital, Chicago, IL / Emotion Management Program, Tinley Park, IL.

2003 - 2004 Graduate psychometrics extern - Neuropsychology, University of Chicago Hospital, Chicago, IL.

2002 - 2003 Graduate therapy extern - Mood disorders, North Chicago Veterans Affairs Hospital, North Chicago, IL.

OTHER APPOINTMENTS

2013 - Reviewer – German-Israeli Foundation for Scientific Research and Development, Young Scientist's Program Grant

2012 - Reviewer - Social Sciences and Humanities Research Council of Canada, Insight Grant Program

2012 - Member - Editorial Board, Legal and Criminological Psychology

2012 - Member - Advisory Board, Multidisciplinary Association for Psychedelic Studies (MAPS) Canada

2011 - Director - UBC Centre for the Advancement of Psychological Science and Law

2010 - Member - Board of Directors, John Howard Society of the Central and South Okanagan

2008 - 2010 Psychiatry faculty - Personality and Impulse Disorders Section, Faculty of 1000 Medicine.

2008 - 2009 Project manager - National Institute on Alcohol Abuse and Alcoholism funded R01: *Brief intervention to reduce drinking among batterers,* PI: Gregory L. Stuart, Butler Hospital, Providence, RI.

2008 - 2009 Project manager - National Institute on Alcohol Abuse and Alcoholism funded R01: *Brief alcohol intervention for violent women,* PI: Gregory L. Stuart, Butler Hospital, Providence, RI.

2007 - 2008 Graduate research intern - National Institute of Mental Health funded R01: *Collaborative longitudinal study of personality disorders,* site PI: M. Tracie Shea, Brown University, Providence, RI.

1997 - 2001 High school teacher - Manitoba School Divisions 1 & 6, Winnipeg, MB.

Ad hoc reviewer: *Addictive Behavior; Biological Psychology; Criminal Justice and Behavior*; *Current Drug Abuse Reviews; International Journal of Law and Psychiatry*; *Journal of Abnormal Child Psychology*; *Journal of Interpersonal Violence*; *Personality and Mental Health*; *Personality Disorders: Treatment, Theory and Research*; *Psychology of Addictive Behavior; Social Science and Medicine*; *Substance Abuse Treatment, Prevention and Policy; Suicide and Life Threatening Behavior; Violence Against Women*

UNIVERSITY COMMITTEES

2011 - Member, UBC IK Barber Undergraduate Research Award Selection Committee

2010 - Member, UBC Travel Award Selection Committee

2010 - Member, UBC Task Force Committee on Student Alcohol Use

2010 - Member, UBC Sessional Selection Committees

2009 - Member, UBC Clinical Psychology Graduate Committee

2009 - Member, UBC Forensic Students Research Group

2009 - Member, UBC Forensic Psychology Honours Program Selection Committee

2007 - 2008 Member, Brown University Psychology Internship Admissions Committee

2001 - 2007 Member, Rosalind Franklin University Graduate Students Association

MEMBERSHIPS IN SOCIETIES & ORGANIZATIONS

Canadian Psychological Association

Canadian Consortium for the Investigation of Cannabinoids

Physicians for Human Rights

Society for the Scientific Study of Psychopathy

Stop the Violence BC

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Research paper

Cannabis for therapeutic purposes: Patient characteristics, access, and reasons for use

This is Exhibit "B" referred to in the Affidavit of Zachary Walsh sworn before me at Kelowna, BC this 15th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

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ABSTRACT

Background: The authorized and unauthorized use of cannabis for therapeutic purposes (CTP) has increased dramatically in recent years, and physicians have called for further research to better clarify the parameters of effective and appropriate use. We report findings from a large cross-sectional study of the use of CTP in Canada and compare use across medical conditions and across authorized and unauthorized users.

Methods: We examined cannabis use history, medical conditions and symptoms, patterns of current use of CTP, modes of access and perceived effectiveness among 628 self-selected Canadians consumers of CTP. Participants were recruited from medical cannabis dispensaries and from organizations that assist users of CTP.

Results: Patients reported using cannabis to treat multiple symptoms, with sleep, pain, and anxiety being the most common. Cannabis was perceived to provide effective symptoms relief across medical conditions. Patterns of use were also consistent across medical conditions. Notable differences were observed with regard to modes of access.

Conclusion: Across medical conditions respondents reported using cannabis to effectively address diverse symptoms. Results indicate a substantial disconnect between the therapeutic use of cannabis and research on the risks and benefits of such use; particularly with regard to the anxiolytic and sedative use of cannabis. Authorized and unauthorized users exhibited few meaningful differences with regard to medical conditions and patterns of use, but faced substantial differences regarding access.

Cannabis has a long history of medical use (Abel, 1980; Earleywine, 2005; Iverson, 2008), and after decades of marginalization the therapeutic properties of cannabis and cannabis derivatives are receiving increased attention (Earleywine, 2005; Holland, 2010; Lucas, 2008). Indeed, robust and growing evidence indicates that cannabis has medical benefits for diverse conditions and an acceptable risk profile (Joy, Watson, & Benson, 2003). In response to legal recognition of the constitutional rights of Canadians to access cannabis for therapeutic purposes (CTP), the federal government enacted the *Marihuana Medical Access Regulations* and initiated a centralized program in 2001, and in 2003 Health Canada began to provide CTP to patients. This program authorizes two categories of individuals to possess cannabis for medical purposes; Category 1 includes symptoms associated with HIV/AIDS, arthritis, spinal cord injury or disease, cancer, epilepsy, or MS, whereas Category 2 includes other symptoms and conditions assessed by a physician and a specialist. Those authorized can purchase dried cannabis from Health Canada, can purchase seeds to grow cannabis, or designate a person to grow cannabis on their behalf. In addition, medical cannabis dispensaries that operate under an ambiguous legal status provide CTP and related services to over 50,000 patients across Canada (Lucas, 2008).

Despite widespread concern with the efficiency of the Health Canada program (Holland, 2010), registration has grown exponentially from under 500 registrants in 2002 to over 26,000 in 2012 (Health Canada, 2012a). National surveys indicate substantial access outside of the Health Canada program; recent estimates

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suggest that 400,000 to 1,000,000 Canadians use CTP (Health Canada, 2011). Diverse reasons for use and multiple modes of access complicate the characterization of use of CTP, and health care professionals have expressed concern regarding the dearth of information on CTP; a recent Canadian Medical Association-sponsored survey reported that over 80% of physicians wanted more information on therapeutic indications, clinical guidelines, and risks and benefits of CTP (CMA, 2012).

Several studies have examined CTP use among Canadians. A regional survey reported that approximately 2% of adults used CTP in the past year, primarily to relieve nausea and pain (Braitstein et al., 2001), and a more recent national survey estimated that one million Canadians, or 4% of those aged 15 and older, used cannabis to treat self-defined medical conditions in the previous 12 months (Adlaf, Begin, & Sawka, 2005). Studies of persons living with HIV/AIDS report rates of 15–30% use of CTP, primarily for treatment of nausea, pain, and mood-related symptoms (Belle-Isle & Hathaway, 2007; Ware, Rueda, Singer, & Kilby, 2003). Studies of patients with MS and patients with chronic pain report similar results; approximately 15% of respondents report use of CTP with high levels of perceived effectiveness for diverse symptoms including nausea, pain, and mood (Belle-Isle & Hathaway, 2007; Ware et al., 2003; Clark, Ware, Yazer, Murray, & Lynch, 2004). Studies of CTP from the US, Europe, and Australia report findings that are consistent with those of Canadian studies; CTP is perceived to be an effective treatment for symptoms including pain, nausea, and negative mood (Grotenherman & Schnelle, 2003; Harris et al., 2000; Lucas, 2012; Reiman, 2007; Reinarman, Nunberg, Lanthier, & Heddleston, 2011; Swift, Gates, & Dillon, 2005; Ware, Adams, & Guy, 2005).

In sum, patient-centered research provides evidence for the acceptability and perceived effectiveness of CTP. However, substantial knowledge gaps remain and health care professionals have explicitly called for further research to better specify the parameters for appropriate use of CTP (CMA, 2012). Indeed, to date no studies have directly compared use of CTP across medical conditions or across modes of access (i.e., authorized vs. unauthorized). In the present study we report demographic characteristics, medical conditions and symptoms, reasons for use, perceived effects, and authorized and unauthorized modes of accessing CTP among Canadians. Comparing users of CTP across symptoms and across medical conditions with regard to patterns of use, and perceived effectiveness may help direct future controlled studies of the efficacy of CTP for specific conditions, and inform the development of tailored CTP regimens. In addition, comparing authorized and unauthorized CTP users may elucidate factors that underlie patient adoption of the Canadian CTP program, and help to guide the refinement of the complex process of CTP distribution and monitoring.

Method

Design

We obtained cross-sectional data in 2011–2012 from 628 self-selected current CTP users. Participants were recruited from two contexts; *national* participants completed the survey online from the location of their choice, and *local* participants completed the survey at a cannabis dispensary in the Interior region of British Columbia (BC). This recruitment strategy was designed to allow for comparison of the relatively less controlled online *national* condition with the confirmed CTP users queried in-person in the *local* condition. A total of 702 *national* participants completed the consent form, of whom 541(77%) reported current CTP use. All 87 *local* participants who completed the consent form reported current CTP use. The *national* survey was promoted via organizations and media that serve users of CTP patients (e.g., Canadian AIDS Society, Canadian Aboriginal AIDS Network, Cannabis Culture), and by national advertisements at MC dispensaries. To preserve confidentiality, no identifying data (i.e. IP addresses) were collected for *national* participants. The *local* group was comprised of dispensary members who were either authorized to possess cannabis through Health Canada or had documented confirmation of a medical condition for which CTP is indicated. No confirmation of medical condition was provided for *national* participants; however such confirmation is required to obtain Health Canada authorization and to obtain dispensary membership. Participants in the *local* group were compensated $10 and were aided by research assistants; participants in the *national* group were not assisted or financially compensated.

Table 1
Demographics.

	CTP patients, % (*n*)	Census, %	*Z*
Male	71(443)	49	11.03[a]
Ethnicity			
White	92 (581)	80	7.52[a]
Aboriginal	7 (47)	4	3.80[a]
Age			
18–24yrs old	17 (99)	12	3.86[a]
25–34	26 (158)	16	6.84[a]
35–44	19 (115)	20	.63
45–54	24 (141)	20	2.51
55>	14 (85)	32	9.67[a]
Education			
<high School	4 (27)	15	−7.86[a]
HS Grad	37(234)	24	7.63[a]
% post secondary	58 (367)	61	−1.54
Income			
<$20,000	33 (206)	44	−5.55[a]
$20,000–39,999	26 (165)	27	−.56
$40, 000–59,999	17 (103)	15	1.43
$60,00 +	24 (146)	14	7.22[a]
Residence			
Rural	22 (137)	20	1.25
Urban	78 (485)	80	−1.25

Note: *Z*=One sample *Z-test* for proportions, comparing medical cannabis users to values from the 2006 Canadian Census (Statistics Canada, 2006).
[a] $p < .01$.

The survey was designed to be completed in less than one hour, and consisted of a total of 414 adaptive questions administered online without forced response. The survey was organized hierarchically such that many items were contingent on prior responses; as a result, respondents were presented with diverse item sets and response rates for specific items, and total response times varied accordingly. The survey was developed based on previous research, and on consultations with a community research board comprised of CTP patients and experts, and includes questions drawn from a prior study of CTP use (Belle-Isle & Hathaway, 2007). It queried access, perceived effectiveness, patterns and history of cannabis use, medical diagnoses and symptoms, mood, and demographics (a copy of the survey is available upon request from the first author). The study was approved by the Behavioural Research Ethics Board of the Okanagan campus of the University of British Columbia. All categorical data were compared using X^2. In light of varying response rates across items, total number of responses is reported for each analysis. Due to the large number of comparisons all significance testing was conducted at the $p < .01$ level to minimize the likelihood of interpreting chance results while maintaining power (Nakagawa, 2004).

Results

Preliminary analyses

We compared the responses of *local* participants who reported residency in the province of BC and accessing CTP via

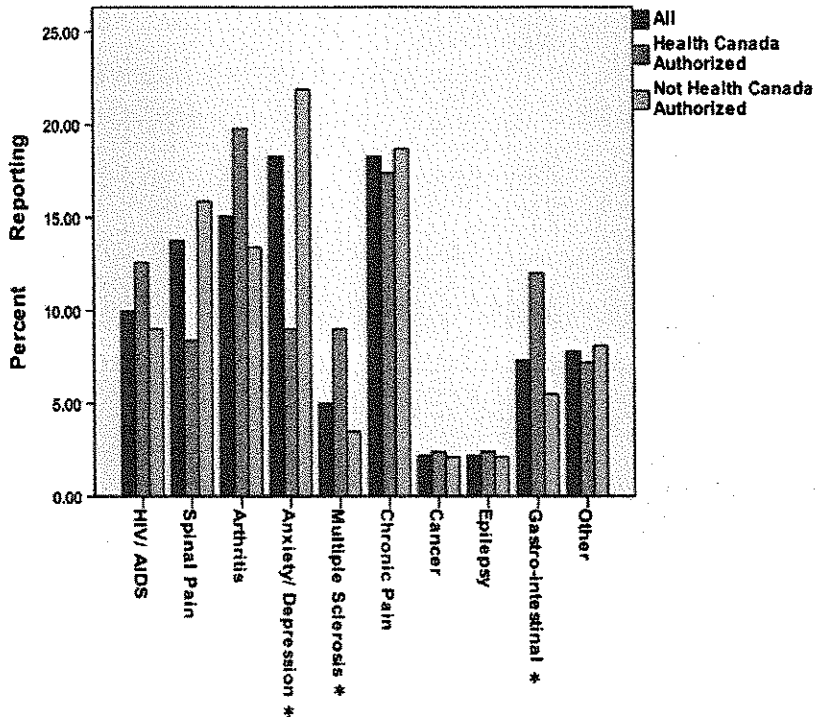

Fig. 1. Primary medical conditions treated with cannabis by authorization. *Note:* Sleep Disorders, Attention Deficit Disorder, Fibromyalgia, Hepatitis C, Parkinson's Disease, Wilson's Disease, Scleroderma, Tourette's Syndrome, and unspecified Psychotic Disorder Conditions each comprised less than 2% of the sample and were aggregated into the category 'Other'. The anxiety and mood disorders category included 35 participants who reported a primary *illness/condition* of anxiety, 34 who reported depression and 40 who reported both anxiety and depression. Comparisons of these groups indicated equivalent profiles with regard to demographic characteristics, health, and use of CTP, and were therefore aggregated for statistical analyses; $n = 502$ * = difference between proportion Health Canada Authorized and Unauthorized $p < 01$.

dispensary ($n = 63$) to *national* participants who reported BC residency and accessing CTP via dispensary ($n = 53$). Analysis indicated no differences with regard to quantity or frequency of cannabis use, and indicated substantial similarity with regard to primary medical condition; the only difference was a smaller proportion of *local* respondents reporting gastrointestinal (GI) condition as primary ($X^2 = 8.94\,(1)$, $p < .01$). This broad similarity between in-person confirmed users of CTP (i.e. *local*) and online respondents increased our confidence in the validity of online responses.

Demographics

Comparisons of the sample to values drawn from the Canadian 2006 Census of Population (Statistics Canada, 2006; Table 1) indicated that male, White, and Aboriginal participants were over-represented. The users of CTP were also younger, had a higher income, and were more likely to have completed high school. The regional distribution was consistent with participation in the Health Canada program (Health Canada, 2012b).

Medical conditions and symptoms

Participants were queried regarding a single primary *condition* treated with cannabis (Fig. 1). Participants also checked all applicable *symptoms* (Table 2) they treated with cannabis from a list. The mean number of symptoms patients endorsed treating was 6.74 ($n = 605$, SD = 3.00, Median = 6.00, Interquartile range = 4.00–8.00). Symptoms reportedly treated with CTP by fewer than 10% of the sample include high blood pressure (9%), tics (8%), regulating blood sugar (7%), seizures (6.%), bladder dyscontrol (6%) and impotence (6%). Aggregate examination across *condition* indicated that pain, anxiety, and sleep problems were the most frequently endorsed symptoms; 57% reported use to address all three symptoms, and 99% endorsed treating one or more of the three.

Symptoms treated with cannabis varied across *condition* (Table 2). Use to address pain symptoms was more prevalent among individuals whose primary conditions were pain-related (i.e., chronic spinal and non-spinal pain, arthritis). Chronic spinal pain participants were more likely to report treating muscle spasms. Participants with arthritis were more likely to report use for inflammation and ocular pressure, and less likely to report use to address anxiety and appetite. Participants who identified mood and anxiety disorders as their primary condition were more likely to use cannabis to address mental health-related symptoms (i.e., anxiety, depression, aggression, mania/psychosis), and were less likely to treat pain, inflammation, and muscle spasms. Participants who identified HIV/AIDS or GI as their primary conditions were more likely to treat symptoms of nausea and appetite, and HIV/AIDS was associated with less treatment of pain and aggression. Overall, cannabis was perceived to provide effective symptoms relief; 72% ($n = 439$) reported that CTP was *always* helpful and an additional 24% ($n = 147$) described it as *often* helpful. The proportion of participants who described CTP as *always* helpful was relatively consistent across conditions. The only difference across groups was relatively lower endorsement of *always* helpful (55%) by participants with HIV/AIDS ($X^2 = 10.04\,(1)$, $n = 593$, $p < .01$). Over half (57%, $n = 358$) of participants reported using other medications to address the symptoms they were treating with CTP. Of these, 79% ($n = 281$) described CTP as having fewer side effects than the concurrent treatment.

Use patterns

History of non-therapeutic cannabis use prior to therapeutic use was reported by 82% ($n = 441$) of participants.

Table 2
Symptoms addressed with medical cannabis by condition.

	All		Pain-spinal			Pain–nonspinal			Arthritis			Mood			HIV/AIDS			GI		
	n	%	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2
Sleep	502	85	68	83	0.35	93	85	<.01	80	90	1.91	99	93	5.7	47	78	2.4	33	77	2.54
Pain	486	82	80	98	15.13[a]	102	94	11.56[a]	86	97	14.67[a]	56	52	81.21[a]	41	68	9.07[a]	40	93	3.62
Anxiety	463	79	65	79	0.04	85	78	0.02	57	64	12.92[a]	106	99	32.81[a]	44	73	1.05	29	67	3.34
Depression	394	67	55	67	<.01	68	62	1.16	51	57	4.24	98	92	36.26[a]	34	57	3.08	27	63	0.33
Appetite/weight	331	56	43	52	0.52	56	51	1.21	35	39	11.98[a]	61	57	0.04	46	77	11.47[a]	33	77	8.02[a]
Nausea	294	49	36	44	1.34	56	51	0.13	33	37	6.82[a]	43	40	4.86	47	78	21.71[a]	35	81	18.48[a]
Inflammation	291	49.	51	62	6.31	52	48	0.14	79	89	65.23[a]	25	23	35.23[a]	20	33	6.83[a]	25	58	1.44
Spasms	280	48	58	71	20.69[a]	53	49	0.07	50	56	3.2	23	22	35.33[a]	20	33	5.34	22	51	0.255
Headache	237	40	44	54	7.21	56	51	6.99[a]	36	40	<.01	38	36	1.18	15	25	6.4	12	28	2.9
Aggression	140	24	19	23	0.01	28	26	0.28	16	18	1.92	42	39	17.40[a]	5	8	8.75[a]	8	19	0.67
Drug Withdrawal	76	13	10	12	0.04	17	16	0.88	10	11	0.25	18	17	1.81	8	13	0.01	1	2	4.61
Ocular Pressure	68	12	11	13	0.33	11	10	0.27	19	21	9.92[a]	8	8	2.1	7	12	<.01	1	2	3.85
Mania/Psychosis	67	11	9	11	0.01	11	10	0.21	7	8	1.27	25	23	18.72[a]	4	7	1.46	5	12	<.01
Respiratory	67	11	5	6	2.62	20	18	6.5	14	16	1.99	12	11	<.01	3	5	2.68	6	14	0.31
Skin Conditions	63	11	8	10	0.08	7	6	2.54	13	15	1.7	16	15	2.51	3	5	2.26	5	12	0.04

Note: X^2 = Comparison of each groups versus aggregation of other groups.
[a] $p < .01$.

Mean age was 17.30 years ($n = 540$, SD = 7.08, Median = 16, Interquartile range = 14.00–18.00) for first use and 28.35 years ($n = 538$, SD = 11.25, Median = 25, Interquartile range = 19.00–37.00) for first therapeutic use. Individuals with and without history of non-therapeutic use did not differ with regard to demographic characteristics, or conditions and symptoms. Most participants who reported prior use reported increased use with the initiation of therapeutic use; 33% reported a large increase and 32% a small increase, whereas 7% reported a large decrease and 10% a small decrease. Aggregate analyses indicated that 40% ($n = 167$) of users fell into the modal quantity of use category of *more than 14 grams per week*, and that 42% ($n = 226$) fell in the modal frequency of use group reporting *2–3 uses per day*. Among the group that used more that 14 grams per week, the median weekly amount used was 28 grams (Interquartile range = 21–45). Comparisons of the six medical conditions that each account for 5% or more of the sample (Table 3) indicated no difference with regard to modes of use and few differences in patterns of use; a larger proportion of individuals identifying HIV/AIDS as primary condition were among the groups with lowest quantity and frequency of use, and those who identified anxiety and/or depression as primary conditions were less likely to fall in the most frequent use group. Overall health quality was also associated with frequency of use such that participants who described their overall health as *fair* or *poor* (34%, $n = 161$) were overrepresented in the most frequent use group ($X^2 = 8.31$ (1), $n = 473$, $p < .01$).

Access

Aggregate examination indicated that 32% ($n = 167$) of respondents had Health Canada authorization to possess CTP. An additional 12% ($n = 64$) had applications in process, and 3% ($n = 13$) had applied and been rejected. The proportion of authorized individuals varied across condition (Fig. 1); individuals who identified anxiety and/or depression as primary condition were less likely to be authorized ($X^2 = 13.13$ (1), $n = 502$, $p < .01$), whereas a greater proportion of MS ($X^2 = 11.08$ (1), $n = 502$, $p < .01$) and GI ($X^2 = 8.68$ (1), $n = 502$, $p < .01$.) participants were authorized. Most participants reported using more than one mode of accessing CTP; the mean number of access modalities was 1.89 ($n = 500$, SD = .88, Median = 2.00, Interquartile range = 1.00–2.00). Authorization was a determinant of access (Fig. 2): the mean number of access modalities for authorized individuals was 2.11 ($n = 162$, SD = .98, Median = 2.00, Interquartile range = 1.00–3.00) compared to 1.78 ($n = 337$, SD = .81, Median = 2.00, Interquartile range = 1.00–2.00) for unauthorized users (F (1, 497) = 16.26, $p < .01$). Authorized users were more likely to access CTP via Health Canada ($X^2 = 11.88$ (1), $n = 443$, $p < .01$), to grow for themselves ($X^2 = 31.42$ (1), $n = 493$,

Table 3
Characteristics of cannabis use by condition.

	All		Pain-spinal			Pain-nonspinal			Arthritis			Mood			HIV/AIDS			GI		
	n	%	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2	*n*	%	X^2
Amount per week (Grams)																				
≤2	42	9	5	8	0.1	9	10	0.13	3	4	2.59	9	10	0.3	11	27	18.01[a]	1	3	1.68
2.1–5	60	13	8	13	<.01	11	12	0.05	10	13	0.04	11	13	<.01	5	12	<.01	0	0	5.46
5.1–9	85	18	7	11	2.44	22	24	2.81	11	15	0.63	24	28	6.81[a]	6	15	0.33	6	17	0.02
9.1–14	76	16	15	24	3.04	15	16	<.01	15	20	1.06	11	13	0.89	4	10	1.3	6	17	0.04
>14	212	45	29	45	0.01	35	38	2	46	48	0.41	32	37	2.66	15	37	1.18	22	63	5.08
Frequency of use																				
< daily	58	11	6	9	0.4	13	13	0.31	3	4	4.72	13	14	1.06	13	25	10.85[a]	2	5	1.4
1x day	71	14	7	10	0.71	16	16	0.43	12	16	0.32	17	19	2.31	8	15	0.12	1	3	4.17
2-3x	174	33	21	31	0.19	31	30	0.56	26	34	0.01	36	39	1.77	16	30	0.24	14	37	0.24
4x+	221	42	34	50	1.96	43	42	0.01	36	47	0.78	26	28	8.86[a]	16	30	3.48	21	55	2.88
Preferred mode of use																				
Smoke ($n = 513$)	293	57	35	54	0.33	62	61	0.94	41	53	0.55	48	53	0.86	35	67	2.45	24	65	0.98
Vaporize ($n = 502$)	217	43	31	49	1.05	42	43	<.01	30	39	0.67	37	41	0.3	22	44	0.01	16	43	<.01
Oral ($n = 501$)	139	28	16	26	0.13	29	30	0.21	29	39	5.25	25	26	0.1	15	31	0.22	8	22	0.75

Note: X^2 = Comparison of each groups versus aggregation of other groups.
[a] $p < .01$.

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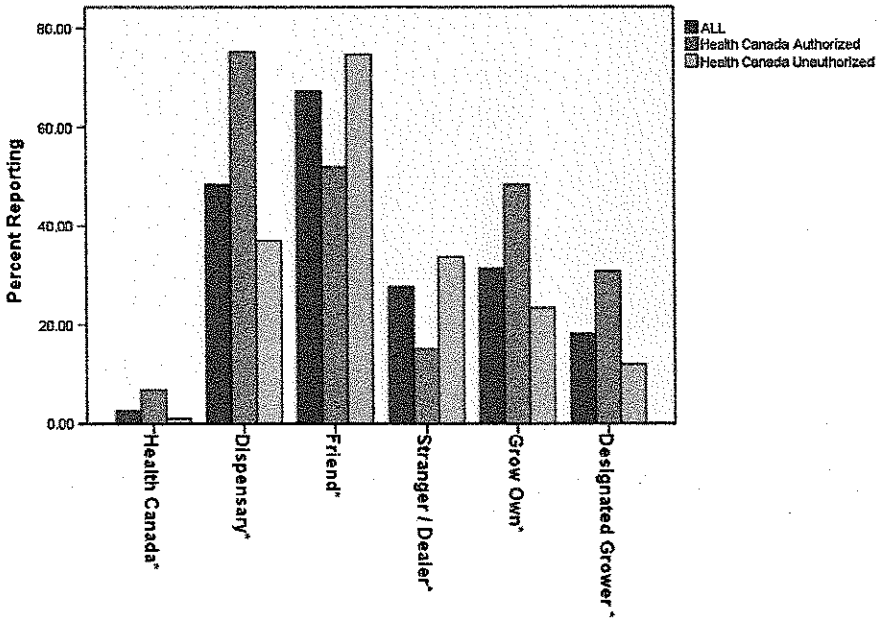

Fig. 2. Modes of Access. *Note:*. * = difference between proportion Health Canada Authorized and Unauthorized $p < 01$; $n = 498$.

$p < .01$), have a designate grow for them ($X^2 = 25.85$ (1), $n = 493$, $p < .01$) or use a dispensary ($X^2 = 54.46$ (1), $n = 444$, $p < .01$). In contrast, unauthorized users were more likely to access CTP from a friend ($X^2 = 25.46$ (1), $n = 495$, $p < .01$) or from a stranger ($X^2 = 18.69$ (1), $n = 494$, $p < .01$).

Discussion

Canadians use cannabis to treat diverse conditions and symptoms in a manner that only partially overlaps with the federally authorized program. There is considerable consistency with regard to patterns of use and reported effectiveness; nearly all respondents used cannabis to treat pain, anxiety, or sleep disturbances, and over half used it to treat all three symptoms. We also observed consistency across participants with and without histories of non-therapeutic cannabis use, which suggests that, with regard to CTP, individuals who may enjoy non-therapeutic use of cannabis were not different with regard to therapeutic application of cannabis from those participants who may have been less likely to expect extra-therapeutic benefit. The substantial minority of respondents who were federally authorized to possess cannabis exhibited few differences from unauthorized users with regard to symptoms treated and patterns of use, but differed considerably with regard to mode of access.

Most respondents reported using CTP to treat conditions that are explicitly listed within the federal program; however, a large contingent also reported use for other conditions. Comparisons of symptoms treated across conditions indicated high levels of congruence (e.g., respondents with pain-related conditions were more likely to use cannabis to address pain symptoms), but also reflected substantial consistency across conditions. Specifically, use to treat sleep disturbances, and to a lesser extent anxiety and depression, was consistently high across conditions. However, despite widespread use for anxiolytic and sedative purposes, participants who reported anxiety or depression as primary reason for CTP use were less likely to have obtained federal authorization to access CTP. This may be due to the absence of these conditions among those explicitly listed by the federal program, but may also reflect accentuated stigma associated with the use of cannabis to address mental health issues. Indeed, stigma has been identified as a substantial barrier to accessing care for mental health conditions such as depression and anxiety (Brown et al., 2010), and this may be compounded by the considerable stigma associated with use of CTP (Bottorf et al., 2013) to create a substantial barrier to accessing treatment. Research that further elucidates the appropriateness of using cannabis to treat anxiety and depression is required to guide effective treatment and help to reduce stigma.

Patterns of use were also consistent across medical conditions, with the only notable difference being slightly lower levels of use among respondents with HIV/AIDS, a difference which may be due to intermittent use to address nausea. Most participants reported initiating non-therapeutic use prior to use of CTP, and noted increased levels of use associated with the transition to therapeutic use. This reported increase is consistent with our observation that the median level of therapeutic use exceeds typical levels of non-therapeutic use (Reinarman, Cohen, & Kaal, 2004; Hazekamp et al., 2013; but see also Hazekamp & Heerdink, 2013), and suggests a potentially meaningful distinction between therapeutic and non-therapeutic use. In contrast, the relative consistency of use among CTP-users suggests that CTP regimens might transfer well across conditions, and enjoy good adherence. The most pronounced differences across respondents involved modes of access, such that unauthorized users were much less likely to access CTP from authorized, or semi-authorized (i.e. dispensaries) sources. This discrepancy contrasts with the pronounced similarity between authorized and unauthorized users on indicators of health and use of CTP, and suggests that the current system of authorization may not be discriminating among qualitatively different groups.

The primary limitations of this study are common to online medical surveys such as potential for multiple responses from a single respondent, a potentially unrepresentative sample, and lack of physician confirmation of medical conditions. In addition, response bias related to participant self-selection, and recruitment through organizations that support medical cannabis patients likely resulted in overrepresentation in our sample by individuals who respond favourably to CTP. In light of this potential bias, our characterization of the therapeutic use of cannabis should be interpreted with caution pending replication from research that employs a more systematic recruitment approach. However, these limitations are counterbalanced by several methodological

strengths including the inclusion of an in-person subsample, engagement of a community research board in the development and dissemination of the survey, and general adherence to established standards for reporting internet-based surveys (Eysenbach, 2004).

Conclusions

This was the largest and most comprehensive study to date of the therapeutic use of cannabis in Canada. We draw three primary conclusions from the data. First, reasons for use and perceived effectiveness were generally consistent across medical conditions; respondents overwhelmingly reported using cannabis to effectively address pain, sleep disturbance, and anxiety. Second, further research is required to address the substantial disconnect between the therapeutic use of cannabis and research on the risks and benefits of such use. This is particularly evident with regard to the anxiolytic and sedative use of cannabis; extrapolation from our sample to the national population of CTP users suggests levels of use for anxiolytic and sedative purposes that may be comparable to the number of Canadians who currently use benzodiazepine and other sedatives (Kassam & Patten, 2006). Such widespread use suggests a need for the systematic evaluation of the effectiveness and adverse effects of cannabis for the treatment of these conditions, as well as comparisons of cannabis with the widely-used pharmaceutical products that currently represent frontline treatments. Finally, our findings highlight the apparent discrepancy in access to cannabis across CTP users. Authorized and unauthorized users exhibit few meaningful differences with regard to medical conditions and patterns of use, but face substantial differences regarding access; many seriously ill Canadians risk increased stigma (Bottorf, Bissell, Balneaves, Oliffe, Capler & Buxton, 2013), legal sanction, and other negative outcomes associated with accessing cannabis from illegal markets. At the time of this writing the federal medical cannabis program is undergoing substantial structural changes. The present study provides a baseline for assessing the impact of these changes, the most important of which must surely involve providing a program that facilitates informed, safe, legal, and affordable access to a source of CTP for ill Canadians.

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Conflict of interest statement

None of the authors have any conflicts of interest with regard to the contents of this manuscript. Access.

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Survey on Barriers to Access to Cannabis for Therapeutic Purposes in Canada

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Abstract

Background: There is increased interest in the therapeutic potential of cannabis in recent decades. Canada, the Netherlands, Israel and some states in the United States have developed programs to allow access to cannabis for therapeutic purposes (CTP). In Canada, enrollment represents fewer than 5% of the estimated users of CTP. The discrepancy between the number of Canadians who report using CTP and the rate of utilization of the federal CTP program suggests the existence of barriers to access to this program. **Methods:** The present study draws on data from the Cannabis Access for Medical Purposes Survey. We employ a health services analytical framework, developed to define the concept of 'access' and its relationship to patient satisfaction, to examine barriers to access to CTP. We define barriers to access as areas of poor fit between clients and services and use five dimensions to examine access to CTP: *accommodation*, *accessibility*, *availability*, *affordability*, and *acceptability*. **Results:** Our findings reveal that it is difficult for Canadians to find a physician to support their application to access CTP. Accessing CTP from unauthorized sources is common; only 7% of respondents accessed CTP exclusively from authorized sources. Accessibility to CTP was positively associated with the presence of medical cannabis dispensaries, though they are excluded from the regulatory regime. Access to CTP varied by medical condition and general quality of health. Affordability of CTP is a significant barrier to access that should be addressed under future programs. **Conclusions:** Strategies need to be developed to encourage scientific inquiry into CTP and address the barriers to access to CTP and the stigma and controversy that surround CTP and strain patient-physician relationships.

Keywords: cannabis, medical cannabis, cannabis for therapeutic purposes, regulations, barriers to access, health services analytical framework, Canada

Survey on Barriers to Access to Cannabis for Therapeutic Purposes in Canada

Background

After a period of marginalization, there is increased interest in the therapeutic potential of cannabis in recent decades. Canada, the Netherlands, Israel and some states in the United States have developed programs to allow access to cannabis for therapeutic purposes (CTP) (Shelef, Mashiah, Schumacher, Shine, Baruch &, 2011). An estimated one million Canadians, or 4% of those aged 15 and older, reported using cannabis to treat self-defined medical conditions in the previous 12 months (Adlaf, Begin, & Sawka, 2005; Belle-Isle & Hathaway, 2007). Court cases in Canada have confirmed the constitutional right of Canadians to choose cannabis as medicine without fear of criminal sanction (e.g. *R. v. Parker, Wakeford v. Canada, Hitzig et. al. v. Canada, R. v. Mernagh, R. v. Smith*), and in 2001, the *Marihuana Medical Access Regulations* (MMAR) established guidelines for Canadians to obtain legal authorization to possess CTP. As of December 2012, 28,115 Canadians had obtained an authorization under these regulations to possess CTP and obtain CTP from a legal source (Health Canada, 2013). Although uptake of the federal program has increased in recent years, this enrollment represents fewer than 5% of the estimated users of CTP in Canada. The discrepancy between the number of Canadians who report using CTP and the rate of utilization of the federal CTP program suggests the existence of barriers to access to this program.

To obtain authorization to legally possess CTP under the MMAR, Canadians are required to obtain the written support of a physician on an application form and then apply to a federal authority. Those authorized can purchase dried cannabis from Health Canada, produce their own cannabis, or designate a person to grow cannabis on their behalf. In 2014, the MMAR are scheduled to be replaced by the *Marihuana for Medical Purposes Regulations* (MMPR).

Under the MMPR, Canadians who wish to use CTP will need to obtain a medical document directly from a physician or nurse practitioner, similar to a prescription, which they will then submit to a commercial licensed producer. Both personal and designated licences to produce cannabis will be phased out. These imminent changes make it timely to analyze barriers to access to CTP under the current regulatory regime and to examine how new programs might address or exacerbate existing barriers.

In addition to authorized sources of CTP, medical cannabis dispensaries, also known as compassion clubs, represent a parallel source of CTP, providing CTP and related services to over 40,000 patients in Canada (Canadian Association of Medical Cannabis Dispensaries, 2013). Medical cannabis dispensaries arose in Canada in 1997 in response to demand for a community-based, safe, and quality controlled source of CTP (Capler, 2010). These dispensaries predate, and are not officially recognized by, the MMAR and operate under a legally ambiguous status (Belle-Isle, 2006). Additionally, many Canadians access CTP through friends, illicit self-production, and the street market.

The present study draws on data from the largest survey of Canadians who use CTP to date, the Cannabis Access for Medical Purposes Survey (CAMPS). We employ a health services analytical framework, developed to define the concept of 'access' and its relationship to patient satisfaction (Penchansky & Thomas, 1981), to examine barriers to access to CTP under the current program.

A health services analytical framework to examine barriers to access.

Penchansky and Thomas (1981) offered a framework to define 'access' and its relationship to patient satisfaction in the context of health services research. Others have adapted this framework to examine barriers to health care and health services in low-income countries

(Jacobs, Ir, Bigdeli, Annear, & Van Damme, 2012; Peters et al., 2008). For the purposes of our study, and in keeping with Penchansky and Thomas (1981), we define barriers to access as areas of poor fit between clients and services and use five dimensions to examine access to CTP: *accommodation*, *accessibility*, *availability*, *affordability*, and *acceptability*. Our study uses these dimensions as a lens through which to consider both access to authorization to possess CTP, as well as access to a source of CTP.

Accommodation refers to the "relationship between the manner in which the supply resources are organized to accept clients...and clients' ability to accommodate to these factors and the clients' perception of their appropriateness" (Penchansky & Thomas, 2008, p. 128). We conceptualize accommodation as an overarching dimension that broadly taps the appropriateness of the current model of CTP access in Canada with regard to meeting patients' needs. *Accessibility* refers primarily to the geographic location of services in relation to the location of the people in need of those services (Pechansky & Thomas, 2008; Peters et al., 2008). With regard to CTP, we examine the influence of provincial region of residence and community type (i.e. rural, suburban, and urban) on access both to physicians to obtain support to possess CTP, and to a source of cannabis. *Availability* refers to the adequacy of available services according to the nature of patient needs (Pechansky & Thomas, 2008; Peters et al., 2008). In the CTP context, we examine how medical conditions and general quality of health impact availability of physicians to support applications, the responsiveness of the administrative process required to obtaining authorization to possess CTP, and the availability of sources of CTP. *Affordability* reflects the relationship between the costs of services and products and the patients' willingness and ability to pay for them (Pechansky & Thomas, 2008; Peters et al., 2008). We address this dimension by examining associations among income, costs associated with CTP, and ability to

access CTP. *Acceptability* covers patients' attitudes regarding service providers and how they perceive their service providers' attitudes toward them (Pechansky & Thomas, 2008; Peters et al., 2008). To examine this dimension we review indices of patient-physician communication, stigma with regard to communication with physicians, and patients' attitudes to the official program.

Literature review on barriers to access to CTP in Canada.

A few studies have touched on issues related to barriers to access to CTP in Canada. In 2005, the Canadian AIDS Society conducted a survey of people living with HIV/AIDS which revealed that the majority of those who used or wanted to use CTP had spoken to their physician about CTP, and that only a small minority reported lack of physician support to be a substantial barrier to access (Belle-Isle & Hathaway, 2007). That study also found that just over one third of respondents had applied to the federal medical cannabis program, with many respondents describing barriers including the onerous, complicated or intimidating requirements of the program, mistrust of government, concerns about the repercussions, negative impression of the program, and lack of awareness of the program. Further, 86% of respondents reported obtaining CTP from illegal sources, including friends, dispensaries, unauthorized self-cultivation, and street dealers, whereas 8% had a license to produce their own CTP, 4% had a licensed designated grower and fewer than 2% reporting purchasing CTP from Health Canada. A more recent survey that was limited to federally authorized users of CTP reported similarly low levels of obtaining CTP from Health Canada, and high levels via dispensaries and licenced self-cultivation; however, these respondents reported generally high levels of satisfaction with the federal program (Lucas, 2012a).

Studies of physicians' attitudes and practices have identified their substantial concerns with the current state of CTP use and regulation in Canada. Jones and Hathaway (2008) found that the majority among a sample of family physicians, medical residents and medical students felt that, with regard to CTP, they "did not have access to the quality of evidence to which they are accustomed and with which they felt comfortable" (p. 170). The investigators also found that physicians tended not to ask their patients about their cannabis use and patients tended not to tell. A recent survey conducted by the Canadian Medical Association (Canadian Medical Association, 2012) revealed similar results; the majority of physicians believe they lack sufficient information on risks, benefits, and appropriate use of CTP. The same survey reported that one third of physicians never support their patients' request for CTP, whereas more than half do so only occasionally or seldom.

In sum, findings regarding CTP use in Canada indicate relatively low uptake of the authorized program on the part of patients and substantial discomfort on the part of physicians, suggesting a generally poor degree of "fit" between client and service. The present study presents a theoretically informed examination of the extent and nature of barriers to accessing CTP as experienced by Canadians. In light of the internationally expanding role of cannabis within the medical pharmacopeia, the elucidation of these barriers has the potential to inform and refine the development of CTP programs, and might more broadly contribute to the understanding of barriers to access for emerging and potentially stigmatized therapies.

Methods

The study was approved by the Behavioural Research Ethics Board of the University of British Columbia. The research team consisted of academic researchers, representatives from community-based organizations and non-governmental organizations, and people who use CTP.

The research thus borrowed from a participatory approach. The survey collected cross-sectional data from 628 self-identified current users of CTP in 2011-2012, both online at the national level and at a local British Columbia medical cannabis dispensary. This recruitment design allowed a comparison of the online *national* condition with the confirmed CTP users queried in-person in the *local* condition. Of the 702 *national* participants, 541(77%) reported current CTP use. All 87 *local* participants reported current CTP use. Organizations and media that serve people who use CTP as well as dispensaries assisted with promoting the survey (e.g., Canadian AIDS Society, Canadian Aboriginal AIDS Network, social media). No identifying data (i.e. IP addresses) were collected, to ensure confidentiality. The *local* group consisted of members of the dispensary who were either authorized to possess cannabis through Health Canada or had documented confirmation of a medical condition for which CTP is indicated. Participants in the *local* group received a $10 compensation and help from research assistants; participants in the *national* group were not assisted or financially compensated.

The questionnaire consisted of 414 questions designed to be completed in less than one hour. It queried demographics, detailed CTP use, communications with health care providers, access to and experiences with the federal medical cannabis program and a supply of CTP and general indicators of health and well-being. The questionnaire also included questions drawn from the Barriers Questionnaire (Ward et al., 1993) and from prior studies of CTP use (Belle-Isle & Hathaway, 2007; Lucas, 2012a). It was administered online, and organized in a hierarchical manner such that exposure to many items was contingent on prior responses. As a result, the number of recorded responses varies across items and no participants completed all items. All reported percentages are based on number of responses to given items rather than on the entire

sample. In order to enhance clarity we accompany all reported percentages with number of responses. Comparisons were conducted using χ^2 tests.

Results

Demographics.

The 628 respondents were 71% male, 29% female and 0.5% transgender and other genders, 92% Caucasians and 7% First Nations and Metis. Mean age was 39.10 years (SD = 13.12), median household income was $30,000 - $39,999, 96% had completed secondary school and 58% had completed some post-secondary education. Responses were obtained from all ten Canadian provinces and one of the three territories, and self-reported living in urban (47%), suburban (32%), and rural or remote areas (22%) (Table 1). Respondents reported using CTP for anxiety and depression, pain, arthritis, spinal pain, HIV/AIDS, multiple sclerosis, cancer, epilepsy and a variety of other illnesses. Medical use of cannabis was mainly reported for the treatment of pain, followed by nausea, mood, spasticity and other symptoms. A detailed description of the demographic and medical characteristics of this sample is available elsewhere (Walsh et al., 2013).

Accommodation.

Accommodation refers to the appropriateness of the current model of CTP access to meeting patients' needs. Experiencing obstacles to accessing CTP was reported by 86% of respondents (n = 420). Respondents described obstacles as affecting their mood, enjoyment of life, sleep, general activity, normal work outside or inside the home, and relationships (Figure 1). Most respondents (81.1%; n = 489) reported discussing the use of CTP with a physician, and almost one third of respondents (32%, n = 156) reported that they had sought a new physician in relation to their use of CTP, with the majority of those (57%, n = 89) changing physicians more

than once. Respondents reported equivocation on the part of physicians with regard to recommending and authorizing use of CTP. Among respondents who discussed CTP with their physicians, 29% (n=143) reported that physicians recommended they access CTP but refused to endorse their application for authorized access.

Nearly half of respondents (48%, n = 245) had applied for a federal authorization to possess CTP, of whom 68% (n=167) received authorization, 5% (n=13) reported they did not, and 26% (n=63) had applications that were under review at the time of the survey. Among applicants to the federal CTP program, 59% (n=145) found the process difficult or very difficult, and 47% (n=114) reported being somewhat or completely unsatisfied with the program. Incongruent accommodation between patients and services is further evidenced in access to a source of CTP; the federal program makes available a single strain of dried cannabis, whereas 93% (n = 415) of respondents identified access to a specific preferred strain, a variety of strains, and/or alternative CTP products (e.g. baked goods, tinctures) as important options. Indeed, less than one third of respondents (31%, n= 139) accessed CTP from authorized sources (i.e. licensed self-production, licensed designated producer, direct purchase from the federal program) (Figure 2), and more than three quarters (76%, n = 106) of respondents who had access to authorized sources also accessed CTP from unauthorized sources (i.e. dispensary, friend, street, unlicensed self-production, unlicensed designated producer). Overall, only 7% (n= 33) of respondents accessed CTP exclusively through authorized sources.

Accessibility.

Accessibility refers to the influence of provincial region of residence and community type (i.e. rural, suburban, and urban) on access both to physicians to obtain support for an authorization to possess CTP and to a sources of cannabis. The rate of experiencing obstacles to

access to CTP did not differ according to community type (urban, suburban or rural) (X^2 = 1.39 (2), p = 0.50) or region (X^2 = 5.32 (4), p = 0.27). The proportion of those who had spoken to a physician regarding CTP use varied according to region with the highest level in British Columbia (88%, n=191), and lowest in the Maritimes (71%, n=29) (X^2 = 16.58 (4); p<.01). Across regions, respondents from rural areas were more likely than urban or suburban respondents to discuss CTP with physicians; 89% (n=116) of rural respondents discussed use of CTP with a physician, compared to 80% (n=224) of urban and 77% (n=144) of suburban respondents (X^2 = 7.59 (2); p = 0.02). Rural residents were also more likely to report having received federal authorization to possess CTP (41%, n = 45), relative to suburban (36%, n=58) and urban dwellers (26%, n = 63) (X^2 = 8.69 (2), p = .01). The proportion of respondents who reported changing physicians for reasons related to CTP use was stable across regions (X^2 = 3.11 (4); p = 0.54) and across community types (X^2 = .19 (2); p = 0.67).

With regard to accessibility to sources of CTP, regional differences were identified in the proportion of respondents who accessed CTP from a dispensary, with higher levels among respondents from British Columbia (70%, n=118) and Ontario (41%, n=68) and lower use among residents of the Prairie (18%, n=11) and Maritime (25%, n=7) regions (X^2 = 62.61 (4); p < .01). A complementary pattern of results emerges from examining access to cannabis from a friend or acquaintance, with higher levels among residents of the Prairies (80%, n=52) and Maritimes (88%, n=28) regions and lower levels from British Columbia (58%, n=106) (X^2 = 18.23) (4), p< .01) (Figure 3). Participants who lived in rural, suburban and urban areas differed with regard to the extent to which they produced their own cannabis, with the highest level of self-production among respondents from rural areas (48%, n=51), followed by suburban (31%, n=46) and urban residents (25%, n=58), (X^2 = 18.25 (2); p < .01).

Availability.

Availability in this context refers to how medical conditions and general quality of health impact availability of physicians to support applications to access CTP, the responsiveness of the federal government's administrative process required to obtaining authorization to possess CTP, and the availability of sources of CTP. The rate of experiencing obstacles to access to CTP differed across medical conditions, such that individuals who identified HIV/AIDS as their primary condition were less likely to report obstacles (70%, n=33), (X^2 = 10.29 (1), $p < .01$). Physician communication also varied according to medical conditions, such that a greater proportion of individuals with HIV/AIDS (93%, n=55), (X^2 = 5.51 (1); p = .02), and arthritis (91%, n=80), (X^2 = 4.54 (1); p = .02) discussed CTP with their physicians, whereas respondents with anxiety/depression as primary condition were less likely to discuss CTP with a physician (64%, n=69), (X^2 = 27.68 (1); p < .01). Respondents with HIV/AIDS were also relatively less likely than other patients to change physicians for reasons related to CTP (11%, n=6), (X^2 = 13.14 (1); p < .01). Having physicians recommend CTP but refuse to endorse applications for authorized access was less prevalent among respondents with HIV/AIDS (13%, n=7), (X^2 = 10.90 (1); p < .01), and more common among respondents with chronic pain that was not due to spinal injury or arthritis (51%, n=40), (X^2 = 12.43 (1); p < .01).

Respondents who reported *fair to poor* general health were more likely than respondents who reported *good to excellent* general health to discuss CTP with a physician (91%, n=147) (77%, n=240) (X^2 = 13.59 (1); p <.01),to have obtained federal authorization (42%, n=68) (27%, n=85) (X^2 = 10.59 (1); p <.01), and to access CTP through authorized means (36%, n = 57) (25%, n=76) (X^2 = 6.00 (1); p =.02). However, comparisons according to general health of respondents identified no differences with regard to experiencing obstacles (X^2 = .16 (1); p =.68),

(X^2 = .16 (1); p =.68), changing physicians related to CTP (X^2 = .39 (1); p =.57), or having physicians recommend CTP but refuse to endorse an application for authorization (X^2 = .08 (1); p =.81).

With regard to sources of CTP, almost one third of the respondents (31%, n = 155) reported self-producing CTP, of whom 50% (n=77) were licensed to produce CTP for personal use. The proportion of licensed versus unlicensed self-producers was consistent across medical conditions (X^2 = 2.01 (8); p = .98). However, self-producers who reported *fair to poor* general health were more likely to be licensed (64%, n=30) than were those who reported *good to excellent* general health (42%, n=43) (X^2 = 6.05 (1); p =.01). Approximately one third (34%, n=42) of self-producers reported that it was difficult or very difficult to learn to cultivate cannabis. The proportion of self-producers who reported difficulty was consistent across medical conditions (X^2 = 9.04 (8); p = .34) and general health quality (X^2 = .39 (2); p = .58). Reported difficulties associated with self-production included arrest (16%, n = 24) and break-ins (12%, n = 19). Among the 339 respondents who provided reasons for not self-producing CTP, the most prominent reasons were lack of space (43%, n=146), expense of set up (37% n=124), and legal concerns (32%, n=108). The extent to which lack of space was identified as a reason for *not* self-producing differed according to community type, such that urban residents were most likely to report this reason (52%, n=91), followed by suburban (35%, n=36), and rural residents (31%, n=17) (X^2 = 12.04 (2), p <.01). No such difference were identified for expense (X^2 = 3.01 (2), p =.22) or for legal concerns (X^2 = 2.59 (2), p=.27). The most important reason for self-producing was quality (39%, n=52), followed by price (36%, n=47), avoiding the black market (29%, n=40), selection of a specific strain of cannabis (24%, n=33), and safety (12%, n=15).

Of those who reported that someone else produced CTP for them (18%, n=90), 67% (n=60) had designated producers who were licensed. Difficulties finding a designated producer were reported by 39% (n=35) of respondents with designated producers, and the proportion reporting such difficulties was stable across medical conditions (X^2 = 7.14 (8); p = .52) and health quality (X^2 = .27 (1); p = .66).

Affordability.

Affordability refers to costs associated with CTP and ability to pay according to income. Costs to access CTP occur both in the process of obtaining physician support for authorization to possess CTP and in obtaining a supply of cannabis. Many applicants (40%, n = 98) were charged by their physician for the service of having their application completed, with charges ranging from $10 to $800. The proportion of respondents who were charged by physicians to complete the application varied according to income such that a relatively smaller proportion of the lowest income group (≤$20,000/yr) were charged (30%, n=26, X^2 = 7.18 (1); p < .01), and a larger proportion of the $40,000-60,000/yr group were charged (62%, n=21, X^2 = 6.76 (1); p =.01). Among participants who reported buying CTP (n=433), the median amount reportedly spent was $200 (Inter-quartile Range = $100-$400) per month. Experiencing obstacles did not differ across income groups (X^2 = 3.17 (3); p = .37), however 54% (n=278) of respondents reported that they were *sometimes or never* able to afford to buy sufficient quantity of CTP to relieve their symptoms, and approximately one third (33%, n=173) reported that they often or always choose between cannabis and other necessities (e.g. food, rent, other medicines) because of lack of money. The proportion of respondents who reported that they were *sometimes or never* able to afford to buy sufficient quantity of CTP differed according to income such that it was most frequently reported by the lower income group (72%, n = 123) and least frequently reported by

the highest income group (≥ $60,000/yr) (30%, n = 36) (X^2 = 51.26 (3); $p < .01$). The frequency of reports of choosing between CTP and other necessities followed a similar pattern, with highest levels of reporting among lowest income (51%, n = 88) and lower levels at highest income (11%, n=13) (X^2 = 56.93 (3); $p < .01$). The proportion of respondents who reported financial strain associated with CTP also varied according to health status such that approximately two thirds of respondents who reported *fair to poor* general health were *sometimes or never* able to afford sufficient CTP (67%, n=107) compared to 48% (n=147) of respondents who reported *good to excellent* health (X^2 = 15.56 (1); $p < .01$). Respondents reporting poorer health were also nearly twice as likely to report choosing between CTP and other necessities (48% (n=78) versus 25% (n=79), X^2 = 25.85 (1); $p < .01$).

The proportion of respondents who obtained authorization varied according to income, such that 40% (n=68) of respondents in the lowest annual income group obtained authorization compared to 28% (n=95) of respondents from higher income groups (X^2 = 6.86 (1); $p = .01$). Income was not associated with discussing CTP with a physician (X^2 = 1.48 (3); $p = .69$) or with changing physicians for reasons associated with CTP (X^2 = 1.14 (3); $p = .79$). Income was also not associated with accessing CTP from an authorized source (X^2 = 2.61 (3); $p = .46$).

Acceptability.

Acceptability refers to patients' perceptions of physicians' attitudes regarding CTP and the official program and indices of patient-physician communications. Respondents reported some reluctance regarding communication with physicians related to CTP. Approximately half of the respondents (48%, n=277) reported that they had at some time wanted to discuss CTP with *a* physician but had not done so. Among respondents who wanted to discuss CTP but refrained, 38% (n=105) had not discussed CTP with *any* physician. The most frequent reason for not

discussing CTP despite a desire to do so was "don't feel comfortable" (62%, n= 172), followed by "illegal" (46%, n= 127), and "can't afford cannabis" (9%, n=25). Although our sample was comprised of *current* users of CTP, queries regarding *past* avoidance of CTP also evinced patient concerns regarding potential reactions from physicians and others; the most frequently cited reason for avoiding CTP was "I could be discriminated against" (60%, n = 326), followed by "Doctors might find it annoying to be asked about cannabis" (51%, n = 275), "Discussing cannabis could distract a doctor" (17%, n=90) and "It could make me drowsy" (17%, n=90). Answers to an open ended question related to physicians' perceived negative response to CTP included – "After multiple negative responses from doc, I've stopped broaching the subject."; "He shut me down every time I brought it up." Several responses also indicated concern that discussing CTP with a physician might have a negative impact on their patient/physician relationship – "fear of getting no treatment at all"; "fear of losing my doctor"; "I am afraid they will black list me as a patient and I would not have access to health care!" Compared to their communication with their physician regarding other medical issues, half of the respondents (50%, n = 235) were less satisfied with their communication about the use of CTP, and 31% (n = 146) reported that they often or always felt discriminated against by their physician because of their use of CTP.

Discussion

Access to CTP involves both legal authorization to possess CTP and access to a source of cannabis. Our results reveal substantial barriers related to both components of access involving dimensions of *accommodation*, *accessibility*, *availability*, *affordability*, and *acceptability*.

Obtaining authorization to possess CTP requires the support of a physician, and the majority of respondents had discussed the use of CTP with a physician. However, a large

proportion of respondents spoke to several physicians and many changed physicians in order to access CTP. Ultimately, less than one third of respondents had obtained authorization that allowed them to legally possess CTP, indicating that despite the existence of a legal framework, a substantial number of chronically and seriously ill Canadians continue to access CTP without legal authorization and from illegal sources. This discrepancy suggests poor *accommodation* of the federal CTP program to client needs. Indeed more than 85% of respondents reported experiencing obstacles to accessing CTP. Among the minority of respondents who engaged with the federal program, over half found the process difficult, and nearly half were dissatisfied with the program. Among those who managed to obtain access to authorized sources of CTP, three quarters also accessed unauthorized sources. In sum, fewer than 10% of our sample accessed cannabis exclusively from authorized sources, which suggests substantial barriers to efficient and acceptable authorized access.

The *availability* of sources of CTP varied across Canada. Although medical cannabis dispensaries are not recognized under existing regulations, British Columbia and Ontario have numerous active medical cannabis dispensaries, whereas other regions do not have any, or as many, active dispensaries. Our finding of regional differences in the *accessibility* to CTP, with residents in BC and Ontario more likely to access CTP from a dispensary, was expected. Other regional differences may also be attributable to the presence of dispensaries. Specifically, BC has the greatest density and longest history of dispensary activity (Lucas, 2012b), and BC residents were more likely to have discussed CTP with a physician and less likely to purchase CTP from a friend or acquaintance. Although the cross-sectional nature of our study prevents assertions regarding causality, these findings indicate that the presence of cannabis dispensaries is

associated with increased physician consultation around CTP and reduced prevalence of illegal access through friends and acquaintances.

Also related to the dimension of *availability* were the findings that rural respondents were more likely to communicate with their physicians regarding CTP, to have obtained federal authorization to possess CTP, and to self-produce. Further inquiry is required to fully elucidate the factors that underlie the increased adoption of the federal program by rural residents. However, the increased space associated with rural living may contribute to these differences. Indeed, rural residents who abstained from self-production were less likely than urban and suburban residents to cite space restrictions as a factor that contributed to their decision not to produce CTP.

Medical conditions and general health were associated with differences in *availability* of CTP. In particular, respondent with HIV/AIDS experienced fewer obstacles, were more likely to discuss CTP with physicians, less likely to change physicians related to CTP, and less likely to have physicians recommend CTP but refuse to endorse authorization. The relatively lower levels of obstacles facing people living with HIV/AIDS attempting to access CTP may be attributed to several factors, including the relatively more established efficacy of the therapeutic uses of cannabis for the management of symptoms related to HIV/AIDS, the long history of grassroots advocacy for the use of CTP by the HIV/AIDS movement, and the potentially greater alliance between health care providers and patients among this community. As such, the relatively fewer barriers experienced by individuals living with HIV/AIDS suggest that further research into factors that have facilitated access to CTP among such individuals might help develop strategies to improve access for other groups. These findings also raise the possibility that prior research that focused exclusively on HIV/AIDS patients who use CTP (e.g. Belle-Isle & Hathaway, 2007)

may present an underestimate of the obstacles experience by the broader community of people who use CTP.

Also related to the dimension of *availability*, individuals who identified anxiety and/or depression as primary reasons for using CTP were less likely to discuss CTP use with physicians. This difference may reflect characteristics of these conditions, as behavioral inhibition and reduced communication may be associated with depression and anxiety (Angélico, Crippa, & Loureiro, 2013; Tse & Bond, 2004). Alternately, this finding may reflect perceived reluctance on the part of physicians to recommend CTP for psychiatric symptoms. Given the prevalence of anxiety and depression in the general population, and the substantial problems with extant pharmacological treatments such as benzodiazepines and SSRIs (Gartlehner et al., 2011; Uzun, Kozumplik, Jakovljević, & Sedić, 2010), our findings of high levels of unauthorized CTP use to address these conditions suggest that further effort is required to better determine the antidepressant and anxiolytic efficacy of CTP.

General health status was also associated with difference in the availability of CTP, such that poorer health was associated with higher rates of physician communication and authorized access. However, no differences according to general health status were observed with regard to experiencing obstacles to access, changing physicians related to CTP and physicians recommending CTP but refusing to endorse applications for authorized access. Nevertheless, our findings indicate that over a quarter of patients in poor health had the experience of physicians recommending CTP and refusing to assist with authorization. This finding points to the need for further education to address equivocation and reluctance on the part of physicians to assist patients in obtaining legal access to CTP.

Our examination of *affordability* identified further obstacles to optimal CTP use, with over half of respondents indicating that financial consideration interfered with their ability to treat symptoms with cannabis. Of course lower income individuals were most vulnerable to this obstacle, with approximately half of participants in the lowest income group reporting having to choose between CTP and other necessities. Even a third of the highest income group reported difficulty affording CTP. Affordability appeared to disproportionately impact the most seriously ill patients, such that the group who reported fair to poor health were twice as likely as healthier patients to report having to choose between CTP and other necessities. Surprisingly, the lowest income group were more likely to have obtained authorization to possess, which suggests that it is the cost of cannabis per se, rather than the cost of obtaining authorization, that presents the primary barrier to affordability. The ubiquity of CTP-related financial strain highlights the need for developing approaches to mitigate financial barriers and integrate CTP within a subsidized medicine framework.

In light of the considerable stigma and controversy that surrounds the use of CTP (Bottoroff et al., 2013), and evidence from surveys of physicians that indicate discomfort with CTP (Jones & Hathaway, 2008; Canadian Medical Association, 2012), we were not surprised that patients' perception of service providers' attitudes toward CTP users constituted substantial barriers to *acceptability* of services. Indeed, almost half of the respondents had at some point wanted to discuss cannabis for medical purposes with a physician but avoided doing so, most commonly citing fear of discrimination and feelings of discomfort. Reports of patient-physician interaction suggest that such fears may not be unfounded; half of respondents were relatively less satisfied with CTP-related physician interactions than with interactions that were unrelated to CTP, and nearly one third reported experiencing CTP-related discrimination on the part of

physicians. The large proportion of patients who changed doctors to access CTP, and who reported that physicians recommended CTP but would not sign official authorizations, provides further evidence of lingering discomfort related to CTP on the part of some physicians. This discomfort may stem from their stated lack of knowledge about the medical use of cannabis (Jones & Hathaway, 2008; Canadian Medical Association, 2012) and their disapproval of smoking as a route of administration for any treatment (Canadian Medical Association, 2012). It may also stem from their personal views on cannabis use, which may be an interesting topic for further inquiry. Organizations such as the Canadian Consortium for the Investigation of Cannabinoids have developed programs to help educate physicians on the relative harms and benefits of CTP, and the past decade has witnessed a notable increase in the international acceptance of the therapeutic potential of cannabis. This increased prominence, together with the concerted efforts of CTP advocates and educators, may play a valuable role in helping to reduce barriers related to acceptability of services.

The cross-sectional nature of our study does not permit causal inferences and it is possible that unmeasured factors may play an important role in determining access to CTP. Our sample consisted of mostly male, Caucasian and well educated respondents and our findings may not reflect the situation of other Canadians who use CTP. An additional limitation involves response biases related to participant self-selection, and recruitment through organizations that support people who use CTP. These factors likely resulted in overrepresentation in our sample by individuals who are strongly invested in increasing access to CTP; it is possible that barriers to access may be less pronounced or otherwise different were we to collect data using a more systematic approach to recruitment. Conversely, barriers to access to CTP may be greater for those who may not have access to online resources or organizations that support people who use

CTP. We also focused on barriers to access for those who are using CTP and did not delve into the barriers for people who may want to use CTP but are not able to overcome barriers to access. These limitations are balanced by several strengths, including a relatively large national sample that tapped into both authorized and unauthorized CTP users across diverse medical conditions and health statuses. The engagement of both community and academic experts in the construction and dissemination of the survey is a further strength of our study, as it increased the breadth, relevance and validity of our queries. More broadly, our examination of issues related to access to CTP was guided by a theoretically informed analytical framework which added to our confidence regarding the dimensions that are central to access to health services.

Conclusion

Utilizing a health services analytical framework, CAMPS provides useful data to examine barriers to access to CTP in terms of dimensions of *accommodation, accessibility, availability, affordability, and acceptability*. An in-depth analysis of barriers to access to CTP provides insights into access to CTP under the current regulatory framework and may help inform the provision of safe and efficient access to CTP under future regulatory regimes (e.g., the new MMPR which come into force on April 1, 2014).

Our findings reveal poor *accommodation* of the current system of legal access to CTP to client needs due to difficulties in obtaining the required support of a physician. Less than one third of respondents had obtained authorization to legally possess cannabis for medical purposes. Under the new MMPR, Canadians will need to obtain a medical document similar to a prescription from a physician or a nurse practitioner in order to have legal access to CTP. Given the reservations physicians had with signing a medical declaration on the current application form under the MMAR, it is possible that physicians will be even more reluctant to prescribe

CTP within the new regulatory framework, as noted in the statement released by the Canadian Medical Association on June 10, 2013 (Canadian Medical Association, 2013). It is encouraging that nurse practitioners will be allowed to prescribe CTP under the new MMPR in jurisdictions where they can prescribe, though it remains to be seen whether this will result in better access to CTP.

The current system further fails to accommodate access to a legal source of CTP, as only 7% of our sample accessed cannabis exclusively from authorized sources. The current regulations do not include medical cannabis dispensaries, and the new MMPR will not integrate them into the regulatory system. Our findings show that *accessibility* to CTP was associated with the presence of medical cannabis dispensaries. Regions that have such dispensaries also had increased physician consultation around CTP and reduced prevalence of illegal access through friends and acquaintances. Including medical cannabis dispensaries under the regulatory regime could facilitate better access to CTP.

The *availability* of CTP varied by medical condition. In particular, respondent with HIV/AIDS experienced fewer obstacles, while individuals with anxiety and/or depression experienced more. Furthermore, the general quality of health was also associated with differences in the availability of CTP, such that poorer health was associated with higher rates of physician communication and authorized access. Perhaps this finding indicates that Canadians wait until they are in desperate need of therapeutic options where other options have failed before they gather enough courage to speak to their physician about CTP. Perhaps physicians are more comfortable supporting the use of CTP for Canadians who are in poorer health. Further inquiry could shed light on this. Regardless of their health status, however, it remained difficult for Canadians to find a physician to support their application to the federal program, further

indicating a need to build a stronger body of evidence regarding the appropriate therapeutic uses of cannabis for specific conditions and to better inform physicians of the evidence that does exist.

Affordability of CTP remains a significant barrier for many Canadians. Our findings reveal that this is especially true for the most seriously ill. Under the new MMPR, Canadians who use CTP will no longer have the cost-effective options of producing their own cannabis or designating a producer. The move to commercial licensed producers will increase the price of CTP, as indicated in the government's Regulatory Impact Analysis Statement regarding the new MMPR (Government of Canada, 2012). Strategies to mitigate these financial barriers and to integrate CTP within a subsidized medicine framework must be developed.

Finally, strategies need to be developed to address the stigma and controversy that surrounds CTP and strain patient-physician relationships. These barriers to *acceptability* impede frank and open discussions about CTP and have a negative impact on continuity of care. The ongoing prohibition of cannabis and associated anti-cannabis messages have tarnished its reputation as a potentially beneficial and safe therapeutic option, thwarted scientific inquiry and stigmatized both the plant and its users. Perhaps the current international climate of cannabis policy reform will bring about alternative policies to regulate cannabis and will slowly open doors for more rational and sensible investigation and education regarding its therapeutic uses.

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CANNABIS ACCESS FOR MEDICAL PURPOSES SURVEY (CAMPS): PATIENT CHARACTERISTICS, PATTERNS OF USE & BARRIERS TO ACCESS

This is Exhibit "D" referred to in
the affidavit of [illegible]
sworn before me at [illegible]
this [illegible] day of [illegible]

A Commissioner for taking Affidavits
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Methods

- Cross-sectional national & local online & in person
- 628 self-selected current users of cannabis for therapeutic purposes
- Collected between July 2011 and August 2012

Demographics

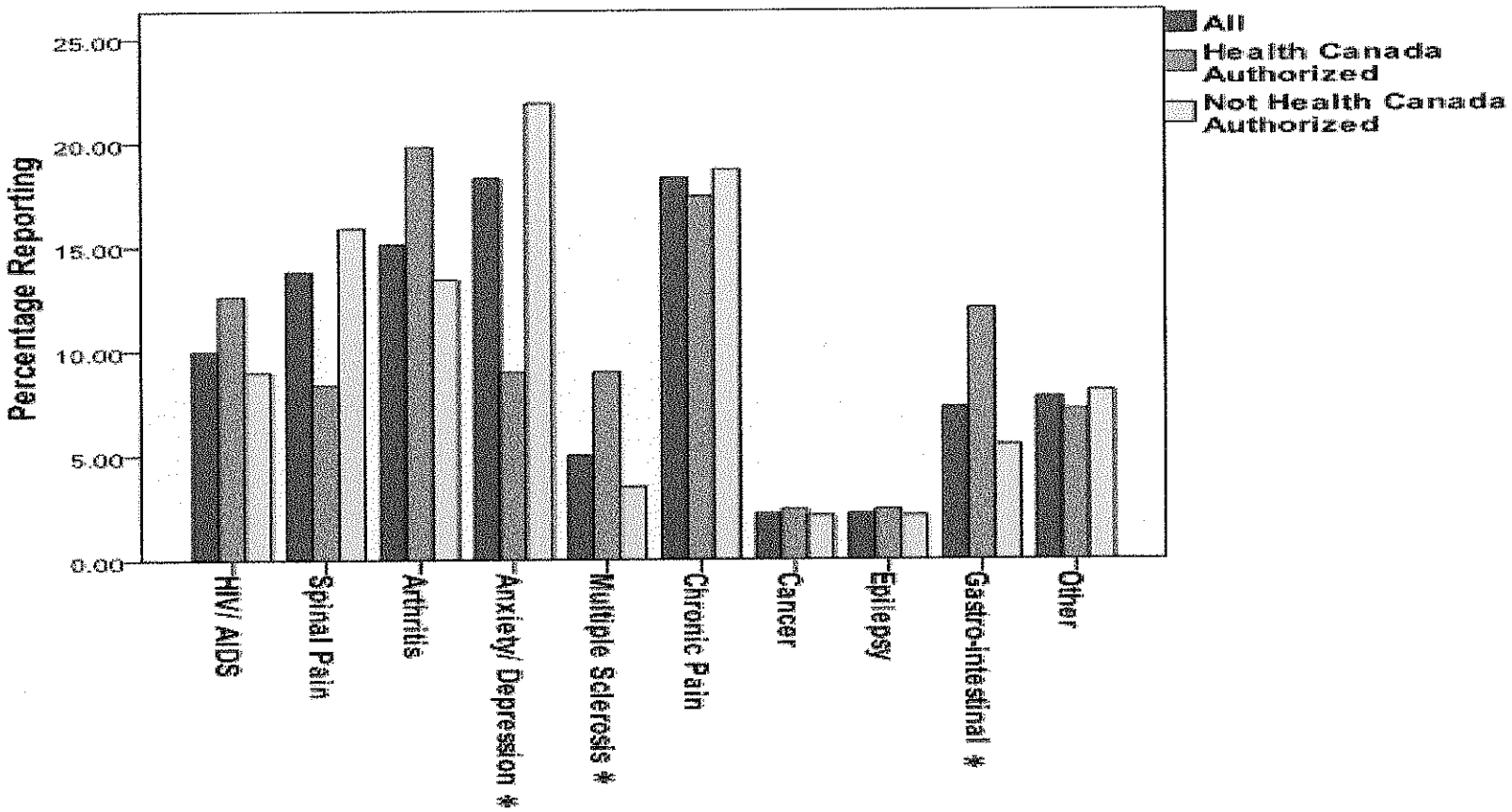
	CTP (%)	Census (%)	Z
% male	71	49	11.03*
% white	92	80	7.52*
% aboriginal	7	4	3.80*
Age			
18-24yrs old	17	12	3.86*
25-34	26	16	6.84*
35-44	19	20	.63
45-54	24	20	2.51

Demographics

	CTP(%)	Census (%)	Z
Education			
<high School	4	15	-7.86*
HS Grad	37	24	7.63*
post secondary	58	61	-1.54
Income			
<20,000	33	44	-5.55*
20,000-39,999	26	27	-.56
40, 000-59,999	17	15	1.43
60,00 +	24	14	7.22*
Region			
Rural	22	20	1.25

Medical Conditions – Authorized / Unauthorized

32.49% Health Canada authorized (12.45% in process)



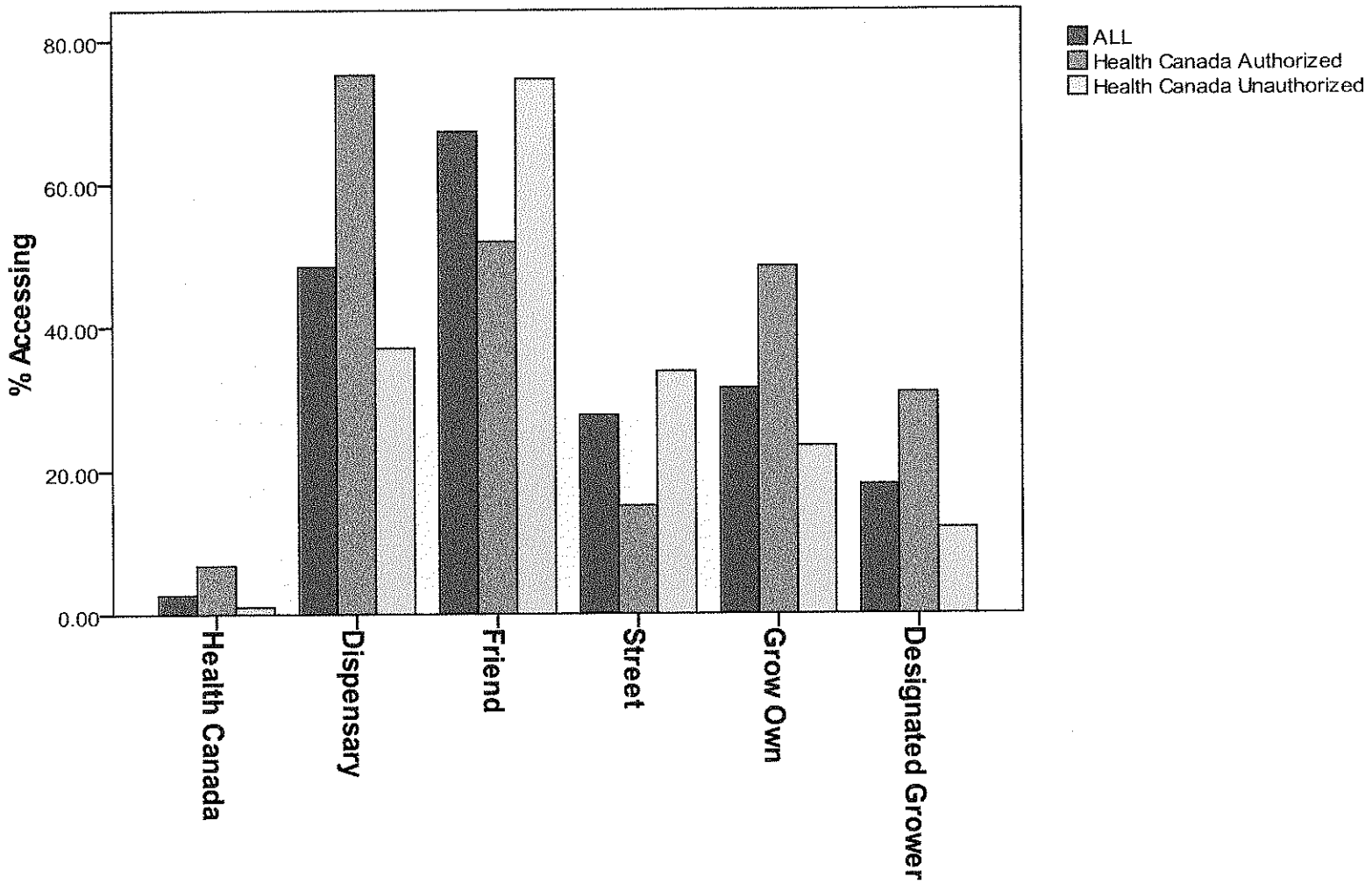
Medical Conditions - Symptoms

	All	Pain – Spinal	Pain - Nonspinal	Arthritis	Mood	HIV/AIDS	GI
Sleep	85.3%	82.9%	85.3%	89.9%	92.5%	78.3%	76.7%
Pain	81.8%	97.6%**	93.6%**	96.6%**	52.3%**	68.3%**	93%
Anxiety	78.3%	79.3%	78%	64%**	99.1%**	73.3%	67.4%
Depression	66.1%	67.1%	62.4%	57.3%	91.6%**	56.7%	62.8%
Appetite/ Weight	56.0%	52.4%	51.4%	39.3%**	57%	76.7%**	76.7%**
Nausea	49.4%	43.9%	51.4%	37.1%	40.2%	78.3%**	81.4%**
Inflammation	48.3%	62.2%	47.7%	88.8%**	23.4%**	33.3%	58.1%
Spasms	46.8%	70.7%**	48.6%	56.2%	21.5**	33.3%	51.2%
Headache	40.5%	53.7	51.4	40.4%	35.5%	25%	27.9%

Patterns of Use

	All	Pain Spinal	Pain	Mood	Arthritis	HIV/AIDS	GI
Amount per week (Grams)							
≤2	8.8%	7.8%	9.8%	10.3%	4%	26.8%*	2.9%
2.1-5	12.6%	12.5%	12%	12.6%	13.3%	12.2%	0%
5.1-9	17.9%	10.9%	23.9%	27.6%	14.7%	14.6%	17.1%
9.1-14	16%	23.4%	16.3%	12.6%	20%	9.8%	17.1%
>14 (Median = 28)	44.6%	45.3%	38%	36.8%	48%	36.6%	62.9%
Freqency of Use							
< daily	11.1%	8.8%	12.6%	14.1%	3.9%	24.5%*	5.3%
1x day	13.5%	10.3%	15.5%	18.5%	15.6%	15.1%	2.6%
2-3x	33.2%	30.9%	30.1%	39.1%	33.8%	30.2%	36.8%

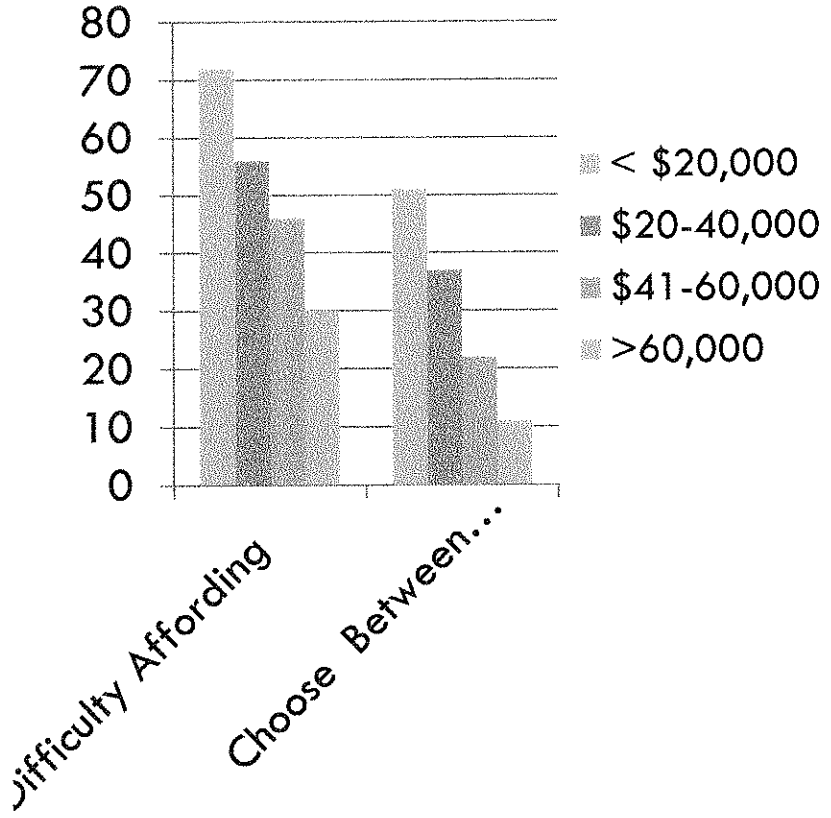
Access - Modes

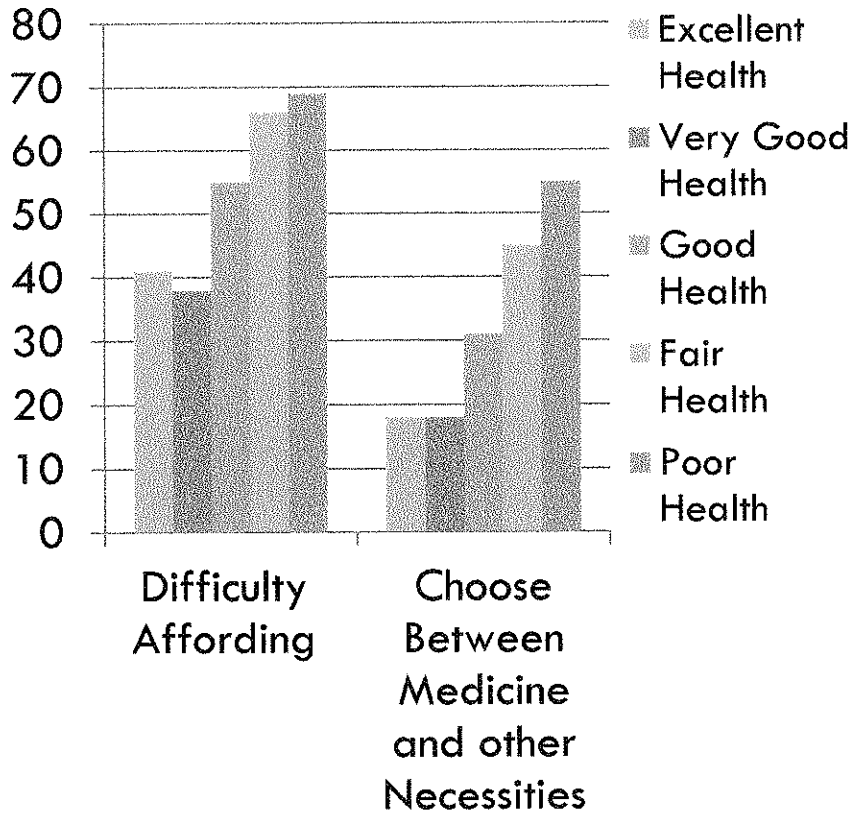


Access – Obstacles

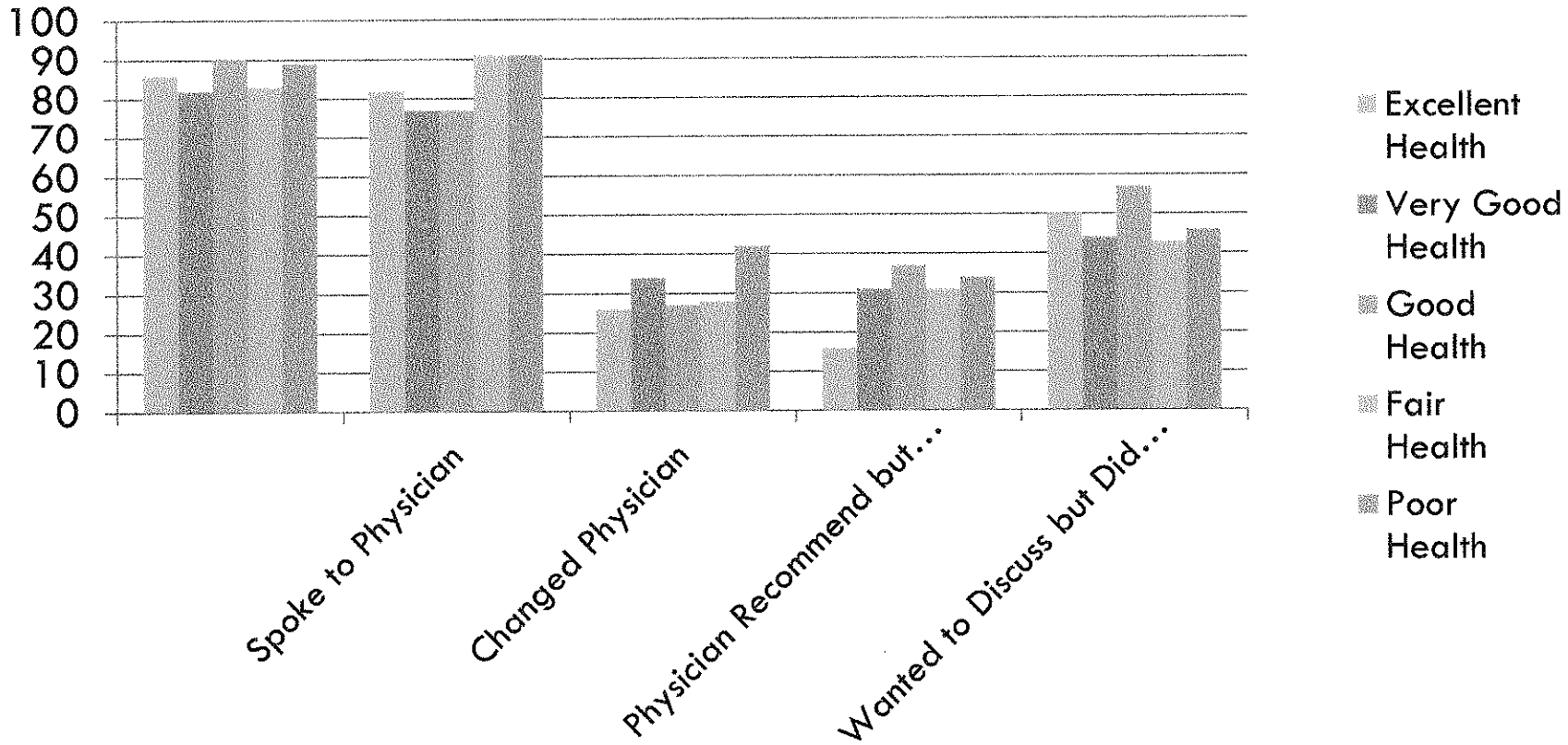
- Difficulty finding a physician to sign application:
  - 32% changed physicians
    - 38% did so once
    - 27% did so twice
    - 24% did so three times or more
  - 48% wanted to discuss cannabis but did not do so
    - fear of discrimination
    - feelings of discomfort
    - fear of annoying the physician
  - 50% relatively less satisfied with CTP-related physician interactions than with interactions that were unrelated to CTP
  - 31% felt discriminated against

Access – Affordability

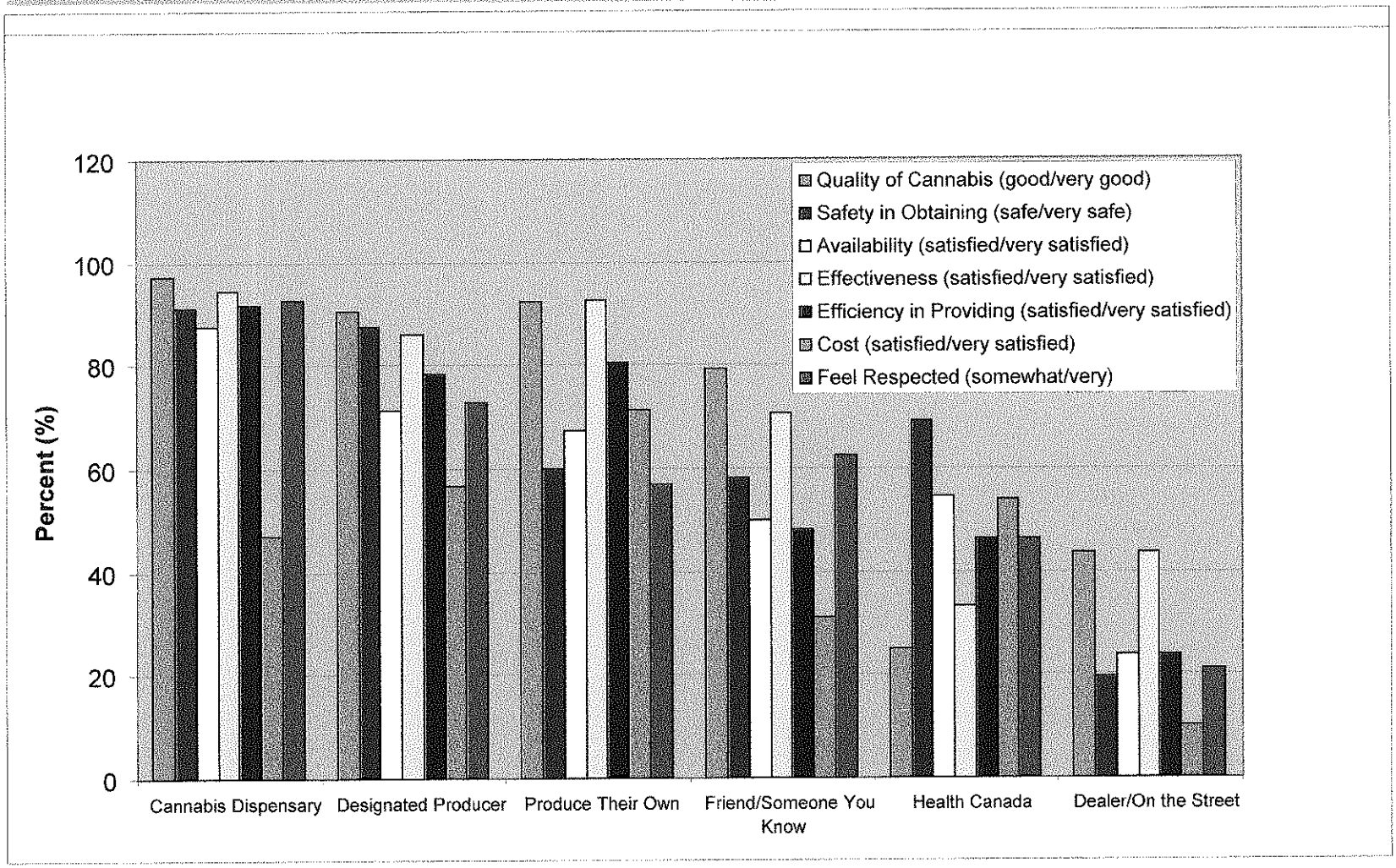




Access – Availability



Access – Modes



Discussion

- Reasons for use and perceived effectiveness were generally consistent across medical conditions; respondents overwhelmingly reported using cannabis to effectively address pain, sleep disturbance, and anxiety.

- A substantial disconnect between the medical use of cannabis and research on the risks and benefits
  - Particularly evident with regard to the anxiolytic and sedative use
  - Extrapolation from our sample to the national population of CTP users suggests that the number who use cannabis for these purposes is comparable to the number who currently use benzodiazepine and other sedatives (Kassam & Patten, 2006).

Discussion

- Authorized and unauthorized users exhibit few meaningful differences with regard to medical conditions and patterns of use, but face substantial differences regarding access
  - many seriously ill Canadians risk legal sanction and other negative outcomes associated with accessing cannabis from illegal markets.
- Medical cannabis users are nearly unanimous with regard to experiencing substantial obstacles to access
- Affordability is a substantial barrier to access – respondents from all income groups reported difficulty affording medical cannabis
  - Worse among those with the poorest health
- Physician communication is also a substantial barrier to access
  - A substantial portion of even the most seriously ill patients have had recommendations to use medical cannabis and support denied for obtaining legal access
- Medical cannabis dispensaries are the preferred mode of access across multiple dimensions of patient satisfaction

Cost-Benefit Analysis of Regulatory Changes for Access to Marihuana for Medical Purposes

Final Report

December 2012

Prepared by:

David Stambrook, Senior Economist, Delsys Research Group Inc.

Derek Ireland, Ph.D., Senior Economist, Delsys Research Group Inc.

Wei Xie, Senior Policy Analyst, Delsys Research Group Inc.

This is Exhibit "E" referred to in the affidavit of Zachary Walsh sworn before me at Kelowna BC this 15th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

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Final Report

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Table of Contents

Executive Summary

The Government of Canada requires a Cost-Benefit Analysis (CBA) to be undertaken as part of the Regulatory Impact Assessment process involved in publication of certain proposed Regulations in the Canada Gazette – Part 1. This requirement was applicable for the development of the proposed Marihuana for Medical Purposes Regulations (MMPR), which will replace the existing Marihuana Medical Access Regulations (MMAR).

The Marihuana Medical Access Program (MMAP) is governed under the Marihuana Medical Access Regulations pursuant to the Controlled Drugs and Substances Act (CDSA). The current regulations came into effect in 2001 after Canadian courts ruled that individuals demonstrating a medical need for marihuana have a Charter right to possess marihuana and to have reasonable access to a legal source of supply. The MMAR provide a process for Canadians to legally obtain access to marihuana for medical purposes by applying to Health Canada for an authorization to possess (ATP) and, if applicable a license to produce.

An authorization to possess dried marihuana for medical purposes requires application by an individual to Health Canada. The individual must obtain physician support for their application to access dried marihuana.

Persons authorized by Health Canada to possess may obtain access to dried marihuana via three supply methods:

1. Government supply: purchase of dried marihuana from Health Canada through a contracted government supplier;

2. Personal-use production: under a Personal Use Production License (PUPL) to produce for their own use; or

3. Designated-person production: under a Designated Person Production License (DPPL) where another individual produces for a person authorized to possess dried marihuana.

About 60% of current persons with an ATP access marihuana through PUPL, 20% access through DPPL, 10% access through the Government supply and 10% appear to access marihuana from unknown supply sources. As of August 13, 2012 there were 21,986 ATP persons under the MMAP. The MMAP has grown at an exponential rate since its inception and has generated a number of public policy concerns.

In 2009, following the expression of significant stakeholder concerns with the current program, the Minister of Health instructed Health Canada officials to conduct a review of the MMAP. In 2011, the Government of Canada proposed changes to the regulatory framework based on the concerns that had been expressed. There was a public and targeted stakeholder consultation on these proposed regulatory reforms, which will lead to the publication of draft regulations in Canada Gazette-Part I, for which the CBA was undertaken.

Proposed Regulatory Changes

The objective of the proposed Marihuana for Medical Purposes Regulations is to reduce the risks to public health, security and safety of Canadians, while significantly improving the way in which individuals access marihuana for medical purposes.

To reduce the risks to public health, security and safety of Canadians, a new supply and distribution system for dried marihuana would be established that relies on commercial production of marihuana for medical purposes. Security requirements would be in place for the production site and key personnel of the licensed producer (LP). Standards for packaging, transportation and record-keeping would contribute to achieving security objectives.

The process for individuals seeking to access marihuana for medical purposes would no longer require application to Health Canada. Individuals would obtain marihuana, of any strain commercially available, by obtaining the support of a health care practitioner (a physician or, potentially, a nurse practitioner), and subsequently purchasing marihuana from commercial producers that are licensed by Health Canada under the proposed regulations. Quality and sanitation standards appropriate for a product for medical use will be in place. In line with other controlled substances, personal and designated production of marihuana for medical purposes would be phased-out. This would reduce the health and safety risks to individuals and to the public, while allowing for a quality-controlled and more secure product for medical use.

CBA Methodology and Results

Both quantitative and qualitative analytical methods were applied in the CBA. The study developed and applied a consistent approach to modelling the Status Quo scenario (existing policy and regulations) and the Policy scenario (proposed policy and regulations). There were four basic components of the quantitative (i.e., quantified and monetized) model for each of the two cases:

- User benefits and costs: Costs associated with the production and consumption of marihuana for medical purposes through authorized methods;

- Program administration costs: Costs borne by Health Canada in the exercise of authorization, licensing and inspection powers under the regulations;

- Safety costs: Costs associated with health and safety consequences of residential marihuana cultivation, which focus on the risk of residential fires from production licenses, especially in cases of misuse and supply of the illegal market; and

- Security costs: Costs associated with violence and home invasions directed at residential marihuana cultivation misuse and supply of the illegal market.

The quantitative analysis focused on a "Reference case" which represents the most likely outcome of the regulatory change. Sensitivity analysis of the results was undertaken by identifying key parameters associated with uncertainty/risk, and modelling a likely range and

distribution of these parameters whose impact on the results was explored probabilistically using a Monte Carlo method.

The study focused on the consumption of marihuana for medical purposes obtained from a legal source of supply. The broader issue of illicit market supply and use was considered to be outside the scope of the study. The only aspect of illegal activity that is included is the misuse of residential production licenses under the Status Quo scenario and its likely decline in the Policy scenario.

Reduction in Residential Fire Risks

The focus on safety impacts was on the risk and consequences of residential fires resulting from faulty electrical wiring, overloading of electrical circuits, tampering with electrical usage monitoring and other electrical system malfunction arising from indoor marihuana cultivation. The analysis assumed that under the proposed policy, the risks of property damage, personal injury or death resulting from marihuana production-related fires would be significantly reduced but not completely eliminated. Over the period from 2014-24, the social costs of adverse safety events related to marihuana for medical purposes production was estimated to be reduced by about 40% under the proposed regulations, at a present value of $64.32 Million. This represents annualized savings (avoided costs of property damage, injury and death from residential fires) of approximately $9.58 Million per year for 10 years.

Reduction in Risk of Break-Ins/ Home Invasion

The focus of the security impacts was on the risk and consequences of home invasion, violence targeting residential production involved in misuse, and criminal activity related to marihuana distribution on the illegal market. Information from Canadian law enforcement authorities on misuse of production licences, home invasions and shootings was used as the basis to estimate the risk of violence. Overall, the analysis valued the projected reduction in the risks of break-ins/home invasions due to the proposed policy at $0.38 Million in 2014, rising to $26.48 Million in 2024. The present value of security cost savings under the proposed policy was estimated at approximately $89.03 Million over the policy impact period, with an average annualized value of $13.27 Million. The proposed policy would have lower security costs (over 40% lower than under the status quo) due to the reduction in misuse activity that results from the expectation that eliminating personal and designated production in favour of a commercial licensing scheme would deter individuals interested in exploiting the current Program.

Program Administration Costs Savings

Under the current Program, Government administration costs have increased significantly as the number of Program participants has grown. In the absence of the proposed regulatory changes, the analysis assumed a continuation of the growth in Program applications and corresponding substantial increases in the cost to Health Canada to authorize possession and licensed production of marihuana for medical purposes, provided that program participation continues to grow at the current rate. The CBA estimated that the administration cost of the current Program would increase from $20.63 Million in 2014 to over $120M in 2024 in the

absence of any changes. These costs include salary, employee benefits and accommodation costs associated with dedicated staff, operations and maintenance costs, training, supplies and other corporate overhead costs.

Under the proposed Policy scenario, Health Canada would eliminate the role it plays in determining eligibility of persons to access a supply of marihuana for medical purposes, and return to its traditional role as a regulator of industry. This results in significant administrative cost savings over the policy impact period. Under the Policy scenario assumed for the new regulated market, the regulatory proposal was estimated to lead to more than a 90% reduction in Health Canada's administrative expenditures. The present value of administration costs savings over 10 years was estimated at $478 Million. On average, the proposed regulations would generate administrative cost savings of approximately $71.24 Million per year over this period.

Producer Surplus Gains

The proposed regulations would establish a regulated commercial market for the production and sale of marihuana for medical purposes. Private industry participation in the proposed regime is expected to yield benefits to society. Under the status quo, marihuana is either produced through private arrangements or at a cost to the tax-payer. There are no benefits to society at large beyond the benefits to the individuals involved. Under the proposed regulations, there would be beneficial impacts for the industry, over and above the benefits to the individuals involved in the market. The analysis measured this change in welfare by estimating a change in producer surplus gains under the proposed policy. No producer surplus is derived in the status quo. The CBA found that the new regulated market would generate an overall producer surplus of $2.64 Million in the first year of implementation 2014, rising to about $110 Million in 2024 as the market expanded. The present value of producer surplus gains over the policy horizon (2014-2023) was estimated at $339.85 Million or about $50.65 Million (annualized average) per year for 10 years.

Reduction in Deadweight Loss

The CBA estimated the deadweight loss under the current marihuana access regime from the effective subsidy to supply that resulted in excess demand relative to what a market equilibrium quantity would be. The value of this economic efficiency loss was relatively small as the Government supply component in the CBA model was comparatively small. Under the proposed regulations, the analysis assumes the imposition and payment of the regular consumption tax (HST) by consumers of marihuana under the proposed framework. Both the presence of an effective subsidy in the government supply market for the status quo and the assumed, potential imposition of tax on purchases in the commercial market were projected to cause welfare losses to society by distorting market signals and causing sub-optimal allocation of scarce resources.

The economic efficiency loss under the status quo was estimated to be reduced by about $1.51 Million during the first year of implementation (2014), rising to about $7.70 Million in 2024. This represents an average annualized reduction of about $5.03 Million or a total present value of approximately $33.74 Million over 10 years. Overall, the reduction in deadweight loss is small and not a significant benefit of the regulatory change.

In total, the present value of benefits of the proposed regulations was estimated to be $1.005 Billion from 2014-2024. On average, this represents an annualized savings of approximately $149.77 Million each year for 10 years.

The CBA projected the negative impacts of the proposed policy on social welfare on the basis of a change in the welfare of the individuals most directly affected by the regulatory change. Because the available scientific evidence does not conclusively support use of dried marihuana for therapeutic purposes, the causal relationships between the use of the substance and purported medical benefits are inconclusive. Thus, the analysis chose to measure the change in individual welfare under the policy directly by estimating the change in users' consumer surplus. Economic theory does not require the existence of scientifically proven medical benefit in order to measure the welfare implications of a public policy change. The observation that some in society are willing to pay to obtain marihuana for medical reasons was deemed as a sufficient basis for measuring a change in consumer welfare.

Loss of Consumer Surplus

Consumer surplus was estimated as the area under the demand curve and above the price consumers would potentially pay for marihuana under the proposed MMPR. Under the proposed policy, the analysis projected a reduction in the number of authorized users of marihuana for medical purposes vis-à-vis the Status Quo, and a reduction in the quantity consumed due to a potential increase in the price of marihuana in the regulated market. Under this scenario, the CBA predicted a significant loss of consumer surplus from this policy change.

The analysis assumes a price change from about $7.60 per gram to about $8.80 per gram over the 10 year period. This assumption reflects the potentially higher cost of producing marihuana in the new commercial market, compared to personal or designated production under the current MMAP. The higher price also reflects the potentially higher product quality due to quality control measures to limit contaminants and toxic substances and to ensure a product of consistent quality over time. The analysis assumes that this projected price change would lead to a decrease in the relative number of individuals who obtain marihuana for medical purposes from a legal source by about 30% over the next 10 years compared to the Status Quo scenario.

The total quantity of marihuana consumed was also estimated to decrease. On average, the loss in consumer surplus (representing the total social costs of the proposed regulations) was estimated to be about -$166 Million per year. The present value over 10 years was estimated to be about $1.115 Billion. (The study did not estimate consumer surplus for any consumption derived from illicit supply sources).

Business Compliance Costs

Business compliance costs were estimated as 10% of overall supply cost. On this basis, business compliance costs were estimated to be about double under the proposed Policy scenario. As business compliance costs are incorporated in the supply cost for both the Status Quo and Policy scenarios, they do not form part of the CBA. The business compliance costs mostly fall on medium and large business (as opposed to smaller businesses), as the scale of licensed producer activity (in terms of employees and sales revenue) is expected to grow beyond that of a small business after two years.

Net Present Value

The Reference case, representing the most likely outcome of the cost benefit model, was the focus of the quantified results for the net present value over a ten year forecast period from FY2014-15 to FY 2023-24. The net present value was calculated to be -$109.7 Million with an annualized value of -$16.35 Million. This loss in consumer surplus results from reduced relative growth in consumption and a higher supply price, due mostly to the shift from less-costly home production to a commercial market with appropriate regulatory controls and oversight.

The Status Quo scenario was modeled on the assumption that Government resources required to administer the current Program would continue to grow over time to fully accommodate the required Program uptake, in terms of numbers of persons wanting to access a legal source of marihuana for medical purposes. The Program administration cost was projected to increase from $13.8 Million (FY2013-14) to over $120 Million (FY2023-24). In reality, it is highly unlikely that such additional resources would be available to accommodate the forecast increase in Program participation in an era of fiscal restraint.

Results by Stakeholder

Government, especially the federal government, is the main beneficiary of regulatory change, through the reduction in Health Canada's program administration costs.

Industry, especially medium-sized business, is also a beneficiary in terms of producer surplus benefits and the expansion of a regulated industry to supply marihuana for medical purposes that could grow to more than $1.3 Billion per year in annual sales by the end of the forecast period. It is important to note that producer surplus is not related to profitability and should not be taken as such an indicator.

Households, especially users of marihuana for medical purposes authorized under the MMAR, are the stakeholder that is most impacted by the reduction in consumer surplus. The general public, in contrast, benefits slightly in terms of reduced deadweight loss and the reduced safety costs, which would be borne through residential insurance. The general public would be a major beneficiary if the government benefits were attributed to them as ultimate taxpayers.

Results by Region

Several regions have negative overall impacts, as these are dominated by the consumer surplus reduction, which is allocated based on MMAP participation. The two regions with disproportionate shares of MMAP participation (relative to population) are British Columbia and the Atlantic region (primarily Nova Scotia). Some regions are shown to have positive overall impacts as the locus of government activity is in Ontario (where there are savings from lower administrative costs) and the locus of the existing marihuana production activity is in the Prairie region.

Sensitivity Analysis

A full assessment of the sensitivity of the net present value result to all key parameters was undertaken using Monte Carlo probabilistic methods. The results showed that there was substantial variability in the estimate (a range of -$26 Billion to +10 Billion, with a mean of -$1.688 Billion).

The sensitivity analysis highlighted an inherent uncertainty regarding various impacts of the proposed regulatory change. These uncertainties arise due to:

i) the rapid growth in the number of persons wishing to access marihuana for medical purposes under the proposed supply and distribution scheme;
ii) the fundamental change that the elimination of individual production licenses will bring about;
iii) the complex dynamic behaviour that arises from: a) price elasticity effects (for non-trivial effective price change); b) deterrence effects related to criminal misuse of production licenses; and c) the market entry and price-setting mechanics and dynamics involved in the establishment of a new industry and market; and
iv) the inherently unknown outcome for the end state in FY2023-24.

There are plausible parameter values that would give rise to a very large negative net present value as well as those that would give rise to a very large positive value. The parameters with the biggest impact on the quantitative result influence the valuation of the consumer surplus (the supply costs for personal use and designated person supply and the price elasticity of demand in the status quo). The other parameters with large impacts are an affordability parameter relative to mean annual income which limits the quantity of marihuana for medical purposes consumed in the policy scenario with higher supply price; and parameters which estimate the volume of marihuana consumed in the status quo.

Qualitative Discussion

The qualitative discussion uses the major findings from the Literature Review, Stakeholder Consultations and other sources to describe some of the additional benefits, costs and risks of the regulatory change that may be important over the longer term, but cannot be quantified and monetized at this time because of data constraints and the unique attributes of the policy scenario.

Major attention is given to:

i) additional safety and security issues, impacts and possible benefits;

ii) reductions in information, administration and other transaction costs for users, the medical community and other stakeholders;

iii) the possible longer-term benefits from the full establishment of a large, competitive and innovative industry for users of marihuana for medical purposes, the economy and Canadian society; and

iv) the longer term possibility that a fully functioning and reasonably competitive, efficient and innovative market will promote the process of "reverse diversion", whereby the legal market expands at the expense of the illicit drug market.

These qualitative benefits could be substantial over the longer term, but they are highly contingent on a number of economic, social and regulatory factors and would likely become measurable and substantive only near the end of, or after, the ten-year projection period for the quantified CBA.

Conclusions

There is no Pareto efficient result that supports a statement that one option is superior. The Reference case (Policy scenario) results indicate that the sum of benefit and cost changes across all stakeholders is slightly negative. It can be characterized as being only slightly negative because the sensitivity analysis of the result shows a wide range of possible outcomes with a central tendency near zero.

One class of stakeholder bears the cost (in terms of a reduction of benefits) from consumer surplus - namely the users of marihuana for medical purposes. The remaining stakeholders (e.g., the general public, government, commercial producers) are made better off.

These results are qualified in the analysis by highlighting some of the methodological challenges facing the discipline of cost benefit analysis in such a rapidly growing Program context involving fundamental change and complex dynamic behavioural responses.

Economists measure user benefit in terms of consumer surplus. The available scientific evidence does not support the acceptance of marihuana for medical therapeutic use. However, Canadian courts have ruled that individuals have a legal right to possess marihuana for medical purposes and that the Government of Canada has a legal duty to provide reasonable access to marihuana for such purposes. The consumer surplus measure is not evidence, in any fashion, of the existence of medical benefits attributed to the consumption of marihuana for medical purposes. Therefore, the significant consumer surplus over the forecast time period that is reduced by the proposed regulatory change (due to lower consumption levels and higher supply price) may arguably be discounted by policy makers.

This analysis has monetized and quantified the benefits to be gained from reducing risks to public health and safety, to the extent possible, and these benefits are significant in number and value. The Reference case does not show these to outweigh the loss in consumer surplus. It may be that the ability of economists to apply a social valuation to these impacts may not adequately reflect a social valuation of the maintenance of public health and safety.

In addition, it is possible that there will be substantial benefits that can only be assessed qualitatively at this time. These include greater reduction in safety and security risks, reduced costs for consumers, and the benefits of establishing a competitive and innovative legal industry of marihuana for medical purposes.

This CBA report is divided into six sections:

Chapter One presents an overview of Access to Marihuana for Medical Purposes.

Chapter Two profiles Stakeholder groups who may be affected by the proposed regulatory changes: Consumers and Households; Industry; and Government.

Relevant literature on marihuana use, crime prevention and public safety, regulatory compliance and system dynamics theory are summarized in Chapter Three.

Chapter Four discusses the CBA methodology. A description of the model developed and used in deriving monetized valuations of costs and benefits for the status quo and policy scenarios is presented.

The results of the analysis as well as a discussion on qualitative effects are presented in Chapter Five, followed by a series of conclusions of the overall study in Chapter Six.

Each of these sections is discussed in detail in the next pages.

CHAPTER ONE

1.0 Overview – Access to Marihuana for Medical Purposes

Access to marihuana for medical purposes in Canada is governed under the Marihuana Medical Access Regulations (MMAR) pursuant to the Controlled Drug and Substances Act (CDSA).

The current MMAR came into effect in 2001. They provide a process for Canadians to legally obtain access to marihuana for medical purposes. Currently, persons with an Authorization to Possess (ATP) may obtain marihuana from one of three legal sources:

1. Under a Personal Use Production License (PUPL) to produce for themselves;
2. Under a Designated Person Production License (DPPL), where another designated individual can produce for them; or
3. Through purchase of dried marihuana from Health Canada through a Government Supplier.

The Marihuana Medical Access Program (MMAP), which administers the MMAR, has grown at an exponential rate from 2003 to 2012. With this growth, a number of concerns have been identified. These include:

- Escalating cost under the contract with the government supplier;
- Increasing administrative burden/cost of managing the MMAP under Health Canada;
- Negative impacts on communities and law enforcement where personal and designated production occurs; and
- Concerns from the medical community that they do not have sufficient information about marihuana for medical purposes to allow them to appropriately discuss risks and benefits with their patients.

A review of the MMAP was undertaken by Health Canada during 2010-11, which gave rise to a significant public consultation process and subsequent proposed regulatory changes.

1.1 Government Objectives

In 2010, the Minister of Health committed to a review and reform process for the MMAP with four pillars:

1. Protection of public health,
2. Safety and security;
3. Provision of reasonable access to marihuana for medical purposes; and
4. Examination of the overall costs to the Government of Canada.

1.2 Access to Marihuana for Medical Purposes

Authorization to possess marihuana for medical purposes requires application by an individual to Health Canada. The individual must obtain physician support for their access. Unlike medical therapies and drugs that are authorized by Health Canada – after scientific review of clinical studies which have demonstrated clinical efficacy and safety– dried marihuana for medical purposes has not been authorized for sale and distribution in Canada because its benefits have not been scientifically proven to outweigh its risks. This has complicated government policy, especially after Canadian courts ruled that the Government of Canada has a responsibility to ensure reasonable access to a legal source of marihuana for individual use for medical purposes.

In response to Canadian court rulings, the MMAR provide a structure that allows Canadians to access a legal supply of marihuana for medical purposes. Two categories of patient symptoms are recognized:

> Category 1: individuals who suffer various symptoms (related to Multiple Sclerosis, severe arthritis, cancer, epilepsy, HIV/AIDS, spinal cord injury/disease or for compassionate (end-of-life) care).
>
> Category 1 individuals must have a physician signature in support of the application for Authorization to Possess; and
>
> Category 2: individuals who suffer any other symptoms for which conventional treatments have been deemed inappropriate.
>
> Category 2 individuals must have a physician signature in support of the application for Authorization to Possess and an assessment by a specialist in an area relevant to the treatment of the individual's medical condition (unless the physician is such a specialist).

Once an individual has applied and been approved for an Authorization to Possess, they can:

1. Apply to access the Government Supply of dried marihuana. This is provided through a firm contracted by the government, Prairie Plant Systems (PPS), with deliveries made directly to a residence using regular courier service;

2. Apply for a 'Personal-Use Production License' (PUPL), with seeds for cultivation that are available from PPS; or

3. Designate someone else to produce on their behalf under a 'Designated-Person Production License' (DPPL) with seeds for cultivation available from PPS.

Historically, persons with an Authorization to Possess dried marihuana under the MMAR have been comprised of:

- 60% who access marihuana for medical purposes through personal production;
- 20% who access marihuana for medical purposes through designated production;
- 10% who purchase dried marihuana for medical purposes from Health Canada; and
- 10% for whom there is an unaccounted supply.

1.3 Government Supply Contract

Since 2000, the Government of Canada has contracted for the supply of marihuana for medical purposes with Prairie Plant Systems Inc. (PPS). Initially, this arrangement was established to support research on the risks and benefits associated with the use of marihuana for medical purposes.

Persons who rely on the government supply pay a flat fee of $5.00 per gram, with no additional shipping cost. The supply cost for the government supply is around $11.00 to $12.00 per gram. As a result, there is an effective subsidy to the user of more than 50% of the product cost.. This price structure was introduced in 2003 and was based on an estimated number of 300 individuals participating per year. About 2,300 persons are expected to rely on the government supply during FY2012-13.

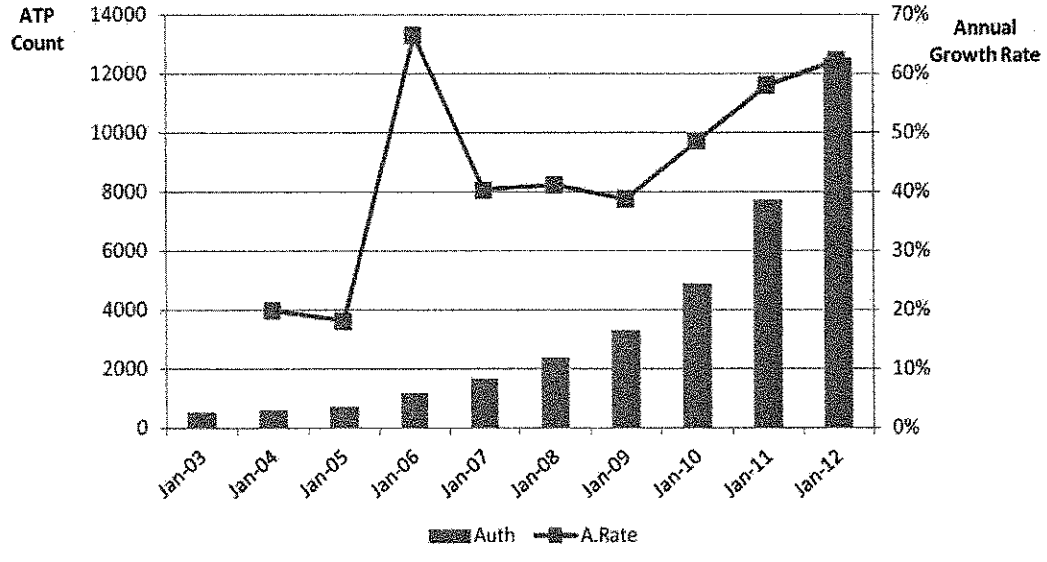
In 2003, the government supply contract was expanded to meet Court-imposed requirements, under the Canadian Constitution, to provide reasonable access to a legal source of marihuana for medical purposes to approved users. The existing contract was amended to cover the period to October 2008. The contract was then re-awarded to cover the period to October 2011. A competitive RFP process was undertaken during 2009-10 in which PPS was the successful bidder to provide the government marihuana supply through to March 2014 (including an option year).

The current (2010) contract involved an estimated contract price (over 3 fiscal years) of $16.8M with an option to extend to the 2013-14 fiscal year.

1.4 MMAP Activity Volumes

As of August 13, 2012, there were 21,986 persons with Authorizations to Possess. The exponential growth of MMAP over time is shown in Figure 1.1, which documents a nine year cumulative growth rate of 43%.

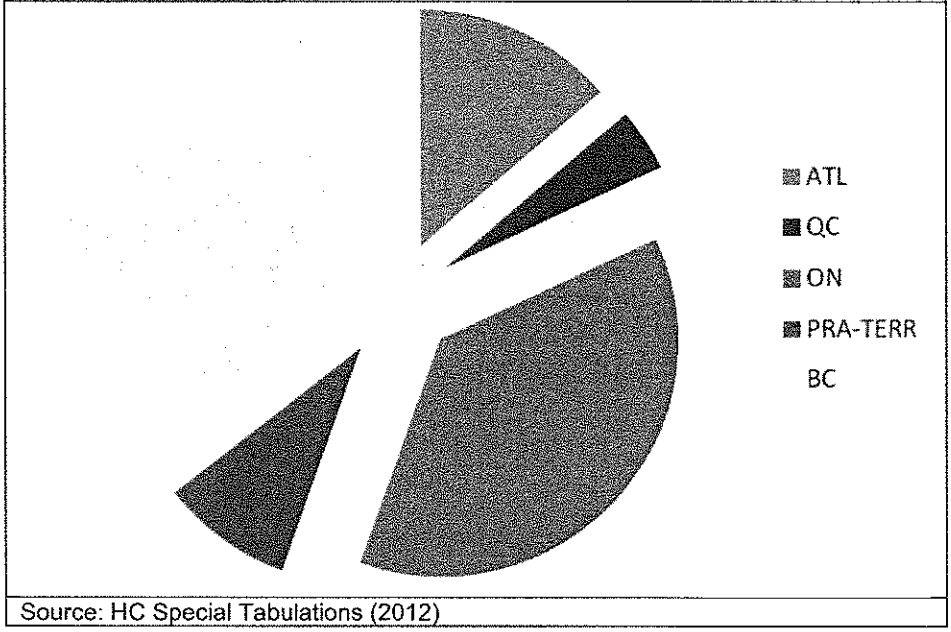
Figure 1.1 – Growth of MMAP (Persons with AP)



Source: HC website, HC data (2012)

Figure 1.2 shows Authorizations to Possess by region. Certain provinces have shares of MMAP participation that exceed their population shares, most notably British Columbia and Nova Scotia. The share of MMAP participation for Quebec is disproportionately lower than its population share.

Figure 1.2 – Authorizations to Possess (ATP) By Region



Source: HC Special Tabulations (2012)

In 85% of recent ATP applications, there was a single reported disease condition, while in 15% of cases there were two or more disease conditions reported.

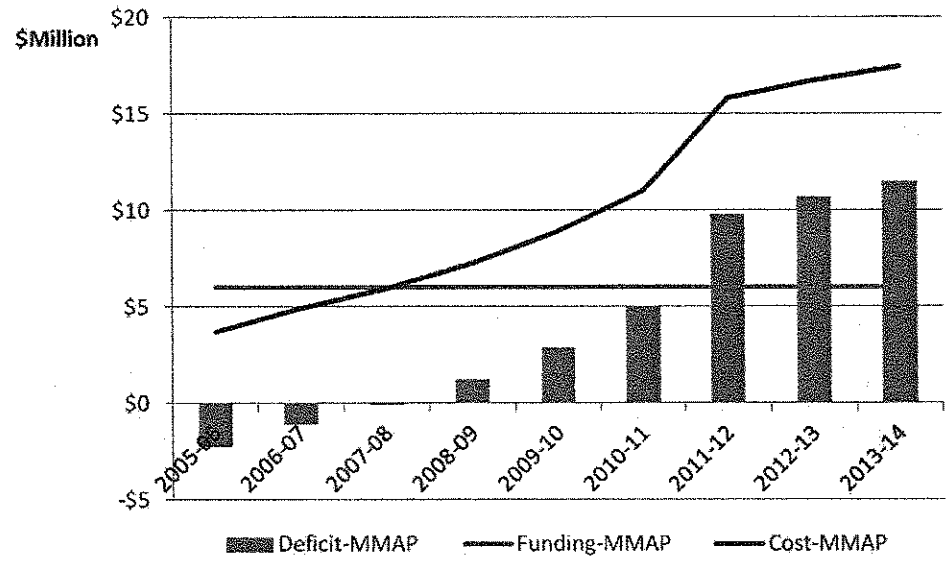
The majority (72%) of ATP applications involved Category 1 medical conditions (i.e., severe arthritis, spinal cord injury, spinal cord disease, multiple sclerosis, cancer, AIDS/HIV, epilepsy or others) while a minority (28%) involved Category 2 diseases for which a specialist (in addition to a General Practitioner) had to support the application. The Category 2 medical conditions included: chronic pain, Crohn's Disease and Hepatitis B and C.

1.5 MMAP Program Costs

Since FY2005-06, the MMAP has been resourced at an 'A-base' funding level of $6.0M per year. Against this, program costs (comprised of HC salary, O&M and corporate costs for program administration and the contract costs for the government suppler) have risen sharply in response to the exponential increase in the number of ATP-persons. This is shown in Figure 1.3, which shows program costs of $8.9M (FY2009-10) with forecast growth to $17.5M (FY2013-14). Roughly half of MMAP program costs relate to HC program administration; the other half relate to the contract costs for the production and distribution of marihuana for medical purposes.

The expected program deficit would increase from $2.9M (FY2009-10) to $11.5M (FY2013-14) and continue to grow over time. In the current fiscal restraint environment this is a major challenge.

Figure 1.3 – Forecast Growth of MMAP Costs ($Million)



Source: HC Supplemental Funding Request (2010)

1.6 Concerns with MMAP

Residential marihuana cultivation, which is authorized under PUPL and DPPL production licenses, is the primary concern related to safety and security.

Canadian law enforcement authorities have documented alleged cases of misuse of marihuana production licenses relating to diversion of product to the illicit market. Some 190 cases of alleged criminal misuse were reviewed over the period from 2003 to 2010. Some of these involved the presence of a weapon (8% of misuse cases), violent attacks and home invasion (8%) and shootings (1%). About half of the misuse incidents involved persons holding production licenses who had previous criminal records.

It may be more onerous for law enforcement to obtain an entry warrant at a residence that is a licenced production site (PUPL or DPPL) where it is believed that marihuana is being diverted to the illegal market, as the existence of this legal operation cannot likely on its own constitute reasonable and probable grounds that an offence has been committed. This means that evidence over and above the mere existence of residential marihuana production must be obtained through investigation, intelligence gathering, tips received, the presence of unusually high electrical consumption, etc., in order for police to have the requisite reasonable and probable grounds on which to obtain a search warrant for a MMAP site. This need for evidence beyond the existence of residential cultivation of marihuana is referred to in this analysis as the need for additional evidence. As stated earlier, it follows that law enforcement, under the new program, may be able to obtain search warrants with only evidence of residential cultivation, as all residential cultivation of marihuana will be illegal.

Law enforcement authorities believe that current production levels can generate much higher yields per marihuana plant than what is estimated by Health Canada for the purpose of determining the 'maximum number of plants' permitted to be grown to generate a reasonable

legal supply for medical use. Their concern is that persons have the opportunity to grow well in excess of their authorized daily amount for medical use and also supply to the illicit market from their excess supply (even if they are within the approved limit of marihuana plants).

Health Canada has limited inspection resources to ensure compliance with the conditions of production licenses in residences and cannot enter a residence without the homeowner's consent in the absence of a warrant. In 2010, Health Canada carried out inspections of 75 MMAR production license sites. Of the 27 sites for which a person answered the door, only 55% allowed inspection of the residence and 45% refused the inspection.

Residential marihuana cultivation (usually indoor hydroponic) gives rise to various safety concerns. There is an increased risk of fire associated with 'jerry-rigged' modifications to home electrical systems by unqualified individuals. It is recognized that residences used for marihuana production have a much higher risk of residential fire than a normal residence. The review based on Canadian law enforcement information of MMAP misuse identified an electrical hazard in 12% of cases and there were 2 cases (1%) where residential fires had occurred.

In addition to fire risk, the presence of high humidity (from poor ventilation of indoor cultivation) can lead to mould build-up that is associated with an increased prevalence of asthma-related symptoms such as chronic wheezing, irritation symptoms, and non-specific symptoms. There is also potential exposure to chemical contamination from pesticides and fertilizers.

There is also broader social concern with the exposure of children to marihuana through home-based marihuana cultivation. The presence of marihuana at home increases potential drug access, exposure to potential illegal activities, criminal association and possible home invasion. The police noted that children were present in 15 of the alleged misuse cases (8% exposure rate).

These concerns are addressed, where possible (given available empirical literature and empirical data), in the methodology section of this report.

1.7 Regulatory Proposal

Under the proposed regulatory changes:

- Physicians and nurse practitioners will provide the patient with a medical document which will then authorize the patient to order marihuana from a Licensed Producer (LP). The patient will then register to become a client of the LP and the LP will verify the information provided by the patient. Health Canada will play no direct role in this process;
- Residential marihuana cultivation will no longer be authorized;
- The production and distribution of marihuana for medical purposes will be restricted to producers who apply to be licensed for this purpose by Health Canada as a LP;
- Patients will register and order dried marihuana directly from an LP by phone, fax, mail or on-line and be required to provide an original medical document from an authorized health care practitioner in support of their registration;
- The LP will determine whether: a) the physician/nurse practitioner document is genuine; b) the physician/nurse practitioner document has not been tampered with; and c) the

physician/nurse practitioner is in good standing with an appropriate professional licensing authority;

- The LP will ship marihuana directly to their registered client, or to a physician/nurse practitioner, pharmacist or hospital;
- The LP 'product label' will act as necessary proof of authorization of possession of marihuana for medical purposes;
- Health Canada will manage the licensing, auditing and inspecting of LPs;
- The LP is the commercial entity that will supply dried marihuana to meet the authorized demand for the use of marihuana for medical purposes, subject to commercial viability; and
- The commercial market will determine the price of supply/demand of marihuana for medical purposes in an unregulated manner.

The proposed changes anticipate the commercial viability of LP entrants and a high degree of competition in the market, which should lead to efficient production and prices that are sufficiently competitive so as to lead to continued growth in volumes demanded by individuals with a healthcare practitioner's support to use marihuana for medical purposes.

1.8 Potential Benefits of the Regulatory Proposal

Under the proposed changes, the regulations will no longer specify the disease conditions for which marihuana may be authorized by physicians or other authorized health care providers. In addition, Health Canada will no longer be involved in:

- subsidizing marihuana for medical purposes; and
- managing the authorization process to access a legal source of marihuana and having access to confidential personal medical information.

Law enforcement will no longer be unsure about:

- whether marihuana cultivation is permitted in a residence (as all such production will be illegal).

Fire/emergency services and municipal authorities will no longer be unsure about:

- whether a residence may pose a safety threat as a result of the cultivation of marihuana for medical purposes under the MMAR, with potential fire/electrical hazard, toxic chemical hazard and mould hazard.

The purpose of the subsequent sections in this report is to present the results of the CBA conducted to assess and quantify the social benefits and costs that are likely to arise from the regulatory proposal, by inducing behavioural change that alters the level of net social benefits.

CHAPTER TWO

2.0 Stakeholder Summary

This section presents a portrait of various agents and actors in society who are likely to be affected by the proposed regulatory changes governing access to marihuana for medical purposes. In general, stakeholders affected by the public policy change fall into three broad categories: a) households or consumers; b) businesses or industry; and c) governments. The proposed regulations are expected to impact individuals and institutions in all three categories.

A. CONSUMERS & HOUSEHOLDS

2.1 Current and Future Users of Marihuana for Medical Purposes

The first category of consumer stakeholder includes those persons currently engaged with the Marihuana Medical Access Program (MMAP). These are individual Canadians who have been authorized to possess marihuana for medical purposes in response to a particular medical condition. There were 21,986 such persons as of August 13, 2012. It is important to note, however, that the number of participants in the MMAP has grown exponentially over the past ten years, with 40% year-on-year growth from 2003 to 2010, and then 60% from 2010 to 2011. This dramatic growth is crucial to understanding the needs of both the Status Quo and the Policy scenarios, as this is a consumer base that is rapidly expanding.

Of the current MMAP participants, there are four categories of supply source:

a) those who are licensed to grow their own marihuana for medical purposes (Personal Use Production License or PUPL);

b) those who have designated another individual to grow marihuana for them (Designated Person Production License, or DPPL);

c) those who purchase marihuana directly from the Government of Canada supply; and

d) those whose source of supply is unknown.

Individuals in these four categories constitute the foundation of the authorized demand for marihuana for medical purposes in Canada. This is distinct from the overall demand for marihuana, which includes the illegal use of the marihuana for recreational purposes, as well as unauthorized use of marihuana for medical purposes, both of which are beyond the scope of the regulations and this study.

Under the MMAP, the two provinces with the heaviest usage of marihuana for medical purposes per capita are British Columbia (6.7% of MMAP participants are in BC), and Nova Scotia (5.6%).

The MMAR allow access to marihuana for medical purposes for persons with the following conditions: Multiple Sclerosis; Spinal Cord Injury; Spinal Cord Disease; Cancer; AIDS/HIV Infection; Severe Arthritis; Epilepsy; and End of Life (Category 1). There is also a category for

conditions beyond the contemplated scope, where access to marihuana for medical purposes requires support from a medical specialist (Category 2).

Under the proposed regulations (Policy scenario), the current MMAP participants will become the core customer base for the new LPs. They will drive most of the demand for the LPs' products.

The proposed regulations would eliminate the PUPL and DPPL designations. As a result, all Canadians who use marihuana for medical purposes would be required to obtain their marihuana from LPs (and, possibly from pharmacists, physicians or nurse practitioners who could also be authorized to stock and sell it). The new regime would eliminate the specification of medical condition categories that are eligible for access to marihuana for medical purposes, which could potentially expand the number of legal users.

A successful policy regime would have the capacity to reach new users, provided they obtain the support of a healthcare practitioner, who are price- and risk- sensitive, and who might obtain marihuana from the illegal market as they seek relief for their symptoms. These persons might have found the current MMAR program to be difficult to deal with.

New program participants might be attracted away from the illegal market to the new regime through a combination of:

a) prices that are lower than those prevailing in the illegal market;

b) a product of higher quality;

c) a product with higher assurance of availability from LPs under legal and normal business conditions;

d) removal of legal threats and/or social stigma related to marihuana use; and

e) belief that marihuana could be used by patients with a wider variety of symptoms.

It is estimated currently that there are roughly 450,000 marihuana users in Canada who report using marihuana for medical purposes. Provided they obtain the support of a healthcare practitioner, these persons could potentially make a strong market base for LPs[1].

2.2 General Canadian Population

A change to the MMAR will also have an impact on the general population of Canada – i.e., persons who do not use or purchase marihuana for medical purposes. Despite not being active participants (or consumers) of marihuana for medical purposes, the general population is nevertheless affected by marihuana production and consumption in two important respects.

[1] The Canadian Alcohol and Drug Use Monitoring Survey (CADUMS) for 2011, administered by Jolicoeur et Associé for Health Canada, identified that 1.6% of Canadians aged 15 years and over reported using marihuana in the past

Firstly, there is extensive evidence (elaborated further in the Literature Review and other sections of this report) that residential production of marihuana raises public safety concerns. These include increased risk of fire, exposure to toxic chemicals and mould, and potential ground water contamination from improper waste disposal. Secondly, according to law enforcement officials, residential production of a controlled substance tends to produce adverse public security issues – increased risk of burglary, home invasion, criminals convening in areas where they believe marihuana is being grown, and potential violence against individuals who are carrying marihuana.

The MMAR impact on the general Canadian population has been documented by law enforcement, and is largely due to the misuse of PUPLs and DPPLs as de facto "grow ops" under the legal cover of a MMAR production license. In the Policy scenario, all non-LP production of marihuana becomes illegal by definition, making any non-LP "grow ops" illegal and, therefore, no longer an unintentional by-product of the MMAR.

B. INDUSTRY, BUSINESS & MEDICAL SERVICES

2.3 Physicians/Medical Community

There are 69,700 licensed physicians in Canada (2011 Census), which is a ratio of 203 physicians per 100,000 Canadians. This number is divided between 35,350 family medicine practitioners, and 34,350 specialist physicians. Under both the existing MMAR and the proposed Policy scenarios, physicians play a key role in supporting an individual's access to marihuana for medical purposes. As with the treatment of all symptoms and conditions, they are responsible for assessing and evaluating their patients' medical needs to determine the most appropriate and effective treatment.

Under the MMAR, the paperwork required to support the patient's application for authorization to access marihuana for medical purposes has been characterized by physicians as onerous. If the patient's medical condition is not covered under the nine recognized conditions listed (i.e., Category 1), the MMAR require patients to seek advice from a specialist to support the patient's application as appropriate in light of their symptoms and overall treatment plan.

Physician willingness to support the use of marihuana for medical purposes varies considerably from province to province, with British Columbia and Nova Scotia having the highest rate of support. Under the MMAR, physicians bear a time cost to support program administration in filling out the necessary paperwork to support patient authorization for the use of marihuana for medical purposes.

Under the proposed Policy scenario, the need to recommend a specialist will be eliminated, as there is no category of allowable conditions. Furthermore, the document required to be completed by physicians is anticipated to be much less complex and time-consuming to complete.

In addition to physicians, it is anticipated that other health care practitioners (e.g., nurse practitioners) will also be able to support the access to marihuana for medical purposes, if authorized by their provincial regulatory authorities.

Health Canada will no longer play a role in authorizing user access to the regime, although it will continue to support health care providers through the support and review of scientific investigation of the health effects of using marihuana for medical purposes.

2.4 Pharmacists

There are 30,550 pharmacists in Canada (2011 Census). Pharmacists are regulated health care professionals who assist their patients with access to, and information regarding, pharmaceutical products and medical therapies to safely achieve health outcomes at home, in the community and in hospitals. The current MMAR allow for pharmacists to dispense marihuana that has been produced by a licensed dealer under contract with Her Majesty in right of Canada to the holder of an authorization to possess. This provision was added in 2005 when some provinces and territories expressed an interest in allowing pharmacists to undertake this activity. While it is permitted under the current MMAR, dispensing of marihuana for medical purposes by pharmacists has never been done to date.

In the proposed Policy scenario, pharmacists would be able to distribute dried marihuana, as supplied to them by LPs, provided that this is permitted under provincial/territorial law.

By adding an additional class of product to their operations, pharmacies could stand to increase their revenues. Pharmacies already must adhere to stringent security requirements because of the controlled substances in their inventories. It is possible that they may incur increased costs in terms of complying with new regulations with respect to security requirements and potential risks of increased criminal activity (e.g., burglary) due to the presence of a substance with strong black market demand. The potential role of pharmacists in supporting access to marihuana for medical purposes is still undecided.

2.5 Licensed Producers (LP) of Marihuana for Medical Purposes

Under the proposed regulations, the Government of Canada will license commercial producers (individuals and/or incorporated businesses) to produce and distribute dried marihuana for medical purposes. These licensed producers (LPs) will be responsible for growing cannabis, storage of dried marihuana, security requirements, regular reporting about product quality and adherence to various regulations and distribution to eligible consumers. Over 100 companies have indicated an interest in applying for an LP license and participating in this regulated market. However, considerably fewer are expected to meet the minimum standards established by the new regulations.

In summary, under the proposed regulatory process:

- Consumers will consult their physician (or other authorized health care provider), who will assess their condition and determine if marihuana for medical purposes is an appropriate component of a treatment plan;
- The physician/health care provider will fill out a short medical document with standardized content;
- The patient can then choose from which LP they would like to obtain their legal supply of dried marihuana, in the authorized amount and via courier delivery;

- LPs will have flexibility in terms of their business operations. They will not be restricted in the number and type of cannabis strains they supply. They will have flexibility in product pricing and regarding the scale of their operations (subject to inspection and to the approved production volume associated with a specific facility). However, they will not be able to operate "storefront" sales locations, and their marketing and promotional activities will be limited as a result of marihuana's status as a controlled substance. All marihuana will be distributed in dried form. All LPs must provide standardized packaging and labelling for their product, and ensure its safe and secure distribution (with signatures required at all transition points during delivery).

LP start-up costs will be significant in the short term, as they are required to obtain a license, to establish a secure indoor growing area, to provide sufficient manpower and infrastructure to grow crops, to prepare operations for mandatory inspections by Government of Canada and to provide regular reporting to the Health Canada's Office of Controlled Substances (OCS). LPs will pay for their supply of seeds, production supplies (e.g., water, electricity, equipment, packaging materials, etc.) and provision of a secure delivery system.

LPs will benefit from the opportunity to participate in the new industry of providing marihuana for medical purposes directly to eligible consumers. They will be free to compete within the bounds of the regulations and grow their client base. Projecting the size, number, productive capacity and viability of LP is the crux of the Policy case and is a matter of particular focus in the analysis.

C. GOVERNMENTS

2.6 Municipal Governments

There are 5,600 municipalities in Canada of varying sizes and socio-demographic composition. These municipal governments will be impacted by the proposed regulations in two key respects. First, they currently shoulder the burden of the majority of the public safety and security costs identified above (e.g., fires, burglary) as the responsible agencies (e.g. fire department, police service) are generally funded municipally. Under the current MMAR, municipal governments have consistently highlighted the dangers of residential production of marihuana.

Second, municipal governments would potentially be involved in the business regulation of LPs, through land-use zoning, business permitting and by-law inspection of LP facilities. Municipalities will generally require that LPs be registered as a business entity and pay for municipal services like any other business. It is possible that LP production facilities and places of business may require a greater response from municipal agencies and first responders if they become the undue target of crime. Commercial indoor marihuana production by LPs may also impact on municipal land-use or environmental by-laws where applicable.

Municipal governments are also responsible for the fire departments that must respond to the increased risk of fire from residential indoor marihuana cultivation. While all forms of residential marihuana cultivation likely involves a higher fire risk than the baseline (i.e., for all family residences), the evidence from fire services data is that the risk of fire resulting from electrical wiring/equipment and risks related to faulty installation or construction are likely to be much higher when the legal scale of approved marihuana cultivation is exceeded and the MMAR production activity is misused.

2.7 Law Enforcement Agencies

Law enforcement in Canada is handled in three tiers – Federal, Provincial/Territorial, and Municipal. There are 64,150 police officers in Canada or roughly 206 police officers per 100,000 Canadians. There are two likely impacts of the existing and proposed regulations on this group. First, under the current MMAR, law enforcement has reported incidents of robbery and, more rarely, violence towards households or individuals growing marihuana under a DPPL or PUPL. These are typically handled by municipal police forces.

Second, law enforcement has also reported cases of alleged misuse of the DPPL or PUPL by criminal elements. These cases of misuse may be investigated by some combination of municipal and/or provincial police service (depending on the level of illegal activity). Law enforcement agencies have documented almost 200 alleged cases of abuse of the MMAR over a six year period from 2003-10 which, when accounting for the likelihood of detection, might support an estimate that 35% of DPPL and PUPL production involves some degree of misuse and diversion of marihuana intended for personal medical use to the illicit market.

Of special note are the issues noted by law enforcement officers when investigating alleged misuse (e.g., growing more than licensed, diverting marihuana supply to the illegal market) in connection with a DPPL or PUPL. In such cases, evidence over and above the mere existence of residential cultivation will likely be required to obtain a search warrant. This increases the cost of investigating marihuana violations to law enforcement, as more resources must be dedicated to investigation and evidence collection. Under the Policy scenario, this becomes irrelevant, since all residential production becomes illegal.

2.8 Provincial/Territorial Governments

The ten provinces and three territories are currently indirect participants in the MMAP. Under the existing program, they have no role in approving authorizations to possess and use marihuana for medical purposes. Currently, dried marihuana is not covered by any provincial or territorial health/drug plan as an approved treatment for which there is co-insurance related to the purchase of medication.

Under the Policy scenario, the role of provinces and territories would change. LPs would be subject to standard provincial/territorial oversight or regulations that are typical for a business of their size and context (e.g., environmental regulations) but would also derive tax revenue from them in terms of: a) corporate income tax; and b) HST or provincial sales tax on the sale of marihuana for medical purposes.

In addition, provinces/territories may face pressure to include coverage for marihuana for medical purposes under their respective health/drug plans. They may also, in their discretion, expand the range of health care professionals who could authorize the use of marihuana for medical purposes (e.g., nurse practitioners) and may also allow pharmacies to distribute to authorized users.

2.9 Federal Government

The Government of Canada administers the existing MMAP. Under the MMAP, the Government of Canada faces three main cost pressures.

First, it has engaged a Government Supplier under contract – Prairie Plant Systems (PPS) – to provide marihuana for medical purposes to authorized users. This contract was the result of an open competition in 2000, followed by subsequent amendments. PPS produces a contracted amount of dried marihuana, which is distributed to individuals at a price of $5.00 per gram. The size of the MMAP has grown exponentially over the past ten years resulting in amendments to the contract with PPS to provide an adequate legal supply.

Second, Health Canada is responsible for administration of the MMAP. Individual Canadians fill out forms and apply for an authorization to possess and use marihuana for medical purposes (ATP). In addition, the Government of Canada bears the administrative costs of processing applications for PUPLs and DPPLs. As of August 13, 2012 there were 21,986 ATP persons under MMAP, and this number is expected to continue to rise to 40,000 ATPs by 2014. Processing and monitoring active ATPs requires system and human resource support.

Third, the Government of Canada is subject to ongoing litigation with respect to the MMAR.

The contract with PPS will expire at the end of March 31st, 2014. This will generate cost savings related to the effective subsidy (i.e., the difference between the actual supply cost and the price paid by users). Program administration costs will diminish, as rather than processing and licensing individual applicants, the Government of Canada will only deal with the licensing and inspection related to a small number of LPs. These LPs will be subject to regulatory oversight, including security and quality inspections, as well as regular reporting and business license extensions. LPs would also be subject to corporate income tax.

Under the MMAP, the licensing and administration of ATPs is handled by a dedicated team within Health Canada, along with the management of the contract with the Government Supplier. In the Policy scenario, licensing and administration related to LPs will be incorporated into the operations of the Office of Controlled Substances.

CHAPTER THREE

3.0 Literature Review Summary

The fundamental challenge of this CBA is to articulate and substantiate a Reference case that corresponds to the way the future will likely unfold under the proposed regulations. There are no similar regulations elsewhere in the world, so there is limited opportunity to learn from the experience of others. The analysis is predicated on the founding and growth of a new marihuana for medical purposes industry that does not currently exist and that will operate under a unique set of regulatory requirements and market conditions. There is significant inherent uncertainty related to how users and the producers in this new industry will behave, for which we look to evidence in the literature in several fields for guidance.

For clarity, the literature consulted and cited has been broken into four categories:

1) Cannabis/Marihuana Use and Trafficking: While there is no direct comparison to the proposed Canadian system, other jurisdictions (notably California, Israel and the Netherlands) have developed regulatory regimes for the use of marihuana for medical purposes, which can, to some extent, be used as reference points. Additionally, there are studies of Canada's existing MMAP, including internal data from Health Canada, which can assist in an understanding of the nature of the existing Canadian market for marihuana for medical purposes.

2) Crime Prevention and Public Safety: A principal criticism of the existing regime is that it results in misuse of personal and designated production licenses to divert marihuana to the illegal market. These activities have been examined by Canadian law enforcement authorities and other sources.

3) Regulatory Compliance Theory: Any new regulatory regime must consider the immediate, short-term and long-term impacts of regulation. In this specific scenario, the government must establish a regulatory structure that empowers and enables a new industry to be created in a short 'ramp-up' period to ensure that those who require marihuana for medical purposes can access a legal supply. The regulatory regime should encourage and cultivate a competitive market, allowing purchasers of marihuana for medical purposes to enjoy the benefits of an industry that competes on the merits of price, quality and other product attributes. The regulatory regime must be secure and sustainable, without undue regulatory burden. It must also consider the compliance of existing stakeholders, particularly those who are currently engaged in the MMAP. How existing "Personal-Use" and "Designated" Producers will interact with the new regime is crucial, and compliance theory literature is reviewed to investigate the likely outcomes.

4) System Dynamics Theory: One methodology used to support this CBA is System Dynamics – a mathematical modeling discipline which focuses on modeling the causal relationships in complex social, economic, and environmental systems. System Dynamics, unlike much economic modeling, assumes that systems are rarely in equilibrium and that unforeseen consequences of policy changes and non-linear changes in outcomes can often occur due to the complex feedback relationships that

exist in real-life systems. The System Dynamics literature is reviewed in the following analysis, where relevant.

3.1 Cannabis/Marihuana Usage and Trafficking

A series of reports from consultations with multiple stakeholders, conducted by Health Canada in regards to the MMAP, was analyzed. This included feedback from doctors, government officials, law enforcement, compassion clubs and individual Canadians, often with personal stories of their use of marihuana for medical purposes and experience with the existing regulatory regime. This review provided a framework to understand the current regime and its challenges, and to identify further resources to pursue.

Existing personal-use growers, designated growers and participants in the current MMAP were largely opposed to the new regulatory proposals. A minority of participants, largely those who were not growing or who had found a designate, had mixed response to the new regime. However, the comments of some participants and other stakeholders, when combined with inferences from the literature, suggest that these groups could benefit from the proposed regulations via: (i) easier access to marihuana for medical purposes, which would lead to lower information and other transaction costs, as well as shorter delays; and (ii) greater product choice and "freedom of choice" from a regulated industry that, in time, would be producing a product of higher and more predictable and reliable quality.

A review of studies [Dandurand et al (2002), Easton (2004), Jaworski (2009), Lucas (2009), Patton-Bodnarchuk (2004), Plecas et al (2005), Tjepkema (2004)] identified key trends in Canadian marihuana use and trafficking.

A review of studies [Ben Amar (2006), Hazekamp (2006), Health Canada (2010b), Seamon (2007) Williams-Skeel (2006)] of the medical perspective on the use of cannabis for medical purposes was also assessed There is some clinical evidence to suggest modest therapeutic benefits of smoked or vaporized cannabis for a limited number of medical conditions but the clinical trials have generally been of very short duration, and have used a small number of patients, many of whom were already experienced with cannabis.

Health Canada's published information for health care practitioners (Health Canada, 2010b) indicates that:

a. Precise dosages for cannabis have not been established. The complex pharmacology of cannabinoids, inter-individual differences in cannabinoid bioavailability, prior exposure to and experience with cannabis, the variable potency of the plant material, and different dosing regimens used in different research studies all contribute to the difficulty in reporting precise doses or establishing uniform dosing schedules;

b. While there are many anecdotal reports concerning the therapeutic value of cannabis, clinical studies supporting the safety and efficacy of smoked cannabis for therapeutic purposes in a variety of disorders are limited but slowly increasing in number and;

c. The risk/benefit ratio of marihuana should be carefully evaluated in patients with the following medical conditions (because of individual variation in response and tolerance to its effects, as well as the difficulty in dosing):

i. patients with cardiac disorders (i.e., concerns re: hypotension, possible hypertension, syncope, tachycardia, or myocardial infarction);

ii. patients with respiratory insufficiency such as asthma or chronic obstructive pulmonary disease (concern re: smoked marihuana);

iii. patients with a history of substance abuse including alcohol abuse (concerns re: risk to abuse marihuana and risks regarding developing dependencies);

iv. patients with mania, depression, or schizophrenia who should be under careful psychiatric monitoring (concern re: exacerbation of such illnesses);

v. patients receiving concomitant therapy with sedatives, hypnotics or other psychoactive drugs such as opioids (concern re: additive or synergistic effects on the central nervous system);

vi. patients should be advised of the negative effects on memory and to report any mental or behavioural changes that occur after using marihuana; and

vii. patients with ongoing chronic hepatitis-C should be strongly advised to abstain from daily cannabis use (concern re: marihuana use as a predictor of steatosis severity in these individuals, i.e., worsening of the disease).

This medical assessment and overall concern regarding marihuana's use as a 'treatment' was supported by the feedback from the Canadian medical community during the Health Canada consultations [CMA (2011)] and the "needs assessment" conducted with family doctors at the College of Family Physicians of Canada (CFPC) Family Medicine Forum in Montréal in November 2011. Key concerns cited by medical professionals and practitioners were:

Lack of scientific evidence, information and guidance available to the ordinary physician on the risks and benefits of marihuana for medical purposes;

Lack of established/regulated standards and clinical practice guidelines on prescribing practices for marihuana for medical purposes;

Medical support has too much similarity with typical prescriptions under the new regime (which is seen as a negative feature by the medical community and a positive feature by many other stakeholders);

Lack of guidance on 'prescribed dosage' and 'period of treatment time', and the potential impact on medical legal liability;

The risk of "over-prescribing" marihuana, particularly given the absence of clinical practice guidelines for its usage. This risk creates additional costs and burdens for physicians because they need to conduct additional oversight and monitoring;

Pressure on physicians who are the sole practitioners in their communities to support the use of marihuana for medical purposes despite their discomfort on medical grounds; and

Lack of research and/or a clinical trial component in the reform proposal.

A wide body of literature on the economic considerations of marihuana use and trafficking has been considered in the context of the broader policy of marihuana legalization. Much of these economic considerations are also valid within the context of this more focused assessment of the regulatory change and the use of marihuana for medical purposes. This CBA does not address the larger policy issue related to marihuana legalization. Key studies [Becker et al (2006), Bretteville-Jensen-Line (2006), Godfrey et al (2002), Kilmer et al (2010), Kilmer-Pacula

(2009), McDonald et al (2005), Pacula et al (2003), Rhodes et al (2000), Single (1998)] suggest that economic regulation, rather than prohibition, of access to marihuana for medical purposes would generate economic benefits that far outweighed the costs associated with pursuing and prosecuting low-level crime like marihuana dealing.

Key considerations for potential LPs, which are relevant for assessing the impact of the proposed regulation, include:

The cost of applying for and receiving a license and approvals from local governments;

The full cost of investment, including: financing costs; information and transactions costs (which can be significant for a new industry); costs of establishing the distribution system and relationships with suppliers; costs of attracting, hiring and training the work force; and the costs of meeting the safety, security, quality, record-keeping and other regulatory costs (many of which are 'sunk costs' that may be difficult to recover in the event of company, industry and/or regulatory failure);

The cost of operation, including: costs of labour and intermediate inputs (goods and services) from suppliers' on-the job training; ongoing regulatory compliance; and providing reliable information on their products to doctors, Health Canada and other stakeholders;

The cost of adapting to and complying with new regulatory requirements after start-up; and

Any regulatory constraints on advertising and marketing.

3.2 Crime Prevention and Public Safety

Crime prevention studies [Bowles (2010), Cohen (1998, 2010), Cohen et al (2004), Dhiri-Brand (1999), Reppetto (1976), Roman (2010)] have shown that any attribution of benefits to government law enforcement must take into account the 'displacement effect' of crime reduction on shifting (rather than diminishing) criminal activity. This literature has also developed willingness-to-pay or economic costs of criminal activities.

An economically-rational deterrence effect on illicit drug activity was developed [Chang et al (2008)] using a calibrated general equilibrium model result for the United States (US) to determine optimal drug policy for a low-income neighbourhood. This model analyzed the consequence of both demand-side and supply-side drug policies and compared welfare gains through calibrated simulation analysis in a manner similar to a general-equilibrium tax incidence model.

Effectively, drug trafficking was treated as an occupational choice with employment and drug transactions modelled in a search-theoretic manner. The drug market equilibrium was established through supply/demand interaction and the entry of drug dealers continued until expected (risk-adjusted) pure profit was eliminated. The extent to which community members opted for a career in the drug market determined the supply of drugs by the community.

This model and its results were considered relevant to this study as it was the only empirical model in the literature that provided a behavioural response of drug trafficking to changes in the probability of conviction. The calibrated simulation results indicated that a 10% increase in the

probability of criminal conviction for drug trafficking or production would decrease the number of active dealers by 0.26%.

Additionally, a consortium of twenty (20) law enforcement agencies [RCMP (2010)] (representing services to perhaps more than 75% of the Canadian population) reviewed 190 cases over a six to seven year period in which police made an investigation of a residence for which a person held a valid MMAR production license (PUPL, DPPL)[2].

A review of alleged 'misuse' cases (Figure 4.7 below) showed that the number of such alleged misuse cases as a proportion of MMAR authorizations to possess varied from 1.5-3.0% over 2005-2010. However, there is a low estimated rate of police detection for illegal marihuana cultivation (i.e. grow operation). One British Columbia (BC) study estimated this rate at 5% [Dandurand et al (2002)] while another study estimated the rate for Quebec at 2.5% [Bouchard (2007)]. If a higher (10%) rate of detection is assumed, this implies that the estimated rate of MMAP 'misuse' could be in the range of 15-30%. The lower rate of 5% detection would imply an estimated rate of MMAP 'misuse' in the range of 30-60%.

Health Canada regulatory analysis dealing with cigarette ignition propensity [Health Canada (2005)] used fire statistics from the Canadian Association of Fire Chiefs Annual Report – Fire Losses in Canada for various years to estimate probabilities of fires. The analysis followed this approach using available average Canadian data for a five year period (1998-2002) that involves the most recent data available.

3.3 Regulatory Compliance Theory

The theory of regulatory compliance was assessed to better understand how the proposed regulations might impact the behaviour of persons already accessing marihuana under the MMAR and persons who always have an option to access marihuana for medical purposes from the illegal market. In particular, this study explored what evidence exists to help anticipate the expected regulatory compliance of Canadians under the proposed new regulatory regime. The success or failure of the new LP industry is predicated in the assumption that, as in other regulatory regimes, the new regulations will be enforced such that the requirements are obeyed by persons subject to the regulations.

Key insights were derived for three key issues relevant to the transition between the existing and new regulatory regimes of accessing a legal supply of marihuana for medical purposes:

1) Monitoring regulatory performance and the behavioural response of agents following regulatory change;

2) Impact of regulatory change on compliance performance and market dynamics; and

3) Impact of inspection on compliance motivation and relationship between the regulatory authority and the affected population.

[2] RCMP (2010) *An Analysis of National Cases Related to the Marihuana Medical Access Regulations.* The law enforcement agencies including RCMP, OPP, SQ and municipal police in Toronto, Montreal, Vancouver, Ottawa, Calgary, Edmonton etc.

A) Monitoring Regulatory Performance

Existing regulators taking on new and unfamiliar responsibilities typically encounter limitations in their ability to measure and report on performance [Sparrow (2000, 2008)]. Although the proposed regulations are patterned on the existing regulatory regime for controlled substances, the performance management and reporting by Health Canada will likely be based on the following:

Presumed relationships between inputs, outputs, intermediate outcomes and final policy outcomes from the logic model and "theory of the regulation";

Qualitative and anecdotal information and complaints from the media, competitors, business customers, civil society groups and other affected and interest groups on the determinants of compliance and other indicators of outcomes and results; and

Improvements to compliance and other outcomes resulting from projects that mitigate a specific regulatory problem, risk or harm, and which are selected because of their ability (based on the theory and logic model) to contribute to the higher level outcomes and objectives of the regulatory regime.

In the context of the uncertainty of establishing a new and commercially viable LP industry to supply a legal source of marihuana for medical purposes, Health Canada will need to closely monitor the performance of LPs as they ramp up to full production. This may be challenging in terms of accessing information beyond what is required to meet regulatory requirements.

B) Impact of Regulatory Change

The proposed regulations make fundamental changes to the marihuana for medical purposes supply industry. Generally, regulatory change results in the expansion or contraction of regulations affecting an existing stakeholder group. However, the proposed regulatory regime for marihuana for medical purposes will fundamentally change who is being regulated. As this is an uncommon occurrence, the literature was investigated to determine the likely results of a fundamental shift in the focus of government regulation, in particular, how Health Canada's focus (away from licensing of individuals and towards licensing commercial producers) will change the incentives and behaviour of individuals.

Changes in regulatory scope and reach (i.e., the affected population and their attitudes) could have either a positive or negative influence on compliance and other intermediate and final outcomes [May-Koski (2004)]. These outcomes will depend on:

(i) The affected population's experience, resources and interest in complying with the regulation;

(ii) Structural change and (possible) market concentration in the industry, which could either improve compliance (i.e., fewer firms are easier to regulate) or make compliance more problematic (i.e., larger and more powerful firms can increase political lobbying and regulatory capture, and lead to the "too-big-to-fail" erosion of enforcement);

(iii) Changes in political, voter and consumer interest and media attention can change regulatory compliance and performance over time [Sparrow (2000, 2009)];

(iv) Changes in a regulated market's growth and profitability can result in competitive turbulence and greater compliance variation, especially during market downturns when cost cutting pressure can reduce compliance resources; and

(v) Rapid market growth and entry of new regulated firms can also place pressure on the regulatory authority's inspection and enforcement during times when investment and market pressures are focused on increased production, perhaps to the point where the firms may cut corners in complying with regulations.

C) Impact of Inspection

The establishment of a new LP market under the proposed regulations requires a series of inspections, particularly at the start-up phase of the new businesses. Regulatory compliance theory [May-Koski (2004)] highlights the importance of the relationship between inspectors and regulated industry managers which may create positive and negative motivations and trade-offs between the two. For example, inspectors that are collegial, respectful, less formalistic and provide good information on the requirements of the regulation can increase positive motivations through shared information, learning, "mental models", problem solving and a "social contract" between the regulator and affected population. Such an approach also reduces negative motivations through increasing transparency, demystifying the regulation and its enforcement and compliance programs, and reducing the fear, risk and uncertainty that promote negative motivations towards compliance.

3.4 System Dynamics

Marihuana use results from a complex set of relationships and interactions between markets and stakeholders (e.g., governments, users, doctors, law enforcement authorities, suppliers). A System Dynamics approach [Sterman (2000), Morecroft (2007)] captures the inter-relationships between these system elements and enables the analysis of causal loops that affect the behaviour of the overall system.

System Dynamics (as opposed to Systems Thinking) requires "causally-closed" models [Richardson (1991)], as the causes of the behaviour exhibited by the system must be found endogenously – within the structure of the system model itself. While there will be external inputs and outputs which have an impact on the magnitude of the system's operations, the causal relationships which create that behaviour must be entrenched within the system itself.

The CBA benefited from a System Dynamics model of individual and firm behaviour over time for the regulated marihuana for medical purposes supply industry. This model involved: LPs, production capacity, strategic resources, market processes, production processes, pricing impacts, projected growth, projected users etc.

The System Dynamics model was based heavily on various studies related to modeling and the conceptualization process [Forrester (1961), Randers (1980), Vennix et al (1992), Hodgson (1992), Saeed (1992), Richardson et al (1992), Winch (1993)] which include examples of the process and structure of developing an industry model, including how consumers gain awareness of products, the development of supply, marketing, distribution, and consumer usage patterns.

Specific studies that were relevant to regulatory compliance and legal/illegal market dynamics included:

a) Homer (1993, 1997), which developed a 'War on Drugs' model to understand cocaine prevalence trends and policy impacts. The model captured the cocaine market mechanism including supply, demand, price, and market actors as well as how the criminal justice system interacts with the illicit market;

b) Lyneis (1999, 2000), which developed a detailed, calibrated model to support the development of business strategies. It focused on market share and resource allocation between competing companies and assessed cost-benefit tradeoffs of business strategies. Lyneis (2000) also explained the causes for market behaviours and illustrated that System Dynamics models can "provide more reliable forecasts than statistical (non-structural models);

c) Cavana-Clifford (2006), which tested the causality between tobacco import behaviour and government policy options in New Zealand;

d) Dudley (2004), which examined the inter-relationships between demand, price and forecast stock and log availability, log harvesting capacity, log exports and the impact of an export ban on Papua New Guinea;

e) Delsys Research Group (2012), which developed a qualitative system dynamics model depicting the "theory of the business" for the new consumer product safety regulatory regime at Health Canada; and

f) Tawileh et al (2009), which developed a model of alcohol misuse, which touched on many of the same issues as marihuana use for medical purposes, including law enforcement and doctor/patient relations.

Specific studies that were relevant to business and user dynamics included:

g) Sterman (2000), which modeled commodity cycles and examined how price functions to balance supply and demand, and examined the business supply chain mechanism and how business adjusts capacity to meet orders and demand; and

h) Delsys Research Group (2004), which developed a strategic 'business flight simulator' for First Nations Statistical Institute. This business-planning tool modeled inter-relationships between market demand for statistical services, production, human resources and financing.

Specific studies that were relevant to licensing, compliance and law enforcement issues included:

i) Delsys Research Group (2008), which mapped broadcasting and telecom licensing processes and tracked information flows into and through the process. The model included unavoidable re-work cycles and tested how to sustain organizational capacity to meet performance requirements;

j) Morecroft (2007), which focused on drug-related crimes and modeled inter-connections between drug users, street market, police and the community; and

k) Delsys Research Group (2005), which developed simulation models to support strategies for combating mass-marketing fraud, including: entry, exit, marketing activity investment, ROI, and sales success rates (i.e., victim responsiveness). The models tested different compliance strategies, including law enforcement activities and related deterrent effects.

Other literature that was specific to identification of variables and parameters required in the CBA model is cited in the Methodology section.

CHAPTER FOUR

4.0 CBA - Methodology

This section describes in detail the methodology used in the Cost Benefit Model to estimate the Status Quo and Policy scenarios over the forecast period and the Net Present Value difference between them for monetized benefits and costs.

This section is divided into sub-sections that describe the following components:

1. Persons Accessing A Legal Supply of Marihuana for Medical Purposes;
2. Status Quo – Program Administration Costs;
3. Status Quo – User Benefits & Costs;
4. Status Quo – Safety Costs;
5. Status Quo – Security Costs;
6. Status Quo – Summary of Benefits & Costs;
7. Policy – Transition Model (April 2014);
8. Policy – Demand Curve;
9. Policy – Supply Curve;
10. Policy – LP Market Equilibrium;
11. Policy – User Benefits & Costs;
12. Policy – Safety Costs;
13. Policy – Security Costs;
14. Policy – Program Administration Costs;
15. Policy – Summary of Benefits & Costs; and
16. Net Present Value (Policy vs. Status Quo)

The methodology description will address each of these components separately.

It is important to note that the CBA focuses on the consumption of marihuana obtained from legal sources of supply for medical purposes. The broader issues of illicit market supply and use (except the potential misuse of residential production licenses under the MMAR and in the Policy scenario) are outside the scope of the study.

4.1 Persons Accessing a Legal Supply of Marihuana for Medical Purposes

The CBA study estimates a pool of potential persons who, over time, would be interested in accessing a legal source of marihuana for medical purposes. This was used to estimate the time path of authorized marihuana users in the Status Quo scenario. Following the development of a Transition Model, this pool of potentially eligible marihuana users was also used to estimate the path of legal users in the Policy scenario.

4.1.1 Future Growth & Likely Upper Bound

Health Canada data on persons with Authorization-to-Possess (ATP) status were available for the month of January values from 2003 to 2012 (Figure 1.1 above). This data showed exponential program growth of over 40% per year since 2006.

It is difficult to confidently assume that such exponential growth can continue for another ten years, as there is good reason to believe that there is a natural ceiling towards which the level would approach (or a steady- state growth path that is much lower than 40% per year).

Assuming that exponential growth of 40% per year continues for the 12-year forecast horizon from 2012 to 2024, this would effectively project an ATP level of about 690,000 persons in 2024.

The Canadian Alcohol and Drug Use Monitoring Survey (CADUMS) for 2011, administered by Jolicoeur et Associé for Health Canada, identified that 1.6% of Canadians (aged 15 years and over) reported using marihuana, hashish, hash oil, or other cannabis derivatives in the past year for medical purposes. This would suggest that there were 420,000 persons in 2011 who may use marihuana for medical purposes. Of these persons, about half reported that their medical reason for cannabis use was related to a chronic pain condition, while the other half reported use related to nausea or vomiting, lack of appetite or weight loss, depression, multiple sclerosis or spinal cord injury, epilepsy, anxiety or nerves, glaucoma, insomnia and other unspecified reasons.

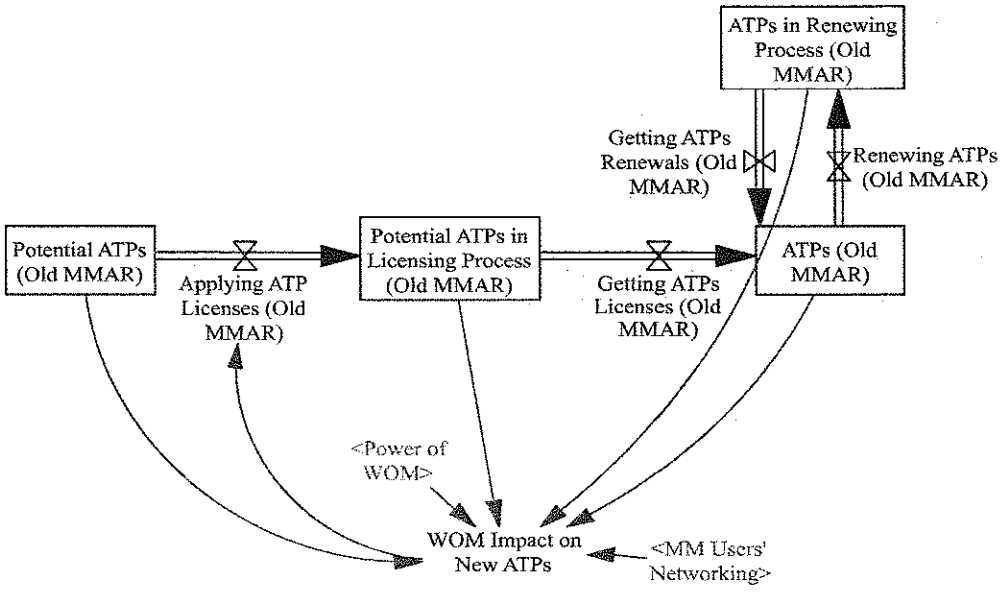
For the purpose of modelling the future growth of the MMAP (in the Status Quo scenario) over the forecast period from 2014-15 to 2023-24, the analysis used an upper bound (or ceiling) of 450,000 Canadians who might become participants in the MMAP as the Reference case. In order to provide a sensitivity analysis, the range of upper limit was assessed from 250,000 to 650,000 persons participating in the MMAP.

A System Dynamics model[3] of program uptake was developed to track the growth of the program (to 2012) and to forecast program uptake to 2025. This continuous simulation model used differential equations to calculate variable changes over time. Figure 4.1 shows a

[3] System Dynamics simulation models map the causal relationships that determine the behaviour of complex systems and use differential equations to account for dynamic changes in stocks (accumulations) and flow processes over time. These models can be calibrated to replicate known data and can be used to rigorously assess how complex interaction and feedback processes in economic, environmental and social systems influence behaviour over time. They can help identify potential unanticipated consequences of policy proposals in both public and private sector contexts. Systems Dynamic models were used to inform the CBA with respect to the growth of MMAP usage both with and without resource constraints under the Status Quo scenario, as well as the transition process between the Status Quo and Policy scenarios. These models also informed other aspects of the regulatory change process.

simplified model structure in which potential ATP persons move through a process to become aware of, and apply for, access to the existing MMAP regime.

Figure 4.1 – Status Quo – System Dynamics Model
ATP Awareness, Application, Approval Process



Source: Delsys Research

The ATP process models the movement of potential ATP persons through the license application and renewal activities. The full model captures the complex dynamics of how Health Canada issues and renews ATPs, DPPLs and PUPLs, and provides access to the Government supply of marihuana for medical purposes.

The upper bound (ceiling) is represented by the sum of four stocks: 1) potential ATP persons; 2) persons applying for an ATP in the licensing process; 3) persons with an ATP; and 4) ATP persons involved in the renewal of their ATP, where:

Ceiling Value = Potential ATP + ATP Applications + Existing ATP + ATP Renewals

For the Reference case (i.e. deterministic case), the study assumed there are 450,000 persons who might be in need of marihuana for medical purposes (for simplicity, it is assumed that this is constant over the forecast period to 2025). As there were 4,884 ATP persons in January 2010, the majority of persons were in a 'potential pool' of persons who might want to access the MMAP regime. As the number of persons with ATP grows over time, the size of the potential pool drops.

There is no Health Canada marketing or promotion of the MMAP, even though historical growth has been about 40% per year over several years. Peer influence (i.e. 'word-of-mouth' - WOM) is assumed to be the dominant process that continues to drive MMAP growth. Such a process is often modeled in System Dynamics.

ATP Applications = Existing ATP * WOM Factor * [Potential ATP / Ceiling Value]

The resulting path of ATP persons over time is an 's'-shaped logistics curve. This curve initially tracks and continues the historical exponential path of growth before slowing and approaching the ceiling value asymptotically.

Over time, with infirmity of a growing and aging Canadian population, the effective ceiling could rise. However, it is likely that the effective ceiling on the number of ATPs would be reached before 2024 and would involve a slowing of the rate of growth to some value less than 40% per year.

The System Dynamics model produced outputs for January values which allowed calculation of monthly compound growth rates. These allowed a monthly time series to be generated so that fiscal year annual average values could be determined.

The System Dynamics growth path is expressed in terms of the percentage movement towards the asymptotic upper limit (ceiling). In order to allow for a different value for the upper limit, the CBA model used the shape-path of the percentages and adjusted these to reflect that the starting value (i.e. the value for FY2013-14) was a different percentage of the different ceiling value. This can be seen in Figure 4.2, which shows several paths for the percentage movement towards the asymptotic upper limit (for ceiling values of 250,000, 450,000 and 650,000). The shape of the paths is similar to a logistics ('s'-shaped) curve.

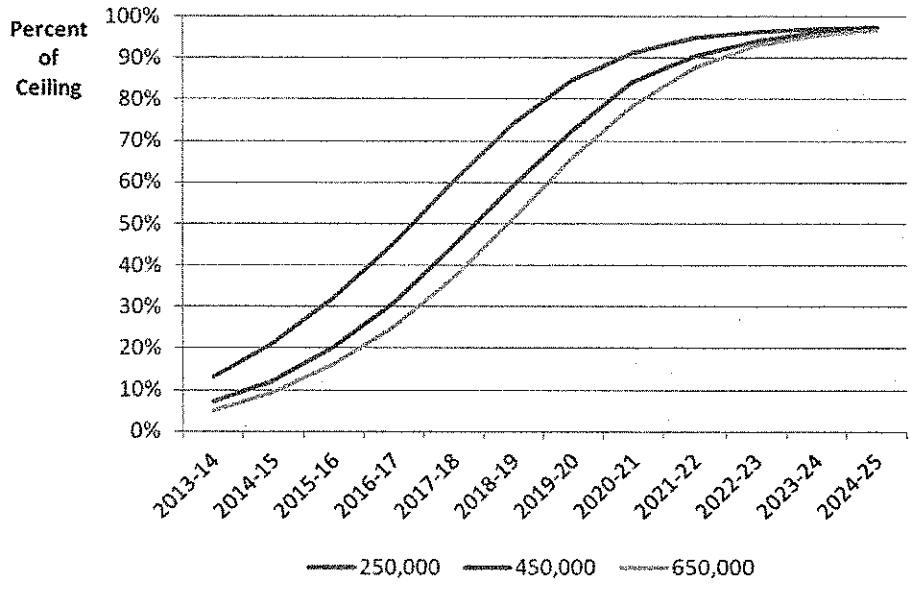
The CBA model for ATP in the Status Quo scenario is of the form[4]:

(01) ATP(t) = Upper Limit Value * % of Ceiling(t)

where the percent of ceiling at time (t) is based on the System Dynamics growth path (for a ceiling of 450,000) and adjusted for the difference in starting value. This path is determined for the aggregate number of ATP persons[5].

[4] Numbered equations focus on calculations that are embedded in the CBA Model.
[5] Effectively, the percentage increment was estimated as a polynomial of degree two relative to the lagged value of the ceiling. This produced a good fit for the System Dynamics growth path.

Figure 4.2 – Status Quo – ATP Forecast Growth Path
As % of Ceiling Value Showing Upper Limit Values



Source: Delsys Research

4.1.2 Status Quo – Composition by Supply Method

Under the MMAR, there are various supply methods that an ATP person can use to access legally produced marihuana for medical purposes:

- Access the Government Supply (these are referred to as ATP-G);
- Grow their own supply under a Personal Use Production License (PUPL) (referred to as ATP-P); or
- Arrange for their supply to be grown by a designated person under a Designated Person Production License (DPPL) (referred to as ATP-D).

For the purpose of the CBA, it is important to forecast the composition of these different types of MMAP participants. In addition to these streams of ATP users, it also turns out that a substantial proportion of persons with an ATP-G to access the Government Supply do not in fact ever place an order through Health Canada to access this supply. Therefore, as this study needed to estimate the actual usage of the Government Supply, the stream of ATP-G persons was subdivided into two types:

- Persons who do, in fact, access the Government Supply (referred to as ATP-GS); and
- Persons who do not access the Government Supply (referred to as ATP-O).

While there has been variation of time in the relative proportions of these ATP supply types, there is guidance from Health Canada that the current proportions are roughly:

- 10% ATP-GS: who access the Government Supply;

- 10% ATP-O: who access unknown supply;
- 60% ATP-P: who grow their own supply under a PUPL; and
- 20% ATP-D: who arrange for their supply to be grown under a DPPL.

The model for ATP-P in the Status Quo scenario is of the form:

(02) ATP-P(t) = ATP(t) * %share-P

where the percent share of ATP who hold PUPL is fixed over the forecast period.

The model for ATP-D in the Status Quo scenario is of the form:

(03) ATP-D(t) = ATP(t) * %share-D

where the percent share of ATP who hold DPPL is fixed over the forecast period.

The model for ATP-G in the Status Quo scenario is of the form:

(04) ATP-G(t) = ATP(t) * (1 - %share-P - %share-D)

and is calculated as a residual to be consistent with the above forecasts for ATP (total) and ATP-P and ATP-D.

The model for ATP-GS in the Status Quo scenario is of the form:

(05) ATP-GS(t) = ATP-G(t) * %share-GS

where the percent share of ATP-G who actually access the Government Supply is fixed over the forecast period.

The model for ATP-O in the Status Quo scenario is of the form:

(06) ATP-O(t) = ATP-G(t) * (1 - %share-GS)

and is calculated as a residual to be consistent with the above forecasts for ATP-G and ATP-GS.

These share parameters were assumed to be fixed over the forecast period. In order to provide sensitivity analysis, the percentage shares for ATP-P and ATP-D was varied over a range and the share of the residual ATP-G was divided between ATP-GS and ATP-O based on a percentage that also varied over a range.

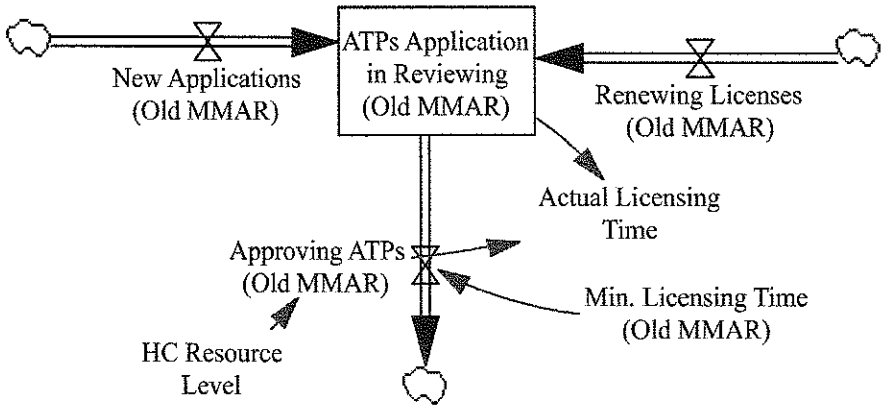
4.1.3 Future Growth and Upper Bound Under Resource Constraint Scenario

Since the MMAR were introduced, Health Canada has been faced with escalating program costs due to the increasing numbers of ATPs - over 40% in the past 7 years. MMAP costs increased from $3.7 million in 2005 to $16.7 million in 2012. A scenario in which program costs must scale resources to meet an exponential growth in demand is unsustainable for any

regulator. However, this analysis adopted a Status Quo scenario that nevertheless assumed that resources would scale as necessary to meet the demand. The reason this approach was adopted was two-fold: 1) There was no basis on which to base an assumption about what proportion of required resources the government would be willing to allocate; and 2) a scenario in which resources were not scaled would have implied the government would tolerate significant delays in issuing ATPs to users.

With a limited budget, it is inevitable that the number of ATPs will experience slower growth compared with an unlimited budget Status Quo scenario. An alternate to the Status Quo scenario was analyzed using a System Dynamics model that illustrated how a budget limitation impacts on program performance. Figure 4.3 shows the model for the MMAP licensing process, including new applications and renewal applications.

Figure 4.3 – Resource Constraint – System Dynamics Model
ATP Applications & Backlog Process



Source: Delsys Research

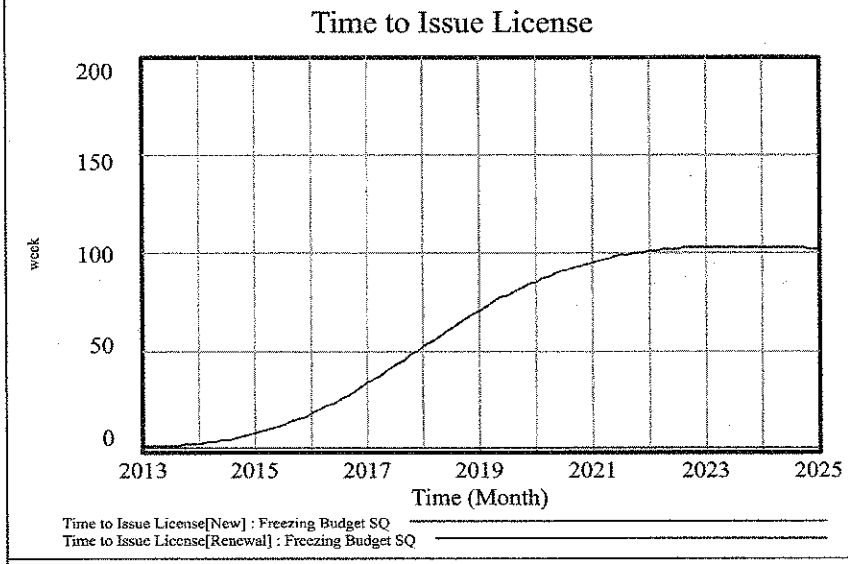
The constrained-budget scenario assumed that MMAP administration was frozen at current levels effective April 1, 2013 (estimated at $4.87 million per year). With this resource level, Health Canada forecasts that there would be 27,847 individuals authorized to possess marihuana for medical purposes by April 1, 2013[6]. In other words, this resource level would allow the MMAP to process 10,767 new applications and renew 17,080 existing licenses per year.

Figure 4.4 shows MMAP service performance relating to the time required to issue and renew ATP licenses. In the constrained-budget scenario, the average time to renew a license remained the same – approximately 0.54 weeks in the study period. This level of performance was achieved by giving greater priority to licensing renewals as opposed to issuing new licenses, a management decision designed to minimize the service gap for existing ATPs. The consequence, however, of the assumed budget freeze, coupled with the priority on renewals, was that the time to issue new licenses increased from 1 week to 102 weeks by 2025. This

[6] Health Canada forecast. As of August 13, 2012, there were 21,986 ATPs. This number is in line with the projected amount of 20,452.

result occurred because increasing program capacity was dedicated to ever-increasing license-renewal activities, and fewer resources were available for new applications.

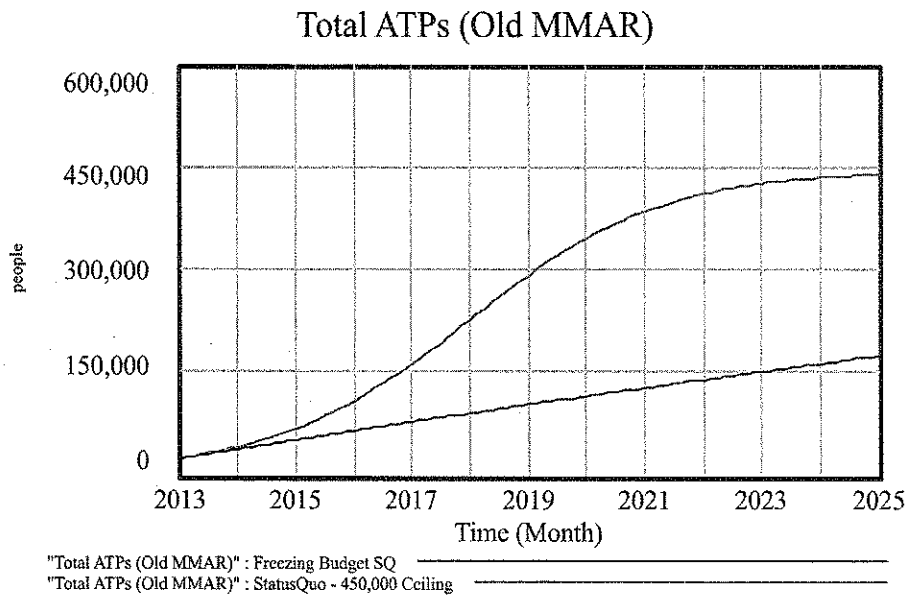
Figure 4.4 – Resource Constraint – System Dynamics Model
ATP Application Backlog (Weeks) Over Time



Source: Delsys Research

In this scenario, the System Dynamics model projected that the total number of ATPs would increase at a much slower rate compared to the unlimited resource status quo scenario, as shown in Figure 4.5, on the next page.

Figure 4.5 – Resource Constraint – System Dynamics Model
ATP Volume Over Time Showing a) No Resource Constraint and b) Effect of Resource Constraint and Backlog



Source: Delsys Research

Although the constrained-budget scenario is likely to result in practice (if the Status Quo were maintained), it was not used as the Status Quo scenario for a variety of reasons. First, there were a number of critical assumptions (e.g., the duration of the budget freeze, the decision on funding levels, alternate assumptions regarding program resource allocations) that change the results of the scenario for which there was no evidentiary basis. Second, to ensure consistency if budgetary constraint assumptions were applied to the Status Quo scenario they should also apply to the Policy scenario. Again, there was no evidentiary basis for applying specific assumptions. Accordingly, the Status Quo scenario incorporated an assumption that the government would scale resources sufficiently to meet emerging demand.

4.2 Program Administration Costs

Health Canada – Program Administration Costs are comprised of:

- Salary and Human Resources (HR)-related costs such as Employee Benefits Program (EPB) and staff accommodation costs;
- Operations & Maintenance (O&M) costs for travel, training, supplies and professional contracts;
- Corporate Cost to reflect departmental shared services and overhead; and
- Contract Cost for the Contracted Government Supply.

This latter cost is counted as part of Health Canada's MMAP Cost but is not included in the CBA as a Program Administration cost as it is related to the cost of supply for those persons

accessing the Government Supply. Contract costs are taken into account as part of the User Benefits and Costs.

Salary & HR-Related Costs

Health Canada administrative costs (human resource costs, accommodation, O&M costs) were documented for 2005-06 to 2009-10 as part of a Health Canada (2009) Supplemental Funding Request. The majority of the operational requirements under the Status Quo scenario arise from the administration of the ATP eligibility requirements and the administration and order processing related to the contract Government Supply. As there has been a fairly steady proportion (10%) of ATP persons who rely on the Government Supply for their access to marihuana for medical purposes, this analysis was able to model the Health Canada program administrative costs directly in relation to the total number of persons with ATPs.

The number of full-time equivalent persons (FTE) for FY2010-11 was reported as 33 FTEs and allowed the computation of an average salary cost per FTE ($68,060) based on the total salary cost for the fiscal year. It was assumed that salary costs per FTE were subject to a fixed salary escalator factor (e.g., 2% per year). This allowed the estimation of FTE for the same years for which salary costs were known (2005-06 to 2009-10).

As the activity volume is considered to be proportional to the average number of ATP persons in a fiscal year, a productivity measure was calculated as the ratio of ATP persons to estimated FTE. This showed an upward trend over time that was fitted with a logarithmic function in Figure 4.6.

The logarithmic equation allows for a prediction of the future number of FTEs required for Health Canada program administration in relation to the number of ATPs expected over time in the forecast period.

The MMAP ratio of ATP/FTE in the Status Quo is given by:

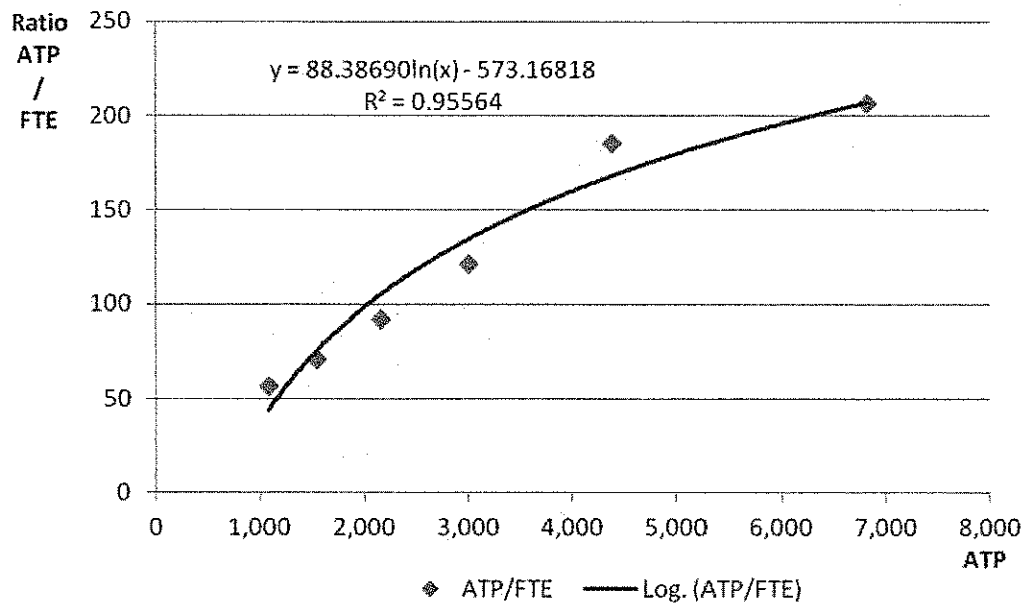
$$(07)\quad ATP/FTE(t) = -573 + 88.4 * LN[ATP(t)]$$

where:

ATP = the forecast number of persons with ATP in future years

LN[ATP] = the natural logarithm of the above.

Figure 4.6 – Status Quo - Productivity Measure
Ratio of ATP Persons per MMAP-FTE
and Fitted Logarithmic Function



Sources: Delsys Research using HC (2009) data and fitted logarithmic function

The number of required MMAP-FTE over time is then given in the Status Quo scenario by:

(08) FTE(t) = ATP(t) / [ATP/FTE(t)]

The average salary per FTE was benchmarked for $68,060 for 2010-11 and was adjusted annually based on a salary escalation factor, so that the salary per FTE over time is then given in the Status Quo scenario by:

(09) Salary/FTE(t) = Base Year Salary * (1 + Escalation Factor)^(t - base year)

where '^' means raised to the power.

The Salary Cost is then given in the Status Quo scenario by:

(10) Salary Cost(t) = FTE(t) * Salary/FTE(t)

Data in the benchmark period (2010-11) indicate that Employee Benefits Program (EBP) and Accommodation costs are proportional to Salary Cost at a fixed percentage (41%).

The EBP & Accommodation Cost is then given in the Status Quo scenario by:

(11) EBP & Accomm Cost(t) = Salary Cost(t) * 0.41

4.2.1 O&M Costs

Data in the benchmark period (2010-11) indicate that O&M costs are proportional to Total Administration Cost at a fixed percentage (20%). As Total Administration Costs = Salary Cost + EPB & Accommodation Cost + O&M Cost, this allows for the following equation for O&M Costs in the Status Quo scenario:

(12) O&M Cost(t) = [.2 / (1 - .2)] * [Salary Cost(t) + EBP & Accomm Cost(t)]

The Health Canada Administration Cost is then given in the Status Quo scenario by:

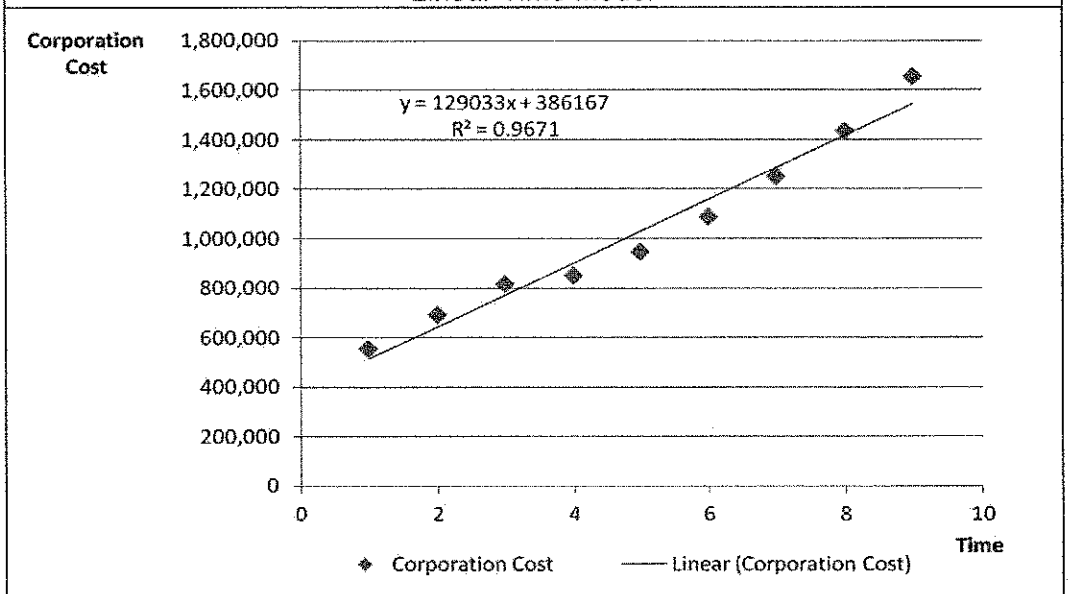
(13) HC-Admin Cost(t) = Salary Cost(t) + EBP & Accomm Cost(t) + O&M Cost(t)

4.2.2 Corporate Cost

Health Canada Corporate Cost includes Human Resources, Finance, Corporate Services and other departmental functional costs that are allocated to program activities such as MMAP.

For FY2005-06 to FY2013-14 (based on HC estimates), the Corporate Cost was a linear function of time as shown in Figure 4.7.

Figure 4.7 – Status Quo – Corporation Cost
Linear Time Model



Sources: Delsys Research

The linear equation allows a prediction of the future Corporate Cost over time in the Status Quo scenario as:

(14) Corporate Cost(t) = 386,167 + 129,033 * (t)

where:

t = a time trend which has values of 10 (FY2014-15) to 20 (FY2024-25).

The sum of Health Canada administrative cost (equation 13) and corporate cost (equation 14) equal the total Program Administration Costs for the Status Quo scenario:

(15) Program Administration Cost(t) = HC-Admin Cost(t) + Corporate Cost(t)

4.2.3 Contract Costs – Government Supply

Health Canada, through Public Works and Government Services Canada (PWGSC) has a contract to cultivate and distribute marihuana for medical purposes to persons authorized to access the Government Supply under the MMAP. The contract terms provide for payment related to a schedule of payments against certain deliverables, the most important of which is the Kilogram (KG) produced to meet the expected MMAP demand.

KG-Demand, Supplied and Produced

The model for KG-Demand for persons eligible to access the Government Supply was estimated based on actual data for KG-Supplied (for FY2005-06 to 2011-12) and an estimate of the Maximum KG-Demand based on the number of ATP persons who are:

- existing ATP-GS at the beginning of the FY (April of the year) who are eligible to access 12 months of Government Supply;
- new ATP-GS during the FY who are eligible (on average) to access 6 months of Government Supply; and
- new ATP-P/D during the FY who are eligible to access 4 months (on average) of 'interim' Government Supply.

From the Fiscal Year forecast of the Total ATP persons, a monthly time series was calculated that allowed, based on parameters for the proportion of Total ATP persons in different supply methods, an estimate of the number of persons in each category as described above.

The mean number of 'Proposed Daily Amount' from the ATP application form for each of the supply categories was obtained, which for 2010-11 showed that the proposed daily amount was significantly higher for DPPL supply (mean=9.0 grams) and PUPL supply (mean=7.6 grams) than for persons accessing the government supply (mean=3.6 grams). The mean across PUPL/DPPL supply was 8.0 grams.

For the years up to FY2009-10, during which ATP persons were able to access the Government Supply without prepayment, there was a significant rate of non-payment (around 20%) – and the 'effective utilization' rate[7] was around 17-20%. In other words, the actual KG-Demand was only 17-20% of what was theoretically possible to have been made available to persons eligible (and likely[8]) to access the Government Supply.

For the FYs after 2010-11 and including an estimate for FY2012-13 (based on one quarter's data[9]) the 'effective utilization' rate following the demand for full pre-payment was around 6%.

The Maximum KG-Demand (Government Supply) is given in the Status Quo scenario by:

(16) Max KG-GS(t) = {[Starting ATP-GS(t) * 12 * 30 * PDA-GS]

+ [New ATP-GS(t) * 6 * 30* PDA-GS]

+ [New ATP-P/D(t) * 4 * 30 * PDA-P/D]} / 1,000

where the first term in each of the three expressions on the right-hand side of the equation is the number of relevant ATP persons eligible to access the Government Supply, the first integer is the months of possible orders in the FY, the second integer is the mean days per month and the last term is the mean Proposed Daily Amount (a maximum) for each category of user.

The KG-Demand is given in the Status Quo scenario by:

(17) KG-Demand(t) = Max KG-GS(t) * Utilization Rate-GS(t)

where the effective utilization rate was assumed to be 6% for the beginning of the forecast period and allowed to rise towards the end of the forecast period as the growth of new ATP persons slows and there was expected to be higher utilization from the persons who start the year as ATP-GS.

It was assumed that the KG-Demand equalled the KG-Supply, as this is an actual transacted market with Health Canada as the intermediary between the consumer and the contracted producer.

The ratio of KG-Supply to KG-Produced was estimated to be 85% for FY2008-09. As a result of reduced demand as a result of pre-payment of orders, this ratio might have fallen to around 50% for FY2009-10. Access was only available for planned expenditures in additional FYs and the actual contracted amounts for KG-Produced were unknown. It was assumed, for the purpose of costing the Government Supply contract, that there was a constant 85% ratio between KG-Supply (and KG-Demand) and KG-Produced.

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[7] The effective utilization rate is the ratio of the KG actual supplied to persons from the Government Supply to this study's estimate of the Maximum KG-Demand, based on the number of persons eligible to access the Government Supply and the maximum amount they were eligible to obtain based on the application 'Proposed Daily Amount'.

[8] The theoretical maximum does not include the persons eligible for Government Supply who never place an order. It includes the existing and new ATP-GS who are expected to make use of the Government Supply and the new PUPL/DPPL persons who are eligible for interim Government Supply.

[9] There was little predictable seasonality in KG-Supply data by month for 2010 and 2011.

The KG-Produced is given in the Status Quo scenario by:

(18) KG-Produced(t) = KG-Supply(t) / 0.85

Government Supply - Contract Cost

Health Canada contracted Government Supply costs were documented for 2005-06 to 2009-10 as part of a HC (2009) Supplemental Funding Request. These costs were in addition to Health Canada administration costs.

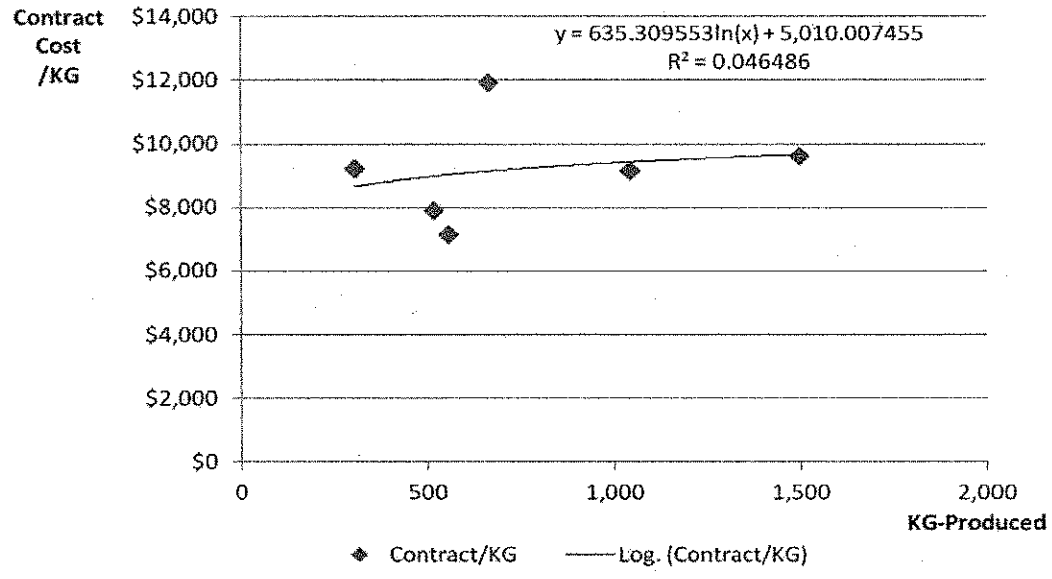
Contract Cost included dried marihuana supply, marihuana seed pouches, various reporting requirements and other miscellaneous work. Payment was made against a schedule of unit costs negotiated in a supply contract between the Government of Canada and the contract Government supplier.

The contracted KG supply costs were known for six fiscal years that spanned the two Supply Contracts signed in 2008 and 2010. There were two prices specified in the Contract: a) a price for 'base quantity' (referred to by Health Canada as 'firm deliverable'); and b) a price for 'optional quantity'. For the purposes of estimating a supply cost, a weighted average was selected, with 90% of the price of the 'base quantity' and 10% of the price for the 'optional quantity'.

These prices were plotted against actual and estimated KG produced for FY2008-09 to 2013-14 in Figure 4.8. There was a poor fit to the data as there was an increase for prices in the 2010 contract over the 2008 contract, but in each of these contracts there was (generally) declining prices over the three fiscal years of the contract. This produced a 'ratcheting' movement over time. Even though the estimated fit of a logarithmic function was poor, this model was used, as it made full use of available data[10].

[10] While the statistical 'fit' of the logarithmic regression is poor it still captures the (generally) upward movement over time (between successive Contracts) but at a declining rate that seems to be reflected by the decrease over time for the years of any particular Contract. Neither the slope not intercept parameter had much impact on the variation of the NPV results.

Figure 4.8 – Status Quo – KG Supply Cost
Relation of KG-Supply Cost and KG-Produced
and Fitted Logarithmic Function



Sources: Delsys Research

The logarithmic equation allowed a prediction of the future KG supply cost over time in the Status Quo scenario as:

(19) KG Supply Cost(t) = 5,010 + 635.3 * LN[KG(t)]

where:

LN[KG(t)] = is the natural logarithm of forecast KG-produced over time.

An estimated KG Cost was then calculated, based solely on the KG Supply Cost and the KG-Produced forecast. This value would not represent the full Contract Cost as it excludes the costs associated with seeds, reporting and miscellaneous work requirements for which the contract supplier is compensated under the contract. It does represent the bulk of the Contract Cost.

Estimated KG Cost over time in the Status Quo scenario is given by:

(20) Estimated KG Cost(t) = KG-Produced(t) * KG Supply Cost(t)

A comparison of the relationship for the observed and estimated period for FY2005-06 to FY2013-14 can be made between the Health Canada reported Contract Cost (for all items) and the Estimated KG Cost. This ratio has fluctuated from 67% to 92% over time. This study assumed that the Estimated KG Cost represented a fixed 90% ratio to Contract Cost over the forecast period.

Estimated Contract Cost over time in the Status Quo scenario is given by:

(21) Contract Cost(t) = Estimated KG Cost(t) / 0.90

4.2.4 Program Cost

The total Health Canada Program Cost for the MMAP is the sum of the Program Administrative Cost and the Contract Cost.

Total Program Cost over time in the Status Quo scenario is given by:

(22) Total Program Cost(t) = Contract Cost(t) + Program Administrative Cost(t)

For the purposes of the CBA it is important to note that the Administrative Cost component was treated as an economic cost of the program administration while the Contract Cost was treated as the supply cost associated with a market transaction in the estimation of Consumer Surplus and Producer Surplus.

4.2.5 Status Quo – Business Compliance Cost

It was assumed that Regulatory Compliance Cost was 10% of the Contract Cost. There was no available evidence to support this assumption but the best available information was that the new regulations governing LP supply security and reporting requirements would be less onerous than those embedded in the Government Supply contract.

Compliance Cost over time in the Status Quo scenario is given by:

(23) Compliance Cost(t) = Contract Cost(t) * 0.10

4.2.6 Status Quo – Government Supply Curve

The Government Supply Curve is the relationship between KG-Demand and Supply Price per KG over time. This differs from the Estimated Contract Cost as it: a) excludes the Compliance Cost component; and b) uses KG-Demand as the denominator (rather than KG-Produced).

Generally, the volume of seeds produced and supplied is a trivial component of the Supply Contract and is omitted from these calculations.

The Supply Price per KG-Demand over time in the Status Quo scenario is given by:

(24) Supply Price/KG-Demand(t) = [Contract Cost(t) * (1 - 0.10)] / KG-Demand(t)

When the Supply Price per KG-Demand and the KG-Demand are plotted over time for the forecast period, an upward sloping Government Supply Curve is obtained.

The linear equation for the Government Supply Curve over time in the Status Quo scenario is given by:

(25) Supply Price/KG-Demand(t) = 11,511 + 0.160595 * KG-Demand(t)

where

S-Intercept-GS = 11,511

S-Slope-GS = 0.160595 (times the quantity supplied in KG)

4.3 Status Quo– User Benefits & Costs

The existence of a market for transacted quantities of marihuana for medical purposes allows an inference, from observed and estimated market quantities and prices and parameters related to linear Demand and Supply curves, of measures of welfare in the form of Consumer Surplus and Producer Surplus. Before formulae for these welfare measures can be derived, intercept and slope parameters for the Supply and Demand curves must be developed. For the Demand curve, the single parameter assumed in this study will be the Price Elasticity of Demand.

4.3.1 Price Elasticity of Demand

Marihuana is a controlled substance and shares many of the demand characteristics of illegal drugs. Demand for illegal drugs has been found to be price inelastic, meaning that the percentage change in quantity demanded is less than the (absolute value) of the percentage change in price.

Mathematically, own-price elasticity of demand ε_p is defined in this study as:

ε_p = %Δ in quantity / %Δ in price = d(ln q) / d(ln p)

where d is the differential operator and ln is the natural logarithm function, q is quantity demanded and p is price.

A comprehensive assessment of US marihuana demand [Rhodes et al (2000)] found evidence that ε_p was in the inelastic range of -0.25 to -0.50 for young people and less frequent adult users. Marihuana price elasticity was:

- lower in the short term than the long term [Becker et al (2006) show that habits change slowly for products with physical and/or social addiction];

- lower for frequent versus first-time users than for regular users [Bretteville-Jensen (2006) shows higher price elasticity among heavy users of heroin]; and

- lower for young adults than for older users.

A comparable form of price responsiveness has been found for a 'participation' elasticity which measures the relationship between price changes and the number of users. A participation elasticity for marihuana of about -0.3 is reported [Kilmer et al (2010)].

The demand for marihuana for medical purposes from a legal source might differ from the demand for marihuana as an illicit substance and might be closer to that for prescription drugs. It is important to note that marihuana is not an approved therapeutic product in Canada.

Qualification – Marihuana for Medical Purposes is not an Approved Therapeutic Product
Marihuana for medical purposes is not an approved therapeutic product and the scientific studies of the safety and efficacy of marihuana for medical (therapeutic) purposes are generally inconclusive [Health Canada (2010)].
HC (2010) Marihuana (marijuana, cannabis) – (Information for Health Care Professionals)

With this qualification, it may still be that the demand for marihuana for medical purposes exhibits similarities (in terms of consumer preferences and price sensitivity) to demand for prescription drugs. At the very least, individual Canadians appear to perceive there to be anecdotal therapeutic benefit of marihuana consumption in relation to various disease conditions.

The price elasticity of demand for prescription drugs in Canada has been estimated at ε_p = -0.10 to -0.15 [Contoyannis et al (2005)] or very inelastic.

Prescription drug price elasticity was:

- lowest ($|\varepsilon_p| < 0.20$) for lowest income/lowest usage and for moderate income/highest usage;

- highest ($|\varepsilon_p| > 1.0$) for higher income/low-to-moderate usage.

Another study [Kapur-Basu (2005)] found a similar non-linear relationship between drug expenditures and household income with an overall (average) income elasticity for prescription drugs of ε_y approx = 0.

Empirical evidence for Canada does not indicate much price sensitivity (in terms of out-of-pocket costs) for prescription drug demand for changes in price. The low price elasticity of

demand for prescription drugs is a result of medical need and the generally low out-of-pocket cost for prescription medicines after insurance (public and private) plan coverage[11].

The combined evidence from both marihuana use (as an illegal substance) and from prescription drug use (as a legal substance) indicate that the price elasticity of demand for marihuana for medical purposes is likely to be low (inelastic) and in the range of ε_p = -0.10 to -0.50 (with a median value of ε_p = -0.25). It was therefore expected that the Marshallian demand curve for marihuana for medical purposes would be downward sloping with a steep slope indicating highly price inelastic.

For the purpose of the CBA study, linear demand and supply curves were assumed. These are the simplest economic specification and facilitate calculation of Consumer Surplus and Producer Surplus measures. They also require the fewest assumptions (e.g., intercept and slope) which must be inferred based on minimal empirical evidence.

The price elasticity of demand for a linear demand curve varies at different points along the curve, with high price elasticity at points near the y-axis intercept (i.e. zero demand) and low price elasticity at points near the x-axis (i.e. maximum demand) intercept point. The assumption that the Status Quo scenario supply markets all exhibit inelastic demand (at the observed positions of supply price and actual consumption) means that the observed market position is found towards the lower right-hand arc of the demand curve close to the x-axis.

Annex 1 contains a comprehensive discussion of the concepts of Consumer and Producer Surplus and the challenge of estimating the impacts of a policy change that involves:

- the existence of an effective consumer subsidy in the Status Quo scenario; and
- a Policy scenario that removes the effective subsidy and also allows for more efficient, lower cost supply.

For the case of the portion of the market that involves the Government Supply, this is effectively what occurs between the Status Quo and the Policy scenarios.

Measures of Consumer Surplus and Producer Surplus were estimated for three categories (i.e., separate markets) of persons with ATP:

1. Government Supply Market: persons who access marihuana for medical purposes from the Government Supply through Health Canada;
2. Personal Use Market: persons who supply their own marihuana for medical purposes from self-cultivation; and
3. Designated Person Market: persons who access a supply of marihuana for medical purposes from a designated person who grows it for them.

These categories were treated as separate markets for two main reasons: a) the supply price is estimated to be very different between these markets; and b) the product characteristics of the

[11] At present (2012), expenses to acquire marihuana for medical purposes are not eligible for reimbursement under Provincial/Territorial Drug/Health plans. For this reason the Status Quo scenario assumes that 100% of the cost of accessing a legal supply of marihuana for medical purposes is borne by the user.

marihuana may vary considerably between the Government Supply (i.e., a single strain of cannabis) and 'private production' (i.e. which may involve many strains of cannabis). The available literature on cannabis use suggested that certain users have a marked preference for certain strains of cannabis. There was no scientific evidence as to the actual or possible therapeutic properties of different strains of cannabis.

4.3.2 Government Supply Market

A Government Supply curve was estimated in equation 25. This involved a linear relationship between the KG-Demand and the Supply Price per KG-Demand. For the purpose of estimating Consumer Surplus and Producer Surplus, the Government Supply curve Slope was kept constant at the value (0.160595) in equation 25 and the Supply curve Intercept was allowed to vary slightly over time so as maintain the constant slope at the equilibrium values (Supply Price per KG-Demand, KG-Demand) determined from equations 24 and 17 above.

The slope of an upward-sloping line is given by the ratio:

Slope = Rise / Run = (Δvertical / Δhorizontal)

The Δvertical up the y-axis (price) is given by the difference between a point on the Supply Curve (i.e. Supply Price per KG-Demand) and the Supply Intercept.

The Δhorizontal along the x-axis (quantity) is given by the difference between KG-Demand and Zero (i.e. the quantity associated with the Supply Intercept).

Therefore:

Slope = (Supply Price per KG-Demand - Supply Intercept) / (KG-Demand - 0)

This equation can be rearranged to solve for the value of the Supply Intercept. The Government Supply curve Intercept over time in the Status Quo is given by:

(26) Intercept-GS(t) = Supply Price per KG-Demand(t) – [KG-Demand(t) * Slope-GS]

The definition of the price elasticity of demand is:

Price Elasticity ε_p = %Δ in quantity / %Δ in price

One point on the Demand curve (for the Government Supply) is known, as this is the point (observed or forecast) that results in quantity KG-Demand at the User Price ($5.00/gram * 1,000 grams = $5,000/KG).

In order to estimate the value of the Demand Intercept, the known point and the Price Elasticity of Demand can be utilized. By definition, the Demand Intercept is the point where the Demand curve intersects the y-axis and the quantity demanded is equal to zero. This corresponds to a -100% change in quantity. Therefore, the associated % change in price can be determined.

%Δ in price = %Δ in quantity / ε_p

The %Δ in price associated with the movement from the point (User Price, KG-Demand at User Price) to the Demand Intercept is given by:

$\%\Delta$ in price = (Price Intercept – User Price) / User Price

These two equations can be brought together to give the following value of the Demand Intercept. The Demand curve Intercept (for the Government Supply) over time in the Status Quo scenario is given by:

(27) Intercept-D(t) = User Price(t) [1 – (1.0 / ε_p)]

With two points of the Demand curve specified – the y-axis intercept and the observed transaction point (User Price, KG-Demand at User Price) – and the assumption that this curve is linear, it is possible to calculate the Demand curve Slope (which is negative as the curve is downward-sloping).

The Demand curve Slope (for the Government Supply) over time in the Status Quo scenario is given by:

(28) Slope-D(t) = [User Price(t) – Intercept-D(t)] / KG-Demand(t)

One characteristic of a constant Price Elasticity of Demand and a constant Demand Intercept is that the Demand Slope declines (in absolute value) as the scale of the market (i.e., KG-Demand) increases.

As shown in Figure 4.9, the Government Supply users (ATP-GS and those who are new ATP-P/D who access an interim supply) face an (effectively subsidized) User Price ($5,000/KG) when they consume KG-Demand. The actual cost associated with KG-Demand is the higher Supply Cost.

In the absence of an effective subsidy, users would face a price slightly less than the Supply Cost (associated with KG-Demand) and would consume at KG*-Equilibrium. Note that the Supply curve (while somewhat flat) is not horizontal, and has a positive slope.

Because the equations for the Supply and Demand curves are known and the equilibrium is determined by their intersection, it is possible to determine the value of KG*-Equilibrium.

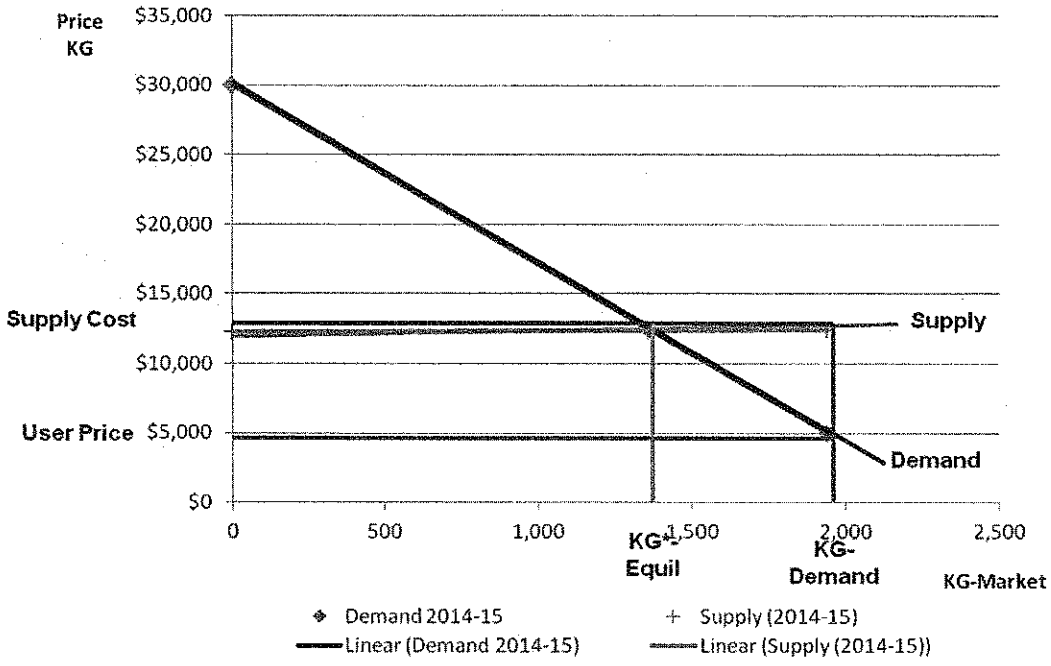
If the Demand and Supply curves are given by:

Supply Curve = Intercept-GS(t) + (Slope-GS * KG)
Demand Curve = Intercept-D - (Slope-D(t) * KG)

then it can be determined that the KG*-Equilibrium over time in the Status Quo scenario is given by:

(29) KG*-Equilibrium(t) = [Intercept-D – Intercept-GS(t)] / [Slope-GS + Slope-D(t)]

Figure 4.9 – Status Quo – Government Supply
Demand & Supply Curves Showing KG*-Equilibrium
and KG-Demand at (Effectively Subsidized) User Price



Sources: Delsys Research
NB: as supply curve is flat-ish it is not possible to show equilibrium price line.

The associated P*-Equilibrium can then be found using the above value for KG*-Equilibrium and either the Supply or Demand equations.

Using the Demand curve equation, P*-Equilibrium over time in the Status Quo scenario is then given by:

(30) P*-Equilibrium(t) = Intercept-D + [Slope-D(t) * KG*-Equilibrium(t)]

Consumer Surplus-GS

Consumer Surplus is a measure of the user benefit not captured in the market transaction. As the Demand curve represents the marginal willingness-to-pay for consumption, Consumer Surplus is the integral of marginal willingness-to-pay above the transacted value. This is (for an unsubsidized market) the area under the Demand curve and above the price line at the market equilibrium quantity.

For a situation of a subsidized market, as is the case here, the Consumer Surplus (Government Supply) is the area under the Demand curve and above the Supply Cost associated with the User Price at the KG-Demand[12]. While the Supply curve is very flat, it is not horizontal. In order

[12] See Annex 1 for a more detailed explanation of this point.

to correctly estimate the Consumer Surplus, it is necessary to find the KG'-Demand that is associated with the Supply Price per KG.

Using the Demand Curve equation, KG'-Demand over time in the Status Quo scenario can be determined by:

(31) KG'-Demand(t) = [Intercept-D - Supply Price per KG-Demand] / Slope-D(t)

Consumer Surplus can be estimated using a geometric formula which exploits the fact that, with linear Demand and Supply curves, the areas to be measured are triangles whose area is half that of the associated rectangles.

Consumer Surplus (Government Supply) over time in the Status Quo scenario is given by:

(32) CS(Govt Sup)(t) = 0.5 * [Intercept-D - Supply Price per KG-Demand(t)]

* KG'-Demand(t)

Producer Surplus-GS

For reasons explained in Annex 1, there is no Producer Surplus (Government Supply), as the market is subsidized and the marginal cost of production is always above the (effectively) subsidized price.

Deadweight Loss-GS

Deadweight Loss is the cost of producing at a quantity that exceeds KG*-Equilibrium such that the social value (i.e. willingness-to-pay) is less than the marginal cost of production. This occurs in markets where there is a subsidy or tax that creates a 'price wedge' between what users pay and what suppliers receive in a market transaction. The Deadweight Loss (Government Supply) over time in the Status Quo scenario is given by:

(33) DWL(Govt Sup)(t) = {0.5*[P*-Equil(t) - User Price(t)] * [KG-Dem(t) – KG*-Equil(t)]}

+ {0.5*[Supply Price(t) - P*-Equil(t)] * [KG-Dem(t) – KG*-Equil(t)]}

The Deadweight Loss calculation requires the area of two triangles to be calculated.

This completes the discussion of the Government Supply market in the Status Quo scenario.

4.3.3 **Personal-Use Supply Market**

Equation 2 gives the number of persons with a PUPL who self-supply their marihuana under the MMAR in the Status Quo scenario.

Personal Use – Supply Cost

The estimate for Supply Cost (Personal Use) used in the CBA model was based on an Activity-Based Costing (ABC) model which follows the analysis of small-scale indoor marihuana production [Kilmer et al (2010), Caulkin (2010)]. The model converted from US imperial/dollar units to Canadian metric/dollar units and replaced certain values (e.g. electricity cost per kwh)

with Canadian values. In addition, the opportunity cost for residential facility space and own time was included.

The maximum number of allowable plants for the mean Proposed Daily Amount (for ATP-P persons) was calculated using the Health Canada formula. For a mean PDA of 7.6 grams, this corresponded to 37 marihuana plants. The space requirement for this number of plants was based on 15 plants per square metre. The dried marihuana yield was 30 grams per plant per harvest and there was an assumed 3 harvests per year.

Variable labour cost was calculated using an assumption that each harvest (for this quantity of plants) required 60 labour hours and an opportunity cost of $10.00 per hour. Estimates of growing medium/supplies, electricity, space cost (for growing, drying and supplies) and equipment requirements were also used. There was also an estimate of fixed labour (equipment set-up) costs in addition to space usage cost based on a proportion of amortized housing cost.

The resulting Supply Cost (Reference case) was estimated at $1.80/gram (or $1,800/KG). In the CBA analysis, the sensitivity of the results was tested by allowing this parameter to vary over a range of values.

Table 4.1 – Status Quo – Personal-Use Supply Cost

Cost Summary per m^2 of Grow Area	Per Harvest	Per Year
Variable Consumables & Power	$222	$667
Variable Labour	$240	$720
Fixed Space & Equipment & Labour	$210	$631
Total Cost	$673	$2,018

Cost Using m^2 of Grow Area	Per Harvest	Per Year
Variable Consumables & Power	$555	$1,666
Variable Labour	$600	$1,800
Fixed Space & Equipment & Labour	$526	$1,579
Total Cost	$1,682	$5,045

Assumed Personal Use (Grams)	2,774

Cost per Gram of Use	Per Year
Variable Consumables & Power	$0.60
Variable Labour	$0.65
Fixed Space & Equipment & Labour	$0.57
Total Cost	$1.82

Sources: Delsys Research

Personal Use – KG-Demand

As with Government Supply users, a Maximum KG-Demand for Personal Use was calculated based on the mean PDA (7.6 grams) for ATP-P persons and the maximum number of days that persons could consume, allowing for persons who were ATP-P at the start of the Fiscal Year to consume for 12 months (at 30 days per month) and new ATP-P persons to consume for 3 months, on average (after they have successfully harvested their first crop, during which they are eligible to access the government supply for 4 months).

The Maximum KG-Demand (Personal Use) is given in the Status Quo scenario by:

(34) Max KG-PU(t) = {[Starting ATP-P(t) * 12 * 30 * PDA-P]

+ [New ATP-P(t) * 3 * 30* PDA-P] / 1,000

where the first term in each of the two expressions on the right-hand side of the equation is the number of relevant ATP persons eligible for Personal Use production, the first integer is the months of possible supply in the FY, the second integer is the mean days per month and the last term is the mean Proposed Daily Amount (a maximum) for each category of user.

In terms of actual use, it was assumed that this is less than the amount indicated in the PDA figure. For Personal-Use ATP persons, the PDA figure determines the maximum amount of marihuana plants legally allowed to be grown. This likely overstates actual usage. Data on MMAP users [Lucas (2009)] suggests that about 72% of users rely on inhalation methods of ingestion while 28% of users rely on oral methods of ingestion. Analysis [Kilmer-Pacula (2009)] suggests that heavy marihuana users (presumably smokers) consume about 1.2 grams per day +/- 0.4 grams. If this range is considered to represent a Standard Deviation (SD), then very heavy smokers might consume 2.0 grams per day (i.e. the mean of 1.2 plus two SD). Assuming that oral ingestion requires five times the amount of marihuana than that required for inhalation, 10.0 grams per day can be estimated as the oral ingestion mean. A weighted average of these would come to about 4.2 grams per day.

The ratio between the estimated mean daily consumption (4.2 grams) and the mean PDA for ATP-P (7.6 grams) provides the effective Utilization Rate (Personal Use), which is equal to 55%.

The KG-Demand (Personal Use) is given in the Status Quo scenario by:

(35) KG-Demand(t) = Max KG-PU(t) * Utilization Rate-PU(t)

Personal Use – Supply Curve

For the Personal-Use market segment it was assumed that the Supply Curve is horizontal at the Supply Cost (i.e., infinitely elastic supply which corresponds to Constant Returns to Scale production, based on the replication of small scale operations).

Personal Use – Demand Curve

Based on the estimate of the equilibrium quantity demand (equation 35) it is possible to infer, using the estimated Price Elasticity of Demand, the parameters of the Demand curve.

The Demand curve intercept (for Personal Use Supply) over time in the Status Quo scenario is given by:

(36) Intercept-D(t) = Supply Price(t) [1 – (1.0 / ε_p)]

As there were two known points of the linear Demand curve – the y-axis intercept and the estimated transaction point (Supply Price, KG-Demand at Supply Price) – it was possible to calculate the Demand curve slope (which is negative as the curve is downward-sloping).

The Demand curve slope (for Personal Use Supply) over time in the Status Quo scenario is given by:

(37) Slope-D(t) = [Supply Price(t) – Intercept-D)] / KG-Demand(t)

One characteristic of having a constant Price Elasticity of Demand and a constant Demand Intercept is that the Demand Slope declines (in absolute value) as the scale of the market (i.e. KG-Demand) increases.

Personal Use users have a lower Demand Intercept than those for the Government Supply market. This is a mathematical result of the assumption that the elasticity of demand is the same in the two markets. It implies that the initial (marginal) users of Personal Supply have a lower willingness-to-pay for the initial quantity units than those in the Government Supply market.

Consumer Surplus-PU

Consumer Surplus (Personal Use) over time in the Status Quo scenario is given by:

(38) CS(PU)(t) = 0.5 * [Intercept-D - Supply Price per KG-Demand(t)]

* KG-Demand(t)

Producer Surplus-PU

As the Personal-Use Supply Curve is horizontal, there is no Producer Surplus.

Deadweight Loss-PU

As there is no effective subsidy, there is no Deadweight Loss.

This completes the discussion of the Personal-Use supply market in the Status Quo scenario. In the next section, dealing with the Designated-Person supply market, this logic is replicated.

4.3.4 **Designated Person Supply Market**

Equation 3 gives the number of ATP persons associated with a DPPL who arrange for a Designated Person to supply their marihuana under MMAR in the Status Quo scenario.

Designated Person – Supply Cost

As noted above, the Supply Cost (Designated Person) was estimated based on an Activity-Based Costing (ABC) model (see description of Personal Use above). There was no information on the specific arrangements that are typically made between persons holding an ATP (the user) and the person with a DPPL (the supplier). Health Canada has no regulations related to the commercial arrangements between these parties. It is possible that a family member does the cultivation, for which the Supply Cost would be comparable to that for Personal Use production. However, the arrangement could involve a person undertaking marihuana production for up to two persons and expecting a commercial return for their efforts.

For the purpose of calibrating a model, the estimated mean PDA for ATP-D persons specified at a higher level (9.0 grams), which allows for a maximum of 44 marihuana plants. The production for a DPPL cultivating for two ATP-D users was scaled to allow for some economies of scale. With similar parameters (as for Personal Use), the estimated Supply Price was lower ($1.40/gram) when no profit and overhead were allowed. When an allowance was made for an overhead/profit factor of 50% of total cost, the CBA model generated a Supply Price of $2.80/gram. This result was very sensitive to the overhead/profit factor. If that value is higher (65%) the Supply Price becomes $4.00/gram.

As the generally accepted supply price from a compassion club is believed to be between $10.00-$12.00/gram, the estimated Supply Price would be more attractive than reliance on the 'grey market' illicit supply from those organizations.

The resulting Supply Cost (Reference case) is estimated at $2.80/gram (or $2,800/KG). The sensitivity of the results was assessed by allowing this parameter to vary over a range of values.

Table 4.2 – Status Quo – Designated Person Supply Cost

Cost Summary per m^2 of Grow Area	Per Harvest	Per Year
Variable Consumables & Power	$222	$667
Variable Labour	$105	$316
Fixed Space & Equipment & Labour	$203	$610
Total Cost	$531	$1,592
Cost Using m^2 of Grow Area	Per Harvest	Per Year
Variable Consumables & Power	$1,933	$5,799
Variable Labour	$915	$2,745
Fixed Space & Equipment & Labour	$1,770	$5,310
Overhead & Profit	$4,618	$13,854
Total Cost	$9,236	$27,708
Assumed Personal Use (Grams)		9,855
Cost per Gram of Use		Per Year
Variable Consumables & Power		$0.59
Variable Labour		$0.28
Fixed Space & Equipment & Labour		$0.54
Overhead & Profit		$1.41
Total Cost		$2.81

Sources: Delsys Research

Designated Person – KG Demand

As with Personal-Use users, an estimate was calculated for Maximum KG-Demand for Designated-Person Use based on the mean PDA (9.0 grams) for ATP-D persons and the maximum number of days that persons could consume. This calculation allowed for persons who were ATP-D at the start of the Fiscal Year to consume for 12 months (at 30 days per month) and new ATP-D persons to consume for 3 months, on average.

The Maximum KG-Demand (Designated Person Use) is given in the Status Quo scenario by:

(39) Max KG-DP(t) = {[Starting ATP-D(t) * 12 * 30 * PDA-D]

+ [New ATP-D(t) * 3 * 30* PDA-D] / 1,000

where the first term in each of the two expressions on the right-hand side of the equation is the number of relevant ATP persons eligible for Designated Person production, the first integer is the months of possible supply in the FY, the second integer is the mean days per month and the last term is the mean Proposed Daily Amount (a maximum) for each category of user.

The analysis assumed the same actual mean daily consumption (4.2 grams) as for Personal Use which, compared to the mean PDA for ATP-D (9.0 grams), provides an effective Utilization Rate (Designated Person) equal to 47%.

The KG-Demand (Designated Person) is given in the Status Quo scenario by:

(40) KG-Demand(t) = Max KG-DP(t) * Utilization Rate-DP(t)

Designated Person – Supply Curve

For the Designated Person market segment it was again assumed that the Supply Curve is horizontal at the Supply Cost (i.e., infinitely elastic supply which corresponds to Constant Returns to Scale production-based on the replication of small scale operations).

Designated Person – Demand Curve

Because the equilibrium quantity demand (equation 40) was already estimated, it was then possible to infer, using the assumed Price Elasticity of Demand, what were the parameters of the Demand curve.

The Demand curve Intercept (for Designated Person Use Supply) over time in the Status Quo is given by:

(41) Intercept-D(t) = Supply Price(t) [1 – (1.0 / ε_p)]

As there were two known points on the linear Demand curve, the y-axis intercept and the estimated transaction point (Supply Price, KG-Demand at Supply Price), it was possible to calculate the Demand curve Slope (which is negative as the curve is downward-sloping).

The Demand curve Slope (for Designated Person Supply) over time in the Status Quo is given by:

(42) Slope-D(t) = [Supply Price(t) – Intercept-D)] / KG-Demand(t)

Designated-Person users have a lower Demand Intercept than those for the Government Supply market. This is a mathematical result of the assumption that the elasticity of demand is the same in the two markets. It implies that the initial (marginal) users of Designated-Person Supply would have a lower willingness-to-pay for the initial quantity units than those in the Government Supply market.

Consumer Surplus-DP

Consumer Surplus (Designated Person) over time in the Status Quo is given by:

(43) CS(DP)(t) = 0.5 * [Intercept-D - Supply Price per KG-Demand(t)]

* KG-Demand(t)

Producer Surplus-DP

As the Supply Curve is horizontal there is no Producer Surplus.

Deadweight Loss-DP

As there is no effective subsidy there is no Deadweight Loss.

4.4 Status Quo – Safety Costs

The policy rationale for the proposed regulatory change involves a number of risks to public health and safety including: a) fire risk due to use of family residence for marihuana cultivation; and b) health risk for family members and public service officials as a result of the possible presence of mould, chemicals and other toxic materials related to the production of marihuana.

For the purposes of this CBA, only the safety costs associated with the risk of fire were quantified, as this is more tangible and has better data availability than the other risks. The broader safety risks are addressed in the qualitative analysis discussion.

4.4.1 Fire Risk Due to Faulty Electric Wiring/Use & Outcomes

One intended consequence of the proposed regulatory change is an improvement to public safety, by removing from residential areas the locus of legal marihuana cultivation under the MMAR (i.e. home cultivation under PUPL/DPPL).

Fire Causes Specific to Residential Marihuana Cultivation

The principal public safety risk relates to house fire caused by faulty electrical wiring, overloading of electrical circuits, tampering with electrical usage monitoring and other electrical system malfunctions.

Evidence has been offered in support of the existence of such fire risks associated with indoor marihuana cultivation (i.e., grow operations) although much of this evidence is not specific to misuse of PUPLs/DPPLs:

- [Ontario Fire Marshal/OPP (2009)] reported for a 6-month period that they had been called to fires involving either a marihuana grow operation or illegal drug lab approximately every 15 days (i.e. 24 times/yr)[13];

[13] An unknown proportion of these involved other 'drug labs' and were not specifically marihuana grow-op related.

- [Plecas et al (2005)] estimated that residences used for marihuana production have a 24x greater risk of residential fire than a regular home and that Surrey, BC (2003) attributed about 9% of house fires to electrical problems in residences used for marihuana production[14]; and

- [RCMP (2010)] reported that among MMAR 'misuse' cases (n=190) there were 23 cases (12%) where electrical hazard was mentioned, and 2 cases (1%) where a fire had occurred.

Health Canada regulatory analysis dealing with cigarette ignition propensity [Health Canada (2005)] used fire statistics from the Canadian Association of Fire Chiefs Annual Report – Fire Losses in Canada for various years to estimate probabilities of fires. This analysis followed that approach using available average Canadian data for a five-year period (1998-2002) that involves the most recent data available.

Fire Outcomes

The overall annual fire numbers (annual average over the five-year period 1998-2002) are shown in Table 4.3. The following information is provided: a) the number of total fires, b) the death rate per fire, c) the injury rate per fire, d) the average property damage per fire and information about the number of fires (by type) for residential occupancy (one- and two-family dwellings) compared to the number of Census (2001) family dwellings of a similar nature[15].

Table 4.3 – Canada Fire Data (Annual Average 1998-2002)	
Total Annual Fires	55,081
Total 1-2 Family Dwellings	8,273,535
Total 1-2 Family Dwelling Fires	11,279
Incidence of 1-2 Family Fire (per 100,000 family dwellings)	136
Rate of death per Fire	0.0062
Rate of injury per Fire	0.0448
Property Damage per Fire	$23,654
Source: CCFMFC Annual Report – Fire Losses in Canada for selected years.	

For the CBA, it was necessary to focus on risks associated with faulty wiring in residential homes. Data provided by the Canadian Association of Fire Chiefs data has several breakdowns of relevance to this analysis. The fire loss data provides the statistical breakdown for fires by:

- Property classification: which includes residential occupancy and further breakdown for 1- & 2-family dwellings (urban, rural) which is most relevant for MMAR misuse circumstances;

[14] As Surrey and British Columbia (more generally) are thought to be hotspots for marihuana grow-operations, these rates may not be representative of the average situation across Canada

[15] Census (2001) Dwelling count for single-detached, semi-detached, row house, detached duplex apartment and other single-attached house. This is said to correspond to the one- and two-family dwellings from CCFMFC data.

- Sources of ignition: which includes three categories relevant for MMAR misuse special electrical circumstances, i.e., 1) appliances and equipment (e.g. dryers, electrical appliances); 2) electrical distribution equipment (e.g. electrical wiring); and 3) other electrical equipment (e.g. lamps, electrical motors); and

- Act or omission causing fire: which includes two possible categories relevant for MMAR misuse special circumstances, i.e., 1) mechanical/electrical failure or malfunction (e.g. short circuit, part failure); and 2) construction design/installation deficiency (e.g. over-fusing).

As the death, injury and property damage profiles for all three relevant sources of ignition were similar, the CBA took an aggregate profile of their combination to represent the situation for special ignition sources specific to the marihuana production situation.

The analysis used the death, injury and property damage profiles for the latter act or omission causing fire to represent the situation for special acts/omissions specific to the marihuana production misuse associated with the MMAR, as it was more deadly and seemed to better relate to the main fire safety concern related to 'jimmy-rigged' electrical systems (e.g., electrical over-loading, poor electrical wiring, breaker-box bypass) involved in marihuana production situations.

Table 4.4 shows the fire data specific to these circumstances of interest.

Table 4.4 – Detailed Fire Data (Annual Average 1998-2002) for special circumstances relevant to marihuana production situations

	All	FRD	Electrical	Design/Install
Total Annual Fires	55,081	11,279	8,463	2,492
Probabilities	100%	20.5%	15.4%	4.5%
		Compound Factors		
Rate of death per Fire	0.0062	2.0815	0.3765	0.5872
Rate of injury per Fire	0.0448	1.7715	0.8382	0.6704
Property Damage per Fire	$23,654	1.2121	1.2074	1.0949

Source: CCFMFC Annual Report – Fire Losses in Canada for selected years.
FRD – Family residential dwelling
Electrical – all forms of electrical sources of ignition
Design/Install – construction design/installation act or omission

The row for total annual fires shows the annual average for the five-year period for each separate circumstance of interest relevant to the marihuana production misuse situation.

The row for probability shows the ratio of number of fires for a specific circumstance to the total number of fires.

The column for 'All' shows the actual rates (for all fires) for death and injury and the average property damage per fire.

The rows of rates (death and injury and property damage per fire) for the columns for 'Family Residential Dwelling' (FRD), 'Electrical' and 'Design/Install' show a compounding factor which,

when applied to the overall rates (of death and injury) or for property damage per fire, yield the appropriate values which can separately by derived from the data directly for those values.

The data was compiled in this way because the CBA model required the assumption that the probabilities and compound factors for the three circumstances of interest are statistically independent. This assumption allows them to be used multiplicatively (without adjusting for correlations which would be required if they were not independent) to develop compound probabilities and compound rates (for death/injury) and compound property damage per fire.

These values for the compound factors suggest that, for example:

- 1 & 2 family residential fires (FRD): have a higher (208%) death rate (than for all fires), a higher (177%) injury rate and higher (121%) property damage per fire;
- Electrical source of ignition fires (Electrical): have a lower (38%) death rate (than for all fires), a lower (84%) injury rate and higher (121%) property damage per fire; and
- Construction design/installation act or omission fires (Design/Install): have a lower (59%) death rate (than for all fires), a lower (67%) injury rate and higher (109%) property damage per fire.

All the above statements are relative to the same base (i.e. all fires).

Assuming that these three circumstances of interest are statistically independent, it is possible to compute the factors associated with a 'compound situation' having all three of these circumstances of interest. In other words, fire parameters can be estimated for 1- & 2- family residential dwellings where the ignition source is electrical and there is a construction design/installation deficiency. These are the circumstances of most concern for fire safety related to marihuana production misuse situations.

Table 4.5 shows the fire data specific to these circumstances of interest. The compound probability of 0.14% (i.e., a fire of this type given any kind of family dwelling fire), the specific rates of death per fire (0.0028) and injury per fire (0.0252) and average property damage per fire ($37,903) generate estimates that there would have been, nationally for Canada for an annual average over the five year period 1998-2002, 78 such fires corresponding to this compound set of circumstances and 0 deaths, 4 injuries and about $3.0M in cumulative property damage per year.

Table 4.5 – Residential Marihuana Cultivation
Relevant Fire Parameters

Estimated Annual Fires	78	
Probability	0.14%	Number
Rate of death per Fire	0.0028	0
Rate of injury per Fire	0.0252	4
		Total Damage
Property Damage per Fire	$37,903	$2.956M

Source: Delsys calculations based on CCFMFC data for selected years.

In the calculation of deaths, these estimates were rounded to the nearest integer value.

Although the estimates were rounded to the nearest integer, the calculation of injuries in the CBA model took into account the 'rounding difference' that arises from the death calculation. Therefore, if the estimate of deaths is 0.3 and this was rounded down to 0.0, the rounding error (i.e., 0.3 minus 0.0) was added to the estimate of injuries before rounding for injuries. In essence, this is equivalent to saying that 0.3 deaths means zero deaths, but means an extra 0.3 injuries. This was taken as an intuitively proper way for dealing with 'integer lumpiness' in this aspect of the CBA model.

The above data was used in the CBA to represent the probabilities of injury, death and property damage per fire caused by marihuana production "misuse-like" conditions.

4.4.2 Misuse of Residential Marihuana Cultivation

A review of alleged MMAR 'misuse' cases (n=190) shows that there were 23 cases (12%) where electrical hazard was mentioned [RCMP (2010)]. This suggests that the potential for a fire is present in 12% of MMAR 'misuse'. In the section of this report dealing with public security (below), an 80:20 'rule of thumb' was assumed in respect of MMAR 'misuse'. This assumption postulates that major misuse (i.e., closest to a grow operation) is 20% of all estimated misuse while 80% involves minor misuse (i.e., misuse of a smaller scale of criminality and involving minimal illegal activity, such as distribution of excess marihuana production to friends).

The alleged MMAR misuse data found that there were n=2 cases (1%) where a fire had occurred. As this probability is specific to MMAR misuse, which is a specific focus of concern in the CBA, this probability was used for the risk of fires associated with misuse of marihuana cultivation activities under MMAR production licenses.

How does this MMAR-misuse-related fire risk relate to the fire risk for all residences? Based on data from the Canadian Association of Fire Chiefs, it was estimated that the probability of a house fire among all Canadian residences (one- and two- family dwellings) associated with all causes was 0.14%. If the 1% probability of fire among known MMAR misuse cases is taken as a true measure, it suggests that the probability of fire for a MMAR misuse is about seven (7) times higher than for an average house. This estimate compares to a BC estimate [Plecas et al (2005)] that a residence used for marihuana production has a twenty-four (24) times greater risk of residential fire than a regular home. As MMAR misuse involves a family residence compared to marihuana production sites that are dedicated to marihuana cultivation, it would be reasonable to expect family members to engage in less risky makeshift electrical setups than is found in an average marihuana production site, so the lower risk assumed in the CBA may be more in keeping with this type of less risky and smaller scale operation than a full (average) marihuana production site.

The specific fire risk and outcome parameters (Table 4.5) were utilized in the CBA.

4.4.3 Residential Dwellings at Risk

The 78 fires (for simplicity the base period was assumed to be 2002) are related to specific circumstances relevant to marihuana production. However, it is known that they arise from all marihuana production sites, and not just those associated with the misuse of MMAR production licenses (PUPL/DPPL).

In the section (below) on public security risk, it was assumed that 36% of MMAR production licenses (PUPL/DPPL) were involved in some degree of possible 'misuse' but only 20% of that (i.e. 20% of 36%) was of a major misuse which would give rise to the type of elevated fire risk addressed in the CBA . Therefore, using probability compounding, the percentage of all MMAR production licenses giving rise to the elevated risk of house fires would be 2.6% (36% * 20%). This is the constant rate that is applied to a base year number of MMAR production licenses (e.g. 2012 value of 12,000) with growth over time in the Status Quo scenario. Therefore, for example, in 2012 there are an estimated 15,000 MMAR production licenses, of which 36% are assumed to be engaged in some degree of alleged misuse (5,400) and only 20% of these are assumed to engage in major misuse (1,080). Of these, 12% are likely to involve the presence of electrical hazards (130) and 1% will experience a house fire (11, rounding from 10.8).

The rate of growth of Census family dwelling has been 1.410% per year (based on the observed Census value for one- and two- family dwellings over the period 2001-05), so there would have been roughly 13,000 house fires in 2012. There were an estimated 13,000 indoor hydroponic marihuana cultivation (grow-op) sites in Quebec in 2000 [Bouchard 2007]. As Quebec accounted for 46% of Canadian police-reported cases of cannabis cultivation, this would imply that Canadian indoor grow operations were perhaps 28,000 in 2000. The estimated probability of fire for a grow-operation residence is 3.3% [Plecas et al (2005)], so one would expect about 925 house fires associated with grow-operation marihuana cultivation. This compares to an estimate of 11 house fires associated with MMAR misuse of production licenses. Accordingly, the MMAR-related contribution to fires in marihuana production sites would be only 1%.

4.4.4 **Misuse-Related Fires – Status Quo**

The CBA used the specific fire incidence as a parameter going forward in time as the scale of MMAR production and misuse activities was projected to increase.

The benchmark Pr_{fire} is 1%, which was taken to be specific to major misuse of MMAR production licenses. This is an increased probability above the baseline risk of fire for a 1 & 2 family residential home (which is estimated to be 0.14% for all of Canada). It was also assumed that there are elevated fire risks for minor misuse of MMAR production license (assumed to be 33% of that for major misuse) and for no misuse of MMAR production license (assumed to be 10% of that for major misuse). The rationale for these categories having some risk of residential fires (above the benchmark) is that, while there is a lesser (or no) level of misuse, there are inherent fire risks from the nature of indoor marihuana cultivation.

For purposes of the analysis it was not possible to lump ATP-P (PUPL) and ATP-D (DPPL) persons together, as there could be multiple DPPLs held by a single producer. In the case of DPPL production, the fire risk (from marihuana cultivation) is not borne by the person holding the ATP-D but the person engaged in marihuana cultivation under the DPPL. The analysis assumed, for production costs, that an average of 1.5 production licenses was held by the average DPPL producer which, in terms of fire risk, means that there is a lower fire risk for each ATP-D user than for each ATP-P user.

PUPL Licenses – Fire Events

The number of fires in the Status Quo scenario associated with MMAR-PUPL production is:

(44) House Fire-PU(t) = {ATP(t) * %PUPL * %Misuse * %Major * Pr_{fire}}

+ {ATP(t) * %PUPL * %Misuse * (1 - %Major) * Pr_{fire} * 0.33}

+ {ATP(t) * %PUPL * (1 - %Misuse) * Pr_{fire} * 0.10}

Where:

ATP-P(t) is the total number of ATP persons in time t

%PUPL (60%) is the proportion of ATPs with PUPL

%Misuse (36%) is the probability of misuse of PUPLs/DPPLs

%Major (20%) is the proportion of misuse that was assumed to be major misuse

Pr_{fire} (1%) is the probability of house fire (related to marihuana cultivation) given MMAR major misuse.

Pr_{fire} * 0.33 is the probability of house fire given MMAR minor misuse.

Pr_{fire} * 0.10 is the probability of house fire given normal MMAR use.

The number of fires is rounded to the nearest integer value.

DPPLs– Fire Events

The number of fires in the Status Quo associated with MMAR-DPPL production licenses is:

(45) House Fire-DP(t) = {[ATP(t) * %DPPL / Scale Factor] * %Misuse * %Major * Pr_{fire}}

+ {[ATP(t) * %DPPL / Scale Factor] * %Misuse * (1 - %Major) * Pr_{fire} * 0.33}

+ {[ATP(t) * %DPPL / Scale Factor] * (1 - %Misuse) * Pr_{fire} * 0.10}

where

%DPPL (20%) is the proportion of ATPs with DPPL

Scale Factor (1.5) is the assumed number of DPPL per Designated Person producer (or is otherwise a scaling factor for possible lower risk for DPPL producers versus PUPL producers).

4.4.5 Fire Outcome Social Cost – Status Quo

Three consequences of fire were assessed quantitatively:

A. Risk of Death from Fire

B. Risk of Injury from Fire

C. Property Damage from Fire

For 'risk of death from fire', the analysis used an estimate specific to fires that involved: a residential home, an electrical source of ignition, and faulty construction design or installation. This was estimated to be 0.28% (2000 data) [CCFMFC Annual Report – Fire Losses in Canada data]. The analysis used a Value of Statistical Life of $5.8M [Health Canada (2005)] in the event of a death being realized.

For 'risk of injury from fire', the analysis used an estimate specific to fires that involve: a residential home, an electrical source of ignition, and faulty construction design or installation. This was estimated to be 2.52% (2000 data) [CCFMFC Annual Report – Fire Losses in Canada data]. A willingness-to-pay (WTP) to avoid injury was estimated to be $13,300, based on healthcare costs associated with different forms of injury [as reported in Health Canada (2005)] with a scalar adjustment of 2.5 to adjust this health care cost to a WTP measure based on a rule-of-thumb used in some of the literature.

For 'property damage from fire', the analysis used an estimate specific to fires that involved: a residential home, an electrical source of ignition, and faulty construction design or installation. This was estimated to be $37,900 (2000 data) [CCFMFC Annual Report – Fire Losses in Canada data].

4.4.6 Status Quo - Fire Costs

For each of the fire events associated with PUPLs and DPPLs, the social costs associated with fires related to marihuana cultivation are given, in the Status Quo scenario over time, by:

$$(46)\quad \text{Fire Costs}(t) = [\text{House Fire}(t) * WTP_{damage}] + [\text{House Fire}(t) * Pr_{injury} * WTP_{injury}] + [\text{House Fire}(t) * Pr_{death} * WTP_{death}]$$

where:

WTP_{damage} = $37,903 i.e. the mean property damage per such fire

Pr_{injury} = 4.46%

WTP_{injury} = $13,300

Pr_{death} = 0.28%

WTP_{death} = $5.8M

The total fire costs for the Status Quo scenario are the sum of the Fire Cost for each of PUPL and DPPL.

The number of injuries and deaths for any year is rounded to the nearest integer value. A slight adjustment is made to the Pr_{injury} to reflect the non-integer part of the Pr_{death} so that, effectively, a 'partial death' is treated as an additional injury in the rounding related to the number of injuries.

4.5 Status Quo – Security Costs

The policy rationale for the proposed regulatory change involves a number of risks to public security, including: a) the threat of home invasion and violence to family members (including shooting) as a result of criminal 'grow-rip' from marihuana production activity under MMAR production license misuse; and b) the exposure to young children in the family to possible criminal activity which may have a lasting impact on such children.

For the purposes of the CBA, only the security costs associated with the risk of home invasion and violence to family members were quantified, as this is more tangible and has better data availability than the other risks. The broader security risks are addressed in the qualitative analysis section of this CBA (below).

4.5.1 Criminal Misuse of MMAR Production Licenses

One intended consequence of the proposed policy is to improve public security by removing from residential areas the locus of legal marihuana cultivation under MMAR (i.e., home cultivation under PUPL/DPPL). It is thought that some portion of PUPL/DPPL production licenses may be used as a 'cover' by persons who divert marihuana into the illicit market. This could take the form of:

a) growing an excess amount above what is legally permitted under the terms of the production license from Health Canada, which is subsequently sold or distributed illicitly; and/or

b) diverting some unconsumed amount of the marihuana grown within the permitted amount under the production license from Health Canada which is subsequently sold or distributed illicitly.

Health Canada Inspections

In 2010, Health Canada carried out inspections of PUPL/DPPL premises. Of 75 production sites identified: 27 persons answered the door (36%) and of these 15 allowed inspection (55%), while 12 did not allow inspection (45%). Therefore, based on this small sample (n=75), there were 16% of all residences that did not allow inspection and 45% of those residences for which a person was present at the time of the inspection.

Law Enforcement Review of Criminal Misuse

A consortium of 20 law enforcement agencies [RCMP (2010)], providing services to perhaps more than 75% of the Canadian population, reviewed 190 cases over a six- to seven-year

period in which police carried out an investigation of a residence for which a person held a valid MMAR production license (PUPL, DPPL)[16].

A review of the suspected 'misuse' cases (Figure 4.10) shows the number of cases reviewed by police. This is compared to the total number of PUPLs/DPPLs to show the 'observed' rate of MMAR misuse which varied from 1.5-3.0% over 2005-2010.

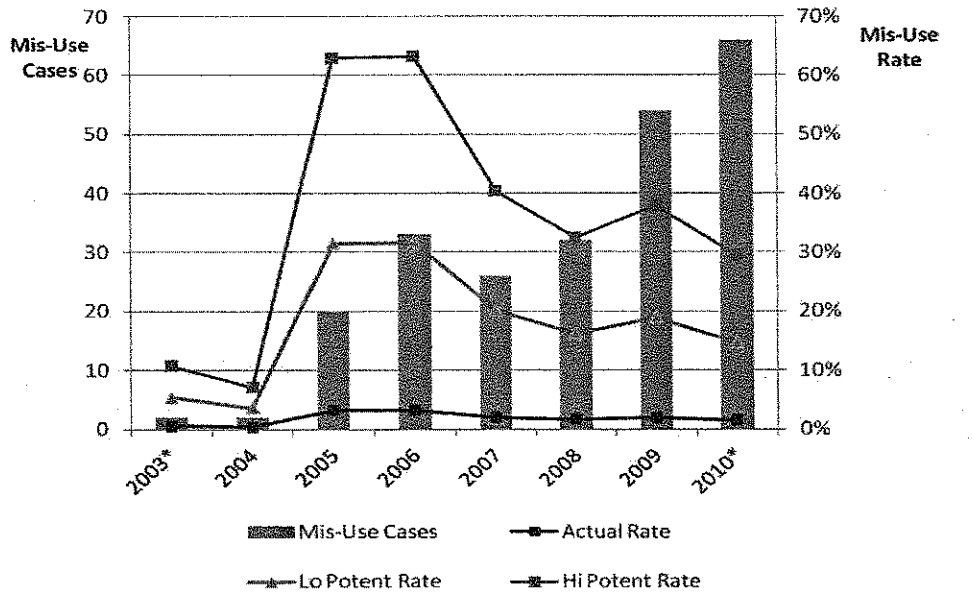
There is a low estimated rate of police detection for marihuana cultivation (i.e. grow operation). One BC study estimated this rate at 5% [Dandurand et al (2002)], while another study estimated the rate for Quebec at 2.5% [Bouchard (2007)]. If a higher (10%) rate of detection is assumed, this implies that the estimated rate of MMAR 'misuse' could be in the range of 15-30%. The lower rate of 5% detection would imply an estimated rate of MMAR 'misuse' in the range of 30-60%. When we use the average-per-year number of alleged misuse cases (29) and the average number of MMAR production licenses per year (1,653) for the 2003-2010 period and assume that there is a 5% probability of detection, it is estimated that about 36% of MMAR production licenses are 'likely' to be involved in misuse. The 36% 'misuse' rate reflects an average observed rate of 1.8% per year and an estimated 5% probability of detection. For purposes of sensitivity analysis, a misuse probability range from 25% to 45% was examined.

It was estimated [RCMP (2010)] that about 13% of Canadian adults have a criminal record. A police review of alleged MMAR misuse cases indicated that in about 50% of MMAR licenses involved in 'misuse' the person had a criminal record (n=67 of 134, with 1 ATP, 9 DPPL and 54 PUPL).

Some alleged MMAR misuse incidents involved the presence of weapons (n=16; 8%) or involved attacks and home invasion (n=16; 8%). There were 2 incidents (1%) where individuals were shot during a home invasion.

[16] The law enforcement agencies include: RCMP, OPP, SQ and municipal police in Toronto, Montreal, Vancouver, Ottawa, Calgary, Edmonton, etc.

Figure 4.10 – MMAR Misuse – Incidents Investigated By Police (2003-10)



Sources: RCMP (2010) and HC (website).
Data are adjusted for full year for 2003 and 2010.

The public security risks arising from 'misuse' under the MMAR relate to:

- Diversion of marihuana produced under PUPL/DPPL to the illicit market;

- Increased resources for law enforcement to address potential misuse – i.e., the need for additional evidence to support reasonable and probable grounds over and above the existence of a residential grow operation, since some operators are authorized and licensed to produce marihuana under the MMAR;

- The corrupting influence of illegal activity occurring in the residence on children residing there; and

- Threat of violence to family members from the potential targeting of the residence for armed robbery by other criminals who want to seize the drugs, profits or materials of crime.

With respect to the presence of children, the police reported that about 8% of MMAR 'misuse' involved the presence of children.

With respect to the threat of violence, the police reported that:

a) weapons were present in 8% of 'misuse' cases;

b) an attack or home invasion had occurred in 8% of 'misuse' cases; and

c) a person was shot during a home invasion in 1% of 'misuse' cases. It is not known whether these cases were all related (i.e., the weapons were necessarily related to the attack/home invasions).

Other data [Dandurand et al (2002)] found that a firearm was involved in about 3% of marihuana trafficking cases.

4.5.2 Social Costs Associated with Crime

Costs of Crime & Willingness-to-Pay to Avoid Crime

CBA techniques have been increasingly applied to crime reduction policy and evaluation of programs. The social cost of crime, or value per crime averted, is comprised of [Bowles (2010)]:

1) Victim costs: in terms of damage/replacement of property, health/care cost, loss of earnings, intangible quality-of-life aspects (i.e., WTP to avert pain and suffering);

2) Fear of crime costs: willingness to pay to avert possible crime in anticipation of future crimes (which may or may not be informed and rational); and

3) Criminal justice system costs: direct costs for police, courts, corrections etc.

Evidence from the United Kingdom (UK) suggests that (for all crime) the relative contribution of these three components is: 70% (victim costs), 5% (fear of crime) and 25% criminal justice system costs [UK-Home Office (2011)]. These components differ by type of specific crime.

There are various national level estimates of the overall 'cost of crime' that range from US$450-1,700B for the US (late 1990s), $40B for Canada (1993 estimate) and AU$35B for Australia (2005 data).

These estimates have been refined to the level of cost of crime by type of criminal offence. They generally rely on one of two types of methodologies:

a) 'Bottom-up' accounting of detailed cost (e.g., activity-based costing); or

b) 'Top-down' measures of individual (or social) willingness-to-pay be avert or avoid crime (or accept the harm caused by crime).

As in most fields where WTP approaches have been applied, the top-down estimates are often two (2) times higher (or more) than the bottom-up accounting estimates [Cohen (2010)].

Macro-econometric analysis [DiTella-MacCulloch (2008)] for the United States (US) found that an increase in the violent crime rate (from 242 to 388 assaults per 100,000 population) was equivalent to a 3.5% decrease in GDP per capita. This result, calibrated for US values for 2011, implied a WTP of US$1.15M to eliminate one violent crime.

4.5.3 Crime Prevention Costs - General

Out-of-pocket costs for the Canadian criminal justice system (1993) have been estimated at about $10 Billion [Federation of Canadian Municipalities (2000)] including the costs of police

services, the courts, legal aid and corrections. Evidence from the US and UK suggest that such costs represent perhaps 25% of the entire cost of crime when victim impacts and fear of crime are taken into account [National Crime Prevention Council (1996)].

4.5.4 Crime Prevention Benefits - General

Various United States studies have used stated preference methods to estimate the willingness to pay (WTP) to avoid crimes with estimates by specific types of crime. One study [Cohen et al (2004)] asked individuals to report their willingness to pay to reduce crime in their specific neighbourhood that implied marginal WTP to prevent crimes of about: US$25,000 per burglary, US$70,000 per serious assault, US$232,000 per armed robbery, US$237,000 per rape and sexual assault, and US$9.7 million per murder. As can be seen, these WTP measures have been estimated for serious crimes with clear victim impact.

Most drug crimes (especially drug possession and drug trafficking) are considered to have lesser victim impact. Drugs play into broader criminal activity when considering the criminal acts undertaken by certain drug addicts to meet their drug habit. One US estimate of the annual cost of crime attributable to each drug abuser is approximately US$60,000 [Miller et al (2006)]. Other US evidence [Cohen-Piquiero (2009)] indicates that the WTP to reduce drug-related crime among young adults is much lower (US$30,000 per crime) than for other types of crime such as aggravated assault (US$335,000 per crime), armed robbery (US$210,000 per crime) and murder (US$855,000 per crime) (2007 data).

The UK government produces standardized cost-of-crime estimates [UK-Home Office (2011)] for different types of crime. These vary from: GBP1.8 million per murder, GBP37,000 per sexual offence, GBP8,800 per robbery-personal, GBP3,900 per burglary in a dwelling to GBP1,750 for common assault.

4.5.5 Crime Costs - Drugs

One UK study [Dubourg-Pritchard (2007)] estimated that the social cost of illicit drug use was GBP15.4B (in 2003). The bulk (90%) of these costs was related to crime versus health costs (4%) and drug-related death (6%). The primary components of drug related crime costs were robbery/burglary (43%), fraud (32%) and shoplifting (12%). Drug arrests (in and of themselves) accounted for only 3.5% of all drug use costs (GBP540M). The UK analysis suggested a ratio of social costs of illicit drug use to street value of drug consumption of 3:1.

4.5.6 Security Cost Associated with Residential Cultivation Misuse

For the Status Quo scenario, two forms of MMAR 'misuse' were modeled:

- 20% was assumed to involve 'major' misuse in which production licensees grow more than the authorized amount and divert the excess to the illicit market; and

- 80% was assumed to involve 'minor' misuse in which operators act as retail traffickers for a small part of their marihuana cultivation.

This assumption was based on the 80:20 rule-of-thumb (i.e., 20% of inappropriate activity creates 80% of the social problem) and allowed the analysis to concentrate on the major

misuse, which, most importantly, is the activity that is assumed to increase the risk of home invasion and violence.

Four effects were examined that generate social welfare gains in the form of social willingness-to-pay to avoid the harm associated with crime related to the misuse of MMAR production licenses and the expected behavioural changes under the proposed Policy scenario.

a) Avoidance of Residential Misuse

b) Avoidance of Home Invasion

c) Avoidance of Non-Fatal Shooting

d) Avoidance of Fatal Shooting

In the analysis, event a) was applied to all 'major' and 'minor' misuse of MMAP production licenses. It was assumed that events b), c) and d) would apply only to the activity considered to be 'major' misuse of MMAR production licenses.

Data on social willingness to pay (WTP) (i.e., a 'top-down' measure) to avoid crimes has been estimated for the US [Cohen et al (2004)]. Similar data based on social costs (i.e. a 'bottom-up' measure) to avert crimes has been estimated for the UK [UK-Home Office (2011)]. To "convert" the social cost estimate to a WTP estimate[17] the analysis took an average of comparable estimates from the US and UK after adjusting for exchange rates[18]. Generally, in all cases the US and UK estimates were in the same order of magnitude.

a) Risk & Consequence of Residential Misuse

All MMAR misuse is considered to be residential misuse. There is no evidence in the literature as to a social WTP to avoid drug trafficking or to avoid marihuana cultivation in a residential area. Accordingly, the analysis did not include a value for this WTP in the absence of an estimate available in the literature.

b) Risk & Consequence of Home Invasion

Over the seven years of the police review of alleged MMAR misuse cases, there were 16 alleged cases of home invasion reported in relation to 190 police cases of alleged MMAR misuse. During those years, there was an average of about 1,650 MMAR production licenses and, based on the 36% misuse rate, about 595 estimated cases of misuse. On an annual basis, in terms of the probability of home invasion occurrence, this worked out to 0.38% per year per MMAR misuse. As all home invasion events were attributed in the CBA to major misuse, this worked out to a probability of 1.92% per major case of MMAR misuse.

[17] The analysis employed a rule of thumb adjustment factor of 2.0 so that the UK social cost estimates were multiplied by 2.0 to reflect WTP estimates.

[18] US$1.00 = CA$1.00 ; GBP1.00 = CA$1.30 (as of June 4, 2012).

For 'home invasion', the analysis used adjusted WTP estimates from the UK for 'robbery-personal' and the US for 'burglary' which averaged to $23,900 (US estimate of CA$25,000, UK adjusted estimate of CA$22,900).

c) Risk & Consequence of Non-Fatal Shooting

There were two (2) cases of shootings associated with home invasion reported in relation to the 190 police cases of alleged MMAR misuse. Represented as an annual probability, this is 0.048% per year per MMAR misuse. Since all shooting events were attributed in the analysis to major misuse, this worked out to a probability of 0.24% per year per major case of MMAR misuse. Data [Kleck (1991)] suggest that the probability of a fatality (given shooting) is 15%, so the probability of a non-fatal shooting would be 85% (given shooting).

For 'non-fatal shooting' the analysis used adjusted WTP estimates from the UK for 'serious wounding' and the US for 'serious assault', which averaged to $68,500 (US estimate of CA$70,000, UK adjusted estimate of CA$67,000).

d) Risk & Consequence of Fatal Shooting

For 'fatal shooting', the CBA used adjusted WTP estimates from the UK and US for 'murder' which averaged to $7.2M (US estimate of CA$9.7M, UK adjusted estimate of CA$4.7M). These WTP estimates for tragic, violent loss of life were much higher than the Canadian Statistical Value of Life, which is a WTP measure of death in normal circumstances.

4.5.7 Social Cost Associated with Residential Misuse – Status Quo

The social loss associated with residential misuse is given in the Status Quo scenario by:

(47) $\text{Social Loss}_{misuse}(t) = \text{ATP-P/D}(t) * Pr_{misuse} * WTP_{misuse}$

where:

ATP-P/D(t) = number of persons ATP-P and number of persons with ATP-D divided by a scale factor to allow for multiple DPPL.

Pr_{misuse} = 36%

WTP_{misuse} = $0

4.5.8 Social Cost Associated with Home Invasion – Status Quo

The social loss associated with home invasion is given in the Status Quo scenario by:

(48) $\text{Social Loss}_{invasion}(t) = \text{ATP-P/D}(t) * Pr_{misuse} * Pr_{major} * Pr_{invasion} * WTP_{invasion}$

where:

ATP-P/D(t) = number of persons ATP-P and number of persons with ATP-D divided by a scale factor to allow for multiple DPPLs.

Pr_{misuse} = 36%

Pr_{major} = 20% (conditional probability given misuse)

$Pr_{invasion}$ = 1.921% (conditional probability given major misuse)

$WTP_{invasion}$ = $23,900

4.5.9 Social Cost Associated with Non-Fatal Shooting – Status Quo

The social loss associated with non-fatal shooting is given in the Status Quo scenario by:

(49) $Social\ Loss_{non\text{-}fatal}(t) = ATP\text{-}P/D(t) * Pr_{misuse} * Pr_{major} * Pr_{shoot} * (1-Pr_{fatal}) * WTP_{non\text{-}fatal}$

where:

ATP-P/D(t) = number of persons ATP-P and number of persons with ATP-D divided by a scale factor to allow for multiple DPPLs.

Pr_{misuse} = 36%

Pr_{major} = 20% (conditional probability given misuse)

Pr_{shoot} = 0.240% (conditional probability given major misuse)

Pr_{fatal} = 15% (conditional probability given shooting)

$WTP_{non\text{-}fatal}$ = $68,000

Social Cost Associated with Fatal Shooting – Status Quo

The social loss associated with fatal shooting is given in the Status Quo scenario by:

(50) $Social\ Loss_{fatal}(t) = ATP\text{-}P/D(t) * Pr_{misuse} * Pr_{major} * Pr_{shoot} * Pr_{fatal} * WTP_{fatal}$

where:

ATP-P/D(t) = number of persons ATP-P and number of persons with ATP-D divided by a scale factor to allow for multiple DPPLs.

Pr_{misuse} = 36%

Pr_{major} = 20% (conditional probability given misuse)

Pr_{shoot} = 0.240% (conditional probability given major misuse)

Pr_{fatal} = 15% (conditional probability given shooting)

WTP_{fatal} = $7,190,000

4.5.10 Status Quo – Security Cost

For each of the security events associated with PUPL/DPPLs, the social costs associated with residential misuse, home invasions and non-fatal/fatal shootings are given in the Status Quo scenario over time, by:

$$(51)\quad \text{Security Cost}(t) = \text{Social Loss}_{misuse}(t) + \text{Social Loss}_{invasion}(t) + \text{Social Loss}_{non\text{-}fatal}(t) + \text{Social Loss}_{fatal}(t)$$

4.6 Status Quo – Summary of Benefits & Costs

Status Quo – Program Administration Costs

Health Canada – Program Administration Costs are from equation 22.

Compliance cost is given from equation 23.

Status Quo – User Benefits

User benefit is the sum of the Consumer Surplus measures for each of Government Supply (equation 32), Personal Use (equation 38) and Designated Person (equation 43) supply markets.

The Deadweight Loss (from the effective subsidy for the Government Supply) is given from equation 33.

There is no Producer Surplus in the Status Quo scenario.

Status Quo – Safety Costs

Safety cost is the sum of the Fire Costs (equation 46) for each of the PUPL and scaled DPPL supply.

Status Quo – Security Costs

Security cost is given from equation 51.

This concludes the discussion of the Status Quo scenario and measures to be calculated for the CBA. The next section addresses the Policy scenario that embodies the proposed Regulatory changes.

4.7 Policy – Transition Model (April 2014)

It is contemplated that, as of April 1, 2014, there will be a migration from the existing MMAP (Status Quo scenario) to the new (Policy scenario) regime for access to marihuana for medical purposes. This migration (transition) may take place in a number of ways.

The CBA model did not attempt to capture the complexity of the transition dynamics. Generally, the CBA focused on the 'steady state' of this transition process and the number of persons who will 'remain' in the regulated marihuana access regime and the number of persons who will choose an illegal supply source.

The reasons that persons who have been participating in the MMAP (prior to April 1, 2014) may choose to obtain marihuana from an illegal supply source are various and include:

- the supply cost of marihuana from LP may be too high;
- persons may prefer the control and quality of their own production; and
- persons may want to engage in illicit marihuana cultivation and distribution.

It has already been noted that some proportion (36%) of PUPL/DPPLs may involve misuse. Some 80% of ATP persons are associated with PUPL and DPPL production activities. The cost of legal supply through LPs will likely be higher than the supply cost for PUPL/DPPL production.

The CBA assessed the likely migration of persons from each of ATP-GS, ATP-O, ATP-P and ATP-D status to the new regime.

4.7.1 Policy Transition – Government Supply

In April 2014, the Status Quo scenario was forecast to have 1,823 KG-Demand for the Government Supply with an estimated 387 grams per year per full-time user[19]. One of the reasons for the relatively low usage rate for the Government Supply was the perceived quality of the cannabis strain used [Lucas (2009)]. In the Policy scenario, LP suppliers would be able to offer a variety of cannabis strains. It is therefore probable that, subject to affordability, the amount per person purchased could be different from this amount per year. The analysis, therefore, made an adjustment to the KG-demand that would be purchased at $5.00/gram (the Status Quo user price) before applying a model based on the operation of demand price elasticity.

Analysis [Kilmer-Pacula (2009)] suggests that heavy marihuana users consume about 1.2 grams per day +/- 0.4 grams. The analysis took 1.6 grams per day as the desired mean daily amount that a person would want to consume of marihuana. This would imply an annual

[19] This average is based on 1,823KG and 4,712 ATP-GS users. For this calculation, no consumption was attributed to persons on interim supply with new PUPL/DPPL production licenses.

consumption of 560 grams which, at $5.00/g, would cost $2,800 per year. This was felt to be affordable for the mean MMAP ATP person with a mean annual income of $30,000[20].

The base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for the initial number of persons with ATP-GS in April 2014 and at the Status Quo user price of $5.00 per gram, is given by:

(52) Base KG-GS(User Price) = ATP-GS(April 2014) * 560 grams / 1,000

For the establishment of the benchmark transition to the Policy scenario, it was assumed that the LP market price of marihuana would be $7.50/g[21]. This represents a 50% increase in price (over the Status Quo user price per gram). With an assumed price elasticity ε_p of -0.25, the quantity demanded would be expected to fall by 12.5%.

$$\%\Delta\text{Quantity} = \varepsilon_p * \%\Delta\text{Price}$$

Therefore, the base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for the initial number of persons with ATP-GS in April 2014 and at the higher LP market price of $7.50 per gram, would be:

(53) Base KG-GS(Market Price) = Base KG-GS(User Price) * (1 + %ΔQuantity-GS)

This equation captures the operation of the price elasticity, after a base adjustment for the different type of cannabis strains that will be supplied in the LP market. The operation of the price elasticity means that the quantity amount of marihuana has decreased as price rises. There are three ways in which, using a simple formula, this quantity reduction could be determined. The formula for the base quantity is:

Base KG-GS = User-GS * Days of Use * Quantity Per Day

The price elasticity effect could come about via some combination of changes in: a) the number of users; b) the number of days of use per year; and/or c) the mean quantity per day of use. For simplicity, the analysis assumed that there is no change in the number of days of use per year, so the above equation reduces to:

%ΔQuantity-GS = %ΔUser-GS + %ΔQuantity Per Day-GS

In order to assess the affordability of the quantity per day at the LP market price, the Proportion of Mean Annual Income (pre-tax) that would be comprised of marihuana purchases was computed. This proportion is:

%Annual Income = [Days-of-Use * Quantity-per-Day * Market Price] / Mean Income

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[20] Lucas (2009) reports an income distribution for a sample of MMAP users that implies a mean annual income of about $30,000, although 30% report earning less than $20,000 per year. At $5.00/gram, the expenditure of $2,800 per year would account for about 9% of pre-tax individual income.

[21] The reasonableness of this estimate was assessed in terms of an equilibrium model of Supply and Demand in the LP market for marihuana (see below). Effectively, the study assumed that ATP persons in the Transition face an *ex ante* expected user price of $7.50/gram which may be slightly more or less than the *ex post* realized price in LP market equilibrium when supply and demand interact.

In the CBA model, if the annual cost per user did not exceed $4,500 (i.e., 15% of mean annual income of $30,000), all of the price elasticity effect was ascribed to a reduction in the number of users. Conversely, if the annual cost per user did exceed $4,500, some proportion of the price elasticity was allowed to reduce the quantity per day so that the percentage of mean annual income required did not exceed 15%.

Various studies have shown that, with co-payment (usually 20% of private prescription drug costs), the annual amount spent on certain prescription drugs or treatment can be up to 17% of annual family income [Canadian Cancer Society (2009), Canadian Diabetes Association (2010)]. The out-of-pocket costs of new cancer drugs can be up to $13,000 per year and for Type I diabetes drugs and insulin pump up to $4,700 per year.

The Quantity per Day in the Policy scenario, for persons on Government Supply (as of April 2014), is calculated as:

(54) Quantity/Day-GS = MIN{1.6, [Mean Annual Income * Max % of Income / 350

/ $7.50]}

In the Reference case, the effective minimum of the right-hand side was 1.6 grams per day. This equation allows, in the sensitivity analysis for a lower assumption as to maximum percentage of income, for the amount to be less than 1.6 grams per day.

The %ΔQuantity Per Day can therefore be calculated as:

(55) %ΔQuantity/Day-GS = [Quantity/Day-GS - 1.6] / 1.6

The %ΔUser-GS can therefore be calculated as:

(56) %ΔUser-GS = %ΔQuantity-GS - %ΔQuantity/Day-GS

The number of users in the Policy scenario, for persons formerly on Government Supply (as of April 2014), is calculated as:

(57) Users-GS(Market Price) = ATP-GS(April 2014) * (1 + %ΔUsers-GS)

Equations 53 and 57, therefore, represent the KG-Demand and the number of users in the Policy scenario that would result from the transition from the Status Quo for persons formerly on the Government Supply.

4.7.2 Policy Transition – Other (Government Supply)

There was the same number of persons with ATP-G who did not access the Government Supply (i.e., ATP-O) as those who accessed the Government Supply (ATP-GS) in the Status Quo as of April 2014. The analysis did not count their consumption for the Consumer Surplus measure, as there was no indication as to where the marihuana was obtained.

In the Policy scenario, such persons might start to obtain marihuana from the LP supply, provided that the LP market price was at or below the price prevailing in the illicit market. The

rationale for this switch is that the cannabis strains and quality are likely to be diverse in the LP market and should be comparable to those currently available in the illicit market.

The analysis assumed that these persons would generally consume at the same level of daily usage, at the LP market price, as the persons formerly reliant on the Government Supply, provided that the LP market price was below that of the illicit market price. However, as they would likely experience a decrease in their supply price, they might be able to afford an increased amount per day.

The logic flow for this component of the transition is reversed from that for the above component. Provided that the LP market price is less than the illicit market price, it is possible to calculate the %ΔPrice experienced by these users as:

(58) %ΔPrice-O = [LP-Price – Illicit Price] / Illicit Price

The associated %ΔQuantity can therefore be calculated as:

(59) %ΔQuantity-O = ε_p * %ΔPrice-O

The additional quantity consumed is reflected in a higher Quantity/Day, while the number of users is kept constant:

(60) %ΔQuantity/Day-O = 1.60 + (1 + %ΔQuantity-O)

Therefore, the base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for the expected number of persons with ATP-O who will transition to the LP market at the lower LP market price of $7.50 per gram, is expected to be:

(61) Base KG-O(Market Price) = ATP-O(April 2014) * * 350 * (1 + %ΔQuantity/Day-O).

The Number of Users in the Policy scenario, for persons formerly in Other Supply (as of April 2014) is calculated as:

(62) Users-O(Market Price) = ATP-O(April 2014)

Therefore, equations 61 and 62 represent the KG-Demand and Number of Users in the Policy scenario that result from the transition from the Status Quo for persons formerly on Other Supply.

4.7.3 **Policy Transition – Personal Use**

Persons with PUPL who are ATP-P in April 2014 must decide whether to switch their use to the legal supply from the LP market. This is the only option for these persons to access a legal supply of marihuana for medical purposes.

There are two aspects to the transition of persons who formerly held PUPLs (and DPPLs) that make this process more complicated:

- Some proportion (36%) of these persons is likely engaged in some form of misuse (based on police data) and may want to continue that activity in the future; and

- Some other proportion of these persons may feel 'entitled' to continue to cultivate own-use marihuana, even if not involved in misuse in terms of otherwise supplying the illicit market – such entitlement may arise from civil disobedience in reaction to a change in their previous legal authorization to produce.

In the first case, the 'economics of crime' must be considered in terms of the relative, risk-adjusted rewards and penalties associated with illicit behaviour. It is still necessary to differentiate between the scale of operation involved in this form of marihuana cultivation from the normal 'grow-op' because the locus of production is the family residence in the presence of family members.

In the second case, allowance is made for some proportion that may opt out, based on their perceived right to grow marihuana for their own use.

Economics of Residential Misuse

The analysis applied a model of rational criminal activity based on Canadian studies [Desroches (2005), Dandurand et al (2002), Bouchard (2007), Easton (2004)]. It is important to distinguish between residential misuse marihuana cultivation and 'grow-op' activity. While these share some similarities, what is different about residential misuse is the presence of family members. Grow-op houses are usually dedicated to marihuana cultivation and operated by paid employees or persons who share the criminal proceeds of the operation.

One study [Dandurand et al (2002)] of British Columbia marihuana trafficking over a four-year period found that there was a very low (5%) risk of a grow operation coming to the attention of police. In terms of the consequence of police detection, the biggest risk was seizure of plants and other assets for evidence (pr=100%), followed by charges laid (pr=85%), conviction of at least one suspect in the case (pr=63%), the payment of a fine (pr=25%) and prison sentence (pr=17%). The average prison term upon conviction was 2.5 months and the average fine was $1,000[22].

One study [Bouchard (2007)] of Quebec marihuana cultivation over a seven-year period found that there was a very low (2.5%) risk of arrest per offender at risk (for indoor hydroponic cultivation). The study estimated the number of marihuana cultivation operations in Quebec, which was extrapolated using a growth rate per year of 16% to derive an estimate of about 60,000 grow operations in 2012. There are probably less than 1,000 PUPLs/DPPLs in Quebec, so the contribution of MMAR 'misuse' to the overall marihuana cultivation activity level is minimal (less than 1%, assuming that perhaps 36% of PUPL/DPPL activity involves 'misuse').

There could be several reasons why marihuana cultivation under the MMAR is such a small share of overall activity:

a) It requires identifying a residence and producer to Health Canada (which police can access under certain conditions); and

[22] Note that probabilities and magnitude of both fines and prison sentences likely have changed as a result of recent amendments to the law. The magnitude of any such changes could not be assessed at this time and therefore historical values were used for the purposes of the analysis.

b) It generally involves a residence where people live, whereas commercial-scale illicit grow-ops involve much larger scale production than can be accommodated in a family residence also used for the benefit of the family.

Scale of Residential Misuse Marihuana Cultivation

This analysis assumed that the scale of marihuana cultivation for residential misuse is less than that for a grow-op.

The mean number of permitted plants under MMAR-PUPL, based on the mean Proposed Daily Amount of 7.6 grams, is 37 marihuana plants. These are expected to yield 30 grams of dried marihuana but also have a wastage factor of 1.2 so that the effective yield is actually 25 grams per plant per harvest. The yield is based on a 120-day harvest cycle and three (3) harvests per year. The mean PUPL producer, keeping to the maximum allowable number of plants and MMAR yield and harvest assumptions, would produce about 2.8KG of dried marihuana.

Yield per Year = Plants * Yield/Plant/Harvest * Harvest/Year

In terms of the expected actual marihuana consumption of such a person, the CBA used an estimate of about 4.2 grams per day, which comes, for 350 days per year of use, to about 1.5KG of consumption. It is possible that actual consumption accounts for the entire production or that production is scaled to meet consumption for own use.

For the 64% of persons who are not involved in any misuse, it was assumed that there is no illicit distribution of any excess production capacity. For the 36% of persons involved in MMAR misuse it was assumed that they are engaged in illicit marihuana distribution.

Minor Misuse (80%)

For 80% of misuse cases, it was assumed that that such misuse is minor in scale. As described below, some parameters were then applied to this activity to estimate the likely returns and risk associated with that activity.

Minor Misuse - Rewards

For minor misuse, this study assumed that the maximum number of plants would be kept at the legal limit (37) and that the yield would be higher (60 grams per plant per harvest) with a 90-day cultivation cycle and four (4) harvests per year. These parameters seem reasonable in relation to actual criminal evidence from grow-op activity [RCMP (2010)].

This would allow for the production of 8.9KG of dried marihuana against estimated personal consumption of 1.5KG, leaving 7.4KG of excess production available for illicit distribution. Data suggests that wholesale distribution [RCMP (2010)] by the pound generates about $2,800 (or $6.17/gram), so that the estimated sales value of the excess production is about $45,000.

This sales revenue is comparable to about half the sales revenue for a British Columbia grow operation [Easton (2004)]. Allowing the same supply cost per gram as for PUPL production generates an estimated gross margin (over costs) of about $40,000. This represents the 'reward' from criminal activity (for minor misuse).

The reference case reward for minor misuse (PUPL) is given in the Policy User Transition by:

(63) Reward-Minor = {[(Plants * Yield/Plant * Harvest/Yr) – Use/Yr]

* Wholesale Price/Gram} – Supply Cost/Yr

Minor Misuse - Risks

Probabilities [Dandurand et al (2002)] were available for the risk of detection, seizure, charges laid, conviction and receipt of fine or prison sentence. The analysis assumed various economic losses as a result of uncertain events occurring for the criminal activity. The study assumed the following values of economic loss: seizure ($50,000[23]), facing charges ($5,000[24]), fines ($1,000[25]) and prison ($9,000[26]).

An important parameter in the model is the aforementioned requirement for additional evidence as evidence of the mere presence of residential cultivation associated with an MMAR production license will generally be insufficient grounds for obtaining a warrant to search the premises. The result has been, according to law enforcement officials, that police resources are not as effective as they might be in terms of resulting law enforcement actions when there is suspected misuse of such MMAR licenses.

In the CBA model, this effect was introduced by assuming that cases of MMAR misuse faced a 2.5% probability of detection by police and that the probability of police action (given police detection) is reduced by a factor of 75% from its base probability value of 80% [Dandurand et al (2002)]. Therefore, the effectiveness of law enforcement to address MMAR misuse impacts on a lower probability of detection and a lower probability of police action, given police detection.

The analysis assumed that minor misuse does not attract home invasion and 'grow-rip' type robbery by other criminal elements as the scale of misuse is relatively minor. This risk was reserved for major MMAR misuse of residential cultivation.

Based on compound probabilities of law enforcement actions and consequences, an expected value of loss for minor misuse (PUPL) in the Policy User Transition was estimated as:

(64) $\text{Risk-Minor} = [\text{Minor-Misuse} * Pr_{detection} * Pr_{action} * (1 - \text{Enforcement Clarity}) * Pr_{found}]$

$* \{[Pr_{seizure} * \text{Loss-Seizure}] + [Pr_{report} * Pr_{charge} * \text{Loss-Charge}] +$

$[Pr_{convict} * \{(Pr_{fine} * \text{Loss-Fine}) + (Pr_{prison} * \text{Loss-Prison})\}]\}$

where

Minor-Misuse = ATP-P(Apr 2012) * 36% * 80%

[23] Based on the annual revenue * (1+.10) with an adjustment for the value of seized materials and supplies.
[24] Assumed as an inconvenience (value of time) factor with or without legal fees (which may be by a public defender).
[25] From Dandurand et al 2002.
[26] Based on 2.5 months sentence from Dandurand et al 2002 with hourly wage of $25 for 35 hours per week and 4.1 weeks per month.

$Pr_{detection}$ = probability of police detection (given misuse) = 2.5% (under MMAR)

Pr_{action} = probability of police action (given detection) = 80%

Enforcement Clarity = reduction in Pr_{action} as a result of MMAR = 75%

Pr_{found} = probability of case found (given action) = 95%

$Pr_{seizure}$ = probability of police seizure (given case found) = 100%

Loss-Seizure = expected economic loss from police seizure = $50,000

Pr_{report} = probability of report to Crown Prosecutor (given seizure) = 87%

Pr_{charge} = probability of charges laid (given report to Crown) = 98%

Loss-Charge = expected economic loss from facing charges = $5,000

$Pr_{convict}$ = probability of conviction (given charges laid) = 73%

Pr_{fine} = probability of fine imposed (given conviction) = 39%

Loss-Fine = expected economic loss from fine = $1,000

Pr_{prison} = probability of prison sentence (given conviction) = 42%

Loss-Prison = expected economic loss from fine = $9,000

In the Reference case, the expected loss from police action and criminal justice sanctions was about $270 and largely the result of police seizure.

Minor Misuse – Opportunity Cost

In addition to the supply cost of marihuana production, the analysis also accounted for the opportunity cost of time spent on criminal activity (in terms of additional cultivation time, transaction time and overhead for running of the illicit enterprise). A proportional value of this time relative to a target annual income ($60,000) for a work-year of 1,800 hours (i.e., $33.33/hour) was applied. For minor misuse this opportunity cost was roughly $4,700.

Minor Misuse – Net Expected Return

In the Reference case, the net expected return for minor misuse was about $35,800 and represents an expected rate of return of about 370% over the expected costs of activity (excluding loss from risks).

Minor Misuse – Compensation for Risk

The analysis also considered risk sensitivity, as people are generally risk-adverse. The analysis conceptualized risk sensitivity in terms of the ratio of the expected rate of return to some risk threshold rate of return, which reflects the expected value of loss from risks. The rationale is

that most people care about the absolute level of risk they bear and want a very high return to compensate them for such risk. For the purposes of the CBA, it was assumed that persons engaged in illicit activity want a minimum ten (10)-fold return to compensate them for illicit undertakings. In the reference scenario, the minimum expected return for minor misuse was estimated to be 28%.

Minor Misuse – Reward-to-Risk Multiple

In the Reference case, the expected rate of return (370%) was about thirteen (13) times higher than the minimum expected return for misuse (28%). This reward-to-risk multiple suggests that persons engaged in MMAR minor misuse would appear to be very comfortable in terms of the reward-to-risk profile (under the Status Quo scenario parameters).

If, with the Policy scenario, a marked change is seen in the reward-to-risk multiple, it would be reasonable to expect a reduction in illicit activity. This reflects a form of risk elasticity, for which it is possible to infer some value to generate behavioural change that should result from gaining more clarity under the MMAR (in terms of a higher probability of police detection of potential misuse and a higher probability of police action, given police detection).

The same calculations for major misuse, which also invites the risk of home invasion and 'grow-rip' theft by other criminal elements, are described below. The absolute dollar value of illicit reward was much higher for major misuse but the expected rate of return in the Reference case was lower (305%) and the minimum expected return for major misuse (based on the risk profile and losses) was estimated to be 128%. Therefore, the reward-to-risk multiple was much lower (2.4) for major misuse. However, this multiple is still economically attractive.

Deterrence Effect on Residential Misuse

In terms of the economically rational effect of crime prevention and deterrence on illicit activity, the analysis used a result for the US [Chang et al (2008)] which estimated that a 10% increase in the probability of criminal conviction for drug trafficking/production would decrease the number of active dealers by 0.26%. This implies a 'conviction elasticity' ($\varepsilon_{convict}$) of -0.026.

$$\varepsilon_{convict} = \%\Delta\text{persons involved in cultivation} / \%\Delta Pr_{convict}$$

Using Canadian parameters and the CBA effect of addressing the current need for additional evidence through the policy scenario (equation 62), the cumulative $Pr_{convict}$ for the Status Quo reference case is:

$$Pr^{SQ}_{convict} = Pr^{SQ}_{detect} * Pr_{action} * (1 - \text{Enforcement Clarity}) * Pr_{found} * Pr_{report} * Pr_{charge} * Pr_{convict}$$

$$= 0.296\% \text{ (for the Status Quo reference case)}$$

With the clarifying effect (removing the need for additional evidence), the Pr^{POL}_{detect} increases and results ina higher $Pr^{POL}_{convict}$:

$$Pr^{POL}_{convict} = Pr^{POL}_{detect} * Pr_{action} * Pr_{found} * Pr_{report} * Pr_{charge} * Pr_{convict}$$

$$= 2.365\% \text{ (for the Policy reference case)}$$

The impact in terms of the number of persons involved in illicit misuse (residential marihuana cultivation, formerly associated with MMAR production licenses) is given by:

(65) $\%\Delta$persons involved in cultivation = $\varepsilon_{convict} * \%\Delta Pr_{convict}$

where

$\varepsilon_{convict}$ = -0.026 * {[2.365% - 0.296%] / 0.296%}

= -0.026 * 700% = -18%

Therefore, one would expect there to be 18% fewer persons involved in residential marihuana cultivation as a result of the higher probability of detection and greater policy action effectiveness from the removal of valid MMAR residential production licenses (PUPL/DPPL).

The analysis assumed that this effect would be experienced for major misuse activity. As it is likely that persons involved in minor misuse are more risk adverse than persons involved in major misuse, the analysis assumed that the elasticity response for minor misuse would be twice (two times) that of major misuse.

Equation 62 is therefore estimated using $\varepsilon^{major}_{convict}$ = -0.026 and $\varepsilon^{minor}_{convict}$ = -0.052. These assumptions were tested in terms of the sensitivity of CBA results.

The number of persons who will cease their residential marihuana cultivation in the Policy transition (due to the clarifying effect of removing the need for additional evidence in enforcement) is given by:

(66) Cease = Misuse (major or minor) * $\%\Delta$persons involved (major or minor)

The number of persons who will continue their residential marihuana cultivation in the Policy transition (despite the 'enforcement clarity' effect) is given by:

(67) Continue = Misuse (major or minor) * [1 + $\%\Delta$persons involved (major or minor)]

Opting-Out for Residential Producers with No Misuse

The analysis also contemplated the possibility that persons who produce marihuana in the Status Quo scenario with no misuse (i.e., strictly for their own consumption) might opt out of the Policy scenario regime, and continue their own production illegally. These are people who were law-abiding in the Status Quo scenario (i.e., legal marihuana cultivation) but who might exercise civil disobedience in the Policy scenario through illegal marihuana cultivation at a small scale and without illegal marihuana distribution or sales.

In the Reference case, it was assumed that the Opt-Out Rate for such non-misuse PUPL users would be 0% (i.e. there is no civil disobedience). However, the sensitivity analysis allowed for a rate up to 20% of such persons.

The number of formerly ATP-P persons who are considered in terms of the Price Elasticity effect as still being in the market, ATP-P*, is given by:

(68) $\text{ATP-P}^* = \text{ATP-P(April 2014)} - \text{Cease}_{(minor)} - \text{Cease}_{(major)}$

$$- [\text{ATP-P(April 2014)} * (1 - .36) * \text{Opt-Out Rate}]$$

Once the persons who, despite the 'enforcement clarity' effect, will continue to engage in residential marihuana cultivation have been removed, the number of persons who are likely to be involved in the Transition to the new Policy regime can be calculated. It is then necessary to take into account the operation of the Price Elasticity of Demand as it affects these people.

The reference Price Elasticity of Demand $\varepsilon_p = -0.25$ and represents the %ΔQuantity in response to a %ΔPrice (ceteris paribus[27]). The situation of the regulatory change involves more than just an effective price change, as it represents a policy change and declaration of a formally legal activity as illegal. As discussed above, persons who were formally (and legally) cultivating marihuana for their own use (with no misuse) are expected to cease this activity as it is no longer considered legal. The analysis separately allowed for some Opt-Out Rate.

The %ΔPrice experienced by these users is given by:

(69) %ΔPrice-P = [LP-Price – Own Supply Cost] / Own Supply Cost

which, for an initial LP Price of $7.50 and an Own Supply Cost of $1.80, gives a %ΔPrice-P of 317%.

The operation of the price elasticity is given by:

(70) $\%\Delta\text{Quantity-P} = \varepsilon_p * \%\Delta\text{Price-P}$

The %ΔQuantity-P in the reference scenario is -79%. As the Status Quo scenario initial quantity demand (Personal Use) was 41,365KG, this means that the Policy Transition Quantity-P (after the price elasticity effect) will be 8,618KG (i.e. 41,365 * (1 + %ΔQuantity-P).

It is then necessary to assign this %ΔQuantity-P to either %ΔUser-P or %ΔQuantity/Day-P, and to again check to see if the Status Quo Quantity/Day is affordable in relation to Mean Annual Income (as in equation 54).

The Quantity per Day in the Policy scenario, for persons who were on Personal-Use Supply (as of April 2014) is calculated as:

(71) Quantity/Day-P = MIN{4.18, [Mean Annual Income * Max % of Income / 350

$$/ \$7.50]\}$$

In the Reference case, the effective minimum for Quantity/Day-P is 1.7 grams per day. This means that, relative to the Status Quo Quantity/Day-P (4.18 grams), the %ΔQuantity/Day-P is -59%.

[27] Ceterus paribus (roughly 'all other things unchanged') is the assumption used in partial equilibrium analysis.

The number of User-P is calculated as:

(72) User-P = MIN{(ATP-P*), [(Quantity-P * 1,000) / (350 * Quantity/Day-P)]

Where

ATP-P* from equation 68

Quantity-P is the resulting quantity demanded after the operation of the Price Elasticity of Demand; and

Quantity/Day-P is the result from equation 71.

It is then possible to calculate the %ΔUser-P as [(User-P – Base User-P) / Base User-P]. In the reference scenario, the %ΔUser-P is -49%.

Therefore, the base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for the expected number of persons with ATP-P who will transition to the LP market at the higher LP market price of $7.50 per gram, would be expected to be:

(73) Base KG-P(Market Price) = ATP-P*(April 2014) * (1 + %ΔUser-P) * 350 * Quantity/Day-P

The number of users in the Policy scenario, for persons formerly in Personal-Use Supply (as of April 2014) is calculated as:

(74) Users-P(Market Price) = ATP-P*(April 2014) * (1 + %ΔUsers-P)

Equations 73 and 74, therefore, represent the KG-Demand and number of users in the Policy scenario that result from the transition from the Status Quo for persons formerly on Personal-Use Supply.

4.7.4 Policy Transition – Designated Person

The analysis considered a transition model for Designated-Person use in a similar manner. Here the situation differed slightly, as the persons consuming the marihuana are different from the persons producing the marihuana. The same reasoning (logic and equations) holds for such persons engaged in DPPL production. Here again it was assumed that the mean DPPL producer supplies for two ATP-D persons. The number of allowable marihuana plants is higher (44), as the Proposed Daily Amount mean is higher (9.0 grams).

Equations 63-67 apply for DPPL producers, resulting in an estimate of the number of persons who cease and continue producing marihuana. Although it not possible to know if the locus of production is a residence, for the purposes of the CBA of safety and security benefits this assumption is made for simplicity.

The number of persons who will cease their residential marihuana cultivation in the Policy transition (due to the law enforcement effect) is given by:

(75) Cease = Misuse (major or minor) * %Δpersons involved (major or minor)

The number of persons who will continue their residential marihuana cultivation in the Policy transition (despite the law enforcement effect) is given by:

(76) Continue = Misuse (major or minor) * [1 + %Δpersons involved (major or minor)]

When the shift is made from DPPL producers to ATP-D consumers, it is not possible to assume that the consumers whose producer is prepared to supply them illicitly will continue to source their marihuana requirements from these illicit producers. This is not an automatic result, as producers and consumers in the DPPL/ATP-D relationship may have different preferences, risk tolerances and other characteristics. The analysis assumed that all persons who held ATP-D authorizations would seek legal sources of supply.

The number of ATP-D persons who were considered as potential Policy scenario users (ATP-D*) was calculated as:

(77) ATP-D* = ATP-D(April 2014)

The price elasticity effect was then applied to these persons.

In the reference case, the %ΔPrice-D is 142% (from $3.10 to $7.50 per gram) and the operation of the Price Elasticity of Demand (ε_p = -.25) requires that the %ΔQuantity-D is -35%. This %ΔQuantity-D must then be assigned to either %ΔUser-D or %ΔQuantity/Day-D. Then, a check must be made to see if the Status Quo Quantity/Day is affordable in relation to Mean Annual Income (as in equation 71). Generally, the same result (as for Personal Use) will apply, so the Quantity/Day-D is 1.7 grams per day, which is a -59% change from the Status Quo scenario.

As the percentage change arising from the affordability condition (-59%) exceeds the required Price Elasticity of Demand required change in quantity demanded (-35%), there is no required change in the number of users (i.e. %ΔUsers-D = 0%). The affordability condition demands that the price response actually exceeds the ε_p = -.25 requirement. This is why the price elasticity in the Policy scenario often exceeds that for the Status Quo scenario.

As above (for ATP-P transition), the analysis estimated the base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for the expected number of persons with ATP-D who will transition to the LP market at the higher LP market price of $7.50 per gram, to be:

(78) Base KG-D(Market Price) = ATP-D*(April 2014) * (1 + %ΔUser-D) * 350 * Quantity/Day-D

The Number of Users in the Policy scenario, for persons formerly in Designated-Person Supply (as of April 2014) is calculated as:

(79) Users-D(Market Price) = ATP-D*(April 2014) * (1 + %ΔUsers-D)

Equations 78 and 79, therefore, represent the KG-Demand and number of users in the Policy scenario that result from the transition from the Status Quo for persons formerly on Designated-Person Supply.

4.7.5 Policy Transition – All Users

It is possible to compute, based on the behavioural responses of producers and consumers, what the base level of demand (at an expected Market Price of $7.50/gram) would be across all users and taking into account the likely continued misuse/desire to continue illicit marihuana production and the likely operation of a price elasticity of demand. This gives a first look at the scale of the LP market demand (as of April 2014).

The base annual quantity of marihuana (in KG) that would be consumed in the Policy scenario, for all persons expected to transition to the LP market at the expected LP market price of $7.50 per gram is given by:

(90) Base KG(Market Price) = Base KG-GS + Base KG-O + Base KG-P + Base KG-D

The Number of Users in the LP market at the expected LP market price of $7.50 per gram is given by:

(91) Users(Market Price) = Users-GS + Users-O + Users-P + User-D

The scale of the expected LP market (as of April 2014) at an expected LP market price of $7.50 per gram is 19,385KG for 32,623 users, each consuming a mean of 594 grams per year (or 1.70 grams per day for 350 days per year) at an annual user cost of $4,460. This is the Reference case that was used to estimate the evolution of the LP market over time in the Policy scenario.

The analysis calculated an Implied Price Elasticity, based on the transition from the Status Quo to the Policy scenario and taking into account the options to 'opt-out' of the Policy Regime by illicitly cultivating marihuana for own use.

(92) Transition ε^{*}_{p} = {[KG(Market Price) - KG(User Cost)] / KG(User Cost)}

/ {[Market Price - User Cost] / User Cost}

where

KG(Market Price) = Base KG-Demand at LP Market Price (April 2014)

KG(User Cost) = Base KG-Demand at User Cost (as in Status Quo) (April 2014)

Market Price = $7.50/gram * 1,000 (this study's assumed estimated LP Market Price)

User Cost = $2.60/gram * 1,000 (from weighted average in Status Quo)

The last value is a weighted average of User Costs from ATP-GS, ATP-O, ATP-P, and ATP-D who all face different User Costs in the Status Quo scenario.

For the Reference case, the value of the Implied Price Elasticity is -0.36. This is higher than the initial Price Elasticity-Status Quo assumption (-0.25) as it explicitly allows for choosing to 'opt-out' of the Policy Regime. For the purposes of estimating Consumer Surplus in the Policy scenario, the analysis estimated the Intercept-D (Price Intercept of the Demand Curve) using the Price Elasticity of Demand which is computed in the Policy Transition model.

The Implied Grams Per Year-Policy is estimated using the KG (Market Price) and Users (Market Price) as:

(93) Grams/Year-POL = KG(Market Price) * 1,000 / Users(Market Price)

Implied Annual User Cost-POL is estimated as:

(94) Annual Cost-POL = Grams/Year-POL * Market Price

The Implied Grams Per Day-Policy is estimated using the Implied Grams Per Year-Policy as:

(95) Grams/Day-POL = Grams/Year-POL / 350

4.8 Policy – Demand Curve

The analysis again assumed that the Demand Curve is linear in the Policy scenario, the same assumption used in the Status Quo scenario. From the Transition Model (April 2014), an initial point on the Demand Curve-Policy was estimated, based on an expected LP Price of $7.50/gram.

The equilibrium LP Market Price is known when both a Demand and Supply curve estimate for the LP Market (Policy scenario) are obtained.

1. *Demand Curve – Intercept*

From equations 90 and 91 there is a point on the Demand curve (in April 2014) of (Market Price, KG(Market Price)) or ($7,500, 19,385) when expressed as a Price/KG and KG-Demand. The calculated Price Elasticity of Demand (Policy) is -0.36. As above (equations 27 and 28), it is therefore possible to estimate, for a linear Demand curve, the Intercept-D and Slope-D.

The Demand curve intercept in the Policy scenario is given by:

(96) Intercept-D = Market Price * [1 – (1.0 / ε^*_p)]

As there are now two points of the Demand curve (the y-axis intercept) and the estimated transaction point (Market Price, Base KG) the Demand curve slope (which is negative as the curve is downward-sloping) can be calculated.

2. *Demand Curve - Slope*

The Demand curve slope (for the Policy scenario at April 2014) is given by:

(97) Slope-D(April 2014) = [Market Price – Intercept-D] / KG(Market Price)

For the Reference case, these values are: Intercept-D = $28,335 and Slope-D = -1.07. It is known that, as the market expands in scale over time, the value of the Slope-D will fall (in absolute terms) in order to be linear with a constant Price Elasticity over time. This was the case for the Status Quo model.

The Demand curve for the LP Market assumed an instantaneous switch from the Status Quo to the Policy scenario as of April 2014. This is unrealistic, as the complexity of Policy Transition would likely occur over a 6- to 18-month period. As the CBA is intended to look at the long-term (10 year) 'steady state' impact of the Policy scenario, the complexity of the actual transition process is ignored for simplicity.

The model logic and results must now be applied from the Policy Transition to forecast the future evolution of Potential Demand Users over time.

From the Policy Transition, it was estimated that 15% of ATP-Persons in April 2014 would 'opt out' of the new Policy regime and access their marihuana from illicit sources, mostly from own-production that is now illegal (i.e., 6,844 Users 'Opt Out' from 47,123 assumed ATP-Persons).

From the Policy Transition, it was estimated that 16% of ATP-Persons in April 2014 would be 'priced-out' of the new Policy regime at the estimated LP Market Price of $7.50/gram (i.e., 7,656 User 'Priced Out' from 47,961 assumed ATP-Persons[28].

These probabilities were used as a constant over time to remove persons from the stream of Potential Policy User*, which is given by:

(98) $\text{Policy User}^{*}(t) = \text{Policy User}^{*}(t-1) + \{\text{New Entrants}(t) * [1 - Pr_{optout}] * [1 - Pr_{priceout}]\}$

where

New Entrants(t)	= ATP(April)(t+1) - ATP(April)(t) for April values of ATP numbers in the Status Quo over time between any two Fiscal Years.
Pr_{optout}	= the probability of Potential Policy Users to 'opt-out' of the Policy regime
$Pr_{priceout}$	= the probability of Potential Policy Users to be 'priced-out' of the Policy regime

[28] This study applies the 'price-out' effect against an estimated Market Price of $7.50 per gram. Subsequently, in a model of demand/supply equilibrium in the LP market, the study will determine an equilibrium price which may be greater than $7.50 per gram. The analysis does not estimate a further price elasticity effect should the equilibrium price be greater than $7.50 per gram. This was done to segment the analysis and provide simplicity.

In order to compute the Demand curve Slope over time, for the Policy scenario, it is necessary to estimate some position on the Demand curve over time. There is the constant Intercept-D which we calculated from the implied (constant) Price Elasticity of Demand. This analysis estimated a point associated with $7.50/gram LP Price, which was the Reference case price used in the Policy Transition Model. This will not necessarily be the Equilibrium Price when the LP Demand and Supply curves are allowed to intersect.

The KG-Demand in the LP Market, over time and at the estimated LP Market Price of $7.50/gram, is given by:

(99) KG-Demand*(t) = Policy User-FY*(t) * Grams/Day-POL / 1,000

where

Policy User-FY*(t) = FY average of monthly values determined over time based on April values for successive years.

The Demand curve slope (for the Policy scenario), over time, is given by:

(100) Slope-D(t) = [Market Price – Intercept-D] / KG-Demand*(t)

As for the Status Quo, the Slope-D(t) declines in absolute value over time as the market expands.

The parameters for the Demand curve (LP Market) over time are given in equation 96 (for constant Intercept-D) and in equation 100 (for time variant Slope-D(t)).

This analysis now turns to the LP Supply Model.

4.9 Policy – Supply Curve

A detailed activity-based costing (ABC) model was built for LP Supply production based on various parameters from the literature, and estimates that are comparable to the Government Supply (Status Quo) production, where these are appropriate.

It was assumed, except for the role of the Incumbent Supplier, that an LP entrant would have a beginning scale of operation of 500KG production. This can change in the actual Supply model and is used as a fixed target for the purposes of supply costing.

LP-Scale = 500KG

4.9.1 LP Production – Supply Cost Model

LP-Production Component

It was estimated that the number of production workers per KG produced is 0.072 FTE, based on reported data in the press (2006) about production at the Government Supply. The Scale = 500KG would require about 36 production workers.

LP-PROD = 0.072 FTE Production Workers / KG-Supplied

It was estimated that the production facility could support about 5 plants per m^2 of production space.

LP-PM2 = 5 Plants per m^2 of Production Space

It was estimated that a marihuana plant produces 33.6 grams/plant/harvest for 4 harvests per year, or 134 grams/plant/year.

LP-GPP = 134 grams / Plant / Year

The production space requirement to achieve the LP-Scale output, in terms of m^2 of production space, can be determined by:

(101) Production Space = LP-Scale / [LP-GPP * LP-PM2 / 1,000]

For the parameters assumed, this results in about 745m^2, or about 8,000ft^2 of production facility. In order to allow space for: a) storage and drying; b) worker change/toilets/day-use; c) secure delivery/pick-up; d) administration; e) maintenance/cleaning supplies; and f) miscellaneous needs, the production requirement was effectively doubled to get an overall estimate of the required facility size.

(102) Production Facility = Production Space * 2

It was estimated that a suitable production facility could be obtained for about \$9.00/ft^2, including Net Lease and TMI (taxes, maintenance and insurance)[29]. Therefore, the annual Production Facility Cost (LP-PFC) is given by:

(103) LP-PFC = Production Facility * \$9.00

which is about \$144,000 per year for the assumed LP-Scale.

It was estimated that production supplies are about \$85/m^2/harvest for growing medium and other sundry supplies (excluding electricity).

LP-SUPP = \$85/m^2/harvest

It was estimated that electricity requirements are 40 watts/ft^2, which, converting to metric for 24 hours per day for the LP-Scale, and converting to KWH, with electricity cost of \$0.04/KWH, gives:

LP-ELEC = \$146/m^2/year

Variable labour cost (production workers) was estimated at about \$35,000/year (based on \$15/hour for 1875 hours and EBP Cost Factor of 1.25).

[29] The \$9.00/ft^2 estimate was developed for Toronto Industrial locations (Canadian Property Management website). While these costs may be higher or lower by geographic area, this estimate is used for the reference scenario.

LP-LAB = $35,000/year

Production equipment costs are $120/m^2/year in relation to production space, based on amortized cost.

LP-EQUIP = $120/m^2/year

Production security costs are $20,000/year in relation, based on amortized costs for various security requirements and unit costs (e.g., entrance, fence, detection/alarm systems, IT security).

LP-SEC = $20,000/year

Total Production Costs, for the LP-Scale facility, is found by sum of various production cost items:

(104) Production Cost = LP-PFC + [LP-SUPP * Prod-Facility * Harvest]

+ [(LP-ELECT + LP-EQUIP) * Prod-Facility]

+ LP-LAB + LP-SEC

Production cost of about $1.9M is estimated for the LP-Scale production.

LP-Order Processing Component

Average shipment size is estimated to be 50 grams.

The number of annual shipments is given by:

(105) LP-SHIP = LP-SCALE * 1,000 / 50

which is 10,000 in the reference case. This would work out to about 40 shipments per working day (for 50 weeks/year and 5 working days per week). Some peak demand is allowed in the analysis so that the workforce is assumed to accommodate up to 1.5 * Average Orders/Day = 60 shipments/day.

It is estimated that an Order Clerk can process 10 Orders per day, so to accommodate the peak order there is a need for 6 FTE Order Clerks.

LP-ORD = [(LP-SHIP / 250) * 1.5] / 10

The same Annual Salary cost is assumed for Order Clerks ($35,000).

The Courier Cost per Shipment is estimated to be $50.

LP-COUR = $50

Order and Shipping Costs are therefore given by:

(106) Order/Ship = [LP-ORD * $35,000] + [LP-COUR * LP-SHIP]

An order/shipping cost of about $0.7M is estimated for the LP-Scale production.

LP – Corporate Component

There are a total of 36 production works and 6 order clerks. It was assumed that there is a Supervisor Span of Control of 12, so that the number of Supervisors is given by:

(107) LP-SUP = (LP-PROD + LP-ORD) / 12 (rounded to nearest integer)

It is assumed that Supervisors are paid 1.65 times the salary of Production/Order workers.

It is assumed that there are 1.35 Corporate Managers/Executives per $1M in sales revenue. For the LP-Scale that implies 5 Corporate Managers. It is assumed that these Managers earn $90,000 annually.

LP-EXEC = $450,000/yr

It was estimated for 12 Corporate Staff the requirement for Corporate Office space for about 4,600ft^2 at a commercial lease cost of $14.00/ft^2/yr.

The Corporate HQ Space Costs were estimated at $65,000/year.

LP-HQ = $65,000/yr

Corporate Security/IT and Equipment Costs were estimated at $30,000/year.

LP-IT&S = $30,000/yr

Corporate Costs are therefore given by:

(108) LP-CORP = [LP-SUP * $35,000 * 1.65] + LP-EXEC + LP-HQ + LP-IT&S

Corporate Costs were estimated at about $0.8M for the LP-Scale production.

LP – Total Operating Cost

LP-Total Operating Costs are the sum of Production, Order/Shipping and Corporate Costs.

(109) LP-OPER = [LP-SUP * $35,000 * 1.65] + LP-EXEC + LP-HQ + LP-IT&S

It was estimated that Total Operating Costs, for the LP-Scale production, would be $3.4M per year.

LP – Net Margin (EBIDT)

LP-Net Margin (Earnings Before Interest, Debt and Taxes) is given by:

(110) LP-NET = [LP-SCALE * $7.50 * 1,000] - LP-OPER

and the % Net Margin is LP-NET / LP-REVENUE (first part of right-hand side of above equation). In the reference scenario, this results in LP-NET = $390,000 and %Net of 10%.

LP – After Tax Profit

It was estimated that LP interest costs and taxes would be about $105,000, so that after-tax profit is about $285,000, or 8% of Revenue.

By definition, as the analysis has fully exhausted the revenue, the total cost (per gram or KG) is the same as the sales revenue (per gram or KG).

Table 4.6 summarizes the LP Supply Cost model. This is not presented as a reliable guide to LP costing, but as an order-of-magnitude cost estimate that corresponds reasonably well to Health Canada expectation that the LP Market Price could be in the vicinity of $7.50/gram.

In Table 4.6, the LP supply cost works out to $6.72/gram, which, in a market after HST is applied (at 13%), would give a user price of roughly $7.60/gram.

Table 4.6 – Policy – LP Supply Cost		
Model 2.20 LP Parameters (Initial Scale for LP)		
LP-Small Scale (KG)	500	
Target Revenue - Small	$3,750,000	
Production Site Workers	36.0	
Production Space Requirements		
Plants / m^2	5	
Yield / Plant / Year (grams)	134	
Yield / m^2 / Year (grams)	672	
Grow Space Requirement m^2	744	
Grow Space ft^2	8,000	
Storage / Drying ft^2	1,600	20%
Worker Facility ft^2	800	10%
Secure Delivery Space ft^2	1,200	15%
Administration ft^2	1,600	20%
Maintenance/Cleaning ft^2	1,200	15%
Other/Misc. ft^2	1,600	20%
Total Production Facility ft^2	16,000	
Ratio of Grow / Total Space	50%	
Production Facility Cost/Year	$144,000	
Cost per m^2 Grow Area	$194	
Production Facility Value	$1,920,000	
Variable Cost Parameters		
Supplies per m^2 / harvest	$85	
Supplies per m^2 / year	$340	
Supplies per / year	$252,976	
Electricity KwH per m^2 / year	3,650	
Electricity KwH / year	2,715,774	
Electricity Cost / year	$108,631	
Electricity Cost per m^2 / year	$146	
Labour Hours per KG	135	
Labour Hours / year	67,500	
Labour Cost / year	$1,260,000	
Labour Cost per m^2 / year	$1,693	
Equipment Cost / year	$89,286	
Equipment Cost per m^2 / year	$120	
Physical Security Requirements		
Security Cost / year	$20,000	
Security Cost per m^2 / year	$27	
Production Cost Sub-Total		
Total Production Costs / year	$1,874,893	
Total Production Costs / m^2 / year	$2,520	
Total Production Costs / KG	$3,750	
Order Processing		
Average Shipment Size (gram)	50	
No. Shipments / Year	10,000	

Table 4.6 – Policy – LP Supply Cost	
No. Shipments / Day	40
Peak Shipments / Day	60
Shipments / FTE / Day	10
Peak FTE Requirement	6
Order Proc Labour Cost / year	$210,000
Labour Cost / Shipment	$21
Courier Cost / Shipment	$50
Courier Cost / year	$500,000
Management & Overhead	
Operational Staff FTE	42
Supervisors FTE	4
Supervisors Cost	$231,000
Corporate FTE	5
Corporate Staff Cost	$450,000
Corporate Space m^2 per FTE	28
Corporate Staff	12
Corporate Overhead Space m^2	93
Corporate Space m^2	429
Corporate Space ft^2	4,618
Corporate Space Cost/Year	$64,648
Corporate Security Cost/Year	$10,000
IT/Equipment Costs	$20,000
Order/HQ Cost Sub-Total	
Total Order/HQ Costs / year	$1,485,648
Total Order/HQ Costs / KG	$2,971
Operating Cost Sub-Total	
Total Costs / year	$3,360,541
Total Costs / KG	$6,721
Operating Margin	$1,644,107
% Operating Margin	44%
EBIDT	$389,459
% Net Margin	10%
Working Capital Requirement	$616,438
Debt Load	$750,000
Interest Cost	$42,329
EBT	$347,130
Taxes	$62,483
Profit After Tax	
Earning After Tax	$284,647
% After-Tax Profit on Revenue	8%
Sources: Delsys Research	

This LP costing model provides some support for believing that an LP Market could be operative in FY2014-15 at around $7.50/gram.

4.9.2 LP – Compliance Cost

The TBS Regulatory Cost Calculator was used with an activity-costing model for specific policy regulatory requirements to derive an estimated Business Compliance Cost of $20M on an annualized basis for the LP market entrants. This was estimated to involve Fixed Compliance Costs (per year) of $322,160 per LP and Variable Compliance Costs of $62,476 per LP based on the scale of the LP operation.

This study developed a Scale Factor(t) over time based on the KG-Supply in the LP market over time and made adjustments to the Fixed Compliance Cost as additional LPs entered the market.

The LP Compliance Cost was estimated in the Policy scenario to be:

(111) LP-COMP = {Fixed Cost * #LP(t)} + {Variable Cost * Scale Factor(t)}

where

#LP(t) = the number of LP entrants at time t

Fixed Cost = $332,160 per LP

Variable Cost = $62,476 per LP (when Scale Factor = 1.00)

Scale Factor(t) = KG-Supply(t) / KG-Supply(2014-15) which is a value between 1.0 and 6.44 over time

In the reference case, the LP compliance costs represent about 11% of Revenue (FY2014-15) and fall to 3% of revenue (FY2013-14).

4.9.3 LP – Supply Curve

It was not possible to derive the Supply curve Intercept or Slope directly from the LP costing model (above). The Supply curve represents the impact of a (possibly) lower marginal cost Incumbent, and the introduction of LP Entrants with higher marginal costs. It was expected that the Supply curve would have an upward slope, reflecting the fact that market expansion draws in LP entrants, at the margin, who may be less efficient and have higher marginal costs.

The following heuristic rationale was posited for the Supply curve parameters.

It is not anticipated that there would be any LP Market supply at a price (per KG) below $6,000. Effectively, it is believed that the Incumbent's marginal cost is at least $6,000/KG.

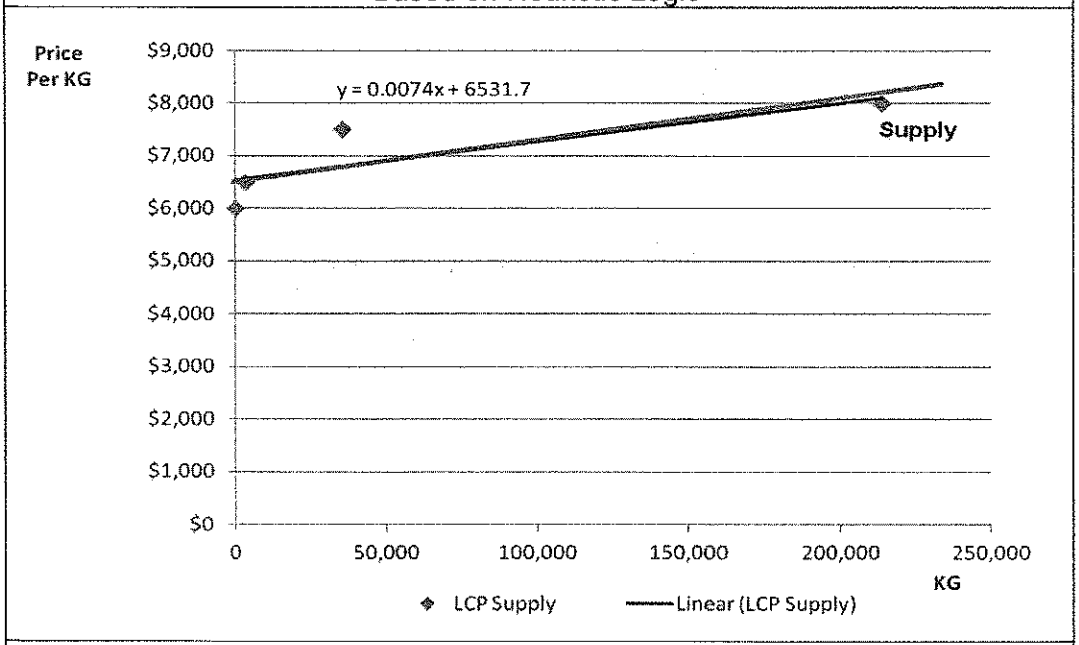
It is estimated that the Incumbent could supply, perhaps, 3,500KG, at a marginal cost (Price) of $6,500.

It is estimated that a scaled Incumbent and about 50 LP Entrants (at the LP-Scale used in the Costing Model) could supply 35,500KG at a Market Price of $7,500/KG.

It is estimated that a scaled Incumbent and, perhaps, 400 LP Entrants could supply 200,000KG at a Market Price of $8,000/KG.

These are heuristic estimates. When these points are graphed and used to estimate a Linear Regression line in the supply space (Figure 4.11), an estimate of the Supply curve is obtained.

Figure 4.11 – Supply Curve - LP Market
Based on Heuristic Logic



Sources: Delsys Research

Supply – Intercept & Slope

Based on this heuristic reasoning, an Intercept-S of $6,500 and a Slope-S of 0.0074 are estimated. These will be fixed over time in the model.

Intercept-S = 6,500

Slope-S = 0.0074

This study will analyze the sensitivity of the CBA results to these parameters. When analyzing this sensitivity, the Intercept-S is allowed to vary and the Slope-S is calculated so that there is always a fixed point at (P=$6,722, Q=30,000). Effectively, there is allowance for the Supply curve to 'swivel' around that fixed point, which establishes the April 2014 position in the LP Market.

Now that the Demand and Supply curve parameters are obtained and are linear in form, it is straightforward to determine the Market Equilibrium (Price, KG) at any point in time in the model.

One additional factor taken into account is the 'tax wedge' that HST introduces between the Market Price (User) and Market Price (Supplier). The existence of HST means that, at any point in time in the Policy scenario,

(112) Market Price(User)(t) = Market Price(Supplier)(t) * (1 + HST)

where it was assumed, for simplicity, a single HST rate for all provinces/territories of 13%.

4.10 Policy – LP Market Equilibrium

The two equations for Supply and Demand in this analysis are:

Supply-P = A + B * KG (i.e. A=Intercept-S, B=Slope-S)

Demand-P = C + D(t) * KG (i.e. C= Intercept-D, D(t)=Slope-D)

In equilibrium, the KG are the same in the two equations and Demand-P = (Supply-P * 1.13). Rearranging and solving for KG-Equilibrium:

(113) KG-EQ(t) = [C - 1.13A] / [1.13B - D(t)]

This equation is used to determine KG-EQ(t) over time. The Supply equation is then used to determine Supply-P(t) over time.

In the FY2014-15, the reference scenario gives:

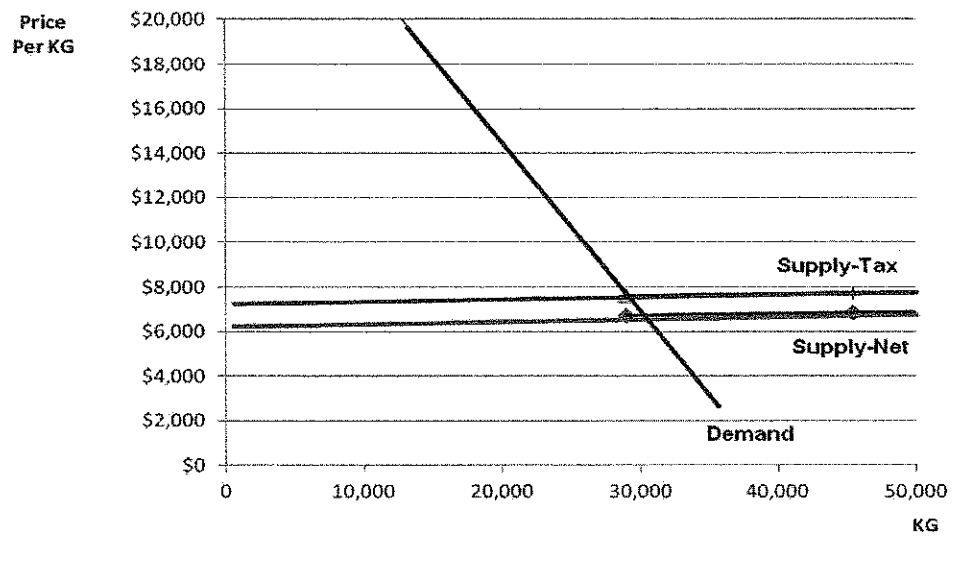
KG-EQ = 26,731 KG

P-EQ-Supply = $6,698/KG

P-EQ-Demand = $7,569/KG

These are shown in Figure 4.12.

Figure 4.12 – Equilibrium - LP Market (2014-15)



Sources: Delsys Research

Initially, in the Reference case, it was anticipated that the LP Market could be supplied by a Scaled Incumbent and 50 New LP Entrants. The analysis allows additional LP Entrants to enter the market in FY2016-17 and in FY2018-19 if the market capacity utilization ratio is sufficiently close to 85% over the average of the next four years. It is assumed that once LP Entrants join the market they scale their production from the Base-Scale of 500KG annually to about 4,000KG annually by 2024-25.

4.11 Policy – User Benefits & Costs

Consumer Surplus – LP Market

Consumer Surplus is estimated in a similar manner to equation 32 (for Government Supply).

The existence of the HST tax wedge means there is a Deadweight Loss associated with the LP market and it is necessary to separately track the Supply Price (P*S-EQ) and Demand Price (P*D-EQ) as well as the Equilibrium Quantity (with Tax) (KG*-EQ) for various calculations. It is also necessary, for the Deadweight Loss calculation, to calculate the Price ($P^{\#}$-EQ) and Equilibrium Quantity (no Tax) ($KG^{\#}$-EQ).

Consumer Surplus (LP Market) over time in the Policy scenario is given by:

(114) CS(LP)(t) = 0.5 * [Intercept-D - Demand Price(t)] * KG*-Demand(t)

Producer Surplus – LP Market

Producer Surplus (LP Market) over time in the Policy scenario is given by:

(115) PS(LP)(t) = 0.5 * [Supply Price(t) - Intercept-S] * KG*-Demand(t)

Deadweight Loss – LP Market

Deadweight Loss is estimated in a similar manner to equation 33 (for Government Supply).

Deadweight Loss (LP Market) over time in the Policy scenario is given by:

(116) $DWL(LP)(t) = \{0.5*[P^{\#}\text{-EQ}(t) - \text{Supply Price}(t)] * [KG^{*}\text{-EQ}(t) - KG^{\#}\text{-EQ}(t)]\}$

$+ \{0.5*[\text{Demand Price}(t) - P^{\#}\text{-EQ}(t)] * [KG^{*}\text{-EQ}(t) - KG^{\#}\text{-EQ}(t)]\}$

The Deadweight Loss calculation requires the area of two triangles to be calculated.

4.12 Policy – Safety Costs

It was estimated in the Reference case of the Policy Transition Model (for April 2014), that 8,000 producers (PUPL/DPPL) might 'opt out' of the Policy regime and continue cultivation, illicitly and principally in their family residence. This was modelled in equation 63-67. This was a reduction of 33% in misuse by persons who held production licenses.

It was also known that about 60% of persons who are interested in accessing marihuana for medical purposes are prepared to undertake own-production. This is a historical fact in the MMAP experience.

It was also estimated, in equation 98, that the number of persons that would enter the new Policy regime, based on the number of persons who would have participated in the MMAP in the Status Quo scenario. The analysis used the number of persons who would have participated in the MMAP as the base against which to estimate the continued stream of persons who will continue to engage in misuse in the Policy scenario.

4.12.1 Policy – Residential Misuse

The number of persons who will continue to grow marihuana in their family residence in the Policy scenario who were, counterfactually, related to MMAP in the Status Quo scenario, is given by:

(117) Misuse(Policy)(t) = 7,605 (for April 2014)

(118) Misuse(Policy)(t) = Misuse(Policy)(t-1) + [MMAP-New Entrant(t) * 0.6 * (1 - .33)]

where

MMAP New Entrant(t)		= the number of persons who would enter MMAP in the Status Quo
Pr(PUPL)	=	0.6
%Misuse Reduction	=	0.33

It is important to highlight that this study does not assume that all residential cannabis/marihuana cultivation would cease as a result of the Policy changes. Effectively, the operation of the crime prevention/deterrent effect of clarification (through the removal of the need for additional evidence) is only assumed to reduce such activity by 33%. It may be that the actual impact will be higher, but this study modelled the response based on evidence in the literature dealing with drug crime prevention.

The analysis assumed, as for the Status Quo scenario, the same parameters for minor and major misuse, fire risk, injury and death rates, economic loss from injury, death and property damage. Therefore, equations 44 to 46 are effectively used to estimate the same losses associated with fire to obtain Fire Costs for the Policy scenario.

4.12.2 Policy – Fire Costs

For each of the fire events associated with misuse, the social costs associated with fires related to marihuana cultivation are given, in the Policy scenario over time, by:

$$(119)\ \text{Fire Costs}(t) = [\text{House Fire}(t) * WTP_{damage}] + [\text{House Fire}(t) * Pr_{injury} * WTP_{injury}] + [\text{House Fire}(t) * Pr_{death} * WTP_{death}]$$

as in equation 46.

4.13 Policy – Security Costs

The misuse stream, over time, in the Policy scenario, as given in equation 118, is also used as the primary input into the Security model which otherwise uses the same parameters and logic as equations 47 to 51 for the Status Quo.

Crime Prevention Benefits & Costs

One intended consequence of the proposed Policy is to improve public security by removing from residential areas the locus of licensed marihuana cultivation.

Attribution of crime prevention benefits is made difficult by the presence of the 'displacement effect'. This is defined as the unintended increase in targeted crimes in other locations following from the introduction of a crime reduction scheme. Five different forms of displacement have been identified [Reppetto (1976)]: a) temporal (change in time), b) tactical (change in method), c) target (change in victim), d) territorial (change in place), and e) functional (change in type of crime).

Effectively, the attribution of benefits to crime reduction must be able to document logically (and with evidence, preferably) that the reduction of crime is not localized in time, space, location or type of crime and merely displaced elsewhere. If such displacement occurs there is no (or less) social welfare gain.

Crime reduction/control benefits arise from:

a) savings of resources for law enforcement activity; and

b) reduced societal harm (i.e. willingness-to-pay (WTP) to avoid harm or willingness-to-accept' (WTA) harm).

The elimination of the option to personally produce marihuana for medical purposes under Health Canada regulation is a main feature of the intended improvement in public security outcomes. Such a policy will only have an impact to the extent that the underlying activity is stopped or reduced in level. To the extent that this activity remains (at the same level) and becomes illicit (without cover of the MMAR), there would be no social welfare change. This is an example of what is called the 'displacement effect,' which must be taken into account in CBA related to crime prevention.

There are two main mechanisms by which the proposed Policy could, theoretically, reduce the level of criminal activity related to marihuana cultivation in residences:

a) Signal effect: declaration of the activity as illicit may result in some people ceasing their activities; and

b) Deterrence effect: increasing the risk of detection, arrest, seizure and punishment without the legal cover of MMAR production licenses may reduce the marginal return of the illicit activity.

The first effect would appear to be naïve. The second effect is based on rational criminal activity and the altering of the risk/reward trade-off. The economic/rational theory of criminal activity [Becker (1968)] treats crime as a rational activity and postulates that crime prevention/control should also be demonstrated to be rational (and effective).

Crime Prevention Impacts of the Proposed Policy

The proposed Policy will no longer allow (following a phasing-out transition period) the cultivation of marihuana for medical purposes under what are now MMAR production licenses (that mostly involve family residences). This will eliminate the legal ability to cultivate marihuana in a family residence.

As such, it will logically eliminate the threat of violence against families in their residence who cultivate marihuana for medical purposes in their residence. This is not to say that some persons may not continue to do so, but this activity will now be illegal. Therefore, the expected magnitude of this impact depends crucially on the degree to which people desist from future illegal marihuana cultivation in their residence.

Crime Prevention Benefits - Policy

By explicitly developing a model (Policy Transition Model) to look at the rewards and risk of marihuana cultivation misuse (under MMAR in the Status Quo) and the economic returns to crime, this study can more accurately estimate, with the assistance of a behavioural parameter found in the 'economics of crime' literature, the possible impact (net of displacement) on the underlying residential marihuana cultivation. As this CBA has explicitly modelled the continuation of some crime (estimated at 67%) in the Policy scenario, the analysis has appropriately ascribed a reasonable estimate for the benefits arising from crime prevention as a result of the intended Policy impact.

4.13.1 **Policy – Security Cost**

For each of the security events associated with misuse in the Policy scenario, the social costs associated with residential misuse, home invasions and non-fatal/fatal shootings are given in the Policy scenario over time, by:

$$(120)\quad \text{Security Cost}(t) = \text{Social Loss}_{misuse}(t) + \text{Social Loss}_{invasion}(t) + \text{Social Loss}_{non\text{-}fatal}(t) + \text{Social Loss}_{fatal}(t)$$

as in equation 51.

4.14 Policy – Program Administration Costs

As above for the Status Quo scenario, Health Canada Program Administration Costs are comprised of:

- Salary and Human Resources (HR)-related costs such as Employee Benefits Program (EBP) and staff accommodation costs;
- Operations & Maintenance (O&M) costs for travel, training, supplies and professional contracts; and
- Corporate Cost to reflect Departmental shared services and overhead.

4.14.1 Policy – Salary & HR-Related & O&M Costs

Health Canada administrative costs (human resource costs, accommodation, O&M costs) were estimated to be about $1.4 Million in the first year, presumably FY2014-15, for the Policy scenario. These estimates did not include Employee Benefit Program (EBP) costs or HC Corporate functional overhead (which were embedded in the Status Quo MMAP Costs). To ensure consistency between the Status Quo and Policy scenarios, these adjustments were made and base year costs were associated with activity volumes to allow a basis for forecasting changes in HC Program Administration Cost over time as the volume of activity grows.

The assumptions used by Health Canada to underpin the administration cost estimate was that there would be 60 LPs requiring licensing as producers, and that there was a need for two (2) inspections per license, or 120 field inspections. In addition, there were 100 files to be reviewed, although it was unclear how this related to the licenses issued or inspection volume.

HR salary cost, 'grossed-up' by 41% for EBP costs, results in an estimate of $1.89 Million in the first year. About 79% of this cost is HR-Related and 21% is O&M-Related (travel, training, police accompaniment, office supplies, publishing etc). Certain line item costs appeared to be of a fixed nature, so this study estimated that $132,000 (O&M) and $346,675 (HR) were of a fixed nature and the remainder were variable with the volume of activity which is largely related to the number of LP producers.

Based on the assumed number of 60 LPs, these variable cost elements were $4,258 (O&M) per LP and $19,185 (HR) per LP. There were 13.25 FTEs in this base-year estimate.

In the LP Supply Model, the analysis estimated the number of producers that were expected to be in the LP Market, over time, based on a model of LP New Entrants and a scaling growth path over time as they expand along with the overall market scale. Allowance was also made for a Salary Escalation factor (2%) to increase HR costs over time in real terms.

The Health Canada Administration Cost over time, in the Policy scenario is given by:

$$(121)\ \text{HC-Admin Cost}(t) = \{\text{Fixed-HR} + [\text{Variable-HR} * \#\text{LP}(t) * (1 + \text{Salary Escalation})^t]\}$$

$$+ \{\text{Fixed-O\&M} + [\text{Variable-O\&M} * \#\text{LP}(t)]\}$$

This is the counterpart to equation 13 for the Status Quo scenario.

4.14.2 Policy – Corporate Cost

In the Status Quo scenario, there was a fixed component and a variable component of these costs which meant that the Corporate Cost increased at a fixed amount per year.

It was estimated that the HC Corporate Cost represented about 14% of the HC-Administration Cost (FY2013-14), so this ratio was used to benchmark an initial year value of ($1.89 Million * 0.14 = $257,092) for the initial year. Based on the ratio of fixed/total cost in the Status Quo for FY2013-14, it was estimated that about $100,000 is fixed Corporate Cost and about $150,000 is variable Corporate Cost. It was estimated that the step-function increase, per year, would be about $15,000.

The linear equation to predict the future Corporate Cost over time in the Policy scenario is given by:

$$(122)\ \text{Corporate Cost}(t) = 100{,}000 + 15{,}000 * (t)$$

This is the counterpart to equation 12 for the Status Quo scenario. The value for t (FY2014-15) is 10, which is the continuation of the time trend from the Status Quo.

4.14.3 Policy – Program Administration Costs

The sum of Health Canada administrative cost (equation 121) and corporate cost (equation 122) equal the total Program Administration Costs for the Policy scenario:

$$(123)\ \text{Program Administration Cost}(t) = \text{HC-Admin Cost}(t) + \text{Corporate Cost}(t)$$

This is the counterpart to equation 15 for the Status Quo scenario.

4.15 Policy – Summary of Benefits & Costs

Policy – Program Administration Costs

Total HC Program Administration Costs are from equation 123.

Compliance cost is given from equation 111.

Policy – User Benefits

User benefit is the Consumer Surplus measure from equation 114.

Producer Surplus is from equation 115.

The Deadweight Loss (from the HST tax) is given in equation 116.

Policy – Safety Costs

Safety cost is the sum of the Fire Costs from equation 119.

Policy – Security Costs

Security cost is given from equation 120.

4.16 Net Present Value (Policy vs Status Quo)

The Net Present Value is – with the use of a Social Discount Rate (SDR) – the discounted sum over time of the difference between the streams of benefits and costs in the Policy scenario and benefits and costs in the Status Quo scenario.

The Net Present Value is given by:

(123) $NPV = \sum_t [Policy(t) - Status\ Quo(t)] / [(1+SDR)^t]$

where

Policy(t)	= the sum of the Policy scenario benefit (if positive) or cost (if negative) estimates for each of the components of the CBA;
Status Quo(t)	= the sum of the Status Quo scenario benefit (if positive) or cost (if negative) estimates for each of the components of the CBA;
SDR	= the Social Discount Rate (8%);
t	= time index from 1 (FY2014-15) to 10 (FY2023-24)

This completes the discussion of the CBA methodology. The report now turns to the CBA Model results.

CHAPTER FIVE

5.0 CBA - Results

This section reports the CBA results from the model described in the previous section on methodology. It presents the CBA results in four sections and provides detailed tables, including the two Accounting Table summaries required by Treasury Board Secretariat.

The CBA results are presented in terms of:

1. Program Usage & Outcomes: resulting from the proposed regulation changes in terms of authorized users and authorized consumption, residential producers, marihuana cultivation misuse and resulting safety and security impacts;

2. Monetized Cost and Benefit Measures: related to users, producers, deadweight loss (from taxes and effective subsidies) and safety and security benefits resulting from lower social costs;

3. Net Present Value Measure: the Discounted Net Present Value (NPV) based on the difference between the Policy scenario and Status Quo scenario streams of costs and benefits over time; and

4. Sensitivity Analysis: the sensitivity of the NPV measure to different reasonable parameter values.

In a CBA, the key measure is the NPV for the Reference Case, supplemented by Sensitivity Analysis of the CBA results based on Monte Carlo analysis of changes to parameter values that underpin the model dynamics (behavioural responses to changes) and monetization of events (in terms of willingness-to-pay measures).

5.1 Program Usage & Outcomes

Tables 5.1 and 5.2 show the forecast results over the 10 year period (FY2014-15 to FY2023-24) for the Reference case for each of the Status Quo and Policy scenarios. These tables show forecast values for:

Program Usage Indicators:

- Authorized marihuana users under the MMAR (Status Quo) and the proposed Policy regime;

- Licensed marihuana producers under the MMAR (DPPL/PUPL) and as LPs;

- KG quantity of marihuana consumed from legal sources of supply; and

- Average supply cost (per KG) from legal sources of supply.

Safety Indicators:

- Number of residential misuse cases for marihuana production (i.e., misuse of PUPL/DPPL production licenses under the MMAR; and persons who are forecast to 'opt out' of the Policy regime and continue home cultivation that is expected to involve supply to the illicit market);

- Number of residential fires predicted to occur as a result of residential misuse marihuana cultivation;

- Number of predicted fire injuries resulting from the residential fires resulting from misuse marihuana cultivation; and

- Number of predicted fire deaths resulting from the residential fires resulting from misuse marihuana cultivation.

Security Indicators:

- Number of potentially violent home invasions that are predicted to arise from residential misuse cases for marihuana production;

- Number of non-fatal shootings that are predicted to arise in relation to home invasions and residential misuse cases for marihuana production; and

- Number of fatal shootings that are predicted to arise in relation to home invasions and residential misuse cases for marihuana production.

A discussion follows (below) on the impact of the Policy in terms of changes between the two cases. The change in outcomes is summarized in Table 5.3 as the difference between the Policy and Status Quo scenarios.

TABLE 5.1 - STATUS QUO – PROGRAM OUTCOMES & INDICATORS								
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	202
Usage Indicators								
Authorized Marihuana Users	57,799	93,338	141,461	201,426	267,769	330,345	378,943	409
Licensed Marihuana Producers	38,532	62,226	94,308	134,284	178,512	220,230	252,629	273
Marihuana KG Consumed	67,573	107,841	163,853	233,748	312,556	388,859	450,964	493
Value of Consumption ($M)	$156	$248	$373	$526	$702	$869	$1,001	$1,
Supply Value Per KG	$2,310	$2,300	$2,277	$2,251	$2,247	$2,235	$2,220	$2,
Safety Indicators								
Residential Misuse	15,259	24,641	37,346	53,177	70,691	87,212	100,041	108
Fires	96	158	237	340	451	557	638	6
Fire-Injuries	5	7	10	15	20	26	29	3
Fire-Deaths	0	0	1	1	1	1	1	
Security Indicators								
Home Invasions	53	86	130	186	247	305	349	3
Non-Fatal Shootings	6	9	14	20	26	32	37	4
Fatal Shootings	1	2	2	3	5	6	7	

TABLE 5.2 - POLICY – PROGRAM OUTCOMES & INDICATORS								
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	202
Usage Indicators								
Registered Marihuana Users	41,384	66,435	100,814	143,138	189,486	233,131	267,559	290
Licensed Marihuana Producers	51	51	51	51	61	61	61	6
Marihuana KG Consumed	26,734	41,681	61,462	84,809	109,458	132,216	150,204	162
Value of Consumption ($M)	$179	$284	$427	$604	$800	$989	$1,143	$1
Supply Value Per KG	$6,698	$6,808	$6,955	$7,128	$7,310	$7,478	$7,612	$7
Safety Indicators								
Residential Misuse	11,102	17,276	25,248	34,539	43,957	51,976	57,598	60
Fires	66	104	152	207	264	312	345	3
Fire-Injuries	3	5	7	9	12	14	15	
Fire-Deaths	0	0	0	1	1	1	1	
Security Indicators								
Home Invasions	43	66	97	133	169	200	221	2
Non-Fatal Shootings	4	7	10	14	18	21	24	2
Fatal Shootings	1	1	2	3	3	4	4	

TABLE 5.3 – CHANGE/POLICY IMPACT – PROGRAM OUTCOMES & INDICATOR								
	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	202
Usage Indicators								
Registered Marihuana Users	-16,415	-26,903	-40,647	-58,288	-78,283	-97,214	-111,384	119
Licensed Marihuana Producers	-38,481	-62,175	-94,257	-134,233	-178,451	-220,169	-252,568	273
Marihuana KG Consumed	-40,838	-66,160	-102,392	-148,939	-203,098	-256,643	-300,760	330
Value of Consumption ($M)	$23	$36	$54	$78	$98	$120	$142	$1
Supply Value Per KG	$4,387	$4,509	$4,678	$4,877	$5,063	$5,243	$5,391	$5
Safety Indicators								
Residential Misuse	-4,157	-7,365	-12,098	-18,638	-26,734	-35,236	-42,443	-47
Fires	-30	-54	-85	-133	-187	-245	-293	-3
Fire-Injuries	-2	-2	-3	-6	-8	-12	-14	-
Fire-Deaths	0	0	-1	0	0	0	0	
Security Indicators								
Home Invasions	-10	-20	-33	-53	-78	-105	-128	-1
Non-Fatal Shootings	-2	-2	-4	-6	-8	-11	-13	-
Fatal Shootings	0	-1	0	0	-2	-2	-3	

Authorized Users of Marihuana for Medical Purposes

The number of authorized users of marihuana for medical purposes decreases by about 30% over the period as a result of potential users: a) 'opting out' to undertake illegal residential marihuana cultivation; and b) being 'priced out' of the market through higher prices and the operation of the price elasticity of demand. This is shown in Figure 5.1.

Consumption of Marihuana from Legal Sources

The quantity of marihuana consumption from legal sources decreases by over 65% as a result of the reduction in the number of users and the quantity consumed per user. The latter effect results from the higher price, the operation of price elasticity of demand, and an affordability effect that spending on marihuana from legal sources does not exceed more than 15% of the mean annual income of users. This is shown in Figure 5.2.

Figures 5.1 & 5.2 – Program Usage Indicators

Figure 5.1 Legal Users

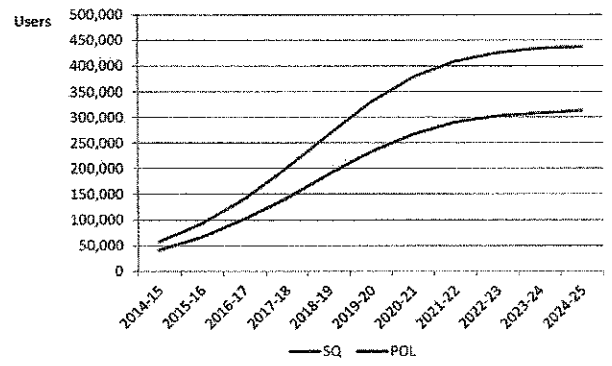
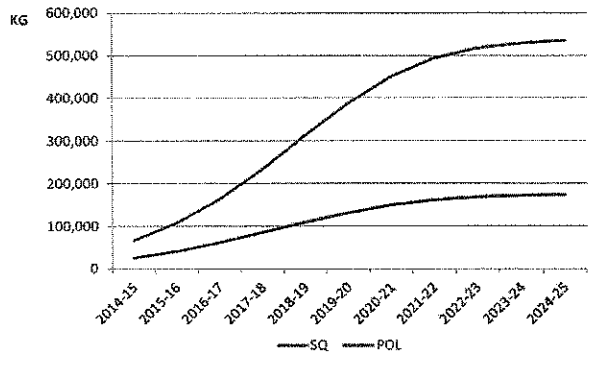


Figure 5.2 Legal Consumption KG



Source: Delsys Research

Value of Marihuana Consumed by Authorized Users

The value of marihuana consumed by authorized users increases by almost 15% as a result of the interplay between lower marihuana consumption and higher marihuana supply price. This value is the product of the quantity of authorized marihuana consumption (KG) times the supply price of the marihuana obtained from a legal source consumed. This is shown in Figure 5.3. The Policy change to create a regulated marihuana supply market comprised of Licensed Producers could, over time, grow to be a $1.3 Billion per year industry.

Price of Marihuana Produced by LPs

The average supply price for marihuana produced by licensed producers increases by about 250% over time as a result of the elimination of low-cost legal own-cultivation (and designated person production) and the transition to LP supply with security, quality control and other regulatory requirements. This is shown in Figure 5.4.

Figures 5.3 & 5.4 – Program Usage Indicators

Figure 5.3 Legal Value $M

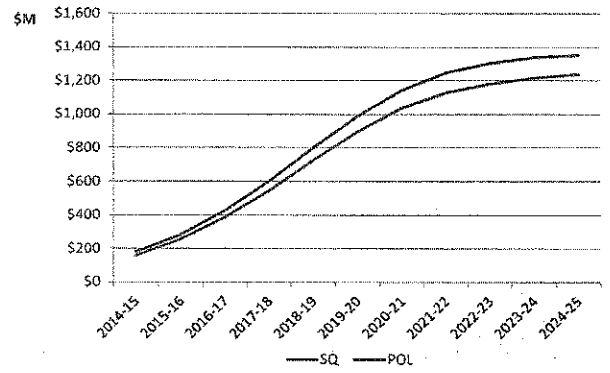
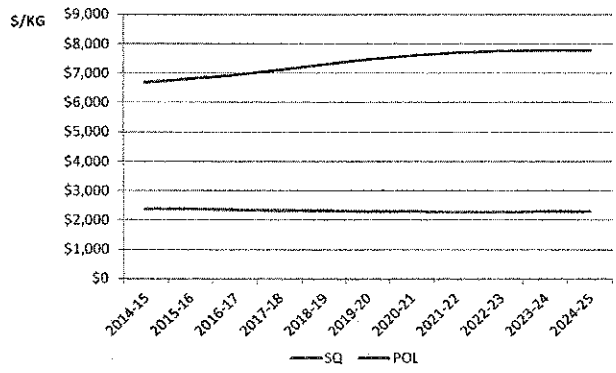


Figure 5.4 Supply Price $/KG



Source: Delsys Research

Safety Indicators

The number of cases of potential misuse in terms of residential marihuana cultivation for the purpose of supplying the illicit market decreases by 45% over the forecast period as a result of: a) more effective law enforcement activity through the elimination of MMAR production licenses by removing the need to obtain additional evidence (above that normally required to obtain reasonable and probable grounds to investigate potential misuse); and b) a deterrent effect as the probability of conviction increases.

The number of residential fires caused by faulty/misused electrical devices and systems that arise from indoor marihuana cultivation decreases by almost 50%. This is shown in Figure 5.5.

The number of fire-related injuries is reduced by a similar percentage – close to 50%. There is a cumulative reduction of 92 injuries over the forecast period. This is shown in Figure 5.6.

There are four (4) fire-related deaths averted over the forecast period as a result of the policy to eliminate legal residential marihuana cultivation.

Figures 5.5 & 5.6 – Safety Indicators

Figure 5.5 Fires Related to Misuse

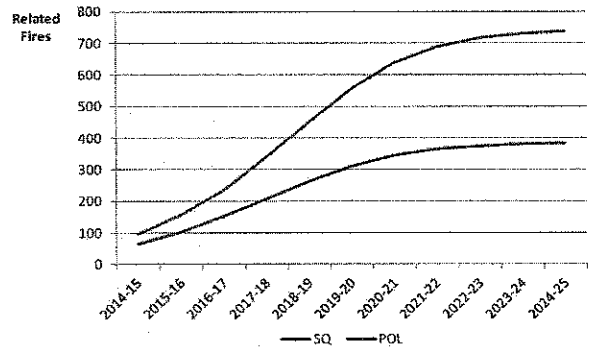
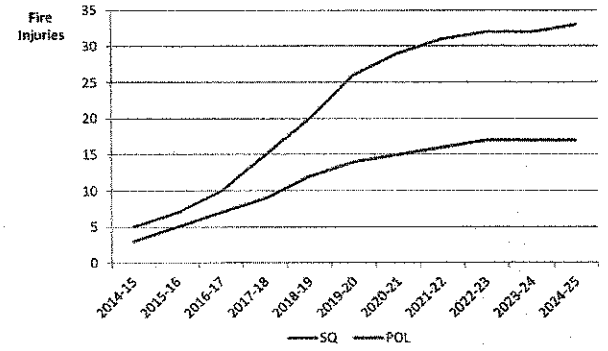


Figure 5.6 Fire-Related Injuries



Source: Delsys Research

Security Indicators

The number of potentially violent home invasions that arise because of misuse in terms of residential marihuana cultivation for the purpose of supplying the illicit market decreases by 40% over the forecast period as a result of: a) more effective law enforcement activity due to the increased clarity as a result of the elimination of MMAR production licenses; and b) a deterrent effect as the probability of conviction increases. This is shown in Figure 5.7.

The number of cases of home invasions with non-fatal shootings decreases by over 40%. There is a cumulative reduction of 94 non-fatal shootings over the forecast period. This is shown in Figure 5.8.

There is a cumulative reduction of 16 fatal shootings over the forecast period.

Figures 5.7 & 5.8 – Security Indicators

Figure 5.7 Home Invasion Related to Misuse

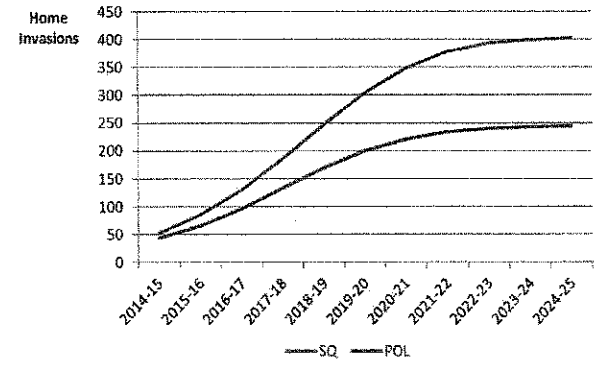
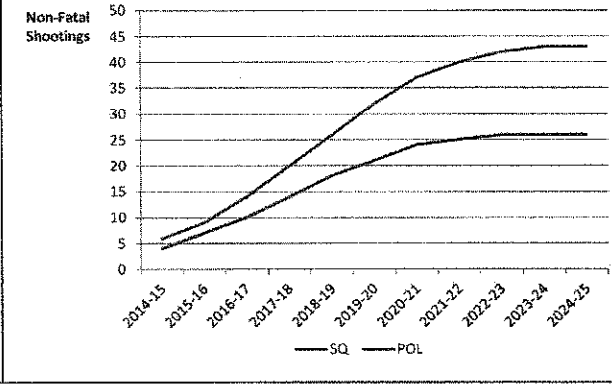


Figure 5.8 Non-Fatal Shootings



Source: Delsys Research

5.2 Monetized Cost & Benefits Measures

Tables 5.4 and 5.5 show the forecast results over the 10-year period (FY2014-15 to FY2023-24) for the Reference case for each of the Status Quo and Policy scenarios. These tables show forecast values for monetized Costs and Benefits including:

1. Consumer Surplus: a measure of user benefit;
2. Producer Surplus: a measure of supplier benefit;
3. Deadweight Loss: a measure of economic loss resulting from tax/subsidy distortions from the market equilibrium most efficient use of resources;
4. Program Administration Costs: Health Canada program administration costs to oversee the Marihuana Medical Access Program;
5. Safety Costs: a measure of the economic loss associated with fires resulting from residential marihuana cultivation;
6. Security Costs: a measure of the economic loss associated with home invasion and shootings resulting from the misuse of residential marihuana cultivation; and
7. Business Compliance Costs: a measure of the incremental costs that business must bear as a result of regulatory requirements that are beyond normal business practice[30].

For the purposes of these Tables, CBA costs are those variables with negative values (implying a social cost) and CBA benefits are those variables with positive values (implying a social benefit).

A discussion follows of the impact of the proposed Policy in terms of changes between the two cases. The change in outcomes is summarized in Table 5.6 as the difference between the Policy and Status Quo scenarios. These are the values that are discounted, using a Social Discount Rate of 8% in the Reference case, to produce the estimate of the Net Present Value (NPV).

[30] Business Compliance Costs are shown in the CBA as they form a part of the RIAS analysis. As Business Compliance Costs are already included in the cost of supply, these are not additional in terms of the CBA result.

TABLE 5.4 – STATUS QUO – MONETIZED CBA RESULTS

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
CBA - Costs (Negative)								
HC - Program Administration	-20,630,103	-30,008,114	-42,160,070	-56,881,976	-73,004,828	-88,422,448	-101,019,733	-1
Deadweight Loss	-1,971,263	-3,171,138	-4,526,278	-5,830,658	-7,820,031	-9,236,870	-9,893,372	-
Safety - Social Cost	-3,705,188	-6,081,774	-14,916,011	-18,886,520	-23,160,253	-27,257,771	-30,367,814	-
Security - Social Cost	-8,864,700	-17,047,400	-18,439,000	-27,375,400	-43,621,300	-52,605,500	-61,187,100	-
Sub-Total CBA Costs	-35,171,254	-56,308,426	-80,041,359	-108,974,554	-147,606,412	-177,522,589	-202,468,019	-2
CBA - Benefits (Positive)								
User - Consumer Surplus	278,021,823	443,096,890	672,631,011	959,070,572	1,281,745,711	1,594,297,577	1,848,899,513	2,
Producer Surplus	0	0	0	0	0	0	0	
Sub-Total CBA Benefits	278,021,823	443,096,890	672,631,011	959,070,572	1,281,745,711	1,594,297,577	1,848,899,513	2,
Other (Non-CBA) Costs								
Business Compliance	-2,354,664	-3,584,649	-4,927,424	-6,193,331	-8,095,245	-9,437,517	-10,057,428	-

TABLE 5.5 – POLICY – MONETIZED CBA RESULTS

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
CBA - Costs (Negative)								
HC - Program Administration	-1,924,268	-1,965,770	-2,007,272	-2,048,775	-2,340,055	-2,385,394	-2,430,733	-
Deadweight Loss	-464,119	-748,188	-1,152,209	-1,671,596	-2,271,736	-2,874,843	-3,385,975	-
Safety - Social Cost	-2,541,498	-4,008,412	-5,854,356	-13,765,621	-15,965,992	-17,811,936	-19,076,035	-
Security - Social Cost	-8,489,700	-9,243,400	-17,378,300	-25,700,700	-26,833,100	-34,968,000	-35,673,900	-
Sub-Total CBA Costs	-13,419,585	-15,965,771	-26,392,137	-43,186,691	-47,410,883	-58,040,173	-60,566,643	-
CBA - Benefits (Positive)								
User - Consumer Surplus	289,235,420	448,337,593	656,021,931	896,947,174	1,146,355,466	1,372,117,274	1,547,502,175	1,
Producer Surplus	2,644,475	6,428,038	13,976,839	26,612,531	44,329,865	64,679,652	83,476,731	
Sub-Total CBA Benefits	291,879,895	454,765,631	669,998,770	923,559,704	1,190,685,331	1,436,796,926	1,630,978,906	1,
Other (Non-CBA) Costs								
Business Compliance	-20,126,430	-21,907,819	-24,265,316	-27,047,930	-33,307,251	-36,019,576	-38,163,485	-

TABLE 5.6 – CHANGE/POLICY IMPACT – MONETIZED CBA RESULTS

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	20
CBA - Costs (Negative)								
HC - Program Administration	18,705,835	28,042,344	40,152,798	54,833,201	70,664,773	86,037,054	98,589,000	107,
Deadweight Loss	1,507,145	2,422,949	3,374,069	4,159,063	5,548,296	6,362,027	6,507,397	6,4
Safety - Social Cost	1,163,690	2,073,362	9,061,655	5,120,899	7,194,261	9,445,835	11,291,779	18,2
Security - Social Cost	375,000	7,804,000	1,060,700	1,674,700	16,788,200	17,637,500	25,513,200	26,0
Sub-Total CBA Costs	21,751,670	40,342,656	53,649,222	65,787,863	100,195,529	119,482,416	141,901,375	158,
CBA - Benefits (Positive)								
User - Consumer Surplus	11,213,597	5,240,702	-16,609,079	-62,123,399	-135,390,245	-222,180,303	-301,397,337	-358,
Producer Surplus	2,644,475	6,428,038	13,976,839	26,612,531	44,329,865	64,679,652	83,476,731	97,3
Sub-Total CBA Benefits	13,858,072	11,668,741	-2,632,240	-35,510,868	-91,060,380	-157,500,652	-217,920,606	-261,
Total CBA Net Benefits	35,609,742	52,011,396	51,016,982	30,276,995	9,135,149	-38,018,236	-76,019,231	-102,
Other (Non-CBA) Costs								
Business Compliance	-17,771,766	-18,323,170	-19,337,892	-20,854,599	-25,212,005	-26,582,059	-28,106,057	-29,2

5.2.1 Consumer Surplus Measure of User Benefit

Consumer Surplus is a measure of user benefit over and above what is reflected in the user price paid for acquiring the good (i.e., marihuana for medical purposes produced by an authorized LP). It reflects the willingness-to-pay by users and is captured as the area under the Demand curve and above the price either paid by consumers or reflecting the supply cost of producing the good.

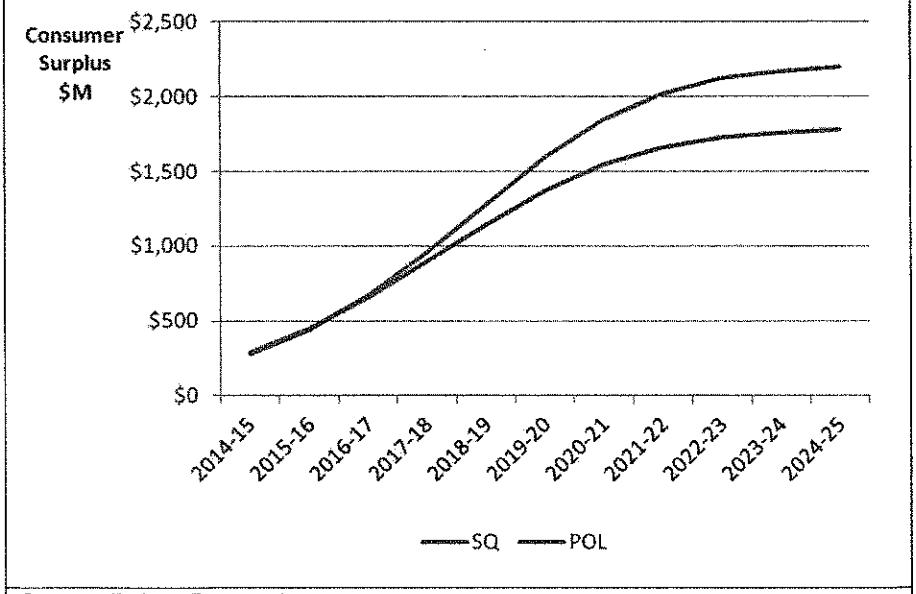
As is shown in Table 5.3 and Figures 5.1, 5.2 and 5.4, the Policy scenario projects a reduction in the number of individuals accessing marihuana under the MMAP, and KG consumed, and an increase in the user price of marihuana consumed. These changes indicate that there would be a loss of Consumer Surplus under the Policy scenario.

The valuation of Consumer Surplus depends on the Slope and Intercept of the Demand curve, which was inferred from a single assumption related to the Price Elasticity of Demand for a linear Demand curve. For the Status Quo scenario, separate measures were taken for each of the distinct 'supply markets' pertaining to Government Supply, Personal-Use supply and Designated-Person supply options. These were then summed to give an overall Consumer Surplus.

The Policy scenario has a single legal LP Market for supply and similar reasoning can be applied for the Price Elasticity of Demand and a linear Demand curve to estimate Consumer Surplus.

The Consumer Surplus decreases in the Policy scenario by almost 20% over the forecast period. This is shown in Figure 5.9. That Consumer Surplus decreases by about 20% when the marihuana KG consumed for medical purposes under the MMAP decreases by 65% requires some explanation.

Figure 5.9 Consumer Surplus – Measure of User Benefit



Source: Delsys Research

The estimation of Consumer Surplus is influenced by the willingness-to-pay valuation of consumers as reflected in the Demand curve and determined (in part) by the Demand Intercept, which captures the marginal willingness-to-pay for the first user in the market. With linear Demand and this study's estimation of the Demand Intercept based on the Price Elasticity of Demand, the Demand Intercept is much higher when the known (observed) transacted market price is higher.

The Policy scenario involves market transactions in the range of $7.60 to $8.80 per gram over time, reflecting the higher cost of marihuana from the LP market. The higher cost also reflects higher product quality in terms of multiple strains of cannabis and production quality control to limit contaminants and toxic substances and ensure a consistently high quality of product over time. In the Reference case, the Demand Intercept in the LP market is equivalent to $29.20 per gram.

The Status Quo scenario involves three separate supply markets, each with their own supply price. The Demand intercepts for these separate markets are: $25.00 per gram (Government Supply), $14.00 per gram (Designated Person) and $9.00 per gram (Personal Use).

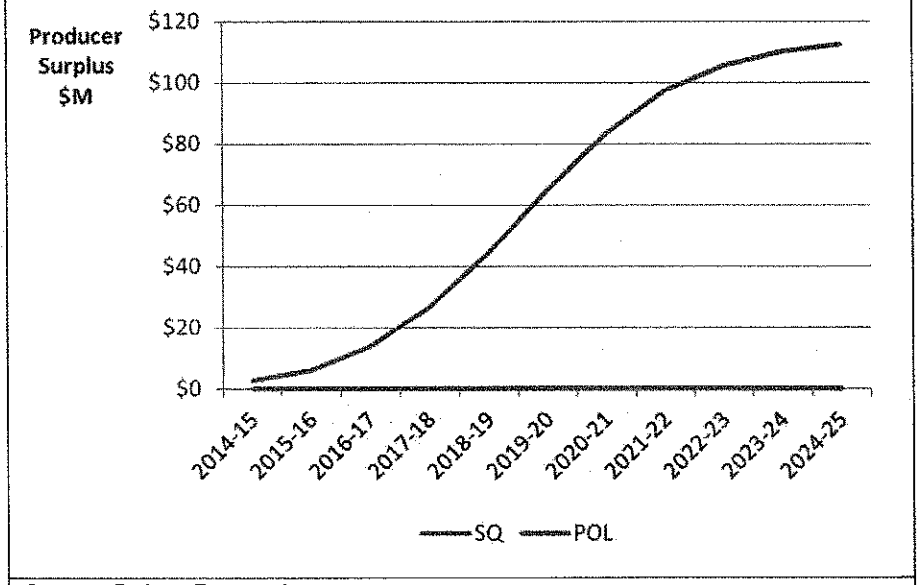
Therefore, the Consumer Surplus measure in the Policy scenario is much higher (for a given level of marihuana consumption) than in the Status Quo scenario. This is a direct result of the mathematical logic of the study's model and is generally reflective of higher product quality and costs associated with marihuana cultivation by LPs operating under rigorous quality control standards.

5.2.2 Producer Surplus Measure of Supplier Benefit

Producer Surplus is a measure of supplier benefit over and above what is reflected in the user price paid for acquiring the good (i.e. marihuana for medical purposes produced by an authorized LP). It reflects lower marginal cost for units below the equilibrium quantity. There was no Producer Surplus in the Status Quo scenario as the social valuation of the marihuana produced in the Government Supply was below the supply (and marginal cost) of production as a result of the effective subsidy to production. There also was no Producer Surplus in the Personal-Use or Designated-Person supply markets as these have perfectly elastic (i.e., flat) Supply curves.

There was Producer Surplus in the Policy scenario as the LP Supply curve is upward sloping. The value of Producer Surplus, however, was quite small in comparison with Consumer Surplus, as can be seen in Figure 5.10 (when compared to the scale in Figure 5.9). This result was attributable to the relatively inelastic (i.e., relatively flat) Supply curve in the Policy scenario.

Figure 5.10 Producer Surplus – Measure of Supplier Benefit



Source: Deloitte Research

Consumer and Producer Surplus are the two measures of social benefit in the CBA. The analysis of the Policy scenario involves a projected reduction in Consumer Surplus and an increase in Producer Surplus. However, because the former overshadows the latter, the overall result is a projected reduction in social benefit, which contributed negatively to the NPV overall result.

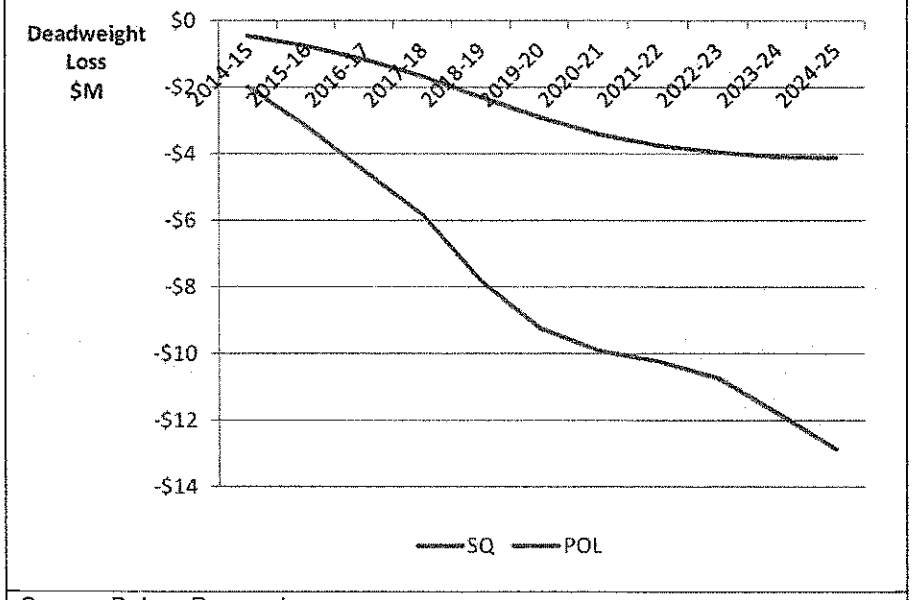
5.2.3 Deadweight Loss from Market Distortion (Tax/Subsidy)

Deadweight Loss arises in the Status Quo scenario from the effective subsidy to production that results in excess demand relative to the market equilibrium without such subsidy. The value of this loss is relatively small as the Government Supply component in the CBA model was comparatively small.

Deadweight Loss arises in the Policy scenario from the projected application of HST tax on marihuana which creates a 'tax wedge' between the price users would pay and the supply price that would be received by suppliers. The value of this loss is also relatively small.

The estimated Deadweight Loss in both cases, as shown in Figure 5.11, plays no significant role in the overall CBA results and findings. The analysis projects a small Deadweight Loss as a result of the Policy change. The loss is shown as a negative value compared to the benefit measures related to Consumer and Producer Surplus.

Figure 5.11 Deadweight Loss – Economic Cost of Tax/Subsidy



Source: Delsys Research

As the Policy scenario involves a lesser loss (i.e., smaller negative value), this outcome constitutes a reduction in social cost which contributes positively to the NPV overall result.

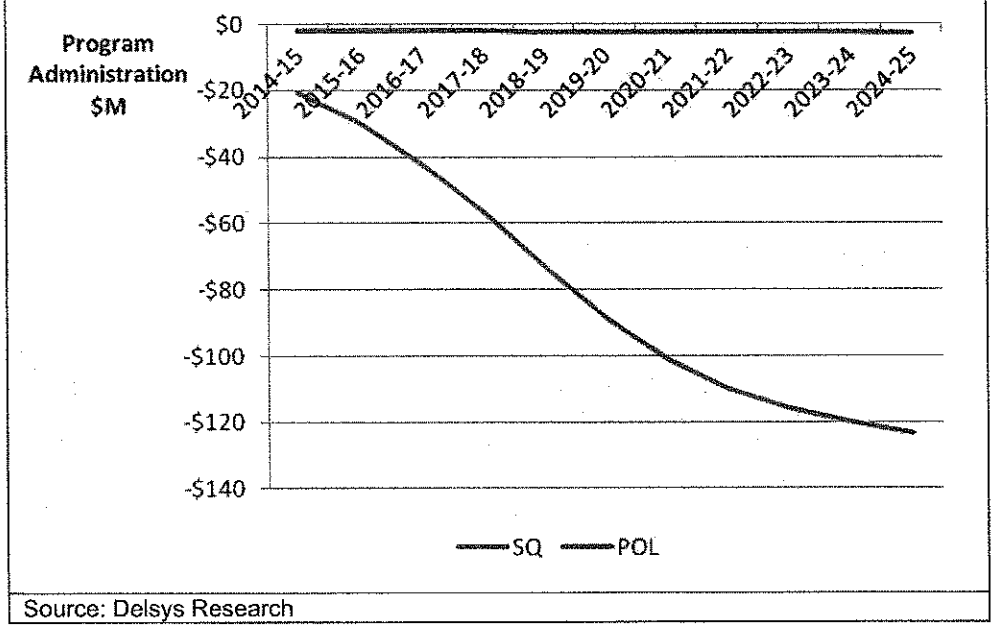
5.2.4 Health Canada - Program Administration Costs

In both the Status Quo and Policy scenarios, Health Canada is responsible for Program Administration in terms of employee salaries, benefits and accommodation as well as travel and supply (e.g., specialized equipment) costs associated with inspections and office work. These are costs and are represented as negative values in the analysis.

The 'contract value' associated with the Government Supply in the Policy scenario is not included in this section, as it forms part of the cost of supply that was taken into account in the estimation of Consumer and Producer Surplus measures.

As Health Canada will eliminate the role it plays in determining eligibility of persons to access the legal supply of marihuana for medical purposes, the Program Administration cost is lower in the Policy scenario than in the Status Quo scenario. This is shown in Figure 5.12.

Figure 5.12 HC Program Administrative Cost



Source: Delsys Research

The Policy scenario reduction of over 95% of Program Administration costs is a relatively modest source of savings (and benefits) in the context of the overall NPV result.

This graphic highlights an important point about the Status Quo scenario. The Status Quo scenario is modeled on the assumption that government resources required to administer the MMAP will continue to grow over time to fully accommodate the required program uptake in terms of numbers of persons wanting to access a legal source of marihuana for medical purposes. The Program Administration cost is projected to increase from $13.8M (FY2013-14) to over $120M (FY2023-24). In reality, the Government of Canada is, and will likely continue to be for some time, operating under a fiscal restraint. It is, therefore, highly unlikely that such additional resources would be available (over time) to fully accommodate the forecast increase in the MMAP participation in the status quo.

Consequently, achievement of the Status Quo scenario benefits, in terms of increasing Consumer Surplus, is at considerable risk of not being realized. Rather than impose a specific government resource constraint on the Status Quo, the analysis of the Status Quo scenario adopted an assumption of continued ATP growth and growing Health Canada program administration costs (and contract costs) – even though it is acknowledged that such growth might well not be realized in reality due to fiscal restraint.

This qualification to the achievement of the Status Quo results is very important when interpreting the overall NPV result. This analysis compares a Policy scenario – whose rationale is partially based on the requirement to reduce administrative costs – to a Status Quo scenario in which it is assumed that sufficient resources would be made available to scale program delivery capacity in response to service demands growing at an exponential rate up to some limit – even though there is substantial risk that this would not be realized in reality.

Figure 5.12 shows the large resource 'gap' (the difference between the Status Quo and Policy scenarios) which represents the Health Canada savings that would be required to respect overall departmental and Government of Canada fiscal restraint objectives.

The impact of a resource constraint was analyzed (Figure 4.5 above) using a System Dynamics simulation model. The simulation results indicated that the number of ATPs in a constrained Status Quo scenario might be only about 1/3rd of the unconstrained case (i.e. perhaps only 150,000 ATPs could be accommodated in the program over the forecast period in the constrained Reference case compared to the ceiling value of 450,000 in the unconstrained Reference case). The practical implication of a resource constraint is that there would be substantial backlogs and lengthy time delays for processing new applications and renewals of ATPs.

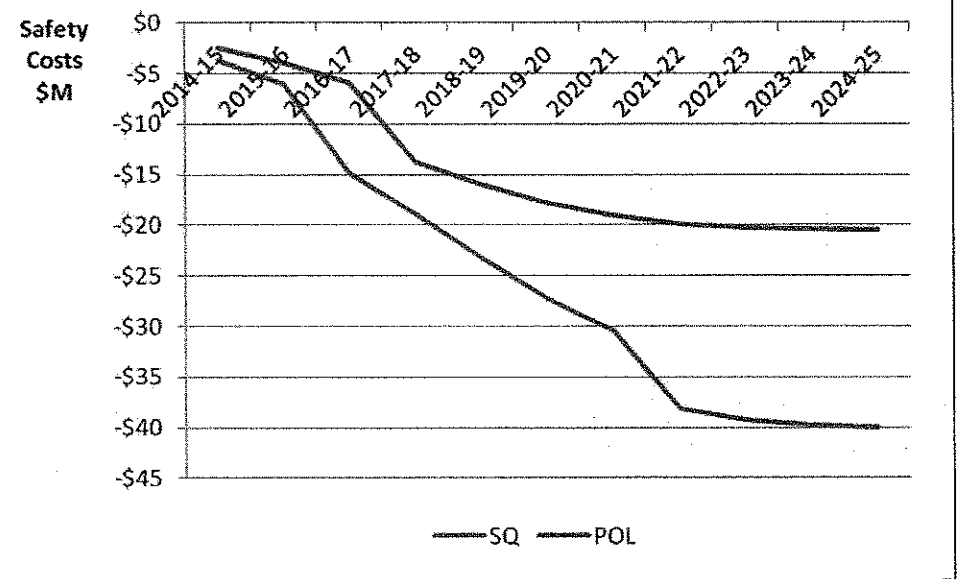
5.2.5 **Monetized Safety Costs**

Monetized Safety Costs relate to residential fire events and the estimated property damage and willingness to pay to avoid fire-related injuries and deaths. Canadian data for fires specific to electrical causes have been used to estimate fire risks and outcomes in terms of damage, injury and deaths. The property damage estimate (from insurance claims) provides a direct estimate for that cost. The values for willingness to pay to avoid injury and death has been were derived from other Canadian and international studies.

It is known (Table 5.11 and Figure 5.5) that the Policy scenario involves a reduction in the number of residential cases of misuse and fire events related to marihuana cultivation and residential misuse. It would therefore be expected that the Safety Costs would decrease in the Policy scenario. As costs are treated in the CBA analysis as negative values, the reduction in negative values is a positive benefit.

The Policy scenario involves a decrease in Safety Costs of almost 50% over the forecast period. This is shown in Figure 5.13. The scale of the Safety Costs is small in relation to the Consumer Surplus change so these represent a modest source of savings (and benefits).

Figure 5.13 Safety Costs



Source: Delsys Research

The step-function nature of the curves in the above figure is a result of the large monetary value attributable to fire deaths which change in a discontinuous manner as the number of fire deaths is restricted to integer values.

The reduction of adverse safety and security outcomes is, perhaps, the most important aspect of the Health Canada proposed changes to the regulatory regime. Figure 5.13 (safety) and Figure 5.14 (security) demonstrate that the model of behavioural response and valuation of outcomes resulting from the Policy change achieve a substantial reduction in the social costs arising from adverse public safety and public security outcomes.

5.2.6 **Monetized Security Costs**

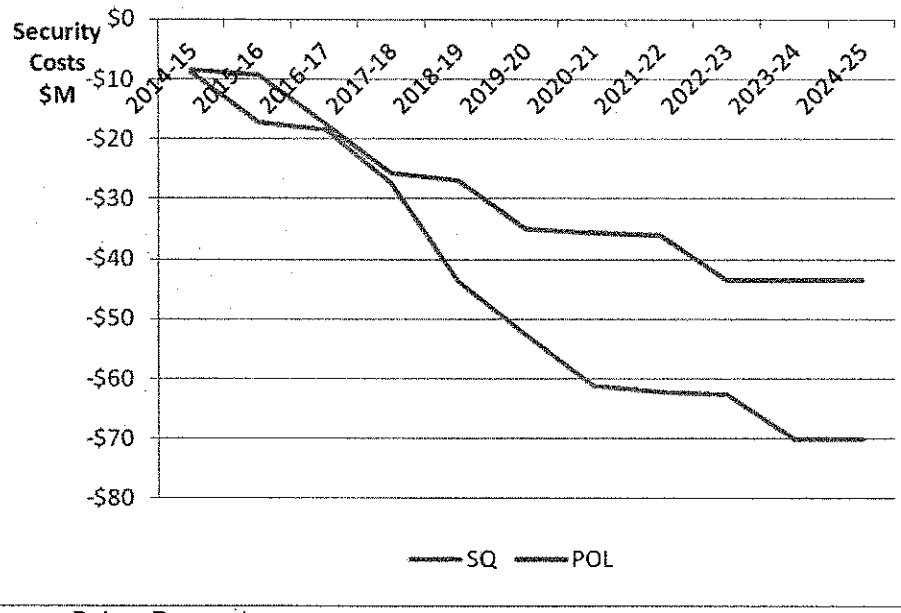
Monetized Security Costs relate to violent home invasions and shootings (non-fatal and fatal) that arise from criminal attempts to seize the asset value associated with marihuana cultivation and misuse. Law enforcement authorities refer to such crime, directed at 'grow-op' type operations, as 'grow-rip' robberies. The presence of handguns by perpetrators of home invasions, as well as possibly handgun possession by persons engaged in marihuana cultivation misuse, can (and have, in the past) led to shootings.

Canadian data on home invasions and shooting related to marihuana cultivation under the MMAR are available and have been used to estimate security risks and outcomes in terms of home invasions, shootings and deaths. Willingness to pay to avoid home invasion, non-fatal shooting and fatal shootings have been adapted from US and UK social-cost data specific to comparable types of crime.

It is known (Table 5.11 and Figure 5.7) that the Policy scenario involves a reduction in the number of residential cases of misuse. Security Costs are therefore expected to decrease in the Policy scenario. As costs are treated in the CBA as negative values, the reduction in negative values is a positive benefit.

The Policy scenario involves a decrease in Security Costs by roughly 40% over the forecast period. This is shown in Figure 5.14. The scale of the Security Costs is small in relation to the Consumer Surplus change, so these represent a modest source of savings (and benefits).

Figure 5.14 Security Costs



Source: Delsys Research

Security Costs are estimated to be about twice the scale of Safety Costs and contribute proportionally the same to the NPV benefit gain of the Policy scenario over time.

The Deadweight Loss, Program Administration Costs, Safety Costs and Security Costs are the four measures of social cost in the CBA. As the Policy scenario involves a reduction in all these costs the overall result is a reduction in social cost, which contributes positively to the NPV overall result.

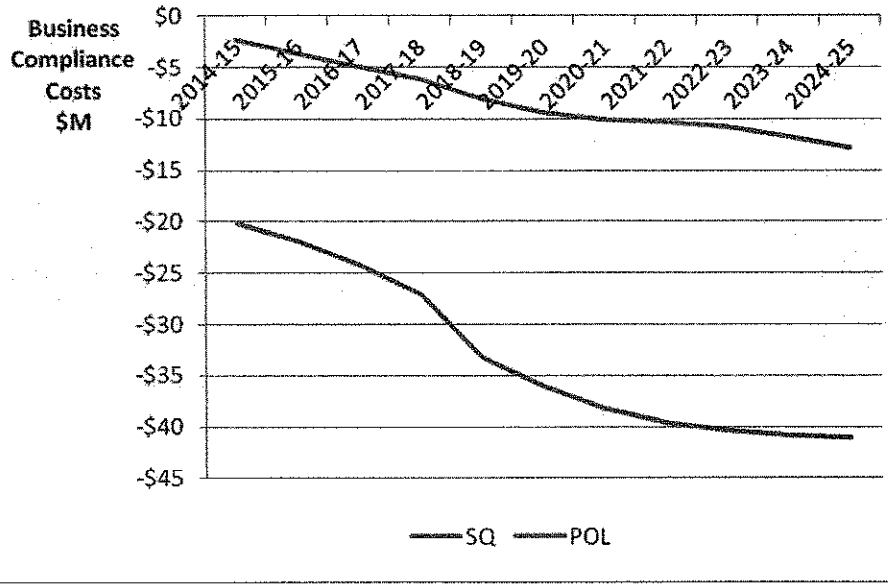
5.2.7 Business Compliance Costs

Business Compliance Costs are estimated in both the Status Quo and Policy scenarios. The assumption used in the Status Quo scenario is that a fixed share of overall Supply Cost (10%) is comprised of Business Compliance Costs. This is a fairly high value as a result of the nature of the contractual relationship between Health Canada and the contracted Government Supplier. It is generally perceived by Health Canada that the regulatory burden faced by LPs in the Policy scenario will be considerably less per unit of production (i.e., reduced red tape per supplier).

However, Government Supply represents a small share (about 10% in terms of people, about 3% in terms of KG consumed) of marihuana supply in the Status Quo scenario, whereas Licensed Producers will account for all (100%) of the marihuana supply in the Policy scenario. Therefore, while the regulatory compliance burden per unit of activity will be substantially less, it will apply to a much larger volume of activity. Business Compliance Costs are anticipated to fall from 10% of revenue in the Status Quo scenario to about 3% of revenue in the Policy scenario (by FY2020-21).

The overall result, as shown in Figure 5.15, is that the Business Compliance Costs will be about two to three times greater in the Policy scenario.

Figure 5.15 Business Compliance Costs



Source: Delsys Research

As Business Compliance Costs are incorporated in the Supply Cost for both the Status Quo and Policy scenarios, they do not form part of the CBA result and are used, instead, in the RIAS and other TBS regulatory assessment processes[31].

The Business Compliance Costs mostly fall on Medium and Large Business (as opposed to Small Business) as the scale of LP activity (in terms of employees and sales revenue) is expected to grow beyond that of a Small Business after two years.

[31] TBS 'One for One' and 'Small Business Lens' requirements.

5.3 Net Present Value

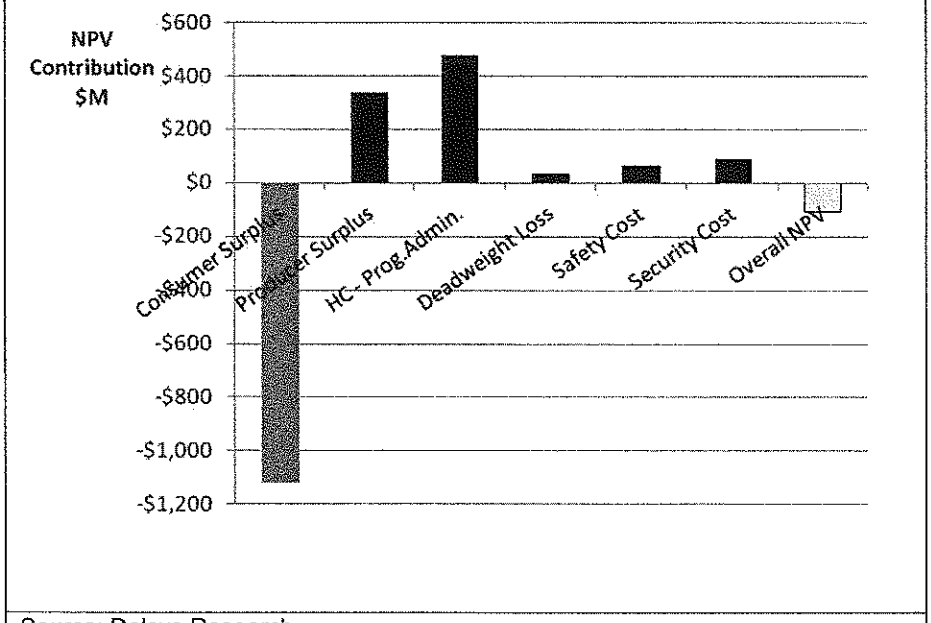
The main focus of the CBA results is on the Reference case (i.e., most likely) estimate of the Net Present Value. This sums the various cost and benefit measure differences between the Policy and Status Quo scenarios, over time, after discounting by a social discount rate that values future year results as less valuable than more current year results. The purpose of social discounting is to reflect the social opportunity cost of resources which are values higher the closer they are in time to the present period.

5.3.1 Reference Case

The Reference case NPV is -$109.72 Million, with an annualized NPV of -$16.35 Million. This result is shown in Table 1 of the CBA Accounting Statement (as per TBS guidelines).

As discussed in the previous section, the bulk of the NPV result arises from the loss of Consumer Surplus resulting from reduced consumption and a higher supply price for persons consuming marihuana for medical purposes under the MMAP. Figure 5.16 shows the contribution to the overall NPV result from each of the CBA cost and benefit components. In terms of the offsetting positive contributions the largest contributors are the reduction in Health Canada Program Administration costs and the Producer Surplus. While the contribution to the NPV result from reduced safety and security costs is small in comparison to the overall NPV result, these are still large in absolute value.

Figure 5.16 Composition of Reference Scenario NPV
By Benefit-Cost Component



Source: Delsys Research

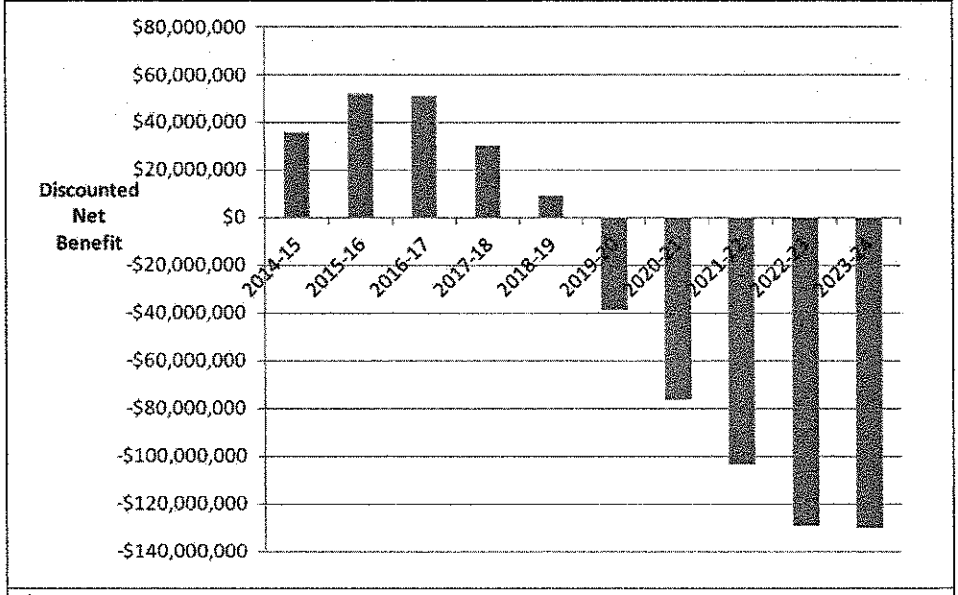
The relative magnitude of the net benefit contributions to the overall NPV result can also be seen, in undiscounted flows by year, in Table 5.6.

5.3.2 Time Profile of Discounted Net Benefits

The Reference case NPV of -$109.72 Million results from the sum of a discounted stream of net benefits (i.e., benefits less costs) for each year. This is shown in Figure 5.17.

The net benefits start off positive for the first five years (i.e., discounted benefits exceed discounted costs), then turn sharply negative for the remaining five years of the time horizon. The sum of positive discounted net benefits for the first five years (+$158 Million) is more than offset by the sum of negative discounted net benefits for the last five years (-$268 Million), which generates the negative NPV result in the Reference case.

Figure 5.17 Time Profile of Contribution to NPV Result



Source: Delsys Research

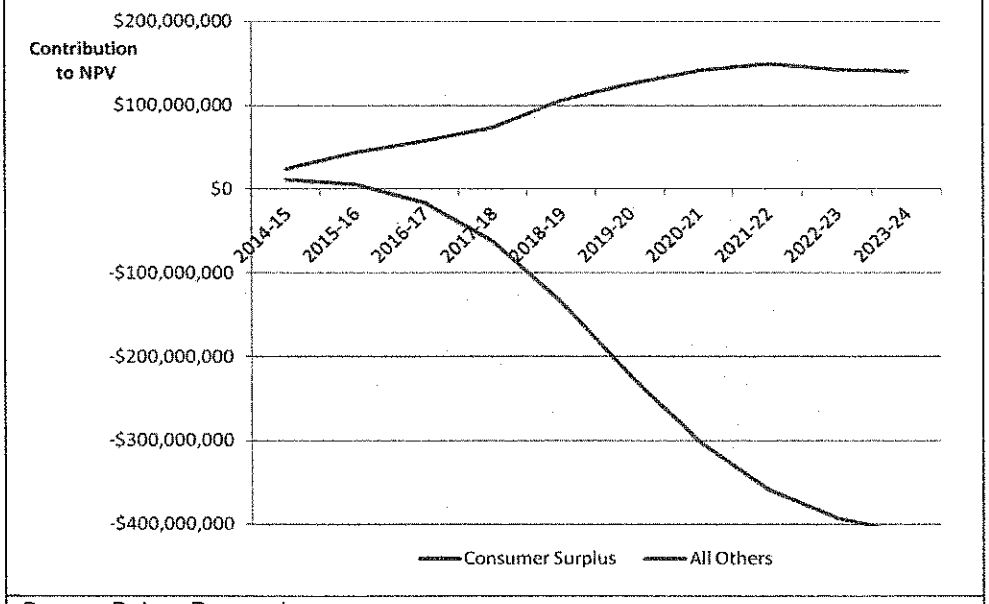
In the first five years, with positive discounted net benefits, there are a number of circumstances that produce greater benefits (with positive discounted net benefit) than costs (with negative discounted net benefit):

a) The change in Consumer Surplus (Policy scenario minus Status Quo scenario) starts off as positive and becomes negative by year 3 – up until that point, all components of NPV are positive; and

b) With the Consumer Surplus contribution negative in year 3, it is not sufficiently negative for another three years (until year 6), at which time the negative value for the change in Consumer Surplus fully offsets the other positive components of NPV.

This can be seen in Figure 5.18, which shows the time paths for Consumer Surplus (in red) and for the sum of 'Other' components (in blue). Consumer Surplus grows more rapidly (i.e., negatively) than the Other components grow (positively). It is between the fifth and sixth years that the vertical distance between the blue line and the x-axis is the same as the vertical distance between the red line and the x-axis. This is where the contribution to NPV becomes zero and the negative contribution to NPV from Consumer Surplus is exactly offset by the positive contribution to NPV from Other components.

Figure 5.18 Time Profile of Consumer Surplus and Other Components: Contribution to NPV Result



Source: Delsys Research

Rationale for Positive Initial Consumer Surplus Contribution

This study now turns to the rationale for the change in Consumer Surplus starting off positive for the first two years of the time horizon. The change in Consumer Surplus is broken down as a function of: a) lower KG-Demand moving towards the higher priced Policy scenario; and b) a higher valuation of Consumer Surplus in the higher priced Policy scenario (as seen in Figure 5.19):

A. Less KG-Demand: If this is valued at the Consumer Surplus value (per KG) in the Status Quo scenario, the impact of reducing KG-Demand in the Policy scenario is negative (in terms of contribution to NPV) – as seen in the blue data points – and its slope, in terms of KG-Demand, is -$2,668/KG; and

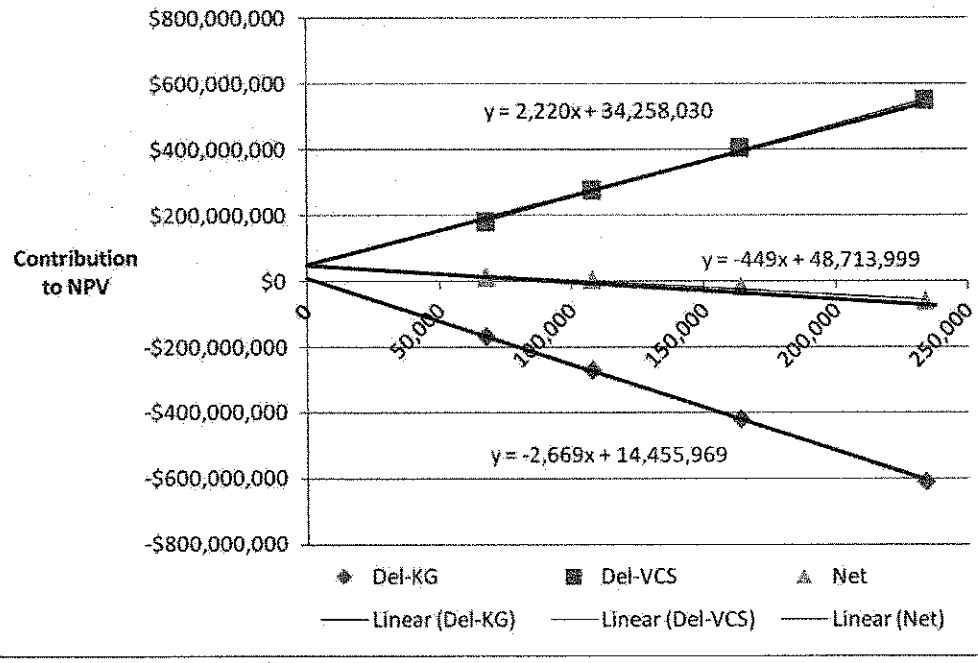
B. Greater CS-Value per KG: In the Policy scenario, each KG-Demand adds to Consumer Surplus at a higher value (per KG) – roughly $10,500/KG – than each KG-Demand in the Status Quo scenario – roughly $4,100/KG. This is a consequence of the higher exchange value (i.e., price) and the higher price intercept for the Demand curve. When this contribution is valued at the KG-Demand in the Policy scenario, its contribution is positive (in terms of NPV) – as seen in the red data points – and its slope, in terms of KG-Demand, is $2,220/KG.

As the combined effect (i.e., slope) is the sum of these separate effects (i.e., slopes), the overall slope of the relationship (i.e., the marginal effect on Consumer Surplus per KG-Demand) is negative ($2,220 + - $2,668 = -$449).

However, the intercept of the net relationship is positive ($34.3 Million + $14.5 Million = $48.7 Million). Therefore, the overall contribution of Consumer Surplus is positive up to the value of

KG-Demand = 109,000KG (where this is KG-Demand under the Status Quo scenario) – which is not reached until year 3.

Figure 5.19 Consumer Surplus Contribution to NPV
as a Function of KG-Demand (Status Quo) showing
a) Impact of Lower KG-Demand;
b) Impact of Higher Consumer Surplus Value per KG; and
c) Net (combined) Impact



Source: Delsys Research

5.3.3 Discussion of Results

This CBA has undertaken a careful, informed approach to the monetization of some of the major (but by no means exhaustive) anticipated outcomes of the proposed regulatory change for access to marihuana for medical purposes. This has attempted to capture meaningful and realistic behavioural reactions to the removal of licensed marihuana cultivation by individuals for their personal or designated-person use. This study thus documents a likely reduction in the number of adverse safety (i.e. fires) and security (e.g. misuse and home invasion) incidents that can be monetized in terms of social and security costs to society.

The CBA documents significant reductions in Health Canada Program Administration costs that are likely to arise as Health Canada ceases to be the principal medium of individual access to a legal supply of marihuana for medical purposes and focuses its regulatory effort on licensing and inspection of the commercial (legal) producers. These savings are significant, as the scale of the MMAP is expected to expand by about 750% in the ten year forecast period (for ATP persons in the Status Quo).

The impact on individuals authorized to access marihuana under the MMAR on the elimination of legal personal-production and designated-person production and its replacement by commercial supply will make the legal supply price higher, although this analysis does not

presently observe the transacted market price for Designated Person supply and only the supply price for Personal Use supply can be estimated. Also, only the likely LP Market price can be forecast. However, the Reference case, reflecting the best information and data available, indicates a relatively large supply price increase in the Policy scenario.

There is some possibility that the LP Market price could be lower than what is estimated in this analysis. This will only become known once the market is established in FY2014-15. Competitive market pressure between LP suppliers and greater production efficiencies, if supported by the Regulatory regime, may drive the supply price in the Policy scenario lower than this study's Reference case.

The impact of higher LP market price is a reduction in the KG consumed in the market. The effect of the elimination of legal own-production is not expected to result in the cessation of that activity but its curtailment, as a result of a higher expected probability of police action, arrest and conviction.

The reduction in the KG consumed in the market is reflected in the reduction in the Consumer Surplus measure that tends to dominate the overall NPV result. While the sensitivity analysis (in the next section of this report) demonstrates that there are realistic parameter estimates that generate a positive NPV, this analysis suggests that the Reference case result with a negative NPV is the single most likely CBA result.

The TBS Guidelines for Cost-Benefit Analysis direct the results to be summarized (primarily) in terms of the Reference case. This report presents them as such. These Guidelines also require a sensitivity analysis of the CBA results to investigate the range of NPV results that can arise from alternative, realistic parameter values. This is undertaken below. It is important to highlight that the results show considerable variability and that the Reference case finding of a negative NPV is not, in fact, statistically significantly different from zero in light of the standard deviation of the resulting NPV distribution[32].

[32] The mean and standard deviation of the NPV distribution, based on 10,000 Monte Carlo trials, are: μ (mean) = $-1,476M; σ (standard deviation) = $2,799M. As a rule of thumb, there is a 95% probability that this study's estimate of the mean lies within a bound of +/- (2*Std Dev) of the 'true' mean. As that range includes the value zero and this study's Reference case estimate of -$728M this analysis can not say that a Null Hypothesis that this study's estimate is equal to zero can be rejected (at the 95% confidence interval).

CBA Accounting Statement (Table 1)

PART 1: Deterministic Case — NPV Results & Sensitivity Analysis

Category of Impact	NPV	Annualized NPV	Year 1	Year 2	Year 3	Year 4	Year 10
1. Monetized							
Benefits			13,858,072	11,668,741	-2,632,240	-35,510,868	-300,334,092
Costs			21,751,670	40,342,656	53,649,222	65,787,863	170,944,178
Net Benefits (All)	-109,723,604	-16,352,053	35,609,742	52,011,396	51,016,982	30,276,995	-129,389,915
Net Benefits (Exc. Users)	1,004,940,153	149,765,717					
2. Quantified / Non-Monetized							
Benefits							
Reduction-Legal Users			-16,415	-26,903	-40,647	-58,288	-124,933
Reduction- Legal KG-Consumed			-40,838	-66,160	-102,392	-148,939	-357,221
Costs							
Reduction-Misuse (Residential)			-4,157	-7,365	-12,098	-18,638	-51,225
Reduction-Residential Fires			-30	-54	-85	-133	-350
Reduction-Fire-Injuries			-2	-2	-3	-6	-15
Reduction-Fire-Deaths			0	0	-1	0	-1
Reduction-Home Invasions			-10	-20	-33	-53	-157
Reduction-Non-Fatal Shootings			-2	-2	-4	-6	-17
Reduction-Fatal Shootings			0	-1	0	0	-3
3. Unquantified							
Benefits	There are additional benefits in terms of reduced health risks to family members as a result of mould/chemical exposure resulting from residential marihuana cultivation in the home. There are also other general benefits from removing marihuana cultivation from homes, e.g., reduced fear, reduced policing costs, higher property values, and reduced environmental impacts from chemical waste).						
B. Cost-Effectiveness Analysis	Not Applicable						

PART 2: Risk/Uncertainty

Category of Impact	Values of Risk Variables (Low-High Range)			Type of Probability Distribution (Distribution Parameters)	
1. Key Risk Parameters	Lo	Mean	Hi	Type of Distribution	Parameters
Designated Person - Supply Cost	$1.40	$2.80	$5.00	Uniform	Minimum - Maximum
Max % of Mean Annual Income	10%	15%	20%	Uniform	Minimum - Maximum
Price Elasticity of Demand	-0.50	-0.25	-0.10	Triangular	Minimum - Likeliest - Maximum
Personal Use - Supply Cost	$1.00	$1.80	$2.50	Uniform	Minimum – Maximum
Utilization Rate - Personal Use	40%	55%	65%	Uniform	Minimum - Maximum
Utilization Rate - Designated Person	35%	47%	55%	Uniform	Minimum - Maximum

2. Monte Carlo Simulation	Project Outcome Values (NPV)	
	Mean Value	-1,687,872,721
	Median Value	-1,342,604,699
Sensitivity Analysis Results	Standard Deviation	2,855,961,358
	Low	-26,289,518,277
	High	10,010,797,264

Source: Delsys Research – as per TBS (2007) p.42

5.3.4 Stakeholder Analysis

The reference scenario NPV of -$109.72 Million can be broken down by results attributable to different stakeholders. This is summarized in Table 2 of the CBA Accounting Summary (as per TBS guidelines) and shown in Figure 5.20.

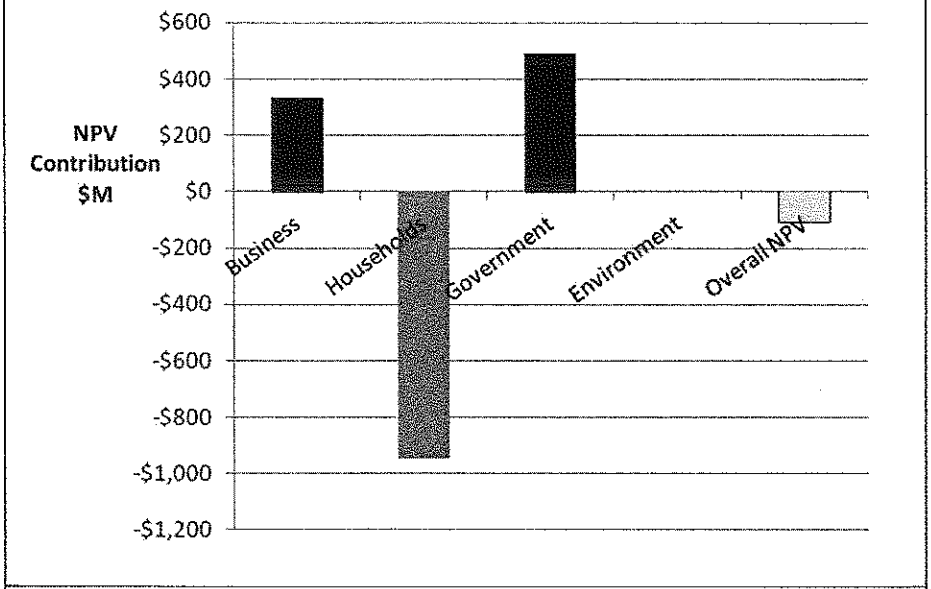
a) By Type of Stakeholder

Government (Federal Government) is the main beneficiary of benefits resulting from the Policy scenario through the reduction in Health Canada's Program Administration Costs.

Households, especially MMAP users, are the main stakeholder group impacted in terms of reduced Consumer Surplus benefits.

Businesses, especially Medium-Sized Businesses, are also a main beneficiary of the Policy scenario in terms of Producer Surplus benefits. It is important to note that Producer Surplus is not related to profitability and should not be taken as an indicator of such.

Figure 5.20 Composition of Reference Scenario NPV
By Stakeholder Type



Source: Delsys Research

CBA Accounting Statement (Table 2)

Stakeholder Impacts

Category of Impact	NPV	Annualized NPV	Year 1	Year 2	Year 3	Year 4	Year 10
Cumulative Net Impact	-109,723,604	-16,352,053	35,609,742	52,011,396	51,016,982	30,276,995	-129,389,915
1. Impact on Business							
Small Firms	7,622,719	1,136,010	2,368,944	5,674,077	0	0	0
Medium Firms	293,793,341	43,783,871	275,531	753,961	13,976,839	23,491,078	98,517,365
Large Firms	34,377,298	5,123,231	0	0	0	3,121,453	11,517,494
2. Impact on Households							
Participants in MMAP	-1,000,602,469	-149,119,274	12,002,322	13,110,613	-8,565,862	-58,585,004	-375,552,827
Non-Participants in MMAP	58,312,807	8,690,328	2,075,690	3,446,330	4,984,947	6,679,612	14,335,706
3. Impact on Government							
Federal Government	481,637,405	71,778,176	18,749,528	28,286,699	40,267,369	55,012,377	118,558,853
Other Government	11,081,795	1,651,514	137,728	739,715	353,689	557,479	3,233,494
4. Impact on Environment							
Not Relevant in Context	NA	NA	NA	NA	NA	NA	NA
5. Impact by Region							
Atlantic	-93,371,867	-13,915,162	2,222,267	3,051,185	970,316	-4,364,215	-38,001,962
Quebec	11,183,903	1,666,731	1,008,401	1,716,715	1,962,993	1,796,741	1,193,257
Ontario	199,063,164	29,666,281	24,567,758	35,888,291	41,784,033	41,018,600	6,015,633
Prairies / Territories	35,464,319	5,285,229	2,208,915	3,828,505	4,611,755	4,709,199	6,389,183
British Columbia	-260,950,029	-38,889,249	5,585,289	7,505,651	1,691,620	-12,821,928	-104,557,718

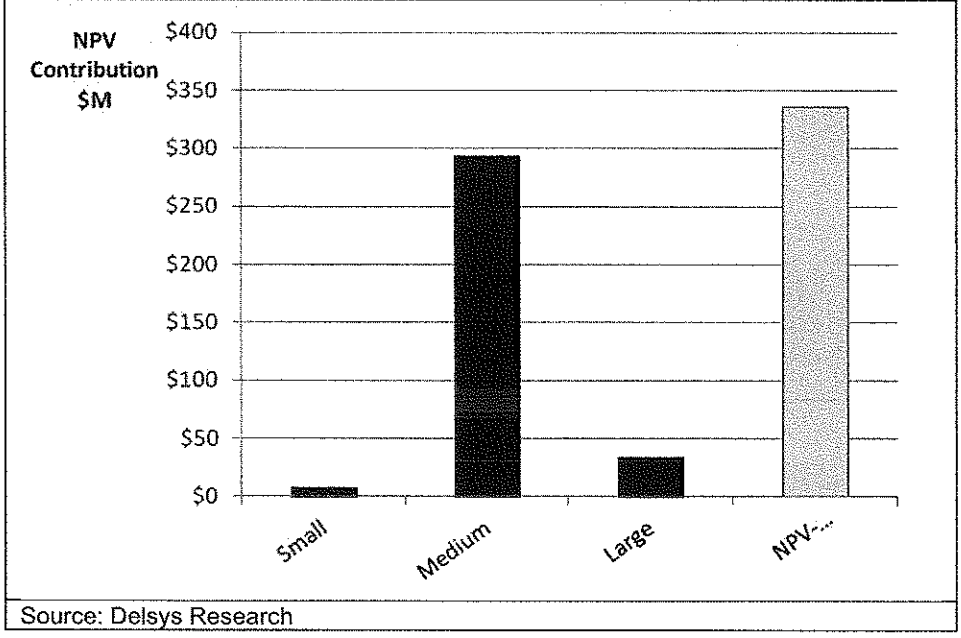
Source: Delsys Research – as per TBS (2007) p.43

b) By Size of Business

The Federal Government's regulatory streamlining initiatives place considerable focus on the elimination of business compliance costs and administrative burden on business, especially on Small Business[33].

The distinction between results in terms of size of business requires careful interpretation. Basically, all new LP entrants start as Small Businesses and grow to become Medium Businesses during the forecast period. Therefore, there is no real result specific to Small Business, as this is a transitory impact in the first two years, which is then overwhelmed by gains achieved – by the same businesses – over the balance of the forecast period as Medium-sized Businesses. This is shown in Figure 5.21.

Figure 5.21 Composition of Reference Scenario NPV By Size of Business



Source: Delsys Research

[33] Small Business is defined as less than 100 employees and/or less than $5M in Sales Revenue. In the CBA model for this regulatory proposal, New Entrant LPs are all Small Businesses during the initial two years of their operation and grow to become Medium businesses after two years.

c) By Household Type

The CBA considered two types of households: a) those associated with a family member who accessed marihuana for medical purposes or with a family member who is a Designated Producer; and b) members of the general public. These are shown in Figure 5.22.

i. Households – Family Member Participating in the MMAP

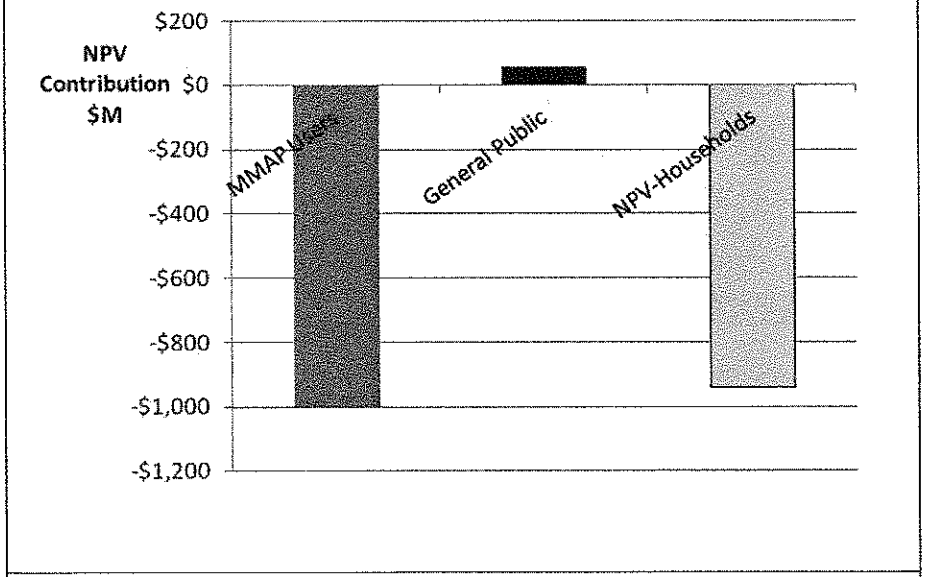
These households experience the loss of Consumer Surplus associated with more expensive marihuana and less quantity of marihuana consumed, the non-insured portion of fire property damage and the consequences of fire death and fire injury not attributed to firefighters, as well as the majority of home invasion consequences that are not attributed to the criminal justice system. Of these impacts, the monetary value associated with Consumer Surplus is the largest.

ii. Households – General Public

The General Public bears the Deadweight Loss associated with the market distortion arising from the effective subsidy or tax impact on regulated commercial marihuana supply, as well as the insured component of the property damage associated with fire events attributable to misuse of residential marihuana cultivation related to the MMAP.

It should be noted that, ultimately, the impacts on Governments (Federal and other) are also borne by these households as taxpayers. This value is not included, as Government is a separate Stakeholder in the analysis.

Figure 5.22 Composition of Reference Scenario NPV
By Household Type



Source: Delsys Research

If we attribute the Government NPV benefit to the General Public i.e., as taxpayers, the bar in Figure 5.22 for the general public NPV would be almost $500M higher.

d) By Level of Government

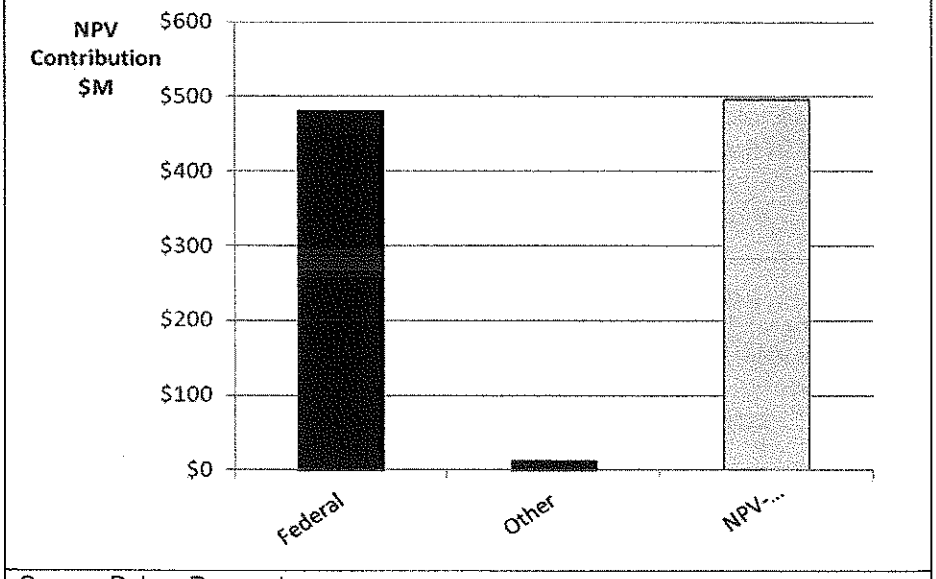
The Federal Government receives benefits from: a) the reduction in Health Canada – Program Administration Costs and b) a share of the costs of the criminal justice system as it pertains to Security social costs that are not borne by victims of Home Invasion crime.

Other Government receives benefits from: a) fire injuries sustained by firefighters associated with misuse of residential marihuana cultivation and b) a share of the costs of the criminal justice system as it pertains to security social costs that are not borne by victims of home invasion crime.

The bulk of Government benefits are related to the reduction in Program Administration cost and accrue to the Federal Government. This is shown in Figure 5.23.

It should be noted that, ultimately, the impacts on Governments (Federal and other) are also borne by the general public as taxpayers.

Figure 5.23 Composition of Reference Scenario NPV
By Level of Government



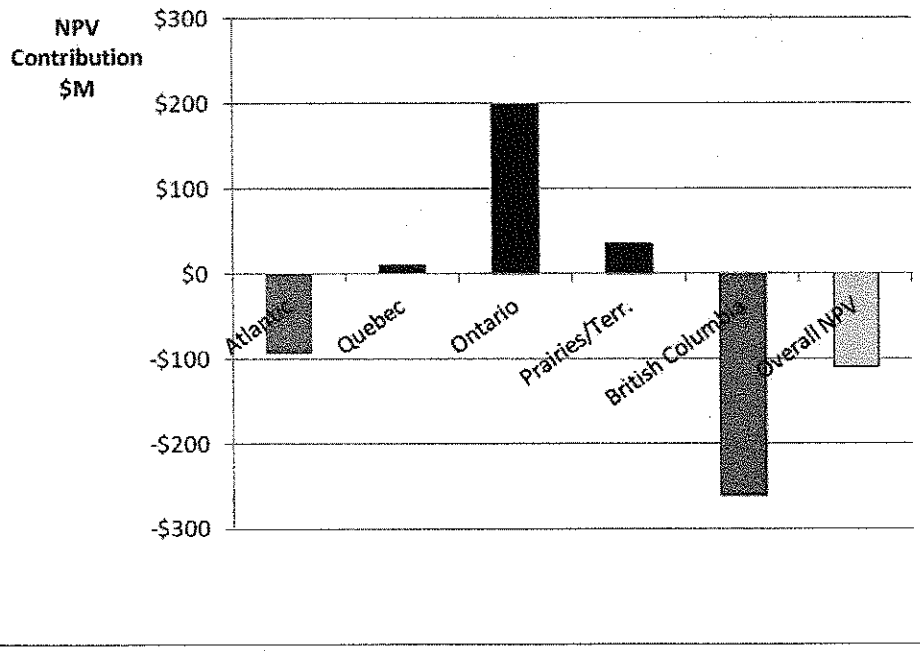
Source: Delsys Research

e) By Geographic Region

The CBA costs and benefits were allocated by geographic region of Canada according to known distributions of MMAP participation (which determines the bulk of the allocation) and an assumption about the expected locus of LP market production.

The large negative NPV attributable to British Columbia and the Atlantic[34] region result from their disproportionate share of MMAP participation in terms of persons authorized to possess marihuana for medical purposes. This is shown in Figure 5.24.

Figure 5.24 Composition of Reference Scenario NPV
By Geographic Region



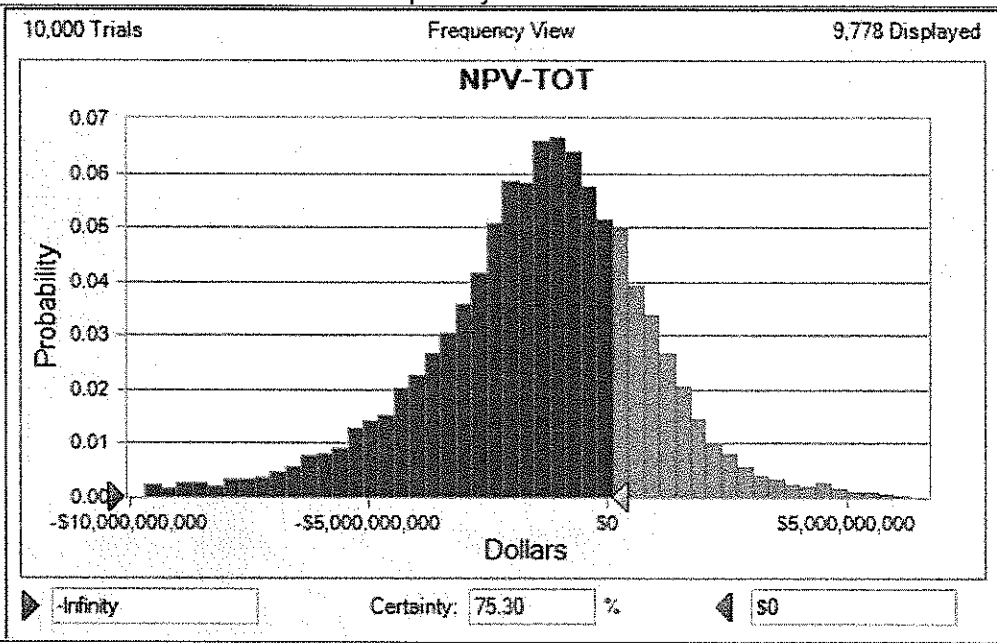
Source: Delsys Research

[34] The Atlantic region concentration of MMAP participation is largely driven by the high MMAP participation rates in Nova Scotia.

5.4 Sensitivity Analysis

The Monte Carlo simulation results, given the various assumptions and parameter distributions assumed in this model, are shown in Figure 5.25 and Table 5.7.

Figure 5.25 – NPV Result Distribution
Frequency Distribution



Source: Delsys Research

When the NPV distribution of results from the 10,000 Monte Carlo trials are examined, it is evident that the NPV central tendency is about -$1.690 Billion with a range from -$26 Billion to +11 Billion. About one quarter of all sensitivity trials resulted in a positive NPV.

Table 5.7 – NPV Result Distribution
Summary Statistics

Forecast: NPV-TOT		Forecast: NPV-TOT	
Statistic	Forecast values	Percentile	Forecast values
Trials	10,000	0%	-$26,289,518,277
Mean	-$1,687,872,721	10%	-$4,860,448,101
Median	-$1,342,604,699	20%	-$3,346,114,210
Mode	'---	30%	-$2,481,262,361
Standard Deviation	$2,855,961,358	40%	-$1,880,177,393
Variance	8.157E+18	50%	-$1,342,809,145
Skewness	-1.4200	60%	-$859,519,865
Kurtosis	9.02	70%	-$329,264,841
Coeff. of Variability	-1.69	80%	$310,124,093
Minimum	-$26,289,518,277	90%	$1,160,314,066
Maximum	$10,010,797,264	100%	$10,010,797,264
MSE	$28,559,614		

Source: Delsys Research

Investigation of the trials for which there is a positive NPV showed that such trials were more likely to be associated with:

- lower Status Quo scenario supply prices (combined across the three supply markets), primarily lower Designated-Person supply price and Personal-Use supply price;

- relatively higher consumption in the Policy scenario as a result of more Grams Per Year and a lower proportion of cases (21% of trials with positive NPV) for which the affordability constraint was operative (compared to 61% of trials with negative NPV) and/or higher maximum percentage of mean annual income comprising that affordability constraint; and

- more inelastic demand in the Policy scenario (although more elastic than the Status Quo) which results in a higher Demand intercept and slope[35].

The first of these reduces the Consumer Surplus measure in the Status Quo scenario. The second and third increase the Consumer Surplus measure in the Policy scenario. In all of these cases, there is considerable variability in the range of parameters that can generate a positive NPV result. This study looked at the mean value of various parameters for trials for which the NPV result is positive and compared this to means values for trials for which the NPV result is negative.

5.4.1 **Key Parameters**

The sensitivity analysis, Figure 5.26, shows the most important assumptions that give rise to variability for the NPV-Total result. The most important assumptions, in terms of contribution to variance, are:

DP-Cost - the Supply Cost (reference case = $2.80/gram) for Designated Producer in the Status Quo scenario.

PC-INCOME - the Maximum % of Mean Annual Income (for Users) that the Annual Cost of Marihuana Supply can account for (reference case = 15%).

P-ELAS-SQ - the Price Elasticity of Demand (reference case = -0.25) for all users in the Status Quo scenario.

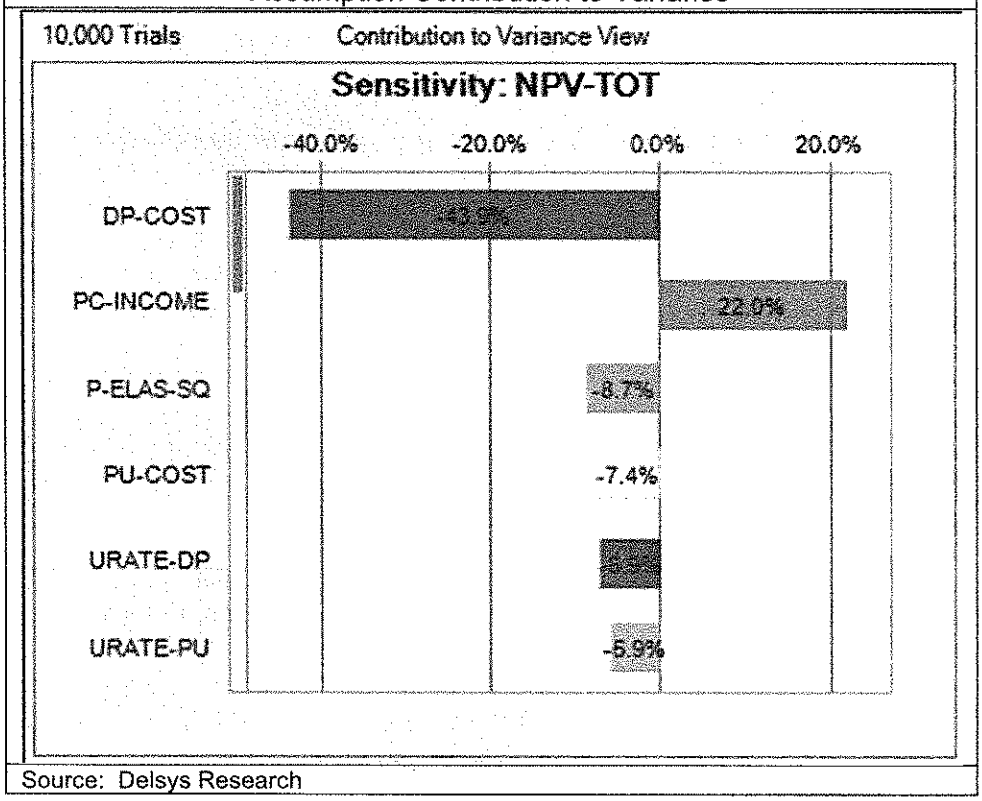
PU-Cost - the Supply Cost (reference case = $1.80/gram) for Personal Use in the Status Quo scenario.

URATE-DP - the Utilization Rate for Designated Persons in the Status Quo scenario, which is a ratio of the estimated actual usage relative to a theoretical maximum quantity based on the Proposed Daily Amount (9.0 grams) included in the ATP application by the user.

[35] More elastic demand in the Status Quo scenario leads (generally) to fewer legal users of Marihuana for Medical Purposes in the Policy scenario.

URATE-PU - the Utilization Rate for Personal Use in the Status Quo, which is a ratio of the estimated actual usage relative to a theoretical maximum quantity based on the Proposed Daily Amount (7.6 grams) included in the ATP application by the user.

Figure 5.26 – NPV-Total Sensitivity
Assumption Contribution to Variance



Source: Delsys Research

Further assessment of the sensitivity analysis shows the rank correlation between each of these important assumptions and the NPV result:

DP-Cost	ρ = -.50 to NPV
PC-INCOME	ρ = .35 to NPV
P-ELAS-SQ	ρ = -.22 to NPV
PU Cost	ρ = -.21 to NPV
URATE-DP	ρ = -.20 to NPV
URATE-PU	ρ = -.18 to NPV

For further discussion of response functions for key parameters of the CBA model, refer to Annex 2.

5.4.2 Discussion – Uncertainty in Quantitative Modeling

The most important finding of the sensitivity analysis is the considerable variation in possible NPV results from realistic parameter values and the complex interactions that are captured in the model.

This variability does not diminish the sense that the Reference case is the single most likely result.

The variability does reflect inherent uncertainty of the impacts of the proposed regulatory change. There are several key aspects of this variability, which is another way of reflecting regulatory risk:

1. Rapid Growth of the MMAP;
2. Fundamental Change;
3. Complex Dynamic Behaviour;
4. Establishment of a New Market; and
5. A Wide Range of Plausible Outcomes.

1. Rapid Growth of the MMAP

The MMAP has grown exponentially at an average annual rate of 40% for more than eight years. While it is believed there is a ceiling (upper limit) to future growth, it is expected that this will not be reached until the end of the forecast period. As a result of this inherent growth, the values involved (e.g., users, KG consumed, Administration Costs, safety and security events) are expected to change substantially. Any time that there are such large growth factors, there is an inherent risk regarding forecast accuracy and confidence levels over the forecast period.

One important qualitative impact, which the literature on drug crime prevention (which forms part of the policy rationale for proposed regulatory change) has identified, is that such crime prevention has a higher probability of success when the market is relatively small and emerging. While the illicit marihuana market is mature, the levels of MMAR misuse of residential home cultivation of marihuana are quite small (in FY2012) compared to the levels that are expected to arise by the end of the forecast period (FY2023-24). This suggests the need for reform of the regulatory regime before the scale of authorized cultivation of marihuana for medical purposes in homes grows further. It will be much harder (and possibly less successful) to reduce this activity (once declared illegal as a result of the elimination of PUPLs/DPPLs) if the policy change were delayed for five or ten years.

2. Fundamental Change

Regulatory change modelling is much easier and more certain when reform is incremental in nature. The proposed regulatory change for access to marihuana for medical purposes is more fundamental, especially the elimination of PUPLs/DPPLs which comprise 80% of user supply, in terms of persons, and the bulk (perhaps 97%) of legal KG supply.

It is unreasonable to believe that all residential marihuana cultivation that would have occurred under MMAR (and misuse) will cease as a result of its prohibition. This study has thus modelled a behavioural response that depends on the probability of conviction and builds in an effect which reflects the current inhibition that law enforcement authorities have stated exists with respect to their ability to take investigative police action once a problem resident (association with a MMAR production license) is identified. Once that inhibition is removed (a process of increasing clarity by eliminating the additional evidence required to obtain reasonable and probable grounds to investigate potential misuse), it is anticipated that there will be a deterrence effect on misuse associated with residential marihuana cultivation.

This study also anticipates that the effective supply price for marihuana for medical purposes will increase as LP Market supply is projected to be more expensive than PUPL/DPPL supply. It is expected that there will be a price elasticity effect that will consequently reduce the quantity of marihuana consumed for medical purposes in the Policy scenario LP Market relative to what would have been consumed in the Status Quo. This is the price effect.

Both the deterrence and price effects involve fundamental and large regulatory changes whose outcomes on behavioural change are inherently difficult to predict.

3. Complex Dynamic Behaviour

Human behaviour, in terms of criminal activity, crime prevention, market entrance and market demand), involves complex interactions and options. For the purposes of modelling the regulatory impact, this study assumed a degree of individual rationality and predictability of human behaviour in response to incentives (rewards and penalties).

That production activities which are authorized under the current MMAR will, under the proposed regulatory change, become illegal, raises an issue of regulatory compliance. Access to marihuana for medical purposes remains a debated subject of public policy[36]. By some Canadian public opinion evidence, Canadians appear divided on issues regarding the criminality (and morality) of marihuana use. This divided public opinion, and the sense that many Canadians may believe they have a right to access marihuana[37], means that the degree of compliance with the proposed regulatory change is uncertain.

4. Establishment of New Market

[36] Not to mention the broader policy of marihuana decriminalization, which is outside the scope of the proposed regulatory change and this CBA.

[37] Canadian court decisions, which underpin the MMAR regulatory regime, appear to recognize a right to access a legal supply of marihuana for medical purposes.

Most regulatory analysis deals with legal activities for which there is some history and experience in terms of market outcome. In the case of marihuana for medical purposes, the current MMAR regime has three distinct markets, of which only one (the Designated-Person supply market) might reflect a competitive market outcome. However, the market outcome in this case is not observed by Health Canada (as the regulator of participation in the MMAP).

The elimination of PUPLs/DPPLs and the termination of the contract governing the Government Supply market will bring about the establishment of a new LP Market.

This CBA study has attempted to estimate and anticipate likely demand and supply parameters for this market.

Market dynamics, in terms of entry of new LP suppliers, the growth of the existing incumbent (i.e., Contract Government Supply provider), the response of users to higher prices, and the elimination of legal residential marihuana cultivation, are complex and uncertain.

There is also a high degree of financial/business risk that Licensed Producers will face in the establishment of this new market.

5. A Wide Range of Plausible Outcomes

All of the above factors suggest that the analysis cannot project with any certainty, what the initial post-transition (i.e., phasing out of MMAR authorizations and production licenses) market outcomes will be, nor what these market outcomes will be in FY2023-24.

The broad variability of NPV outcomes, as reflected in the NPV Result distribution, is a simple quantified reflection of the underlying uncertainty and risks inherent in the proposed regulatory change.

5.5 Qualitative Discussion

5.5.0 Reference Case Qualitative Impacts

The Reference case generates a negative Net Present Value result and is based on reasonable assumptions that are inherently uncertain. Note that certain factors (i.e., impacts, behavioural responses) have been excluded from the quantitative CBA as there is insufficient information on which to assess the factor. As such, the quantitative analysis does not tell the full story of the overall impact of the proposed regulations. There are costs and benefits – possibly significant in size – that could not be quantified but which are relevant for public policy purposes.

The following subsections examine the qualitative impacts that are applicable across all of the scenarios considered under the probabilistic analysis, and discuss some core issues and trends which are likely to result from the proposed changes to the regulation (and creation of the new industry). Before these issues are examined in depth, however, it bears examination which qualitative impacts will (or will not) be evident under the Reference case.

Perhaps the most notable impact of the Reference case, and of the program in general, is the introduction of a regulated marihuana production and distribution industry (for the use of marihuana for medical purposes) into the Canadian economy. The proposed marihuana

access program will create hundreds of new jobs across Canada within the projected ten-year period. As private businesses, the licensed producers/distributors will be subject to scrutiny and attention from the public as well as the media. This process may inhibit marihuana production that operates outside the bounds of the law (i.e., at least as it pertains to marihuana use for medical purposes) and raises questions as to the product safety of using illicitly-obtained marihuana. Just as bootleg whiskey is considered to be more dangerous and more variable in quality in relation to a quality-controlled product available from a regulated industry, so too could a regulated marihuana for medical purposes industry make the illicit product less attractive over time.

Under the Reference case, a reduction in the alleged misuse of marihuana for medical purposes is anticipated. However, not all criminal activity will cease. The proposed regulations provide certain safeguards against illicit diversion from licensed producers: a) the requirements and background checks prescribed by the new regulations are significant; and b) the significantly lower number of entities subject to regulation, enforcement and monitoring by Health Canada should allow for more effective management and greater compliance over time.

The quantitative CBA includes calculations as to the impact of ending personal and designated person production, both of which involve fire hazards, crime risk and concern as to the evidentiary requirements in investigating potential misuse. From a qualitative perspective, this is one of the most noticeable impacts of the new policy structure. Whereas law enforcement authorities previously encountered difficulty in determining which residences where marihuana was being produced were operating outside the law, the proposed regulations provide certainty that any residence conducting marihuana cultivation will be strictly outside the law and subject to enforcement. This regulatory simplification should increase the effectiveness of law enforcement efforts and result in improvements in compliance dynamics.

The Reference case assumes that the new industry will ramp up and become competitive quickly. While the first six months of the transitional period will be challenging for most new LPs, the already significant and growing demand for product will justify additional investment and short-term staffing/production to smooth over the difficult start-up phase that is likely to be experienced by many new licensed producers.

Once LPs are up and running, additional qualitative factors may come into effect. The regulations specifically will not allow the advertisement of marihuana to the general public. However, the marihuana for medical purposes client base tends to be socially connected and capable of using social networks to quickly spread information informally. While LPs will not be able to advertise their products in a conventional sense there is likely to be a strong incentive for individuals accessing marihuana from LPs to share information (e.g., with respect to pricing, delivery, customer service, personal perceptions of the impact of usage, etc.) among themselves, and support the creation of brand identities – even without LPs having the legal ability to manage this process overtly.

This informal branding/advertising structure may have two impacts: a) it will raise awareness of the new system and LP industry; and b) it will provide a means for the regulator and for LPs to conduct market research on consumer attitudes, word-of-mouth response with respect to all products and LPs in the market.

The first effect is akin to restaurant reviews using social networking which will increase the power of the word-of-mouth dynamic for branding and product differentiation.

The second impact is akin to an early warning system and provides customer informal feedback and customer preference indicators with respect to product/service characteristics (e.g. price responsiveness, product perception, service experiences, customer problems) which provides the opportunity for product/service adaptation and improvement.

The Reference case projects the continued growth of marihuana for medical purposes usage in Canada and assumes that medical professionals will continue to expand their support of patient access. The Reference case projects that the average cost of a gram of marihuana will increase under the new regime over the average supply price under the existing MMAR regime, largely due to the elimination of lower cost personal-use and designated-person production. From a qualitative perspective, there are two price-response factors that can be identified: a) the legal supply price (for marihuana for medical purposes) is expected to remain below the illicit street price for marihuana (for retail quantities); and b) market dynamic forces may lead to product improvement over time from R&D and, potentially, investment in science to meet the Health Canada requirement for authorization as a therapeutic drug.

The expected LP price will likely be less than that of the illicit market. Persons wanting to access marihuana for medical purposes are therefore, it is suggested, unlikely to want to access their product from the illicit street supply. It is anticipated that the market demand for marihuana for medical purposes usage is driven by a perception that this is an effective means of treating certain health conditions. An increase in the 'legal supply' price (i.e., the price for the LP market is expected to be above that for the MMAR supply markets) may result in users (and potential future users) considering alternative treatment options and/or in using less marihuana for medical purposes. Assuming that the projected increase in the Status Quo for use of marihuana for medical purposes is fully reflective of legitimate health conditions, there will be no diminution of the underlying demand for idiosyncratic pain relief or other perceived benefits to individuals.

The complex relationships and interactions between price, access, quality and demand in the Status Quo scenario, Policy scenario and (implicitly) in the illegal market, are captured to a large degree in the Reference case of the CBA where a large and growing number of users remain "willing to pay" for marihuana for medical purposes from LPs in the Policy scenario despite the higher price compared with the Status Quo scenario.

It is anticipated that LPs may have an incentive to invest in R&D and scientific study of the use of marihuana products/delivery methods as recognized medical therapy. This will especially be the case if profitability is high and market growth remains strong. The potential for strong profitability (given regulatory and commercial entry requirements) can spur innovation, which has not been factored into the CBA results.

These are some of the key qualitative impacts of the Reference case pertaining to market dynamics. The following subsections examine other potential impacts.

5.5.1 Safety and Security

A major objective of the regulatory proposal is to enhance public and personal safety and security in Canadian residential communities. The benefits of achieving this objective are captured to a large degree in the quantified CBA.

However, the literature review, stakeholder consultations and other sources indicate some additional benefits regarding public and personal safety and security. These additional benefits are more difficult to quantify and monetize because of the absence of data relevant to the Canadian context. For example, additional improvements in health, quality of life, and the environment will result from the reduced presence and health/safety risks of mould, chemical contamination and problems that are associated with production of marihuana in small, enclosed spaces in private residences.

Improvements in the quality of life and the physical environment are likely to lead to higher residential and other property values. It may also lead to lower home insurance costs for households and businesses in the communities which experience a decrease in the production and misuse of personal use and designated production now taking place under the MMAR regime. The improvement in law enforcement clarity and effectiveness of police resources could allow for better law enforcement outcomes and greater deterrence effect from drug crime policing.

5.5.2 Reduced Information, Administration and Related Transaction Costs

The regulatory proposal is designed to reduce the information, administration, and related transaction costs for access to a regulated supply of marihuana for medical purposes. Compared with the Status Quo scenario, the regulatory proposal (Policy scenario) involves less costly administrative requirements for users/patients and physicians to access a regulated supply of marihuana for medical purposes. While the program administrative costs facing Health Canada has been reflected in the CBA results these patient/health professional benefits have not been included. The time and effort savings under the Policy scenario from a shorter form, reduced processing steps (e.g., no application to Health Canada, no requirement for medical specialist consult) are difficult to quantify but are recognized to be real and tangible.

It is possible that less costly and more timely access could result in greater use uptake than has been forecast and reflected in the CBA results. In particular, removing the government from the physician-patient interaction, eliminating the categories of conditions or symptoms for which an individual may possess marihuana for medical purposes, removing the requirement for some individuals to consult with and obtain permission from a specialist, and simplifying the form to be filled out by the doctor should:

(i) reduce the information and transactions costs and related delays and risks of both physicians and their patients, and

(ii) make the interaction quite similar to doctor/patient discussions on other drug and medical therapies.

Physicians and patients that may have been discouraged from participation in the MMAP in the Status Quo scenario could have some of these impediments overcome by the proposed regulatory changes. This could expand market demand and result in additional incremental benefits of the Policy scenario.

Information was provided through stakeholder consultations with Health Canada regarding administrative and other cost savings, including for certain municipal government functions. The Policy scenario could lead to lower costs and/or greater effectiveness of municipal law

enforcement, fire protection and related services (e.g. by law enforcement) as a consequence of reduced fire risk and reduced misuse associated with residential marihuana production.

5.5.3 Establishment of a Competitive and Innovative Industry

The regulatory proposal will eliminate licensed personal-use and designated-person production (and the current government-contracted supply) of marihuana. It is anticipated that the regulated LP market will grow to be reasonably large (e.g., sales >$1 Billion per year), competitive (perhaps ~50 suppliers) and profitable – which over time has the potential to lead to innovation. The LP market could have the incentives, resources, ability and competitive pressures to undertake (over time) investment in R&D and product, process and organizational innovations that could result in the following[38]:

(i) Economies of scale and scope, accumulated learning, and related internal and external efficiencies;

(ii) Higher yields; lower production, overhead, handling, shipping and other costs; and higher quality products, better strains and greater product variety that better meet the diverse needs of their customers (i.e., some of these dynamics could lead, over time, to reduced product prices [Hazekamp (2006, 2007)];

(iii) User social-networking that will result in shared information and learning between LPs, Health Canada and other government agencies that may lead, over time, to lower compliance, administration and related regulatory costs that will achieve desired regulatory objectives; and

(iv) Industry research and public research to expand the scientific knowledge base regarding the medical efficacy and toxicity of marihuana products and ingestion methods as potentially approved therapies

5.5.4 Potential Benefits and Risks of "Reverse Diversion" from the Illicit Marijuana Industry and Other Legal and Illegal Substances to the Marihuana for Medical Purposes Industry under the Policy Scenario

An extensive body of literature on cannabis/marihuana use suggests the possibility of an unintended consequence of a regulated marihuana production and supply industry. Over time, a regulated market could be characterized by: monopolistic competition based on product differentiation and lesser price elasticity; and a product substitute for persons seeking alternative methods for alleviating pain and other condition symptoms.

Furthermore, the existence of a regulated marihuana supply at a price below the illicit street price raises the potential for what may be referred to as "reverse diversion." This term refers to the desire to substitute illicit marihuana supply with a less expensive supply for reasons other

[38] The diagram Annex I section 5 uses comparative statics analysis to illustrate how user demand and consumer surplus could increase in the future through the combined effects of these dynamic factors. The potential for greater consumer surplus, higher producer surplus, and other economic and societal benefits from the dynamic industry and market changes associated with the Policy scenario over the longer term is the consequence of a number of the pro-competition and pro-innovation features of the Policy scenario compared with the Status Quo scenario.

than medical purposes. The potential demand for access to a legal supply of marihuana may be greater than projected in the CBA[39].

The literature review and stakeholder consultation process both indicated that "reverse diversion" could lead to net incremental benefits. Lower quality-adjusted prices are possible, over time, under dynamic market behaviours. These could generate greater consumer surplus for each user (i.e., infra-marginal gain) as well as greater consumer surplus from induced users (i.e., extra-marginal gain).

The literature suggests that, over the long term, growth in market size, market competitiveness and market innovation capabilities (aided by "reverse diversion" and other processes) could result in decreased abuse of alcohol, marihuana, hard drugs and certain prescription drugs for relieving pain that are reportedly causing problems. As a consequence, additional user and societal benefits could result from the reduction in the addiction, abuse, crime, health, and other problems and government and social costs that are currently associated with alcohol, hard drugs and certain prescription drugs [Payne (2012) and Kilmer et al (2010)].

The process of "reverse diversion" is not without certain costs and risks, however. The illicit drug market has a reputation for responding flexibly, aggressively, and (sometimes) effectively to various market, legal and other risks that threaten its customer base, revenues and profits. Producers, importers and dealers in the illicit market may respond with violence, intimidation, sabotage, theft and other criminal acts when faced with the risk of losing customers to the legal supply market for marihuana for medical purposes. They could also engage in standard economic responses such as predatory pricing, non-price predation and other anti-competitive conduct directed at participants in the legal market and industry [Becker et al (2006) and Rhodes et al (2000)].

The potential for "reverse diversion" is a risk to the undermining of public confidence in the proposed regulatory regime. The public might perceive rapid growth based (in part) on reverse diversion as an abuse of the proposed regulatory regime that was intended to be restricted to persons seeking alleviation of medical conditions under physician or other health care practitioner supervision.

5.5.6 Limitation of CBA

This CBA is intended to quantify the most likely Reference case Net Present Value result, as well as a sensitivity analysis of the NPV Result distribution. The associated qualitative analysis adds further context to the quantitative CBA results.

Government policy decision-making often is based on factors, judgments and priorities that are unlikely to be reflected in a CBA study. Practitioners of CBA are aware of this reality and have been guided to recognize the limitations of their tools, data and analysis.

This CBA study is a fair and reasonable reflection of quantitative and qualitative measures to evaluate the proposed regulatory changes to access to marihuana for medical purposes. It is offered in full accordance with Treasury Board Secretariat Guidelines for Cost-Benefit Analysis.

[39] It is also possible that the rapid expansion of the existing MMAP (and its projected future growth in the Status Quo scenario) is also a result of similar desire to access marihuana for other than medical purposes.

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The order of magnitude of the quantitative CBA results reasonably account for the most important aspects of the policy rationale related to the proposed regulatory change. These CBA results may not, however, reflect the weight, priority and valuation of factors leading to the development of the proposed MMAR regulatory change. The CBA results are one form of regulatory analysis, among others, that have been undertaken in accordance with the Federal Government regulatory impact assessment requirements.

CHAPTER SIX

6.0 Conclusions

The monetized CBA results, in terms of Discounted Net Present Value, show that the expected benefits and costs of the proposed Regulatory change fall onto different stakeholders in varying degrees of impact.

There is no clearly Pareto superior result that supports a statement that one scenario (i.e., Status Quo or Policy) is superior to the other. The fact that the Reference case NPV is negative (-$109.72 Million) indicates that the sum of benefit and cost changes across all stakeholders is negative. The sensitivity analysis of the NPV result clearly shows a wide range of possible outcomes with a central tendency that is not statistically different from zero.

The analysis of the Reference case by stakeholder group shows that one class of stakeholder bears a cost in terms of NPV impact - namely the users of marihuana for medical purposes - while the remaining stakeholders (e.g., the general public, government, licensed producers) are made better off. This is a classic result that demonstrates there is no Pareto superior outcome and that economic analysis methods (such as Cost-Benefit Analysis) cannot, unequivocally, state that one option is better than the other. In such cases it is traditional to rely on priority judgements by policy makers to indicate which option is superior in terms of social welfare.

Both the quantitative and qualitative CBA results reflect the following factors:

i) rapid program uptake and continued growth;

ii) the fundamental nature of the regulatory change;

iii) the complex dynamic behavioural changes that could occur as a result of the elimination of residential marihuana cultivation and its replacement by higher cost commercial supply;

iv) the uncertainty surrounding the establishment of a new industry and market; and

v) the inherently unknown final outcome of the regulatory change after ten years.

It is important to bear in mind that while, from an economic perspective, user benefit is measured from the consumption of marihuana for medical purposes in terms of consumer surplus, the available scientific evidence does not support the authorization of marihuana use for therapeutic purposes under the Food and Drugs Act and Regulations. Canadian courts have ruled that individuals have a legal right to possess marihuana for medical purposes and that the Government of Canada has an obligation to provide reasonable access to a legal supply of marihuana for such medical purposes.

The consumer surplus measure of user benefit does not purport to show, and should not be taken as evidence, that there is any quantifiable medical benefit attributed to the consumption of marihuana for medical purposes.

Policy makers, apparently, have attributed much more weight to the negative impacts on social welfare that have been shown to arise from higher safety and security risks attributable to residential marihuana cultivation, and to the much higher program administration costs that would fall on Health Canada if the Status Quo were maintained and significant future growth in MMAP participation were to be accommodated. These have been monetized and quantified as best as possible and they are significant in number and value. While the Reference case does not show these to outweigh the loss of consumer surplus, it may be that the application of a social valuation to these impacts (from an economic perspective) may not adequately reflect a social valuation of the maintenance of public safety and security.

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ANNEX 1 – Consumer & Producer Surplus with Subsidy

1. Consumer & Producer Surplus – Impact of Subsidy

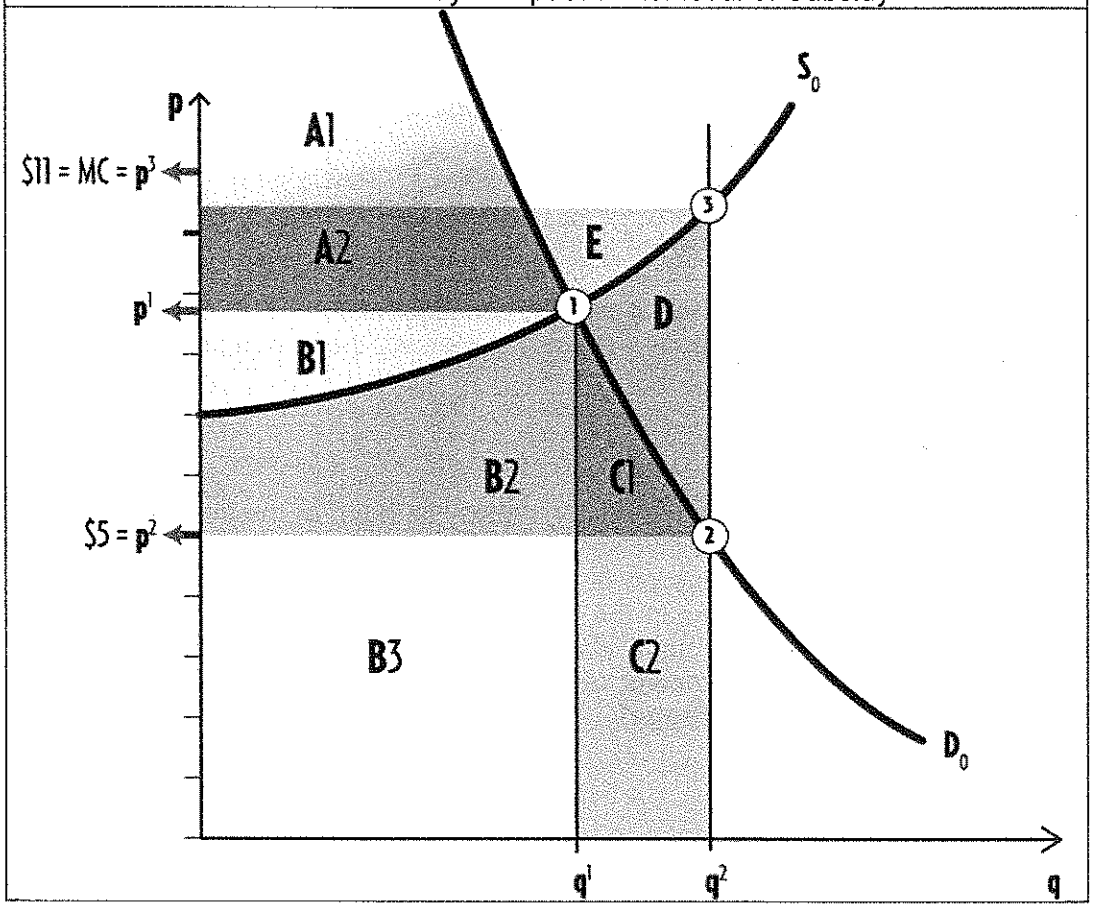
The graphic calculation of Consumer Surplus (CS) and Producer Surplus (PS) is described in a market with an upward sloping Supply curve (S_0) and a downward sloping Demand curve (D_0) that intersect at point 1. This is seen in Figure A-1.

Figure A-1 is used to assess the social welfare consequences of an introduction of a subsidy. First, the outcome of a market without a subsidy is viewed; then changes are observed when a subsidy is introduced.

Equilibrium – No Subsidy (Figure A-1)

The market equilibrium in the absence of any subsidy is found at the intersection of the Supply and Demand curves at point 1 and involves price p^1 and quantity q^1. In a perfectly competitive market the marginal cost of production is equal to p^1 (where the Supply curve shows rising marginal cost as quantity increases in the market) and the marginal willingness-to-pay is also equal to p^1 (where the Demand curve shows falling marginal willingness-to-pay as quantity increases in the market). Total market revenue is $p^1 * q^1$ and is equal to the sum of areas B1+B2+B3 in Figure A-1 (see next page).

Figure A-1 – Consumer & Producer Surplus
Market with Subsidy – Impact of Removal of Subsidy



Consumer Surplus is the area below and to the left of the Demand curve and above the price line at p^1. This equals the sum of areas A1+A2. It represents the amount of consumer willingness-to-pay that exceeds the out-of-pocket expense to secure quantity q^1 in the market. It is a benefit to consumers that is not captured in the market transaction through the price of the good.

Producer Surplus is the area above and to the left of the Supply curve and below the price line at p^1. This equals the area B1. It represents the amount of producer revenue that exceeds the total variable cost to produce quantity q^1 in the market. It is a benefit to producers that is captured in the market transaction through the price of the good.

Equilibrium – With Subsidy (Figure A1)

An allowance is now made for the existence of a price subsidy. The form of the subsidy (i.e. how it is paid) is less important than its existence and impact on market behaviour. The subsidy means that consumers can purchase the good at a price that is below what producers receive for providing the good. The quantity produced and sold in the subsidized market q^2 will be larger than the equilibrium quantity in the absence of the subsidy q^1.

In Figure A-1, consumers will effectively be at some point 2, such that at the traded quantity q^2 the price they face is p^2 and is less than the equilibrium price p^1 without the subsidy. Producers

will conversely be at some point 3, such that at the traded quantity q^2 the price they receive is p^3. The subsidy s (per unit of output) is equal to the difference between the two prices (p^3-p^2 = s) and the quantity demanded equals the quantity supplied at q^2.

While the operation of the market in terms of prices at the quantity q^2 has been explained, the actual market operation is in the reverse order. The existence of the subsidy per unit s generates a subsidy wedge and the subsidized market equilibrium quantity q^2 is determined where the quantity demanded equals the quantity supplied for the given value of the subsidy s.

The subsidy value is the value s * q^2 and is represented in Figure A-1 by the sum of the areas A2+B1+B2+C1+D+E.

The treatment of what is Consumer Surplus and Producer Surplus is complicated by the existence of the subsidy.

The logic used above, which took the Consumer Surplus to be the area below and to the left of the Demand curve and above the price line at p^2, would lead one to believe that this can be measured by the sum of the areas A1+A2+B1+B2+C1. This is obviously larger than in the market equilibrium case. However, the existence of the subsidy does not allow us to associate that area with Consumer Surplus.

The logic used above, which took the Producer Surplus to be the area above and to the left of the Supply curve and below the price line (i.e. at p^3), would lead one to believe that this can be measured by the sum of the areas B1+A2+E. However, the existence of the subsidy does not allow us to associate that area with Producer Surplus.

A new concept, Deadweight Loss, is used to refer to the value of resources consumed in production that exceed (at the margin) the value associated with consumer willingness-to-pay. In the subsidized market, this is the area above the Demand curve and below the Supply curve to the right of the marketing equilibrium point 1 (i.e. in the absence of the subsidy). This is the area D in Figure A-1. This Deadweight Loss is a social loss of productive resources that have been allocated to a use (the production of the good) for which the cost of the resources exceeds the marginal value ascribed to them by consumers (i.e. in their transformed state of the good produced and consumed).

For the purposes of ascertaining Producer Surplus, the lower price p^2 is effectively taken as the appropriate measure of the marginal social valuation of the use of the good. There is, therefore, no Producer Surplus in the subsidized market equilibrium.

Conversely, when measuring Consumer Surplus, the higher price p^3 is effectively taken as the appropriate measure of the margin social cost of the resources used in the production of the good. Therefore, the Consumer Surplus is the area A1 in Figure A-1.

Table A-1 summarizes the impacts on price, quantity and this study's welfare measures of Consumer Surplus, Producer Surplus and Deadweight Loss.

Table A-1 - Consumer Surplus, Producer Surplus & Deadweight Loss In a Market with a Subsidy (Figure 1) Showing Various Results With No Subsidy and With a Subsidy		
Variable	No Subsidy	Subsidy
Price to Seller	p^1	p^3
Price to Buyer	p^1	p^2
Subsidy (per unit)	zero	$s = p^3 - p^2 > 0$
Equilibrium Quantity	q^1	q^2
Value of Subsidy or Value of Transfer	zero	sum of area A2+E+B1+B2+C1+D
Consumer Surplus	sum of area A1+A2	area A1
Producer Surplus	area B1	zero
Deadweight Loss	zero	area D

The introduction of a subsidy involves:

- an increase in quantity demanded and supplied (i.e. $q^2 - q^1$);
- the transfer of value to producers and consumers (usually from taxpayers) equal to the sum of the areas A2+E+B1+B2+C1+D and which equals $s * q^2$ in value;
- the Deadweight Loss equal to area D;
- the elimination of Producer Surplus equal to area B1; and
- the reduction in Consumer Surplus equal to area A2.

In terms of a CBA measure of social welfare change, the transfer enters as a transfer and is neither a gain nor a loss. It is considered a transfer of resources from one owner (perhaps the taxpayer) to another owner (consumers and/or producers).

The only changes that are meaningful from a CBA measure of social welfare, involve the Deadweight Loss (area D), the elimination of Producer Surplus (area B1) and the reduction in Consumer Surplus (area A2). As all these involve a loss of social welfare, it suggests that the introduction of a subsidy in the market for this good resulted in the following Social Welfare Change:

$$(3.1) \quad \Delta\text{Social Welfare} = \Delta\text{Consumer Surplus} + \Delta\text{Producer Surplus} - \text{Deadweight Loss}$$

$$= (-\text{ area A2}) + (-\text{ area B1}) - (\text{area D}) < 0$$

The introduction of a subsidy involves social welfare loss as a result of economic distortions and misallocation of resources from their 'best use' as determined in a market equilibrium without subsidy.

2. Consumer & Producer Surplus – Impact of Shift of the Supply Curve

It is now necessary to assess the social welfare consequences of a shift of the Supply curve in terms of the impact on market equilibrium. This is shown in Figure A-2. In Figure A-2, it is assumed that some change in the structure of the market results in a downward shift in the supply curve from S_0 to S_1.

A downward shift in the Supply curve could result from improvement in technology, reduction of regulatory impediments to efficiency or some other cause. The result is that at any quantity to be supplied in the market the marginal cost (per unit) of production is lower, so that S_1 lies below S_0. As the market can now (i.e. after the shift to supply curve S_1) be supplied more efficiently, a resulting social welfare gain is expected.

First the outcome of a market with Supply curve S_0 is examined; then any changes are observed when the market is supplied by the more efficient (lower marginal cost) Supply curve S_1.

Equilibrium – Supply Curve S_0 (Figure A-2) – Higher Marginal Cost

The market equilibrium is found at the intersection of the Supply curve S_0 and the Demand curve D_0 at point 1 and involves price p^1 and quantity supplied and bought q^1.

As there are more horizontal and vertical lines and points of reference in Figure A-2, some of the areas that were defined in Figure 1 have been broken up into components so that the labelling format for distinct areas of the graphic are more complicated. The relationship between areas is shown in Figure A-2 (versus corresponding areas in Figure A-1) using suffix numbers.

Total market revenue is $p^1 * q^1$ and is equal to the sum of areas (B1.1+B1.2) + (B2.1+B2.2+B2.3) + B3 in Figure 2 (i.e. corresponding to the sum of areas B1+B2+B3 in Figure A-1).

Consumer Surplus is the area below and to the left of the Demand curve D_0 and above the price line at p^1. This equals the sum of areas A1+A2 (i.e. as in Figure A-1).

Producer Surplus is the area above and to the left of the Supply curve S_0 and below the price line at p^1. This equals the sum of the areas (B1.1+B1.2) (i.e. corresponding to area B1 Figure A-1).

Equilibrium – Supply Curve S_1 (Figure A-2) – Lower Marginal Cost

The market equilibrium is found at the intersection of the Supply curve S_1 and the Demand curve D_0 at point 3 and involves price p^3 and quantity supplied and bought q^3.

As marginal cost (per unit produced) is lower along Supply curve S_1 than for Supply curve S_2 the market equilibrium price has fallen (i.e. $p^1 > p^3$) and with the downward sloping Demand curve D_0 the quantity supplied and bought has increased (i.e. $q^3 > q^1$).

Total market revenue is $p^3 * q^3$ and is equal to the sum of areas (B1.2 + B2.2 + C1.2 + B2.3 + C1.3 + B3 + C2.1) in Figure A-2.

Consumer Surplus is the area below and to the left of the Demand curve D_0 and above the price line at p^3. This equals the sum of areas (A1 + A2 + B1.1 + B2.1 + C1.1) in Figure A-2.

Producer Surplus is the area above and to the left of the Supply curve S_1 and below the price line at p^3. This equals the sum of the areas (B1.2+B2.2+C1.2) in Figure A-2.

Figure A-2 – Consumer & Producer Surplus
Market with Subsidy

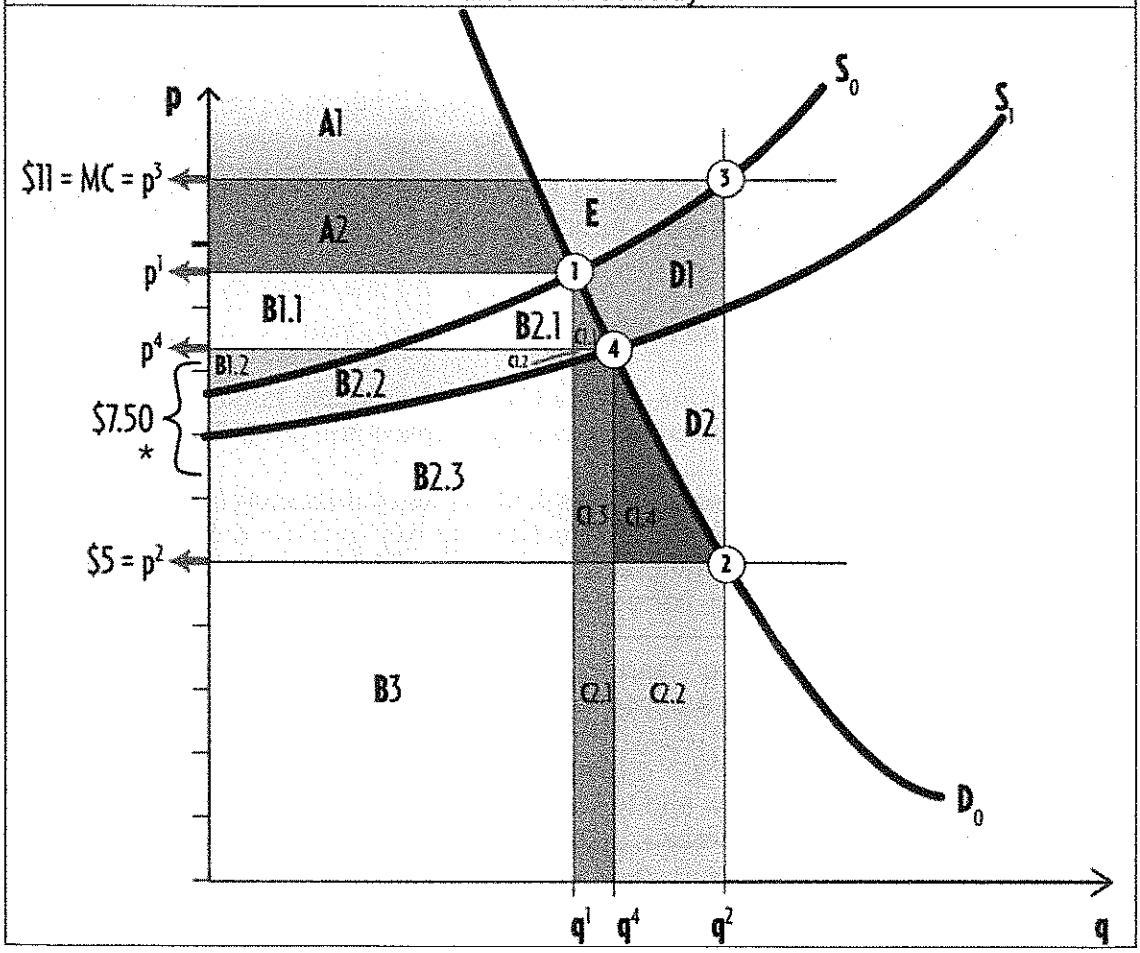


Table A-2 summarizes the impacts on price, quantity and this study's welfare measures of Consumer Surplus and Producer Surplus. As there is no subsidy involved in the shift in Supply curves there is no Deadweight Loss issue.

Table A-2 - Consumer Surplus, Producer Surplus & Deadweight Loss In a Market with a Shift of the Supply Curve (Figure 2) Showing Various Results With Supply Curve S_0 and S_1 (lower cost)		
Variable	Supply S_0 (higher cost)	Supply S_1 (lower cost)
Price to Seller	p^1	p^3
Price to Buyer	p^1	p^3
Subsidy (per unit)	zero	zero
Equilibrium Quantity	q^1	q^3
Value of Subsidy or Value of Transfer	zero	zero
Consumer Surplus	sum of area A1+A2	sum of area A1+A2+B1.1+B2.1+C1.1
Producer Surplus	sum of area B1.1+B1.2	sum of area B1.2+B2.2+C1.2
Deadweight Loss	zero	zero

As can be seen in Table A-2, the value of Consumer Surplus has increased as a result of the shift to a lower marginal cost Supply curve. The change in Consumer Surplus is larger by the sum of the areas B1.1+B2.1+C1.1 in Figure A-2. In deriving the change in Consumer Surplus, the net difference between the two situations was assessed.

For the purposes of ascertaining the change in Producer Surplus, this study will not look at the net difference between the two situations. It is widely accepted in economics (since Schumpeter and the concept of creative destruction) that technological advances create losers and that society is still better off as a result of improvements in technology. Therefore, from the perspective of social welfare change, the elimination of the original Producer Surplus (associated with Supply curve S_0) is not a social welfare loss. The study therefore does not take the difference between in Producer Surplus as the measure of social welfare gain. The measure of social welfare gain is the Producer Surplus associated with the more efficient (lower marginal cost) Supply curve S_1. The Producer Surplus is the sum of the areas B1.2+B2.2+C1.2 in Figure A-2.

The meaningful changes in terms of a CBA measure of social welfare, involve the Producer Surplus (areas B1.2+B2.2+C1.2) and the gain in Consumer Surplus (areas B1.1+B2.1+C1.1). As all these involve a gain of social welfare, it suggests that the shift in Supply curve resulting from more efficient production in the market for this good resulted in the following Social Welfare Change:

$$(3.2) \quad \Delta\text{Social Welfare} = \Delta\text{Consumer Surplus} + \text{Producer Surplus}$$

$$= (\text{areas B1.1+B2.1+C1.1}) + (\text{areas B1.2+B2.2+C1.2}) > 0$$

3. Consumer & Producer Surplus – Combined Effect

To look at the combined effect of the elimination of a subsidy and a shift in Supply curve involving more efficient (lower marginal cost) production, it is necessary to combine (i.e. sum) the two effects that considered above. These can all be seen in Figure A-2 provided that accommodation is made to the break-up of areas into components in the transition from Figure A-1 to Figure A-2.

Table A-3 summarizes the impacts on price, quantity and the welfare measures of Consumer Surplus, Producer Surplus and Deadweight Loss. This combined the results from Tables A-1 and A-2 above.

Table A-3 - Consumer Surplus, Producer Surplus & Deadweight Loss
Combined Effect of a) Elimination of Subsidy and b) More Efficient Supply

Variable	Subsidy Supply S_0	No Subsidy Supply S_0	Lower Cost Supply S_1
Price to Seller	p^3	p^1	p^3
Price to Buyer	p^2	p^1	p^3
Subsidy (per unit)	$s = p^3 - p^2 > 0$	zero	zero
Equilibrium Quantity	q^2	q^1	q^3
Value of Subsidy or Value of Transfer	sum of area A2+E+B1.1+B1.2 +B2.1+B2.2+B2.3 +C1.1+C1.2+C1.3+C1.4 +D1+D2	zero	zero
Consumer Surplus	area A1	sum of area A1+A2	sum of area A1+A2+B1.1+B2.1+C1.1
Producer Surplus	zero	sum of area B1.1+B1.2	sum of area B1.2+B2.2+C1.2
Deadweight Loss	area D	zero	zero

The social welfare consequences of a move from the subsidy case with Supply curve S_0 to a market equilibrium with Supply curve S_1 is the additive impact of the two equations developed above – to allow the addition the combined effects of a) the move from the subsidized to the non-subsidized market equilibrium associated with Supply curve S_0 (as captured in equation 1); and b) the move from higher cost Supply curve S_0 to the lower cost Supply curve S_1 (as captured in equation 2).

The meaningful changes in terms of a CBA measure of social welfare are reflected in the following Social Welfare Change:

$$(3.1) \quad \Delta\text{Social Welfare} = -\Delta\text{Social Welfare(1)} + \Delta\text{Social Welfare(2)}$$

$$= (A2+B1.1+B1.2+D1+D2) + (B1.1+B2.1+C1.1+B1.2+B2.2+C1.2)$$

$$= A2 + B1.1 + B1.2 + B2.1 + B2.2 + C1.1 + C1.2 + D1 + D2 > 0$$

Note that the ΔSocial Welfare(1) is measured for the introduction of the subsidy so the effect of removal of the subsidy is the negative of this value. Also note that there is no 'double-counting' the same area twice if it appears as a benefit for both the removal of the subsidy and the more efficient Supply curve.

In terms of trying to understand the net social welfare gain it is useful to break this up into three components along the lines of equation 1 above:

(3.2) ΔSocial Welfare = ΔConsumer Surplus + ΔProducer Surplus + ΔDeadweight Loss

= (A2+B1.1+B2.1+C1.1) + (B1.2+B2.2+C1.2) + (D1+D2)

This simply rearranges the results from equation 3.1.

The social welfare gain is derived from:

1. The increase in Consumer Surplus as a result of increased consumption of the good (relative to the Consumer Surplus associated with point 3 in Figure A-2 involving price p^3);

2. the Producer Surplus at the final position associated with the more efficient Supply curve S_1 at point 4 and price p^4; and

3. the elimination of the Deadweight Loss associated with the subsidy at point 3.

4. Consumer & Producer Surplus – Estimation

Generally, in order to operationalize this analysis, it is customary to assume linear forms of the Demand and Supply curves and to estimate the area sizes using geometric relationships. Linear forms mean that all the relevant areas are triangles whose area is ½ the value of the corresponding rectangle.

5. Possible Responses of User Demand and Consumer Surplus to a More Competitive and Innovative Industry

The following diagram uses comparative statics analysis in order to illustrate how user demand and consumer surplus could increase in the future through the combined effects of the dynamic factors discussed in section 5.5.3 of the Qualitative Discussion. The demand curve moves outward to the right from D1 in black to D2 in red because the consumer/user of marihuana for medical purposes is willing to pay more for a higher quality and more innovative and reliable legal product that is more accessible and has proven its ability to provide health, quality of life and related benefits.

The supply curve moves downward and to the right from S1 in black to S2 in red because of economies of scale and scope, learning effects, internal and external efficiencies, and reductions in fixed/compliance and variable/administrative regulatory costs.

The combined effects of the changes in position of the demand and supply curves are: higher quantities supplied, demanded and consumed at a lower actual price, resulting in greater consumer surplus for each and every consumer/user of marihuana for medical purposes (as the market equilibrium moves from P1Q1 in black to P2Q2 in red.

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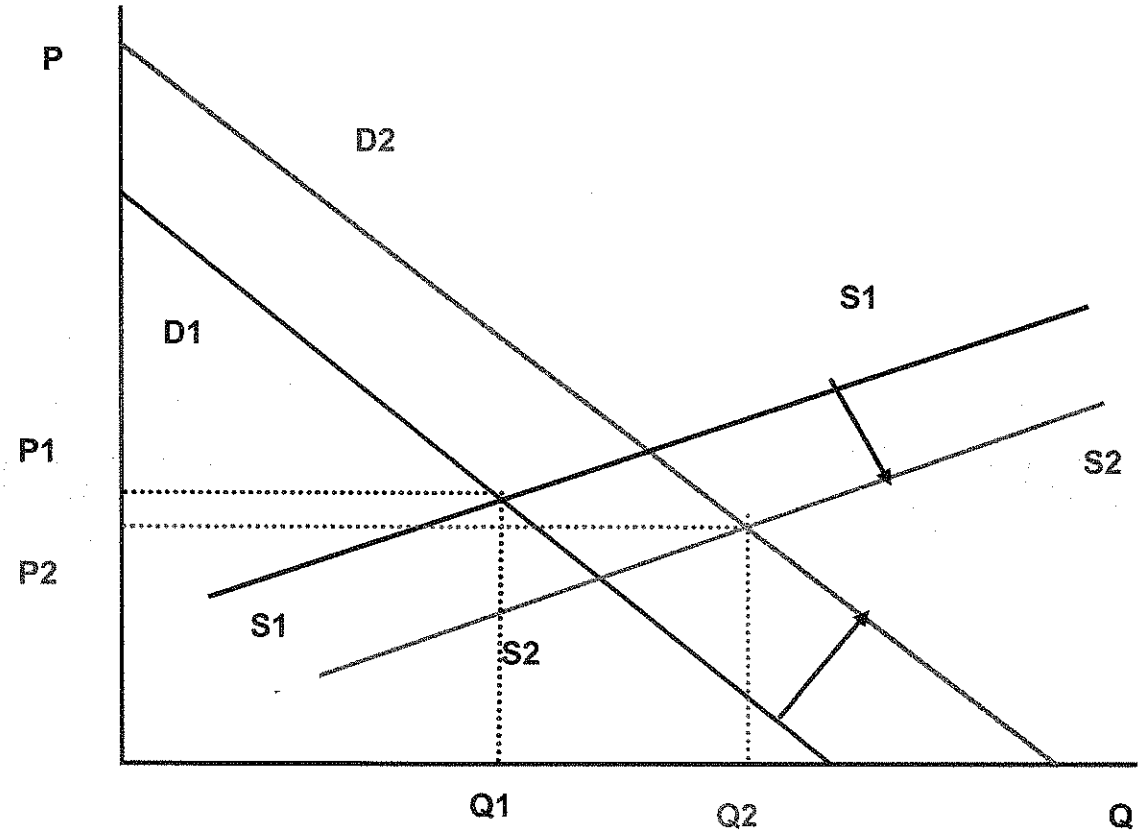


The supply and demand relationships illustrated in the above diagram are fully consistent with the dynamic growth experienced by many new industries and markets that have emerged over the past many decades as a consequence of technological, policy, regulatory, institutional and other transformative and fundamental changes as described in the work of Marshall, Arrow, Romer and the many endogenous growth theorists over the past century.

ANNEX 2 – Response Functions For Key Parameters

It should be noted that this study examines the impact of a 'change of a change', i.e., as the NPV impact is a change (depending on the change of the variable value) of a change (i.e. Total NPV equals NPV-POL minus NPV-SQ).

There are several reasons why the model exhibits non-linearity in several response functions for key parameters:

3. There are two kinds of constraints: a) the 'affordability' condition of expenditures < 15% of mean income; and b) quantity can't fall beyond zero (-100%) for a price elasticity response;

3. There are two avenues for quantity responses from: a) affordability limiting grams per day and b) misuse to reduce the required decrease in Policy users resulting from lower prices; and

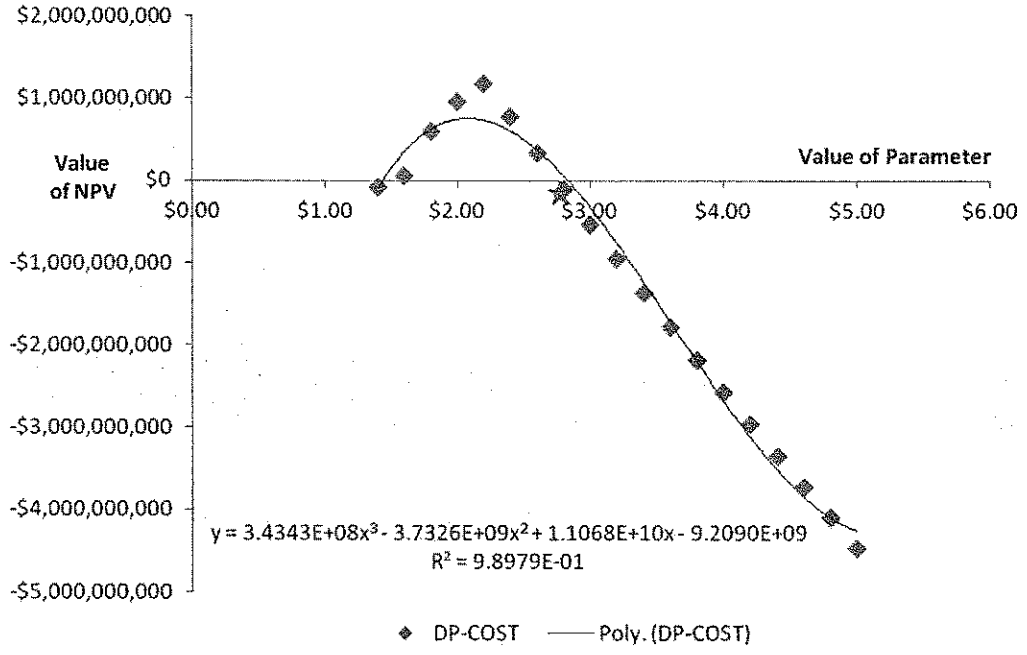
3. There are 'dual' (and opposite effect) uses of the price elasticity of demand to: a) compute the price intercept points which affects Consumer Surplus valuations; and b) affect the transition from the SQ to the Policy scenarios through the User Transition model.

These impacts can be either reinforcing or offsetting.

Designated Person Supply Cost:

The elasticity response to changes in the Designated-Person Supply Cost (DP-COST) is significant. A 1% increase (in the absolute value) of this variable from the Reference Case value of $2.80 (i.e., an increase of $0.028) reduces the NPV by 55% (ε_V=-55.0). The Reference case sits on the negatively sloped portion of the response curve (Figure 5.27).

Figure 5.27 NPV Response Curve: DP-COST



Source: Delsys Research

For most of the response curve ($2.20 < DP_{cost}): there are two reinforcing effects:

- Status Quo scenario: The value of CS-SQ rises with a higher DP_{cost} as a result of a higher price intercept of the Status Quo demand curve, which increases the valuation of consumer surplus in the Status Quo scenario; and

- Policy scenario: The value of CS-POL falls. This effect is caused (at this price level) by the fact that, in the Transition Model, there is no change in the Policy scenario quantity response (as this is dominated by the binding affordability (percentage of income) constraint, which forces the quantity to fall by more than what is required to satisfy the price elasticity effect) while the percentage price change has fallen. This implies that the ELAS-POL is more elastic, so that the price intercept of the Policy demand curve is reduced, which reduces the valuation of consumer surplus in the Policy scenario.

At the middle and high end of the price range, there is no reduction of users in the Policy scenario beyond that from continued misuse, so the overall negative NPV impact (from a DP_{cost} increase) comes from the increase in CS-SQ.

At the low end of the price range, the increase in price requires a quantity reduction that can't be accommodated by the continued misuse, and must be achieved from a reduction in Policy users (transitioning from ATP-D). However, a DP_{cost} increase requires a lesser quantity reduction and therefore results in an increase in the number of Policy users. The CS-POL impact is greater than the CS-SQ impact so there is a positive NPV impact.

Affordability Constraint (Maximum Percent of Mean Income):

The elasticity response to changes in the Maximum Percentage of Income (PC-INCOME) gets at the issue of 'affordability' and how consumers' budget constraints impact on the quantity consumed and the overall value of the resulting consumer surplus in the Policy scenario. A 1% increase of this variable from the Reference Case value of 15% (i.e. an increase of .15 percentage points) increases the NPV by 42% (ε_v=42.0).

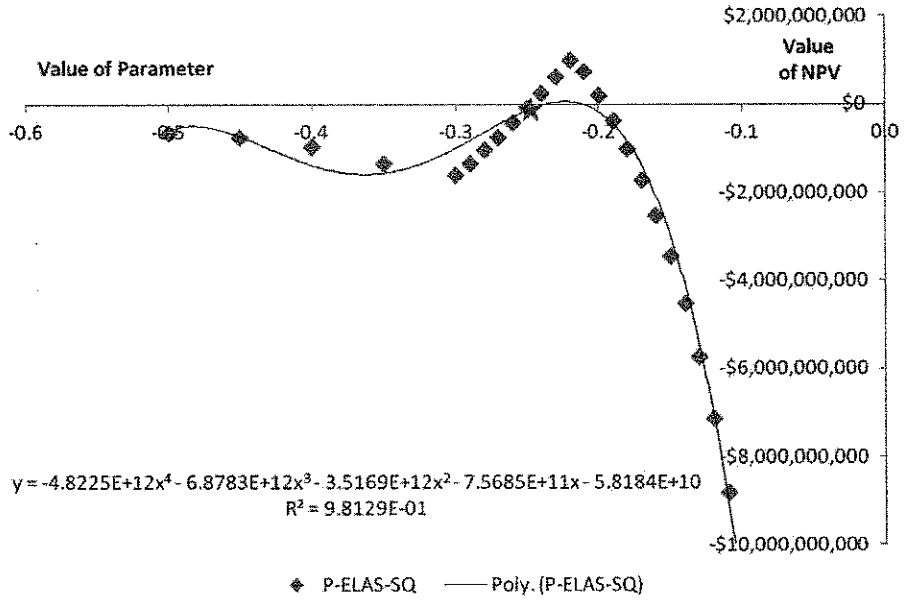
This constraint means that the Grams per Year (and Per Day) will be reduced if the Supply Price increases. In the Policy Transition Model this determines the number of persons who will switch and the level of demand they will exercise in the LP Market.

When the PC-INCOME is lower, this constrains the KG-Demand in the Policy scenario which, despite an increase in the number of Policy Users, reduces the scale of the LP Market and the Consumer Surplus that is generated in the Policy scenario.

Price Elasticity of Demand:

The elasticity response to changes in the Price Elasticity of Demand (P-ELAS-SQ) is significant. A 1% increase (in the absolute value) of this variable from the Reference Case value of -0.25 (i.e. an 'increase' of -.0025, which makes the price elasticity of demand more elastic) reduces the NPV by 23% (ε_v=-23.0). The Reference case sits on a relatively flat position of the response curve (Figure 5.28), where the slope of the response curve is negative.

Figure 5.28 NPV Response Curve: P-ELAS-SQ



Source: Delsys Research

At low (absolute value) levels (-.22 < ε < -.10): The high valuation of CS-SQ overwhelms all other results and generates a high negative NPV, as the inelastic demand generates very high price intercept points for the demand curve in the Status Quo scenario. The same does not occur for the Policy scenario, as the effective price elasticity is more elastic due to the dampening of the pure price elasticity effect caused by the 'opting out' of persons from the

former ATP-P/PUPL, due to misuse. This has the effect of making the Reference case ELAS-POL more elastic (-.35 versus -.25 for P-ELAS-SQ), so that the response in terms of the Policy scenario is muted, relative to the response for the Status Quo scenario. Over this range of values, everything is happening in terms of lower CS-SQ with only minor changes to the number of persons in the Policy scenario - but with no change over this range in the valuation of the CS-POL, as the effective ELAS-POL remains the same (-.31).

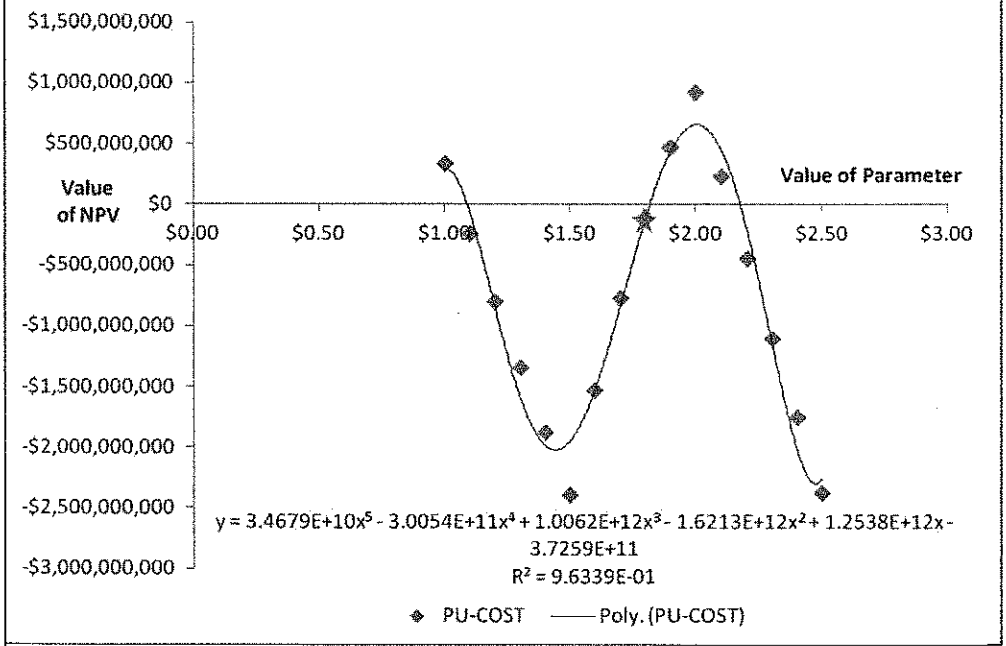
At mid levels ($-.32 < \varepsilon < -.22$): The CS-SQ and CS-POL both fall as the effective price elasticity of demand in the Policy scenario begins to respond to the higher price elasticity in the Status Quo scenario. Over this range of values, the fall in CS-POL is faster than the fall in CS-SQ so that the NPV falls over this range. The Reference case is in this section of the response curve.

At high levels ($-.50 < \varepsilon < -.32$): The fall in CS-POL is slower than the fall in CS-SQ so that the NPV rises over this range.

Personal Use Supply Cost:

The elasticity response to changes in the Designated Person Supply Cost (PU-COST) is significant. A 1% increase (in the absolute value) of this variable from the Reference Case value of $1.80 (i.e., an increase of $0.018) reduces the NPV by 98% (ε_v=-98.0). The Reference case sits on the positively sloped portion of the response curve (Figure 5.29).

Figure 5.29 NPV Response Curve: PU-COST



Source: Delsys Research

There are three distinct cases of response over the range of PU-CCOST.

4.8.1 High Values ($2.00 < PU_{cost}): As PU_{cost} increases there is a gain in CS-SQ, resulting from the higher supply cost and price intercept term in the Status Quo scenario; and a reduction in the price intercept term which leads to a fall in CS-POL, which reinforce the overall effect of a decline in the NPV result.

4.8.2 Mid Values ($1.40 < PU_{cost} < $2.00): As PU_{cost} increases there is a gain in CS-SQ resulting from the higher supply cost and price intercept term in the Status Quo scenario; and a gain in the number of users in the Policy scenario and an increase in the price intercept term which leads to a rise in CS-POL. The change in CS-POL increases at a faster rate than the change in CS-SQ so there is an overall positive slope to the response curve (i.e. the change in CS-POL dominates over the change in CS-SQ).

4.8.3 Low Values (PU_{cost} < $1.40): As PU_{cost} increases in this range, the increase in CS-SQ is reinforced by a decline in CS-POL which leads to the overall decline in the NPV result.

As PU_{cost} increases (at the low end of the range and at the high end of the range) there are reinforcing impacts:

1. an increase in CS-SQ and a reduction in CS-POL which produce the overall negative NPV effect.

As PU_{cost} increases (over the mid range from about $1.50 to $2.00) there are offsetting impacts:

2. an increase in CS-SQ and an increase in CS-POL, with the CS-POL effect dominating which produce the overall positive NPV effect.

It remains to explain why the mid range has different results – which is determined by the change (or lack of change) of the number of Policy scenario users at the high and low ends of the range.

At the high end of the price range, the reduction in quantity resulting from the binding affordability constraint is more than sufficient to achieve the desired price elasticity effect so that there is no loss of users in the Policy scenario beyond that from continued misuse.

At the middle of the price range, there is a need for the number of Policy users to decrease substantially to achieve the desired price elasticity effect. However, as PU_{cost} increases the required change in users is reduced so the impact on Policy users is decreased and this results in the gain in CS-POL.

At the low end of the price range, the reduction in quantity reaches its limit of -100% as Policy users (transitioning from ATP-P) fall to zero. At this extreme point there is no further loss in CS-POL and the reduction in CS-POL comes from the reduced price intercept.

URATE-PU/URATE-DP:

These parameters affect the quantity of marihuana that is estimated to be consumed in the Status Quo scenario. When these values are higher, the quantity of marihuana consumed is higher and the estimated Consumer Surplus (Status Quo) is higher. As the Consumer Surplus (Status Quo) is higher, and there is little impact of these parameters on the Policy scenario, they have a negative impact on the NPV result.

A 1% increase of the URATE-DP from the Reference Case value of 47% (i.e., an increase of .47 percentage points) decreases the NPV by 37% (ε_v=-37.0).

A 1% increase of the URATE-PU from the Reference Case value of 55% (i.e., an increase of .55 percentage points) decreases the NPV by 13% (ε_v=-13.0).

Delsys Research Group Inc. is a consulting company headquartered in Ottawa, Ontario, Canada. It was established as a multi-disciplinary firm, synthesizing the disciplines of law, economics, public administration, Systems Thinking, and Visual Thinking to provide public policy, program administration and regulatory improvement services to public and private sector clients.

www.delsys.ca

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF SUSAN BOYD

I, SUSAN C. BOYD, Professor, Faculty of Human and Social Development, University of Victoria, Victoria, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am currently a Professor at the University Victoria and the Faculty of Human and Social Development having obtained a Bachelor of Arts in Women's Studies from the University of California at Santa Cruz in 1984, a Master of Arts in Clinical Psychology from Antioch University, San Francisco, California in 1985 and a Ph.D. in Criminology from Simon Fraser University in 1996, now produced and marked as Exhibit "A" to this my affidavit is a copy of my Curriculum Vitae in the format required by the University of Victoria and setting out the details of my academic career.

2. A review of Exhibit "A" discloses my major fields of scholarly or professional interest as including drug law, history and policy as well as research methodology and news

media and I have researched and written extensively in the area of drugs of all kinds and the laws in relation thereto, including their impact and media reporting in relation thereto quite extensively.

3. I am the author along with Connie Carter, Senior Policy Analyst for the Canadian Drug Policy Coalition of a book currently in publication but not as yet available entitled "Killer Weed: Marihuana Grow Ops, Media and Justice" by the University of Toronto Press, Toronto, Ontario, Canada. In that book we deal with aspects of crime in Canada and media reporting of such in particular in relation to cannabis (marihuana) including the reported dangers of marihuana production in relation to firearms, fires, booby traps, mold and public safety and there is a complete section in the book on the topic of "medical marihuana" including recent changes in Canadian government policy, the reasons for the changes and the evidence or lack thereof in support. Consequently, based on the above, I have personal knowledge of the matters and facts hereinafter deposed to save and except where same are stated to be made on information and belief in which case I verily believe them to be true.

4. Now produced and marked as Exhibit "B" to this my affidavit is a copy of a brief summary of the contents of the book from it's cover, a copy of it's cover and publication details and a copy of the table of contents and table of figures. As indicated above, the book is not yet available to the public and consequently I am unable to provide the court with a complete copy at this time, but will do so as soon as it is available.

5. In the meantime, with the permission of my publishers, I now attach and mark as Exhibit "C" to this my affidavit a series of excerpts from the book with respect to the following topics and at the following pages:

C1. "Crime in Canada" pp. 109-113
C2. "Danger / Firearms" p. 32
C3. "Risk of Fires / Booby Traps" p. 133-134
C4. "Mould" p. 184
C5. "Medical Cannabis" p. 161
C6. "Medical Marihuana and Organized Crime Claims" pp. 155-165

6. A review of the excerpt with respect to "Crime in Canada" shows that in contrast to media reports about the marihuana industry being responsible for more crime and violence that in fact the overall crime rate in 2010 fell both in volume and severity and reached its lowest level since the '70s. We deal extensively with crime rates and differences between various areas in this excerpt. We found the scholarly research to be very limited in relation to various associations made between organized crime and gangs and marihuana "grow ops" and a focus on enforcement in relation to simple possession. Our review of some of the research disclosed that many of our findings did not support the claims made in those studies.

7. Similarly, in our section excerpt entitled "danger/firearms" our review of a 2005 study by Darryl Plecas, of the University of the Fraser Valley, supported by the RCMP, that purported to link "grow ops" to violence and organized crime and that called for harsher penalties, disclosed that 9 out of 10 or 89% of the grow ops brought to the attention of the police during the study did not have firearms or other weapons or hazards present. In fact, only 6% of the cases included in the study were reported to have firearms on site, which is only slightly higher than the 5.5% of the Canadian population overall that has valid firearms licenses. Consequently, the statistics in the study were inflated from 6% to 11% because they included all "grow ops" brought to their attention, rather than "founded cases". Therefore the conclusions seeking harsher laws and to establish greater links to organized crime did not match their findings. Similarly with respect to "risk of fires/booby traps" as the excerpt from the book indicates, there was little evidence to substantiate the claims made by Darrel Plecas and Surrey Fire Chief Glen Garris about indoor marihuana grow ops and the increased risk of fire in British Columbia. We examined tables and statistics which are referred to and found that the actual proportion of fires in British Columbia relating to grow ops would be 1.21% in 2001, 1.02% in 2002 and 1.30% in 2003 compared to the percentages indicated by those authors. Similarly the extent of booby trap hazards or explosives or dangerous chemicals was found to be overstated when examined in a study by the RCMP between 1997 and 2003.

8. With respect to "mold" as the excerpt indicates, this was frequently mentioned in reporter highlights in relation to "grow ops" but other factors that occur, particularly in the west coast rain forest, were just as likely to be contributory and were not dealt with.

9. With respect to "medical cannabis" we point out in the first excerpt that the safety of such production sites can easily be corrected by having better guidelines, education and monitoring of the cannabis (marihuana) outdoor and indoor gardens, which is something that Health Canada in it's administration of the program to date has failed to do. As we point out it is somewhat hypocritical to focus on these issues and leave unmonitored greenhouses and outdoor gardens producing other plants and produce and using chemicals and pesticides for industrial food production. Again with respect to the claims of public safety risks, we could not discern any comprehensive scholarly and peer reviewed research to support claims that legal medical marihuana sites are linked to criminal elements or post safety hazards to children and our community research was to the contrary.

10. At pages 155 – 165 of the book we address "medical marihuana" in considerable detail including the proposed Health Canada changes to the existing program. At first we deal with the issue of medical marihuana and "organized crime claims" and the claims of greater fire risk from bad wiring and the need for inspections. We also review the literature with respect to the medicinal qualities of marihuana that provide relief for a number of serious illnesses, including chronic pain. We review some of the history leading up to the litigation in Canada that led to the establishment of the *Marihuana Medical Access Regulations* and ultimately to the government's supply through Prairie Plants System together with Personal Production and Designated Grower permits. According to information obtained from Health Canada in 2009 there were 2,822 people licenced to cultivate their own marihuana for medical purposes and 754 people as designated growers, but by 2012 there were 21,986 people authorized to possess dried marihuana under those Regulations and only 13% would access the dried marihuana from the federal government's source, namely Prairie Plant Systems. We then speculate as to what the more than 85% of the licenced medical users were doing to

access cannabis with the various options and point out the problems and limitations of the government's supply compared to that available through other sources.

11. In that section we also point out the recent media attention given to the marihuana issue by politicians despite overwhelming support for legal medical marihuana programs by the Canadian population and numerous court rulings that safe, affordable and legal marihuana should be available to medical marihuana patients in Canada. We note the various differences being taken by various townships and cities and the federal Minister and the assertions of public safety and health risks and once again, similar to news media claims about the risks associated with marihuana grow ops, the politicians we quoted fail to substantiate or provide evidence in support of their positions written and otherwise. We point out that not all Mayors are unanimous on this issue and some are quite supportive and participate in the program. We note in particular the comments of Joy Davies as such a person and patient pointing out that people who need marihuana for medical purposes will not have a safe and affordable access to the plant once Personal Production Licences are cancelled or eliminated. We note the June 17th, 2011 Health Canada announcement with respect to the proposed improvements and found once again that they were typical of news media claims with no evidence being provided to substantiate how many Canadians or what groups of people had concerns about the medical marihuana program simply making the usual assertions about exploitation by criminal elements, electrical and fire hazards and excess mold and poor air quality. We note that the new proposed limit to Licenced Producers and the elimination of personal production or by a designated caregiver will not only increase the cost of medical cannabis significantly leading to another hardship for patients as such is not covered by Provincial drug programs, unlike other medicines, and also because it will be limited to free market production leaving cannabis dispensaries out of the loop so there will be limits to patient access to specific strains, including other effective forms, such as tinctures and perhaps edibles and certainly anything other than "dried marihuana" which is again a limitation imposed.

12. As we state at page 161:

"By removing personal licences to grow marijuana, patients are vulnerable to market prices and may be denied access to strains of cannabis they have developed that work best to alleviate their symptoms.

The safety of personal legal cannabis production sites could be easily corrected by having better guidelines, education, and monitoring of these outdoor and indoor gardens. It seems quite hypocritical to focus on safety when Canadians throughout the country have unmonitored greenhouses and outdoor gardens for other produce. In addition, given the chemicals and pesticides used for industrial food production, the focus on legal cannabis growers seems misguided and influenced by a small and vocal group of critics, rather than by the needs and constitutional rights of critically and chronically ill Canadians who could benefit from the medical use of cannabis.

Health Canada's claims that medical marijuana production sites are associated with "criminal elements" and endanger the "safety of children" suggest that the changes to the MMAR are politically motivated. There is no comprehensive scholarly and peer-reviewed research to support claims that legal medical marijuana sites are linked to criminal elements or pose safety hazards to children..."

13. In conclusion we note that newspaper coverage has created a persistent and resilient framework effectively shaping perceptions that all grow ops or spaces where criminality is linked with specific public safety risks that bring issues like fire, mold and other property damage to unsuspecting safe neighbourhoods and innocent home buyers. The fire departments, real estate agents and insurance company representatives have become the new experts. These municipal enforcement agents have moved into the area of criminal justice regulation.

14. In summary, it is my opinion based on my past research and in particular my research for the book "Killer Weed" that the situation across Canada with respect to the dangers from "grow ops" generally and "medical marihuana grow ops" specifically have been greatly exaggerated and overstated and are undoubtedly limited to a few exceptional cases, at least in relation to the medical marihuana situation. Most studies reported in the newspaper have overstated the situation and exaggerated the alleged problems leading politicians and others to seek to prohibit them instead of ensuring public safety, including safety from electrical, fire and mold hazards through appropriate regulation and inspection, including proper construction and ventilation and alarm systems as are available and in use for many other activities that are conducted in and

about dwelling houses or outbuildings without any negative impact upon neighbours or others whatsoever. There does not appear to be any significant evidence of significant impact from fires, mold or public safety that has been documents and supported by peer reviewed research in Canada.

15. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

I. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

II. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

III. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Vancouver the Province of British Columbia, this 15th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

SUSAN BOYD

KYLE McCLEERY
Barrister and Solicitor
Ritchie Sandford
502–602 West Hastings Street
Vancouver, BC V6B 1P2
Telephone: 604-684-0778
Fax: 604-684-0799

This is Exhibit " A " referred to in the affidavit of Susan Boyd sworn before me at Vancouver in the Province of British Columbia this 15th day of January 20 14

A Commissioner for taking Affidavits for British Columbia

FACULTY CURRICULUM VITAE

Name: **BOYD, Susan C., Professor**

Faculty: **Human and Social Development**

DEGREES AND DIPLOMAS

BA	Women's Studies	University of California, Santa Cruz	1984
MA	Clinical Psychology (Concentration in Feminist Therapy)	Antioch University San Francisco	1985
PhD	Criminology	Simon Fraser University	1996

Title of Dissertation: "Mothers and Illicit Drugs: Transcending the Myths"

POSITIONS HELD PRIOR TO APPOINTMENT AT UNIVERSITY OF VICTORIA

1999-02	Associate Professor, Department of Sociology and Criminology, and Graduate Committee on Women's Studies, Saint Mary's University, Halifax, NS
1999 (term)	Assistant Professor, School of Criminology, Simon Fraser University, Burnaby, BC
1997-98	Assistant Professor, Department of Women's Studies, (1-year term) Simon Fraser University, Burnaby, BC
1997-98	Associated Member, School of Criminology, Simon Fraser University, Burnaby, BC
1995-97	Instructor, School of Criminology, Department of Sociology & Anthropology, Simon Fraser University, Burnaby, BC
1988-91	Instructor, Canadian International College, North Vancouver, BC
1986-88	Instructor, Fraser Valley Childbirth Education Association

MAJOR FIELD(S) OF SCHOLARLY OR PROFESSIONAL INTEREST

- drug law, history and policy
- maternal drug use
- maternal/state conflicts
- women, law, and the state
- reproduction autonomy
- research methodology
- film and culture
- news media
- radio and film documentary
- community-based research

MEMBERSHIPS AND OFFICE HELD IN LEARNED AND PROFESSIONAL SOCIETIES

2011-	Canadian Drug Policy Coalition: Steering Committee; Chair, Drug Policy Working Group.
2011-	International Visual Sociology Association
2013-	Canadian Sociology Association
2009-	Canadian Students for Sensible Drug Policy, Advisory Board
2004-	Associate Editor, *Contemporary Justice Review*
2001-04	Advisory Board, *Contemporary Justice Review*
2005-	Appointment: Research Associate, The Institute for Gender, Race, Sexuality and Social Justice, University of British Columbia, Vancouver, February 2005
2002-	Justice Studies Association
2001-04	Canadian Women's Studies Association
2001-	The Canadian Harm Reduction Network
2000-	The Canadian Foundation for Drug Policy
1995-2010	American Society of Criminology (Division of Critical Criminology and Women and Crime)
1995-	The International Harm Reduction Association

SCHOLARSHIPS, FELLOWSHIPS, HONORS AND AWARDS

2014	University of Victoria Distinguished Professor Award
1993-95	Doctoral Fellowship, Social Sciences and Humanities Research Council of Canada, $14,436 yearly.
1994	President's PhD Research Stipend, Simon Fraser University, $4,800.
1993-94	Canadian Soroptimist Grant 1993, $5,000.
1993	Special Graduate Research Fellowship, Simon Fraser University, $4,000.
1992	Graduate Fellowships, Simon Fraser University, $4,800.

APPOINTMENTS AT UNIVERSITY OF VICTORIA

Academic

2013	Professor	Human and Social Development
2009/2012	Professor	Studies in Policy and Practice
2002	Associate Professor	Studies in Policy and Practice
2004-08	Senior Research Fellow	Centre for Addictions Research-BC

Administrative

Sept 2008–July 2009	Coordinator	Studies in Policy and Practice
Jan-July 2006	Coordinator	Studies in Policy and Practice

SCHOLARLY AND PROFESSIONAL ACHIEVEMENTS

Articles Published in Refereed Journals

Boyd, S. (submitted July 3, 2013). The Criminal Addict: CBC Documentary Radio, 1950-1969. *Contemporary Drug Problems.*

Boyd, S. (2013). A Canadian Perspective on Documentary Film: *Drug Addict. International Journal of Drug Policy, 24*: 589-596.

Boyd, S. & NPA (2013). Yet they failed to do so: Recommendations based on the experiences of NAOMI Research Survivors and a Call for Action. *Harm Reduction Journal,* 10(6), http://www.harmreductionjournal.com/content/10/1/6.

Boyd, S. (2012). Drugpeace. *Contemporary Justice Review: Issues in Criminal, Social, and Restorative Justice*, 15(2): 163-171.

Boyd, S., & Carter, C. (2011). Using children: Marijuana grow-ops, media, and policy. *Critical Studies in Media Communication*, 29(3): 238-257. (Boyd ½, Carter ½)

Bungay, V., Johnson, J., Varcoe, C., **& Boyd, S.** (2010). The Context of Crack Cocaine Use: The Perspectives of Women who Use, *International Journal of Drug* Policy, 21: 321-329.

Boyd, S., & Carter, C. (2010). Methamphetamine discourse: Media, law and policy. *Canadian Journal of Communications*, 35(2), 219-237.

Boyd, S. (2009). *High*: Marijuana, women and the law. *Canadian Journal of Women and the Law*, Special Issue: Law, Film and Feminism, 21(1), 35-54.

Bungay, V, Johnson, J., **Boyd, S.** Malchy, L., Buxton, J., & Loudfoot, J. (2009). Women's Stories/Women's Lives: Creating Safer Crack Kits. *Women's Health & Urban Life: An International & Interdisciplinary Journal*, 8(1): 28-41.

Boyd, S., Johnson, J., & Moffat, B. (2008). Opportunities to learn and barriers to change: Crack-cocaine use and harm reduction in the Downtown Eastside of Vancouver. *Harm Reduction Journal*, 5(34): 1-12. http://www.harmreductionjournal.com/content/5/1/34

Boyd, S. (2008). Community-based research in the Downtown Eastside of Vancouver. *Resources for Feminist Research, Special Issue: Decolonizing* Space, 33(1/2): 19-43.

Boyd, S. (2007). Drugs films, justice, and nationhood. *Contemporary Justice Review, 10*(3): 263-282.

Boyd, S. & Macrory, F. (2007). Developing comprehensive primary and secondary services for drug and alcohol dependent mothers. *Seminars in Fetal and Neonatal Medicine, 12*: 119-126.

Boyd, S. (2004). Femmes et drogues: Survol des lois et des conflits mere/Etat aux Etats-Unis et au Canada. *Psychotropes*, 10(3-4): 153-172.

Boyd, S. (2002). Media Depictions of Drugs, Users, and Traffickers: Another look at *Traffic. International Journal of Drug Policy*, 13(5): 397-407.

Boyd, S. (2001). Feminist Research on Mothers and Illegal Drugs. *Resources for Feminist Research,* 28(3): 113-130.

Boyd, S. (2001). The Regulation of Altered States of Consciousness: A history of repression and resistance. *Contemporary Justice Review*, 4(1), 71-100.

Boyd, S. & Faith, K. (1999). Women, Illicit Drugs and Prison: Views from Canada. *International Journal of Drug Policy*, 10, 195-207.

Boyd, S. (1995). Critical and Historical Overview of Reproductive Autonomy: Implications for Midwifery. *Aspiring Midwife*, 9(Summer), 15-17.

Boyd, S. (1994). Women and Illicit Drug Use. *The International Journal of Drug Policy*, 5(3), 185-189. Reprinted in *International News Magazine: Women and Drugs*, 1996, 2(1).

Boyd, S. (1986). Poetry. *CV2,* 9(2), 26,27.

Books

Boyd, S., & Carter, C. (2014). *Killer Weed: Marijuana grow-ops, media, and justice.* Toronto: University of Toronto Press. (290 pages).

Boyd, S., Osborn, B., & MacPherson, D. (2009*) Raise Shit! Social Action Saving Lives.* Halifax: Fernwood Press (192 pages).

Boyd, S. (2009, paperback edition). *Hooked: Drug War Films in Britain, Canada, and the U.S.* Toronto: University of Toronto (250 pages)

Boyd, S. (2008). *Hooked: Drug War Films in Britain, Canada, and the U.S.* NY: Routledge (250 pages).

Boyd, S., & Marcellus, L. (Eds.). (2007). *With Child: Substance use during pregnancy, A woman-centred approach.* Halifax: Fernwood (136 pages).

Boyd, S. (2006; 2nd rev.). *From Witches to Crack Moms: Women, drug law, and policy).* Durham, NC: Carolina Academic Press (367 pages).

Boyd, S. (2004). *From Witches to Crack Moms: Women, drug law, and policy.* Durham, NC: Carolina Academic Press (367 pages).

Boyd, S., Chunn, D., Menzies, R. (Eds.). (2002). *Toxic Criminology: Environment, Law and the State in Canada.* Halifax: Fernwood (128 pages).

Boyd, S., Chunn, D., Menzies, R. (Eds.) (2001), *(Ab)Using Power: The Canadian Experience*. Halifax: Fernwood (287 pages).

Boyd, S. (1999). *Mothers and Illicit Drugs: Transcending the Myths*. Toronto: University of Toronto Press (243 pages).

Chapters in Books

Boyd, S., Murray, D., & NAOMI Patients Association (submitted May 30, 2013). Ethics, Research and Advocacy: The Experiences of the NAOMI Patients Association in the Downtown Eastside of Vancouver. In M. Marrow and L. Halinka Malcoe (Eds.). *Critical Inquiries: Theories and Methodologies for Social Justice in Mental Health.* Toronto: University of Toronto Press.

Boyd. S. (2011). Women, substance use and pregnancy. (Chapter 32). In R. Immarigeon (Ed.), *Women & Girls in the Criminal Justice System: Policy Issues and Practice Strategies* (Volume II). Kingston, NJ: Civic Research Institute.

Boyd, S. (2011). Pleasure and pain: Representations of illegal drug consumption, addiction, and trafficking in music, film, and video. In S. Fraser and D. Moore (Eds.). *The Drug Effect: Health, crime and society* (57-72). London: Cambridge Press.

Boyd, S. (2010). Reefer Madness and Beyond. In M. Deflem (Ed.), *Popular Culture, Crime, and Social Control, Sociology of Crime, Law, and Deviance*, Volume 14, (pp. 3-24). Bingley, UK: Emerald Group Publishing.

Boyd, S. (2007). Women, drug regulation, and maternal/state conflicts. In M. Morrow, O. Hankivsky, & C. Varcoe (Eds.). *Women's Health in Canada: Critical Perspective on Theory and Policy* (pp. 327-354). Toronto: University of Toronto Press.

Boyd, S. (2007). The Journey to compassionate care. In S. Boyd & L. Marcellus (Eds.). *With Child, Substance Use During Pregnancy: A Woman-Centred* Approach (pp. 10-19). Halifax: Fernwood.

Boyd, S. (2007). Drug scares and practice: Socio-historical considerations. In S. Boyd & L. Marcellus (Eds.). *With Child, Substance Use During Pregnancy: A Woman-Centred Approach* (pp. 20-27). Halifax: Fernwood.

Boyd, S. (2006). Representations of women in the drug trade. In G. Balfour & E. Comack (Eds.). *Criminalizing Women: Gender an (In)justice in Neo-Liberal Times* (pp. 131-151). Halifax: Fernwood.

Boyd, S., Chunn, D., Menzies, R. (2002). "We all live in Bhopal."In S. Boyd, D. Chunn, & R. Menzies (Eds.). *Toxic Criminology: Environment, Law and the State in Canada.* (pp. 7-24). Halifax: Fernwood.

Boyd, S., Chunn, D., Menzies, R. (2001). Introduction. In S. Boyd, D. Chunn, & R. Menzies (Eds.). *[Ab]Using Power: The Canadian Experience* (pp. 11-24). Halifax: Fernwood.

Boyd, S. & Marcellus, L. (2007). Harm reduction in action: Future directions. In S. Boyd & L. Marcellus (Eds.). *With Child, Substance Use During Pregnancy: A Woman-Centred Approach* (pp. 111-119). Halifax: Fernwood.

Articles

S. Boyd, & Carter, C. (2013, April). Drug policy reform: A political imperative. Commentary, *Lower Island News*, *30*(2): 17.

Boyd, S. (2012, October). How the drug war impacts women. *DTEAST Newspaper*, 1(7): 8.

Boyd, S. (2009). Interview with Stark Raven. *The Word is Out*, (8), 3 9-10.

Boyd, S. (2008). Drug scares and practice: Sociohistorical considerations (modified and revised from *With Child* chapters). *Women, Girls & Criminal Justice*, (9)1, 3-6.

Boyd, S. (2007). The journey to compassionate care: One woman's experience with early harm-reduction programs in BC. *Network, Canadian Women's Health*, 10(1), 26-28.

Boyd, S. (2006). Systemic Violence: The Social Dimensions of Prohibition. *Carnegie Newsletter*, March 1, 2006, 21.

Boyd, S. (2004). Good drugs, bad drugs: Pregnancy, substances and social attitudes. Reprint of a section, *From witches to crack moms*, *Visions*, 2(4), 31.

Boyd, S. (2002, October 2003). *The methodology chapter*. University of Victoria, BC: www.uvic.ca;spp/documents/methdology.pdf

Boyd, S. (2000). In the Name of Harm Reduction: Repression and Control. *International IHRA Network Women and Drugs Magazine*, 7, 11,14-16.

Boyd, S. (1998). Mom, Kids and Drugs. *Cannabis Culture*, 14 (Sept./Oct.), 56-58.

Boyd, S. (1985). Poetry. *New Directions*, 2(2), 24.

Other Publications

Published In-House

Boyd, S. & SNAP (2013). *SNAP: Telling Our Stories, Heroin-Assisted Treatment and Advocacy* (43 pages). Vancouver, November 30, 2013. Available at www.drug policy.ca/

Boyd, J. & Boyd, S. (2013). *Strengths and Travels of DTES Women* (8 pages). Vancouver, November 26, 2013.

Boyd, S., & Carter, C. (October 24, 2013). *Live saving heroin assisted treatment dealt serious blow*. Canadian Drug Policy Coalition. See: http://drugpolicy.ca/2013/10/hat/

Boyd, S. (September, 2012). *Downtown Eastside (DTES) Drug Facts*. (2 pages). Vancouver, BC. (Douglas Haddow, CDPC, did layout and design)

Boyd, S., & The NAOMI Patients Association (February, 2012). *NAOMI Research Survivors: Experiences and Recommendations* (37 pages). Vancouver, BC.

Oscapella, E., & Canadian Drug Policy Coalition Policy Working Group (2012, January). *Changing the Frame: A new approach to Drug policy in Canada* (25 pages). Canadian Drug Policy Coalition, Simon Fraser University, Vancouver, BC.

Bill C-15 Submission. Written for VANDU. House of Commons Standing Committee on Justice and Human Rights. Ottawa, ON: May 4, 2009.

Johnson, J., Malchy, L., Moffat, B., Boyd, S., Buxton, J., Bungay, V., Loudfoot, J. (June 2008). *Lessons Learned from the SCORE Project: A document to support outreach and education related to safer crack use* (61 pages).

Safer Crack Use, Outreach, Research and Education Team (SCORE) (2007). *Crack use, drug paraphernalia and the law*. Author.

Safer Crack Use, Outreach, Research and Education Team (SCORE) (2007). One Year Later. *SCORE Newsletter*, (1), 1-4. Author.

Safer Crack Use, Outreach, Research and Education Team (SCORE) (2006). *Why Woman*? Information Sheet. Author.

Boyd, S., & Elliot, L. (2000). *Introduction to Criminology*. Burnaby, BC: Centre for Distance Education, Simon Fraser University (171 pages).

Boyd, S. (1997). Women and Drugs: An Examination of Ideologies and Social Control. Course Outline. In J. Brockman & D. Chunn (Eds.). *Teaching Law and Society from Feminist Perspectives, 1997*. Burnaby: Feminist Institute for Studies on Law and Society, Simon Fraser University, 90-94.

Research – Funded grants

June 2013 Drug Prohibition, Addiction and the Regulation of Reproduction and Mothering. Principal Investigator. One-day Workshop and Lecture Seed Grant. Centre for the Study of Gender, Social Disparities and Mental Health Canadian Institutes of Health Research (CIHR), $15,000.

Oct. 2012 Reel Lives: Madness, Addiction and Crime in Canada, One-Day Workshop, Seed Grant, Centre for the Study of Gender, Social Disparities and Mental Health (CIHR), $14,964. Co-applicants: K. Kendall, S. Boyd, W. Chann, D. Chunn and R. Menzies. Oct. 2012 to June 2013.

June 2011 SSHRC 4A Grant. University of Victoria, $1,000.

Sept 2011 Addiction and Drug Crime: Radio Educational/Documentaries, 1920-1969. Principle Investigator. Seed Grant, Centre for the Study of Gender, Social Disparities and Mental Health (CIHR), $14,755. One-year grant.

August 2010 Media Representations of Madness, Addiction and Crime/Criminalization: A Preliminary, Intersectional Analysis of Documentary Films Used for Public Education in Canada, 1920-1969. W. Chan & D. Chunn (principal applicants, and S. Boyd, K. Kendall, R. Menzies, K. Pacey, K. Teghtsoonian, K. (co-applicants). Seed Grant, Centre for the Study of Gender, Social Disparities and Mental Health (CIHR), $9,985.

July 2009 Grant Application Accepted: Centre for the Study of Gender, Social Disparities and Mental Health Canadian Institutes of Health Research (CIHR), $1,990,117. Five year grant. Co-Applicant. Theme Group: Criminalization, Mental Health, and Substance Use.

Nov. 2008 The Letter of Intent for the "Centre for Research on Gender and Social Disparities in Mental Health and Addictions" has been approved by the Canadian Institutes of Health Research (CIHR) as has the development funds of $10,000.

June 2008 (Applied). Centre for Research on Gender and Social Disparities in Mental Health and Addictions (Co-Principal Applicants: Marina Marrow, Elliott Goldner, Howard Chodos, & Judith Cook, Co-applicant: Susan Boyd, et al.). Canadian Institutes of Health Research (CIHR).

The proposed Centre for Research on Gender and Social Disparities in Mental Health and Addictions will support and create collaborative inter-sectoral teams of researchers, who apply gender and sex based analysis (GSBA) and intersectional frameworks for understanding and responding to health inequities and gender disparities in mental health and addictions across the lifespan with the goal of improving the mental health of men and women in Canada and internationally. The Centre will undertake research, knowledge translation, and training/mentoring activities in five key theme areas: Mental Health Reform and Policy, Recovery and Housing, Reproductive Mental Health, Violence, Mental Health, and Substance Use, and Criminalization, Mental Health, and Substance Use.

2007-10 Media, Methamphetamine and Marijuana Grow-op Project. Principal Researcher. SSHRC ($78,261). Examine national, provincial, and local print media, policy initiatives, and criminal and civil responses over a 12 year period in relation to discourses about methamphetamine and marijuana grow-ops.

2006 Methamphetamine Use: Health, harms and the media. Principal Researcher. Seed Grant ($7,160.) BC Mental Health and Addictions Research Network.

2005-08 "Safer Crack Use in an Urban Crack Using Population." J. Johnson (Principal Investigator) and S. Boyd, J. Buxton, and J. Loudfoot (Co-Investigators). Health Canada, Drug Strategy Community Initiatives Fund, March 2005. ($200,790). This is a community-based project with the Safer Crack Use Coalition of Vancouver. The study provides information about the feasibility and utilization of a specific harm reduction initiative (crack kits) among crack users in Vancouver.

2003-06 "Drug Films, Justice, and Society Study" Principal Researcher, SSHRC, University of Victoria, BC ($44,692). Socio-historical inquiry into illegal drug films, censorship and discourse. Coding and analyzing of 120 illegal drug films produced from 1912 to 2006 in Britain, Canada and U.S against the backdrop of criminal justice and addiction narratives.

2000-05 "Health and Home Research Project" Collaborator, SSHRC, Simon Fraser University, Burnaby, BC ($683,413). An ethnographic study in the Downtown Eastside of Vancouver bringing forward the voice of marginalized women and order to examine wider social factors that shape health and housing.

2000 "Families and Children" Principal Researcher Senate Research Grant, Saint Mary's University, Halifax, NS. ($3,100).

Conference Presentations

Boyd, S. (2013). Presenter and organized panel. The Canadian Experience: Activism and Heroin Assisted Treatment. Panel: Heroin Assisted Treatment: Victory in Canada and what comes next. International Drug Policy Reform Conference, Denver, Colorado, October 26, 2013.

Boyd, S. (2013). Drug Policy, equity, justice. 2013 Vancouver Women's Visionary Congress, Harbour Centre, Simon Fraser University, October 20, 2013.

Boyd, S. (2013). Plenary Speaker. *Emerging Health-Centered Approaches to drug Policy: Removing Barriers and Addressing Stigma.* New Directions Colorado: A Public Safety and Health Approach to Drug Policy. Drug Policy Alliance and the Centre for Public Health Practice. Denver, Colorado, June 6, 2013.

Boyd, S., & Carter, C. (2013). *Civil Regulation and Bylaws: Drug policy at the local level.* Canadian Sociology Association. Congress 2013 of the Humanities and Social Sciences. University of Victoria, June 4, 2013.

Boyd, S. (2013). *Drug Prohibition, Treatment, and Radio Documentaries.* Canadian Sociology Association. Congress 2013 of the Humanities and Social Sciences. University of Victoria, June 4, 2013.

Boyd, S. (2013). Plenary Speaker. *The Vancouver Area Network of Drug Users is "@ the edge."* Canadian Sociology Association. Congress 2013 of the Humanities and Social Sciences. University of Victoria, June 3, 2013.

Boyd, S. (2013). Plenary Speaker. *Women and Harm Reduction.* 12th Alberta Harm Reduction Conference, Calgary, AB, May 22-23, 2013.

Boyd, S. (2013). *Street Involved Pregnant Women: The Bigger Picture.* 12th Alberta Harm Reduction Conference, Calgary, AB, May 22-23, 2013.

Boyd, S., & Murray, D. (2013). *Heroin-Assisted Treatment: Ethics, Drug Prohibition, and Activism.* 12th Alberta Harm Reduction Conference, Calgary, AB, May 22-23, 2013.

Boyd, S. (2013). *Gender and the Criminal Addict: CBC Radio Documentaries (1950-1969).* Critical Inquiries: Engaging theories and methodologies for researching social inequities in Mental Health. Centre for the study of gender, social inequities and mental health, Simon Fraser University, Harbour Centre, Vancouver, BC, May 10, 2013.

Boyd, S. (2012). *Heroin Assisted Treatment: NAOMI Research Survivors and Advocates* (With Dave Murray, Diane Tobin, and Kevin McGarragan). From Public Health to Social Justice. 9th National Harm Reduction Conference. Portland, Oregon, November 15, 2012.

Boyd, S. (2012). *Criminalization and Resistance: Canadian Drug Policy*. International Conference of the Global Ibogaine Therapist Alliance, Harbour Centre, Simon Fraser University, Vancouver, BC, October 2, 2012.

Boyd, S. (2012). *Visual and Narrative Representations of Illegal Drugs*. Annual Conference of the International Visual Sociology Association: Revisualizing the City. Saint Francis College, Brooklyn Heights, NY, July 11, 2012.

Boyd, S. (2012). *Addicted Bodies and the City: Visual and Narrative Representations of Heroin-Assisted Treatment.* Annual Conference of the International Visual Sociology Association: Revisualizing the City, Saint Francis College, Brooklyn Heights, NY, July 11, 2012.

Boyd, S., with Murray, D., & Tobin, D. (2012). *Challenging Drug Prohibition Research Models: The Experiences of the NAOMI Patients Association.* Critical Inquiries in Mental Health Inequities: Exploring Methodologies for Social Justice, Centre for the Study of Gender, Social Inequities and Mental Health, Harbour Centre, Simon Fraser University, Vancouver, BC, May 10, 2012.

Boyd, S. (2012). *Addiction and Drug Crime: CBC Documentary Radio, 1950-1969*. Poster Presentation. Critical Inquiries in Mental Health Inequities: Exploring Methodologies for Social Justice, Centre for the Study of Gender, Social Inequities and Mental Health, Harbour Centre, Simon Fraser University, Vancouver, BC, May 10, 2012.

Boyd, S. (2012). *How the Media Portrays Drug Issues*. Progress not Prisons. Canadian Students for Sensible Drug Policy. University of Calgary, March 3, 2012.

Boyd, S. (2012). *NAOMI Research Survivors*. Progress not Prisons. Canadian Students for Sensible Drug Policy. University of Calgary, March 3, 2012.

Boyd, S. (2011). *Documentary Drug Films and Knowledge Production*. 2011 Annual Conference of the International Visual Sociology Association, Vancouver, BC: University of British Columbia, July 8, 2011.

Boyd, S., & Carter, C. (2011). Kids and Grow-ops: Visual and Media Representation. 2011 Annual Conference of the International Visual Sociology Association, Vancouver, BC: University of British Columbia, July 8, 2011.

Boyd, S. (2011)." Drug Addict": Documentary film and representation. Discourse, representation, science and the state. Critical Inquiries in Mental Health: Paradigms and Praxis. Simon Fraser University, Harbour Centre, Vancouver, BC, May 10, 2011.

Boyd, S. (2010). *Obstacles to Harm Reduction and Drug Policy Reform: Representations of Marijuana Grow-Operations*. Poster presentation. 21st International Conference on Harm Reduction, Liverpool, April 25-29, 2010.

Boyd, S. (2010). *Drug Addict*. Drugs and Harm Reduction Film Festival. Burnet Institute. 21st International Conference on Harm Reduction, Liverpool, April 26, 2010.

Boyd, S. (2009). Key note. *Women, drugs, and pregnancy: New directions in policy and practice*. Alberta Harm Reduction Conference, Edmonton, March 4, 2009.

Boyd, S. (2009). Discussant. *Resolving marijuana prohibition*, Wosk Centre, Simon Fraser University, Vancouver, BC, February 22, 2008.

Boyd, S. (2008). *Impacts of Drug Prohibition*. Celebrating 100 Years of Failed Drug Policy in Canada. Canadian Students for Sensible Drug Policy, University of Ottawa, November 8, 2008.

Boyd, S. (2008). *Drug Fears: A hundred years of print media and film representations of women and drug*s. Raising the bar: Historical Perspectives on Women and the Law. Women's History Network of British Columbia, Victoria BC, October 4, 2008.

Boyd, S., & Carter, C. (2008). *Hegemonic Struggles: Mayerthorpe, Marijuana Grow Operations and the Media*. Socialist Studies Association. The Canadian Federation for the Humanities and Social Sciences Annual Congress, University of British Columbia, June 5, 2008.

Boyd, S. (2008). Chair and organizer of two panels. *New Directions in Drug Policy Research I & II.* Socialist Studies Association .The Canadian Federation for the Humanities and Social Sciences Annual Congress, University of British Columbia, June 5, 2008.

Boyd, S. (2008). Keynote Address. *Harm Reduction: A Woman-Centred Approach*. Gender Matters. Ontario Ministry of Health and Long-Term Care (hosted by Jean Tweed Centre. Toronto, ON, May 27, 2008.

Boyd, S. (2008). *Visualizing a century of fictional film representations of women and drugs*. International Conference on Harm Reduction 2008. Barcelona, Spain, May 12, 2008.

Boyd, S., & Carter, C. (2008). Drug Scares, law and harm reduction. Poster Presentation. International Conference on Harm Reduction 2008. Barcelona, Spain, May 7 11-15, 2008.

Bungay, V., Boyd, S., Buxton, J., Johnson, J., Malchy, L., Loudfoot, J., Mulvogue, Moffat, B. (2008). Lessons Learned from the SCORE (Safer Crack Use and Outreach Education Project). Poster Presentation. International Conference on Harm Reduction 2008. Barcelona, Spain, May 7 11-15, 2008.

Boyd, S. (2007). Women, Poverty and Drugs: Lesson from the past and future considerations. *Pregnant women: Another casualty of the drug war*. 2007 International Drug Policy Reform Conference. New Orleans: December 6, 2007.

Boyd, S., & Carter, C. (2007). *Methamphetamine discourse: Media, law, and policy*. Canadian Law and Society Association, The Canadian Federation for the Humanities and Social Sciences Annual Congress, University of Saskatchewan, Saskatoon, SK, June 1, 2007.

Boyd, S. (2007). *Chair*. The City. Canadian Law and Society Association, The Canadian Federation for the Humanities and Social Sciences Annual Congress, University of Saskatchewan, Saskatoon, SK, June 1, 2007.

Boyd, S. (2007). Facilitator. Responding to Alcohol: Monitoring, Treatment, Policy and Harm Reduction, Centre for Addictions Research, Vancouver, BC. May 11, 2007.

Boyd, S. (2007). *Illegal drug films: Representations of the Other*. Human and Social Development Spring Research Day, Research Spaces in Human and Social Development. University of Victoria, Victoria, BC, April 12, 2007.

Boyd, S. (2007). *Representations of justice and militarism in fictional drug films*. International Symposium on the Arts and Society. New York University, Tisch School of the Arts, NY, February 23, 2007.

Boyd, S. (2006). Keynote Address. *Women, drugs and harm reduction: Lessons from the past and future considerations*. Beyond the Epidemics: From Knowledge to Action, Regina, SK, November 30, 2006.

Boyd, S. (2006). *Protecting the nation: Drug film narratives*. Justice Studies Association Annual Conference. Berkeley, CA, June 9, 2006.

Boyd, S. (2006). *Cinematic representations of illegal drug users, addiction, and drug services*. 17th International Conference on the Reduction of Drug Related harm. Vancouver, BC, May 3, 2006.

Boyd, S. (2006). Discussant and speaker. *Half the World are Women: Gender and Harm Reduction*.17th International Conference on the Reduction of Drug Related harm. Vancouver, BC, May 1, 2006.

Boyd, S. (2005). Panel facilitator and Chairperson. *Public representations of truth, crime and justice*. 2005 American Society of Criminology Annual Meeting. Toronto, ON, November 17, 2005.

Boyd, S., & Stoddard, M. (2005). *Drug films, justice & society: Representations of drug dealers and users in film*. 2005 American Society of Criminology Annual Meeting. Toronto, ON, November 17, 2005.

Boyd, S. (2005). *Justice literacy: What every student of justice needs to know (And speak intelligently about) before graduation*. 2005 American Society of Criminology Annual Meeting. Toronto, ON, November 17, 2005.

Boyd, S. (2005). *Drug films, justice, and nationhood*. Law's Empire Conference. Harrison Hot Springs, BC, June 29, 2005.

Boyd, S. (2005). Moderator. Law's Empire Conference. Harrison Hot Springs, BC, June 29, 2005.

Boyd, S. (2005). *From witches to crack moms*. Entheogenesis 2nd Annual conference. From Darkness Back to Light, Vancouver, BC, May 21, 2005.

Boyd, S. (2005). *Beyond Hamilton: The criminalization of racialized and poor women.* NAWL & West Coast LEAF National Conference, Vancouver, BC, April, 29, 2005.

Boyd, S. (2005). *Drugs, birth and the law*. (Paper read by Connie Carter). 16th International Conference on the Reduction of Drug Related Harm, Belfast, North Ireland, March 24, 2005.

Boyd, S. (2003). *Drugs and Reproductive Freedom*. Presentation at the Drug Policy Alliance 2003 Biennial Conference. Reason, Compassion, Justice. Newark, NJ, November 7, 2003.

Boyd, S. (2003). *Drug courts in Canada: Therapeutic intervention and punishment*. Faculty Research Day. University of Victoria, BC, April 11, 2003.

Boyd, S. (2003). *Life Today*. Forum Panel Facilitator for Mid-term crisis: Exposing the impacts of provincial government decisions. University of Victoria, BC, March 11, 2003.

Boyd, S. (2003). *Drug policy and the regulation of "unruly" women*. Presentation at the Western Society of Criminology 30th Annual Conference. Vancouver, BC, February 22, 2003.

Boyd, S. (2002). *Pregnancy and Drug Use*. Presentation at the 4th National Harm Reduction Conference. Seattle, Washington, December 2, 2002.

Boyd, S. (2002). *From witches to crack moms: A historical perspective on the subordination of women*. Presidential Session at the American Society of Criminology 54th Annual Meeting, Chicago, November 14, 2002.

Boyd, S. (2002). *Gender and Justice*. Presidential Roundtable presentation at the American Society of Criminology 54th Annual Meeting, Chicago, November 14, 2002.

Boyd, S. (2002). *Women, drugs, community and justice*. Presentation at the 73rd Annual Pacific Sociological Association Meeting. Vancouver, BC, April 19, 2002.

Boyd, S. (2002). *In the name of the children*. Commentator at the Maternal-State Conflicts: Claims of Fetal Rights & the Well-being of Women & Families conference. Mt. Sinai Hospital, New York, NY, January 27, 2002.

Boyd, S. (2001). *Women and Drugs: Repression and Resistance*. Presentation at Women's Resistance: From Victimization to Criminalization. Ottawa, October 2, 2001.

Boyd, S. (2001). *Drugs as a source of peace*. Presentation at the Justice Studies Association Third Annual Meeting. Wheaton College, Norton, MA, May 31, 2001.

Boyd, S. (2001). *The demonization of women suspected of using illegal drugs*. Presentation at the Association for Research on Mothering conference on Mothers Without Their Children. York University, Toronto, ON, May 5, 2001.

Boyd, S. (2000). *Drug Series*. Poetry Reading for the Vancouver Symposium on Networks Needles, Drugs, Risk, and Infectious Disease with S. Friedman & B. Osburn,. Vancouver, BC, August 31, 2000.

Boyd, S., & Faith, K. (2000). *Decarcerate by Decriminalizing Drugs*. Workshop and presentation at the 1X International Conference on Penal Abolition. Toronto, ON, May 2000.

Boyd, S. (2000). *In the Name of Harm Reduction: Repression and Control*. Plenary presentation at the First International Congress on Women and Drugs. St. Helier, Jersey, April 9, 2000.

Boyd, S. (2000). *In the Name of Harm Reduction: Repression and Control*. Presentation at the 11th International Conference on the Reduction of Drug Related Harm. St. Helier, Jersey, April 11, 2000.

Boyd, S. (1999). *Harm Reduction and Methadone in BC: A Conservative Alliance*. Presentation at 1999 Annual Conference American Society of Criminology. Toronto, ON, November 19, 1999.

Boyd, S. (1998). *Women & Addiction*. Presentation at the 11th Annual BC HIV/AIDS Conference. Vancouver, BC, November 24, 1998.

Boyd, S. (1998). *"The Widening Net": The regulation of mothers who use illicit drugs*. Presentation at Biennial Meeting of the Western Association of Sociology and Anthropology. Vancouver, BC, May 16, 1998.

Boyd, S. (1995). *Social Control and Risk Assessment*. Presentation at the 1995 Annual Conference American Society of Criminology. Boston, Ma., November 16, 1995.

Boyd, S. (1995). *The social construction of the double risk: neonatal abstinence syndrome and abusive parents*. Presentation at 6th International Conference on the Reduction of Drug Related Harm. Florence, Italy, March 26, 1995.

Boyd, S. (1995). *Women, Social Control and Resistance*. Presentation at Canadian Law & Society Association Annual Meeting. Learned Societies Conference. Montreal, Quebec, June 6, 1995.

Boyd, S. (1994). *Regulation and Control: Illicit Drug Use and Mothering*. Presentation at Canadian Law & Society Association Annual Meeting. Calgary, Alberta, June 12, 1994.

Boyd, S. (1994). *Women and Illicit Drug Use: The Significance of Legal, Medical, and Social Service Intervention.* Presentation at the 5th International Conference on the Reduction of Drug Related Harm. Toronto, On, March 6-11, 1994.

Boyd, S. (1994). *D.A.M.S An Alternative Approach to Working with Women, Children and Drug Use*. Presentation at the 5th International Conference on the Reduction of Drug Related Harm. Toronto, On, March 6-11, 1994.

Boyd, S. (1993). *The Criminalization of Narcotics and Pregnancy*. Presentation at The Western Association of Sociology and Anthropology 1993 Annual Meetings. Vancouver, BC, April 15-18, 1993.

Boyd, S. (1993). *Critical and Historical Overview of Reproductive Autonomy: Implications for Midwifery*. Presentation at the International Confederation of Midwives 23rd Triennial Congress. Vancouver, BC, May 12, 1993.

Invited Lectures, Consultations and Workshops

Public Launch and presentation, *SNAP: Telling Our Stories, Heroin-Assisted Treatment and Advocacy*. Vancouver: VANDU, December 7, 2004.

Co-presenter, *SNAP Experiences*. Vancouver: VANDU, December 3, 2013.

Co-presenter, *Strengths and Travels of DTES Women*. Vancouver: VANDU, Vancouver, November 26, 2013.

Participant, roundtable. Ending the Drug War: A roundtable discussion with Javier Sicilia and Canadian Drug Policy Coalition. Simon Fraser University, Woodwards, October 28, 2013.

Participant, strategy meeting. New Directions Colorado: A Public Safety and Health Approach to Drug Policy. Drug Policy Alliance and the Centre for Public Health Practice. Denver, Colorado, June 7, 2013.

Participant. Canadian Drug Policy Coalition Governance Meeting. Calgary, Alberta, May 24, 2013.

Co-organizer for one-day event, and Discussant for afternoon sessions. *Reel Lives: Madness, Addiction and Crime in Canada Workshop*, Simon Fraser University, Harbour Centre, May 11, 2013.

Participant, *Critical Inquiries: Engaging theories and methodologies for researching social inequities in Mental Health.* Centre for the study of gender, social inequities and mental health, Simon Fraser University, Harbour Centre, Vancouver, BC, May 9 to 10, 2013.

Invited Participant, *International Roundtable. Bonding Through Bars: Protecting the health and bond of incarcerated mothers and their children.* Peter Wall Institute, University of British Columbia, Vancouver, BC, May 5 to May 11, 2013 (I only attended until the 7th).

Joint organizer. Film viewing and discussion with Kym Hynes. *Taking the Fall and Rising.* End Prohibition & VANDU, Vancouver, BC, April 20, 2013.

Public Presentation. *Reefer Madness: Marijuana regulation in Canada.* Sensible BC, Simon Fraser University, Burnaby, BC, March 14, 2013.

Public Presentation. *Reefer Madness: Time for a change.* Sensible BC, North Vancouver, BC, March 9, 2013.

Public Presentation. *Drug Prohibition and Resistance in the DTES: Global Shifts.* Carnegie Centre, Vancouver, BC, January 23, 2013.

Public Presentation. *A history of Canadian drug policy and a social justice movement.* Drugs, Crime and Addiction in Surrey: Engaging Community Partners in Harm Reduction. Surrey Campus, BC: Simon Fraser University, November 3, 2012.

Presenter and organizer for all day event in Oppenheimer Park. *The history of drug policy in the DTES.* The War Stops Here! Vancouver, BC: End Prohibition, VANDU, Canadian Drug Policy Coalition. September 22, 2012.

Public Lecture. *A quick overview of Canadian drug policy. Or, How did we get here?* Drug policy is health policy – Locally, nationally and globally. Canadian Nurses Association and Dr. Peter Centre. Dr. Peter Centre, Vancouver, BC. June 17, 2012.

Public Lecture. *The History of Canadian Drug Policy.* Beyond Prohibition: History, Harms, and Alternatives to the War on Drugs. End Prohibition Project. Canadian Memorial Church and Centre for Peace, Vancouver, BC, May 15, 2012.

Public Forum and Report Launch. NAOMI Patients Association public launch of their 2012 Report, *NAOMI Research Survivors: Experiences and Recommendations.* Vancouver Area Network of Drug Users (VANDU), Vancouver BC, March 31, 2012.

Public Lecture, *A brief history of prohibition.* Examining Drug Prohibition: Past, Present and Future. Institute for Liberal Studies, University of Victoria, BC. March 1, 2012.

Public Presentation, *A Brief History of Canadian Drug Policy.* Beyond Prohibition: History, Harms, and Alternatives to the War on Drugs. End Prohibition in the Downtown Eastside of Vancouver, Carnegie Centre, Vancouver, BC. February 8, 2012.

Public Lecture, *International and Canadian Perspectives on Illegal Drugs, Trafficking and Addiction.* The Liu Institute for Global Issues & RAGA, University of British Columbia, Vancouver, BC, January 26, 2012.

Presenter and Organizer, Public Panel, *Naomi research survivors: Experiences and recommendations*. Simon Fraser University Woodward's Campus, Vancouver, BC. November, 8, 2011.

Amicus Curiae: With National Advocates For Pregnant Women, NY, NY.
State v. McKnight
State v. Hernandez Joint DPA-NAPW Brief
Lovill v. Texas Joint ACLU-NAPW Brief
New Jersey Division of Youth and Family Svcs. v. A.L

Research Participant, Critical Inquiries in Mental Health: Paradigms and Praxis, Centre for the Study of Gender, Social Inequities, and Mental Health, Simon Fraser University, Harbour Centre, Vancouver, BC, May 10, 2011.

Public Book Reading. *Raise Shit! Social Action Saving Lives*.Vancouver Public Library. April 13, 2011.

Public Presentation. *Bad Trip: Canada's Failed Drug Policy and Possibly Alternatives*. Streams of Justice, 1803 E. 1st, Vancouver, BC, March 28, 2011.

Canadian Drug Policy Coalition (CDPC), Working participant at three day inaugural meeting, Ottawa, ON, March 7-9, 2011.

Boyd, S., Presentation. *A Century of Prohibition: Legal Discrimination.* Stigma and Drug Use Panel and Discussion. Greater Victoria Anti-Stigma Week: Drug Use, Dignity and Human Rights, Fernwood Community Centre, Victoria, BC, February 8, 2011.

Boyd, S. Book reading. *Raise Shit!* Celebrating UVic Authors: 2010. University of Victoria, BC, October 21, 2010.

Hooked. Book reading and slide show. Public Lecture Series. Vancouver Public Library, BC, October 22, 2010.

Public Lecture. *Media, Marijuana, Discourse and Justice*. Critical Praxis Research Network, Fall Colloquium Series. Studies in Policy & Practice. University of Victoria, September 29, 2010.

Research Participant, Centre for the Study of Gender, Social Inequities, and Mental Health, Simon Fraser University, Harbour Cetnre, Vancouver, BC, May 17-18, 2010.

Consultant. *Discriminatory Nature of Mandatory Minimums*. African Canadian Legal Clinic. Toronto, ON, March 15, 2010.

Public presentation: *Raise Shit! Social action saving lives*, book reading and launch with Victoria Harm Reduction, Solstice Café, Victoria, BC, March 4, 2010.

Public Lecture. Reefer Madness. Human and Social Development, University of Victoria, January 27, 2010.

Public presentation: *Raise Shit! Social action saving lives*, book reading and launch, Interurban Gallery, Portland Hotel Society, Vancouver, BC, October 22, 2009.

Presenter and participant. Pacific Summit on Drug Users Health. VANDU, Morris J. Wosk Centre for Dialogue, June 12-14, 2009.

Participant and Working Member. Canadian Drug Policy Consortium. Strategic Meeting. Vancouver, BC. Blue Horizon, May 27-29, 2009.

Consultant and Working Member. Canadian Drug Policy Consortium: Strategic Meeting. Blue Horiizon,Vancouver, BC. May 27-29, 2009.

Panelist. *Resolving marijuana prohibition: Vancouver*. National Organization for the Reform of Marijuana Laws (NORMAL) and Canadian Students for Sensible Drug Policy. Simon Fraser University, Morris J. Wosk Centre for Dialogue. February 22, 2009.

Lecture. *Drug Use and Pregnancy.* Alberta Outreach Nurses, Edmonton, Al., March 3, 2009.

Presenter. *Harm Reduction and needle exchange*. Fix Victoria. A community dialogue: the public health crises resulting from the loss of harm reduction services in Victoria. First Metropolitan United Church, Victoria, BC, September 18, 2008.

Consultant. Canada's World Drug Policy Roundtable. City of Vancouver and the Simon Fraser University Centre for Dialogue. June 19, 2008.

Book launch and public reading. *Hooked: Drug war films in Britain, Canada, and the United States*. Centre for Addictions Research-BC, BC Mental Health and Addictions Research Network, Studies in Policy and Practice, & Human and Social Development, UVIC Bookstore, University of Victoria, April 1, 2008.

Presenter. Safer Crack Use, Outreach, Research and Education (SCORE) Community Forum, First United Church, Vancouver, BC, March 4, 2008.

Consultant. Beyond 2008: A Global NGO Forum. NGO Regional consultation North America. Vienna NGO Committee on Narcotic Drugs. This is the first time that the UN has consulted with civil society (NGOs) about drug control policy. Nine consultations were held around the world. I participated at the North American forum at the Wosk Centre, Vancouver, BC, February 4 & 5, 2008.

Safer Crack Use, Outreach, Research and Education (SCORE) Open House, VANDU, Vancouver, BC, May 4, 2007.

Public Lecture (Boyd, S., & Marcellus, L.). With Child: Exploring innovative ways of supporting pregnant women with substance use issues. BC Centre of Excellence for Women's Health, Vancouver, BC, May 1, 2007.

Post-show Discussant. We're all in this together. Vancouver Moving Theatre, The Shadows Project: Addiction and Recovery. Russian Hall, Vancouver, BC, April 27, 2007.

Public Lecture. Harm reduction and pregnant women who use substances. Panel presentation and book launch for *With Child*. Centre for Addictions Research-BC, BC Mental Health and Addictions Research Network, & Fernwood Press, University of Victoria, Downtown Office, Victoria, BC, April 11, 2007.

Public Lecture. Woman-centred, harm reduction services for pregnant women who use substances. Panel presentation and book launch for *With Child*. Centre for Addictions Research-BC, BC Mental Health and Addictions Research Network, & Fernwood Press, Segal Business Centre, Vancouver, BC, March 28, 2007.

Guest Lecturer. The performance of gender in illegal drug films. Women and Performance, WS 320-4. Department of Women's Studies, Simon Fraser University, Vancouver, BC, October 29, 2007.

Guest Lecture. Commodities and Substances: Bodies, Consumption and Ingestion, Sociology/Anthropology 421-4, Harbour Centre, Simon Fraser University, Vancouver, BC, March 8, 2007.

Presenter. (Boyd, S., Osborn, B., Dewiert, D., & McCarthy, M.). Regulation, not prohibition of drugs. Humanities 101, Carnegie Community Centre, Vancouver, BC, January 12, 2007.

Presenter. *Drug film narratives*. Addiction: Thinking Outside the Box. The 3rd Annual Downtown Eastside Heart of the City Festival, Carnegie Community Centre, October 30, 2006.

Presenter. *Women, poverty and the war on drugs*. Poverty Amidst Affluence: The Reality of Structural Violence Series. Vancouver, Grandview Baptist Church, October 23, 2006.

Facilitator and organizer for the Victoria Drug Research Group meeting, University of Victoria, BC, October 11, 2006.

Presenter. (2006). *Writing Methodology*. Fourth Annual HSD Graduate Student Conference, The "How-Tos" of Graduate Work, University of Victoria, BC, October 15, 2006.

Lecture. *Prohibition*. Presentation at Churchill Secondary School, Vancouver, BC, June 5, 2006.

Public Lecture. *Images of drug use in movies*. Presentation at public forum, The Devastation of Prohibition. Creative Resistance. Unitarian Church, Vancouver, BC, May 26, 2006.

Discussant. CAR-BC public lecture, Ending the war on drugs. Norm Stamper, Segal Centre, Simon Fraser University, Vancouver, BC, April 10, 2006.

Co-organizer for the Gender Major Session at the 17th International Conference on the Reduction of Drug Related Harm, Vancouver, BC, May 1, 2006. Meetings held from January 2006 to April 2006.

Invited and accepted two year membership on the National Coordination and advisory Committee for the National Research Agenda for Substance Use and Abuse, Heath Canada. Ottawa, ON, Inaugural meeting took place on March 20, 2006.

Presenter. *Systemic Violence: The Social Dimensions of Prohibition*, Public Forum, The War on Drugs: Its Deadly Consequences & Possible Alternatives, Carnegie Community Centre, Vancouver, BC, February 15, 2006.

Facilitator and organizer of the 2nd meeting of Uvic Graduate Students and Faculty, Victoria Drug Research Group, University of Victoria, February 8, 2006.

Public Lecture. *Collaborative Research with Women in Vancouver's Downtown Eastside*. A Workshop Series: Researching for Change, The Vancouver Island Public Interest Research Group (VIPIRG), University of Victoria, January 19, 2006.

Public Lecture. *Health & Justice for Women who Use Illicit Drugs: Building women-centred harm reduction in our community*. Presenter at Community Forum, The Vancouver Area Network of Drug Users Women's Group, Gallery Gachet, Vancouver, BC, December 9, 2005.

Moderator. CAR-BC Lecture: Close to the Street: Homelessness, Addiction and Access to Health Care, Bernadette Pauly, University of Victoria, December 7, 2005.

Participant. Round table discussion. *Merck/Frost Corporation HIV/AIDS vaccine testing on Vancouver women*. Remember Me, A day of action. Vancouver Rape Relief & Women's Shelter. Vancouver Public Library, Vancouver, BC, December 6, 2005.

Presenter. Writing a methodology chapter. The "How To's of Graduate Work. Human and Social Development, University of Victoria, October 21, 2005.

Presenter. Drug prohibition: A policy of mass destruction. Presentation for Beyond drug prohibition: A social awakening. Creative Resistance. Keeping the Doors Open. Roundhouse Community Centre, Vancouver, BC, October 19, 2005.

Member of planning & implementation committee for: Beyond drug prohibition: A social awakening. Creative Resistance. Keeping the Doors Open. Roundhouse Community Centre, Vancouver, BC, October 19, 2005.

Participant: Beyond drug prohibition: a public health approach. A symposium by Keeping the Door Open: Dialogues on drug use. Vancouver, BC, October 18 & 19, 2005.

Participant. Mayor's Forum. Drug Use Prevention Strategy. Mount Pleasant Community Centre, Vancouver, BC, October 15, 2005.

Facilitator for CAR-BC Special Event and Lecture (Planning collaboration with Philippe Lucas): Reflections Forward and Back on the Methamphetamine Crisis, Ethan Nadelmann, and Just Say Know: Getting Real about Teens and Drugs, Marsha Rosenbaum. University of Victoria, September 15, 2005.

Public Lecture. "Stop the Weed Witchhunts" (Rally to protest women being persecuted for their association with cannabis) Vancouver, BC, September 3, 2005.

Consultant. *R.v. Hamilton Intervention - National Consultation* (concerning drug courier case). African Canadian Legal Clinic. Toronto, ON, May 4, 2005 & June 27, 2005.

Participant. Women's Addiction Research - A Virtual Dialogue with Current and Potential Collaborators. IMPART, Vancouver, BC, May 2, 2005.

Public Lecture. (2004). Public Reading. *Drugs, reproductive autonomy, and maternal-state conflicts*. Centre for Addictions Research of BC, University of British Columbia, November 16, 2004.

Public Lecture. Public Reading. *From witches to crack moms*. Centre for Addictions Research of BC, University of Victoria, October 7, 2004.

Participant: *Working with Substance Using Women*, Fir Square, Women's Hospital, Vancouver, BC, October 29-30, 2004.

Consultant: *Consultation Sessions on a National Framework for Action on Substance Use and Abuse*. Sponsored by Drug Strategy and Controlled Substances Programme and Canadian Centre on Substance Abuse, Vancouver, BC, September 23-24, 2004.

Attended symposium: *Moving Forward: Improving Treatment for Heroin Addiction*. Sponsored by Keeping the Door Open: Dialogues on Drug Use, Vancouver, BC, September 20-21, 2004.

Facilitator. *SOLID Community Forum* (Society of Living Intravenous Drug Users Union). Facilitator at community forum. Mustard Seed Church. Victoria, BC, June 27, 2004.

Public Lecture. *From witches to crack moms*. Interurban, Co-ordinated by Portland Hotel and VANDU, Vancouver, BC. July 20, 2004.

Consultant: *R. v. Emmanuel Intervention-national Consultation* (about unlawful arrest and arbitrary detention and the treatment of African Canadian people by the police), May 31, 2004.

Public Lecture: Women and drug offences. *Innovative Responses to Drug Use: A Public Forum*. Centre for Addictions Research of BC, University of Victoria, March 17, 2004.

Public Lecture: *Drug trafficking, women, and the law*. Lecture for the Centre for Research in Women's Studies and Gender Relations. University of British Columbia, Vancouver, February 11, 2004.

Public Lecture: *Parenting and Illegal Drugs*. Workshop for Vancouver Area Network of Drug Users (VANDU), Vancouver, BC, February 10, 2004.

Consultant: Three day workshop. *2nd National Harm Reduction Planning Conference*. Vancouver, BC, January 12-14, 2004.

Consultant: *R.v. Hamilton Intervention - National Consultation* (concerning drug courier case). African Canadian Legal Clinic. Toronto, ON, December 15, 2003.

Public Lecture. *Harm Reduction*. Lecture for Society of Living Intravenous Drug Users (SOLID). Victoria, BC, September 10, 2003.

Forum Presenter. Community Forum Presenter for opening of the documentary *Fix: The story of and addicted city*. Cineplex Odeon, Victoria, BC, March 8, 9, and 26, 2003.

Public Lecture. *Women, law, and drug policy*. Lecture for the Rational Drug Policy Association conference Drugs & the Law, University of Victoria, Faculty of Law, January 25, 2003.

Public Lecture. *The war on drugs and its impacts*. Lecture for UVSS and THUGS. "Armed with understanding." Lecture Series, University of Victoria, November 25, 2002.

Public Lecture. *The war on drugs and its impacts*. Lecture for UVSS and THUGS. "Armed with understanding." Lecture Series, University of Victoria, October 24. 2002

Saint Mary's University supported Seminar series arranged with and for prisoners at Nova Prison for Women, Truro, N.S. from January to May 2002.

May 17, 2002: What do criminologists have to say about women in conflict with the law?
March 22, 2002: Welfare regulation of women
February 8, 2002: Sociological explanations of drug use

Public Lecture. (2002). *Mothers, drugs, and the law*. Lecture for Humanities Storefront Evening Lecture Series, Vancouver, BC, January 2, 2002.

Public Lecture. *Criminalization of Altered States of Consciousness: Regulation and Resistance*. Lecture for Humanities Storefront Evening Lecture Series, Vancouver, BC, August 27, 2001.

Public Lecture. *Altered States of Consciousness: An Alternative View*. Lecture for the Simon Fraser University Seminar Series at Mission Institution, BC, July 19, 2001.

Public Lecture. *Are you a parent? Are you a drug user?* Lecture for Vancouver Area Network of Drug Users (VANDU) and The BC Association of People on Methadone at The Sunrise Hotel, Vancouver, BC, July 18, 2001.

Presenter. New and Former Faculty Members. Panel presentation at Canada's Universities and Colleges: Is There a Future? The Halifax Hearings, Halifax, NS, March 9, 2001.

Public Lecture. *Mothers and Drugs*. Lecture for Women's Studies Colloquium Series, Dalhousie University, Halifax, NS, November 29, 2000.

Public Lecture. *Mothers, Drugs, and Pregnancy*. Lecture for Women's Studies Student Union at Harbour Centre, Simon Fraser University, Burnaby, BC, July 12, 2000.

Public Lecture. *Mothers and Illicit Drugs*. Presentation for Carnegie Community Action Project Lecture Series at Carnegie Centre, Vancouver, BC, April 30, 1999.

Workshop Facilitator. *Exploration of Substance Use and Treatment Models*. Workshop facilitator at Western Canadian Feminist Counselling Association, Vancouver, BC, Oct. 8, 1991.

Workshop Facilitator. *An Easy Pill to Swallow: Women, Drugs and Depression*. Justice Institute of BC, Vancouver, BC, July 26, 1988.

UVic Department/School Committees and Responsibilities

2012 Member, Admissions and Awards Committee
2012 Chair, SPP Salary Review Committee
2012- Member, SPP Program Council (2010, 2009)
2011 Member, Admissions and Awards Committee
2010 Member, Admissions and Awards Committee
2010 Chair, SPP External Review Follow-up Committee
2009 Adjudication Committee, SSHRC Master's Canada Graduate Scholarship, UVic
2009 Chair, Admissions and Awards Committee
2008-09 Coordinator, SPP, September 1, 2008 to July 1, 2009
2008-09 Facilitator, SPP External Review Process
2008- Member, Admissions and Awards Committee
2008- Chair, Curriculum Committee
2007 Chair, SPP Hiring Committee
2007-08 Member, SPP Salary Review Committee
2006-07 Chair, Admissions and Awards Committee
2006 Coordinator, SPP (Jan 2006 to July 2006)
2006 SSHRC Master's Adjudication Committee
2005-06 Chair, Curriculum Committee
2005-06 Member, SPP Salary Review Committee
2005-06 Member, Admissions and Awards Committee
2005 Member, Blue Medal Awards Committee

2005 Appointment Committee (IGOV candidate)
2004-05 Member, Admissions and Awards Committee
2004-05 Member, SPP Salary Review Committee
2003-04 ARPT Committee Member
2003-04 Chair, SPP Recruitment and Poster Committee
2003-04 HSD Advisory Committee Member
2002-03 Planning Committee, Mid-Term Crisis Forum
2002-03 Member, SPP Salary Review Committee
2002-03 Library Representative, SPP Library Committee
2002 Member, SPP Program Council
2002 Member, SPP Curriculum and Awards Committee

University and Community Service, Education: Bridging the Gap between the Community and the University

September 2013 - Strengths and Travels of Downtown Eastside Women. Principal Researcher, Jade Boyd. Weekly gatherings with women in leadership roles in the Vancouver Area Network of Drug Users (VANDU). Four month ethnographic community-based qualitative and creative art project.

03/2011- In March 2011 I began Saturday **Educational Research Workshops** (on research, methodology, & writing) at the NAOMI Patients Association (NPA) meetings, at Vancouver Area Network of Drug Users (VANDU), Vancouver, BC. The first NPA public event took place on November 8, 2011. I organized the public panel presentation at Simon Fraser University Woodward's Campus. The panel was made up of 3 NPA members and myself. The panel was titled, "Naomi research survivors: Experiences and recommendations." The event was very well attended and it received quite a bit of media coverage. AHA social media taped the event. It can be viewed at: http://www.youtube.com/watch?v=ozHCJI6vxOI

The first NPA Report: *NAOMI Research Survivors: Experiences and recommendations* was completed in February 2012. A launch for the Report was organized by myself and NPA at VANDU on March 31, 2012. This event was followed up by a presentation at the conference, Critical Inquiries in Mental Health Inequities: Exploring Methodologies for Social Justice, Centre for the Study of Gender, Social Inequities and Mental Health, Harbour Centre, Simon Fraser University on May 10, 2012.

2011 - I participated in the envisioning, start-up and launch of the Canadian Drug Policy Coalition (CDPC). I am working member of the Steering Committee and Chair of the Drug Policy Group. The central mandate of the new national organization is education and drug policy reform. See: http://www.drugpolicy.ca

2010 to 2011 I co-developed with Connie Carter an educational/policy tool, "**Historical Drug Policy Timeline**." It is now featured on the webpage for the Canadian Drug Policy Coalition,

see: http://drugpolicy.ca/progress/timeline/ The Timeline includes 117 significant historical, social, political events from 1700 to the present that shaped drug policy in Canada. International, national, and local events are included in the Timeline. The 117 individual events are visually represented (the web page was developed by Heiko Decosas) and each event is accompanied by an information box and photo. The Timeline will be an ongoing project as drug policy events unfold.

2009 - I joined the Carnegie Community Action Project (CCAP), End Prohibition Project. We continue to work as a group. We have organized public events, lectures, and educational material on drug policy history and reform.

02/2008 to 02/2009: **Educating Harper**: Created and launched a one-year educational web-based project titled: www.educatingharper.com. It is in response to recent shifts in drug policy by the federal government. The website includes a summary of 52 weekly readings: journal articles, federal, provincial, and city reports, and documentaries on harm reduction and drug regulation. Every Sunday a weekly reading was sent by mail to the Prime Minister. The purpose of the website is to provide easy access to concerned Canadians and the Prime Minister to well researched and peer-reviewed papers, reports, and documentaries on harm reduction and drug regulation. The website remains up and running.

2005- 2006: **Victoria Drug Research Group**: Facilitated and organized the first two years of meetings of UVic Graduate Students, Victoria Drug Research Group, CAR-BC and University of Victoria. The first meeting was on November 23, 2005. This campus-wide group met 3 times a semester for two years. The group identified drug research-related issues that they wanted to learn about. Students presented from their own work, invited speakers presented, and information sharing about upcoming conferences and workshops, drug theory, methodology, and policies were discussed.

Professional and Community Activities

2009 Review and feedback, Center for AIDS Prevention Studies (CAPS), University of California, San Francisco. Fact Sheet "What are crack cocaine users' HIV prevention needs?" October 2009.

2004- Associate Editor, *Contemporary Justice Review*, Routledge.

Article reviews for *Harm Reduction Journal* [5]

Article review for Contemporary Drug Problems [1]

Article review for Contemporary Ethnography [1]

Article reviews for *Contemporary Justice Review* [11].

Article reviews for *International Journal of Drug Policy* [4]

Article review for Critical Public Health [1]

Article review for Radical Criminology [1]

Book manuscript reviews for University of Toronto Press [2]

Book Proposal review for Fernwood Press [4]

Book manuscript review for Thompson Publishers [1]

Board Membership and University Activities

03/2011- Board Member, Steering Committee and Chair, Drug Policy Working Group, Canadian Drug Policy Coalition.

2009- Working member, Carnegie Community Action Project (CCAP), End Prohibition Project

11/07-10 Board Member. Beyond Prohibition Coalition. Vancouver, BC.

2009- Advisory Board, Canadian Students for Sensible Drug Policy.

2006-07 Advisory Board, Going Dutch: Coffeeshops, Cannabis & Prohibition. Documentary by Elaine Briere and Wouter de Jong.

2006-08 Two year membership on the National Coordination and advisory Committee (NCAC) for the National Research Agenda for Substance Use and Abuse, Heath Canada. Ottawa, ON, Inaugural meeting took place on March 20, 2006.

2006-08 Consultant, Society of Living Intravenous Drug Users (SOLID), Victoria, BC

2003-05 Board Member, Society of Living Intravenous Drug Users (SOLID), Victoria, BC

2003-07 Committee Member, Victoria Harm Reduction Coalition

2000-02 Board Member, The International Network on Women & Drugs

1997-98 Conference Co-Coordinator, "(Ab) Using Power: The Canadian Experience" School of Criminology, Simon Fraser University, March to May

1995-99 Methadone Advisory Committee Research & Faculty Committee Member, Vancouver, BC

Media Work

January 9, 2014, phone interview with George Baker, CBC North host. Live interview aired on January 14, 2014, about book *Killer Weed* and marijuana policy.

January 7, 2014, Radio interview with Pamela McCall on CFAX – 1070, about book *Killer Weed* and marijuana policy.

January 6, 2014, Radio interview on Todd Veinotte Show, Atlantic Canada, 195.7 Halifax about book *Killer Weed* and marijuana policy.

January 2, 2014, Radio interview with Jim Fannon, 610 CKTB, St. Catharines, about marijuana grow ops and book *Killer Weed.*

January 2, 2014, Radio interview with Gregor Craigie, On the Island, Radio One, CBC, about marijuana grow ops and book *Killer Weed.*

December 28, 2013, Radio interview with Steve Darling, World Today, CKNW, about marijuana grow ops and book *Killer Weed.*

December 27, 2013, Radio interview with Mike Smyth, Bill Good Show, CKNW, about marijuana grow operations and book *Killer Weed.*

December 26, 2013, *Vancouver Sun* article by James Keller, The Canadian Press, drawing from December 20, 2013 interview about *Killer Weed*: http://www.vancouversun.com/news/Media+police+forces+talking+straight+says+researcher/9324592/story.html

December 25, 2003. *Globe and Mail* article by James Keller, The Canadian Press, highlighting interview conducted on December 20, 2013 about *Killer Weed*: http://www.theglobeandmail.com/news/british-columbia/police-media-misled-british-columbians-on-marijuana-new-book-claims/article16100223/

Boyd, S. (December 20, 2013). Phone interview with James Keller, The Canadian Press – Vancouver, about the themes highlighted in *Killer Weed.*

Boyd, S. (November 20, 2012). Radio interview with Robyn Spilker, CFUV Women's Radio Collective, 101.9 FM. On women, drug law and reproductive regulation.

Boyd, S. (September, 20, 2012). Radio interview with W2 Media Morning, Co-op Radio Vancouver, BC about ending drug prohibition.

Boyd, S. & Murray, D. (May 28, 2012). Radio interview with Murray Langdon about heroin assisted treatment and NAOMI Patients Association report. C-FAX 1070.

Boyd, S. (March 21, 2012). NAOMI Patients Association Report. Website Blog, Canadian Drug Policy Coalition. See: http://drugpolicy.ca/2012/03/naomi-research-survivors-experiences-and-recommendations/

Boyd, S. (March 17, 2012). Interview with Amber Hitchen for *Room*: *Canada's oldest literary journal by and about women*, Vancouver, BC. Published by: Amber Hitchen (2012). Reproductive rights, drug policy, and social justice: A interview with professor Susan Boyd. *Room*, *35*(3): 57-63.

Boyd, S. (February 24, 2012). OpenFile Calgary interview with James Wilt about upcoming Canadian Students for Sensible Drug Policy Annual Conference and drug policy.

Boyd, S. (February 2, 2012), Vancouver Co-op Radio interview with Aiyanas Ormond, People's Health Radio, rabble.ca. CFRO, 102.7FM, about the early history of drug policy in Canada.

Boyd, S. (November 8, 2011). CBC Radio interview with Rick Cluff, The Early Edition, about heroin prescription programs and community based workshops and research that I conducted with NAOMI Patients Association in Vancouver, BC.

Boyd, S. (October 27, 2011). CBC Radio interview with Carol Off, As it Happens, about cannabis regulation and federal and B.C. drug reform.

Boyd, S. (October 27, 2011). Radio interview with Frank Stanford, CFAX, Victoria, B.C., about cannabis regulation and federal and B.C. drug reform.

Boyd, S. (October 25, 2011) interview with Carlito Pablo, *Georgia Straight* about Stop the Violence Coalition (drug reform to legally regulate cannabis). Article: Report says regulating pot may reduce harm, C. Pablo (October 27-November 3, 2011), *Georgia Straight*, 45(2288), p. 21.

Boyd, S. Radio interview with Dean Becker, KPFT, Drug Truth Network, about film representations and the war on drugs. April 10, 2011.

Boyd, S. Radio interview about Bill S-10, mandatory minimum prison sentences for drug offences, with Gregor Craigie, On the Island, CBC, Victoria, BC, February 11, 2011.

Boyd, S. Radio interview about marijuana films and drug policy with Dave Dickson, CFAX 1070, Victoria, BC, January 18, 2010.

Boyd, S. Filmed interview with film director Scott Calbeck on November 21, 2009 for documentary about opium and heroin production.

Boyd, S. Interview about Bill C-15 and its impact on women with Stark Raven, Co-op Radio, 102.7, Vancouver, BC, June 7, 2009. http://www.radio4all.net/index.php/program/34674

Boyd, S. Interview with Carlito Pablo on March 20, 2009, appeared in "Bill C-15 could fill prisons", *Georgia Straight*, March 26 – April 2, 2009 (p. 13).

Boyd, S. Interview with Mindelle Jacobs on March 2, 2009, appeared in "Drug traffickers missed", *Toronto Sun*, March 3, 2009 (p. 17) and *Sun* newspapers throughout Canada. The article describes the "educatingharper" initiative and the Conservative party's failure to understand the link between prohibition and drug trade violence.

Boyd, S. Interview about U.S. and Canadian drug policy with Dean Becker, *Drug Truth Network*, KPFT (90.1 FM), Houston, Texas, October 7, 2008.

Boyd, S. Interview about Canadian Drug Policy and educatingharper website with Tamara Herman, *The Hidden News*, CFUV (101.9 FM), University of Victoria, BC, October 3, 2008.

Boyd, S. Interview with *Global News Hour*, Victoria, BC. Appeared on TV September 18, 2008.

Boyd, S. Interview with Rebecca Aldous, *Victoria News*, September 10, 2008, appeared in "Advocates point to need for fixed needle exchange," *Victoria News*, September 16, 2008.

Boyd. S. Interview with Alan Twigg, *BC Bookworld*, May 2, 2008, appeared in *BC Bookworld, 22(2)*: 20, Demonic Drugs: How celluloid depicts drugs other than alcohol.

Boyd, S. Telephone interview with Cindy Hartnett, *Victoria Times Colonist*, April 10, 2008, appeared in *Victoria Times Colonist,* "UVic prof lectures PM on Tories' drug policy." April 27, 2008.

Boyd, S. Telephone interview with David Karp, *Martlet* Editor-in-Chief, March 7, 2008 about the creation of the website: www.educatingharper.com, appeared in article by David Karp, "Prof educating Harper with weekly readings." *Martlet*, April 3, 2008.

Pivot Legal Society Podcast 7. (March 20, 2008). Jodi Loudfoot and Susan Boyd from SCORE talk about their campaign to provide safer crack kits to addicts. Safer Crack Use Kit Contents and reference to the website: http://www.educatingharper.com/.

Boyd, S. Radio interview with Sucheta Singh about Prime Minister Stephen Harper's drug policy and creation of website: www.educatingharper.com. For the Record, Evolution Radio, 107.9 FM, February 12, 2008.

Boyd, S. Interview with Matthew Borrows on February 1, 2008, appeared in newsprint, "Activist aims to school Harper in drug policy," *The Georgia Straight*, February 7-14, 2008: 19.

Boyd, S. Interview with Nancy MacDonald, *Maclean's Magazine*. On CAST and Vancouver's harm reduction programs. June 27, 2007.

Boyd, S. Radio interview with Jeff Conners about illegal drug films. *On the Dope*, Canada's only weekly youth Drug & Alcohol radio program, Kamloops Campus, CR BX 92.5 FM, April 2, 2007.

Boyd, S. Radio interview with Cheryl Rennie, CBC Saskatchewan, Radio, November 30, 2006.

Boyd, S. Interview with Pamela Cowan, appeared in newsprint "Harm Reduction Aims of 'Beyond the Epidemics,' *Leader-Post*, November 30, 2006.

Boyd, S. Interview with Gail Johnson, appeared in newsprint "Harper's U.S.–style drug stance harms women," *Georgia Straight*, May 11-18, 2006: 37.
Boyd, S. One hour interview about drug addiction with Dee Hon, *Georgia Straight*. October 25, 2005.

Boyd, S. (2005). One hour radio interview about maternal drug use. Kootenay Co-op Radio, Fane of the Cosmos, February 20, 2005.

In fall 2004 I was interviewed by Tyler Hopson, a reporter for *Vancouver Magazine*, about women and illegal drugs in Vancouver. Parts of the interview appeared in the December 2004 issue titled, *She's so high: Female drug addicts are different*. (pp. 19, 20).

Boyd, S. (2004). CFAX, Terry Moore *Newsline* P.M. Victoria, BC, October, 6, 2004.

Boyd, S. (2004). Interview with Reverend Damuzi. *Cannabis Culture*, August, 11, 2004.

Boyd, S. (2004). CKNW, Bill Goode Show. Vancouver, BC, July 19, 2004.

Boyd, S. (2004). Drug Stigma hardest on women, says book by UVic professor. Interview by Mark Browne. *Weekend Edition*, Victoria, BC, July 16, 2004, A10.

Boyd, S. (2004). CFAX, Terry Moore *Newsline P.M.* Victoria, BC, July 16, 2004.

Boyd, S. (2004). CHQR, Dave Rutherford Show. Calgary, Al, July, 13, 2004.

Boyd, S. (2002). CFUV, Chris Cook Program. Victoria, BC, December 9, 2002.

Boyd, S. (2000). CKNW, The Bill Good Program. Vancouver, BC, July, 18, 2000.

Boyd, S. (2000). CKST, The John Pifer Program. Vancouver, BC, July 18, 2000.

Boyd, S. (1999). CKNW, The Rafe Mair Program. Vancouver, BC, April 13, 1999.

Boyd, S. (1999). Canadian Broadcasting Corporation, TV: Newsworld, Dayside. Edmonton, Al., May 10, 1999.

Boyd, S. (1999). Canadian Broadcasting Corporation, Radio: Daybreak, Northern BC. Prince George, BC, May 11, 1999.

Boyd, S. (1999). CFRA. Ottawa, On., May 11, 1999.

Boyd, S. (1999). Canadian Broadcasting Corporation, TV: West Endirect. Winnipeg, MB, May 12, 1999.

Boyd, S. (1999). Canadian Broadcasting Corporation, Radio: Ottawa, On; Edmonton, Al; Halifax, NS; White Horse, YT; Windsor, On; Sidney, NS; Montreal, QC; Winnipeg, MB, May 13, 1999.

Boyd, S. (1999). 630 CHED Radio, Primeau. Edmonton, Al., May 14, 1999.

Boyd, S. (1999). Canadian Broadcasting Corporation, Radio: Western Arctic. Nunavut. May 18, 1999.

TEACHING DUTIES AT THE UNIVERSITY OF VICTORIA

Courses Taught (exclude directed studies)

Evaluation Availability

Year	Course	Hours/Week	Term	No. of Students	Procedures of Evaluation Used	Results
2002	SPP 516/ SOCW 516	3	F	14	a.b.	b.
2002	SPP 502/ SOCW 512	3	S	13	a b.	b.
2002	SPP 580	3	S	5	a.b.	b.
2003	SPP 502/ SOCW 512	3	S	14	a.b.	b.
2003	SPP 580	3	S	6	a.b.	b.
2003	SPP 516/ SOCW 516	3	F	14	a.b.	b.

2004	SPP 502/ SOCW 512	3	S	13	a.b.	b.
2004	SPP 519	3	S	3	a.b.	b
2004	SPP 580	3	F	4	a.b.	b.
2006	SPP 516	3	S	4	a b.	b.
2006	SPP 530	3	F	4	a b.	b.
2006	SPP 519	3	F	8	a b.	b.
2008	SPP 519	3	F	6	a b.	b.
2009	SPP 510	3	F	1	a.b.	b.
2009	SPP 598		F	1	ab.	B.
2009	SPP 516	3	S	16	ab	b.
2010	SPP 519	3	S	6	ab	b.
2010	SPP 519	3	F	6	ab	b.
2010	SPP 550	3	F	4	ab.	B
2011	SPP 580	3	S	4		
2011	SPP 516	3	S	12		
2012	SPP 522	3	S	8		
2012	SPP 519	3	S	7		
2012	SPP 550	3	F	8		
2013	SPP 550	3	S	7		
2013	SPP 580	3	S	1		

Note: Use the appropriate letters to indicate how evaluations were conducted and where the results are available. Instructor consent is normally required for release of any evaluation results. Release of evaluation results may be required for salary review, promotion and tenure decisions or where University policy requires disclosure of teaching evaluations (e.g., procedures under the University Harassment Policy).

[1]a. Student questionnaires (Numerical ratings)
b. Student questionnaires (Written comments)
c. Comparisons of student ratings
d. Peer review(s)

[2]a. Available from the instructor
b. Available from the Department/School (With instructor's consent)
c. Available from the Dean's Office (with Instructor's consent)

e. Self-evaluation(s)
f. Post-graduate survey(s)
g. Other evaluation/review procedures used

Directed Readings Courses Taught

Evaluation Year	Availability Course	Hours/Week	Term	No. of Students	Procedures of Evaluation Used	Results
2003	SPP 590	1	F	1		
2005	SPP 590	1	S	1		
2006	SPP 590	1	S	1		
2009	SPP 510	1	F	1		
2013	SPP 580	1	S	1		
2013	SPP 550	1	F/S	1		

Note: Use the appropriate letters to indicate how evaluations were conducted and where the results are available. Instructor consent is normally required for release of any evaluation results. Release of evaluation results may be required for salary review, promotion and tenure decisions or where University policy requires disclosure of teaching evaluations (e.g., procedures under the University Harassment Policy).

[1]a. Student questionnaires (Numerical ratings)
b. Student questionnaires (Written comments)
c. Comparisons of student ratings
d. Peer review(s)
e. Self-evaluation(s)
f. Post-graduate survey(s)
g. Other evaluation/review procedures used

[2]a. Available from the instructor
b. Available from the Department/School (With instructor's consent)
c. Available from the Dean's Office (with Instructor's consent)

Graduate Supervisor:

2013 HPV Vaccine Policy & Practice: (Re)Producing Women through Neo-Medicalizing. Julie Cormier, MA Extended Essay, Studies in Policy & Practice, University of Victoria.

2013 Offsetting and Carbon Neutrality, or Reductions: Constructing a municipal alternative to carbon markets in BC. Matthew Greeno, MA Thesis. Studies in Policy & Practice, University of Victoria.

2012 Treatment as prevention (TASP) and governing human immunodeficiency virus (HIV) in British Columbia. Ashley Mollison, MA Thesis. Studies in Policy & Practice, University of Victoria, November 7, 2012.

2012 Space to think: Engaging adolescent girls in critical identity exploration. Sarah Woolgar, MA Thesis. Studies in Policy & Practice, University of Victoria.

2011 Streetlight People: Perspectives of Street Outreach Services Staff on the Loss of Harm Reduction Services in Victoria, BC. Heather Hobbs, MA Thesis. Studies in Policy & Practice, University of Victoria.

2010 Challenging heteronormativity in drug policy and practice: Exploring the support needs of queer women who experience problematic substance use. Sher Knox, MA Thesis, Studies in Policy & Practice, University of Victoria.

2010 The Impact of Medical Cannabis on the Use of Opiates in Patients Suffering from Chronic Pain, and Implications for Problematic Substance Use, Public Health and Canadian Drug Policy. Philippe Lucas, MA project, Studies in Policy & Practice, University of Victoria.

2007 Justice?: Interviews with front-line domestic violence workers. Stephanie Abel, MA Thesis. Studies in Policy & Practice, University of Victoria.

2005 Connecting at a Time of Disconnection: The Development and Implementation of Websites by Non-Profits in the Field of Separation and Divorce. Daniel Vandersluis, MA Thesis, Studies in Policy & Practice, University of Victoria

Committee Member:

2013 "Left Him In The Dust:" Father exclusion from maternal harm reduction services. Sydney Weaver, PhD Thesis. Department of Social Work, University of British Columbia, July 8, 2013.

2012 Meth, Fear And Government: a Case Study of Political Pressure and Public Policy-Making In B.C. Connie Carter, PhD Thesis, Department of Sociology, University of Victoria.

2012 The Social Organization of Mothers' Work: Managing the Risk and the Responsibility for Fetal Alcohol Spectrum Disorder. Carolyn Schellenberg, PhD Thesis. Faculty of Human & Social Development, University of Victoria.

2012 A critical ethnography of the Ottawa Drug Treatment Court: Linking discourses of addiction, addicted subjects and treatment practices. Tara Lyons, PhD Thesis, Department of Sociology, Carleton University.

2012 "What's at Stake?" Exposing Power: Mixed-Race Queer Women's Stories of Belonging. Alyvia Raju, MA Project, School of Social Work, University of Victoria.

2012 Governing the Self in Distress: Exploring Online Resources for Youth with Depression. Leah Syme, MA Extended Essay, Studies in Policy & Practice, University of Victoria.

2011 Restoring Women: Community and legal responses to violence in opposite sex intimate relationships. Angela Cameron, PhD Thesis. Faculty of Law, University of Victoria.

2011 "Our authority is community based": Funding, power and resistance in community-based organizations. Sarah Amyot, MA Thesis. Studies in Policy & Practice, University of Victoria.

2008 Health experiences of women who are street-involved and use crack cocaine: Inequity, oppression, and relations of power in Vancouver's Downtown Eastside. Victoria Bungay, PhD Thesis. School of Nursing, University of British Columbia.

2008 Circlework as emancipatory social work practice, Leanne Drumgeller, MA Thesis, School of Social Work, University of Victoria.

2008 A framework for social work practice: Usma Child and Family Services. Linda Lucas, MA Thesis. School of Social Work, University of Victoria.

2007 Reclaiming support: Shifting services to reflect tenant meanings of support in supported housing. Melanie Hope, MA Thesis. Studies in Policy & Practice, University of Victoria.

2007 Remapping the border: Experiences of being diagnosed with borderline personality disorder. George Chris Schmidt, MA Thesis. School of Social Work. University of Victoria.

2006 Exploring the Peninsula Crossroads Restitution Initiative in Two Saanich Middle Schools: Students, Administration Staff and Volunteers Share Their Experiences. Amber Hitchen, MA project, School of Social Work, University of Victoria.

2005 The Open Door/Upper Room research project. Alina Ghiman, MA project, School of Social Work, University of Victoria.

2005 The Open Door/Upper Room research project. Lora Johnston-Corbett, MA project, School of Social Work, University of Victoria

External Examiner:

2013 The *Girl-Mom* experience: A discourse analysis of online (r)evolution. Leanne Gislason, MA Thesis. School of Social Work, University of Victoria, July 26, 2013.

2013 The press and Ashley Smith: Power, knowledge and the production of the truth about a death in custody. Jody Wasserman, MA Thesis. Criminology Department, Saint Mary's University, July 25, 2013.

2013 Complicating Africville: An oral history of gender, race, and power relation in Africville. Patrick Russell, MA Thesis. Criminology Department, Saint Mary's University, April 17, 2013.

2011 Ayahuasca, Entheogenic Education, and Public Policy. Kenneth Tupper, PhD Thesis. Department of Education, University of British Columbia, April 7, 2011.

2009 Alcohol and Cocaine Simultaneous Polysubstance Use: A Qualitative Investigation. Kristina Brache, MA Thesis. Department of Psychology, University of Victoria, June 19, 2009.

2008 *Resisting Confined Identities: Women's Strategies of Coping in Prison.* Jennifer Kilty, PhD Thesis. School of Criminology, Simon Fraser University, February 29, 2008.

2004 *Memories, Observations and Recommendations: A Retrospective Review of Victoria's Hospice Bereavement Services.* Michelle Dale, MA project, School of Social Work, University of Victoria.

2003 *Health and the sex trade: An examination of the social determinants of health status and health care access among sex workers.* Rachel Phillips, MA Thesis, Department of Sociology, University of Victoria.

2002 *Aid or Band-Aid?: Perspectives from the Front-Lines on Community Treatment Programs for Abusive Men.* Sue Bartuk, MA Thesis, School of Criminology, Simon Fraser University.

1999 *Being a Fat Woman in North America: A theoretical Perspective on Fat Liberation.* Shea Pertman, MA Thesis, Department of Women's Studies, Simon Fraser University.

Chair

2013 *Conservation Efforts and Local Livelihoods in Western Serengeti, Tanzania: Experiences from Ikona Community Wildlife Management Area.* Enock Makupa, PhD, Department of Geography, University of Victoria.

Guest Lectures

Boyd, S. (2013). *The DTES and Marijuana Grow ops: Tainted and Gendered Space*. WS 204: Sex and the City, Simon Fraser University, July 2, 2013.

Boyd, S. (2013). *Mixed Methods: Community-based research with the NAOMI Patients Association*. SOC 356: Qualitative Methods. Simon Fraser University, June 27, 2013.

Boyd, S. (2012). *A history of Canadian drug policy, advocacy resistance*. BIBL 520: Solidarity, Resistance, and Liberation. Regent College, University of British Columbia. June 27, 2012.

Boyd, S. (2012). Guest Lecture: *A brief history of Canadian drug policy and activism*. NURS 350: Health and Healing: Promoting Community and societal health. School of Nursing. University of Victoria, March 20, 2012.

Boyd, S. (2012). Guest Lecture: *Representations of women in drug films*. WS 329: Gender and Substance Use. Department of Women's Studies.. University of Victoria, March 15, 2012.

Boyd, S. (2011). Guest Lecture. Sociology and Social Justice. SOC. 450. Department of Sociology, University of Victoria, March 17, 2011.

Boyd, S. (2010). Guest Lecture. Social Justice Movements. WS: 329. Gender and Substance Use. Department of Women's Studies, University of Victoria, November 18, 2010.

Boyd, S. (2010). A century of drug film representations of women. WS: 329. Gender and Substance Use. Department of Women's Studies, University of Victoria, March 25, 2010.

Boyd, S. (2010). Methodology and film analysis. Ethnography. Department of Sociology, Simon Fraser University, February 27, 2010.

Boyd, S. (2009). *A social justice movement in the DTES*, Sociology 450: Social Justice, Social Movements, University of Victoria, November 19, 2009.

Boyd, S. (2006). *Families and the Drug War*. UVSS Hempology 101 Club, University of Victoria, October 25, 2006.

Boyd, S. (2006). *Analyzing your data: Qualitative coding*. Workshop for HSD Graduate Students, University of Victoria, BC, March 2, 2006.

Boyd, S. (2006). *Collaborative Research with Women in Vancouver's Downtown Eastside*. Research Lecture Series, Vancouver Island Public Interest Group (VIPIRG), January 19, 2006.

Boyd, S. (2006). *Qualitative Methods*. Graduate seminar. Faculty of Law, University of Victoria, BC, January 25, 2006.

Boyd, S. (2005). *Qualitative Methods*. Graduate seminar. Faculty of Law, University of Victoria, BC, January 27, 2005.

Boyd, S. (2004). *Theory and Theorizing*. Advanced Theory Class Lecture, Studies in Policy & Practice, University of Victoria, BC, November 18, 2004.

Boyd, S. (2003). Guest Lecture, *Women's Reproductive Health* ANTH 390A. University of Victoria, BC: October 28, 2003.

TEACHING DUTIES and COMMITTEE SERVICE AT OTHER UNIVERSITIES

Saint Mary's University
1999-2000
CRIM 300: Classical Criminology Theory (sections A & B)
CRIM 314/SOC 389: Drug Issues: An investigation of race, class and gender
SOC 406: Directed Readings: Women and Law
CRIM 603: Directed Readings: Drugs and Crime
CRIM 301: Contemporary Criminological Theory (section A & B)
CRIM 320/SOC 345: Women, Law and the State
SOC 406: Women and Law
CRIM 606: Directed Readings: Women and Drugs
WS 605: Directed Readings: Women in Conflict/Law

Summer Session 2000
CRIM 314/SOC 389: Drug Issues: An investigation of race, class and gender

2000-2001
CRIM 300: Classical Criminological Theory (sections A & B)
CRIM 314/SOC 389: Drug Issues: An investigation of race, class and gender
CRIM 301: Contemporary Criminological Theory (sections A & B)
CRIM 320/SOC 345: Women, Law and the State
CRIM 407: Women in conflict with the law
CRIM 611: Directed Readings: Women, witches, and media
CRIM 503: Directed Readings: First Nations Women
WS 605: Directed Readings: Women in Conflict/Law

2001-2002
CRIM 300: Classical Criminological Theory (sections A & B)
CRIM 314/Soc 389: Drug Issues: An investigation of race, class and gender
CRIM 301: Contemporary Criminological Theory (sections A & B)
CRIM 407: Women in conflict with the law
CRIM 503: Directed Readings: First Nations Women
CRIM 611: Directed Readings: Women, witches and the media

CRIM 503: Directed Readings: Women and the Law
WS 605: Directed Readings: Women in Conflict/Law

Seminar series for Nova Prison for Women, Truro, NS, January to May 2002.
May 17, 2002: What do criminologists have to say about women in conflict with the law?
March 22, 2002: Welfare regulation of women
February 8, 2002: Sociological explanations of drug use

School of Criminology, Simon Fraser University
1995-97
CRIM 220: Research Methods in Criminology
CRIM 313: Drug Control in the Twentieth Century: An Investigation of Origins, Class, and Gender
CRIM 333: Women, Law and the State
CRIM 131: Introduction to the Canadian Criminal Justice System
CRIM 416: Women and Drugs: An Examination of Ideologies and Social Control
CRIM 100: Introduction to Criminology.

1999
CRIM 104: Sociological Explanations of Crime and Deviance
CRIM 332: Sociology of Law
CRIM 333: Women, Law and the State

Department of Women's Studies, Simon Fraser University
1997-98
WS 800: Methodology in Women's Studies Research
WS 302: Feminist Ethics
WS 400: Methodological Issues in Women's Studies
WS 301: Women and Drugs
WS 203: Female Roles in Contemporary Society
WS 301: Reproductive Autonomy
WS 824: Directed Readings: Reproductive Autonomy

Department of Sociology and Anthropology, Simon Fraser University
1997
SA 304: Social Control

Canadian International College, North Vancouver
1988-1991
Sociology and Writing
Ethnic Studies
Educational Psychology

Fraser Valley Childbirth Education Association
1986-1988
Developmental Psychology

Counselling the Culturally Different
Psychological Theory

ADMINISTRATIVE ACTIVITIES

University and Faculty Committees

2000-02	Speakers Committee, Saint Mary's University
2000-01	Chair, Selection Committee, Saint Mary's University
2000	Chair, Faculty Recruitment and Retention Committee
1999-00	Hiring Committee, Department of Sociology/Criminology, St. Mary's University
1988-91	Academic Advisory Committee; Evaluation Committee, Canadian International College

OTHER INFORMATION

Community and Professional Activities

1998-99 Keano Women's Healing Circle
St. James Church, Vancouver, BC
Outreach Worker

1992-97 Drug And Alcohol Meeting
Support For Women (DAMS), Vancouver
Counsellor, Life-skills Instructor, Outreach

1991-94 Vancouver Health Department,
Youth Clinic
Vancouver, BC
Counsellor

1992-93 Sponsor A Midwife, Conference Committee Member
Vancouver, BC

1985-87 Private Practice
Vancouver, BC
Counsellor

1985-87 Downtown Eastside Women's Centre
Vancouver, BC
Life-skills Instructor, Workshop Facilitator

1986-87 Women and Words
Vancouver, BC
Board Member

1980-81 Dunbar Information Centre
Vancouver, BC
Information and Referral

1979-80 McLain Park Teen Centre
Vancouver, BC
Outreach Worker

KILLER WEED

Marijuana Grow Ops, Media, and Justice

Killer Weed illustrates how and why marijuana grow ops have been portrayed by law enforcement and the media as a criminal activity of epic proportions and how their regulation is changing civil society, municipal authority, and the criminal justice system. In their study on which the book is based, Susan C. Boyd and Connie I. Carter collected and analysed more than 2500 newspaper articles published in national, provincial, and local newspapers in British Columbia from 1995 to 2009, focusing on the origins and impact of the discourse surrounding grow ops. The authors demonstrate that when it comes to marijuana cultivation the media frequently exhibit similar perspectives and draw on the same spokespeople, especially representatives from law enforcement.

Killer Weed also looks at civil responses to illegal drug production and sales. Boyd and Carter explore the intersections between criminal justice, civil society, and the regulation by insurance companies and public utilities of marijuana grow ops and the people who operate them. Through an examination of court challenges, reports, and legal and civil initiatives, the book contextualizes and supplements the coverage of marijuana grow ops offered by newspaper reporting. It concludes with a critical analysis of the current Canadian approach to the control of drugs in light of the contemporary global movement to legalize and regulate marijuana.

SUSAN C. BOYD is a professor in the Faculty of Human and Social Development at the University of Victoria.

CONNIE I. CARTER is a senior policy analyst for the Canadian Drug Policy Coalition.

SUSAN C. BOYD AND CONNIE I. CARTER

Killer Weed

Marijuana Grow Ops, Media, and Justice

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Contents

Tables and Figures

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This is Exhibit " C " referred to in the affidavit of Susan Boyd
sworn before me at Vancouver
in the Province of British Columbia
this 15th day of January 20 14
A Commissioner for taking Affidavits for British Columbia

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

Exhibits C1 – C6

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C1. "Crime in Canada" pp. 109-113

Crime in Canada

In contrast to media reports about the marijuana industry fuelling more crime and violence, in 2010, the overall crime rate fell in Canada, both in volume and severity of crime. In 2010, the crime rate reached its lowest level since the early 1970s. In 2012, the overall crime rate reached its lowest rate since 1972, a downward trend that has continued for over 40 years.[72] In 2010, British Columbia reported the largest decline in both the volume and severity of crime reported to the police, although there are regional variations; Kelowna saw an increase in violent crime in 2010 and Abbotsford-Mission experienced a decease.[73] However, the homicide rate in British Columba was at its lowest since the early 1960s, continuing a general decline in the province over the past 25 years, although again, there are regional variations.[74] In 2012, British Columbia

had a 16 per cent decrease in homicide from the year before.[75] Although the police believe that gang-related homicides have been rising since 1991, over the past decade, homicide rates in Canada were stable and there was a sharp decline in 2009, 2010, and 2012.[76] The incidence of homicides resulting from gang activity are not always assessed based on court evidence or closed cases; rather, incidents are classified as gang related when police "believe" the homicide to occur as a consequence of organized crime activities.[77] Nationwide, 17 per cent of all homicides were believed to be gang related in 2010.[78]

In Vancouver, BC, the homicide rate fell 42 per cent in 2010 from the year before.[79] The police believe that a third of the homicides in Vancouver in 2010 (12 out of 36) were gang related.[80] Statistics Canada reports that in 2010 the most common drugs identified in drug-related homicide were cocaine (51%) and cannabis (31%).[81] However, we found no scholarly research, aside from Statistics Canada, that examines the gang affiliations of individuals involved in homicides (from reporting to sentencing) in Canada. These homicides are most often unsolved, and there is little empirical evidence revealing what proportion of these homicides were, in fact, related to gang activity.[82] This is an area of scholarship that needs in-depth attention given that speculation about homicide and violent crime rates associated with the drug trade are routinely provided as proof by vocal claims makers and the media who purport that harsher criminal and civil interventions are required to curb the marijuana trade in Canada.

As the overall crime rate in Canada (including BC) declines, only drug offences have increased, a trend that began in the early 1990s. Yet, as noted earlier, marijuana possession arrests made up 52 per cent of all drug charges in 2010. Regardless of politicians' and law enforcement agency statements to the contrary, marijuana users continue to be the focus of police attention rather than high-level marijuana producers and traffickers.[83]

We are not disputing the fact that marijuana-growing operations exist in Canada, or that organized crime plays a part in this illegal enterprise, nor do we condone drug trade–related violence. Rather, we argue that the size of the illegal marijuana business is unknown, as is the rate of gang-related homicide, even to law enforcement agents. Claims reported by law enforcement agents and the media that the value of the underground marijuana industry is allegedly anywhere from $1 billion to $8 billion a year in British Columbia alone speak to uncertainty about the industry's real profits. In addition, police and media reports fail to represent the diversity of marijuana growers, highlighting mostly

those thought to be associated with organized crime, especially motorcycle gangs and racialized Asian criminal groups. In the introduction of this book, we drew from the scholarly research on marijuana grow ops to discuss the diversity of marijuana growers represented in these studies. For example, we noted that according to a 2005 paper funded by the RCMP in British Columbia, no firearms or other weapons and hazards were found at 89 per cent of the grow ops brought to the attention of police during the period under investigation, 1997 to 2003.[84] Rather than grow ops increasing in size and sophistication, as the authors claim, based on the data presented in their study, one could easily conclude that the number of small grow ops is increasing more than the number of large grow ops.[85] We also discuss, in the introduction and in this chapter, a 2011 Canadian Department of Justice[86] study examining court cases involving indoor marijuana grow ops and drug labs in British Columbia, Alberta, and Ontario between 1997 and 2005.[87] The authors of the Department of Justice study state that the literature on marijuana production claims that this activity is linked to organized crime. However, their findings do not support this claim. From their study sample of 530 cases, "only 5% had any indication that the offender was affiliated with organized crime or street gangs."[88]

Conclusion

Legal experts argue that the definition of an organized crime group in the Criminal Code of Canada is so broad that many people producing, buying, or selling drugs collectively to reduce costs or to better obtain criminalized drugs for personal use will be at risk of arrest, especially poor and marginalized people.[89] In Darcie Bennett and Scott Bernstein's 2013 study, *Throwing Away the Keys: The Human and Social Cost of Mandatory Minimum Sentencing*, many of the low-income illegal drug users in Vancouver and Victoria, BC, interviewed for their study, had "been involved in small-scale production" of marijuana in the past. They argue mandatory minimum penalties and tough on crime measures for marijuana production will impact poor, racialized, and marginalized people rather than higher-level producers (similar to mandatory minimum drug penalties in the US).[90]

Woodiwess asserts that the construction of organized crime as an alien and racialized entity has been vital to law enforcement in the United States and elsewhere; organized crime is also constructed as calculating and relentless in its search for "weak spots" and vulnerability

in the "armour" of the morality of the nation state; thus, vigorous policing and harsh laws are necessary to make the nation safe.[91] Yet, when examined more closely, it is evident that organized crime is a fluid and shifting enterprise with participants from every level of society and every ethnic background involved (including governments, banks, drug law enforcement agents and agencies) and the demand for drugs and the criminalized status of these drugs fuels organized crime and the illegal market.[92] Just as important, research findings, as well as journalistic and personal accounts, demonstrate that many people who buy, sell, and grow marijuana are not personally involved with or connected to criminal gangs or organized crime, but rather, marijuana use and buying is a normative activity given its popularity in Canada. Cultivation of marijuana is also a means to obtain the plant for personal use or to supplement income. Given the limited research studies to draw from, trying to determine what proportion of grow ops are the product of organized crime and what proportion are mom-and-pop organizations is nearly impossible. Such studies as are available do not support a major link with organized crime. Nevertheless, expanding police powers, law enforcement budgets, and harsh laws and civil bylaws in Canada are most often premised on the fear of male organized crime and the racialized Other, including white outlaw groups such as the Hells Angels, who are depicted as violent and as posing a threat to national and community security and supposedly threatening innocent and vulnerable citizens (especially youth) because of the encroachment of drug crime into suburban spaces.

US drug eradication programs in other countries such as Mexico, where toxic defoliants such as paraquat were used on marijuana fields in the 1970s, helped to fuel marijuana production at home. Consumers turned to safer domestically grown marijuana.[93] Still, the US 2010 National Drug Control Strategy, which outlines US drug policy, praises drug law enforcement agencies for their operations against marijuana cultivation in and outside of the country.[94] So does the 2012 *US International Narcotics Control Strategy Report*. The report praises Canada for introducing the Safe Streets and Communities Act, which includes mandatory minimum sentencing for a range of drug offences, including marijuana production.[95] Protecting the border from the drug threat is one of their top priorities in the US war on drugs. Mexico, Canada, and Latin America have long been viewed as threats to the United States because of perceived incompetence in regulating illegal drugs at home (see past and current publications of the US Office of National Drug

Control Policy and the US Bureau of International Narcotics and Law Enforcement Affairs). The construction of Canada (and other countries) as an unreliable drug source country with a one-sided porous border deflects attention away from the fact that the United States has a large illegal domestic marijuana-growing industry and drug trade, a seemingly insatiable appetite for illegal and legal drugs (including over-the-counter and prescription drugs), and the largest prison industry in the world – where many prisoners are serving time for drug offences.[96] The North American Congress on Latin America (NACLA) claims that, in the early 2000s, about one-third of marijuana consumed in the United States is grown at home; it also notes that marijuana production supports economically depressed communities.[97] Canadian newspapers in our study also say little about the incursion of US law enforcement agents on Canadian territory. They do not critique US agents working in Canada such as the DEA stationed in Canada or US police stopping cars in the interior of British Columbia.[98]

What remains striking over the 15-year span of our media project is the hyperbole and unsubstantiated claims about marijuana grow ops and organized crime expressed by a small group of spokespeople, mostly RCMP, police, and some government officials, and reported, for the most part, uncritically, by the print media. Taken at face value, the newspapers we analysed depict Vancouver, and British Columbia in general, as a war zone of racialized, violent, greedy, drug gangs vying for profits, endangering law-abiding citizens, and moving rapidly into suburban spaces. Drug-related crime is depicted in a number of articles as a natural outcome of greedy racialized gangs intent on destroying the fabric of the nation. Little critique of this dominant discourse is evident in media coverage. Yet, internationally and at home, a wealth of research points to prohibitionist drug policy and law-and-order initiatives as fuelling drug-related violence, organized crime, and the illegal market. Law-and-order prohibitionist policy has done little to stop illegal drug use, selling, and marijuana cultivation in Canada (or the United States). There is no empirical evidence demonstrating that harsh drug laws and penalties deter marijuana production or any other type of drug offence. Indeed, a growing body of scientific research reveals that drug prohibition and increases in drug law enforcement result in higher rates of drug market violence and fail to reduce the prevalence of drug use.[99] The rush to punish marijuana cultivators, as expressed by the media, claims makers, and vocal RCMP/police spokespeople in our sample, ignores this empirical fact.

72 Perreault, 2013, p. 3; Statistics Canada, 2013a.
73 Brennan & Dauvergne, 2011 , pp. 1, 5.
74 Ibid., p. 9.
75 Perreault, 2013, p. 14.
76 Brennan & Dauvergne, 2011, p. 8; Statistics Canada, 2013a.
77 Ibid.
78 Ibid., p. 1.
79 Mahony, 2011, p. 1.
80 Ibid., p. 24.
81 Ibid., p. 9.
82 Ibid., p. 10.
83 Brennan & Dauvergne, 2011 , p. 17.
84 Plecas et al., 2005 , p. 32.
85 Ibid., p. 42.
86 Solecki, Burnett, & Li, 2011 .
87 Ibid.
88 Ibid., p. 11.
89 Bennett & Bernstein, 2013, p. 4.
90 Ibid., p. v.
91 Woodiwess, 1993, p. 13.
92 Ibid., pp. 24, 25.
93 Bullington, 1993 , p. 41.
94 ONDCP, 2010 , 2011 .
95 US Department of State, 2012 .
96 Pew Center on the States, 2008 , 2009 .
97 NACLA, 2002 .
98 Criticism of Canadian drug policy by US spokespeople continually fails to acknowledge marijuana reform by US states and US domestic marijuana cultivation (as discussed above and in the introduction). Marijuana reform in 17 states has led to de facto decriminalization such as reduced penalties for fi rst time offenders and fi nes rather than prison sentences are the norm. In November 2012, Washington and Colorado legalized the possession of one ounce of cannabis for personal use and the setting of dispensaries for the sale of cannabis.
In addition, adults in Colorado can legally grow up to six plants in their home for personal use. As we write, 20 states and the District of Columbia have legal medical marijuana for qualifi ed patients, yet Canada is framed

by the United States as the culprit for allegedly being the source of highpotency marijuana, medical marijuana, for having weak laws, lenient judges, and porous borders. As disturbing as these unsubstantiated claims are, so is the readiness of Canadian politicians, the RCMP, and the media to leave them unchallenged.
Even though the media claims that the United States is troubled by Canadian drug policy, it is diffi cult to determine the extent to which US drug policy affects Canada, nor did we set out to answer this question in our study. Critics of US drug policy refer to the Americanization of international law, including the implementation of harsh prohibitionist drug law, throughout the world. US support and aid (including military aid) to other nations is linked to enacting US-style international law, including drug law, and economic and social policies. Ethan Nadelman notes, "Foreign governments have responded to US pressure, inducements, and examples by enacting new criminal laws, regarding drug traffi cking, money laundering, insider trading, and organized crime and by changing fi nancial and corporate secrecy laws as well as their codes of criminal procedure to better accommodate US requests for assistance." Since the war on terror following 9/11, US pressure increased.
However, Canada is not reliant on US aid, although the free fl ow of trade is always a concern with its more powerful southern neighbour. Since 2007, a growing number of critics point to the emulation of American-style failed drug policy by the federal Conservative government, including mandatory minimum sentencing for drug offences and prison building.

The DEA and US ambassadors, and other US politicians and pundits have applied pressure to Canadian offi cials. However, outside of public criticism printed in the media, we are not privy to private, off the record, conversations between government offi cials. However, Canadian scholars on US/Canadian relations note that historically there is no solid evidence that the threat of US retaliation has ever been realized nor is it a factor in shaping policy in Canada. (See Bow, 2009 ; Hale, 2012.)

US politicians and bureaucrats make unoffi cial statements to the press complaining about Canada's supposedly more liberal approach; more often than not these statements are intended for a US audience. We note that during our study period (and later) the RCMP and Canadian Border Control appear to be very open to US training and opportunities to work together as does the Conservative federal government led by Prime Minister Harper. However, we contend that US infl uence on Canadian drug policy is much less than some would suggest.

The media's and Canadian offi cials' fear of a negative US response to drug policy reform is often self-serving rather than real. During our

study period, in contrast to media reports, we saw no evidence that US/Canadian trade and relations have been negatively impacted by drug policy reform efforts in Canada. The establishment of the Canadian federal medical marijuana program and later in Vancouver, BC, the fi rst safer injection site, Insite, and the North American Opiate Medication Initiative (NAOMI), the fi rst contemporary heroin maintenance clinical trial, and expanded needle exchange, was not followed by a shift in trade relations. There are also many other examples of divergent Canadian policy, such as Canada's opposition to the Vietnam War and acceptance of US draft dodgers at that time and Prime Minister Chretien's refusal to join the US-led invasion of Iraq in 2003. Events in Canada and the United States are contingent on many factors including governing political parties and global and domestic infl uences. Since 2007, Canadian federal drug policy is more closely aligned with US federal policy.

Prime Minister Harper's law-and-order mandate appears to be more home grown than born out of US political pressure. Moreover, Canadian federal drug policy is in direct opposition to drug policy reform efforts in Canadian provinces, cities, and towns, as well as some US states.

99 Degenhardt et al., 2008 ; Room & Reuter, 2012 ; Werb et al., 2011 ; Wood et al., 2010 .

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C2. "Danger / Firearms" p. 32

In their 2005 paper, it is submitted that nine out of ten (89 per cent) of the grow ops brought to the attention of the police during the study period did not have firearms or other weapons or hazards.[142] Yet, in fact, only 6 per cent of founded cases included in the study were reported as having firearms on site, only slightly higher than the 5.5 per cent of the Canadian population overall who have valid firearms licences.[143]

142 Plecas et al., 2005 , p. 32.

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C3. "Risk of Fires / Booby Traps" p. 133-134

In our study sample, we found 156 news articles (6%) focusing primarily on fires and explosions related to marijuana grow ops. Often, Surrey's Fire Chief Len Garis or Darryl Plecas are quoted highlighting the risk of fire hazards in grow ops. Garis argues that residential grow ops present rampant fire hazards; this claim substantiates his assertion that fire departments should play a role in regulating residential cannabis cultivation. Drawing on the RCMP-commissioned research written

by Plecas et al.,[16] Garis suggests that grow ops are 24 times more likely to catch fire due to unsafe electrical practices such as electrical power bypasses and poor wiring associated with grow lights and other equipment.[17] These issues, Garis warns, have the potential to spill over into the lives of innocent others. Yet there is little evidence to substantiate Plecas' and Garis' claims about indoor marijuana grow ops and the increased risk of fire in British Columbia. The tables provided by Plecas et al. in their 2005 publication on BC fires do not provide sufficient evidence to back up this claim.[18] Data in the *Annual Statistical Fire Report: 2001–2003*, prepared by the Office of the Fire Commissioner, which include various statistics for all fires responded to in British Columbia for the years 2001, 2002, and 2003, suggest that the numbers are lower than those presented for the same years in the Plecas et al. 2005 report. For example, Plecas et al. state that the proportions of indoor grow operations resulting in fire were 3.5 per cent in 2001, 3.7 per cent in 2002, and 4.7 per cent in 2003; however, using the data found in the *Annual Statistical Fire Report*, the actual proportion of fires in British Columbia related to grow ops would be 1.21 per cent, 1.01 per cent, and 1.30 per cent, respectively. These contradictory statistics suggest that claims about the links between grow ops and fires may be exaggerated in the reports that routinely appear in newspaper stories.

Media reports also suggest that grow ops are booby-trapped, and as a result, the police officers who try to discover and eliminate these operations face terrible dangers from these operations. An article from 2001 states:

> Hazards increasingly faced by police and pot-patch intruders include: Shotguns poised to go off if a wire is disturbed; razor blades embedded in plant stalks; fishing hooks that dangle at face level from fine line; boards bristling with nails; and bear traps that will crush a human ankle. Then there's alarms, also trip-wired, and surveillance cameras that will trigger an usually armed response.[19]

Yet a study commissioned by the RCMP of the period in British Columbia between 1997 and 2003 found that only 2.1 per cent of marijuana grow ops contained hazards such as booby traps, explosives, or dangerous chemicals.[20]

16 Plecas, Malm, & Kinney, 2005, p. 33.
17 Ibid., p. 8.
18 Ibid., pp. 32–34.
19 "Booby traps at pot sites," 2001, p. A15.
20 Plecas, Malm, & Kinney, 2005 , p. 32.

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C4. "Mould" p. 184

Not surprisingly, reporters highlight the risk of mould and other health effects in grow ops and fail to mention poverty and lack of adequate housing for poor parents, especially in British Columbia. Federal and provincial cutbacks in social housing, provincial welfare cutbacks, and a low minimum wage negatively shape the lives of parents and children. British Columbia has the highest rate of child poverty in Canada. Inadequate housing and air-tight building envelopes, especially in rainy Vancouver, could be just as likely to contribute to the presence of mould, but no spokesperson has yet claimed that this is a risk to the health of poor children in these homes.

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C5. "Medical Cannabis" p. 161

The safety of personal legal cannabis production sites could be easily corrected by having better guidelines, education, and monitoring of these outdoor and indoor gardens. It seems quite hypocritical to focus on safety when Canadians throughout the country have unmonitored greenhouses and outdoor gardens for other produce. In addition, given the chemicals and pesticides used for industrial food production, the focus on legal cannabis growers seems misguided and influenced by a small and vocal group of critics, rather than by the needs and constitutional rights of critically and chronically ill Canadians who could benefit from the medical use of cannabis.

Health Canada's claims that medical marijuana production sites are associated with "criminal elements" and endanger the "safety of children" suggest that the changes to the MMAR are politically motivated. There is no comprehensive scholarly and peer-reviewed research to support claims that legal medical marijuana sites are linked to criminal elements or pose safety hazards to children (see chapter 6 for a fuller examination of this topic).[98] Significantly, long-time, leading compassion club experts (BC Compassion Club Society and Vancouver Island Compassion Society), note that non-violent, peaceful, mom-and-pop growers are the norm. In all of their collective years working with compassion clubs and marijuana growers, including those who supply the clubs, not one gun or violent encounter has occurred.[99]

Susan Boyd & Connie Carter (2014). Killer Weed: Marijuana grow ops, media, and justice. Toronto: University of Toronto Press.

C6. "Medical Marihuana and Organized Crime Claims" pp. 155-165

Medical Marijuana and Organized Crime Claims

Now that BC citizens are organizing against municipal bylaws, and court decisions are ruling in their favour, a variety of institutional actors including BC fire chiefs, the RCMP, politicians, and Health Canada are setting their sights on legal medical marijuana gardens. Spokespeople for these institutions refer to medical cannabis gardens as "grow sites" and "grow ops," the same terms used to describe illegal marijuana-cultivation operations. The 2009 RCMP report, *Illicit Drug Situation in Canada*, claims that the Marihuana (sic) Medical Access Regulations (MMAR) are susceptible to exploitation by drug-trafficking organizations (DTOs).[69] In January 2009, Surrey Fire Chief Len Garis, a leading proponent of police Green Teams and harsher sentencing for marijuana cultivation, proclaimed that legal medical marijuana grow ops are prone to bad wiring that leads to fires. He argued that the addresses of growers of legal medical marijuana should be made available to "fire and electrical inspectors, especially if they are located in residential areas." These institutional spokespeople are part of an emerging trend to represent legal marijuana gardens as a threat to the public health and safety of their communities.[70]

It has long been acknowledged that marijuana has medicinal qualities that provide relief for a number of serous illnesses such as chronic pain, glaucoma, AIDS-related symptoms, seizures from epilepsy, and arthritis.[71] Marijuana is also one of the oldest known drugs and was used for medicinal purposes for thousands of years; however, it was not until the mid-nineteenth century that Western doctors began to prescribe it to their patients and wrote about its healing qualities.[72] Modern companies like GW Pharmaceuticals have developed and patented cannabis-based medicines now available by prescription in Canada for the treatment of MS-related symptoms and chronic pain.[73] As mentioned earlier, Canada criminalized marijuana in 1922 with no parliamentary debate, and as a consequence, the plant was no longer legally available for medicinal or recreational use. It was not until the 1960s, when marijuana became popular among youth and the counter-culture movement that questions about its medicinal properties began to arise again. In the late 1980s, activists and people living with HIV/AIDs in San Francisco, California, opened the first medical marijuana dispensaries.[74] These initiatives provided patients suffering from HIV/AIDS with "a safe source" of marijuana.[75] In 1996, Proposition 215 was passed in California, and legal medical marijuana dispensaries were

opened throughout the state. Since then, a total of 20 US states (including California) and the District of Columbia have passed medical marijuana legislation, although, as discussed earlier, there has been an ongoing conflict between federal and state law in the United States. The US federal government and the DEA deny that cannabis has medical benefits and defy state law that has legalized medical marijuana; thus, legal medical marijuana users and suppliers are vulnerable to arrest by the DEA. However, in a groundbreaking statement in August 2013, the US Justice Department announced that it will allow states to implement their ballot initiatives to have legalized medical marijuana programs.

Like the early underground dispensaries in San Francisco, the compassion clubs in Canada provide holistic services and a safe supply of marijuana to registered patients.[76] Without a legal mandate, in 1997, Vancouver's BC Compassion Club Society (BCCCS) opened its doors. This club provides six to 12 strains of organic cannabis a day; its services also include a wellness centre providing acupuncture, counselling, nutritional advice, herbal medicine, massage therapy, and yoga at subsidized rates, including a sliding fee scale. Other compassion clubs and societies have opened in Canadian cities such as Toronto and Victoria.

Meanwhile, in response to an Ontario Court of Appeal's decision on the constitutional validity of prohibiting cannabis possession,[77] the Government of Canada initiated a medical marijuana program. However, it was not until 2001 that Health Canada created the Marihuana[78] Medical Access Division (formerly known as the Office of Cannabis Medical Access) to act as the governing body overseeing the implementation of the Marihuana Medical Access Regulations. It recognizes that marijuana is an appropriate medication for many symptoms associated with serious illnesses and that physicians are qualified to approve applications from patients for its use. However, authorized medical marijuana users did not have access to a legal supply of the plant – the growing and dispensing of marijuana for medical purposes remained illegal – and the wait time for approving applications was long. On 9 January 2003, an Ontario Supreme Court ruling stemming from a lawsuit initiated by medical marijuana users and suppliers "upheld the right for patients to have access to a safe, legal source of cannabis" and once again found the federal program unconstitutional for creating what provincial judge Lederman called the "illusion of access."[79] The court gave the government until 9 July of the same year to recommend a legal supplier for medical users authorized under the Marihuana Medical Access Regulations.[80] Following this case, Health Canada authorized

Prairie Plant Systems (PPS) to grow marijuana in Flin Flon, Manitoba. Federally authorized and registered medical marijuana patients could purchase the dried plant from PPS via mail order.

In 2006, the federal Medical Marihuana Access Program initiated regulations that permit medical marijuana users to grow small amounts of marijuana themselves for medicinal use.[81] In recognition that seriously ill people may not be able to grow their own marijuana and that many people live in apartments and urban dwellings that are not conducive to growing the plant, Health Canada has made licences available to designated growers for people who hold an authorization to possess medical marijuana. The application process for growers is onerous and complicated; the formula to determine how many plants and how much marijuana can be grown and stored is particularly complex.

In 2009, Health Canada reported that 2,822 people were licensed to cultivate their own marijuana for medical purposes, although they may not have been actively growing their own supply at that time. During this same period, 754 people were designated growers for medical marijuana patients. In 2012, 21,986 people held an authorization to possess dried marijuana under the MMAR in Canada, yet only 13 per cent of these people had accessed dried marijuana from the federal marijuana source, Prairie Plants Systems. Thus, we can speculate that more than 85 per cent of licensed medical marijuana users obtain their cannabis from the illegal market, community-based dispensaries, or produce or grow their own medicine.[82] Although federally registered medical marijuana users could legally apply to purchase the dried plant from Prairie Plants System, the cumbersome application process, ongoing quality and safety concerns, limited choice of strains, and lack of alternate methods of ingestion such as edibles and tinctures has discouraged users from purchasing the PPS cannabis product. Canada's compassion clubs, on the other hand, provide safe, affordable, and often organically cultivated marijuana from diverse strains and using various methods of ingestion (i.e., sprays and cookies for those who cannot tolerate smoking marijuana) to an estimated "11,000 critically and chronically ill Canadians."[83] Feedback from patients suggests that the quality of the marijuana offered at compassion clubs far exceeds the medical marijuana offered by the federal government. In addition, dispensaries have been involved with or have initiated community-based research projects on the use of medical cannabis that have both empowered patients through knowledge creation and informed the medical, scientific community and policy makers about the potential benefits of community-based access and medical cannabis use in general.[84]

Until recently, politicians and the media had little to say about legal medical marijuana-growing gardens. The Canadian population at large has been overwhelmingly supportive of legal medical marijuana programs.[85] In addition, the courts have ruled – numerous times – that safe, affordable, legal marijuana should be available to medical marijuana patients in Canada.[86]

Some municipalities have, nevertheless, begun to challenge the way that medical marijuana is regulated. In 2011, the mayors of the City of Langley and the Township of Langley, BC, wrote to federal Minister of Health Leona Aglukkaq to advocate for changes to federal medical marijuana policy. In their letter, the mayors contend that current individual licences to grow marijuana should be cancelled and that any "medicinal marijuana would in the future be dispensed through licensed pharmacies by doctor's prescriptions ... and that marijuana that is dispensed be grown at a government regulated facility."[87]

The mayors' claim that the size of legal medical marijuana grow ops and the number of plants grown is "out of control," and they assert it can result in "home invasions, and other criminal related activity." They claim that the residential homes where legal medical marijuana is grown place residents at risk and "may cause long term health risks."[88] They declare that neighbourhoods "have become unsafe, individual lives have been at risk"; thus, they argue, changes in regulation are required. Similar to news media claims about the risks associated with marijuana grow ops, both mayors fail to substantiate or provide evidence in their letter to the minister of health to support their claims (see Figure 5.6).

The mayor of Surrey, Dianne Watts, a leading proponent of civil bylaws to identify and fine "recreational" marijuana growers, forwarded a resolution to the Federation of Canadian Municipalities (FCM), in June 2011, asking Health Canada to require applicants for growing medical marijuana to first obtain municipal permits; this resolution was passed. The City of Surrey also endorsed a new bylaw requiring municipal permits for those growing or using medical marijuana. The bylaw states that medical marijuana can only be grown in agriculturally zoned areas.[89]

Not all mayors or city councillors, however, agree with the mayors of Langley and Surrey. In response to the Langley mayors' letter to the minister of health, Grand Forks, BC, City Councillor Joy Davies expressed her concerns about their call for changes in regulation. Joy Davies uses medical marijuana to help moderate chronic pain from fibromyalgia,

Figure 5.6. Headline Box: Medical Marijuana.[90]

HEADLINES: MEDICAL MARIJUANA

Medical pot farm busted: Plants destroyed as compassion club leaders met with Allan Rock (2001)

Homegrown: This grow-op is legal, but its time may be running out. New federal rules will restrict users of medical marijuana to one supplier, in a mine deep underground in Manitoba. Pot fans aren't happy (2001)

Ottawa to ease rules for medical marijuana (2005)

Medical pot grower challenges law (2006)

Victoria mayor offers support to medical pot users (2006)

Ottawa must loosen medical pot rules, lawyers argue (2007)

Legal marijuana alternatives to go up in smoke: Plans to make Health Canada only purveyor of medical pot discomfit "compassion clubs" (2007)

Feds try to spark change in pot laws: Medical-marijuana users forced to rely on the black market (2008)

Compassion club seeks expansion: Nanaimo group hopes to secure a downtown location to provide marijuana to medical users across the region (2008)

Scrutiny for medical marijuana sites: Council asks where legal pot is grown to ensure homes properly modified (2009)

BC's top fire chief wants to end pot secrecy: Municipalities need to play a role in regulating legal marijuana-growing operations in residential areas, head of Fire Chiefs Association says (2009)

Medical marijuana restrictions get thumbs-down: Federal laws governing supply are ruled unconstitutional (2009)

Court loosens restrictions on medical marijuana (2009)

and she has received a licence from Health Canada to grow medical marijuana. She says that the information provided in the letter by the Langley mayors is not accurate, and their faulty claims will only hurt vulnerable and sick medical marijuana users. She notes that cancelling licences for legally growing medical marijuana can have negative

consequences; people who need marijuana for medical purposes will not have safe and affordable access to the plant. Davies also does not believe that cancelling individual grow licences will deter crime.[91]

On 17 June 2011, Health Canada announced that it was considering improvements to the Medical Marihuana Access Program, and it launched the "Consultation of Proposed Improvements to the Marihuana Medical Access Program." Its website states that the proposed improvements are "in response to concerns heard from Canadians." Typical of news media claims, no evidence is provided to substantiate how many Canadians or what groups of people have "concerns" about the medical marijuana program.[92] The website includes a list of the concerns that support the government's call for changes in the program including "the risk of abuse and exploitation by criminal elements" and "public health and safety risks associated with the cultivation of marihuana plants in homes, including electrical and fire hazards and the presence of excess mould and poor air quality."[93] At the end of their list, Health Canada declares that "the proposed improvements would reduce the risk of abuse and exploitation by criminal elements and keep our children and communities safe."[94]

The proposed new medical cannabis access regulations were released for comment in late 2012. On 10 June 2013, citing public safety and security concerns about growing marijuana in homes, the minister of health released the new regulations that will govern access to cannabis for medical purposes in Canada.[95] The current regulations (MMAR) will be repealed on 31 March 2014. The new regulations, which come into effect on 1 April 2014, reflect some improvements in the programs – patients do not have to apply to Health Canada (nor fill out the lengthy and confusing application form) but can obtain permits to use medical cannabis from qualified prescribers including physicians and nurse practitioners. However, physicians and medical associations in Canada have made it clear that they are "resistant" to prescribing medicinal marijuana to their patients.[96] In addition, the effects of some of the claims making about marijuana cultivation are evident in these new rules. For example, the new regulations eliminate the personal licences (for individual and designated growers) to produce marijuana for medical purposes in homes. In addition, Health Canada will no longer produce or distribute marijuana. Instead, licensed commercial producers will dispense dried marijuana by courier.[97] This regulation also leaves medical cannabis dispensaries out of the distribution loop, sanctions

free-market production, and may limit patient access to specific strains of marijuana (and tinctures and edibles). The omission of medical cannabis dispensaries reflects the federal government's failure to recognize the expertise about medical cannabis use available through these dispensaries. The proposed regulations admit that the cost of medical cannabis will increase significantly. These cost increases will be another hardship for patients as medical cannabis is not covered by provincial drug programs unlike other substances used for medical purposes. By removing personal licences to grow marijuana, patients are vulnerable to market prices and may be denied access to strains of cannabis they have developed that work best to alleviate their symptoms.

The safety of personal legal cannabis production sites could be easily corrected by having better guidelines, education, and monitoring of these outdoor and indoor gardens. It seems quite hypocritical to focus on safety when Canadians throughout the country have unmonitored greenhouses and outdoor gardens for other produce. In addition, given the chemicals and pesticides used for industrial food production, the focus on legal cannabis growers seems misguided and influenced by a small and vocal group of critics, rather than by the needs and constitutional rights of critically and chronically ill Canadians who could benefit from the medical use of cannabis.

Health Canada's claims that medical marijuana production sites are associated with "criminal elements" and endanger the "safety of children" suggest that the changes to the MMAR are politically motivated. There is no comprehensive scholarly and peer-reviewed research to support claims that legal medical marijuana sites are linked to criminal elements or pose safety hazards to children (see chapter 6 for a fuller examination of this topic).[98] Significantly, long-time, leading compassion club experts (BC Compassion Club Society and Vancouver Island Compassion Society), note that non-violent, peaceful, mom-and-pop growers are the norm. In all of their collective years working with compassion clubs and marijuana growers, including those who supply the clubs, not one gun or violent encounter has occurred.[99] The Canadian Association of Medical Cannabis Dispensers (CAMCD), a non-profit organization that supports the establishment of "legally permitted community-based medical cannabis dispensaries providing access to a wide range of high quality cannabis medicines to those in need and regulated in a manner consistent with the highest standard of patient care," also makes clear that compassion clubs are sites that

value compassion, harm reduction services, empowerment, dignity, affordability, and integrity.[100]

A series of policy moves including some of the changes to the MMAR, the present federal Conservative government's National Anti-Drug Strategy, and its resistance to moving forward on the recommendations laid out in the *Report of the Senate Special Committee on Illegal Drugs* suggest that claims makers such as the police/RCMP are, again, the key players shaping drug policy in Canada. This is a disappointment given the growing body of science and social science research that recognizes marijuana as beneficial for the relief of symptoms from many serious diseases.[101]

Conclusion

Despite efforts by residents in Surrey and Mission, British Columbia, to resist the regulation of marijuana cultivation by local governments, newspaper coverage has created a persistent and resilient framework for understanding the dangers of grow ops. Newspaper coverage has effectively shaped perceptions that all grow ops are spaces where criminality is linked with specific public safety risks that bring issues like fire, mould, and other property damage to unsuspecting safe neighbourhoods and innocent home buyers. It has, in turn, naturalized the involvement of a new set of experts – fire departments, as well as real estate and insurance company representatives, who define the problem of grow ops. This coverage has drawn on police, fire department, and other institutional spokespeople such as BC Hydro to make the link between generalized threats to public safety and grow ops. Initiatives such as Surrey's Electrical Fire and Safety Initiative draw on municipal bylaws to compel city residents suspected (but not proven) of operating grow ops to undergo (and pay for) electrical inspections under the auspices of municipal bylaws. The implementation of these initiatives, as well as bylaws to force landlords to keep tabs on their rental properties, have been supported by the efforts of key claims makers. By focusing on public safety in relation to marijuana grow ops, local municipalities have been able to bypass foundational legal safeguards and principles related to issues like the presumption of innocence and warrantless entry.

The implementation of municipal initiatives and bylaws to curtail marijuana grow ops widens the net of surveillance and regulation of

what is normally defined as criminal justice regulation. This widening net of surveillance and regulation includes the increased identification and punishment of individuals, homes, businesses, and any space suspected of housing marijuana grow ops or selling equipment for cultivation. As described above, multi-agency initiatives to identify, regulate, and curtail marijuana grow ops include police/RCMP, BC Hydro, fire departments, and electrical inspectors. This multitude of institutional players work with and overlap with traditional criminal justice in their quest to manage marijuana grow ops and, of course, the people suspected of being responsible for these operations. Municipal councils may feel "emboldened" to enact bylaws to restrict marijuana grow operations given that these institutional players officially advocate for them publicly in and outside of British Columbia with little regard for individuals' Charter rights.[102]

Ultimately, it is people, not grow ops that carry the regulatory brunt of these new municipal initiatives. As the Mission residents make clear in their class action lawsuit, they were expected to pay the price of having their home inspected, regardless of whether or not a grow op was found. Significantly, residents assert that marijuana grow ops are rarely found and that PSIT inspections and the bylaws to regulate them are unconstitutional and unlawful. Mould, moisture damage, potted soil, covered windows, electrical modifications, etc. are all treated as violations of the Controlled Substances Property Bylaw and as evidence of a marijuana grow op. The criteria are so broad that any home in British Columbia could easily be viewed as having "evidence" of a marijuana grow op. Regardless of these facts, the inspections continue in many BC municipalities, and reports from vocal spokespeople that hail the success of inspection teams do not reveal how broad the criteria for evidence are, nor how suspect the inspections are.[103] These programs pose serious questions about the public accountability of such multipartner initiatives, as well as the de facto extension of the enforcement of Canada's Criminal Code to municipalities, including fire departments. At the same time, these municipal programs represent a trend towards the proliferation of enforcement strategies aimed at the production of cannabis. For example, in March 2012, Alberta Specialized Law Enforcement Training (ASLET) with the Calgary Police Service and City of Calgary (Building Regulations) hosted a three-day "War on Grow Ops Conference" in Banff, Alberta. Conference sessions included topics such as theft of power; fire cases; drug-endangered

children; authorities, permits, laws; medical marijuana; civil forfeiture; and real estate.

Inspection teams, RCMP, and BC Hydro who search for evidence of grow ops, also create and distribute tip sheets to encourage individual residents to spy on their neighbours and become police informants. In this new world, we all become complicit, then, in spying, informing, regulating, and ultimately, punishing individuals suspected of participating in an activity that is deemed a public safety risk to otherwise innocent neighbours – growing marijuana. Yet the number of individual people who have suffered through inspections because they were suspected of cultivating marijuana is growing, and until the recent class action lawsuit in Mission, their voices were rendered inaudible. These bylaws and other municipal and private initiatives target individual homeowners and operate outside the normal legal frameworks and checks and balances of criminal justice and the Charter (innocent until proven guilty, warrants to enter homes). Residents suspect that they are being targeted by inspection teams and that "imaginary grow ops" are driving municipalities to enact bylaws that fill their pockets as they collect inspection fees. It is difficult to understand how cities can contravene Charter rights and damage the reputations of homeowners and the value of their homes without recourse. The role of the media, law enforcement agents, and vocal spokespeople in shaping negative discourse about marijuana grow ops cannot be ignored.

It is debatable whether or not these municipal bylaws would have been enacted and implemented if the media had not already informed Canadians repeatedly, over many years, that grow ops are the domain of organized crime and a threat to public safety. The residents targeted by the municipalities were already viewed with prejudice. The Mission class action lawsuit counters the proliferation of misinformation produced by the media, city councils, police, and vocal spokespeople about marijuana grow ops. In this sense, a counter-discourse is emerging and challenging civil initiatives in British Columbia.

Recent amendments to the Controlled Drugs and Substances Act under the Safe Streets and Communities Act passed into law in 2012. The Act increases the maximum penalty for marijuana production from 7 to 14 years and establishes new mandatory minimum penalties to a range of drug offences. The production of more than five marijuana plants warrants a 6-month mandatory minimum sentence. Legal critics note that broadly defined aggravating factors such as growing marijuana

in a rental property (or on property other than one's own) is more "likely to adversely affect poor people" who rent rather than own their homes.[104] Evidence that these claims about public safety have been effective are reflected by the addition of "potential public safety hazards in a residential area" as an aggravating factor in the revised CDSA.

69 RCMP, 2009 .
70 Garis, 2009 ; Health Canada, 2011b , 2011c ; RCMP, 2009 .
71 Grinspoon & Bakalar, 1997 ; Nolan & Kenny, 2003, pp. 93--94.
72 Grinspoon & Bakalar, 1997.
73 See http://www.gwpharm.com/Sativex.aspx , retrieved 23 May 2012.
74 See Fine (2012) for a detailed journalistic account of legal medicinal cannabis cultivators in Mendocino County, California.
75 Lucas, 2008 ; Belle-Isle & Hathaway, 2007 .
76 Belle-Isle & Hathaway, 2007 ; Hathaway & Rossiter, 2007 ; Lucas, 2008 , 2009 , 2010 .
77 See: *R.* v. *Parker* , 2000.
78 Marihuana is the legal spelling in Canada.
79 Lucas, 2009 , p. 297.
80 *Hitzig* v. *The Queen* , 2003; Lucas, 2009 .
81 See Department of Justice, 2011b .
82 See *Canada Gazette* , 2012 .
83 Lucas, 2008 , 2009 .
84 Lucas, 2010 ; Reiman, 2008 , 2009 .
85 Angus Reid Public Opinion, 2010 ; Capler, 2006 ; Lucas, 2008 .
86 See *R.* v. *Parker* , 2000; *R.* v. *Hitzig et al.* , 2003; *Sfetkopoulos* v. *Canada* , 2008; *R.* v. *Mernagh* , 2011; *R.* v. *Wakeford* , 1999.
87 Fassbender & Green, 2011 .
88 Ibid.
89 Diakiw, 2011 .
90 Coleboum, 2001, p. A2; Curtis, 2001 , p. A1; Greenaway, 2005 , p. A4; Tibbetts, 2006 , p. A8; Shaw, 2006 , p. A2; Babbage, 2007 , p. A9; Knox, 2007 , p. A3; Kari, 2008 , p. A26; Walker, 2008 , p. B7; Sinoski, 2009 , p. A3; Bellet, 2009 , p. A8; Mulgrew, 3 Feb. 2009, p. A2; "Court loosens restrictions on," 2008, p. A6.
91 Yu, 2011 .
92 Health Canada, 2011c .
93 Ibid.
94 Ibid.
95 Health Canada (10 June 2013), "Harper Government Announces New Medical Marijuana Regulations," retrieved 12 June 2013 from http:// www.hc-sc.gc.ca/ahc-asc/media/nr-cp/_2013/2013-79-eng.php .
96 See Belle-Isle, Walsh, Callaway et al., 2013.
97 *Canada Gazette* , 2012 .
98 See Solecki, Burnett, & Li, 2010; Moller, Koren, Karaskov, & Garcia-Bournissen, 2011.
99 Personal communication, Philippe Lucas (past director of VICs), Rielle Capler (policy analyst and research coordinator, Vancouver Compassion Club), 9 and 10 Nov. 2011.
100 See Canadian Association of Medical Cannabis Dispensaries, 2011 .
101 Grinspoon & Bakalar, 1997 ; Nolan & Kenny, 2003, pp. 93--4. For further discussion of MAAR and the benefi ts of medical marijuana, see Belle-Isle & Hathaway, 2007 ; Hathaway & Rossiter, 2007 ; Lucas, 2008 , 2009 , 2010 .
102 See Bernstein & Bennett, 2013, p. 5, for a discussion of municipal bylaws that restrict harm reduction and methadone services.
103 See Garis, Plecas, Cohen, & McCormick, 2009 , p. 6.
104 Bennett & Bernstein, 2013, p. 6

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF DAVID W. PATE

I, DAVID W. PATE, Ph.D., M.Sc., of 280 – 1857 West 4th Avenue, Vancouver, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am currently the Director, Canadian Advanced Studies Institute Ltd. in Vancouver, British Columbia and now produced and marked as Exhibit "A" to this my affidavit is a copy of my Curriculum Vitae which sets out that I graduated in 1974 with a Bachelor of Arts degree in science, with a major in Biology and a minor in Chemistry from Webster University in St. Louis, Missouri in 1974 and then a Masters of Science degree in Biology, from the University of Missouri – St. Louis at St. Louis, Missouri in 1979. I have also obtained a Doctor of Philosophy degree in Pharmaceutical Chemistry from the University of Kuopio, Finland in 1999. My CV also sets out my other education and training as well as professional appointments, research grants and memberships and scientific societies as well as my research interests and other academic and

professional activities past and present. A significant amount of my research and experience has been in relation to the medicinal use of cannabis (marihuana).

2. Now produced and marked as Exhibit "B" to this my affidavit is a list of my publications as of July 15th, 2011 showing the various topics I have researched and studied and again indicating significant research in relation to cannabis (marihuana).

3. I appeared and was qualified as an expert in botany and pharmacology in the Supreme Court of British Columba in the case of ***R. v. Owen Edward SMITH (2012 BCSC 544)*** before the Honourable Mr. Justice Johnson in which the court ruled on April 13th, 2012 that on the evidence there had been a violation of liberty and security rights of the medical marihuana users protected by s.7 of the ***Canadian Charter of Rights and Freedoms*** and remedied the breach by deleting the word "dried" wherever it appeared in the ***Marihuana Medical Access Regulations.*** As a consequence the definition of "dried marihuana" became superfluous and was also deleted from those Regulations, leaving in place the balance of the Regulations but removing what the Court described as an artificial restriction on the lawful use of marihuana to its dried form. Now produced and marked as Exhibit "C" to this my affidavit are the Reasons for Judgment in *R. v. Smith* and I refer in particular to paragraphs 125-129 and 131.

4. I am informed by counsel for Mr. Smith, Mr. Kirk Tousaw, and verily believe it to be true, that the Federal Crown (Government of Canada) appealed that decision and that the matter was heard before the British Columbia Court of Appeal on December 6th, 2013 and judgment has been reserved.

5. Now produced and marked as Exhibit "D" to this my affidavit is a copy of the Expert Report that I prepared and that was filed in the *Smith (supra)* proceedings in the Supreme Court of British Columbia. That report sets out my background, history and experience and the focus of my work and expertise in relation to the cannabis plant and I hereby depose to the same information contained therein as my evidence in this affidavit and verily believe the contents of that report to be true.

6. I am informed by counsel for Mr. Smith, Mr. Kirk Tousaw, that my evidence as an expert was accepted by the BC Supreme Court and in particular by Mr. Justice Johnson and that in coming to his decision he accepted my evidence as follows as set out at paragraph [45] of his reasons for judgement:

- The active compounds of the cannabis plant are manufactured in cells at the reservoir base of, and stored in, structures called glandular trichomes.
- These glandular trichomes contain resin, and it is in the resin where the plant secretes THC and CBD.
- From the perspective of either a medicinal or recreational marihuana user, it is the contents of the glandular trichomes that are important.
- There is no known medical utility to the plant matter that is left behind after the glandular trichomes, or their contents, are separated from the host cannabis plant, or in the glandular trichomes themselves after the resin is extracted from them.
- There are different mechanisms for getting the therapeutic components, whether THC or CBD into the body, and Dr. Pate [the defence expert] described each.
- One can ingest the compound orally: if one were taking THC for gastro-intestinal conditions such as Crohn's disease or Irritable Bowel Syndrome this would arguably deliver the therapeutic benefit more directly to the site of pathology.
- Oral ingestion also has the benefit of prolonging the effects of the drug in the system, with the corresponding detriment of taking longer to build a therapeutic level of the drug than would occur with smoking, for example
- Because of the slow build-up of the drug in the body, dosages are more difficult to manage, as it takes some time to determine when the optimum therapeutic level has been reached.
- Because orally ingested THC or CBD stays in the system longer, it would be better for someone with a chronic condition of pain or glaucoma, where some level of therapeutic dosage would remain while the patient slept.
- Smoking achieves a far quicker benefit, as the drug enters the body through the lungs and is dispersed rapidly.
- The level of THC in the body also declines much more quickly with smoke than with orally ingested THC.

- Smoking would be a better way to take a therapeutic dose in case of a sharp increase in pain or discomfort.
- Smoking also has harmful side effects associated with inhaling smoke which although less deleterious than tobacco smoke, may pose risks to the health nonetheless.
- A fourth application or ingestion method would be to spray a solution containing the active compound under the tongue, called trans-mucosal. Its advantages include faster assimilation of the drug, like smoking, without the risks associated with smoking.
- The cannabis marihuana plant and its active compounds are unlikely to cause physical harm in themselves, unlike other drug compounds where taking too much can lead to death.

7. I understand that the Government of Canada in the Marihuana for Medical Purposes Regulations *(MMPR),* and by amendments to the Narcotic Control Regulations *(NCR)* is limiting possession and distribution of cannabis (marihuana) to its "dried form" and therefore again precluding the use of this substance in less harmful and more effective ways through the use of it in forms other than "dried" such as in its natural form as a green plant or extracts such as oils and tinctures and concentrates.

8. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

I. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

II. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and

related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

III. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the *MMAR* after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at ~~the City of San Francisco~~ Alameda, the State of California, USA, this 16th day of January, 2014

_____
A Commissioner for Taking Affidavits in and for the State of California, USA

David W. Pate
DAVID W. PATE

State of California, County of Alameda
Subscribed and sworn to (or affirmed) before me on this 16th day of Jan., 2013
by David Pate
proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

Olin Rust, Notary Public

OLIN E. RUST
COMM. # 2040563
NOTARY PUBLIC - CALIFORNIA
ALAMEDA COUNTY
MY COMM. EXP. SEP. 7, 2017

This is Exhibit "A" referred to in the affidavit of David Pate sworn before me at Alameda this 16th day of Jan 2014
Olin Rust Notary Public
A Commissioner for taking Affidavits for British Columbia.

David W. Pate

CURRICULUM VITAE

David W. Pate PhD, MSc
280-1857 West 4th Ave.
Vancouver, BC V6J 1M4

Current Position: Director
Canadian Advanced Studies Institute Ltd.
DWPateCASIL@yahoo.com

OLIN E. RUST
COMM.# 2040563
NOTARY PUBLIC-CALIFORNIA
ALAMEDA COUNTY
MY COMM. EXP. SEP. 7, 2017

Education and Training:

1999	Doctor of Philosophy degree in Pharmaceutical Chemistry, University of Kuopio, Finland. Nominated by the Faculty of Pharmacy as author of the "Best Dissertation on Campus" for 1999. Dissertation defense opposition provided by Raphael Mechoulam.
1981-83	Participated in Pharmacognosy (Natural Products Chemistry) Program, University of Mississippi, University, MS. Awarded a University Non-Service Fellowship (1981-82) and a Teaching Assistantship (1982-83).
1979-81	Assisted curation of the H.H. Rusby collection of economic plants and completed courses under Richard Evans Schultes at the Harvard Botanical Museum, Cambridge, MA.
1979	Master of Science degree in Biology, University of Missouri-St. Louis, St. Louis, MO. Awarded a Teaching Assistantship (1976-78).
1974	Bachelor of Arts degree in Science, Biology major/Chemistry minor, Webster College, St. Louis, MO.
1972-73	Attended Harris-Stowe State College, St. Louis, MO.
1972	Associate of Arts degree in Liberal Arts, St. Louis Community College-Forest Park, St. Louis, MO.

Professional Appointments:

2006-09	Adjunct Professor, Southern Cross University, Lismore NSW, Australia
1992-01	Senior Technical Officer, HortaPharm B.V., Amsterdam, The Netherlands
1986-92	Staff Research Associate II, University of California-San Francisco
1985-86	Research Associate, University of Missouri-St. Louis
1983-85	Laboratory Supervisor, Rust College, Holly Springs, MS

Research Grants: US NIH grant co-author, 1985 ($207,000)

Memberships in Scientific Societies, Past and Present:

Canadian Consortium for the Investigation of Cannabinoids

International Association for Cannabis as Medicine

International Cannabinoid Research Society

International Hemp Association

Research Interests:

Pharmaceutical Chemistry
- Ophthalmic endocannabinoids
- Glaucoma pathophysiology
- Cyclodextrin technology
- Prodrug strategies

Biological Sciences
- Nutritional value of hemp seed
- Medicinal use of marijuana
- Chemical ecology of *Cannabis*

Other Academic and Professional Activities, Past and Present:

Co-founder and Board Secretary of the International Hemp Association

Co-editor of the Journal of the International Hemp Association

Author of US FDA Drug Master File (IND 43,542) for medical *Cannabis*

Principal author of first license application granted by the Dutch government for commercial development of medical *Cannabis*

Referee for the American Chemical Society Journal of Agricultural Chemistry

Member of the Board of Advisors for the Journal of Cannabis Therapeutics, and the International Association for Cannabis as Medicine (IACM) and its journal "Cannabinoids"

Special Advisor on hemp to Ecofibre Industries (Australia)

HortaPharm technical liaison to GW Pharmaceuticals (UK) and Macfarlan-Smith (UK)

Member of Board of Scientific Advisors for GW Pharmaceuticals (UK)

Consultant to Cannasat Therapeutics (Canada) and member of their Board of Scientific Advisors

Cannabis Defense Expert Witness recognized before the Supreme Court and Provincial Courts of British Columbia, Canada

Invited speaker, and provided adjunct scientific counsel, to the US Institute of Medicine/National Academy of Sciences medical marijuana study - Marijuana and Medicine: Assessing the Science Base, J.E. Joy, S.J. Watson Jr. and J.A. Bensen Jr., Eds., National Academy Press, Washington D.C., 1999

Coined the term "phytocannabinoid" now used commonly in scientific parlance. J.M. McPartland, G. Guy. The evolution of *Cannabis* and coevolution with the cannabinoid receptor – a hypothesis. *In*: The Medicinal Use of Cannabis, G. Guy, R. Robson, K. Strong, B. Whittle, Eds. pp. 71-102. Royal Society of Pharmacists, London, 2004.

Member of international scientific committee submitting a report to Alan Rock, Canadian Federal Minister of Health, in support of his decision to legalize hemp foods, 2001 ("THC in Hemp Foods and Cosmetics: The Appropriate Risk Assessment") http://www.hempreport.com/response/response_january_2001.doc

Contributor to Medical Botany, 2nd Edition, W.H. Lewis and M.P.F. Elvin-Lewis, Wiley-Interscience, New York, 2003

Co-editor of policy discussion paper by the Health Officers Council of British Columbia, 2005 ("A Public Health Approach to Drug Control in Canada") http://www.cfdp.ca/bchoc.pdf

This is Exhibit "B" referred to in the affidavit of David Pate sworn before me at Alameda this 16th day of Jan 2014
Oli Rust (Notary Public)
A Commissioner for taking Affidavits for British Columbia

OLIN E. RUST
COMM.# 2040563
NOTARY PUBLIC-CALIFORNIA
ALAMEDA COUNTY
MY COMM. EXP. SEP. 7, 2017

October 15, 2013

David W. Pate

LIST OF PUBLICATIONS

I. ORIGINAL PUBLICATIONS: 1a. Primary Research

1. Juntunen, Juha, Juhani Huuskonen, Krista Laine, Ricku Niemi, Hannu Taipale, Tapio Nevalainen, David W. Pate, and Tomi Järvinen. Anandamide prodrugs 1. Water-soluble phosphate esters of arachidonylethanolamide and *R*-methanandamide. *European Journal of Pharmaceutical Sciences* 19: 37-43 (2003).

2. Laine, Krista, Kristiina Järvinen, David W. Pate, Arto Urtti and Tomi Järvinen. Effect of the enzyme inhibitor, phenylmethylsulfonyl fluoride, on the IOP profiles of topical anandamides. *Investigative Ophthalmology and Visual Science* 43 (2): 393-397 (2002).

3. Laine, Krista, Tomi Järvinen, Juha Savinainen, Jarmo T. Laitinen, David W. Pate and Kristiina Järvinen. Effects of topical anandamide uptake inhibitors, AM404 and olvanil, on intraocular pressure in normotensive rabbits. *Pharmaceutical Research* 18 (4): 494-499 (2001).

4. Jarho, Pekka, David W. Pate, Rudolf Brenneisen and Tomi Järvinen. Hydroxypropyl-*beta*-cyclodextrin and its combination with hydroxylpropyl-methylcellulose increases aqueous solubility of *delta*^{9}-tetrahydrocannabinol. *Life Sciences* 63 (26): PL381-384, 1998.

5. Pate, David W., Kristiina Järvinen, Arto Urtti, Vaidyanath Mahadevan, Tomi Järvinen. Effect of the CB1 receptor antagonist, SR 141716A, on cannabinoid-induced ocular hypotension in normotensive rabbits. *Life Sciences* 63 (24): 2181-2188 (1998).

6. Pate, David W., Kristiina Järvinen, Arto Urtti, Vaidyanath Mahadevan, Tomi Järvinen. Effects of topical *alpha*-substituted anandamides on intraocular pressure in normotensive rabbits. *Pharmaceutical Research* 14: 1738-1743 (1997).

7. Callaway, J.C., T. Tennilä and D.W. Pate. Occurrence of "*omega*-3" stearidonic acid (*cis*-6,9,12,15-octadecatetraenoic acid) in hemp (*Cannabis sativa* L.) seed. *Journal of the International Hemp Association* 3 (2): 61-63 (1996).

8. Jarho, Pekka, Arto Urtti, David W. Pate, Pekka Suhonen and Tomi Järvinen. Increase in aqueous solubility, stability and *in vitro* corneal permiability of anandamide by hydroxypropyl-*beta*-cyclodextrin. *International Journal of Pharmaceutics* 137: 209-216 (1996).

9. Pate, David W., Kristiina Järvinen, Arto Urtti, Pekka Jarho, Mette Fich, Vaidyanath Mahadevan and Tomi Järvinen. Effects of topical anandamides on intraocular pressure in normotensive rabbits. *Life Sciences* 58 (21): 1849-1860 (1996).

10. Jarho, Pekka, Arto Urtti, Kristiina Järvinen, David W. Pate and Tomi Järvinen. Hydroxypropyl-*beta*-cyclodextrin increases aqueous solubility and stability of anandamide. *Life Sciences* 58 (10): PL181-185 (1996).

11. Pate, David W., Kristiina Järvinen, Arto Urtti, Pekka Jarho and Tomi Järvinen. Ophthalmic arachidonylethanolamide decreases intraocular pressure in normotensive rabbits. *Current Eye Research* 14 (9): 791-797 (1995).

12. Laster, B.H., S.B. Kahl, D.W. Pate, E.A. Popenoe and R.G. Fairchild. Biological efficacy of boronated low density lipoproteins (LDL) for neutron capture therapy (NCT) as measured in cell culture. *Cancer Research* 51: 4588-4593 (1991).

13. Cashman, John R., John Proudfoot, David W. Pate and Thomas Högberg. Stereoselective *N*-oxygenation of zimeldine and homozimeldine by the flavin-containing mono-oxygenase. *Drug Metabolism and Disposition* 16 (4): 616-622 (1988).

14. Pate, David W. and John E. Averett. The flavonoids of *Datura*. *Biochemical Systematics and Ecology* 14 (6): 647-649 (1986).

15. Pate, David W. Possible role of ultraviolet radiation in evolution of *Cannabis* chemotypes. *Economic Botany* 37 (4): 396-405 (1983).

1b. Critical Reviews

16 Järvinen,Tomi, David W. Pate and Krista Laine. Cannabinoids in the treatment of glaucoma. *Pharmacology & Therapeutics* 95: 203-220 (2002).

17. Deferne, Jean-Luc and David W. Pate. Hemp seed oil: A source of valuable essential fatty acids. *Journal of the International Hemp Association* 3 (1): 1, 4-7 (1996).

18. Pate, David W. Guide to the scientific literature on potential medical uses of *Cannabis* and the cannabinoids. *Journal of the International Hemp Association* 2 (2): 74-76 (1995).

19. Pate, David W. Chemical ecology of *Cannabis*. *Journal of the International Hemp Association* 1 (2): 29, 32-37 (1994).

20. Clarke, Robert C. and David W. Pate. Medical marijuana. *Journal of the International Hemp Association* 1 (1): 9-12 (1994).

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IN THE SUPREME COURT OF BRITISH COLUMBIA

Citation: *R. v. Smith*,
2012 BCSC 544

Date: 20120413
Docket: 149345-2
Registry: Victoria

This is Exhibit "C" referred to in the affidavit of David Pate sworn before me at Alameda this 16th day of Jan 2014
Olin Rust, Notary Public
a Commissioner for taking Affidavits
David W. Pate

Regina

v.

Owen Edward Smith

Before: The Honourable Mr. Justice Johnston

OLIN E. RUST
COMM. # 2040563
NOTARY PUBLIC - CALIFORNIA
ALAMEDA COUNTY
MY COMM. EXP. SEP. 7, 2017

Reasons for Judgment

On *Voir Dire*

Counsel for the Public Prosecution Service of Canada:	P.A. Eccles and K. Guest
Counsel for the Accused:	K.I. Tousaw
Place and Date of Trial:	Victoria, B.C. January 16-20, 23-26, 2012; February 1, 6-8, 27-29, 2012; March 1, 2012
Place and Date of Judgment:	Victoria, B.C. April 13, 2012

[1] This is a challenge to the medical marihuana regime developed in response to court decisions starting with *R. v. Parker* (2000), 49 O.R. (3d) 481, 146 C.C.C. (3d) 193 (C.A.).

[2] The accused Owen Smith is charged that on December 3, 2009, he possessed one of the forms of tetrahydrocannabinol ("THC") prohibited by the *Controlled Drugs and Substances Act*, S.C. 1996, c. 19 ("*Act*"), for the purpose of trafficking, and that on the same day he possessed cannabis (marihuana).

[3] For the purposes of a *voir dire*, the accused admits that, as he was separating THC from cannabis marihuana, baking it into cookies, putting THC-infused oil into capsules, and making a variety of other products that contained THC, so that his employer could sell them, he had in his possession THC for the purposes of distribution. He also admits to possession of dried marihuana.

[4] On this *voir dire*, the accused says that the government's responses to court rulings since *Parker* have not only been inadequate, but have been close to contemptuous of orders and directions of the court, and the appropriate remedy for this would be a judicial stay of proceedings.

[5] He argues as well that the *Act* and the *Marihuana Medical Access Regulations*, SOR/2001/227 ("*MMAR*"), as amended from time to time up to his arrest, cannot constitutionally prohibit his rendering of dried cannabis plant material into oils and other substances infused with the active ingredients of the cannabis plant, particularly THC, for medical purposes. To the extent that the *Act*'s provisions and the *MMAR*'s provisions attempt to do so, the accused says that they infringe on his right to life, liberty and security of the person under the *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act*, 1982, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c. 11, s. 7 ("*Charter*"), as well as those rights of others. He seeks a declaration from Part VII of the *Constitution Act*, 1982, c. 11, s. 52(1), that, to the extent that the provisions are inconsistent with the *Charter*, s. 7,

in limiting lawful possession of marihuana for medical purposes to possession in the form of dried cannabis, those provisions are of no force or effect.

[6] In context, the accused was employed at what seems to be a form of compassion club, to render marihuana plants in such a way as to separate the active ingredients from the plant itself, and to infuse those active ingredients into a variety of edible and other products for sale through the club.

[7] These issues were canvassed on a *voir dire* heard before a jury was empanelled for the trial.

Legal Background

[8] Schedule II of the *Act* lists "cannabis, its preparations, derivatives and similar synthetic preparations," including those listed in nine sub-paragraphs. Possession of any of the listed substances is a hybrid offence under s. 4 of the *Act*, punishable by up to five years if proceedings are by indictment, and to a fine of up to $1,000 and/or imprisonment for up to six months for a first offence, and a fine up to $2,000 and/or to one year in jail for a subsequent offence if proceedings are summary. Possession of any of the substances listed in Schedule II for the purpose of trafficking is an offence under s. 5, with punishment up to imprisonment.

[9] In July 2000, the Ontario Court of Appeal released its decision in *Parker*. Mr. Parker had been investigated and charged twice: the first time he was charged with cultivation under the *Narcotic Control Act*, R.S.C. 1985, c. N-1, and the second time with possession under the *Act*, the former having been replaced by the latter between the two charges. The Court ruled that the former prohibition against cultivation of marihuana set out in the *Narcotic Control Act* was unconstitutional as it infringed the rights under the *Charter* of an accused who had shown a need for marihuana to control his epilepsy. The Court declared the possession offence -- which the new *Controlled Drugs and Substances Act*, s. 4, continued -- was invalid as it applied to marihuana, and the Court suspended the effect of its declaration for one year. It granted an exemption from the marihuana prohibitions in s. 4 to the

respondent Mr. Parker during the period of suspension in order to permit him to possess marihuana for his medical needs.

[10] *Parker* arose from facts which established that Mr. Parker had epilepsy, that he required marihuana because marihuana, taken with drugs prescribed by his doctors, helped to control seizures which, if not controlled, could at minimum harm his health and at worst, end his life.

[11] In its reasons, the Court of Appeal agreed with the trial judge that marihuana had medicinal value, at least as to the THC component, and perhaps as to other components.

[12] At the end of the period of suspension, the Government of Canada promulgated the *MMAR*. In its first iteration, the *MMAR* established a regulatory scheme by which someone could apply for an Authorization To Possess marihuana. An applicant needed support of one physician if the need were based on a terminal illness, one specialist if it were based on a listed condition and associated with a terminal condition, and two specialists if the need were based on another medical condition.

[13] The first *MMAR* made no provision for access to marihuana by those who were granted an Authorization To Possess.

[14] There were further challenges, both to the *Act*, when it replaced the *Narcotic Control Act* in 1996, and to the *MMAR*. The successful challenges prompted amendments to the *MMAR*, including provisions that permitted holders of an Authorization To Possess to obtain authorizations that would permit them to produce the marihuana they were authorized to possess. As well, third parties could obtain authorizations to supply marihuana to those with an Authorization To Possess.

[15] Although this is an admittedly rough summary, it is fair to say that after the first major change brought about by *Parker*, subsequent changes in the law have been incremental.

[16] The developments since *Parker* have led the accused here to assert that government response to various court declarations has been inadequate or, worse, obstructive. Some of those developments have led counsel for the Crown to suggest that some court decisions have strayed into the legislative or policy sphere, traditionally and constitutionally the area where Parliament is supreme.

Facts

[17] Commendably, counsel agreed on admissions for the purpose of this *voir dire* only. These include:

1. On December 3, 2009, Cst. Peter Gill of the Victoria Police Department attended to an apartment building at #205 — 865 View Street, Victoria, British Columbia, in response to a complaint from the manager of that building that he (the manager) had received complaints of a strong offensive "skunky" odour coming from Apartment 204 ("the apartment") and wafting throughout the building.

2. Constables Gill and Sark arrived at the apartment building at about 3:00 p.m. and attended to the door to the apartment. Constable Gill could hear loud music coming from the apartment, as well as smell baking. Constable Gill knocked on the door to the apartment, announced himself, and then entered into a brief discussion with Mr. Smith, who initially declined to open the door to the apartment. After a further brief conversation Mr. Smith opened the door to the apartment. Mr. Smith was alone in the apartment.

3. Constable Gill produced his police identification to Mr. Smith and stepped into the apartment, a small bachelor suite of approximately 400 square feet, with a small bathroom as the only room with a door in the suite. Constable Gill immediately noted a strong odour of baking within the suite, which was quite warm, and that it appeared as if the suite was being used solely as a bakery. There was nothing in the

suite indicative of anyone actually residing in it — no couch, no bed, no television, no clothing nor personal articles.

4. Directly beside Mr. Smith, just inside the doorway to the apartment, in plain view, was a small table with a plastic baggy containing approximately one gram of what Cst. Gill believed to be marihuana, along with another gram of the same substance beside the baggy along with scissors that appeared to have marihuana residue on them.

5. Constable Gill arrested Mr. Smith for possession of the marihuana he had seen in plain view, then called for assistance to deal with the balance of the various items in the apartment.

6. A search warrant for the apartment was obtained and executed later that day, into the early morning hours of the next. The police seized from the apartment the forty-eight items set out on the four page Exhibit Flow Chart. It is admitted that this Exhibit Flow Chart accurately sets out the description of the exhibit seized, where it was located, who located it, and continuity of it after seizure. The Exhibit Flow Chart is admitted for the truth of its contents. There is no issue as to the continuity of any exhibits. Continuity is admitted, as is the nature of all substances.

7. The police videotaped their entry of the apartment under the search warrant, and videotaped the apartment itself as it was originally found. This videotape is admitted.

8. The quantities of marihuana derivatives that were seized from the apartment were possessed for the purposes of trafficking.

9. For the purpose of the *voir dire* only, Mr. Smith admits all elements of Counts One and Two.

[18] The accused is employed by Leon Edward (Ted) Smith, to whom he is not related, to process dried marihuana into a number of different products, including cookies, oil-filled capsules, and other edible and non-edible products.

[19] The accused works full-time for Mr. Ted Smith, and earns somewhere between $10 and $13 per hour.

[20] Mr. Ted Smith operates an enterprise called the Cannabis Buyers Club of Canada ("Club").

[21] Although there is a society involved somehow, it appears that the Club is a sole proprietorship wholly owned by Mr. Ted Smith.

[22] The Club admits to membership those who can satisfy Mr. Ted Smith, or those he delegates to screen applicants for membership, that they suffer from a permanent physical disability or disease.

[23] The applicant must produce satisfactory evidence of such a condition, which could be in the form of a document from a physician, a cancer test result, a laboratory test result, or, in some cases, evidence of a prescription for medications recognized by Mr. Ted Smith as being ordinarily prescribed for permanent physical disability or disease.

[24] This distinguishes Mr. Ted Smith's Club from Compassion Clubs with which he is familiar. He understands that Compassion Clubs require a form or certificate signed by a doctor before they will admit someone to membership, and turn away applicants who cannot obtain a doctor's signature.

[25] Mr. Ted Smith's Club is available to those who can persuade him of their need, but who cannot obtain written support for medical marihuana use from a doctor.

[26] An applicant who cannot provide sufficient documentary evidence of permanent physical disability or disease is turned away.

[27] Mr. Ted Smith will not accept as sufficient for membership evidence emanating from naturopathic physicians, chiropractors, or doctors of Chinese medicine.

[28] Mr. Ted Smith will not accept an applicant who has a mental health disorder.

[29] Mr. Ted Smith estimated that the Club has between 3,700 to 4,000 members, and perhaps 5% to 10% of those hold a valid Authorization To Possess dried marihuana issued by Health Canada under the *MMAR*.

[30] Club rules are relatively simple, and include a proscription against reselling or giving away products purchased from the Club, and a warning about operating heavy equipment or driving after consuming Club products.

[31] Mr. Ted Smith says he has taken away 500 to 600 memberships over the years because members have resold or given away cannabis products obtained from the Club.

[32] Mr. Ted Smith buys marihuana in pound quantities, and pays employees, like the accused Mr. Smith, to render between 5% and 10% of the dried marihuana into other forms like cookies, oils, capsules and ointments. The bulk of the dried marihuana is packaged and sold through the store openly operated by the Club in downtown Victoria.

[33] The Club operates its store under a non-profit society formed by Mr. Ted Smith, and while the society maintains minimal records, neither the Club nor the store keeps records.

[34] Mr. Ted Smith estimates that the store generates revenue of about $6,000 to $6,500 per day. He estimates that between 5% and 10% of that volume represents edible and other products, not dried marihuana, and says this proportion is closer to the 5% lower end. Mr. Ted Smith aims for a profit margin of between 20% and 25%.

[35] Neither the store nor the Club collects or remits HST, nor does the business pay income taxes.

Scientific and Regulatory Evidence

Expert Evidence

[36] The accused relied on the evidence of Dr. David Pate, who was qualified as an expert in botany and pharmacology.

[37] The Crown called Dr. Hanan Abramovici, who was qualified as an expert in pharmacology and neuroscience, and Mr. Eric Ormsby, a manager at Health Canada. All three swore affidavits instead of producing written reports or opinions, in an apparent fusion of the documents referred to in s. 657.3 of the *Criminal Code*, R.S.C. 1985, c. C-46. There were no objections to this procedure.

[38] Dr. Pate and Dr. Abramovici, while well-meaning and honest, strayed from objective opinion into advocacy, and each appeared at times argumentative when testifying.

[39] Dr. Abramovici's criticism of Dr. Pate for making assertions with little scientific support is well taken, although lack of science surrounding cannabis marihuana can be partly explained by governmental and public attitudes toward the plant and its products.

[40] Dr. Abramovici lapsed into some of the same reliance on anecdotal evidence for which he criticized Dr. Pate: for example, at the end of para. 23 of his affidavit, he speculates that the number of people injured in accidents arising from solvent-based extractions is probably underestimated as some reported delaying medical treatment because of fear of prosecution.

[41] Dr. Pate seemed a bit too willing to accept some benefits of cannabis products as possible, based on his common sense or extrapolation from other evidence.

[42] Dr. Abramovici swore to an affidavit that contained, in its final four paragraphs, an argument in the form of conclusions that was inserted by his supervisor, Dr. Desjardins. Although Dr. Abramovici swore that he agreed with the

contents of these paragraphs, his supervisor's input was not readily apparent, and her willingness to interfere in his opinions is troubling.

[43] The way in which Dr. Pate gave some of his evidence suggested that he was both amused and frustrated by government attitudes toward cannabis marihuana and its components, given its pervasiveness in both the underground economy and its growing acceptance as medicine. This has lessened the weight I put on Dr. Pate's evidence.

[44] The way in which Dr. Abramovici gave some of his evidence suggested that he was only too aware that Health Canada was his employer. While I accept his assurance that his opinions were his, and not dictated to him by his employer, the interference by Dr. Desjardins, coupled with the tone of Dr. Abramovici's affidavit and his oral evidence, have lessened the weight I put on his evidence.

Dr. Pate's Evidence

[45] From Dr. Pate's evidence I accept:

- The active compounds of the cannabis plant are manufactured in cells at the base of, and stored in, structures called glandular trichomes.
- The main active compounds are primarily tetrahydrocannabinol ("THC") and cannabidiol ("CBD").
- Generally speaking, the concentration of glandular trichomes increases as one moves higher up the cannabis plant, with fewer glandular trichomes near the root, and many near the top.
- Viewed microscopically, the glandular trichomes appear to be stalk rising from the plant surface with a globular top. Dr. Pate accurately analogized this structure to a golf ball on a tee.
- These glandular trichomes contain resin, and it is in the resin where the plant secretes THC and CBD.

- The highest concentration of glandular trichomes is found on or near the outer surface of unfertilized female flowers.

- From the perspective of either a medicinal or recreational marihuana user, it is the contents of the glandular trichomes that are important.

- There are various methods for separating the glandular trichomes from the plant itself: one can agitate dried flowers from the marihuana plant over a fine mesh or screen, causing the glandular trichomes to fall off and pass through the mesh, leaving the host plant material behind; one can immerse the plant material in cold water, then strain the water through a fine mesh to capture the glandular trichomes.

- Both these methods remove the glandular trichomes intact, with the resin still contained inside.

- If the results of these methods of extraction are compressed, it is often referred to as "hash" if the dry sieve method is used, or "bubble hash" if it is wet sieved. If it is not compressed, but left in dry powdered form, it is often referred to – erroneously according to Dr. Pate – as "kif" or "pollen."

- Other methods extract the resin from the glandular trichomes: one might rub the flowers in their hands, then scrape the resin off the hand; one could soak either the trichome-bearing plant, or just separated trichomes themselves, in fat such as butter or food-grade oil, as the contents of glandular trichomes are fat soluble. The same applies to alcohol, as the glandular trichome contents are also alcohol soluble.

- The results of fat-based extraction methods are often referred to as "cannabis cooking oil" or "cannabis butter."

- Other methods involve using petrochemical solvents such as petroleum ether to take up the resin from the glandular trichome, then evaporating off

the solvent. The results of the solvent-based extraction method is often called "hash oil."

- These methods result in separation of THC, CBD, and other potentially active ingredients called terpenes from the plant matter.

- There is no known medical utility to the plant matter that is left behind after the glandular trichomes, or their contents, are separated from the host cannabis plant, or in the glandular trichomes themselves after the resin is extracted from them.

- A caveat on that statement is the possibility that there may be some cannabinoid inside a leaf, not as readily accessible or as easily rendered as the glandular trichomes on the leaf surface.

- If the glandular trichomes containing the active compounds are not separated from the cannabis plant, a user can access the active compounds by smoking dried plant material with the glandular trichomes still attached.

- Release of the active compounds does not require heat as high as that produced by smoking, and an alternative way of inhaling the active compounds is through a vaporizer, which releases the active compounds at a lower temperature than smoking. Vaporizers cost approximately $500.00.

- The medical benefits from THC include anti-inflammatory and anti-spasmodic effects, increasing appetite in those whose appetites are suppressed by medical treatments such as are administered to AIDS patients, and alleviation of nausea in those taking chemotherapy for cancers.

- The well-known non-medical effect of THC is its psychoactive effects, an unwanted side effect from a medical point of view, a primary benefit from a recreational user's point of view.

- CBD has some anti-inflammatory benefits, including some analgesic effects.

- There may be some potential anti-psychotic benefit from CBD in high doses, but that has not yet been fully studied.

- The glandular head of the trichome also is known to contain terpenes.

- Terpenes are compounds commonly associated with aromas, for example pine or mint.

- CBD also has some potential to inhibit the metabolism of THC by the liver, thus reducing the body's ability to intercept and eliminate the medical benefit of THC.

- There are different mechanisms for getting the therapeutic components, whether THC or CBD into the body, and Dr. Pate described each.

- One can ingest the compound orally: if one were taking THC for gastro-intestinal conditions such as Crohn's disease or Irritable Bowel Syndrome this would arguably deliver the therapeutic benefit more directly to the site of pathology.

- Oral ingestion also has the benefit of prolonging the effects of the drug in the system, with the corresponding detriment of taking longer to build a therapeutic level of the drug than would occur with smoking, for example.

- Because of the slow build-up of the drug in the body, dosages are more difficult to manage, as it takes some time to determine when the optimum therapeutic level has been reached.

- Because orally ingested THC or CBD stays in the system longer, it would be better for someone with a chronic condition of pain or glaucoma, where some level of therapeutic dosage would remain while the patient slept.

- Smoking achieves a far quicker benefit, as the drug enters the body through the lungs and is dispersed rapidly.

- The level of THC in the body also declines much more quickly with smoked marihuana than with orally ingested THC.

- Smoking would be a better way to take a therapeutic dose in case of a sharp increase in pain or discomfort.

- Smoking also has harmful side effects associated with inhaling smoke which, although less deleterious than tobacco smoke, pose risks to health nonetheless.

- A fourth application or ingestion method would be to spray a solution containing the active compound under the tongue, called trans-mucosal. Its advantages include faster assimilation of the drug, like smoking, without the risks associated with smoking.

- There are some cannabis, or similar, products that have gone through the clinical trial process and become available.

- One is Sativex, an extract of the cannabis marihuana plant that contains THC and CBD in equal proportions, taken as an oral spray.

- Another is Marinol, a synthetic THC in a sesame oil capsule.

- Another is Navalone, similar to Marinol.

- There remains a risk that a cannabis compound mixed with another drug, like an opioid or alcohol, can have worse results than either drug alone, and as well, the risk that the psychoactive effects of THC can adversely

affect judgment, perception and reaction in those operating automobiles or dangerous machinery.

- Some research is being conducted on cannabis products, but a few clinical trials are needed to bring cannabis products to market.
- However one takes the active compounds in cannabis marihuana, it is unlikely that one will suffer any long lasting harm from an overdose.
- There is some potential for terpenes to have a role in the efficacy of cannabinoids, but this also needs much more research.
- The cannabis marihuana plant and its active compounds are unlikely to cause physical harm in themselves, unlike other drug compounds where taking too much can lead to death.
- It is not possible to tell by looking what the contents of a cookie might be, or what concentration of THC a capsule of oil might contain.

Dr. Abramovici's Evidence

[46] In spite of Dr. Abramovici's doubts about the reliability of evidence of its medical benefits, I infer that the efficacy of marihuana and its therapeutic components in the treatment or management of some medical conditions has been established by custom and usage, but that the precise basis for the efficacy or success is masked to some extent by the belief set or faith with which many medical users have approached their use, and has been made more difficult to achieve or to measure by the historical proscriptions against marihuana use.

[47] Dr. Abramovici pointed out problems that might arise from the lack of quality control or standards being applied or enforced in the underground or illegal marihuana market.

[48] Dr. Abramovici was responsible for updating the Health Canada publication *Information for Health Care Professionals*, which deals with cannabis marihuana.

The front page of this document bears a sub-heading "Marihuana (marijuana, cannabis) dried plant for administration by ingestion or other means Psychoactive agent."

[49] The bottom of the front page bears this warning: "Marihuana (marijuana, cannabis) is not an approved therapeutic substance in Canada and no marihuana product has been issued a notice of compliance by Health Canada authorizing sale in Canada".

[50] The document itself is a compilation of peer-reviewed literature and published materials assembled by Dr. Abramovici.

[51] In the portion of the document that deals with the chemistry of cannabis marihuana, it states at s. 1.2: "Marihuana smoke contains many of the same carcinogenic chemicals found in tobacco smoke." The section goes on to compare in a general way the relative potential harms from smoking marihuana as opposed to tobacco, without arriving at a conclusion.

[52] Later, in s. 8.1, the document reaffirms the carcinogenic aspects of smoked marihuana, but says that the epidemiological link between marihuana use and cancer is inconclusive.

[53] At s. 8.2, the document reads:

> Mucosal biopsy specimens taken from chronic marihuana smoker who reported only smoking marihuana showed a number of histopathic changes including basal cell hyperplasia, stratification, goblet cell hyperplasia, cell disorganization, inflammation, basement membrane thickening, and squamous cell metaplasia.
>
> ...
>
> Heavy chronic cannabis smokers presented with symptoms of bronchitis, including wheezing, production of phlegm and chronic cough and long-term cannabis smoking may be a risk factor for chronic obstructive pulmonary disease.

[54] The first section was not translated during the *voir dire*; Dr. Abramovici did say it described negative findings in the lungs of chronic marihuana smokers, and

those negative findings could be minimized by not smoking or reducing smoking. The second section makes clear some of the harmful effects of heavy chronic cannabis smoking.

Mr. Ormsby's Evidence

[55] Mr. Ormsby provided testimony by affidavit.

[56] He described the process by which a drug can become approved for marketing in Canada under the *Food and Drugs Act*, R.S.C. 1985, c. F-27, and the *Food and Drug Regulations*, C.R.C., c. 870.

[57] The rigors of the current regulatory regime can be explained in part as a response to the experience with Thalidomide in the mid-1960's. There, a drug used to treat nausea in pregnant women caused severe and lasting side effects in their infant children.

[58] Drugs derived from or based on plants are taken through the *Food and Drugs Act* processes under the *Natural Health Products Regulations*, SOR/2003-196. Cannabis products are excluded from this process by the combined operation of the definition of "natural health product," their inclusion in Schedule II of the *Controlled Drugs and Substances Act,* and their consequent exclusion through Schedule 2 of the *Natural Health Products Regulations*.

[59] Marihuana produced under contract to Her Majesty the Queen in Right of Canada or under a designated-person production licence as defined in the *MMAR* is exempt from the application of the *Food and Drugs Act* and the *Food and Drug Regulations* by the *Marihuana Exemption (Food and Drugs Act) Regulations*, SOR/2003-261.

[60] If the ingredients of a substance offered as a medicine are not fully identified, or if the quantities of any ingredients that have been identified are not known, there are risks that include over-dosing and under-dosing, complications arising from

combining the effects of cannabis marihuana with prescribed or other drugs, and risks of contamination or adulteration in the unregulated production process.

[61] There is an obvious difference between those who produce their products in an industry that is tightly regulated, such as the pharmaceutical drug industry, and unregulated producers such as the Club: with the former, there will be standards of production and inspection that ensures consistency of content, predictability of results of use, and greater assurance that contaminants will be eliminated or prevented in the manufacturing process; by contrast, in a bakery such as operated by the Club and staffed by the accused, the cannabis marihuana plants used can only be subjected to visual inspection for contaminants, the processes for rendering active compounds out of the cannabis plant are unsophisticated and unregulated, and the active compounds contained in the foods, oils, and topical products are not capable of precise measurement.

[62] Anecdotal reports of the efficacy of cannabis products in the treatment or management of various diseases and conditions should be approached with some caution: there is the possibility that someone will report experiencing results they have been led to expect, or for which they hoped, from taking a substance -- the so-called placebo effect.

[63] Whether a substance actually achieves the desired result can best be determined through double-blind clinical trials, and that is an expensive and time-consuming process.

[64] Topical administration of the drug, by applying it directly to the site of skin infections, or to inflamed joints, is controversial. The controversy arises in part because, according to the Health Canada document *Information for Health Care Professionals,* prepared by Dr. Abramovici, THC is hydrophobic, meaning that it does not go through water well, and water is a large component of human skin. Dr. Pate and Dr. Abramovici disagreed about the effectiveness of applying cannabis products to the skin.

[65] It is a fair summary to say that the steps required to obtain approvals necessary to market a new drug, or to make new claims for an existing drug, can be very lengthy and expensive.

[66] It is also a fair inference from Mr. Ormsby's evidence that the approval processes are designed with a manufacturing process in mind, where there will be a manufacturing site or sites, where quality can be controlled, and which will be amenable to inspection, supervision and control by regulatory authorities.

[67] The evidence of Dr. Abramovici and Mr. Ormsby sets out various bases for concern on the part of the regulators if a substance with unknown ingredients, variable potency of its psychoactive component, poorly researched therapeutic benefits, and unknown provenance were to be widely available and touted as a medical treatment. It is convenient to classify these concerns as ones of quality control.

Crown and Defence Positions

[68] The Crown also argued that some of the claims made by the Club recipe book support the argument in favour of sustaining the current regulatory scheme. It is convenient to label these as misleading advertising questions.

[69] The recipe book makes claims such as:

> Cannabis can be used to replace almost any type of allopathic medicine, from diuretics to anti-depressants – ear oil; throat sprays and salves that reduce tumors;
>
> Gayle's Super Treats are medicinal biscuits for dogs. Veterinarians have watched tumors disappear, arthritis reverse, and heard chronic cough go away;
>
> To heal broken bones, keep a Cannapatch in place for 10 days to 3 weeks (changing every couple of days);
>
> Tumors of all types (including breast and fibroids) have been reduced with the use of cannabis.

[70] Crown, in argument, likened these claims to a sales pitch for snake oil. Crown enlisted these implausible claims to show the risks posed by any loosening of the

current restrictions on lawful possession of cannabis, and thus to support Crown's argument in aid of continuing strict control on medical marihuana.

[71] In oral argument, counsel for the Crown maintained that the public needs protection from claims such as those suggesting that a marihuana poultice could heal a broken bone. Yet that argument pays too little attention to the apparent fact that government has elected to keep marihuana beyond the reach of its various agencies set up to protect the public from false or overblown claims, such as through the *Natural Health Products Regulation,* for example, or perhaps the *Canada Consumer Product Safety Act*, S.C. 2010, c. 21.

[72] The Crown argued strenuously that the risk of diversion of derivative substances such as THC-infused oils was unacceptably high when compared to their unproven benefits, and, as well, great care had to be taken when contemplating a declaration that might appear to open the way for the dangerous processes of solvent-based extraction.

[73] The current licensing scheme, which restricts authorized medical users to dried marihuana, or that limits the number of plants a licensed producer may grow, allows police or regulators to easily ascertain whether a medical possessor or producer is exceeding the limits of their respective authorizations, thus limiting the chances that some of the product ostensibly might be diverted into the illegal distribution network.

The Issue

[74] This *voir dire* does not turn on whether the requirement that a doctor approve of medical marihuana use ("physician as gatekeeper") offends the *Charter.*

[75] Nor is it necessary for the purposes of this *voir dire* to decide whether there is a threshold level of medical need that must be established to invoke the protection of the *Charter.* Two of the four witnesses, Ms. Quin and Ms. Herman, who testified as members of the Club who obtain products other than dried marihuana, have been issued Authorizations To Possess by Health Canada, and a third, Ms. Arthurs,

applied months ago with the support of her doctor, and is waiting the Authorization To Possess that will probably be issued to her. The fourth, Ms. Large, has been refused by her previous doctor, who retired, and by her present doctor.

[76] Instead, what is at issue here is the requirement imposed by Health Canada through s. 2 of the *MMAR* that those to whom an Authorization To Possess has been issued can lawfully possess their marihuana in dried form only.

[77] If and when Ms. Quin, Ms. Herman, or Ms. Arthurs render the dried marihuana in their lawful possession into another form, such as by infusing it into cooking oil or by separating the glandular trichomes from the dried plant material and mixing those trichomes into tea, they would be subject to prosecution because they would have lost the protection that an Authorization To Possess applies to dried marihuana. Likewise, Mr. Smith is liable to conviction for the offence of possessing THC for the purposes of trafficking if he changes dried marihuana by rendering it into oil, butter, salves, etc., for someone with an Authorization To Possess, whether commercially or gratuitously.

The Law

[78] It is illegal in Canada to possess, produce, or distribute marihuana.

[79] That is a policy choice made by the Government of Canada in exercise of a constitutional right.

[80] *R. v. Malmo-Levine*, [2003] 3 S.C.R. 571, has confirmed that the prohibition against recreational use of marihuana is constitutionally sound.

[81] I find on the evidence before me that marihuana has some medicinal benefits. That finding is not really necessary: Health Canada has acknowledged this by issuing Authorizations To Possess to Ms. Quin and Ms. Herman, and the opening comments by the Ontario Court of Appeal in *Parker* should put the matter beyond question in any event.

[82] *Parker* involved a charge each of cultivation and possession of marihuana. The accused put evidence before the trial judge that his epilepsy was life-threatening, that marihuana improved his health, and that the statutory scheme of the time put a blanket prohibition on cultivation and possession of marihuana that made him liable to prosecution and imprisonment. The Ontario Court of Appeal agreed that a blanket prohibition against possession that exposes someone to criminal prosecution for using marihuana as a medical treatment is constitutionally invalid (paras. 152-153).

[83] A regulatory scheme that would permit someone to possess marihuana for medical purposes but forces a medical user to obtain their marihuana from an illegal source (street or other level trafficker), or which prohibits compensation for an authorized producer is constitutionally invalid (*Hitzig v. Canada* (2003), 171 C.C.C. (3d) 18).

[84] A regulatory scheme that arbitrarily restricts the number of authorized users for whom a producer can produce marihuana is constitutionally invalid (*R. v. Beren and Swallow*, 2009 BCSC 429; *Sfetkopoulos v. Canada (Attorney General)*, 2008 FC 33, affirmed 2008 FCA 328; leave to appeal denied, [2008] S.C.C.A. No. 531).

[85] A regulatory scheme that requires physician approval of marihuana for medical use is constitutionally valid (*Beren*).

[86] A regulatory scheme that requires a physician to approve the use of marihuana for it to become authorized is constitutionally invalid, if physicians as a group refuse to participate in the approval process (*R. v. Mernagh*, 2011 ONSC 2121).

[87] In more general terms, s. 7 of the *Charter* requires two stages of analysis. The first level of inquiry is whether one of the protected interests -- life, liberty or security of the person -- is engaged, or sufficiently put at risk, by the state action in question (*Ref. re Motor Vehicle Act (British Columbia), s. 94(2)*, [1985] S.C.R. 486). If the applicant passes the first stage, the second level of inquiry asks whether the

state's engagement of the protected right nonetheless complies with the principles of fundamental justice. If it does not comply, then the state action infringes the s. 7 right.

[88] The Crown concedes the first level of the s. 7 inquiry: the *MMAR* as currently drafted engages the liberty interests of at least the witnesses Quin and Herman, and will engage Ms. Arthurs' when she receives her Authorization To Possess. As well, these women's liberty interests are affected by the fact that their right to choose how to take medication they are authorized to possess is a decision of fundamental personal importance such as described in *Parker*, para. 92. Finally, the accused's risk of punishment up to imprisonment also takes the inquiry under s. 7 to the second stage on his behalf. Mr. Smith's liberty interests are engaged when he distributes to those who possess an Authorization. See Dickson C.J.C. in *Morgentaler*, cited in turn by the Ontario Court of Appeal in *Parker* at para. 79:

> As an aside, I should note that the appellants have standing to challenge an unconstitutional law if they are liable to conviction for an offence under that law even though the unconstitutional effects are not directed at the appellants per se: *R. v. Big M Drug Mart Ltd.*, at p. 313.

[89] Although strictly speaking it is not necessary to go further in view of the liberty interests engaged, I find that the security of the person interests of the witnesses Quin, Herman, and Arthurs (again, assuming she will receive her Authorization To Possess in due course) are also engaged by the *MMAR*. The requirement that limits the form in which they are legally entitled to possess their medicine to dried marihuana is, to paraphrase the obiter language of *Parker* at para. 111, an interposition of the threat of criminal prosecution between them and the form of medication found effective to treat the symptoms of their very serious illnesses.

Principles of Fundamental Justice

[90] Although Crown concedes this initial stage of the s. 7 analysis, Crown contests the second stage, and says that these engagements comply with the principles of fundamental justice and therefore are not infringements.

[91] In *Canadian Foundation for Children, Youth and the Law v. Canada (Attorney General)*, 2004 SCC 4, the Supreme Court of Canada summarized the criteria required of a "principle of fundamental justice" at para. 8 as:

> ... it must be a legal principle.
>
> ... there must be sufficient consensus that the alleged principle is "vital or fundamental to our societal notion of justice."
>
> ... the alleged principle must be capable of being identified with precision and applied to situations in a manner that yields predictable results.

[92] These are broadly stated criteria reflecting general principles.

[93] Four years earlier, the Ontario Court of Appeal applied much the same reasoning in *Parker*, at para. 112, but went on to focus on a principle of fundamental justice identified in *Rodriguez v. British Columbia (Attorney General)* (1993), 3 S.C.R. 519 at p. 594:

> Where the deprivation of a right in question does little or nothing to enhance the state's interest (whatever it may be), it seems to me that a breach of fundamental justice will be made out, as the individual's rights will have been deprived for no valid purpose.

[94] The court in *Parker* continued at para. 117:

> [117] To summarize, a brief review of the case law where the criminal law intersects with medical treatment discloses at least these principles of fundamental justice:
>
> (i) The principles of fundamental justice are breached where the deprivation of the right in question does little or nothing to enhance the state's interest.
>
> (ii) A blanket prohibition will be considered arbitrary or unfair and thus in breach of the principles of fundamental justice if it is unrelated to the state's interest in enacting the prohibition, and if it lacks a foundation in the legal tradition and societal beliefs that are said to be represented by the prohibition.
>
> (iii) The absence of a clear legal standard may contribute to a violation of fundamental justice.
>
> (iv) If a statutory defence contains so many potential barriers to its own operation that the defence it creates will in many circumstances be practically unavailable to persons who would prima facie qualify for the defence, it will be found to violate the principles of fundamental justice.

> (v) An administrative structure made up of unnecessary rules, which result in an additional risk to the health of the person, is manifestly unfair and does not conform to the principles of fundamental justice.

[95] Crown and defence focused much of their argument on the balance between the state interest and the impairment of the s. 7 right. At the core of the dispute is the identification of different legitimate state interests.

[96] Crown argued that one legitimate interest of the state served by the *MMAR*, as the regulations are currently framed, is to prevent or to control the risk of diversion of medical marihuana from lawful to unlawful streams. The requirement that medical marihuana remain in its dried form is a primary mechanism by which diversion is made difficult, since in its dried form marihuana is more readily quantified by police or regulators, and thus it can easily be determined whether any particular quantity seen exceeds the quantity permitted by an authorization, whether to possess or to produce.

[97] The defence responds that the legitimate state interest is harm avoidance, and that interest is not served by prohibiting derivatives of marihuana.

[98] The Crown's argument contemplates the possibility that someone to whom Health Canada has issued an Authorization To Possess will abuse the privilege represented by the authorization in order to engage in illegal activities. The Crown argues that such a person may more easily mask their illegal activities if they can render dried marihuana into other forms less easily measured or quantified by unaided observation.

[99] While it seems logical that it is easier to judge by looking whether a quantity of dried marihuana is within limits set out in an authorization than it would be if the active ingredient had been infused into oil or butter, some direct evidence on the point would have been helpful. If it is beyond the ability of the scientific staff of Health Canada to ascertain that a given quantity of dried marihuana, if rendered down so as to separate its glandular trichomes, would, if infused into oil or butter,

yield a measurable quantity, in whatever unit of measurement one might select, I would have expected to hear some better evidence of that, and I did not.

[100] This is quite apart from the fact that one who has an Authorization To Possess marihuana, who chooses to render the dried marihuana, infuse it into butter, and bake it into cookies, is amenable to control through the restrictions on the amount of dried marihuana he or she can obtain.

[101] The defence argues that it is arbitrary to expose someone who has a valid Authorization To Possess to criminal sanction if they prefer to take the medicine orally rather than by smoking it.

[102] The Crown says that the *Charter* does not protect a right to tasty cookies: someone who prefers to take their marihuana orally can eat it or bake the dried marihuana into cookies, in spite of some evidence that in its dried form, marihuana is not particularly palatable.

[103] The Crown's argument trivializes this aspect of the arbitrariness issue: the question is not whether constitutional protection is sought for tasty cookies, it is whether a prohibition against someone granted a permit to lawfully possess a medicinal substance that would be illegal but for the permit should not be restricted in how they choose to take the medicine unless the restriction serves a state interest that has more weight than the individual's choice on how to take their medicine.

[104] The defence argues that the restriction to dried marihuana compels people to smoke to get the medical benefit from the drug, and that smoking the drug is more unhealthy than eating it or applying it topically.

[105] The Crown says that no additional risk has been shown on the evidence.

[106] It seems to me that the recital of the risk of smoking the drug set out in the Health Canada *Information for Health Care Professionals* is sufficient to show that there is some additional risk from smoking, over and above any risk arising from taking the drug orally.

[107] As well, this Crown argument does not deal with one of the products produced by the accused, namely capsules filled with oil that has been infused with THC and whatever else is rendered from the dried plant material by the accused. The police investigation of the "bakery" turned up several bottles of oil labeled "Ryanol," one of which was near some empty capsules and a tray apparently designed to facilitate filling empty capsules. There is no dispute that one of the products produced by the accused and offered for sale by the Club was Ryanol capsules, filled with edible oil infused with THC, and easily swallowed. The production by the accused of the Ryanol capsules takes the issue beyond the "tasty cookie" level on which the Crown would like it decided.

[108] I have so far avoided dealing with the arguments based on inflated claims to the efficacy of some of the products offered for sale by the Club.

[109] This *voir dire* has been complicated by a sense that the accused is in many ways a surrogate for Mr. Ted Smith and the Club. Many of the Crown arguments concerned what the Crown said were misleading claims of the medical efficacy of many of the products offered for sale made in Club literature.

[110] Inflated claims, false or misleading advertising and such matters can be dealt with in ways other than unnecessary criminalization of the way in which some people choose to take medicine to which they are entitled. One need only look at the recently-enacted *Canada Consumer Product Safety Act* to find an example.

[111] Some general considerations bear repeating.

[112] Courts should not decide issues of law, particularly constitutional issues, that are not necessary to the resolution of the matter before the court: see, for example, *Phillips v. Nova Scotia (Commission of Inquiry into the Westray Mine Tragedy)*, [1995] 2 S.C.R. 97, at paras. 5-11; *R. v. Banks,* 2007 ONCA 19, at para. 25.

[113] Bearing in mind the respective constitutional positions of parliament and the courts, these excerpts from *Schachter v. Canada*, [1992] 2 S.C.R. 679, at paras. 26 and 31 respectively, are apt:

> Generally speaking, when only a part of a statute or provision violates the Constitution, it is common sense that only the offending portion should be declared to be of no force or effect, and the rest should be spared ...
>
> ... Therefore, the doctrine of severance requires that a court define carefully the extent of the inconsistency between the statute in question and the requirements of the Constitution, and then declare inoperative (a) the inconsistent portion, and (b) such part of the remainder of which it cannot be safely assumed that the legislature would have enacted it without the inconsistent portion.

Breach of the Principles of Fundamental Justice

[114] I conclude that the restriction to dried marihuana in the *MMAR* does little or nothing to enhance the state's interests, including the state interest in preventing diversion of a drug, or controlling false and misleading claims of medical benefit. I find that the restriction is arbitrary, and that its engagement of the rights to liberty and security does not accord with the principles of fundamental justice, and therefore infringes those rights.

Section 1: Reasonable and demonstrably justified in a free and democratic society

[115] The Crown has the burden of showing on a preponderance of probabilities that this dried marihuana limitation on the liberty and security rights protected by s. 7 is reasonable and demonstrably justified in a free and democratic society (*R. v. Oakes*, [1986] 1 S.C.R. 103).

[116] The Crown may do so by, first, showing that the legislative objective underlying the restriction is pressing and substantial, and, second, by showing that the means chosen are reasonable and demonstrably justified. The second stage in turn requires that the Crown show that the measure is rationally connected to the objective and thereby is fair and not arbitrary; that there is a reasonable degree of infringement on the right; and that the benefits and costs of the provisions are proportionate.

[117] I accept that one legislative objective of the restriction to dried marihuana is to limit the risk that the regime making marihuana available for medical purposes might

facilitate the trafficking of illegal drugs. I accept that the objective of limiting or decreasing the trafficking in a psychoactive substance is sufficiently important to warrant overriding a constitutionally protected right or freedom. I also accept that Parliament's interest in controlling the claims that might be made for medical efficacy of a particular product, as well as its interest in regulating the purity of substances sold as medicine, are pressing and substantial.

[118] Whether the Crown has shown that the means chosen by Parliament – the restriction of medical marihuana to its dried form – are reasonable and demonstrably justified, is weighed according to the analysis in *Oakes*, beginning with whether the means chosen by Parliament to achieve these objectives are fair and not arbitrary (para. 70).

[119] According to *Oakes,* a measure can be said to be fair and not arbitrary where it is shown that it has been carefully designed to achieve the objective sought -- in other words, where it is rationally connected to that objective.

[120] If the objective in question is to discourage diversion of medical marihuana into the illegal market, then Crown's argument that restriction to dried marihuana is fair and not arbitrary presumes that no laboratory analysis is needed to enable a police officer or other investigator to distinguish dried marihuana (which might not be in its whole leaf form) from any other dried plant which might also not be in its whole leaf form. If it is possible to distinguish chopped up, dried marihuana from other dried plant material such as might be found in most kitchen spice jars, it seems to me that there should have been evidence led on the point. I am not prepared to infer that it is necessary to restrict medical marihuana to its dried form in order to make enforcement of the drug laws possible. I am not concerned with making enforcement of the drug laws easy if the cost of doing so puts the rights protected by s. 7 of the *Charter* at risk. In the absence of clear evidence that the restriction to dried marihuana is necessary, I conclude that this restriction is arbitrary.

[121] Furthermore, under the "rational connection" step of the s. 1 analysis, the Crown's argument, to the extent that it is based on risk of diversion, also loses much

force in light of the Crown's concession that under the current regulatory scheme, someone with an Authorization to Possess might lawfully bake their dried plant material into a cookie batter or any other food, mix it into a salve, or otherwise deal with it in a similar fashion, so long as they used it as dried material.

[122] I conclude that there is little rational connection between the restriction to dried marihuana and the legitimate objective of preventing diversion of lawful medical marihuana into the illegal market.

[123] I conclude that the restriction to dried marihuana unnecessarily, and therefore to an unreasonable degree, impairs the security right to choose how to ingest the medicinal ingredients in the safest and most effective manner. Given these two findings under the second stage of the s. 1 analysis, I also find that it intrudes disproportionately on the constitutionally protected rights.

[124] Therefore, the dried marihuana restriction's infringement of s. 7 rights to liberty and security of the person is not saved by s. 1.

Remedy

[125] The question becomes what remedy is appropriate, given the considerations just outlined.

[126] The word "dried" appears 58 times in the *MMAR*. Many of its appearances are in formulae by which one calculates the maximum amount or number of marihuana or marihuana plants that may be possessed under the permits issued pursuant to the regulations.

[127] I have reviewed the regulations, including these formulae, and have concluded that it would do no greater violence than necessary to remedy the constitutional breach to delete the word "dried" wherever it appears in the *MMAR,* and I so direct.

[128] As a consequence, the definition of "dried marihuana" becomes superfluous and is also deleted.

[129] This leaves in place the requirement that one obtain and retain the authorizations provided under the *MMAR* in order to lawfully access marihuana for medical purposes, but removes the artificial restriction of that lawful use to marihuana in its dried form.

Judicial Stay

[130] Judicial discretion to grant a stay has been discussed in *R. v. Nixon*, 2011 SCC 34. Two approaches to a judicial stay can lead to the court's use of its discretion, under the *Charter*, s. 24(1), to grant an appropriate and just remedy in the circumstances. First, a *Charter* infringement not saved by a s. 1 analysis may lead the court to exercise its discretion under s. 24(1) to grant a judicial stay (or another remedy). Where the court finds a *Charter* violation, the court must still balance the violation with the remedy, and might not always find that a judicial stay serves societal interests (*R. v. O'Connor*, [1995] 4 S.C.R. 411, at para. 69). Second, abuse of process itself, while formerly a distinct common law doctrine, has merged with s. 7 (*O'Connor*) and, where found, could also lead to use of s. 24(1) to produce a judicial stay. Abuse of process can arise from unfairness of the accused's trial (*Nixon*, at para. 39) or from a residual category of acts "tending to undermine society's expectations of fairness in the administration of justice" (*Nixon*, at para. 41). Where in the latter form, as defence counsel alleges in this case:

> A stay of proceedings will only be appropriate when: "(1) the prejudice caused by the abuse in question will be manifested, perpetuated or aggravated through the conduct of the trial, or by its outcome; and (2) no other remedy is reasonably capable of removing that prejudice" (*Nixon*, at para. 42).

[131] In this case, I have found there has been a violation of liberty and security rights of the medical marihuana users protected by s. 7, as well as Mr. Smith's liberty right. However, I find that society's interests in having the charges against Mr. Smith tried on their merits outweigh the violation of Mr. Smith's liberty right, at least sufficiently to deny him the judicial stay he seeks.

[132] Second, defence would have me find abuse of process in the government's response to court decisions since *Parker* that disregards some of those decisions entirely, or that responds in such a minimal fashion as to amount to a cavalier treatment of courts and their decisions on constitutional matters.

[133] I do not share the defence view of government's response to the various court decisions. This is an area where a substance that continues to be illegal, and constitutionally so (*Malmo-Levine*), must also, since *Parker,* be available to those with a demonstrated medical need. How to achieve a balanced solution is a question that must be left to legislators. The accused would have me ascribe bad faith or motive to Parliament's serial responses, through the *MMAR*, to the court decisions that prompted changes. In my view, a court should be slow to attribute such bad faith or motive to legislative response to court decisions.

[134] I do not find a lack of good faith or an abuse of the processes of the court in this case that would warrant consideration of a judicial stay of proceedings, and that application is denied.

"R.T.C. Johnston, J."
The Honourable Mr. Justice Johnston

File No.149345-2
Victoria Registry

IN THE SUPREME COURT OF BRITISH COLUMBIA

REGINA

v.

OWEN EDWARD SMITH

This is Exhibit "D" referred to in the affidavit of David Pate sworn before me at Alameda this 16th day of Jan 2014
Olin Rust, Notary Public
A Commissioner for taking Affidavits for British Columbia

David W. Pate

OLIN E. RUST
COMM. # 2040563
NOTARY PUBLIC-CALIFORNIA
ALAMEDA COUNTY
MY COMM. EXP. SEP. 7, 2017

EXPORT REPORT OF DR. DAVID PATE

Kirk Tousaw
Barrister
Law Office of Kirk Tousaw
142-757 West Hastings, Suite 211
Vancouver, British Columbia V6C1A1
Counsel for Accused

Peter Eccles
Crown Counsel
Public Prosecution Service of Canada
BC Regional Office
900-840 Howe Street
Vancouver, BC V6Z 2S0

1. My name is Dr. David W. Pate and I make this expert report on the basis of my own personal knowledge, study and experience.

2. I hold two advanced degrees; a Master of Science in Biology and a Doctor of Philosophy in Pharmaceutical Chemistry. My current professional emphasis is the study of cannabis products, including cannabinoids and other constituent components of the *Cannabis* plant, both from a botanical and pharmaceutical perspective.

3. Attached to and made part of this report as Exhibit A is my curriculum vitae. Attached to and made part of this report as Exhibit B is a list of my publications.

4. The emphasis of my professional work is the medicinal aspects of phytocannabinoids (cannabinoids produced in the *Cannabis* plant) and endocannabinoids (cannabinoids endogenous to the human body).

5. Based on my professional expertise, knowledge and study, I am aware of the following facts and hold the following opinions.

6. The *Cannabis* plant (producing the crude drug, marijuana) is a dieocius plant in the family Cannabacae.

7. The female *Cannabis* plant produces flowers, referred to in slang vernacular as "buds", which themselves are composed of varying parts.

8. These parts include the pistil, bracteole (i.e., perigonal bract), and subtending leaflet.

9. The primary therapeutically active compounds found in *Cannabis* are secreted by the plant in the glandular trichomes that are found in their highest population concentration on the bracteole abaxial (i.e., outer) surface of unfertilized female flowers. These glandular trichomes are often referred to as "resin glands". This is scientifically inaccurate as the glandular trichomes manufacture, contain and surround the resin itself.

10. The two primary therapeutically active compounds found in the resin are tetrahydrocannabinol (THC) and cannabidiol (CBD), plus associated minor cannabinoids and terpenes.

11. Within each category of compound there are several to many particular chemical species.

12. For example, there are at least dozens of terpenes and several cannabinoids found in the resin contained within the glandular trichomes of the *Cannabis* plant.

13. Cannabinoids are not found in any other plant species, although the human body produces fatty acid functional analogues (i.e., endocannabinoids) that also fit into cannabinoid receptors in the human body (e.g., brain). Terpenes are found broadly in the plant kingdom, including in mints, fruits, spices and flowers.

14. The medical effects of cannabinoids have been well documented and there is no reasonable dispute, in my opinion, that these compounds are therapeutically active in humans. Terpenes may very well augment these effects.

15. *Cannabis* has a number of phenotypes, commonly referred to as strains. Various strains are created by breeding different varieties of the plant with each other. Different strains are reputed to produce differing effects on the patient, depending on the individual and condition.

16. A reason for the differing effects, which include varying levels of efficacy for a variety of medical symptoms and conditions, is probably due to varying amounts and ratios of the therapeutically active compounds.

17. It has been suggested, and in my opinion it is correct, that the various compounds can produce synergistic effects and that any one compound, in isolation, may not provide the full spectrum of medical benefits sought by the patient.

18. This is because the effects, both positive and negative, of the primary active ingredients may be enhanced or mitigated by secondary compounds. In this regard I attach and incorporate into my opinion the following studies: "Cannabis and Cannabis Extracts: Greater Than the Sum of Their Parts?" McPartland, John

M., and Ethan B. Russo. Co-published simultaneously in Journal of Cannabis Therapeutics (The Haworth Integrative Healing Press, an imprint of The Haworth Press, Inc.) Vol. 1, No. 3/4, 2001, pp. 103-132; and: Cannabis Therapeutics in HIV/AIDS (ed: Ethan Russo), and "Taming THC: Potential Cannabis Synergy and Phtyocannabinoid-Terpenoid Entrourage Effects." Ethan B. Russo, British Journal of Pharmacology (2011) 163 pages 1344-1364.

19. The glandular trichomes containing these chemical compounds can be isolated from the female flowers, thus eliminating most of the plant matter in the final product.

20. There are a variety of methods for isolating the glandular trichomes, including the use of micro-pore screens upon which dried flowers are agitated, causing the glandular trichomes to fall off and pass through the screen; and immersion of the plant matter in cold water followed by straining the water through fine mesh to capture the glandular trichomes. These processes result in removal of the glandular trichomes from most other plant matter, but leave the resin housed within the glandular trichomes.

21. Alternatively, it is possible to directly extract the resin contained within the glandular trichomes by rubbing the flowers by hand then scraping the sticky resin from the hands; by soaking the whole plant matter (or isolated trichomes) in fat (typically food-grade oils

or butter) or alcohol and then straining out the plant debris (the glandular trichome contents are fat and/or alcohol soluble, but are not water soluble); and with the use of petrochemical solvents (e.g., petroleum ether) that are then evaporated. These are extraction processes that result in the separation of the active compounds, such as THC, CBD and terpenes, from the plant matter, including from the glandular trichomes.

22. The resin-containing glandular trichomes remaining after the processes referred to in paragraph 20 are often referred to as "hash" (dry sieved) or "bubblehash" (wet sieved) when found in lump or brick form due to compression, or often referred to (erroneously) as "kif" or "pollen" when found in uncompressed powder form. The material remaining after cannabis extraction into fats is often called "cannabis cooking oil" or "cannabis butter" and the extract produced by solvent extraction is often called "hash oil."

23. All of these processes are designed to capture the glandular trichomes and/or their contents (i.e., the therapeutically active resin), while removing most or all of the plant matter and the various by-products that remain in the plant matter following harvest.

24. The plant matter itself is not a desired therapeutic component, except as a vehicle for carrying the resin prior to, and during, the act of pyrolysis and smoke inhalation.

25. This is because plant matter can contain a variety of harmful or unwanted compounds, which may include heavy metals, fertilizer residue, pesticides, molds and insect remnants.

26. In addition, plant matter is composed of non-digestible cellulose which, while not harmful, may be contra-indicated for persons with gastro-intestinal conditions.

27. Moreover, this plant matter contains silicified non-glandular trichomes that are not digestible and have no therapeutic value, but which, due to their micro-abrasive potential, may be contra-indicated for persons with gastro-intestinal sensitivities.

28. The glandular trichomes themselves are not a desired therapeutic component, except as a vehicle for carrying the resin prior to, and during, the act of extraction into fat, alcohol, solvents or fatty bodily fluids.

29. There are multiple ways to ingest the active compounds in cannabis. These include:

    a. Inhalation: This is either a high-temperature process by which the plant matter, and/or the glandular trichomes themselves, are heated to the point of ignition and the smoke is inhaled

(using a cigarette/"joint" or a pipe) or a low-temperature process by which the plant matter is heated only to the point at which the active ingredients vaporize and become an airborne aerosol which is then inhaled (commonly referred to as "vaporization.")

b. Oral ingestion: This is a process by which the active ingredients are ingested by eating or drinking. Typically, food products are prepared using cannabis-infused oil or butter. Essentially any food product that is made with fat and cannabis will be infused with cannabis resin extracted *in situ*. Common forms of these baked goods are cookies and brownies. In addition, cannabis capsules can be produced that contain an extract of the glandular trichomes which are swallowed in the same manner as over-the-counter remedies, prescription pharmaceuticals or natural health products.

c. Topicals: Oil-based preparations into which the resin has been extracted are either applied directly to the skin or are dispersed from patches which are applied to the skin.

d. Trans-mucosal: This method of ingestion is typically an alcohol extract of the resin that is sprayed under the tongue.

30. The modes of ingestion set out above carry with them different risks and benefits. Specifically, for purposes of this opinion, I focus

on the relative benefits of oral ingestion or topical administration *vs.* the method of inhalation.

31. A primary benefit of orally ingesting cannabis-based medicines arises for people suffering from gastro-intestinal conditions such as Crohn's Disease or Irritable Bowel Syndrome. For these individuals, oral ingestion allows for the application of therapeutic compounds directly to the site of pathogenicity. Good pharmaceutical practice dictates the use of a minimum effective drug amount and a treatment as close to the site of pathogenicity as possible. This provides the benefit of direct therapeutic action that can be more effective and require lesser dosages, thus ameliorating potential unwanted side effects.

32. Another benefit of oral ingestion is that it produces longer lasting therapeutic effects than inhalation. Inhalation tends to produces spikes in the systemic load of the active compounds which quickly fall to low levels, resulting in elevating patient blood levels with more of the active compounds than necessary while making the effect of these compounds more transient. Oral ingestion, by contrast, provides a plateau of longer and more stable systemic load of the therapeutic agents. This eliminates the need to repeatedly ingest the medicine at short intervals in order to achieve continuous therapeutic benefits. It also allows for the treatment to

continue during sleeping hours. This latter aspect is particularly of benefit to glaucoma patients.

33. Another benefit of oral ingestion is the elimination of any damage that may be caused by smoking the dried flowers, a practice discouraged within contemporary medicine. Oral ingestion also excludes possible damage that could be caused by the inhalation of unwanted substances found in or on the plant matter.

34. For certain chronic conditions, oral ingestion is often the more effective mode of ingestion for the reasons set out above.

35. For acute (and particularly crisis) conditions, inhalation may be preferred because of the rapid onset of symptom relief coupled with the transient nature of the condition itself.

36. By way of example, inhalation would be preferable to oral ingestion to treat the acute pain and other symptoms associated with migraine headaches.

37. For many of the same reasons that oral ingestion is preferable to inhalation, topical administration is preferable for certain conditions such as inflammatory skin conditions or some forms of chronic pain, particularly of the joints. The onset time of topical administration is quicker than oral administration, the drug is better targeted to the site of action, and a full systemic treatment to

obtain a localized therapeutic benefit is not administered. An added benefit is the elimination of psychoactive side-effects.

38. In addition to the foregoing, I hold the following opinions:

a. The *Cannabis* plant is harvested for the medicinal resin compounds found inside the glandular trichomes of the plant.

b. There is no medical utility to the dried plant matter.

c. In essence, the plant is no more than a carrier for the glandular trichomes that are, themselves, a manufacturing site and reservoir for the resin that contains the cannabinoids and terpenes.

d. There are negative effects associated with ingesting whole *Cannabis* plant matter, either orally or by smoke inhalation, which can range from minor to serious.

e. Ingesting the resin by means of smoking would be less harmful to the patient than smoking the dried plant matter which bears the resin because: (a) less would need to be consumed to achieve the desired therapeutic effect and, (b) the pyrolysis products of unwanted bulk plant materials would not be inhaled.

f. Ingesting the resin compounds in the form of baked goods is, for some conditions, significantly more effective than other routes of administration.

g. Topical application of the compounds in the resin by way of salves or oils produces no psychoactive side effects while also being more effective for the appropriate conditions.

h. There exists no scientific basis, either botanical or pharmaceutical, to differentiate between the whole dried plants and the glandular trichomes or contained resin in a manner that permits patient access to the whole dried plant, but not the glandular trichomes or contained resin harvested from that very same plant.

No. T-2030-13

FEDERAL COURT

BETWEEN:

NEIL ALLARD
TANYA BEEMISH
DAVID HEBERT
SHAWN DAVEY

PLAINTIFFS

AND:

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

DEFENDANTS

AFFIDAVIT OF DANIELLE LUKIV

I, Danielle Lukiv, Legal Assistant at the law firm of Conroy & Company, 2459 Pauline Street, Abbotsford, British Columbia, MAKE OATH AND SAY AS FOLLOWS, THAT:

1. I am a legal assistant to John W. Conroy, Q.C., counsel for the Plaintiffs and as such have personal knowledge of the matters and facts hereinafter deposed to, except where stated to be based on information and believe, and where so stated I verily believe them to be true.

2. I am informed by Mr. Ron Marzel, Barrister & Solicitor of Toronto, Ontario and verily believe it to be true that on July 19th, 2013 he received a response from the Access to Information and Privacy Division of Health Canada responding to his request under the *Access to Information Act* requesting: 1) the total annual dried cannabis dosage or consumption expressed in kilograms per year of authorizations to possess licencees under the *MMAR* with a dosage between 1to 149 grams per day 2) the total number of Authorization to Possess licensees, under the MMAR with a dosage of 150 grams or

more per day; and 3) at the time of the repeal of licences issued under the MMAR on March 31st, 2014, based on the actual applications received by Health Canada, as well as the licenses Health Canada anticipates to issue for production of cannabis, the anticipated total annual production capacity of dried cannabis, expressed in kilograms per year, of all anticipated Licenced Producers under the MMPR estimated to be as of April 1st, 2014 (provide us with your estimate, in this regard on a monthly basis commencing August 2013 to March 2014).

3. Now produced and marked Exhibit "A" to this my Affidavit is a copy of a letter dated July 19th, 2013 from Amanda Wilson, Coordinator, Access to Information and Privacy Division of Health Canada attaching a page with specific answers to the questions asked indicating that the total annual dried cannabis dosage or consumption in kilograms per year with a dosage between 1-149 grams per day was 188,189 kilograms as of April 2013 and that there were 89 people with Authorizations to Possess under the *MMAR* with dosages of 150 grams or more per day as of April 2013. The answer to the third question with respect to anticipated production in preparation for March 31st, 2014 was simply "nil from the BMC".

4. I am further informed by Mr. Marzel and verily believe it to be true that in addition he made a further request from Health Canada to break down the amounts of the total cannabis produced in relation to the daily grams dosages as authorized from 1-5 grams up to 101 – 150 grams and now produced and marked as Exhibit "B" to this my Affidavit is a copy of the response of Amanda Wilson, Coordinator, Access to Information and Privacy Division for Health Canada dated October 9th, 2013 which attached specific answers to his questions, including, in particular, the graph on page 2 that sets out the daily grams authorized and the corresponding kilograms authorized in those categories.

5. In that letter was also a copy of a letter dated July 31st, 2012 to Mr. Andrés Finguerut, Secretary International Narcotics Control Board, Vienna International Center, Vienna, Austria from Johanne Beaulieu, Director of the Office of Controlled Substances providing the report from Canada regarding annual estimates of requirements of narcotic drugs, manufacturers of synthetic drugs, opium production and cultivation of

the opium poppy for purposes other than opiate production for the year 2013 and at page 7 of that report the annual estimate in relation to Cannabis is set out.

6. I am further informed by Mr. Marzel and verily believe it to be true that he made a further request to the Access to Information and Privacy Division of Health Canada as follows: "At the time of the repeal of licences issued under the MMAR on March 31, 2014, based on the actual applications received by Health Canada, as well as the licences Health Canada anticipates to issue for production of cannabis, the anticipated total annual production capacity of dried cannabis, expressed in kilograms per year, of all anticipated Licensed Producers under the MMPR estimated to be as of April 1st, 2014 (Would you be kind enough to provide us with your estimate in this regard on a monthly basis, commencing August 2013 and ongoing to March 2014).."

7. Now produced and marked as Exhibit "C" to this my affidavit is a letter dated December 13, 2014 from Amanda Wilson, Coordinator, Access to Information and Privacy Division of Health Canada attaching her reply (8 pages) indicating specifically at page two the status of the processing of applications to become Licenced Producers as of October 2nd, 2013, and showing a predicted current risk weighted production forecast of only 3,055 kilograms by April 2014.

8. I looked at the Health Canada Website to see how many Licensed Producers have been approved and now produced and marked as Exhibit "D" to this my affidavit is a print out of a page from that website showing that as of November 1st, 2013 there are only three.

9. Now produced and marked as Exhibit "E" to this my Affidavit is a copy of a document entitled "Fire Losses in Canada Year 2007 and Selected Years" by Mahendra Wijayasinghe, PhD, Office of the Fire Commissioner which I downloaded from the internet providing the most recent fire statistics from across the country.

10. I am informed by John W. Conroy, Q.C. and verily believe it to be true that all medically approved patients under the *MMAR* received a letter from Health Canada and specifically identified to be from the Marihuana Medical Access Program in November

2013 identifying each person as a patient in the program and providing them with information with respect to the proposed changes (15 pages). Now produced and marked as Exhibit "F" to this my Affidavit is a copy of that letter.

11. As a result of the letter referred to in paragraph 10, a Federal class action was launched against Health Canada for invasion of privacy. Now produced and marked as Exhibit "G" is a copy of a press release and Exhibit "H" the filed Statement of Claim.

12. I swear this Affidavit in support of an Application for an Order under s.24(1) of the *Canadian Charter of Rights and Freedoms* as the appropriate and just interim remedy, in the nature of:

I. An interim constitutional exemption from ss.4,5 and 7 of the *Controlled Drugs and Substances Act* for all persons medically approved under the *Narcotic Control Regulations* C.R.C., c.1041 (*NCR*), the *MMAR* or the *MMPR*, including those patients who have a caregiver 'person responsible' for them designated to produce for them, including an exemption for that caregiver 'person responsible' designated producer, pending trial of the merits of the action or such further Order of the court as may be necessary;

or, alternatively

II. an interlocutory exemption/injunction preserving the provisions of the *MMAR* relating to personal production, possession, production location and storage, by a patient or designated caregiver 'person responsible for the patient' and related ancillary provisions, and if necessary, limiting the applicability of certain provisions of the *MMPR* to such patients or designated caregivers that are inconsistent with their s. 7 constitutional right under the *Charter* pending the decision of this Court on the merits of this action.

or alternatively, and together with

III. an interim/interlocutory order in the nature of *mandamus* to compel the Defendant to process all applications, renewals and modifications to any licences pursuant to the *MMAR* in accordance with all of its provisions (other than those challenged as unconstitutional herein), notwithstanding ss.230, 233-234, 237-238, 240-243 of the *MMPR* relating to applications under the

MMAR after September 30th, 2013 as reflected in the amended *MMAR* sections 41-48.

and such further and other relief as the court deems appropriate and just in all of the circumstances.

SWORN BEFORE ME at the City of Abbotsford, in the Province of Ontario, this 17th day of January, 2014

A Commissioner for Taking Affidavits in and for the Province of British Columbia

Danielle Lukiv

DANIELLE LUKIV

Health Canada / Santé Canada

Access to Information and Privacy Division
7th Floor, Suite 700, Holland Cross, Tower B
1600 Scott Street
Address Locator: 3107A
Ottawa, Ontario K1A 0K9

JUL 19 2013

Our file: A-2013-00332 / nm

Ron Marzel
Marzel Law Barrister & Solicitor
265 Rimrock Rd.
Suite 200
TORONTO ON M3J 3C6

Dear Mr. Marzel:

This is in response to your request made under the *Access to Information Act* (the *Act*) for:

Marihuana Medical Access Regulations and the Marihuana for Medical Purposes Regulations:

1) The total annual dried cannabis dosage or consumption, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 1 to 149 grams per day

2) The total number of Authorization to Possess licensees, under the MMAR with a dosage of 150 grams or more per day and

3) At the time of the repeal of licences issued under the MMAR on March 31st 2014, based on the actual applications received by Health Canada, as well as the licenses Health Canada anticipates to issue for production of cannabis, the anticipated total annual production capacity of dried cannabis, expressed in kilograms per year, of all anticipated Licenced Producers under the MMPR estimated to be as of April 1st 2014 (provide us with your estimate, in this regard on a monthly basis commencing August 2013 to March 2014).

Enclosed is a copy of the records requested. Please note the records are being disclosed in their entirety.

If you have any questions or concerns about the processing of your requestplease do not hesitate to contact Nina Muminovic, the Analyst responsible for this request, either by phone at (613) 762-6809, or by fax at (613) 941-4541, or by e-mail at nina.muminovic@hc-sc.gc.ca with reference to the file number cited above.

Please be advised that you are entitled to complain to the Office of the Information Commissioner of Canada concerning the processing of your request within 60 days of the receipt of this notice. In the event you decide to avail yourself of this right, your notice of complaint should be addressed to:

The Information Commissioner of Canada
Place de Ville, Tower B
112 Kent Street, 7th Floor
Ottawa, Ontario K1A 1H3

Yours sincerely,

for Amanda Wilson
Coordinator, Access to Information and Privacy Division

Attached: 1 page

This is Exhibit "A" referred to in the affidavit of Danielle Lukiv sworn before me at Abbotsford this 17th day of Jan 2014

A Commissioner for taking Affidavits

Canada

The total annual dried cannabis dosage or consumption, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 1 to 149 grams per day
Total, based on daily amount authorized

188.189 kg as of April 2013

The total number of Authorization to Possess licensees, under the MMAR with a dosage of 150 grams or more per day

89 as of April 2013

At the time of the repeal of licences issued under the MMAR on March 31st 2014, based on the actual applications received by Health Canada, as well as the licenses Health Canada anticipates to issue for production of cannabis, the anticipated total annual production capacity of dried cannabis, expressed in kilograms per year, of all anticipated Licenced Producers under the MMPR estimated to be as of April 1st 2014 (provide us with your estimate, in this regard on a monthly basis commencing August 2013 to March 2014).

Nil from BMC

Health Canada / Santé Canada

Access to Information and Privacy Division
7th Floor, Suite 700, Holland Cross, Tower B
1600 Scott Street
Address Locator: 3107A
Ottawa, Ontario K1A 0K9

OCT 0 9 2013

Our file: A-2013-00583 / nm

This is Exhibit "B" referred to in the affidavit of Danielle Lukiv sworn before me at Abbotsford, BC this 17th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Ron Marzel
Marzel Law Barrister & Solicitor
265 Rimrock Rd.
Suite 200
TORONTO ON M3J 3C6

Dear Mr. Marzel:

This is in response to your request made under the *Access to Information Act* (the *Act*) for:

With regards to licenses issued under the Marihuana Medical Access Regulations, SOR/201-227, (MMAR) and the Marihuana for Medical Purposes Regulations(citation not available) (MMPR)

1) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 1 to 5 grams per day;

2) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 6 to 10 grams per day;

3) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 11 to 20 grams per day;

4) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 21 to 50 grams per day;

5) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 51 to 100 grams per day; and

6) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 101 to 150 grams per day.

Enclosed is a copy of the records requested. Please note the records are being disclosed in their entirety.

.../2

Canada

If you have any questions or concerns about the processing of your request, please do not hesitate to contact Nina Muminovic, the Analyst responsible for this request, either by phone at (613) 762-6809, or by fax at (613) 941-4541, or by e-mail at nina.muminovic@hc-sc.gc.ca with reference to the file number cited above.

Please be advised that you are entitled to complain to the Office of the Information Commissioner of Canada concerning the processing of your request within 60 days of the receipt of this notice. In the event you decide to avail yourself of this right, your notice of complaint should be addressed to:

The Information Commissioner of Canada
Place de Ville, Tower B
112 Kent Street, 7th Floor
Ottawa, Ontario K1A 1H3

Yours sincerely,

Nina Muminovic

for Amanda Wilson
Coordinator, Access to Information and Privacy Division

Attached: Pages 1 - 2

A-2013-00583

With regards to licenses issued under the Marihuana Medical Access Regulations, SOR/201-227, (MMAR) and the Marihuana for Medical Purposes Regulations(citation not available) (MMPR) 1) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 1 to 5 grams per day; 2) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 6 to 10 grams per day; 3) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 11 to 20 grams per day; 4) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 21 to 50 grams per day; 5) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 51 to 100 grams per day; and 6) The total current annual dried cannabis dosage or consumption for the 2012 calendar year, expressed in kilograms per year, of Authorization to Possess licensees under the MMAR, with a dosage between 101 to 150 grams per day

1. Health Canada has no data on consumption.

2. Health Canada maintains a processing system known as "Safe Access to Medical Marihuana" (SAMMII) to track information, including applications, ATPs and licences to produce issued under the MMAR. The records are created and maintained as part of the usual and ordinary course of business: that is the receipt, verification, and processing of applications for ATPs, applications for PUPLs, DPPLs, renewals, amendments, inquiries, and general administration of the MMAP.

3. SAMMII does not contain the information requested in the form requested. Estimated numbers provided in response to this request are subject to the following factors:

a) While the requestor seeks daily dosage, Health Canada applications refer to "daily amounts", therefore, the daily amount requested on Form B is used. The daily amount shown on the ATP applicant's Form B, is input into SAMMII manually. The daily amount shown on Form B, which is signed by the medical practitioner, is not the same amount as the maximum quantity of dried marihuana that the ATP stipulates the holder may possess at any time. The maximum authorized amount shown on the ATP is the daily amount x 30 in accordance with the formula set out in the MMAR.

b) The request sought annual statistics for those with specified daily amounts that ranged from 1-5, 6-10, 11-20, 21-50, 51-100, and 101-150. Statistics for those daily amounts were included in the figures below and those that fell between or outside of these categories were not extracted nor factored into the calculations.

c) Accordingly, to arrive at an estimated annual number of KGs the daily amount (as described above) was multiplied by 365. This formula was applied to each ATP that fell within the parameters of this request and that were issued in the calendar year specified. This calculation assumes, therefore, that each of these ATPs was licensed to possess dried marihuana for medical purposes for the entire calendar year, from January 1, 2012 to December 31, 2012.

Therefore, using this calculation an ATP issued September 1, 2012, based on the Form B daily amount of 10 grams, would reflect an annual amount of 3,650 grams of dried marihuana for medical purposes.

It should be noted that the authorized person would not have been authorized to possess this amount. The ATP would have actually granted this person authority to possess 300 grams of dried marihuana for medical purposes at any one time.

d) For purposes of this report, amendments seeking to increase daily amounts in the same calendar year have not been factored into this estimate Therefore, if an ATP originally applied to possess 10 grams daily of dried marihuana for medical purposes in January, and then in November of the same year obtained authorization to double that daily amount to 20 grams , this estimated annual amount authorized for this ATP will reflect a daily amount of 10 grams for a 365 day period

Year	Daily Grams	KGs Authorized
2012	1-5g	15,752.88
	6-10g	42,054.31
	11-20g	89,127.44
	21-50g	12,795.62
	51-100g	3,195.21
	101-150g	4,854.87
	Total	167,780.33

Health Canada / Santé Canada

Healthy Environments and Consumer Safety Branch / Direction générale, Santé environnementale et sécurité des consommateurs

Address Locator 3503D
Ottawa ON K1A 1B9

Your file / Votre référence

Our file / Notre référence
12-106966-988

2012-07-31

Mr. Andrés Finguerut
Secretary
International Narcotics Control Board
Vienna International Centre
PO Box 500
A-1400 Vienna
Austria

Dear Mr. Finguerut:

With reference to your communication, E/INCB/EST/C.L. 8/2012, please find enclosed the report from Canada regarding Form B - *Annual Estimates of Requirements of Narcotic Drugs, Manufacture of Synthetic Drugs, Opium Production and Cultivation of the Opium Poppy for Purposes other than Opium Production*, for the year 2013.

If you have any questions regarding this report, please do not hesitate to contact Mr. Carol Langlois, Manager, Licences and Permits Division, Office of Controlled Substances by phone at 613-948-4485 or e-mail at: Carol.Langlois@hc-sc.gc.ca.

Yours sincerely,

Johanne Beaulieu

Johanne Beaulieu
Director
Office of Controlled Substances
Tel.: 613-952-2177
Fax: 613-946-4224

Attach.

cc: Ms. Theresa Ladouceur, DFAIT
Mr. Peter Cahill, DFAIT
Mr. Mark Edwards, Health Canada

Canada

Form B

ANNUAL ESTIMATES OF REQUIREMENTS OF NARCOTIC DRUGS, MANUFACTURE OF SYNTHETIC DRUGS, OPIUM PRODUCTION AND CULTIVATION OF THE OPIUM POPPY FOR PURPOSES OTHER THAN OPIUM PRODUCTION

Single Convention on Narcotic Drugs, 1961, Articles 1, 12 and 19.
Protocol of 25 March 1972 amending the Single Convention on Narcotic Drugs, 1961: Articles 5 and 9.

COUNTRY/TERRITORY: CANADA DATE: 31.07.2012

COMPETENT OFFICE : HEALTH CANADA

RESPONSIBLE OFFICER'S NAME : Johanne Beaulieu

TITLE/FUNCTION: Director, Office of Controlled Substances SIGNATURE

These estimates relate to the calendar year 2013

Remarks

** - *Substance is not controlled by INCB*

These estimates, in a single copy, should be sent to the
INTERNATIONAL NARCOTICS CONTROL BOARD
Vienna International Centre
P.O. Box 500, A-1400 Vienna, Austria
Telephone: (+43-1) 26060-4277 Facsimile (+43-1) 26060-5867/5868
Telegraphic address: UNATIONS VIENNA Telex: 135612 uno a
E-mail: secretariat@incb.org Internet address: http://www.incb.org/

INSTRUCTIONS

General:

1. This form is divided into five parts:

   Part I: Background information and statement of the method

   Part II: Annual estimates of requirements of narcotic drugs

   Part III: Annual estimates of the manufacture of synthetic drugs

   Part IV: Annual estimates of opium production

   Part V: Annual estimates of the cultivation of the opium poppy for purposes other than opium production

2. In order to ensure the accurate completion of this form, the definitions given below, in accordance with the provisions of article 1 of the Single Convention on Narcotic Drugs, 1961, should be borne in mind.

   a. **Consumption** is the action of supplying a narcotic drug to any person or enterprise for retail distribution, medical use or scientific research.

   b. **Drug** designates any substance included in Schedules I and II of the Convention, whether natural or synthetic, and subject to specific control measures under the Convention.

   c. **Manufacture** is any process, other than production (see definition below) by which drugs may be obtained, including the refining and transformation of one drug into another drug.

   d. **Preparation** is a mixture solid, or liquid, containing a drug and subject to the same control measures as the drug it contains. It should be noted, however, that preparations listed in Schedule III of the Single Convention are exempted from some control measures.

   e. **Production** is the separation of opium, coca leaves, cannabis and cannabis resin from the plants from which they are obtained.

   f. **Stocks** are the amounts of drugs held in a country or territory for domestic consumption, manufacture of other drugs or exports.

   g. **Special stocks** are the amounts of drugs held by the Government of a country or territory, for special government purposes and to meet exceptional circumstances.

3. All drugs are listed in the *List of Narcotic Drugs under International Control* (Yellow List), a supplement to the statistical forms on narcotic drugs, distributed to Governments on a yearly basis.

4. Figures included in this form should be expressed in terms of the pure anhydrous drug content contained in crude drugs, salts and preparations. Tables showing the pure drug content of bases and salts, as well as their equivalents, in terms of the pure drug, of certain extracts and tinctures are given in the *List of Narcotic Drugs under International Control* (Yellow List).

5. **The estimated quantities should be expressed in kilograms and grams without decimal points or commas.**

Part I: **This part is to be filled in by all Governments.**

6. Governments are required to provide information on some health-related parameters and on the method used to determine the estimates furnished in the Form B.

Part II: **This part is to be filled in by all Governments.**

7. *Column 1:* **The term "quantity to be consumed" refers to the quantity to be supplied for retail distribution, use in medical treatment or scientific research, to any person, enterprise or institute (retail pharmacists, other authorized retail distributors, institutions or qualified persons duly authorized to exercise therapeutic or scientific functions such as doctors, dentists, veterinarians, hospitals, dispensaries and similar health institutions, scientific institutes, both public and private). Only the amounts needed for *domestic* purposes and not those required for export should be taken into account.**

8. *Column 2:* Not only the requirements for *domestic* purposes, but also those for *export* should be taken into account.

9. *Column 2 (a)*: The estimated quantities should include the quantities of the drug to be transformed by a chemical process into another drug, but not the amounts of the drug to be transformed into the salts thereof. For example, the quantities of morphine base to be converted into codeine base, but not the quantities of morphine base to be transformed into morphine hydrochloride or morphine sulphate.

10. *Column 2 (b)*: The estimated quantities in this column should include the quantities of drugs needed for the manufacture of preparations for the export of which export authorizations are not required (Schedule III preparations) whether such preparations are intended for domestic consumption or for export. For example, quantities of codeine base to manufacture preparations containing codeine phosphate with a concentration of not more that 2.5 per cent (e.g. 3 mg/15 ml).

11. *Column 2 (c)*: The estimated quantities to be inserted in this column should include the quantities of drugs needed for the manufacture of substances not covered by the 1961 Convention, for example quantities of thebaine to manufacture naloxone.

12. *Column 3*: The term "special stocks" is defined in Article 1, paragraph 1 (w), of the 1961 Convention as "the amounts of drugs held in a country or territory by the government of such country or territory for special Government purposes and to meet exceptional circumstances." Quantities held for *"special Government purposes"* include in particular the requirements for the armed forces. *"Exceptional circumstances"* refer to catastrophic events such as large-scale epidemics and major earthquakes. The quantities to be added to the stocks held by the Government for the normal needs of the civilian population are not to be taken into account in computing the estimated quantities to be inserted in this column. The quantities to be held by the Government for such purposes should be included in the estimates to be inserted in Column 4.

13. *Column 4*: Governments are required to furnish an estimate of the stocks they expect to hold at the end of the year. The quantities should cover the actual stocks held at 31 December of the year to which the estimates relate. The estimate should include the quantities to be held in stock for domestic consumption, manufacture of other drugs or preparations and exports. The term "stocks" in accordance with Article 1, paragraph 1 (x), of the 1961 Convention refers to the amounts of drugs held in a country or territory except:

    (a) The quantities held by retail pharmacists or other authorized retail distributors and by institutions or qualified persons in the duly authorized exercise of therapeutic or scientific functions (see 7 above); and

    (b) "Special stocks" held by the Government. Stocks held by the Government for the normal needs of the civilian population should be included in Column 4 (see 12 above).

14. **With respect to concentrate of poppy straw, the gross weight of the material and the average anhydrous alkaloid content, AMA (anhydrous morphine alkaloid), ACA (anhydrous codeine alkaloid), ATA (anhydrous thebaine alkaloid) and AOA (anhydrous oripavine alkaloid), are to be reported.**

Part III: **This part concerns only countries where the manufacture of synthetic drugs is authorized.**

15. For the purposes of preparing the estimates and ensuring uniform interpretation of the term "synthetic drugs", the definition proposed in the Commentary on the 1972 Protocol prepared by the Secretary-General of the United Nations should be followed. The definition is as follows: " 'Synthetic drugs' are all drugs appearing in Schedules I and II of the 1961 Convention, except those at present normally obtained from the opium poppy (its opium or straw), the coca bush or the cannabis plant."

16. The "synthetic drugs" according to this definition are listed in the corresponding part of this Form B.

17. **Industrial establishments** which simply manufacture salts or preparations of "synthetic drugs" from "synthetic drugs" manufactured in other industrial establishments in the country or abroad should not be included in the estimate. In fact, only the quantities of "synthetic drugs" to be manufactured should be included in the estimates, i.e. not any quantities of preparations of "synthetic drugs" to be manufactured.

18. Quantities should be expressed to the nearest kilogram, without decimal point or comma. Where the quantities are less than one kilogram, they should be expressed to the nearest gram and specified as such.

Part IV: **This part concerns only countries and territories where the cultivation of the opium poppy is authorized for the purpose of opium production.**

19. Governments should indicate the regions or locations in which it is permitted or intended to permit opium production in the calendar year to which the estimates relate, regardless of when the sowing takes place, in that year or in the preceding year. All areas sown should be expressed in hectares (1 hectare is

equivalent to 10,000 square metres). The estimated quantities of opium to be produced is also requested. The amount of opium should be expressed in kilograms and the percentage of average moisture content should also be provided. All quantities should be expressed to the nearest kilogram, without decimal point or comma.

Part V: **This part concerns only countries and territories where the cultivation of the opium poppy is authorized for purposes other than opium production.**

20. The information to be furnished should include the geographical location of land used for the cultivation of opium poppy and the area estimated for the cultivation of opium poppy harvested during the calendar year to which the estimates relate, regardless of when the sowing takes place, in that year or in the preceding year. Areas should be expressed in hectares (1 hectare is equivalent to 10,000 square metres).

21. **With respect to poppy straw to be produced for the manufacture of narcotic drugs, the estimated quantities of AMA (anhydrous morphine alkaloid), ACA (anhydrous codeine alkaloid) and ATA (anhydrous thebaine alkaloid) to be obtained from the poppy straw are to be reported.**

Part I

Annual Estimates of Requirements of Narcotic Drugs
(FOR ALL COUNTRIES AND TERRITORIES)

Number of medical practitioners in the country or territory:

Doctors: 72368 Dentists: 20350 Veterinarians: 12035

Number of pharmacies: 9156

Number of hospitals: 721 *Total number of hospital beds:* 86771

STATEMENT OF THE METHOD

Please provide here comments on the methods used in determining the various estimates reported in this Form and on trends in the requirements of narcotic drugs

ADDITIONAL INFORMATION

Please provide any other information which may be useful to the Board in examining the estimated drug requirements

Part II

Annual Estimates of Requirements of Narcotic Drugs
(FOR ALL COUNTRIES AND TERRITORIES)

Narcotic drug	1		2						3		4	
	Quantity to be consumed for domestic medical and scientific purposes		Quantity to be utilized for the manufacture of: (a) Other drugs		(b) Preparations included in Schedule III of the 1961 Convention		(c) Substances not covered by the 1961 Convention		Quantity to be added to special stocks		Quantity to be held in stocks at 31 December of the year to which the estimates relate	
			Whether these other drugs, preparations or substances are intended for domestic consumption or for export									
	kg	g	kg	g	kg	g	kg	g	kg	g	kg	g
ALPHAPRODINE	0	100									0	025
ANILERIDINE	0	100									0	035
BEZITRAMIDE												
CANNABIS	42000	000									3000	000
CANNABIS RESIN												
COCA LEAF	0	100									0	090
COCAINE	20	000									30	000
CODEINE	26531	000			2700	000					10000	000
DEXTROMORAMIDE												
DEXTROPROPOXYPHENE	1250	000			250	000						
DIAMORPHINE												
DIFENOXIN	0	015									0	002
DIHYDROCODEINE	0	200									0	050
DIPHENOXYLATE	50	500									0	500
DIPIPANONE	0	060										
ETHYLMORPHINE	0	002									0	001
HYDROCODONE	110	000									80	000
HYDROMORPHONE	1500	000									600	000
KETOBEMIDONE	0	035										
LEVORPHANOL	0	105									0	002
METHADONE	2500	000									1100	000
MORPHINE	4000	000									2800	000
NICOMORPHINE												

Part II

Annual Estimates of Requirements of Narcotic Drugs
(FOR ALL COUNTRIES AND TERRITORIES)

Narcotic drug	1		2						3		4	
	Quantity to be consumed for domestic medical and scientific purposes		Quantity to be utilized for the manufacture of: (a) Other drugs		(b) Preparations included in Schedule III of the 1961 Convention		(c) Substances not covered by the 1961 Convention		Quantity to be added to special stocks		Quantity to be held in stocks at 31 December of the year to which the estimates relate	
	Whether these other drugs, preparations or substances are intended for domestic consumption or for export											
	kg	g	kg	g	kg	g	kg	g	kg	g	kg	g
NORMETHADONE	20	000			[redacted]	[redacted]					10	000
OPIUM	20	000									15	000
ORIPAVINE **	0	500			[redacted]	[redacted]					0	050
OXYCODONE	10000	000			[redacted]	[redacted]					3000	000
OXYMORPHONE	100	000			[redacted]	[redacted]					3	000
PETHIDINE	1300	000			[redacted]	[redacted]					500	000
PHENOPERIDINE					[redacted]	[redacted]						
PHOLCODINE												
PIRITRAMIDE	0	006			[redacted]	[redacted]						
THEBACON					[redacted]	[redacted]						
THEBAINE	0	100			[redacted]	[redacted]					0	080
TILIDINE	0	016			[redacted]	[redacted]						
	g	mg	g	mg	g	mg	g	mg	g	mg	g	mg
ALFENTANIL	400	000			[redacted]	[redacted]					250	000
ETORPHINE	10	000			[redacted]	[redacted]					8	000
FENTANYL	150000	000			[redacted]	[redacted]					35000	000
REMIFENTANIL	500	000			[redacted]	[redacted]					200000	000
SUFENTANIL	240	000			[redacted]	[redacted]					200	000

Part II

Annual Estimates of Requirements of Narcotic Drugs
(FOR ALL COUNTRIES AND TERRITORIES)

Narcotic drug	1		2						3		4	
	Quantity to be consumed for domestic medical and scientific purposes		Quantity to be utilized for the manufacture of: (a) Other drugs		(b) Preparations included in Schedule III of the 1961 Convention		(c) Substances not covered by the 1961 Convention		Quantity to be added to special stocks		Quantity to be held in stocks at 31 December of the year to which the estimates relate	
			Whether these other drugs, preparations or substances are intended for domestic consumption or for export									
	kg	g	kg	g	kg	g	kg	g	kg	g	kg	g
3-METHYLFENTANYL	0	002										
3-METHYLTHIOFENTANYL	0	010										
ALPHA-METHYLFENTANYL	0	005										
ALPHA-METHYLTHIOFENTANYL	0	005										
BETA-HYDROXYFENTANYL	0	001										
DIAMORPHINE **	3	000									0	500
ISOMETHADONE	0	600										
LEVOMETHORPHAN	0	010										
LEVOMORAMIDE	0	050										
MORAMIDE INTERMEDIATE	0	050										
RACEMORAMIDE	0	050										
THIOFENTANYL	0	011										

Part II

Annual Estimates of Requirements of Narcotic Drugs
(FOR ALL COUNTRIES AND TERRITORIES)

Narcotic drug		1		2						3		4	
		Quantity to be consumed for domestic medical and scientific purposes		Quantity to be utilized for the manufacture of: (a) Other drugs		(b) Preparations included in Schedule III of the 1961 Convention		(c) Substances not covered by the 1961 Convention		Quantity to be added to special stocks		Quantity to be held in stocks at 31 December of the year to which the estimates relate	
				Whether these other drugs, preparations or substances are intended for domestic consumption or for export									
		kg	g	kg	g	kg	g	kg	g	kg	g	kg	g
Concentrate of poppy straw (M)*													
AMA (%)	**												
ACA (%)	**												
ATA (%)	**												
Concentrate of poppy straw (T)*													
ATA (%)	**												
AMA (%)	**												
ACA (%)	**												
Concentrate of poppy straw (O)*													
AOA (%)	**												
AMA (%)	**												
	**												

* Quantities to be expressed in gross weight.

**Average anhydrous alkaloid content of the concentrate of poppy straw.

s.20(1)(b)

Part III

Annual Estimates of the Manufacture of Synthetic Narcotic Drugs
(CONCERNS ONLY COUNTRIES AND TERRITORIES WHERE THE MANUFACTURE OF SYNTHETIC NARCOTIC DRUGS IS AUTHORIZED)

I. Synthetic drugs of Schedule I of the 1961 Convention

Acetylmethadol
Acetyl-*alpha*-methylfentanyl
Alpha-methylfentanyl
Alpha-methylthiofentnayl
Alfentanil
Allylprodine
Alphacetylmethadol
Alphameprodine
Alphamethadol
Alphaprodine
Anileridine
Benzethidine
Betacetylmethadol
Beta-hydroxyfentanyl
Beta-hydroxy-3-methyl fentanyl
Betameprodine
Betamethadol
Betaprodine
Bezitramide
Clonitazene
Dextromoramide
Diampromide
Diethylthiambutene
Difenoxin
Dimenoxadol
Dimepheptanol
Dimethylthiambutene
Dioxaphetyl butyrate
Diphenoxylate
Dipipanone
Drotebanol
Ethylmethylthiambutene
Etonitazene
Etoxeridine
Fentanyl
Furethidine
Hydroxypethidine
Isomethadone
Ketobemidone
Levomethorphan
Levomoramide
Levophenacylmorphan
Levorphanol
Metazocine
Methadone
Methadone-Intermediate
3-methylfentanyl
3-methylthiofentanyl
Moramide-Intermediate
Morpheridine
MPPP
Noracymethadol
Norlevorphanol
Normethadone
Norpipanone
PEPAP
Pethidine
Pethidine-Intermediate-A
Pethidine-Intermediate-B
Pethidine-Intermediate-C
Phenadoxone
Phenampromide
Phenazocine
Phenomorphan
Phenoperidine
Piminodine
Piritramide
Proheptazine
Properidine
Racemethorphan
Racemoramide
Racemorphan
Remifentanil
Sufentanil
Thiofentanyl
Tilidine
Trimeperidine

II. Synthetic drugs of Schedule II of the 1961 Convention

Dextropropoxyphene
Propiram

Industrial establishments which will be engaged in the manufacture of synthetic drugs	Quantities of synthetic drugs to be manufactured by each industrial establishment (In kilograms)								
	3-METHYLFENTANYL	3-METHYLTHIOFENTANYL	ALFENTANIL	ALPHA-METHYLFENTANYL	ALPHA-METHYLTHIOFENTANYL	BETA-HYDROXYFENTANYL	DEXTROPROPOXYPHENE	DIFENOXIN	DIPHENOXYLATE
[redacted]							0.015	0.015	
[redacted]	0.002	0.01	0.002	0.005	0.005	0.001	0.006		0.01

Health Canada / Santé Canada

Access to Information and Privacy Division
7th Floor, Suite 700, Holland Cross, Tower B
1600 Scott Street
Address Locator: 3107A
Ottawa, Ontario K1A 0K9

DEC 16 2013

Our file: A-2013-00587 / nm

Ron Marzel
Marzel Law Barrister & Solicitor
265 Rimrock Rd.
Suite 200
TORONTO ON M3J 3C6

Dear Mr. Marzel:

This is in response to your request made under the *Access to Information Act* (the *Act*) for:

With regards to licenses issued under the Marihuana Medical Access Regulations, SOR/201-227, (MMAR) and the Marihuana for Medical Purposes Regulations(citation not available) (MMPR)

At the time of the repeal of licences issued under the MMAR on March 31, 2014, based on the actual applications received by Health Canada, as well as the licences Health Canada anticipates to issue for production of cannabis, the anticipated total annual production capacity of dried cannabis, expressed in kilograms per year, of all anticipated Licensed Producers under the MMPR estimated to be as of April 1st, 2014 (Would you be kind enough to provide us with your estimate in this regard on a monthly basis, commencing August 2013 and ongoing to March 2014)..

Enclosed is a copy of the records requested. Some records, or portions of records, are withheld from disclosure pursuant to the following provisions of the Act: 20(1)(b) [third party financial, commercial, scientific or technical information given in confidence to the government].

If you have any questions or concerns about the processing of your request, please do not hesitate to contact Nina Muminovic, the Analyst responsible for this request, either by phone at (613) 762-6809, or by fax at (613) 941-4541, or by e-mail at nina.muminovic@hc-sc.gc.ca with reference to the file number cited above.

Please be advised that you are entitled to complain to the Office of the Information Commissioner of Canada concerning the processing of your request within 60 days of the receipt of this notice. In the event you decide to avail yourself of this right, your notice of complaint should be addressed to:

The Information Commissioner of Canada
Place de Ville, Tower B
112 Kent Street, 7th Floor
Ottawa, Ontario K1A 1H3

Yours sincerely,

for Amanda Wilson
Coordinator, Access to Information and Privacy Division

Attached: Pages 1 - 8

This is Exhibit "C" referred to in the affidavit of Danielle Lukiv sworn before me at Abbotsford BC this 17th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Canada

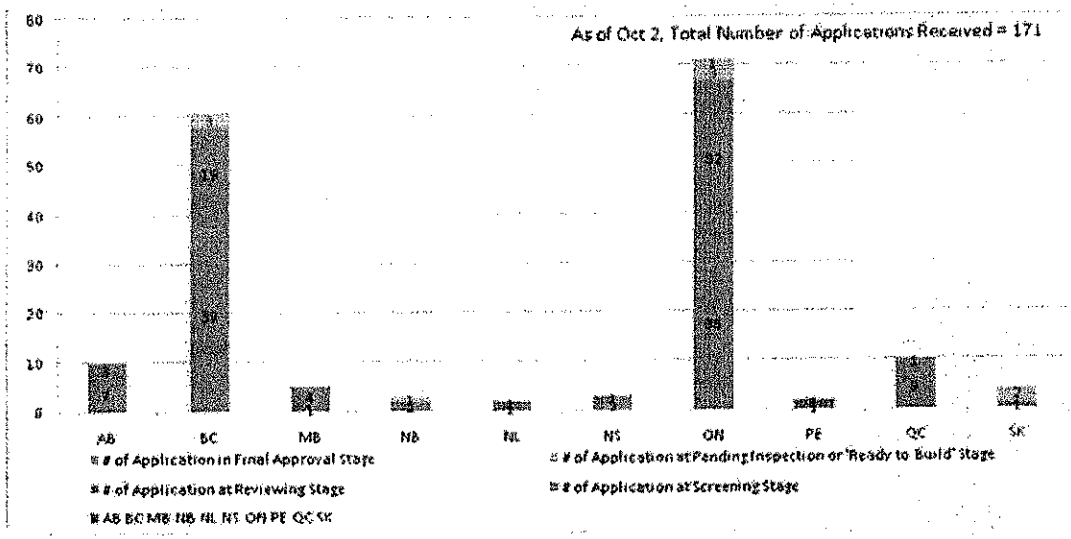
Marihuana for Medical Purposes Regulations (MMPR) Reporting Dashboard

As of October 2, 2013

Application Processing and Licensing Activities

Total Applications to Become a Licensed Producer in Process	Applications in Screening & Triage Phase	Applications to RCMP for Security Clearance	Applications in Review Phase	Applications in Pre-Licence Security Inspection Phase		Applications in Final Review and Approval Stage	Licences Issued
				Staged Licensing	Regular Licensing		
171	97	79	63	1	7	0	3*

*1 of the 3 licences issued is a staged-interim licence (3 months)



s.20(1)(b)

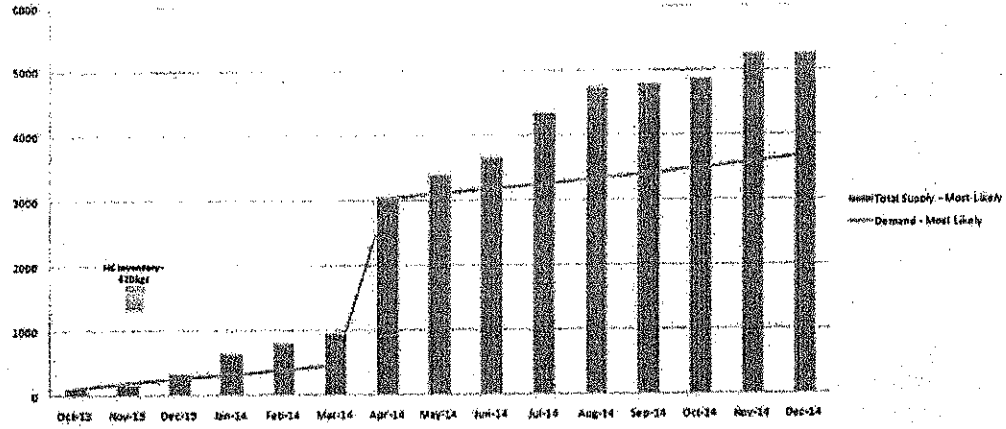
Marihuana for Medical Purposes Regulations (MMPR) Reporting Dashboard

As of October 2, 2013

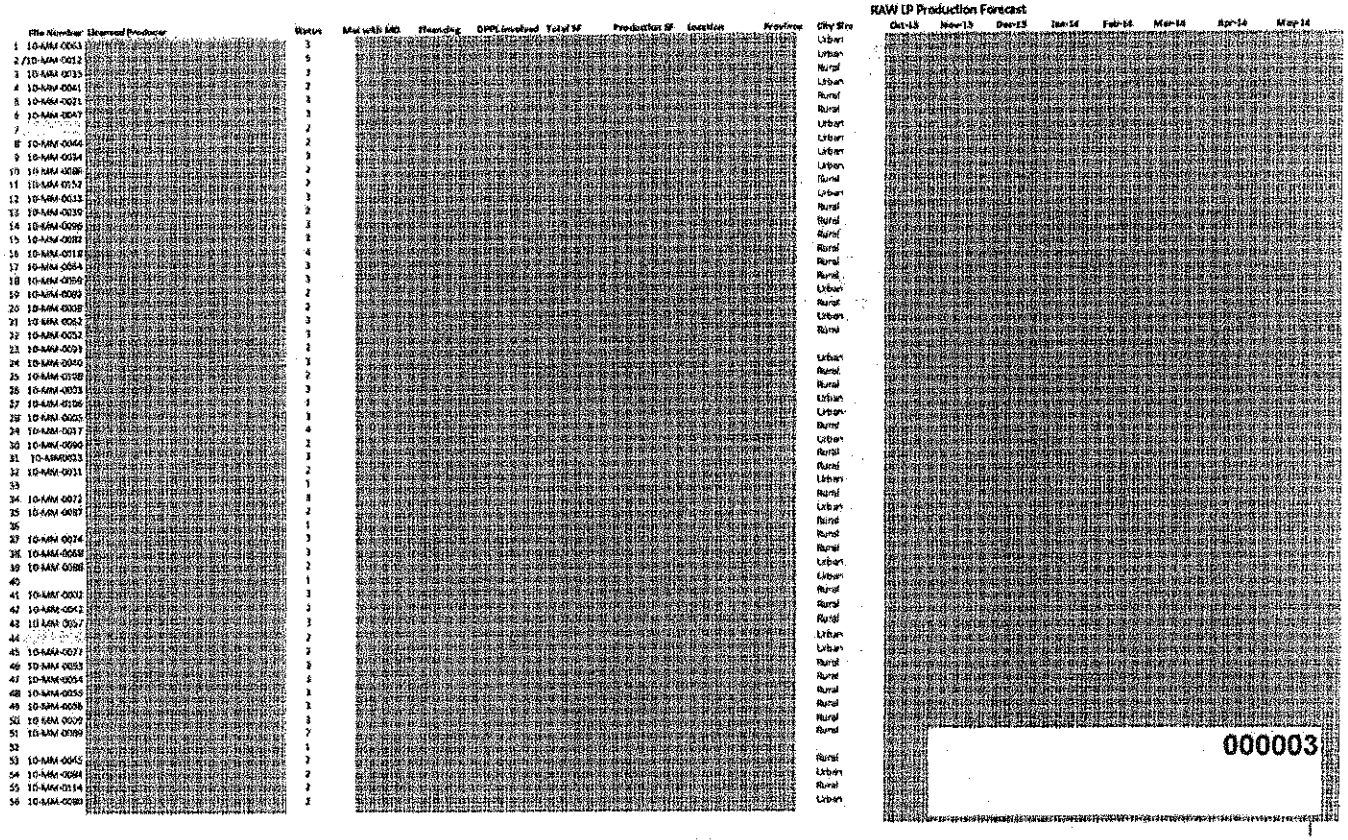
Industry Outreach Activities & Highlights

- Completed calls and meetings with approximately 45 high-potential licensed producers, communications and discussions are ongoing
- [redacted] participation in licensed producer financing
- Follow-up with financial institutions on services (e.g. credit, processing of credit card transactions) for licensed producers
- **CURRENT RISK WEIGHTED PRODUCTION FORECAST – 3,055 kgs in April 2014**

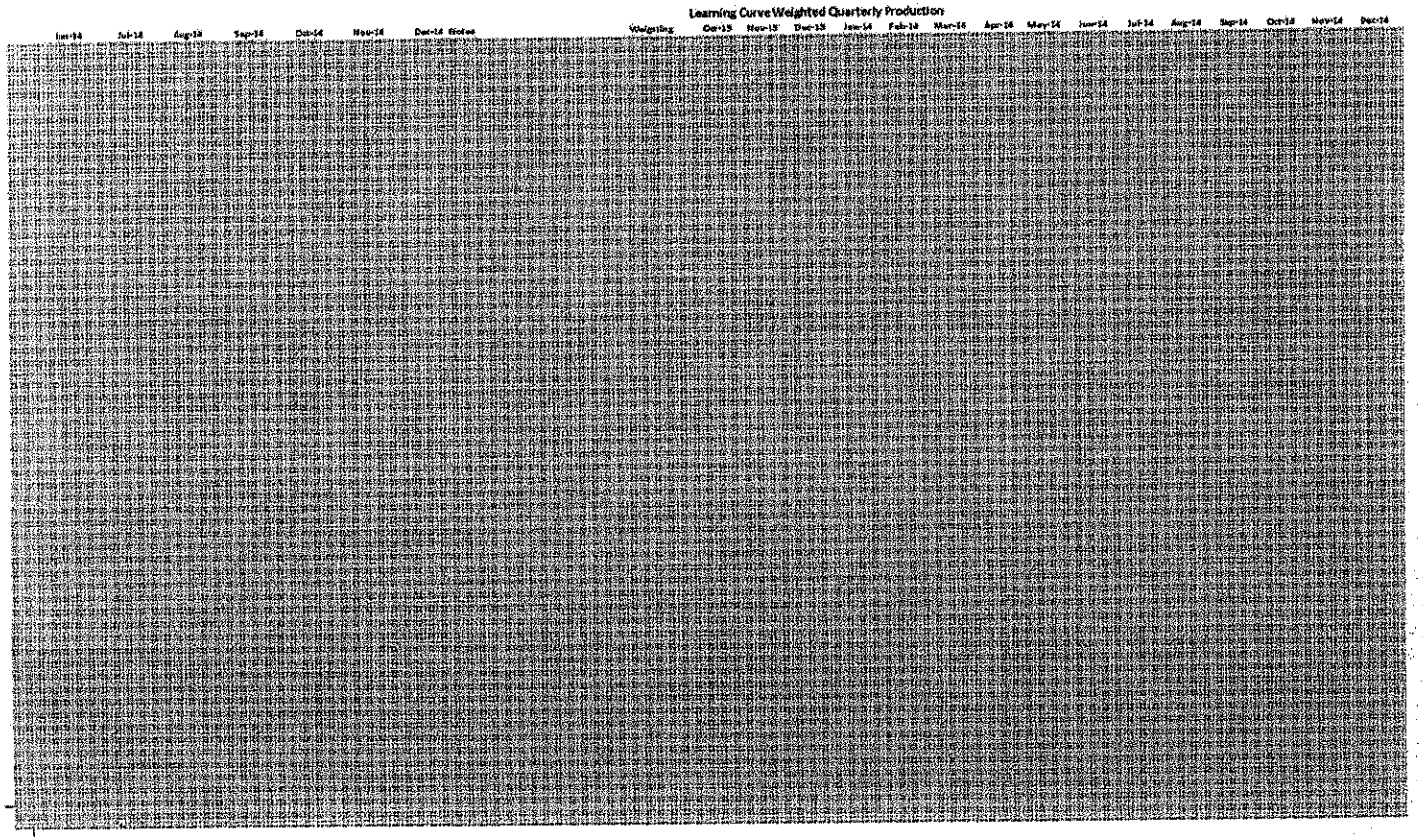
Medical Marihuana Market Projections to December 2014 (kilos/month)
Most Likely Scenario



s.20(1)(b)



s.20(1)(b)



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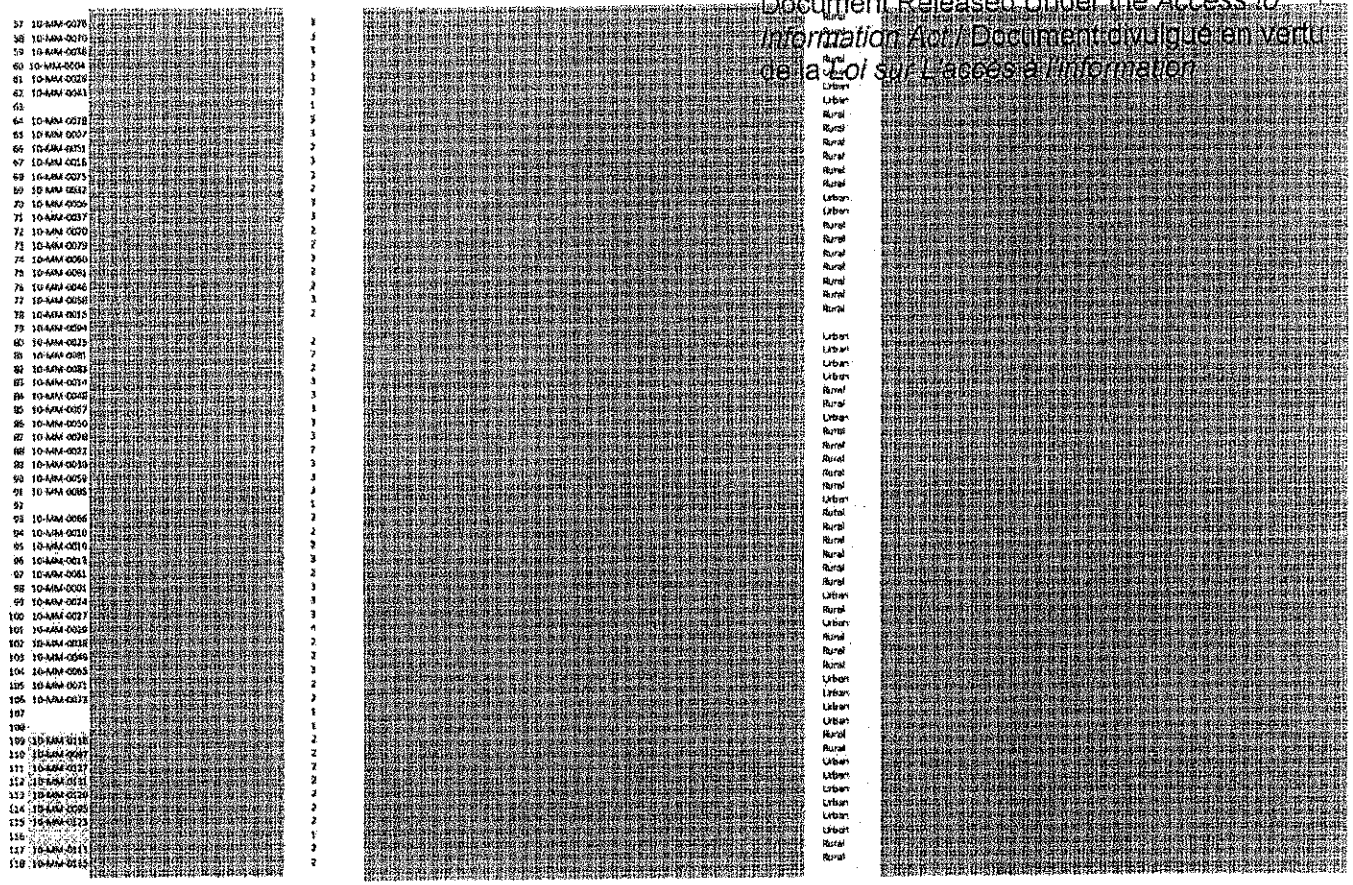

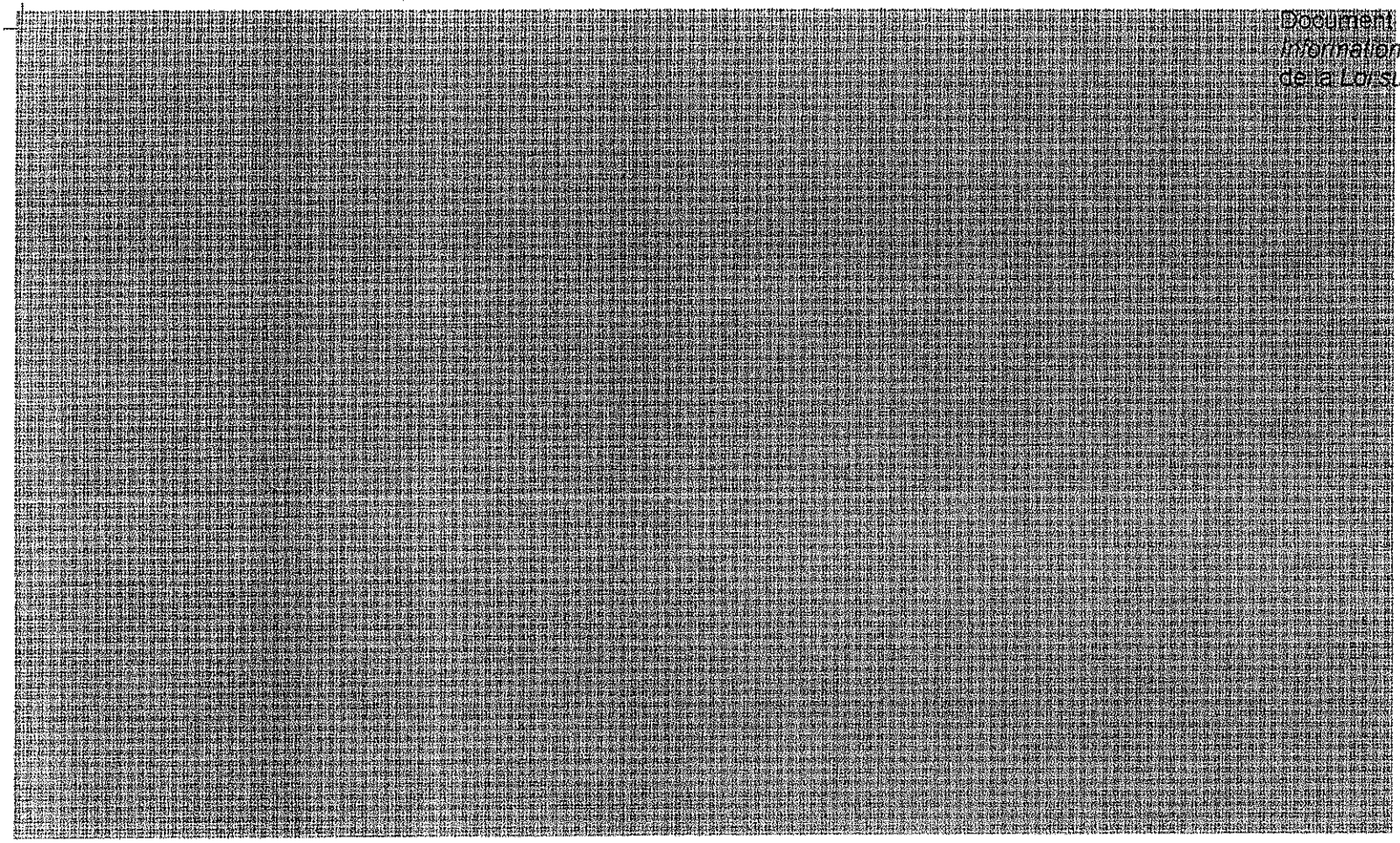

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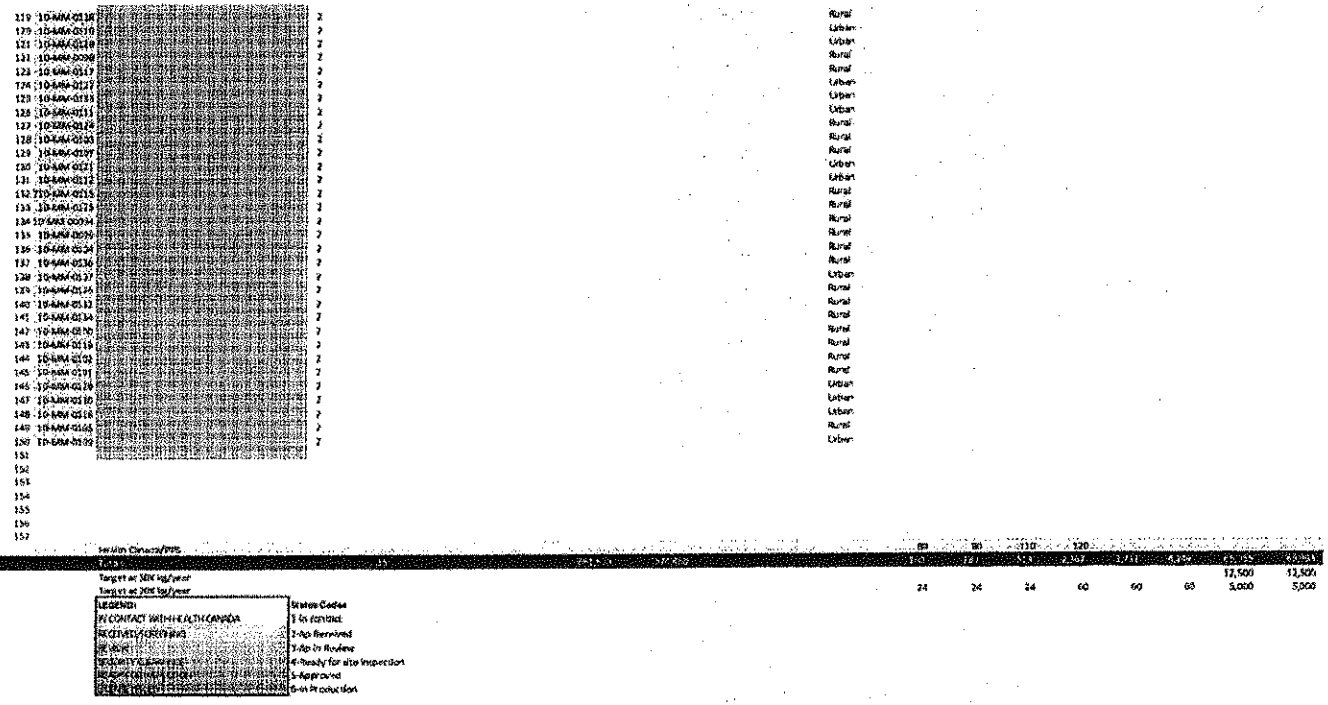

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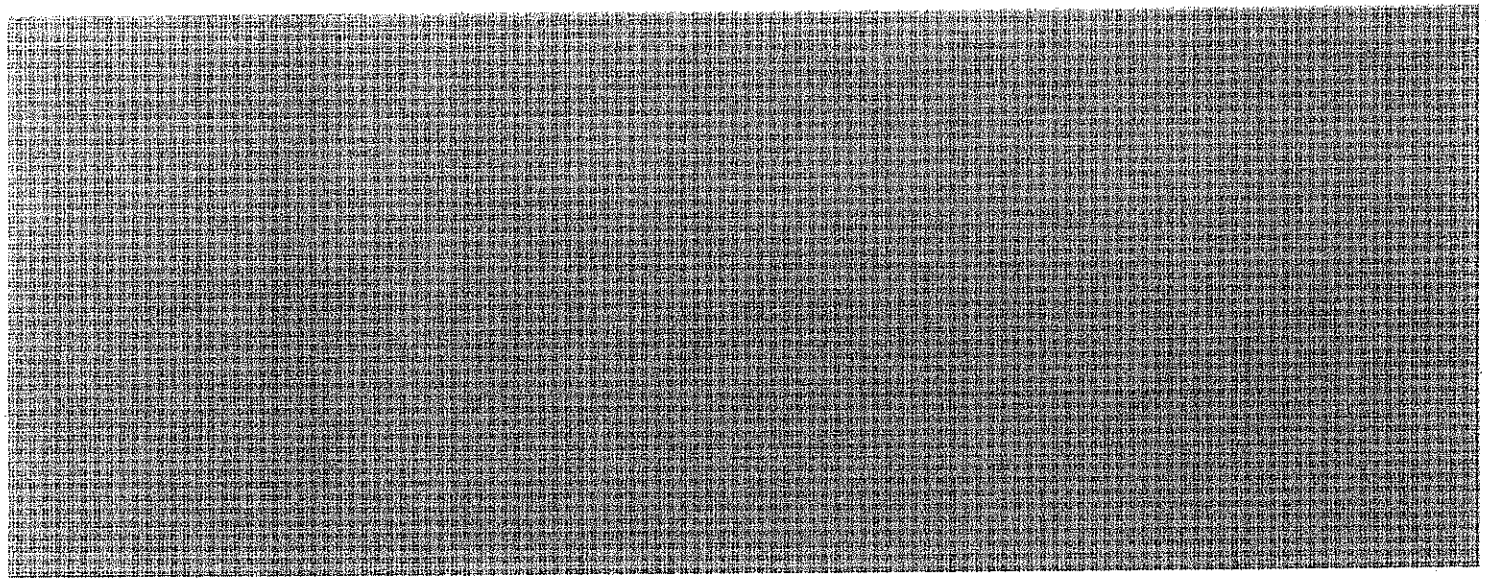

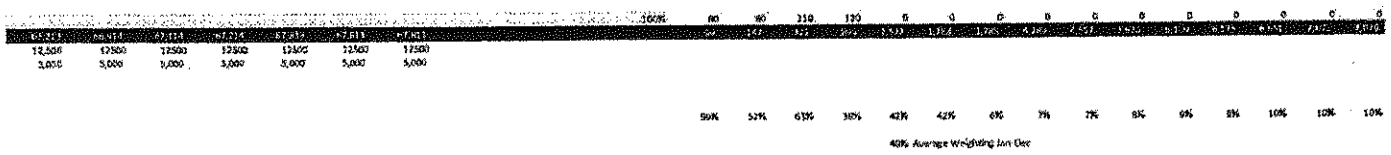

Health Canada Santé Canada

Canada

Drugs and Health Products

List of Authorised Licensed Producers under the *Marihuana for Medical Purposes Regulations*

Below is a list of authorised licensed producers that have provided their consent to share their contact information. The list is sorted by alphabetical order.

Authorised Licensed Producers

Name of licensed producer	Phone number	Email (if applicable)	Website (if applicable)
CanniMed Ltd.	1-855-787-1577	info@cannimed.com	CanniMed
Mettrum Ltd.	1-866-640-3455	info@mettrum.com	Mettrum Ltd.
The Peace Naturals Project Inc	1 888 64-PEACE (73223)	info@peacenaturals.com	The Peace Naturals

Please verify this website regularly for updated information.

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Date Modified: 2013-11-01

This is Exhibit "D" referred to in
the affidavit of Danielle Lukiv
sworn before me at Abbotsford BC
this 17th day of Jan 2014

A Commissioner for taking Affidavits
for British Columbia

Fire Losses in Canada

Year 2007 and Selected Years

Mahendra Wijayasinghe, PhD
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Office of the Fire Commissioner
Public Safety Division
Alberta Municipal Affairs

Presented at the CCFM/FC Meeting – September 2011, Calgary, Alberta, Canada

Abstract

Fire incident data for 2007 from BC, AB, MB, ON, NB, and NS; for 2008 from SK; and for 2003 – 2007 from NT was analysed separately. A total of 42,753 fires resulted in 224 civilian deaths, two firefighter deaths, and $1,551,657,179 in direct property damage.

On average, home fires accounted for 30% of all fires and 73% of all fire deaths in the jurisdictions that contributed data. Cooking is the leading cause of home fires and home fire injuries, while smoking materials are the leading cause of home fire deaths. One-third (33%) of all home fire deaths were caused by fires that started in the living room; 20% resulted from fires originating in the bedroom; and 11% were caused by fires starting in the kitchen. Fire causes in Canadian homes were very similar to those reported for homes in the United States.

Keywords: Canadian fire statistics, home fires, fire causes.

Acknowledgements

The author thanks all the provincial, territorial and Department of National Defence (DND) contacts listed below who assisted in this study by sharing their fire data, resolving data issues and providing feedback on the analysis output:

BC: Dave Ferguson, Deputy Fire Commissioner, Executive Director, Mitigation Emergency Management BC
SK: Cheryl Diebert, Deputy Commissioner, Emergency Management and Fire Safety and Sean McKenzie, Business Information Officer, Emergency Management and Fire Safety
MB: Paige Dimayuga, Statistician, Labour and Immigration, Office of the Fire Commissioner
ON: Alison Wilson, Coordinator, Statistical Services, Office of the Ontario Fire Marshal
NB: Stacey Cooling, Fire Reporting Officer, Office of the Fire Marshal
NS: Sheila S. Harvey, Fire Services Coordinator, Fire Safety Office of the Fire Marshal
NT: Stephen Moss, Fire Marshal
QC: Marc Marcotte, Technicien en administration, Service des statistiques & Sylvie Mathurin Chef du Service des statistiques, Ministère de la Sécurité publique, Direction générale de la Sécurité civile et de la Sécurité incendie
DND: Luc Page, Canadian Forces Fire Marshal

Executive Summary

The 2002 Annual Report of Fire Losses in Canada[1], published in 2007 by the Council of Canadian Fire Marshals and Fire Commissioners (CCFM/FC) is the last available analysis of nation-wide fire losses in Canada. The present analysis was carried out on fire incident data from Canadian provinces, territories and the Department of National Defence (DND) using analytical programs (Statistical Analysis System (SAS) software) developed at the Office of the Alberta Fire Commissioner. Data contributed by BC, AB, MB, ON, NB, and NS for 2007; by SK for 2008; by NT for 2003 - 2007; and by the DND for 2006 - 2008 was analysed. Data from QC was not complete, and from PE, NL, YK and NU was not available, hence not analysed.

An initial assumption of the study was that all Canadian jurisdictions code fire incident data using the Canadian Coding Structure (CCS) accepted in 2002 by the CCFM/FC. However, examination of data structures revealed that none of the contributing jurisdictions fully conform to the CCS. While using the CCS as the base, each jurisdiction has developed their own coding so as to be different from the CCS to varying degrees. A Task Group (National Research Council and the Office of the Ontario Fire Marshal) study (personal correspondence: Mary Prencipe, Fire Protection Engineer, Office of the Ontario Fire Marshal) on National Fire Loss Reporting, presented to the CCFM/FC in 2008, also identified a number of inconsistencies between jurisdictions in definitions of "fire," "fire death," "child," "fires with and without dollar loss." In addition, the same study noted variations in the inclusion of fire incident and fire death data from First Nations Communities. The present study did not attempt to address these jurisdictional fire data differences except that the Alberta analytical programs were modified to suit the somewhat unique data structure of each jurisdiction. Accordingly, the data received from each jurisdiction was analysed separately and presented. In addition, fire death data from the contributing jurisdictions (BC, AB, SK, MB, ON, NB, NS and NT), represented by about 75% of the Canadian population, was combined to characterize the causes of fatal fires in "Canada" and in "Canadian homes." Readers are encouraged to access the respective websites of the provincial/territorial fire marshals or fire commissioners to gain an understanding of jurisdictional variations in fire loss data before attempting any inter-provincial comparisons.

Key variables used in the analysis were: year, property classification, source of ignition/igniting object, material first ignited, act or omission/possible cause, area of origin, deaths, injuries, and $ losses. Analysis was not exhaustive but of a preliminary nature and carried out in two stages: First, a top-down analysis of fire data was conducted for each jurisdiction in the following order: 1. Total number of fires, deaths, injuries, and $ losses. 2. Fires by types of property (structural, vehicle, outdoor). 3. Residential fires. 4. Home fires. 5. Areas of fire origin in homes. 6. Home fire causes. Second, a summary of fire deaths by property classification and fire causes was computed for each jurisdiction.

There were a total of 226 fire deaths recorded in BC, AB, SK, MB, ON, NB, NS, and NT. Of these, MB reported two firefighter deaths. Major causes of fatal fires in Canada were: smoking (22%), arson/set fire (9%), electrical (5%), cooking (5%), child fire-play (3%), flammable gas/flammable or combustible liquid ignition (3% each), candles (2%), heating equipment (2%) and exposure (1%).

A total of 42,753 fires were recorded in BC, AB, SK, MB, ON, NB, NS, NT. Direct property damage from these fires was estimated at $1,551,657,179. The distribution of fires by property type varied vastly between Canadian jurisdictions (DND not included) and averaged 54% (range 32-78%) structural, 19% (range 8-31%) vehicle and 25% (range 8-52%) outdoor. Corresponding distribution in the US[2] for 2007 was 34%, 17% and 49%, respectively. Fires in residential

properties accounted, on average, for 69% of all structural fires and 79% of all structural fire deaths. The corresponding figure for residential fires in the US was 78% in 2007. Homes representing one/two family dwellings, apartments and mobile homes accounted for 82% of all fires in residential properties and 83% of all residential fire deaths. In the US, 75.2% of residential fires occurred in 1 and 2 family dwellings and apartments[3]. In Canada, home fires accounted for 30% of all fires and 67% of all fire deaths.

Major areas of fire origin in Canadian homes (BC, AB, SK, MB, ON, NB, NS, NT) were kitchen (22%), outside area (includes porch, balcony, court, patio, terrace, lawn, other...) (9%), bedroom (9%), living room (8%), chimney/flue-pipe (5%), vehicle garage (5%), exterior wall (4%), and laundry area (3%). In US homes, the leading areas of fire origin were kitchen (41%), bedroom (8%), chimney/flue-pipe (6%), living room (4%), laundry room (3%). One-third (32%) of all home fire deaths were caused by fires that started in the living room; 20% resulted from fires originating in the bedroom; and 12% were caused by fires starting in the kitchen. The distribution of fire deaths by leading areas of fire origin in US homes[3] were bedroom (25%), living room (24%), kitchen (15%), laundry area (1%), and unclassified functional areas (11%).

The major causes of home fires in Canada on the basis of data from BC, AB, SK, MB, ON, NB, NS, NT were: Cooking (20%), heating equipment related fires (12%), arson/set fires (11%), electrical (8%), smoking (7%), candles (3%), appliance/equipment, clothes dryer, exposure, lighting equipment, cutting/welding or blow torch (2% each), and child fireplay (1%). The ranking of fire causes in US homes[3] was very similar – cooking equipment (42%), heating (17%), intentional (8%), electrical (6%), smoking (5%), clothes dryer (4%), and candles (3%), exposure (3%), and playing with heat source (2%).

Where cause was identified, most fire deaths in Canadian homes were from smoking (22%), arson/set fire (10%), cooking (7%), electrical (7%), candles (3%) and child fire-play (3%). The leading cause of home fire injuries in Canadian homes were, cooking (27%), smoking (9%), arson/set fire (8%), heating equipment and electrical (6% each), and candles (5%). About 50% of all cooking related fire injuries were from cooking oil fires.

Conclusion: Fire incident data as it currently exists in various Canadian jurisdictions can be analysed to some degree, as demonstrated in this study, to yield meaningful interpretations and to build a fire picture for Canada as long as variations in data definitions and data collection are kept in mind. Such analysis can be supportive of fire prevention than what has been published in the "*Fire Losses in Canada*[1]" report. The present study was only an initial exploration to examine this feasibility and to generate a somewhat in-depth analysis of home fires which account for most fire deaths and fire injuries in Canada.

References:

[1]*Annual Report 2002, Fire Losses in Canada* (2007). Council of Canadian Fire Marshals and Fire Commissioners. Source: http://www.ccfmfc.ca/stats/en/report_e_02.pdf

[2]*Fire Loss in the United States 2007* (2008). Michael J. Karter, Jr., Fire Analysis and Research Division, National Fire Protection Association, Quincy, MA.
Source: http://tkolb.net/FireReports/2007FireLossUS.pdf

[3]*U.S. Home Structure Fires* (2011), Marty Ahrens, Fire Analysis and Research. National Fire Protection Association, Quincy, MA.

Fire Data Analyses by Canadian Province/Territory

British Columbia

Fire Losses in BC - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	7,847	37	171	436,985,580
Total	7,847	37	171	436,985,580

Fire Losses in BC by Type of Property Class - 2007

Year	Fires	Structural	Vehicle	Outdoor	Equipment
2007	7,847	3,527	2,140	2,239	44
%	100	45	27	29	1

Fire Losses in BC by Major Property Classes - 2007

Major Property Class	Fires	%	$ Losses	% of $ Losses
Assembly	235	3	33,836,099	7.7
Institutional	31	0	423,175	0.1
Residential	2,371	30	229,722,672	52.6
Business and Personal Service	78	1	8,623,079	2.0
Mercantile	111	1	11,685,070	2.7
Industrial Manufacturing Properties	171	2	13,584,377	3.1
Storage Properties	198	3	75,138,202	17.2
Special Property-Transportation Equip.	4,337	55	54,887,935	12.6
Miscellaneous Property	309	4	9,084,171	2.1
Unknown (not coded)	6	0	800	0.0
Total	7,847	100	436,985,580	100.0

Fire Losses in BC by Major Sources of Ignition - 2007

Major Source of Ignition	Fires	%	$ Losses	%
Cooking Equipment	655	8	15,724,644	3.6
Heating Equipment	392	5	21,377,244	4.9
Appliances & Equipment	155	2	9,384,867	2.1
Electrical Distribution Equipment	456	6	30,399,747	7.0
Other Electrical Equipment	196	2	7,833,276	1.8
Smoker's Material & 'Open' Flames	1,565	20	112,003,983	25.6
Exposure	249	3	63,774,861	14.6
Miscellaneous	517	7	17,870,436	4.1
Not Determined	3,662	47	158,616,522	36.3
Total	7,847	100	436,985,580	100.0

Fire Losses in BC by Major Acts or Omissions - 2007

Major Act or Omission	Fires	%	$ Losses	%
Arson or 'Set' Fires	1,942	25	47,753,523	10.9
Misuse of Source of Ignition	527	7	29,788,036	6.8
Misuse of Material Ignited	171	2	6,513,414	1.5
Mech., Electr. Failure, Malfunction	992	13	23,689,246	5.4
Constructn., Design, Installn. Def.	99	1	7,298,801	1.7
Misuse of Equipment	256	3	9,938,351	2.3
Human Failing	1,277	16	94,232,753	21.6
Vehicle Accident	107	1	884,152	0.2
Miscellaneous	95	1	2,716,790	0.6
Not Determined	2,241	29	201,151,952	46.0
xxxx	140	2	13,018,562	3.0
Total	7,847	100	436,985,580	100.0

Fire Losses in BC by Major Materials First Ignited - 2007

Major Material First Ignited	Fires	%	$ Loss	%
Building Components	215	3	30,939,594	7.1
Furniture, Furnishings	238	3	10,293,170	2.4
Clothing, Textiles	297	4	21,196,111	4.9
Wood, Paper Products	1,112	14	90,235,684	20.6
Flammable & Combustible Liquids	675	9	19,512,621	4.5
Flammable Gases	66	1	2,531,003	0.6
Chemicals	340	4	5,090,980	1.2
Agricultural Products	730	9	19,105,923	4.4
Miscellaneous	1,012	13	22,771,926	5.2
Not Determined	3,162	40	215,308,568	49.3
Total	7,847	100	436,985,580	100.0

Fire Losses in BC by Type of Residential Property - 2007

Type of Residence	Fires	%	Fire Deaths	Fire Injuries	$ Losses
One and Two Family Dwellings	1,590	67	17	82	144,903,033
Apartments	528	22	6	38	74,389,839
Residential Miscellaneous-Unclassified	57	2	4	3	2,905,099
Mobile Home, Trailer-Unclassified	31	1	1	1	1,132,949
Motor Home (includes camperized van)	31	1	0	0	545,470
Travel Trailer	30	1	0	1	387,400
Hotel, Inn, Lodge (year round use)	23	1	0	0	246,620
Motor Hotel, Motel (over 20 units)	15	1	0	0	1,542,350
School, College or University Dormitory	9	0	0	0	1,801
Rooming, Boarding, Lodging House (less than 10 persons)	8	0	0	0	240,423
Motor Hotel, Motel (3 to 20 units)	6	0	1	0	662,005
Rooming, Boarding, Lodging House-Unclassified	6	0	0	0	159,230
Truck with Camper	5	0	0	0	10,800
Hotel, Inn, Lodge (hostels)	5	0	0	0	117,400
Single Cabins	5	0	0	0	303,000
Camping Trailer (includes tent trailer)	3	0	1	0	55,000
Tents	2	0	1	0	2,000
Hotel, Inn, Lodge-Unclassified	1	0	0	0	143,703
Dormitory-Unclassified	1	0	0	0	5,000
Children's Playhouse	1	0	0	0	22,000
Hotel, Inn, Lodge (seasonal use, in season)	1	0	0	0	1,600,000
Bunkhouse & Worker's Barracks	1	0	0	0	10,000
Total	2,359	100	31	125	229,385,122

Fire Losses in BC Homes (One/Two Family Dwellings, Apartments, Mobile Homes) - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
One/Two Family Dwellings	1,550	73	16	78	143,602,522
Apartments	528	25	6	38	74,389,839
Mobile Homes	39	2	1	4	1,260,511
Permanent year-round float home	1	0	0	0	40,000
Total	2,118	100	23	120	219,292,872

Home Fires in BC by Major Areas of Fire Origin - 2007

Area of Origin	Fires	%	Deaths	Injuries	$ Losses
Kitchen	556	26	1	37	14,170,221
Living room	204	10	11	21	17,819,916
Bedroom	169	8	6	18	11,286,367
Chimney - masonry/factory built, metal; flue-pipe; gas-vent	131	7	0	0	1,650,291
Outside Area - lawn, balcony, court, patio…	154	8	0	2	15,271,964
Exterior wall	79	4	0	2	8,069,468
Exterior roof	34	2	0	0	1,454,823
Vehicle Garage/ Carport	64	3	0	3	4,821,040
Laundry area	62	3	0	7	1,726,498
Heating equipment room	50	2	0	0	4,843,200
Exposure (including smoke damage)	50	2	0	1	8,282,401
Washroom	47	2	0	3	1,408,284
Ceiling & roof/ceiling space (attic)	46	2	0	3	4,641,865
All Other Area of Origin (each 1% or less)	359	15	0	20	94,690,119
Unknown	113	5	5	3	29,156,415
Total	2,118	99	23	120	219,292,872

Major Known Causes of Home Fires in BC - 2007

Fire Cause	Fires	%	Deaths	Injuries	$ Losses
Cooking (except cooking oil fire)	487	23	0	41	10,339,499
Heating Equipment Related	298	14	1	10	14,715,931
Arson/Set Fire	250	12	0	9	25,179,735
Electrical Distribution Equipment	145	7	0	1	23,280,721
Smoking	80	4	3	3	3,864,767
Candle	66	3	0	7	2,969,217
Exposure Fire	56	3	0	1	9,186,275
Cutting/Welding Equipment or Blow Torch	45	2	0	5	1,720,895
Appliance/Equipment Related	43	2	0	0	3,914,699
Lighting Equipment	42	2	0	3	2,014,708
Clothes Dryer	36	2	0	1	133,739
Other Electrical Equipment	32	2	0	0	871,949
Flammable/Comb. Liquid Ignition	14	1	0	5	1,561,496
Cooking Oil Fire	12	1	0	0	136,670
Flammable Gas Ignition	7	0	0	0	346,400
Other Causes/Unknown	505	24	19	34	119,056,171
Total	2,118	100	23	120	219,292,872

Fire Deaths in BC by Property Class - 2007

Property Class	Deaths	%
One and Two Family Dwellings	17	46
Apartments	6	16
Residential Miscellaneous-Unclass.	4	11
Shed (includes implement shed & workshop)	2	5
Camping Trailer (includes tent trailer)	1	3
Mobile Home, Trailer-Unclass.	1	3
Motor Hotel, Motel (3 to 20 units)	1	3
Chemicals, Petroleum, Paints, Plastics-Unclass.	1	3
Vehicle & Non-Motorized Hauling Vehicle	1	3
Barn Storage (excludes silos & animal barn)	1	3
Tents	1	3
Automobile (Incl. cars/light trucks/vans/single body units)	1	3
Total	37	100

Property Class	Deaths	%
Residential	30	81
Shed	2	5
Chemicals, Petroleum, Paints, Plastics-Unclass.	1	3
Vehicle & Non-Motorized Hauling Vehicle	1	3
Barn Storage (excludes silos & animal barn)	1	3
Tents	1	3
Automobile (Incl. cars/light trucks/vans/single body units)	1	3
Total	37	100

Major Known Causes of Fire Deaths in BC - 2007

Fire Cause	Deaths	%
Other Causes/Unknown	29	78
Smoking	3	8
Heating Equipment Related	1	3
Electrical Distribution Equipment	1	3
Flammable Gas Ignition	1	3
Flammable/Comb. Liquid Ignition	1	3
Appliance/Equipment Related	1	3
Total	37	100

Major Sources of Ignition in Fire Deaths in BC - 2007

Source of Ignition	Deaths	%
Cannot be determined	22	59
Smoker's material	10	8
Heating equipment	1	3
Low voltage wiring	1	3
Chemical reaction	1	3
Miscellaneous igniting object	1	3
Appliances & equipment - unclassified	1	3
Total	37	100

Alberta

Fire Losses in Alberta - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	5,310	23	212	333,256,887
Total	5,310	23	212	333,256,887

Fire Losses in AB by Type of Property Class - 2007

Year	Total # of Fires	Structural	Vehicle	Outdoor
2007	5,310	3,106	1,635	569
%	100	58	31	11

Fire Losses in AB by Major Property Classes - 2007

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	%
Assembly	131	2	0	4	18,569,495	6
Institutional	29	1	1	4	1,753,422	1
Residential	1,903	36	17	141	171,732,020	52
Business and Personal Service	60	1	0	0	10,531,434	3
Mercantile	154	3	0	3	18,928,757	6
Industrial Manufacturing Properties	97	2	0	9	20,228,785	6
Storage Properties	339	6	0	14	30,640,740	9
Special Property-Transportation Equip.	2,238	42	5	27	48,880,512	15
Miscellaneous Property	359	7	0	10	11,991,722	4
Total	5,310	100	23	212	333,256,887	100

Fire Losses in AB by Major Sources of Ignition - 2007

Major Source of Ignition	Fires	%	$ Losses	%
Not Determined	1,497	28	114,373,450	34.3
No Igniting Object	26	0	5,497,171	1.6
Cooking Equipment	382	7	14,926,048	4.5
Heating Equipment	245	5	19,139,189	5.7
Appliances & Equipment	160	3	11,769,213	3.5
Electrical Distribution Equipment	520	10	26,706,152	8.0
Other Electrical Equipment	163	3	8,789,497	2.6
Smoker's Material & 'Open' Flames	1,177	22	59,517,482	17.9
Exposure	620	12	31,109,739	9.3
Miscellaneous	520	10	41,428,946	12.4
Total	5,310	100	333,256,887	100.0

Fire Losses in AB by Major Acts or Omissions - 2007

Major Act or Omission	Fires	%	$ Losses	%
Not Determined	784	15	69,630,930	20.9
Act or Omission N/A	204	4	14,674,426	4.4
Arson or 'Set' Fires	1,429	27	64,640,746	19.4
Misuse of Source of Ignition	384	7	36,672,724	11.0
Misuse of Material Ignited	276	5	16,306,684	4.9
Mech., Electr. Failure, Malfunction	1,251	24	65,328,706	19.6
Constructn., Design, Installn. Def.	102	2	7,624,784	2.3
Misuse of Equipment	82	2	5,538,566	1.7
Human Failing	619	12	35,110,381	10.5
Vehicle Accident	78	1	2,941,164	0.9
Miscellaneous	101	2	14,787,776	4.4
Total	5,310	100	333,256,887	100.0

Fire Losses in AB by Major Materials First Ignited - 2007

Major Material First Ignited	Fires	%	$ Losses	%
Not Determined	1,702	32	134,810,013	40.5
Building Components	621	12	53,630,599	16.1
Furniture, Furnishings	198	4	19,362,179	5.8
Clothing, Textiles	180	3	5,310,089	1.6
Wood, Paper Products	468	9	13,969,070	4.2
Flammable & Combustible Liquids	676	13	31,068,528	9.3
Flammable Gases	69	1	2,017,117	0.6
Chemicals	260	5	10,928,523	3.3
Agricultural Products	309	6	15,335,832	4.6
Miscellaneous	827	16	46,824,937	14.1
Total	5,310	100	333,256,887	100.0

Fire Losses in AB by Type of Residential Property - 2007

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	%
One and Two Family Dwellings	1,330	70	14	86	115,207,877	67
Apartments	339	18	1	27	36,891,986	21
Rooming, Boarding, Lodging House (less than 10 persons)	13	1	0	8	1,078,212	1
Rooming, Boarding, Lodging House-Unclass.	4	0	0	0	86,550	0
Hotel, Inn, Lodge (year round use)	30	2	0	3	10,403,704	6
Hotel, Inn, Lodge (seasonal use, in season)	1	0	0	0	7,000	0
Hotel, Inn, Lodge-Unclassified	1	0	0	0	1,000	0
Motor Hotel, Motel (3 to 20 units)	1	0	0	0	15,000	0
Motor Hotel, Motel (over 20 units)	5	0	0	6	137,550	0
School, College or University Dormitory	3	0	0	0	112,500	0
Bunkhouse & Worker's Barracks	4	0	0	1	675,502	0
Dormitory- Unclassified	2	0	0	1	1,501	0
Mobile Home (1 or 2 family units)	79	4	2	8	3,896,154	2
Travel Trailer	33	2	0	0	419,533	0
Camping Trailer (includes tent trailer)	13	1	0	0	109,453	0
Motor Home (includes camperized van)	18	1	0	1	836,903	0
Truck with Camper	2	0	0	0	8,700	0
Tents	3	0	0	0	1,700	0
Mobile Home, Trailer- Unclassified	1	0	0	0	105,000	0
Single Cabins	5	0	0	0	555,500	0
Camps/Retreats- Unclassified	3	0	0	0	960,000	1
Residential Miscellaneous- Unclassified	13	1	0	0	220,695	0
Total	1,903	100	17	141	171,732,020	100

Fire Losses in AB Homes (One/Two Family Dwellings, Apartments, Mobile Homes) - 2007

Type of Home	Fires	%	Deaths	%	Injuries	%	$ Losses	%
One/Two Family Dwellings	1,330	76	14	82	86	71	115,207,877	74
Apartments, Tenements, Flats	339	19	1	6	27	22	36,891,986	24
Mobile Homes	79	5	2	12	8	7	3,896,154	2
Total	1,748	100	17	100	121	100	155,996,017	100

Home Fires in AB by Major Areas of Fire Origin - 2007

Area of Origin	Fires	%	Deaths	%	Injuries	%	$ Losses
Kitchen	349	20	0	0	43	36	15,404,205
Bedroom	165	9	3	18	26	21	17,442,251
Living Room	127	7	5	29	12	10	15,334,873
Exterior Wall	112	6	0	0	1	1	8,028,150
Outside Area - lawn, balcony, court, patio...	152	9	0	0	3	3	28,947,657
Laundry Area	59	3	0	0	3	2	3,906,411
Vehicle (garage)	50	3	1	6	4	3	5,178,698
Outside Area-Unclassified	40	2	0	0	0	0	2,359,805
Heating Equipment Room	35	2	0	0	2	2	4,170,585
Washroom	34	2	1	6	0	0	2,067,440
Hallway, Corridor	31	2	0	0	0	0	1,935,722
Ceiling and Roof/Ceiling Space-Attic	29	2	0	0	3	2	3,222,169
Wall Assembly	27	2	0	0	0	0	4,063,807
Other Areas (1% or less)	298	16	6	35	21	17	20,222,213
Area of Origin-Unknown	240	14	1	6	3	2	23,712,031
Total	1,748	100	17	100	121	100	155,996,017

Major Known Causes of Home Fires in AB - 2007

Fire Cause	Fires	% Fires	Deaths	Injuries	$ Losses
Arson/Set Fire	372	21	6	10	30,456,963
Other Causes/Unknown	283	16	5	14	28,818,510
Cooking (except cooking oil fire)	202	12	0	27	7,657,017
Smoking	178	10	5	21	27,352,066
Heating Equipment Related	144	8	0	12	14,887,049
Electrical Distribution Equipment	136	8	1	5	12,774,651
Exposure Fire	97	6	0	0	10,783,879
Cooking Oil Fire	87	5	0	11	2,872,942
Candle	54	3	0	9	3,794,553
Appliance/Equipment Related	40	2	0	3	4,653,107
Lighting Equipment	36	2	0	0	4,572,492
Clothes Dryer	31	2	0	0	2,156,643
Child Fireplay	28	2	0	3	1,361,051
Flammable/Comb. Liquid Ignition	28	2	0	4	2,067,883
Cutting/Welding Equipment or Blow Torch	13	1	0	1	546,127
Flammable Gas Ignition	9	1	0	1	181,081
Match/Lighter Not Used From Smoking	6	0	0	0	308,503
Inadequate Control of Open Fire	4	0	0	0	751,500
Total	1,748	100	17	121	155,996,017

Fire Deaths in AB by Property Classes - 2007

Property Class	Deaths	%
One and Two Family Dwellings	14	61
Trucks (incl. light trucks/van/single body units)	2	9
Mobile Home (1 or 2 family units)	2	9
Vehicles	2	9
Long Term Residential Care For Disabled	1	4
Trash/Rubbish/Recyclable	1	4
Apartments	1	4
Total	23	100

Major Known Causes of Fire Deaths in AB - 2007

Fire Cause	Deaths	%
Other Causes/Unknown	8	35
Arson/Set Fire	6	26
Smoking	5	22
Flammable/Comb. Liquid Ignition	1	4
Children Under 12 Set Fire	1	4
Electrical Distribution Equipment	1	4
Match/Lighter Not Used For Smoking	1	4
Total	23	100

Saskatchewan

Fire Losses in Saskatchewan - 2008

Year	Fires	Deaths	Injuries	$ Losses
2008	3,245	21	11	59,020,321
Total	3,245	21	11	59,020,321

Fire Losses in SK by Type of Property Class - 2008

	Total # of Fires	Structural	Vehicle	Outdoor
Fires	3,245	1,116	1,014	963
%	100	34	31	30

Structural = residential, farm, miscellaneous, commercial, manufacturing and industrial
Vehicles = vehicles; Outdoor = outdoor.

Fire Losses in SK by Major Property Classes - 2008

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	%
Vehicle	1,014	31	2	1	11,211,843	19
Outdoor	963	29	0	0	3,385,530	6
Residential	920	29	15	5	31,133,036	53
Farm	190	6	1	0	7,708,076	13
Unclassified*	81	2	1	0	249,907	0
Commercial	63	2	2	5	4,820,332	8
Miscellaneous	6	0	0	0	70,596	0
Industrial	5	0	0	0	284,000	0
Manufacturing	3	0	0	0	157,000	0
Total	3,245	100	21	11	59,020,321	100

*Not coded

Fire Losses in SK by Property Type - 2008

Property Type	Fires	%	Deaths	Injuries	$ Losses
Apartment	55	2	1	0	3,942,115
Boarding	4	0	.	.	294,800
Care Home	2	0	.	.	13,100
Cottage	4	0	.	.	88,000
Farm	107	3	0	0	1,550,546
Garbage	220	7	0	0	694,966
Grass	550	17	1	0	2,769,342
Hotel	2	0	.	.	7,480
House	577	17	13	5	22,389,412
Institution	24	1	0	0	383,599
Mobile Home	39	1	0	0	675,659
Outbuilding	6	0	1	0	60,497
Restaurant	11	0	0	0	318,571
Storage	219	7	0	0	6,330,997
Town House	2	0	.	.	85,000
Unclassified	30	1	.	.	534,724
Unknown (not coded)	1,393	43	5	6	18,881,512
Total	3,245	100	21	11	59,020,321

Fire Losses in SK by Major Acts or Omissions - 2008

Act or Omission	Fires	%	Deaths	Injuries	$ Losses
Undetermined	889	27	4	1	19,475,995
Mechanical Failure	757	23	3	0	18,356,635
Human Failure	684	21	13	8	10,392,983
Not Coded	518	16	1	0	5,427,506
Arson	310	10	.	.	4,253,111
Vehicle Accident	33	1	.	.	331,880
Miscellaneous	23	1	.	.	84,000
Human Failure	18	0	0	2	425,174
Mechanical Failure	6	0	.	.	146,486
Design Flaw	5	0	.	.	106,550
Misuse	2	0	.	.	20,000
Total	3,245	100	21	11	59,020,321

Fire Losses in SK by Type of Home - 2008

Type of Home	Fires	%	Deaths	Injuries	$ Losses
Houses, Town-houses, Cottages	583	17	13	5	22,562,412
Apartments	55	2	1	0	3,942,115
Mobile Homes	39	1	0	0	675,659
Total	677	20	14	5	27,180,186

Fire Losses in SK by Areas of Fire Origin in Residential Properties - 2008

Area of Origin	Fires	%	Deaths	Injuries	$ Losses
Kitchen	131	15	3	1	2,244,674
Exterior	42	5	.	.	1,710,976
Bedroom	31	3	1	2	1,247,058
Living room	26	3	5	1	1,603,400
Laundry	15	2	1	0	3,644,561
Mechanical	9	1	.	.	33,900
Vehicle	7	1	.	.	71,600
Exterior	2	0	.	.	29,000
Patio	2	0	.	.	150,000
Other	69	8	.	.	2,505,222
Unknown*	586	63	4	1	17,892,645
Total	920	100	15	5	31,133,036

*Not coded

Fire Losses in Residential Properties in SK by Sources of Ignition - 2008

Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Open Flame	222	24	.	.	5,534,525
Electrical Distribution Equipment	136	15	3	0	9,865,313
Cooking (except cooking oil fire)	95	10	1	0	1,130,178
Not Coded	61	7	.	.	1,313,891
Heating Equipment Related	60	7	.	.	1,290,285
Smoking	55	6	7	3	1,838,950
Appliance/Equipment Related	41	4	.	.	453,751
Exposure Fire	40	4	0	1	508,202
Other Causes/Unknown	210	21	4	1	9,197,942
Total	920	100	15	5	31,133,036

Fire Losses in Residential Kitchens in SK by Sources of Ignition - 2008

Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Cooking	68	52	1	0	941,107
Heating	22	17	.	.	378,620
Appliance	21	16	.	.	146,501
Electrical	5	4	.	.	158,000
Undetermined	5	4	1	0	252,396
Open Flame	4	3	.	.	180,533
Exposure	2	2	0	1	65,000
Smoker	2	2	1	0	6,517
Misc	1	1	.	.	.
Not Coded	1	1	.	.	116,000
Total	131	100	3	1	2,244,674

Fire Deaths in SK by Property Classes and Causes - 2008

Property Class	Deaths	%
Residential	15	71
Commercial	2	10
Vehicle	2	10
Farm	1	5
Unknown	1	5
Total	21	100

Fire Cause	Deaths	%
Smoking	7	34
Electrical	3	15
Appliance/Flammable gas	2	10
Open flame	1	5
Friction	1	5
Heating/Flam gas	1	5
Unknown/Undet.	4	19
Cooking	1	5
Engine	1	5
Total	21	100

Manitoba

Fire Losses in Manitoba - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	5,983	28	294	125,895,528
Total	5,983	28	294	125,895,528

Fire Losses in MB by Type of Property Class - 2007

Year	Structural	Vehicle	Outdoor	Total
2007	1,915	900	3,118	5,983
%	32	15	52	100

Fire Losses in MB by Major Property Classes - 2007

Major Property Class	Fires	%	Deaths†	Injuries	$ Losses	%
Special Property & Transportation Equipment	3,981	67	9	32	11,675,104	9
Residential	1,165	19	17	210	54,837,023	44
Miscellaneous Property	397	7	2	15	14,477,077	11
Storage Properties	197	3	.	10	6,617,175	5
Assembly	85	1	.	7	18,047,261	14
Industrial Manufacturing Properties	56	1	.	12	5,834,703	5
Mercantile	44	1	.	4	9,821,485	8
Institutional	35	1	.	3	1,114,400	1
Business & Personal Service	23	0	.	1	3,471,300	3
Total	5,983	100	28	294	125,895,528	100

† Two firefighters died in a house fire.

Fire Losses in MB by Major Sources of Ignition - 2007

Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Cannot Be Determined	3,406	57	6	54	53,256,873
Smoker's Material & Open Flame	940	16	10	94	15,486,220
Cooking Equipment	378	6	6	57	11,373,463
Miscellaneous	336	6	5	10	3,525,754
Electrical Distribution Equipment	285	5	.	22	13,305,561
Exposure	271	5	1	10	5,043,361
Heating Equipment	185	3	.	32	10,608,784
Appliances & Equipment	89	1	.	10	2,865,031
Other Electrical Equipment	74	1	.	5	10,107,581
No Igniting Object	19	0	.	.	322,900
Total	5,983	100	28	294	125,895,528

Fire Losses in MB by Major Acts or Omissions - 2007

Act or Omission	Fires	%	Deaths	Injuries	$ Losses
Incendiary Fires or Set Fires	2,138	36	5	46	21,864,661
Miscellaneous Act or Omission	1,806	30	2	76	47,279,345
Mechanical/Electrical Failure/Malfunction	751	13	.	39	28,051,281
Misuse of Source of Ignition	680	11	4	54	11,352,987
Human Failing	282	5	9	31	6,996,274
Misuse of Material Ignited	214	4	1	38	5,673,439
Construction, Design or Installation Deficiency	51	1	.	6	3,353,223
Vehicle Accident	36	1	7	.	890,569
Misuse of Equipment	25	0	.	4	433,749
Total	5,983	100	28	294	125,895,528

Fire Losses in MB by Major Materials First Ignited - 2007

Material First Ignited	Fires	%	Deaths	Injuries	$ Losses
Miscellaneous	2,095	35	4	52	13,918,625
Cannot Be Determined	1,240	21	6	50	47,444,898
Agricultural, Forestry Products	1,226	20	1	12	4,156,294
Wood, Paper Products	521	9	.	31	12,711,557
Flammable Liquids, Combustible Liquids	273	5	7	51	8,211,439
Structural Components, Finish Materials	266	4	4	22	25,444,814
Furniture, Furnishings	143	2	6	49	8,442,915
Chemicals, Plastics, Metals	108	2	.	15	1,723,167
Clothing, Textiles	85	1	.	12	3,775,368
Flammable Gases	26	0	.	.	66,451
Total	5,983	100	28	294	125,895,528

Fire Losses in MB Homes (One/Two Family Dwellings, Apartments, Mobile Homes) - 2007

Property Class	Fires	%	Deaths	Injuries	$ Losses
One/Two Family Dwellings	784	71	15	120	41,352,944
Apartments, Tenements, Flats	288	26	1	77	10,089,045
Mobile Homes	36	3	1	2	1,579,064
Total	1,108	100	17	199	53,021,053

Fire Losses in MB Homes (One/Two Family Dwellings, Apartments, Mobile Homes) by Areas of Fire Origin - 2007

Area of Origin	Fires	%	Deaths	Injuries	$ Losses
Kitchen	357	32	6	54	7,724,830
Bedroom	111	10	6	38	8,484,557
Living Room	105	9	1	50	7,421,925
Outside Area - lawn, balcony, court, patio...	53	5	1	1	1,164,645
Exterior Wall	47	4	.	.	3,539,711
Laundry Area	37	3	.	3	531,502
Chimney, Flue Pipe, Gas Vent	36	3	.	.	767,934
Heating Equipment Room	35	3	.	4	1,602,443
Vehicle Storage - Garage/Carport	33	3	2	14	4,333,907
Crawl Space-Incl. Substructure/Attic	31	3	.	1	1,553,875
Washroom	27	2	.	6	558,631
Lobby, Entrance Way	24	2	.	1	738,220
Other Areas (1% or less)	161	15	0	27	10,140,691
Area of Origin - Unknown	51	5	1	.	4,458,182
Total	1,108	100	17	199	53,021,053

Major Known Causes of Home Fires in MB - 2007

Fire Cause	Fires	%	Deaths	Injuries	$ Losses
Arson/Set Fire	206	19	4	22	10,223,211
Cooking (except cooking oil fire)	202	18	5	21	3,237,293
Heating Equipment Related	122	11	.	23	7,060,827
Cooking Oil Fire	97	9	.	18	1,731,740
Electrical Distribution Equipment	87	8	.	17	6,746,277
Candle	34	3	1	10	1,458,685
Child Fireplay	24	2	.	3	1,613,939
Exposure Fire	23	2	.	1	941,662
Appliance/Equipment Related	22	2	.	2	1,701,300
Cutting/Welding Equipment or Blow Torch	19	2	.	.	449,325
Clothes Dryer	19	2	.	1	144,740
Lighting Equipment	18	2	.	1	1,576,105
Flammable/Comb. Liquid Ignition	2	0	.	3	276,469
Flammable Gas Ignition	2	0	.	.	0
Other Causes/Unknown	231	21	7	77	15,859,480
Total	1,108	100	17	199	53,021,053

Major Known Causes of Fire Deaths in MB - 2007

Fire Cause	Deaths	%
Other Causes/Unknown	12	43
Arson/Set Fire	5	18
Flammable/Comb. Liquid Ignition	4	14
Cooking (Excludes Over Heated Cooking Oil)	5	18
Candle	1	4
Exposure Fire	1	4
Total	28	100

Fire Deaths in MB by Property Classes - 2007

Property Class	Deaths	%
Year-Round Use Dwell-1 Family	14	50
Automobile	6	21
Truck - Semi Trailer	2	7
Mobile Home - 1 or 2 Family	1	4
Apt, Flat, 20+ with or w/o Bus	1	4
Shed-Incl. Implement Shed	1	4
Outdoor Property-Unclass./Unknown	1	4
Year-Round Dwelling-2 Family	1	4
Misc. Property-Unclass/Unknown	1	4
Total	28	100

Ontario

Fire Losses in Ontario - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	14,310	92	836	549,390,867
Total	14,310	92	836	549,390,867

Fire Losses in ON by Type of Property Class - 2007

Property Type	Fires	%	Deaths	Injuries	$ Losses
Structure	8,912	62	85	771	488,850,038
Outdoor	1,612	11	1	34	12,360,806
Vehicle	3,786	27	6	31	48,180,023
Total	14,310	100	92	836	549,390,867

Fire Losses in ON by Major Property Classes - 2007

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	%
Group C Residential	6,347	44	84	637	290,489,803	53
Vehicles	3,786	26	6	31	48,180,023	9
Structures/Properties not classified by O.B.C.	1,978	14	1	34	14,945,185	3
Group F Industrial	725	5	0	73	78,975,975	14
Group A Assembly	538	4	0	10	21,953,270	4
Group E Mercantile	340	2	0	23	23,002,805	4
Group D Business and Personal Services	245	2	0	8	8,153,015	1
Classified under National Farm Building Code	234	2	0	6	57,645,396	10
Group B Care and Detention	117	1	1	14	6,045,395	1
Total	14,310	100	92	836	549,390,867	100

Fire Losses in ON by Major Sources of Ignition - 2007

Major Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Open flame tools, smoker's articles	1,863	13	38	152	66,330,916
Other mechanical, electrical	1,850	13	4	24	33,882,471
Miscellaneous	1,556	11	2	67	44,561,462
Cooking equipment	1,492	10	5	180	30,242,782
Electrical distribution equipment	1,023	7	6	52	45,656,254
Heating equipment, chimney etc.	847	6	3	23	28,727,321
Appliances	420	3	0	10	11,235,527
Lighting equipment	409	3	4	36	16,308,776
Processing equipment	130	1	0	4	8,444,020
Not reported	99	1	3	2	5,480,400
Undetermined	4,621	32	27	286	258,520,938
Total	14,310	100	92	836	549,390,867

Fire Losses in ON by Major Possible Causes - 2007

Major Possible Cause	Fires	%	Deaths	Injuries	$ Losses
Misuse of Ignition Source/Material Ignited	3,191	22	41	349	101,780,137
Mechanical/Electrical failure	2,611	18	6	66	75,594,941
Arson/Riot/Vandalism	2,112	15	6	63	37,791,601
Design, Construction, Maintenance Deficiency	1,202	8	3	36	31,908,828
Other Unintentional	789	6	7	36	22,318,743
Other	260	2	0	3	6,193,215
Unintentional	251	2	5	17	7,107,947
Undetermined	3,894	27	24	266	266,695,455
Total	14,310	100	92	836	549,390,867

Fire Losses in ON by Major Materials First Ignited - 2007

Major Material First Ignited	Fires	%	Deaths	Injuries	$ Losses
Materials	2,627	18	10	78	48,879,001
Other Objects	2,600	18	9	55	53,063,914
Building Component	1,704	12	7	83	102,009,701
Flammable, Combustible Liquids	1,254	9	5	148	31,179,486
Soft Goods, Wearing Apparel	648	5	12	94	20,585,021
Furniture	505	4	13	59	17,621,243
Gases	141	1	3	14	2,774,291
Unknown/Undetermined)	126	1	0	2	6,505,900
Miscellaneous	4,705	33	33	303	266,772,310
Total	14,310	100	92	836	549,390,867

Fire Losses in ON by Type of Residential Property - 2007

Type of Residential Property	Fires	%	Deaths	Injuries	$ Losses
Detached Dwelling	3,328	52	42	255	185,386,158
Multi-Unit Dwelling - Over 12 Units	956	15	10	130	22,195,932
Attached Dwelling (eg. rowhouse, townhouse, etc.)	405	6	7	70	15,949,334
Multi-Unit Dwelling - 2 to 6 Units	390	6	3	73	15,892,841
Semi-Detached Dwelling	355	6	4	35	10,769,344
Detached Garage	271	4	2	11	8,083,193
Multi-Unit Dwelling - 7 to 12 Units	119	2	3	15	3,199,914
Apartment, Flat, Tenement with Business	89	1	1	17	7,920,956
Rooming/Boarding/Lodging House	69	1	1	9	2,428,466
Hotel, Motel, Lodging - 4 or more guests or suites	64	1	0	6	5,769,500
Mobile Home	62	1	3	1	2,051,600
Motor Home, Camper, Trailer	60	1	3	3	996,450
Other Residential	53	1	1	3	2,547,950
Detached Dwelling - Acc. Apartment (above gr.)	28	0	1	3	1,402,000
Attached Dwelling with Business	26	0	0	1	3,201,650
Detached Dwelling - Acc. Apartment (below gr.)	23	0	0	3	481,200
Residential Camp	15	0	3	0	758,095
Detached Dwelling with Business	14	0	0	0	1,173,500
School/College Dormitory (det. from education	6	0	0	2	56,600
Semi-Detached Dwelling with Business	5	0	0	0	196,020
Hostel	3	0	0	0	1,600
Bunkhouse, Workers Barrack	3	0	0	0	14,500
Houseboat	2	0	0	0	12,000
Residential Club	1	0	0	0	1,000
Total	6,347	100	84	637	290,489,803

Fire Losses in ON by Type of Home - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
One/Two Family Dwellings	4,088	70	53	360	212,104,836
Apartments, Tenements, Flats	1,650	28	18	242	55,664,013
Mobile Homes	62	1	3	1	2,051,600
Total	5,800	100	74	603	269,820,449

Major Areas of Fire Origin in ON Homes - 2007

Area of Origin	Fires	%	Deaths	Injuries	$ Losses
Kitchen	1335	23	6	187	34,819,709
Living Room	545	9	27	97	38,805,564
Bedroom	524	9	12	104	27,442,105
Porch or Balcony	323	6	3	15	11,876,348
Garage	273	5	2	19	20,995,385
Chimney/Flue Pipe	246	4	0	0	4,226,370
Court, Patio, Terrace	228	4	0	12	5,807,163
Exterior Wall	226	4	0	5	9,587,380
Laundry Area	203	4	0	11	4,993,222
Undetermined	177	3	0	10	31,420,870
Washroom	133	2	1	17	5,423,755
Basement/cellar not partitioned	132	2	9	32	14,159,199
Other Outside Area	114	2	0	3	1,329,343
Open Area (inc lawn, field, farmyard, park, playing field)	99	2	0	3	1,084,508
HVAC Equipment Room (furnace room, water heater closet, boiler)	85	1	0	10	4,878,875
All Other Areas (1% or less)	1,157	18	14	78	52,970,653
Total	5,800	100	74	603	269,820,449

Major Known Causes of Home Fires in ON - 2007

Fire Cause	Fires	%	Deaths	Injuries	$ Losses
Cooking (except cooking oil fire)	658	11	5	57	14,680,176
Cooking Oil Fire	591	10	0	112	11,884,776
Heating Equipment Related	589	10	1	19	21,669,135
Smoking	543	9	19	65	11,962,886
Electrical Distribution Equipment	486	8	6	36	28,056,525
Arson/Set Fire	427	7	3	34	15,403,823
Candle	172	3	4	24	7,450,001
Appliance/Equipment Related	154	3	0	2	6,382,954
Clothes Dryer	131	2	0	6	1,410,168
Cutting/Welding Equipment or Blow Torch	126	2	0	12	5,420,684
Lighting Equipment	126	2	0	9	4,847,545
Child Fireplay	64	1	4	13	2,893,955
Flammable/Comb. Liquid Ignition	38	1	1	12	1,968,850
Flammable Gas Ignition	13	0	2	1	247,650
Other Causes/Unknown	1,682	29	29	201	135,541,321
Total	5,800	100	74	603	269,820,449

Distribution of Fire Deaths in ON by Property Classes - 2007

Property Class	Deaths	%
Detached Dwelling	42	46
Multi-Unit Dwelling - Over 12 Units	10	11
Semi-Detached Dwelling	4	4
Attached Dwelling (eg. rowhouse, townhouse, etc.)	7	8
Automobile	3	3
Small Truck (eg. pick-up, van, etc.)	3	3
Multi-Unit Dwelling - 2 to 6 Units	3	3
Motor Home, Camper, Trailer	3	3
Detached Garage	2	2
Multi-Unit Dwelling - 7 to 12 Units	3	3
Mobile Home	3	3
Open Land (eg. light ground cover, bush, grass)	1	1
Seniors long term care facility, licensed	1	1
Apartment, Flat, Tenement with Business	1	1
Other Residential	1	1
Detached Dwelling - Acc. Apartment (above gr	1	1
Rooming/Boarding/Lodging House	1	1
Residential Camp	3	3
Total	92	100

Distribution of Fire Deaths in ON by Property Classes (summary) - 2007

Property Class	Deaths	%
Residential	83*	90
Automobile	6	7
Detached Garage	2	2
Open Land (eg. light ground cover, bush, grass)	1	1
Total	92	100

*Of the total number of fire deaths in the residential category, one death occurred in a seniors long term care facility, which is classified under Care Facilities by the Office of the Ontario Fire Marshal.

Fire Deaths in ON by Probable Causes - 2007

Probable Cause	Deaths	%
Asphyxia (CO, HCN)	69	75
Burns or scalds	2	2
Complications from Asphyxia	3	3
Complications from burns/scalds.	11	12
Injured while escaping	1	1
Not coded	4	4
Other	2	2
Total	92	100

Major Known Causes of Fire Deaths in ON - 2007

Fire Cause	Deaths	%
Smoking	22	24
Electrical Distribution Equipment	6	7
Arson/Set Fire	6	7
Cooking (except cooking oil fire)	5	5
Candle	4	4
Child Fireplay	5	5
Heating Equipment Related	3	3
Flammable Gas Ignition	2	2
Cutting/Welding Equipment or Blow Torch	1	1
Flammable/Comb. Liquid Ignition	1	1
Other Causes/Unknown	37	40
Total	92	100

Fire Injuries in ON by Type of Injury - 2007

Injury - Minor	Injury - Serious	Total Injuries
607	229	836
73%	27%	100%

Fire Injuries in ON by Probable Causes - 2007

Probable Cause	Injuries	%
Smoke or Fire	521	62
Accident at incident	169	20
Unknown or Unclassified	115	14
Falling Debris	17	2
Explosion	8	1
FF: Equipment Failure at Incident	4	1
Building collapse	2	0
Total	836	100

Fire Injuries in ON by Age & Sex - 2007

Status and Sex of Casualty		Age in Years							Total
			0-9	10-19	20-39	40-64	65-79	80+	
Firefighter	Female	1	.	.	4	1	.	.	6
	Male	11	.	2	115	180	.	.	308
Occupant (civilian)	Female	27	11	17	36	61	14	11	177
	Male	31	22	22	88	100	14	6	283
Non-Occupant (civilian)	Female	3	.	3	4	5	1	1	17
	Male	6	1	.	19	16	3	.	45
Total		79	34	44	266	363	32	18	836

New Brunswick

Fire Losses in New Brunswick - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	4,585	11	23	26,115,223
Structure Fires- not coded*	717	.	.	.
Total	5,302	11	23	26,115,223

*These fires were not subject to further analysis for this report.

Fire Losses in NB by Type of Property Class - 2007

Year	Fires	Coded	Structural	Vehicle	Outdoor	Equipment	Not Coded
2007	4,585	3,565	2,047	282	1179	57	1,020
% of Coded Fires		100	57	8	33	2	

Fire Losses in NB by Major Property Classes - 2007

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	% of $ Losses
Special Property & Transportation Equipment	1,492	33	0	3	553,441	2
Residential	1,470	32	10	16	20,976,915	80
Miscellaneous Property	167	4	0	0	771,513	3
Assembly	109	2	0	3	1,490,769	6
Storage Properties	105	2	0	0	1,074,692	4
Industrial Manufacturing Properties	84	2	0	0	19,006	0
Mercantile	82	2	0	1	367,115	1
Business & Personal Services	33	1	0	0	472,000	2
Institutional	23	1	1	0	389,772	1
Not Coded	1,020	22	0	0	0	0
Total	4,585	100	11	23	26,115,223	100

Fire Losses in NB by Major Sources of Ignition - 2007

Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Igniting Object - Cannot Be Determined	1,149	25	11	11	11,130,126
Heating Equipment	577	13	0	0	1,600,912
Smoker's Material/Open Flames	437	10	0	0	2,905,052
Exposure	307	7	0	0	725,716
Miscellaneous	223	5	0	0	1,489,666
Cooking Equipment	190	4	0	6	3,313,743
Electrical Distribution Equipment	173	4	0	5	3,630,519
Other Electrical Equipment	58	1	0	1	364,522
Appliances And Equipment	54	1	0	0	954,968
No Igniting Object	37	1	0	0	0
Not Coded	1,380	30	0	0	0
Total	4,585	100	11	23	26,115,223

Fire Losses in NB by Major Acts or Omissions – 2007

Act or Omission	Fires	%	Deaths	Injuries	$ Losses
Incendiary Fires	1,224	27	3	7	7,255,425
Cannot be determined	583	13	3	6	6,875,206
Miscellaneous	462	10	0	0	1,644,742
Mechanical, Electrical Failure Malfunction	441	10	0	2	3,687,875
Human Failing	303	7	1	2	3,372,866
Misuse of Source of Ignition	212	5	4	1	1,366,994
Misuse of Material Ignited	123	3	0	4	1,825,458
Vehicle Accident	38	1	0	1	82,758
Construction, Design or Installation Deficiency	31	1	0	0	3,900
Misuse of Equipment	14	0	0	0	0
Not Coded	1,154	25	0	0	0
Total	4,585	100	11	23	26,115,223

Fire Losses in NB by Major Materials First Ignited - 2007

Material First Ignited	Fires	%	Deaths	Injuries	$ Losses
Miscellaneous	796	17	0	4	2,389,046
Material First Ignited - Miscellaneous, Cannot be	694	15	11	9	10,995,780
Agricultural, Forest Products	663	14	0	0	1,020,577
Wood, Paper Products	378	8	0	1	1,215,385
Building Components	255	6	0	4	5,168,968
Flammable/Combustible Liquids	205	4	0	3	3,069,289
Chemicals, Plastics, Metals	90	2	0	0	109,469
Furniture, Furnishings	59	1	0	2	382,248
Clothing, Textiles	47	1	0	0	319,125
Flammable Gases	11	0	0	0	1,445,337
Not Coded	1,387	30	0	0	0
Total	4,585	100	11	23	26,115,223

Fire Losses in NB by Residential Property Classes - 2007

Property Class	Fires	%	Deaths	Injuries	$ Losses
One & Two-Family Dwellings	899	61	5	11	16,064,586
Residential	337	23	5	3	3,649,209
Apartment, Tenement, Flat, Townhouse, Condominium	142	10	0	2	565,182
Mobile Home, Mobile Accommodation, Trailer	39	3	0	0	645,106
Miscellaneous - Residential	19	1	0	0	7,000
Camp/Retreats - Seasonal Use	14	1	0	0	37,030
Hotel, Inn, Lodge	7	0	0	0	0
Motor Hotel, Motel	6	0	0	0	0
Rooming, Boarding, Lodging House, Hostel	5	0	0	0	8,802
Dormitory	2	0	0	0	0
Total	1,470	100	10	16	20,976,915

Fire Losses in NB by Homes - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
Year-Round Use Dwelling - 1-family	765	72	5	9	13,149,207
One & Two Family Dwellings	50	5	0	0	714,006
Apartment, Tenement, Flat - 5 to 20 units without business	47	4	0	0	214,582
Year-Round Use Dwelling - 2-family	27	3	0	1	266,283
Seasonal Use Dwelling - in season, 1-family	26	2	0	0	292,380
Apartment, Tenement, Flat - 5 to 20 units with business	20	2	0	0	0
Apartment, Tenement, Flat - 1 to 4 units without business	19	2	0	1	59,683
Apartment - 5 - 20 units w/o business	17	2	0	0	.
Apartment, Tenement, Flat - over 20 units with or w/o business	16	2	0	1	26,000
Mobile Home - 1 or 2 family units	16	2	0	0	439,856
Farm Dwelling - 1-Family	11	1	0	0	1,067,009
One & Two-Family Dwelling - unclassified or unknown	10	1	0	1	519,802
Apartment, Tenement, Flat - 1 to 4 units with business	10	1	0	0	1,400
Seasonal Use Dwelling - off season, 1-family	8	1	0	0	52,000
Apartment, Tenement, Flat, Townhouse, Condominium	4	0	0	0	41,552
Apartment - 5 - 20 units w business	3	0	0	0	.
Apartment - 1 - 4 units w/o business	2	0	0	0	51,965
Apartment, Tenement, Flat - unclassified or unknown	2	0	0	0	0
Apartment - 1 - 4 units w business	2	0	0	0	170,000
Seasonal Use Dwelling - off season, 2-family	1	0	0	0	0
Seasonal Use Dwelling - in season, 2-family	1	0	0	0	3,900
Total	1,057	100	5	13	17,069,624

Fire Losses in NB by Homes: One/Two Family Dwellings, Apartments, Mobile Homes - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
One/Two Family Dwellings	899	85	5	11	16,064,587
Apartments, Tenements, Flats	142	13	0	2	565,182
Mobile Homes	16	2	0	0	439,856
Total	1,057	100	5	13	17,069,625

Fire Losses in NB Homes by Areas of Origin - 2007

Area of Origin	Fires	%	Deaths	Injuries	$ Losses
Chimney - masonry/factory built, metal	323	31	0	0	164,224
Kitchen	168	16	1	5	2,284,850
Outside Area - lawn, balcony, court, patio...	107	10	0	0	716,198
Living/Family Room	37	4	0	0	1,641,777
Bedroom	29	3	0	1	983,689
Laundry Area	27	3	0	0	537,745
Vehicle Garage/Carport	23	2	0	0	1,730,925
Unknown Area of Origin	177	17	2	5	4,247,993
Other (1% or less)	166	16	2	2	4,762,224
Total	1,057	100	5	13	17,069,624

Major Known Causes of Home Fires in NB - 2007

Fire Cause	Fires	%	Deaths	Injuries	$ Losses
Heating Equipment Related	340	32	0	0	635,122
Arson/Set Fire	194	18	3	6	3,496,420
Cooking (except cooking oil fire)	108	10	0	2	1,928,983
Electrical Distribution Equipment	68	6	0	1	2,237,613
Smoking	34	3	0	0	476,544
Cooking Oil Fire	25	2	0	1	871,200
Match/Lighter Not Used for Smoking	15	1	0	0	0
Clothes Dryer	14	1	0	0	4,660
Appliance/Equipment Related	11	1	0	0	607,603
Exposure Fire	10	1	0	0	0
Candle	10	1	0	0	1,017,476
Inadequate Control of Open Fire	9	1	0	0	.
Flammable/Comb. Liquid Ignition	6	1	0	0	346,737
Child Fireplay	3	0	0	0	19,477
Cutting/Welding Equipment or Blow Torch	2	0	0	0	223,521
Flammable Gas Ignition	2	0	0	0	0
Other Causes/Unknown	206	19	2	3	5,204,269
Total	1,057	100	5	13	17,069,624

Fire Deaths in NB by Property Class - 2007

Property Class	Deaths	%
Dwelling - 1-family	5	45
Residential	5	45
Home for Aged unclassified or unknown	1	9
Total	11	100

Major Known Causes of Fires involving Deaths in NB - 2007

Fire Cause	Deaths	%
Other Causes/Unknown	4	36
Arson/Set Fire	3	27
Smoking	4	36
Total	11	100

Nova Scotia

Fire Losses in Nova Scotia - 2007

Year	Fires	Deaths	Injuries	$ Losses
2007	659	10	15	19,225,804
Total	659	10	15	19,225,804

Fire Losses in NS by Type of Property Class - 2007

Year	Fires	Structural	Vehicle	Outdoor
2007	659	517	83	58
%	100	78	13	9

Fire Losses in NS by Major Property Classes - 2007

Major Property Class	Fires	%	Deaths	Injuries	$ Losses	%
Residential	388	59	9	9	13,374,784	70
Miscellaneous Property	112	17	1	5	1,210,320	6
Vehicles	83	13	0	1	873,893	5
Assembly	25	4	0	0	393,059	2
Industrial Manufacturing Properties	18	3	0	0	650,923	3
Mercantile	14	2	0	0	123,000	1
Storage Properties	8	1	0	0	2,318,520	12
Institutional	8	1	0	0	61,000	0
Business & Personal Services	3	0	0	0	220,305	1
Total	659	100	10	15	19,225,804	100

Fire Losses in NS by Major Sources of Ignition - 2007

Major Source of Ignition	Fires	%	Deaths	Injuries	$ Losses
Undetermined	203	31	5	3	8,677,380
Miscellaneous	158	24	0	2	3,337,051
Smoker's Material & 'Open' Flames	98	15	3	6	1,357,726
Heating Equipment	83	13	0	1	1,885,556
Electrical Distribution Equipment	75	11	1	1	1,688,854
Cooking Equipment	29	4	1	2	1,529,196
Appliances & Equipment	6	1	0	0	653,141
Lightning	4	1	0	0	74,000
Exposure	3	0	0	0	22,900
Total	659	100	10	15	19,225,804

Fire Losses in NS by Major Acts or Omissions - 2007

Major Act or Omission (Possible Cause)	Fires	%	Deaths	Injuries	$ Losses
Not Determined	144	22	5	4	8,121,881
Misuse of Equipment	94	14	0	3	989,305
Mech., Electr. Failure, Malfunction	89	14	1	0	2,613,541
Misuse of Material Ignited	78	12	0	1	1,013,661
Arson or 'Set' Fires	69	10	0	2	2,210,971
Under Investigation	53	8	0	1	946,094
Constructn. Design, Installn. Def.	45	7	0	0	383,250
Human Failing	37	6	2	1	1,253,121
Unknown	25	4	1	0	705,100
Misuse of Source of Ignition	22	3	1	2	956,530
Vehicle Accident	3	0	0	1	32,350
Total	659	100	10	15	19,225,804

Fire Losses in NS by Major Materials First Ignited - 2007

Major Material First Ignited	Fires	%	Deaths	Injuries	$ Losses
Not Determined	195	30	5	4	9,839,462
Miscellaneous	150	23	0	0	1,478,107
Building Components	75	11	1	0	3,096,811
Other	63	10	0	1	377,859
Agricultural Products	58	9	0	3	217,738
Wood, Paper Products	39	6	0	1	998,913
Flammable & Combustible Liquids	25	4	1	0	1,300,443
Furniture, Furnishings	21	3	2	4	889,351
Vehicle	18	3	0	2	783,620
Clothing, Textiles	10	2	1	0	235,500
Chemicals	5	1	0	0	8,000
Total	659	100	10	15	19,225,804

Fire Losses in NS by Residential Property Classes - 2007

Residential Property Class	Fires	%	Deaths	Injuries	$ Losses
Detached Dwelling	261	67	6	4	10,242,514
Multi-Unit Dwelling 2- 6 Unit	24	6	1	0	1,132,595
Other Residential	18	5	0	2	401,500
Mobile Home	18	5	2	2	252,453
Detached Garage	17	4	0	0	566,660
Detached Dwell/Apt above grd.	11	3	0	0	265,000
Semi-Detached Dwelling	8	2	0	0	202,799
Motor Home Camper Trailer	5	1	0	1	96,400
Multi-Unit Dwelling 13 plus	4	1	0	0	58,942
Detached Dwelling with Business	4	1	0	0	30,000
Residential Camp	3	1	0	0	0
Attached Dwelling-Town house	3	1	0	0	100
Multi-Unit Dwelling 7-12 Unit	3	1	0	0	34,371
Apartment/Flat with Business	2	1	0	0	90,000
Retirement Home	2	1	0	0	200
Motel Motor Hotel-NON Alcohol	2	1	0	0	500
Semi Detach Dwl./Apt above grd.	1	0	0	0	750
Military Barrack	1	0	0	0	0
Attached Dwelling with Business	1	0	0	0	0
Total	388	100	9	9	13,374,784

Fire Losses in NS Homes: By Types of Homes - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
Detached Dwelling	261	77	6	4	10,242,514
Multi-Unit Dwelling 2- 6 Unit	24	7	1	0	1,132,595
Mobile Home	18	5	2	2	252,453
Detached Dwell/Apt above grd.	11	3	0	0	265,000
Semi-Detached Dwelling	8	2	0	0	202,799
Multi-Unit Dwelling 13 plus	4	1	0	0	58,942
Detached Dwelling with Business	4	1	0	0	30,000
Attached Dwelling-Town house	3	1	0	0	100
Multi-Unit Dwelling 7-12 Unit	3	1	0	0	34,371
Apartment/Flat with Business	2	1	0	0	90,000
Semi Detach Dwl./Apt above grd.	1	0	0	0	750
Attached Dwelling with Business	1	0	0	0	0
Total	340	100	9	6	12,309,524

Fire Losses in NS Homes: One/Two Family Dwellings, Apartments and Mobile Homes - 2007

Type of Home	Fires	%	Deaths	Injuries	$ Losses
One/Two Family Dwellings	272	80	6	4	10,445,413
Apartments, Tenements, Flats	50	15	1	0	1,611,658
Mobile Homes	18	5	2	2	252,453
Total	340	100	9	6	12,309,524

Home Fires in NS by Areas of Fire Origin - 2007

Area of Origin	Fires	%	Deaths	%	Injuries	%	$ Losses	%
Chimney Flue Pipe	95	28	0	0	1	17	1,345,629	11
Cooking Area or Kitchen	29	9	1	11	2	33	2,092,592	17
Living Area/Rec./Family/TV Rm.	23	7	5	56	1	17	793,926	6
Other	17	5	0	0	0	0	87,500	1
Sleeping Area or Bedroom	16	5	0	0	0	0	707,475	6
Laundry Area	8	2	1	11	0	0	322,483	3
Not Coded	8	2	0	0	0	0	500,000	4
Other Outside Area	7	2	0	0	0	0	316,194	3
Heating or Cooling Equip. Area	7	2	0	0	0	0	290,027	2
Exterior Wall	7	2	0	0	0	0	342,500	3
Storage Area	6	1	0	0	0	0	128,739	1
Other Areas (each less than 1% or less)	45	15	1	11	0	0	2,336,269	19
Undetermined	72	21	1	11	2	33	3,046,190	25
Total	340	100	9	100	6	100	12,309,524	100

Major Known Causes of Home Fires in NS - 2007

Fire Cause	Fires	% of Fires	Deaths	Injuries	$ Losses
Heating Equipment Related	72	21	0	1	1,844,056
Exposure Fire	39	11	1	1	2,306,396
Electrical Distribution Equipment	33	10	1	0	1,354,889
Arson/Set Fire	25	7	0	2	1,596,971
Cooking (except cooking oil fire)	12	4	0	0	728,719
Smoking	8	2	2	0	274,846
Child Fireplay	2	1	1	0	3,697
Flammable/Comb. Liquid Ignition	1	0	0	0	0
Other Causes/Unknown	148	44	4	2	4,199,950
Total	340	100	9	6	12,309,524

Fire Deaths in NS by Property Classes - 2007

Property Class	Deaths	%
Detached Dwelling	6	60
Mobile Home	2	20
Multi-Unit Dwelling 2- 6 Unit	1	10
Other Misc Structure/Property	1	10
Total	10	100

Property Class	Deaths	%
Residential	9	90
Other Misc Structure/Property	1	10
Total	10	100

Fire Deaths in NS by Causes – 2007

Fire Cause	Deaths	%
Other Causes/Unknown	5	50
Smoking	2	20
Child Fireplay	1	10
Electrical Distribution Equipment	1	10
Exposure Fire	1	10
Total	10	100

Northwest Territories

Fire Losses in Northwest Territories 2003 - 2007

Year	Fires	%	Deaths	$ Losses
2003	111	23	10	1,269,887
2004	73	15	1	1,464,140
2005	162	33	4	1,954,580
2006	81	17	5	1,818,345
2007	57	12	2	2,327,895
Total	484	100	22	8,834,847
Ave.	*97*		*4.4*	*1,766,969*

Fire Losses in NT by Type of Property Class 2003 - 2007

Total # of Fires	Structural	Vehicle	Outdoor
484	313	71	39
%	65	15	8

Fire Losses in NT by Major Property Classes 2003 - 2007

Property Class	Fires	%	Deaths	$ Losses	% of $ Losses
Residential	192	40	15	5,610,167	64
Special/Transportation	115	24	4	642,370	7
Unknown (not coded) 0	60	12	0	182,500	2
Assembly	38	8	0	957,280	11
Miscellaneous	25	5	1	97,100	1
Mercantile	19	4	0	173,000	2
Storage	18	4	2	323,600	4
Business & Personal Service	10	2	0	788,300	9
Institutional	6	1	0	10,530	0
Industrial Manufacturing	1	0	0	50,000	1
Total	484	100	22	8,834,847	100

Fire Losses in NT by Major Sources of Ignition: 2003 - 2007

Source of Ignition	Fires	%	Deaths	$ Losses	% of $ Losses
Not Determined	166	34	12	5,561,077	63
Smoker's Material & 'Open' Flames	91	19	6	1,677,905	19
No Igniting Object	64	13	0	500	0
Heating Equipment	55	11	3	563,300	6
Cooking Equipment	43	9	1	130,920	1
Miscellaneous	21	4	0	64,625	1
Electrical Distribution Equipment	17	4	0	236,720	3
Other Electrical Equipment	14	3	0	265,800	3
Appliances & Equipment	9	2	0	333,000	4
Exposure	4	1	0	1,000	0
Total	484	100	22	8,834,847	100

Fire Losses in NT by Major Acts or Omissions: 2003 - 2007

Act or Omission	Fires	%	Deaths	$ Losses	% of $ Losses
Not Determined	179	37	11	4,483,179	51
Arson or 'Set' Fires	95	20	3	1,614,973	18
Human Failing	67	14	2	641,100	7
Mech., Electr. Failure, Malfunction	55	11	0	747,500	8
Misuse of Source of Ignition	37	8	3	578,950	7
Constructn., Design, Installn. Def.	11	2	2	281,500	3
Misuse of Equipment	11	2	0	159,100	2
Misuse of Material Ignited	10	2	0	257,545	3
Vehicle Accident	8	2	1	54,000	1
Act or Omission N/A	8	2	0	1,000	0
Miscellaneous	3	1	0	16,000	0
Total	484	100	22	8,834,847	100

Fire Losses in NT by Major Materials First Ignited: 2003 - 2007

Material First Ignited	Fires	%	Deaths	$ Losses	% of $ Losses
Not Determined	230	48	13	5,468,697	62
Building Components	50	10	2	1,545,100	17
Wood, Paper Products	46	10	1	436,650	5
Miscellaneous	43	9	2	176,480	2
Agricultural Products	30	6	0	43,700	0
Flammable & Combustible Liquids	27	6	0	320,925	4
Chemicals	27	6	0	291,790	3
Furniture, Furnishings	18	4	1	440,910	5
Clothing, Textiles	11	2	3	108,595	1
Flammable Gases	2	0	0	2,000	0
Total	484	100	22	8,834,847	100

Fire Losses in NT by Residential Property Classes 2003 - 2007

Property Class	Fires	%	Deaths	$ Losses
One and Two Family Dwellings	110	57	12	4,642,627
Apartments	47	24	1	465,740
Hotel, Inn, Lodge (year round use)	5	3	1	6,000
Residential (coded as 3000)	5	3	0	3,700
Residential Miscellaneous- Unclassified	5	3	0	50,000
Mobile Home (1 or 2 family units)	3	2	0	175,000
Single Cabins	3	2	0	105,100
Rooming, Boarding, Lodging House (less than 10 persons)	2	1	0	0
Rooming, Boarding, Lodging House- Unclassified	3	2	0	75,000
Tents	2	1	1	500
Motor Home (includes camperized van)	2	1	0	31,500
Bunkhouse & Worker's Barracks	1	1	0	50,000
Mobile Home, Trailer- Unclassified	1	1	0	0
Military Barracks	1	1	0	0
Camp/Retreats – Seasonal Use (coded as 3800)	1	1	0	0
Childrens' Playhouse	1	1	0	5,000
Total	192	100	15	5,610,167

Fire Losses in NT Homes by Type of Home 2003 - 2007

Type of Home	Fires	%	Deaths	%	$ Losses	%
One/Two Family Dwellings	110	67	12	92	4,642,627	88
Apartments, Tenements, Flats	47	28	1	8	465,740	9
Residential (coded as 3000)	5	3	0	0	3,700	0
Mobile Homes	3	2	0	0	175,000	3
Total	165	100	13	100	5,287,067	100

Fire Losses in NT Homes by Areas of Fire Origin 2003 - 2007

Area of Origin	Fires	%	Deaths	%	$ Losses
Kitchen	32	19	1	8	284,690
Living Room	18	11	2	15	710,000
Bedroom	13	8	7	54	465,300
Heating Equipment Room	9	5	0	0	108,200
Crawl Space - includes sub-structure space	8	5	0	0	111,500
Chimney, Flue Pipe, Gas Vent	5	3	0	0	1,000
Outside Area - lawn, balcony, court, patio…	9	5	1	8	1,355,200
Exterior Wall	4	2	0	0	14,000
Vehicle Parking	5	3	0	0	62,200
Unclassified Areas	5	3	0	0	282,718
Other Areas (each 1% or less)	25	17	1	8	528,600
Area of Origin – unknown	32	19	1	8	1,363,659
Total	165	100	13	100	5,287,067

Major Known Causes of Home Fires in NT: 2003 - 2007

Fire Cause	Fires	% Fires	Deaths	$ Losses
Heating Equipment Related	31	19	0	387,100
Cooking	32	19	1	128,790
Arson/Set Fire	15	9	0	198,418
Smoking	9	5	2	357,200
Candle	7	4	0	285,200
Electrical Distribution Equipment	6	4	0	230,000
Appliance/Equipment Related	4	2	0	98,000
Child Fireplay	3	2	0	171,100
Flammable/Comb. Liquid Ignition	2	1	0	105,000
Clothes Dryer	1	1	0	0
Exposure Fire	1	1	0	1,000
Other Causes/Unknown	54	33	10	3,325,259
Total	165	100	13	5,287,067

Fire Deaths in NT by Property Classes: 2003 - 2007

Property Class	Deaths	%
One and Two Family Dwellings	12	55
Automobile (Incl. cars/light trucks/vans/single body units)	2	9
Apartments	1	5
Hotel, Inn, Lodge (year round use)	1	5
Tents	1	5
Lumberyards, Building Materials Storage	2	9
General Truck (incl. mail truck, trailer truck, tow truck)	2	9
Shed (includes implement shed & workshop)	1	5
Total	22	100

Major Known Causes of Fire Deaths in NT: 2003 - 2007

Fire Cause	Deaths	%
Other Causes/Unknown	13	59
Arson/Set Fire	3	14
Heating Equipment Related	3	14
Smoking	2	9
Cooking (except cooking oil fire)	1	5
Total	22	100

Department of National Defence

Fire Losses in DND 2006 - 2008

Year	Fires	Deaths	$ Losses
2006	353	.	15,974,784
2007	443	.	1,369,584
2008	384	.	135,595,797
Total	1,180	.	152,940,165

Fire Losses in DND by Type of Property Classes: 2006 - 2008

Year	All Fires	Structural	Vehicle	Outdoor	Equipment	Coded Fires
2006	353	76	45	93	7	221
2007	443	82	67	145	16	310
2008	384	90	61	56	7	214
Total	1180	248	173	294	30	745
% of Coded Fires		33	23	39	4	100

Fire Losses in DND by Major Property Classes: 2006 - 2008

Property Class	Fires	%	$ Losses
Special Property & Transportation Equipment	469	40	124,202,557
Not Coded	424	36	80,300
Residential	90	8	892,067
Miscellaneous Property	70	6	782,430
Assembly	50	4	93,755
Business & Personal Services	34	3	25,265,133
Storage Properties	22	2	421,245
Mercantile	11	1	8,315
Institutional	6	1	164,302
Industrial Manufacturing Properties	4	0	1,030,061
Total	1,180	100	152,940,165

Fire Losses in DND 2006 - 2008
By Property Classes in the "Special Property &Transportation Equipment Category"

Property Class	Fires	%	$ Losses
Brush, Grass & Light Ground Cover on Open Land, Field	243	52	274,807
Special Vehicles - unclassified or unknown	46	10	6,599,307
Combat Ship	31	7	217,455
Outdoor Property - unclassified or unknown	25	5	25,000
Ground Transport Vehicle - unclassified or unknown	24	5	102,925,941
Automobile	17	4	97,820
General Truck - includes mail truck, trailer truck and tow truck	16	3	35,604
Military Non-Combat Aircraft - cargo, training	13	3	10,145
Trash / Rubbish / Recyclable	10	2	550
Forest, Standing Timber	9	2	0
Emergency vehicles	7	1	41,579
Trees - includes individual trees only	6	1	800
Military Combat Aircraft - bomber, fighter, patrol	3	1	.
Industrial Truck, Forklift & Material Handling Truck, etc.	2	0	324
Construction Equipment - excludes crane (8830)	2	0	152,500
Aircraft - unclassified or unknown	2	0	.
Snowmobile, all terrain vehicle (ATV)	2	0	3,000
Tractor Trailer	2	0	80,000
Mobile or Fixed Crane	1	0	0
Farm Tractor & Equipment, Grain Dryer, Harvester, Picker, etc.	1	0	6,500
Helicopter & Vertical Take Off Aircraft - non-military	1	0	.
Bus, Trackless Trolley	1	0	10,000
Motor Craft - 20m or less over-all length	1	0	0
Buildings Under Construction	1	0	61,000
Commercial Passenger Aircraft	1	0	.
Vacant Property, Property Without Contents	1	0	13,660,225
Underpass - includes tunnels 30m or less in length	1	0	0
Total	469	100	124,202,557

Fire Losses in DND by Major Sources of Ignition: 2006 - 2008

Source of Ignition	Fires	%	$ Losses
Electrical Distribution Equipment	95	8	903,313
Smoker's Material & 'Open' Flames	94	8	532,590
Not Determined	62	5	14,190,121
Other Electrical Equipment	51	4	25,314,497
Cooking Equipment	42	4	86,453
Appliances & Equipment	28	2	160,273
Exposure	24	2	3,293,022
Heating Equipment	19	2	1,062,428
No Igniting Object	5	0	4,500
Miscellaneous	275	23	7,307,318
Not Coded	485	41	100,085,650
Total	1,180	100	152,940,165

Fire Losses in DND by Major Acts or Omissions: 2006 - 2008

Act or Omission	Fires	%	$ Losses
Not Coded	485	41	100,085,650
Miscellaneous Act or Omission	265	22	638,432
Mechanical/Electrical Failure/Malfunction	178	15	1,751,730
Human Failing	90	8	518,535
Incendiary Fires	71	6	49,326,648
Misuse of Source of Ignition	35	3	217,265
Construction, Design or Installation Deficiency	22	2	173,306
Misuse of Material Ignited	15	1	101,785
Misuse of Equipment	12	1	2,114
Vehicle Accident	7	1	124,700
Total	1,180	100	152,940,165

Fire Losses in DND by Residential Property Classes: 2006 - 2008

Property Class	Fires	%	$ Losses
One & Two-Family Dwellings	36	40	467,934
Dormitory	35	39	101,527
Apartment, Tenement, Flat, Townhouse, Condominium	10	11	230,926
Mobile Home, Mobile Accommodation, Trailer	3	3	110
Miscellaneous - Residential	2	2	0
Camp/Retreats - Seasonal Use	2	2	81,060
Rooming, Boarding, Lodging House, Hostel	1	1	10,000
Hotel, Inn, Lodge	1	1	510
Total	90	100	892,067

Fire Losses in DND Residential Property Classes by Sources of Ignition: 2006 - 2008

Source of Ignition	Fires	%	$ Losses
Smoker's Material	19	21	183,235
Electrical Wiring/switch/outlet...	15	17	83,320
Stove, Range, Top Burner Area	11	12	19,510
Other cooking equipment	6	7	5,800
Heating equipment	6	7	97,179
Incandescent Lamp, Light bulb - includes lantern, flashlight	5	6	2,830
Igniting Object - cannot be determined	5	6	225,176
Individual Air Conditioner or Dehumidifier	3	3	1,645
Clothes Dryer/Washer	2	2	1,300
Candle, Taper	2	2	60,300
Explosive - includes blasting agent	1	1	1,278
Appliances & Equipment - unclassified or unknown	1	1	200
Match, lighter	1	1	500
Bar-b-q Starter (Electric)	1	1	30,000
Exposure fire	1	1	0
Motor, 1HP & Over	1	1	0
Miscellaneous Igniting Object - Unclassified	1	1	178,294
Electrical Equipment - unclassified or unknown	1	1	1,500
No Igniting Object (i.e. lightning)	1	1	0
Unknown (not coded)	7	8	.
Total	90	100	892,067

Fire Losses in DND Residential Property Classes by Acts or Omissions: 2006 - 2008

Act or Omission	Fires	%	$ Losses
Ignorance of hazard	12	13	227,750
Electrical Short Circuit	9	10	160,380
Not Coded	7	8	.
Smoker's Material	7	8	2,685
Distracted, Preoccupied	5	6	1,270
Mechanical/Electrical Failure/Malfunction - cannot be determined	4	4	1,545
Suspected Faulty Connection Involving Copper Wiring	4	4	11,904
Part Failure, Leak, Break	4	4	2,370
Act or Omission - Not Applicable	3	3	9,160
Human Failing - unclassified	3	3	810
Part Worn Out	2	2	5,150
Automatic Control Failure	2	2	2,585
Temporary Loss of Judgement Suspected - includes panic	2	2	40,000
Misuse of Source of Ignition - unclassified	2	2	0
Suspect Not Identified	2	2	242,676
Misuse of Equipment - unclassified	2	2	150
Suspicious	2	2	178,294
Overheated Cooking Oil, Grease, Wax	2	2	2,010
Suspected Impairment - use of alcohol, drugs or medication	1	1	0
Adult - 18 years of age and older	1	1	0
Incendiary Fire	1	1	1,278
Asleep - suspected use of alcohol, drugs or medication	1	1	0
Human Failing - cannot be determined	1	1	100
Mechanical/Electrical Failure/Malfunction - unclassified	1	1	0
Act or Omission - cannot be determined	1	1	200
Young Offender - 12 to 17 years of age	1	1	500
Misuse of Source of Ignition - cannot be determined	1	1	0
Improper Storage	1	1	900
Design Deficiency	1	1	0
Misuse of Material Ignited - cannot be determined	1	1	50
Accident	1	1	0
Miscellaneous Act or Omission - unclassified	1	1	0
Child - 11 years of age or younger	1	1	0
Combustible Placed too Close to Heat	1	1	300
Total	90	100	892,067

Canada

Major causes of fire deaths in Canada and combined home fire losses in participating provinces and territories are provided below.

Major Causes of Fire Deaths in Canada*

Fire Cause	% of Deaths
Smoking	22
Arson or Set Fire	9
Electrical	5
Cooking	5
Child Fire-play	3
Flammable Gas Ignition	3
Flam./Comb. Liquid Ignition	3
Candle	2
Heating	2
Exposure	1
Other Causes/Unknown	45

*Fire data for 2007 from BC, AB, MB, ON, NB, NS; for 2008 from SK; and averaged for 2003 - 2007 for NT. Percent Canadian Population represented = 75%. QC, PE, NL, YK and NU data was not available.

Home Fire Losses in Participating Provinces and Territories

Percent Distribution of Home Fires by Type of Home

Type of Home	% Fires	% Deaths	% Injuries
One/Two Family Dwellings	74	78	62
Apartments, Tenements, Flats	24	17	36
Mobile Homes	2	5	2

This Table summarizes data for BC, AB, MB, ON, NB, NS (for 2007); SK (for 2008); and NT (for 2003-2007).

Home Fires in Canada by Area of Fire Origin

Area of Origin	Fires	%	Deaths	% Deaths	Injuries	% Injuries
Kitchen	2,955	22	20	12	334	29
Outside Area (inc porch, balcony, court, patio, terrace, lawn, other...)	1,201	9	5	3	47	4
Bedroom	1,136	9	35	20	242	21
Living Room	1,077	8	56	33	198	17
Chimney - masonry/factory built, metal; flue-pipe; gas-vent	690	5	2	1	6	1
Vehicle garage...	600	5	6	3	45	4
Exterior Wall	475	4	0	0	8	1
Laundry Area	421	3	2	1	24	2
Washroom	241	2	2	1	26	2
Heating equipment room	221	2	0	0	16	1
Other Areas (<=1%)	2,940	22	31	18	195	17
Undetermined/Unknown	1,299	10	14	8	27	2
Total	13,256	100	173	100	1,168	100

This Table contains data for BC, AB, MB, ON, NB, NS (for 2007); SK (for 2008); NT (for 2003-2007).

Causes of Home Fires in Canada

Causes	Fires*	% Fires	Deaths	% Deaths	Injuries	% Injuries
Cooking∞	2,582	20	11	7	290	27
Heating Equipment Related	1,631	12	2	1	65	6
Arson/Set Fire	1,477	11	16	10	83	8
Electrical Distribution Equipment	1,092	8	11	7	60	6
Smoking	900	7	36	22	92	9
Candle	337	3	5	3	50	5
Appliance/Equipment Related	312	2	0	0	7	1
Exposure Fire	265	2	1	1	4	0
Clothes Dryer	231	2	0	0	8	1
Lighting Equipment	222	2	0	0	13	1
Cutting/Welding Equipment or Blow Torch	205	2	0	0	18	2
Child Fireplay	122	1	5	3	19	2
Flammable/Comb. Liquid Ignition	89	1	1	1	24	2
Flammable Gas Ignition	33	0	2	1	2	0
Other Causes/Unknown	3626	28	72	44	332	31
Total	13,124	100	162	100	1,067	100

* This Table contains data for one/two family dwellings, apartments and mobile homes in BC, AB, MB, ON, NB, NS (for 2007); SK (for 2008); NT (averaged for 2003-2007). Thus, the totals row reflects fire losses for these periods.

∞Cooking fires include cooking oil fires (30%) and all other cooking fires (without ignition of cooking oil) (70%). Injuries were equally distributed between these two types of cooking fires. Please refer to "*Cooking Oil: A Home Fire Hazard in Alberta, Canada*," by Mahendra S. Wijayasinghe and Thomas B. Makey. Fire Technology Second Quarter 1997.

Health Canada
Santé Canada

Healthy Environments and Consumer Safety Branch
Direction générale, Santé environnementale et sécurité des consommateurs

Your file *Votre référence*

Our file *Notre référence*

Dear Client,

Canadian Courts have ruled that individuals who have demonstrated a medical need for marijuana have a right under the *Constitution Act, 1982*, to access a legal supply of marijuana. Because of this ruling, the Government of Canada introduced the *Marihuana Medical Access Regulations* (MMAR) in 2001.

However, Health Canada has heard many concerns that the Marihuana Medical Access Program (MMAP) was widely open to abuse. The current practice of allowing individuals to grow marijuana for medical purposes poses risks to the safety and security of Canadians. The high value of marijuana on the illegal market increases the risks of violent home invasion and diversion to the black market. In addition, these production operations present fire and toxic mould hazards. These risks are not only felt by the individuals licensed to grow, but potentially also by their neighbours and community members.

For this reason, the Government of Canada introduced the *Marihuana for Medical Purposes Regulations* (MMPR). These new regulations strengthen the safety of Canadian communities, while making sure that Canadians with a medical need can access quality controlled marihuana grown under sanitary conditions.

To help facilitate the transition for clients, both the new MMPR and the existing MMAP will be in force until March 31, 2014. At that point, only the new regime will be in effect. Individuals will no longer be licensed to grow marijuana in a private dwelling.

What this means for you:
Health Canada is no longer accepting applications for new Personal-Use Production Licenses (PUPL) and Designated-Person Production Licenses (DPPL). We are also no longer accepting applications to change the production site or increase the number of plants associated with a PUPL or DPPL.

If you are authorized to possess and/or grow marijuana for medical purposes you may still continue to renew your Authorization to Possess (ATP) and/or PUPL and/or DPPL with Health Canada.

It is important to note that while ATPs, PUPLs and DPPLs have traditionally been issued for one year, all ATPs, PUPLs and DPPLs expire on March 31, 2014, even if your document shows a later expiry date.

This is Exhibit "F" referred to in the affidavit of Danielle Lukey sworn before me at Abbotsford BC this 17th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Canada

At any time during the transition process, you can move from your current method of accessing marijuana for medical purposes to buying it from a licensed grower who is authorized by Health Canada. A list of licensed growers is available on the Health Canada website.

How will the changes affect you?
As of March 31, 2014, Health Canada will no longer grow or sell marijuana for medical purposes. The production of marijuana in private dwellings with a PUPL or DPPL will no longer be allowed. Anyone who requires marijuana for medical purposes must purchase it directly from a licensed grower.

Your current Authorization to Possess continues to be your acceptable proof to possess marijuana for medical purposes until March 31, 2014. Once the MMAR are repealed, you will need to show either the shipping label or a separate document from the licensed grower as your proof.

Although you will not be able to use your Authorization to Possess as proof to possess marijuana for medical purposes after March 31, 2014, you may still use it to register with a licensed grower until the validity date or expiry date (whichever is later).

Important Information for PUPL and DPPL holders
All PUPLs or DPPLs expire on March 31, 2014. Health Canada will contact all PUPL and DPPL holders before March 31, 2014, with instructions on how to safely dispose of marijuana plants. You can contact your local law enforcement for guidance.

The Questions and Answers document in this package provides more information on the new MMPR and the transition period.

If you have questions, please contact the Marihuana Medical Access Program at mmap-pamm@hc-sc.gc.ca or call toll-free 1-866-337-7705.

Sincerely,

Louis Proulx
A/Director
Bureau of Medical Cannabis
Controlled Substances and Tobacco Directorate
Health Canada

Health Canada - Santé Canada

Transition and the Marihuana for Medical Purposes Regulations

How the new regulations affect you

Bureau of Medical Cannabis
6/1/2013

Information about the Transition Period

The *Marihuana for Medical Purposes Regulations* (MMPR) were published on June 19, 2013, and are now in force. There will be a period of time until March 31, 2014 when both the MMPR and the *Marihuana Medical Access Regulations* (MMAR) are in force to help facilitate the transition to the system of licensed producers.

During this period, you will be able to access marihuana for medical purposes under either the MMAR or the MMPR, but not both. **The transition period will end on March 31, 2014, after which time only the MMPR will be in force.**

Key points about the transition period:

1. Effective October 1, 2013, you can no longer apply for a new Personal-Use Production Licence or Designated-Person Production Licence, change the location of your production site or increase the number of plants associated with your licence.

You may continue to renew your existing Authorization to Possess (ATP), Personal-Use Production Licence (PUPL) or Designated-Person Production Licence (DPPL); however, your new documents will expire on March 31, 2014.

2. All marihuana possessed or produced under your Authorization to Possess and/or Personal-Use or Designated-Person Production Licence must be destroyed no later than March 31, 2014.

3. The production of marihuana in homes will no longer be permitted beginning April 1, 2014.

4. You may use your ATP to register with a licensed producer until the expiry date shown on the document, however, as of April 1, 2014, your Authorization to Possess marihuana for medical purposes issued under the MMAR cannot be used as proof that you are authorized to possess marihuana for medical purposes. Only the label on the package from the LP or a separate document accompanying your shipment of dried marihuana from your licensed producer can be used as proof of authorization to possess marihuana for medical purposes.

Questions and Answers: How transition and the *Marihuana for Medical Purposes Regulations* (MMPR) affect you

The following pages contain answers to questions you may have about how the MMPR and the transition period will affect you. The questions you will find in this document include:

Q25: Are licensed producers only allowed to produce/sell dried marihuana?

Q26: Will licensed producers have more strain varieties than Health Canada?

Q27: How do I know if the marihuana produced by licensed producers is quality controlled?

Q28: How much will licensed producers charge per gram?

Q29: Will Health Canada continue to charge the same prices for its supply of dried marihuana for medical purposes?

Q30: Under the new regulations, is there a limit to how much marihuana I can possess at any point in time?

Q31: How can I become a licensed producer?

Q32: How can I obtain updated information about the transition period?

Q1: How do I access marihuana during the transition period?

A1:
If you have the support of a health care practitioner, you may access marihuana for medical purposes through either:

1. The current *Marihuana Medical Access Regulations* (by applying to Health Canada); or
2. The new *Marihuana for Medical Purposes Regulations* (by registering with a licensed producer).

Please note that you may only access marihuana for medical purposes under the *Marihuana Medical Access Regulations* or the new *Marihuana for Medical Purposes Regulations*, but not both.

Under the *Marihuana Medical Access Regulations*, you can apply to Health Canada to access one of the three sources of supply: Health Canada supply; Personal-Use Production Licence; or Designated-Person Production Licence. For more information on how to apply, please visit the "How to Apply" web page http://www.hc-sc.gc.ca/dhp-mps/marihuana/how-comment/index-eng.php.

Please note that effective October 1, 2013, you can no longer apply for a new Personal-Use Production Licence or Designated-Person Production Licence or change the production site address or increase the number of plants associated with your licence to produce.

Under the new *Marihuana for Medical Purposes Regulations*, the original medical document signed by your health care practitioner can be submitted directly to a licensed producer along with a completed registration form from the licensed producer of your choice.

Q2: During the transition period, what is my proof of authority to possess marihuana?

A2:
If you continue to access marihuana under the *Marihuana Medical Access Regulations*, your Authorization to Possess (ATP) will remain your proof of authority to possess until March 31, 2014. As of April 1, 2014, your ATP can no longer be used as proof that you are authorized to possess marihuana for medical purposes.

If you register with a licensed producer under the new *Marihuana for Medical Purposes Regulations* (regardless of whether it is before or after March 31, 2014) your proof of authority to possess will either be the label on the packaging or a separate document accompanying your shipment of dried marihuana from your licensed producer.

Q3: I have a valid Authorization to Possess. When can I transition to a licensed producer?

A3: You can transition anytime until the validity date shown on your Authorization to Possess. If you do not register with a licensed producer before your validity date, you can register using a medical document completed by your health care practitioner.

Health Canada has begun issuing licences to LPs. Contact information for LPs is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php. This page will be updated regularly as new LPs are approved.

Q4: If I apply for or renew my Authorization to Possess now, when will it expire?

A4: Starting June 19, 2013, the Program began issuing Authorizations to Possess (ATPs) containing three dates: an issue date, an expiry date and a validity date.

The **issue date** is the date your ATP is issued to you. Your **expiry date** is March 31, 2014. At this time you will no longer be permitted to access the sources of supply available under the MMAR (Personal-Use Production Licence, Designated-Person Production Licence, or Health Canada supply). You will be able to use your ATP, instead of a medical document, to register with a licensed producer until the **validity date**, which is one year from the issue date.

Q5: My Authorization to Possess has an expiry date after March 31, 2014. How do the *Marihuana for Medical Purposes Regulations* affect me?

A5: The repeal date of the *Marihuana Medical Access Regulations* (MMAR) is March 31, 2014.

As of April 1, 2014, the Authorization to Possess (ATP) issued to you under the MMAR cannot be used as proof of authority to possess, even if your ATP shows an expiry date later than March 31, 2014. However, you may use your ATP in place of a medical document to register with a licensed producer prior to your expiry date.

Q6: If my Authorization to Possess expires before March 31, 2014, what are my options for continuing to access marihuana for medical purposes?

A6:
Until March 31, 2014, if you have the support of a health care practitioner, you may access marihuana for medical purposes through either:

1. The *Marihuana Medical Access Regulations* (by applying to Health Canada); or
2. The new *Marihuana for Medical Purposes Regulations* (by registering with a licensed producer).

Under the *Marihuana Medical Access Regulations*, you can apply to Health Canada to access one of the three sources of supply: Health Canada supply; Personal-Use Production Licence; or Designated-Person Production

Licence. For more information on how to apply for one of these sources of supply, please visit the "How to Apply" web page at URL. Please note that effective October 1, 2013, you can no longer apply for a new Personal-Use Production Licence or Designated-Person Production Licence or apply to change the production site address or increase the number of plants associated with your licence to produce.

Under the new *Marihuana for Medical Purposes Regulations*, your health care practitioner must complete a medical document that you submit to a licensed producer along with a completed registration form from the licensed producer of your choice.

Please note that you may only have access to marihuana for medical purposes under either the *Marihuana Medical Access Regulations* or the new *Marihuana for Medical Purposes Regulations*, but not both.

Q7: My Personal-Use Production Licence/Designated-Person Production Licence expires after March 31, 2014. Does that mean I can continue to produce or store marihuana until the expiry date?

A7: No. The *Marihuana Medical Access Regulations* (MMAR) will be repealed on March 31, 2014. Any Personal-Use Production Licences and Designated-Person Production Licences issued under the MMAR are no longer valid as of that date, even if your licence shows a later expiry date. If you were issued a Personal-Use Production Licence or a Designated-Person Production Licence between April 1, 2013 and June 19, 2013, you will receive a letter that explains this in further detail.

The production of marihuana for medical purposes in private dwellings beyond March 31, 2014, is not permitted.

Q8: I have a Personal-Use Production Licence/Designated-Person Production Licence that expires after September 30, 2013. Can I still apply for a renewal?

A8: Yes. You can continue to apply to renew your Authorization to Possess and any associated Personal-Use or Designated-Person Production Licence; however, your new documents will expire on March 31, 2014.

Please note that effective October 1, 2013, you can no longer apply for a new PUPL or DPPL, or change the location of your production site or increase the number of plants associated with your Personal-Use or Designated-Person Production Licence.

Q9: I currently hold an Authorization to Possess and I would like to amend my source to have a Personal-Use Production Licence/Designated-Person Production Licence. Are these still being issued?

A9: To comply with the *Marihuana for Medical Purposes Regulations*, effective October 1, 2013, Health Canada can no longer accept applications for new Personal-Use and Designated-Person Production Licences.

In addition, effective October 1, 2013, Health Canada will not accept applications to change the production site or increase the number of plants associated with a Personal-Use and Designated-Person Production Licence. Applications for new PUPLs and DPPLs, or amendments to existing PUPLs/DPPLs received on or after October 1, 2013, will be returned.

It is important to note that as of March 31, 2014, you will only be able to legally access marihuana for medical purposes through licensed producers.

Q10: I currently hold a Personal-Use Production Licence/Designated-Person Production Licence. Can I make changes to my licence after September 30, 2013?

A10: It depends on the change. Effective October 1, 2013, you can no longer apply to change the location of your production site or increase the number of plants associated with your production site.

Any applications to change the production site address or the number of plants associated with a licence received by Health Canada on or after October 1, 2013, will be returned to you.

You should also note that while applications to change the address of a production site must be received prior to October 1, 2013, the address change must take effect before December 15, 2013. If your application identifies that a change in the production site address will occur after December 15, 2013, it will be returned to you.

You can continue to renew your Personal-Use or Designated-Person Production Licence with no production site changes or increase in numbers of plants. In addition, Health Canada will continue to accept applications for Authorizations to Possess and renewals for Authorizations to Possess, including increases in daily amounts, until March 31, 2014.

Q11: What is the last date on which I can submit an application to the Marihuana Medical Access Program?

A11: Health Canada will issue and renew Authorizations to Possess marihuana for medical purposes and will renew Personal-Use Production Licences and Designated-Person Production Licences that do not change the production site address or increase the number of plants associated with the licence until March 31, 2014. Please note that the service standard for processing incoming, complete applications is up to 10 weeks. **Therefore, if you wish to continue to apply to the Marihuana Medical Access Program, you are strongly advised to submit your completed application to Health Canada no later than 10 weeks prior to March 31, 2014.**

It is important to note the MMAR will be repealed on March 31, 2014. As of March 31, 2014 the only legal means to access dried marihuana for medical purposes is through the system of licensed producers.

Q12: Can I still order dried marihuana from Health Canada during the transition period?

A12: Yes. Health Canada will continue to supply dried marihuana until March 31, 2014. In order to access Health Canada's supply, you must have a valid Authorization to Possess and you must have submitted a complete Form E1 "Application to Obtain Dried Marihuana" with your most recent application to the Marihuana Medical Access Program.

Q13: Where is the list of Health Canada approved licensed producers?

A13: Health Canada has begun issuing licences to LPs. Contact information for LPs is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php. This page will be updated regularly as new LPs are approved.

Q14: Can I register with a licensed producer and still access my source of supply under the *Marihuana Medical Access Regulations*?

A14: No. You can either choose to switch to the system of licensed producers by registering with a licensed producer **OR** continue to access marihuana through a Personal-Use Production Licence, Designated-Person Production Licence, or through Health Canada supply under the *Marihuana Medical Access Regulations* until March 31, 2014. Once you register with a licensed producer you may not access your previous source of supply.

Note: After March 31, 2014, the only legal supply of marihuana for medical purposes is via a licensed producer.

Q15: I currently hold a Personal-Use Production Licence. If I switch to a licensed producer, can I continue to produce marihuana until March 31, 2014?

A15: No. Once you register with a licensed producer your Authorization to Possess and Personal-Use Production Licence will be revoked and all marihuana in your possession must be destroyed.

All Personal-Use and Designated-Person Production Licences expire on March 31, 2014. As of April 1, 2014, the only legal means to access to dried marihuana for medical purposes will be through the system of licensed producers.

Q16: I currently have a designated person producing marihuana for me. Can I still receive marihuana from him/her if I switch to the system of licensed producers?

A16: No. Once you register with a licensed producer, your Authorization to Possess and the associated Designated-Person Production Licence will be revoked. When these licences are revoked, your designated person must destroy all marihuana and marihuana plants produced under the licence.

All Personal-Use and Designated-Person Production Licences expire on March 31, 2014. As of April 1, 2014, the only legal means to access to dried marihuana for medical purposes will be through the system of licensed producers.

Q17: I have a Designated-Person Production Licence. Can I continue to produce marihuana if the person I produce for switches to the system of licensed producers?

A17: No. If the authorized person associated with your licence registers with a licensed producer your Designated-Person Production Licence will be revoked and you are required to immediately destroy the marihuana and marihuana plants in your possession.

If you have a second DPPL to produce for another individual who has not yet switched to the system of licensed producers, you may continue to produce for that individual under a valid licence until March 31, 2014. The amount produced should be in line with the maximum amount listed on the remaining licence.

Q18: If I switch to the system of licensed producers will I have to dispose of my dried marihuana and/or marihuana plants?

A18: Yes. Once you are registered with a licensed producer you must dispose of any dried marihuana and/or marihuana plants in your possession.

Q19: How do I dispose of my dried marihuana and/or marihuana plants?

A19: To dispose of your dried marihuana and/or marihuana plants you must first render it unfit for use or consumption.

One way is to blend the marihuana with water and mix it with cat litter to mask the odour. This can then be placed in your regular household garbage. **You must dispose of your dried marihuana and marihuana plants on or before March 31, 2014.**

Please use discretion when destroying or disposing of your dried marihuana and/or marihuana plants. Health Canada will communicate with you at a later date to provide additional information on destruction. You may also contact your local law enforcement agency for information.

Q20: How do I register with a licensed producer using my Authorization to Possess document?

A20: You can use your Authorization to Possess (ATP) to register with a licensed producer until the validity date shown on the ATP. In order to do so, you must send your original ATP to the licensed producer. Once registered, your licensed producer will return the ATP to Health Canada so that it can be formally revoked. Your new proof of authority to possess will either be the label on the packaging or a separate document accompanying the shipment of dried marihuana provided by the licensed producer.

Please note that you must contact the licensed producer to obtain a registration form, if required, to complete and submit with your medical document. The registration form, along with your ATP, must be submitted directly to the licensed producer. **Do not send your medical document or registration form to Health Canada.**

Health Canada has begun issuing licences to LPs. Contact information for LPs is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php. This page will be updated regularly as new LPs are approved.

Q21: How do I register with a licensed producer using a medical document?

A21: If your health care practitioner supports the use of marihuana for medical purposes in your case, he/she must complete a medical document on your behalf.

You must contact the licensed producer to obtain a registration form, if required, to complete and submit along with your medical document. The registration form and medical document must be submitted directly to the licensed producer. **Do not send your medical document or registration form to Health Canada.**

The licensed producer will process your registration application and once you have been approved, you will place orders directly through your licensed producer.

Health Canada has begun issuing licences to LPs. Contact information for LPs is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php. This page will be updated regularly as new LPs are approved.

Q22: Where can I obtain a medical document to access dried marihuana under the system of licensed producers?

A22: You can download and print a template medical document from Health Canada's website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/med-eng.php. If your health care practitioner chooses to use a different template, you must ensure that all required information, as described in the medical document template, is provided.

Health Canada has begun issuing licences to LPs. Contact information for LPs is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/list-eng.php. This page will be updated regularly as new LPs are approved.

Q23: Can I use Form B "Medical Practitioner's Form" to register with a licensed producer?

A23: Form B should only be used for applications to Health Canada for an Authorization to Possess under the *Marihuana Medical Access Regulations*. However, if your health care practitioner has already filled out the Form B, you can use it to register with a licensed producer instead of a medical document until March 31, 2014.

Q24: If I decide to register with a licensed producer, what information do I need to send to Health Canada?

A24: None. Health Canada is not involved in processing applications under the new system. Your original medical document must be sent directly to the licensed producer, not Health Canada.

Q25: Are licensed producers only allowed to produce/sell dried marihuana?

A25: Yes. Licensed producers are only allowed to provide dried marihuana for medical purposes.

Q26: Will licensed producers have more strain varieties than Health Canada?

A26: The *Marihuana for Medical Purposes Regulations* do not restrict licensed producers to any one strain of marihuana.

Q27: How do I know if the marihuana produced by licensed producers is quality controlled?

A27: Licensed producers are required to follow the Technical Specifications for Dried Marihuana for Medical Purposes. This document is available on the Health Canada website and outlines the conditions that must be met for quality assurance. Health Canada will inspect licensed producers to ensure they meet all requirements of the regulations, including these specifications.

Q28: How much will licensed producers charge per gram?

A28: Under the new *Marihuana for Medical Purposes Regulations*, licensed producers are responsible for setting their own prices.

Q29: Will Health Canada continue to charge the same prices for its supply of dried marihuana for medical purposes?

A29: No. Health Canada will change the price of its own supply to match the price set by the licensed producers.

Q30: Under the new regulations, is there a limit to how much marihuana I can possess at any point in time?

A30: Yes. Under the *Marihuana for Medical Purposes Regulations*, there is a possession cap of either 30 times the daily quantity of dried marihuana indicated by your health care practitioner on your medical document, or

150 grams of dried marihuana, whichever is less. You cannot possess or store an amount of marihuana that exceeds this amount.

Q31: How can I become a licensed producer?

A31: Information on how to become a licensed producer is available on the Health Canada website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/info/index-eng.php.

Q32: How can I obtain updated information about the transition period?

A32: Health Canada will continue to communicate updated information to you throughout the transition period through inserts in authorization and licence packages, direct mail and via the website at http://www.hc-sc.gc.ca/dhp-mps/marihuana/transition/index-eng.php.

You may also contact us at:
Email: mmap-pamm@hc-sc.gc.ca
Toll-free: 1-866-337-7705
Mail: Marihuana Medical Access Program
Health Canada
Address Locator: 0300A
Ottawa, ON K1A 0K9

Glossary of terms

Transition Period - The period between June 19, 2013, and March 31, 2014, in which you can access dried marihuana for medical purposes under either the *Marihuana for Medical Purposes Regulations* (MMPR) or the *Marihuana Medical Access Regulations* (MMAR), but not both.

Terms specific to the MMAR:

Authorization to Possess (ATP) - Authorization to Possess dried marihuana for medical purposes under the MMAR.

Personal-Use Production Licence (PUPL) - Licence to produce marihuana for the applicant's own medical purposes under the MMAR.

Designated-Person Production Licence (DPPL) - Licence to produce marihuana for a named authorized individual's medical purposes under the MMAR.

Issue Date - The date on which your ATP/PUPL/DPPL was issued.

Expiry Date - The date on which your ATP/PUPL/DPPL expires. Since the MMAR will be repealed on March 31, 2014, all ATPs, PUPLs and DPPLs will expire no later than this date.

Validity Date - The last date up to which you can use your ATP in place of a medical document to register with a licensed producer under the MMPR.

Terms specific to the MMPR:

Medical document - The document your health care practitioner completes and that you must submit directly to a licensed producer to register for access to dried marihuana for medical purposes under the MMPR.

Licensed Producer - A producer licensed by Health Canada to produce dried marihuana for medical purposes under the MMPR.

The *Marihuana for Medical Purposes Regulations* (MMPR) and the *Marihuana Medical Access Regulations* (MMAR) at a glance

Questions	MMAR	MMPR
How do I obtain access to marihuana for medical purposes?	Complete Health Canada application forms and submit to Health Canada.	Have your health care practitioner complete a medical document and submit the original directly to a licensed producer.
What are my options for obtaining supply?	Three options: Health Canada supply, Personal-Use Production Licence (PUPL), or Designated-Person Production Licence (DPPL).	One option only: from a licensed producer.
What is my proof of authority to possess?	Health Canada-issued Authorization to Possess (ATP).	The label on the packaging and a separate document accompanying the shipment of dried marihuana provided by the licensed producer. Photo identification may also be requested.
Can I produce for myself or have someone produce for me?	Yes, with a PUPL or a DPPL.	No.
How do I renew?	You can renew using Health Canada application forms. Effective October 1, 2013, Health Canada is no longer accepting applications for new PUPLs/DPPLs and applications with changes to production sites and increases to the number of plants associated with licences.	Have your health care practitioner complete a medical document and submit the original directly to a licensed producer. You will be required to renew annually (or sooner, depending on the duration indicated on your medical document).
How do I make changes to my address/personal information?	Submit an amendment application to Health Canada. Effective October 1, 2013, Health Canada is no longer accepting applications for new PUPLs/DPPLs or applications with changes to production sites and increases to the number of plants associated with licences.	Contact your licensed producer to make any changes to your address/personal information.
How do I place orders for dried marihuana or marihuana seeds?	By using the Health Canada order form.	Order dried marihuana directly from your licensed producer.
Can I possess marihuana for medical purposes after March 31, 2014?	No. All marihuana must be destroyed on or before this date.	Yes, you can possess marihuana that has been shipped to you from a licensed producer.
Can I produce marihuana for medical purposes after March 31, 2014?	No. All marihuana must be destroyed on or before this date.	No.
Can I apply for access to marihuana for medical purposes	Yes. Health Canada will accept applications for ATPs until this date.	Yes. You may register with a licensed producer at any time.

between now and March 31, 2014?	Effective October 1, 2013, Health Canada is no longer accepting applications for new PUPLs/DPPLs and applications with changes to production sites and increases to the number of plants associated with licences..	

FEDERAL CLASS ACTION LAUNCHED IN MEDICAL MARIHUANA PRIVACY GAFFE

Mass Mailing Compromised Private Medical Information and Patient Safety, Suit Alleges

VANCOUVER (November 25, 2013) – A proposed national class action has been filed in the Federal Court of Canada against the Federal Government seeking damages from a privacy breach arising from Health Canada's mass mailing of letters to approximately 40,000 individuals across Canada in envelopes that identified the recipients as participants in the *Medical Marihuana Access Program.*

The national class action was commenced today by Jason Wilcox on behalf of all Canadians whose personal and health information was compromised.

In July 2001, the Federal Government enacted the *Marihuana Medical Access Regulations.* The Regulations, among other things, empower the Minister of Health to issue authorizations and licenses to individuals with certain symptoms associated with particular medical conditions, permitting those individuals to possess and, in some cases, produce marihuana for medical purposes. The Minister of Health is responsible for administering the Regulations and does so through Canada Health's Marihuana Medical Access Program (MMAP).

Prior to November 2013, all correspondence from Health Canada to holders of medical marijuana authorizations and licenses in relation to MMAP was conveyed by a private courier in envelopes that did not include the word "marihuana". However, in November 2013, the Federal Government conveyed letters to participants in the Medical Marijuana Access Program with "Marihuana Medical Access Program" stamped on the outside of the envelope. The letters were conveyed through Canada Post.

"This privacy breach is unlike most. It not only compromises the confidentiality of participants' personal and health information, but it also compromises participants' physical safety and security," said Kate Saunders of Branch MacMaster LLP, the law firm representing the Plaintiff and the proposed class, "The Federal Government does not seem to be learning from its privacy mistakes, which include the recent Student Loan hard drive loss case, in which our firm is also involved."

Anyone who received a letter from Canada Health this month with the "Marihuana Medical Access Program" on the outside of the envelope is encouraged to go to http://www.branchmacmaster.com/medical-marihuana/ for further information regarding this proposed class action, or to email uherlev@branmac.com to be added to a list of known claimants wishing to participate in this action.

For more information, please contact:

Kate Saunders
Branch MacMaster LLP
604.654.2951
ksaunders@branmac.com

This is Exhibit "G" referred to in the affidavit of Danielle Lukiv sworn before me at Abbotsford BC this 17th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Court File No.: T-1934-13

FEDERAL COURT

PROPOSED CLASS PROCEEDING

BETWEEN:

JASON WILCOX

PLAINTIFF

AND:

HER MAJESTY THE QUEEN

DEFENDANT

STATEMENT OF CLAIM

A LEGAL PROCEEDING HAS BEEN COMMENCED AGAINST YOU by the Plaintiff. The claim made against you is set out in the following pages.

IF YOU WISH TO DEFEND THIS PROCEEDING, you or a solicitor acting for you are required to prepare a statement of defence in Form 171B prescribed by the *Federal Court Rules,* serve it on the Plaintiff's solicitor or, where the Plaintiff does not have a solicitor, serve it on the Plaintiff, and file it, with proof of service, at a local office of this Court, WITHIN 30 DAYS after this statement of claim is served on you, if you are served within Canada.

If you are served in the United States of America, the period for serving and filing your statement of defence is forty days. If you are served outside Canada and the United States of America, the period for serving and filing your statement of defence is sixty days.

Copies of the Federal Court Rules information concerning the local offices of the Court and other necessary information may be obtained on request to the Administrator of this Court at Ottawa (telephone 613-992-4238) or at any local office.

IF YOU FAIL TO DEFEND THIS PROCEEDING, judgment may be given against you in your absence and without further notice to you.

Vancouver, November 25, 2013 Issued by:

MUN Y. CHAN
REGISTRY OFFICER
AGENT DU GREFFE

(Registry Officer)

This is Exhibit "H" referred to in the affidavit of Danielle Lukiv sworn before me at Abbotsford BC this 17th day of Jan 2014

A Commissioner for taking Affidavits for British Columbia

Pacific Center, 3rd Floor
701 West Georgia Street
Post Office Box 10065
Vancouver, British Columbia
V7Y 1B6

Centre Pacific, 3ième étage
701, rue Georgia ouest
C.P. 10065
Vancouver (Colombie-Britanique)
V7Y 1B6

Address of Local Office: P.O. Box 10065
701 West Georgia Street
Vancouver, BC V7Y 1B6

TO: The Attorney General of Canada
Attention: Mr. William F. Pentney, Deputy Attorney General of Canada

CLAIM OF THE PLAINTIFF

RELIEF CLAIMED

1. The Plaintiff claims on his own behalf and on behalf of the proposed Class Members (as defined below):

   (a) An Order pursuant to Rules 334.16(1) and 334.17 of the *Federal Court Rules* (the "**Rules**") certifying this action as a class proceeding and providing any ancillary directions;

   (b) An Order pursuant to Rules 334.12(3), 334.16(1)(e) and 334.17(b) appointing the Plaintiff as the representative plaintiff for the Class (as defined below);

   (c) Damages for breach of privacy, reckless intrusion upon seclusion, negligence breach of contract, including damages for:

      i. Costs incurred to ensure personal security,

      ii. Costs incurred to secure marihuana gardens,

      iii. Mental distress,

      iv. Damage to reputation,

      v. Loss of employment,

      vi. Reduced capacity for employment,

      vii. Out-of-pocket expenses, and

      viii. Inconvenience, frustration and anxiety associated with taking precautionary steps to ensure personal security and security of marihuana gardens.

   (d) Punitive damages;

(e) Damages pursuant to section 24(1) of the *Canadian Charter of Rights and Freedoms,* R.S.C. 1985, App. II, No. 44, Schedule B (the "**Charter**");

(f) An Order pursuant to Rule 334.28(1) and (2) for the aggregate assessment of monetary relief and distribution thereof to the Plaintiff and other Class Members;

(g) Pre- and post-judgment interest pursuant to sections 36 and 37 of the *Federal Courts Act,* R.S.C. 1985, c. F-7;

(h) Costs, if appropriate; and

(i) Such further or other relief as this Honourable Court deems just.

THE PARTIES

2. The Plaintiff, Jason Wilcox, is a resident of Vancouver, British Columbia, with an address for service care of Branch MacMaster LLP, 1410 – 777 Hornby Street, Vancouver, British Columbia V6Z 1S4.

3. The Plaintiff brings this action on his own behalf and on behalf of members of a class (the "**Class Members**") defined as:

> All persons to whom correspondence was addressed in November 2013 by, or on behalf of, Health Canada or the Minister of Health and conveyed in envelopes with the following return address:
>
> Health Canada
> Marihuana Medical Access Program
> Health Canada
> AL: 0300A
> Ottawa ON K1A 0K9

4. The Defendant, Her Majesty the Queen, is named as a representative of the Federal Government of Canada and the Minister of Health, the Minister responsible for Health Canada and the Marihuana Medical Access Program.

BACKGROUND

5. In July 2001, the *Marihuana Medical Access Regulations,* SOR/2001-227 (the "**Regulations**") were brought into force. Among other things, the Regulations provide a regulatory framework for the issuance of authorizations and licenses to individuals with certain symptoms associated with certain medical conditions, permitting such individuals to possess and, in some cases, produce marihuana for

medical purposes. The Minister of Health is responsible for administering the Regulations and does so through Health Canada's Marihuana Medical Access Program ("**MMAP**").

6. The Plaintiff and the other Class Members were each issued an authorization to possess marihuana for medical purposes (the "**Authorization to Possess**") pursuant to section 11 of the Regulations.

7. At all material times, the Authorization to Possess authorized the Plaintiff and other Class Members to possess dried marihuana, in accordance with the authorization, for the medical purpose of the holder.

8. The Plaintiff and certain other Class Members were also each issued a personal-use production license ("**Production License**") pursuant to section 29 of the Regulations.

9. At all material times, the Production Licenses authorized the Plaintiff and certain other Class Members to produce and keep marihuana, in accordance with the license, for the medical purpose of the holder.

10. When applying for their Authorization to Possess and Production Licenses, as applicable, the Plaintiff and other Class Members were required to provide their residential address and, if different, a mailing address to the Minister of Health, and were required to notify the Minister of Health of any changes to their residential or mailing address.

11. Prior to November 2013, all hard-copy correspondence from the Minister of Health, Health Canada and/or MMAP relating to the Plaintiff's and other Class Members' Authorizations to Possess or Production Licenses, as applicable, was conveyed to the addresses provided by the Plaintiff and other Class Members via private courier in envelopes that did not reference the word "marihuana".

12. However, in November 2013, the Minister of Health, Health Canada and/or MMAP sent correspondence pertaining to MMAP to the addresses provided by the Plaintiff and other Class Members via Canada Post in envelopes stamped with the following return address (the "**Letters**"):

    Health Canada
    Marihuana Medical Access Program
    Health Canada
    AL: 0300A
    Ottawa ON K1A 0K9

Each Letter also had the name and address of the applicable Plaintiff or other Class Member on the outside of the envelope (collectively, the "**Privacy Breach**").

13. On November 21, 2013, the Deputy Minister of Health issued a statement acknowledging the following about the Privacy Breach:

    (a) Health Canada sent approximately 40,000 letters in envelopes that "were labeled to indicate they were sent by [MMAP]",

    (b) He deeply regretted the error,

    (c) Health Canada is taking steps to ensure it does not happen again, and

    (d) Protection of personal information is of fundamental importance to Health Canada.

14. The Privacy Breach disclosed the following personal and health information about each of the Plaintiff and other Class Members:

    (a) The Plaintiff or Class Member to whom the Letter was addressed (the "**Addressee**") held an Authorization to Possess marihuana,

    (b) The Addressee likely possessed marihuana for medical purposes,

    (c) An address where the Addressee may be located,

    (d) The Addressee may possess a Production License and may be producing marihuana,

    (e) The Addressee currently suffers from, or previously suffered from, at least one of the following:

        i. severe nausea associated with cancer or an AIDS/HIV infection, or associated with medical treatment of one of those conditions,

        ii. cachexia, anorexia and/or weight loss associated with cancer or an AIDS/HIV infection, or associated with medical treatment of one of those conditions,

        iii. persistent muscle spasms associated with multiple sclerosis, or a spinal cord injury or disease, or associated with medical treatment of one of those conditions,

        iv. seizures associated with epilepsy, or associated with medical treatment of that condition,

v. severe pain associated with cancer, an AIDS/HIV infection, multiple sclerosis, a spinal cord injury or disease, or a severe form of arthritis, or associated with medical treatment of one of those conditions, and/or

vi. a debilitating symptom that is associated with a medical condition or with the medical treatment of that condition, and

(f) Conventional treatments for the symptoms enumerated in (e) were found ineffective or medically inappropriate for the Addressee,

(collectively, the "**Personal and Health Information**").

15. The Plaintiff and the other Class Members did not consent to the disclosure of their Personal and Health Information by the Defendant as disclosed in the Privacy Breach, or at all.

RECKLESS INTRUSION UPON SECLUSION

16. The Defendant's intentional or reckless act or omission caused or contributed to the Privacy Breach.

17. The Defendant invaded, without lawful justification, the Plaintiff's and other Class Members' private affairs or concerns.

18. The invasion is highly offensive causing distress, humiliation or anguish to the reasonable person.

BREACH OF CONTRACT

19. Upon applying to Minister of Health for an Authorization to Possess or Production License, each of the Plaintiff and other Class Members entered into an express or implied agreement with the Minister of Health, Health Canada and/or the MMAP (the "**Contract**").

20. The express or implied terms of the Contract required the Minister of Health, Health Canada and/or the MMAP to preserve the confidentiality of the Plaintiff's and other Class Members' Personal and Health Information.

21. The Defendant breached the contract when the Plaintiff's and other Class Members' Personal and Health Information was disclosed in the Privacy Breach.

22. The Plaintiff and other Class Members suffered damages as a result of the Defendant's breach of contract, as particularized below.

23. It was foreseeable that the Defendant's breach of contract would cause the Plaintiff and other Class Members to suffer damages.

NEGLIGENCE

24. The Defendant owed the Plaintiff and the other Class Members a duty of care in the collection, retention, use and disclosure of the Personal and Health Information and to maintain the Personal and Health Information as confidential.

25. The Defendant had statutory duties regarding the collection, retention, use and disclosure of the Plaintiff's and other Class Members' Personal and Health Information, including:

    (a) Permitting the Plaintiff and other Class Members to determine for themselves when, how and to what extent the Personal and Health Information is communicated to others pursuant to sections 7, 8 and/or 15 of the Charter,

    (b) Refraining from disclosing the Plaintiff's and other Class Members' Personal Information without the consent of the respective Plaintiff or other Class Member pursuant to section 8 of the *Privacy Act,* R.S.C., 1985, c.P-21, and

    (c) In British Columbia, Saskatchewan, Manitoba, and Newfoundland and Labrador, refraining from willfully and without claim of right, violating the privacy of the Plaintiff's and other Class Members' pursuant to section 1 of the *Privacy Act*, R.S.B.C. 1996, c. 373, section 2 of the *Privacy Act*, R.S.S. 1978, c. P-24, section 1 of the *Privacy Act*, R.S.M. 1987, c. P125 and section 3 of the *Privacy Act*, R.S.N. 1990, c. P-22, respectively.

26. The Defendant breached it duty of care by:

    (a) Failing to comply with its statutory duties respecting the collection, retention, use and disclosure of the Plaintiff's and other Class Members' Personal and Health Information,

    (b) Failing to create or adhere to policies respecting the collection, retention, use, disclosure and confidentiality of the Plaintiff's and other Class Members' Personal and Health Information,

    (c) Failing to take reasonable steps to ensure the Plaintiff's and other Class Members' Personal and Health Information was not disclosed,

    (d) Failing to maintain the confidentiality of the Plaintiff's and other Class Members' Personal and Health Information,

(e) Failing to comply with its obligations pursuant to the Contract,

(f) Disclosing the Plaintiff's and other Class Members' Personal and Health Information in the Privacy Breach, and

(g) Such further or other particulars as counsel may advise.

27. As a result of the Defendant's negligence, the Plaintiff and other Class Members have suffered damages, as particularized below.

28. It was reasonably forseeable that the Defendant's negligence would cause the Plaintiff and other Class Members to suffer the damages.

BREACH OF *CHARTER* RIGHT TO PRIVACY

29. At all material times, the Plaintiff and other Class Members had a reasonable expectation of privacy pursuant to sections 7, 8 and/or 15 of the Charter.

30. Sections 7, 8 and/or 15 of the Charter guaranteed the Plaintiff's and other Class Members' right to determine for themselves when, how and to what extent their Personal and Health Information is communicated to others.

31. The Privacy Breach infringed or denied the Plaintiff's and other Class Members' right pursuant to sections 7, 8 and/or 15 of the Charter.

DAMAGES

32. As a result of the Defendant's intrusion upon seclusion, breach of privacy, negligence, and/or breach of contract, the Plaintiff and other Class Members have suffered damages including:

(a) Costs incurred to ensure personal security,

(b) Costs incurred to secure marihuana gardens,

(c) Mental distress,

(d) Damage to reputation,

(e) Loss of employment,

(f) Reduced capacity for employment,

(g) Out-of-pocket expenses,

(h) Inconvenience, frustration and anxiety associated with taking precautionary steps to ensure personal security and security of marihuana gardens, and

(i) Such further or other damages as counsel may advise.

33. The Defendant's conduct as particularized above was high-handed, outrageous, reckless, wanton, entirely without care, deliberate, callous, disgraceful, willful and/or in complete disregard for the rights of the Plaintiff and other Class Members, and as such renders the Defendant liable to pay punitive damages.

GENERAL

34. The Plaintiff proposes that this Action be tried at Vancouver, British Columbia.

Date: November 25, 2013

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