Brief to Standing Committee On Public Safety and National Security

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Education and Experience

1. I am a medical doctor with an appointment as an Assistant Clinical Professor of Medicine in the Department of Medicine, Division of Emergency Medicine at McMaster University. I am also an Emergency Physician at St Joseph's Hospital and Hamilton Health Science, both in Hamilton, Ontario.

2. In 1999, I graduated with a Bachelor of Science with a double major in Biochemistry and Molecular Biology and Economics at Simon Fraser University in Burnaby, British Columbia ("**SFU**"). That same year I commenced my post-graduate studies at SFU. I received my Ph.D. in Biochemistry and Molecular Biology from SFU in 2004.

3. Following my matriculation from SFU, I attended Queen's University School of Medicine in Kingston, Ontario, where I obtained my Medical Doctorate degree with honours in 2008.

4. After graduating from medical school, I pursued my residency in emergency medicine and furthered my studies in the speciality of emergency medicine at McMaster University from 2008 to 2013 as a Fellow Royal College of Physicians Canada, Specialist in Emergency Medicine. During this time, I was the Chief Trauma Fellow in 2011 and received the Original Research Award in Emergency Medicine in 2013 for research on Canadian firearms legislation and homicide.

5. I was certified as a Diplomate American Board of Emergency Medicine in October 2014.

6. Since completing my studies in 2013, I have been working as an Emergency Physician at St. Joseph's Hospital and Hamilton Health Science, as well as an Assistant Clinical Professor of Medicine at McMaster University and the Director of the Clinical Teaching Unit at St. Joseph's Hospital.

7. I currently have published three peer reviewed articles on the subject of Canadian firearm legislation and associations with homicide and suicide in Canada. I serve as an academic peer reviewer in the areas of firearm control, homicide, suicide, violence and gang deterrence for academic journals such as Violence and Victims, Journal of Interpersonal

Violence, American Journal of Public Health, Journal of Preventive Medicine, and Nature: Injury and Epidemiology.

Past Testimony

8. I testified to the House of Commons Committee hearing in respect to proposed changes to firearms legislation on November 24, 2011.

9. I also testified to the Standing Committee on Public Safety and National Security in respect to Bill C-71, An Act to amend certain Acts and Regulations in relation to firearms. My brief was submitted in April 2018, and I testified to this Committee on February 25, 2019.

Publications on Firearm Violence and Legislation

10. As an emergency physician, I am called upon to medically respond to the effects of firearms violence, including injuries and death caused by firearm. As a result of my education and practice, I have had the opportunity to study the causes of firearms violence and possible ways to mitigate and reduce firearms violence in Canada and elsewhere.

11. In 2011, I published a research paper entitled "Canadian Firearms Legislation and Effects on Homicide 1974 to 2008" [1]. This paper was a statistical study on the rates of homicide (and, as a subcategory, spousal homicide) in response to legislative changes enacted by Bill C-51 (1977), C-17 (1991) and C-68 (1995). The research paper has been submitted to the Committee.

12. I published a sequent research paper in 2020 entitled "Effect of firearms legislation on suicide and homicide in Canada from 1981 to 2016" [2]. The research paper has been submitted to the Committee.

13. I was asked to produce a review paper for the Journal of Preventive Medicine in 2021. This paper entitled, "Suicide, firearms, and legislation: A review of the Canadian evidence" reviewed 13 studies regarding suicide and legislative efforts and found an associated reduction in suicide by firearm in men aged 45 and older but demonstrated an equivalent increase in suicide by other methods such as hanging [3]. Factors such as unemployment, low income, and indigenous populations were associated with suicide rates.

14. The foregoing research papers are peer reviewed and conclude that Canadian legislation to regulate and control firearm possession and acquisition does not have a corresponding effect on homicide and suicide rates. Two of these papers include data and consider mass homicide events, but the conclusion is drawn more widely with greater statistical evidence regarding all incidents of homicide.

15. To summarize the results, no statistically significant beneficial associations were found between firearms legislation and homicide by firearm, as well as spousal homicide by firearms, and the criminal charge of "Discharge of a Firearm with Intent".

16. Bans of military-appearing firearms, semiautomatic rifles and handguns, short barrel handguns and Saturday night specials in the 1990s has resulted in no associated reduction in homicide rates.

17. Social and economic factors were associated with firearm homicide rates. For instance, the older the age of the population was associated with a lower the rate of homicide using a long gun while an increase in the unemployment rate was associated with an increase in spousal homicide.

18. Homicide by handgun, usually used by people involved in criminality, was associated with an increase in the unemployment rate, poverty rates, and immigration. As well the overall increase in incarceration was associated with increases in homicide rates likely reflecting in increase in crime rates overall. These results suggest further areas to study as well as beneficial areas to target by public policy to reduce homicide rates.

19. What appears to occur is that either there is a substitution effect (i.e., the homicide or suicide is carried out in a different method), or the firearms were obtained illegally and hence unaffected by the legislation.

20. My conclusions are based on sound statistical analysis and information specifically related to Canada. I am not aware of any other Canadian research which uses reliable statistical models to dispute or disagree with my conclusions.

21. Other studies have demonstrated agreement with my studies that laws targeting restricted firearms such as handguns and certain semi-automatic and full automatic firearms in Canada also had no associated effect with homicide rates. Canadian studies by Leenaars and Lester 2001, Mauser and Holmes 1992, and McPhedran and Mauser 2013, are all in general agreement with my study [4-6]. Koper and Roth 2001, Guis 2014, and Webster et al. 2020, also found that the Assault Weapons Ban in the United States had no associated relationship to firearms homicide [7-9]. One of the most recent and commonly cited Australian papers, Chapman et al. 2016, demonstrates no statistically significant association between Australian firearms legislation and firearms homicide reduction from 1979 to 2013 [10]. Lee and Suardi 2008, Baker and McPhedran 2008, and most recently Gilmour et al. 2018, demonstrate the same results [11-13].

Mass Homicide

22. As per my research and analysis in preparation for my testimony for the Standing Committee on Public Safety and National Security in April 2018, I analyzed the incident of mass homicide.

23. I adopted the definition of mass homicide as a single event with three or more victims. I used a difference-in-difference statistical model to analyze the effects of firearm legislation on the occurrences of mass homicide.

24. I found no associated effects between firearm legislation and mass homicide events in Canada from 1974 or 2010. Specifically, legislative changes which reduced magazine capacity for rifles to five rounds and prohibited certain semi-automatic firearms have made no discernable reduction in mass homicide rates in Canada.

25. In Figure 1 of this Committee Brief, I have plotted the number of victims in mass homicide events and recorded victims of firearm as compared to victims of non-firearm incidents (i.e., the perpetrator used a non-firearm weapon, such as a vehicle, to cause the event). As is shown in this figure, mass homicide events are sporadic, and unaffected by legislation.

Recent Regulations

26. The *Regulations Amending the Regulations Prescribing Certain Firearms and Other Weapons, Components and Parts of Weapons, Accessories, Cartridge Magazines, Ammunition and Projectiles as Prohibited, Restricted or Non-Restricte*d, SOR/2020-96 (the "**Regulation**") recently resulted in the prohibition of a number of military-appearing firearms.

27. A Regulatory Impact Analysis Statement ("**RIAS**") was issued with the Regulation. It is my understanding from the RIAS, that the Regulation's purpose and intent is to reduce incidents of gun violence and mass shootings in Canada. Generally, the RIAS suggests that the Regulation will improve public safety by prohibiting firearms that were, previous to May 1, 2020, legal to possess and acquire in Canada. In my view, these aspirations are misplaced. There is no reliable evidence which would show that the Regulation, by prohibiting certain firearms, will reduce the frequency or severity of mass shootings.

28. My research papers and additional analysis on this topic show that previous legislative changes which prohibit the possession and acquisition of certain firearms have made no discernable impact on the rates of homicide or suicide in Canada or elsewhere. Increased legislation has had no demonstrable beneficial effect on homicide or suicide rates in Canada.

29. For example, the following findings have been made in the academic literature on the subject of firearm legislation and firearm violence:

    (a) There was no demonstrable, beneficial association between firearms legislation and firearm homicide rates between 1974 and 2008 in Canada. The introduction of the Canadian firearms legislation of 1977 did not have a significant associated effect on homicide rates. The rates of homicides carried out with legal registered firearms (firearms associated to restricted or prohibited authorizations under the *Firearms Act*, SC 1995, c 39) have not responded to the introduction of firearm laws in Canada. There is little evidence to suggest that increased firearms legislation in Canada has a significant impact on pre-existing trends in lethal firearm violence

against women. The results do not support the view that increasing firearms legislation is associated with a reduced incidence of firearm-related domestic homicide victimization [1, 2, 4].

(b) The buyback of firearms from legal owners implemented by governments in connection with legislation prohibiting the ownership, and use of certain firearms, including semi-automatic firearms, had no statistically observable impact on suicide or assault mortality attributed to firearms in Australia. The buyback program in that case did not have any large effects on reducing firearm homicide or suicide rates in Australia [10, 11, 13].

(c) It was also found that the so-called assault weapon ban of 1994 did not significantly affect murder rates at the state level in the United States. No evidence was found to show reductions in multiple-victim gun homicides or multiple gunshot wound victimizations in the United States following the Federal assault weapons ban in that country [7, 8, 14, 15].

(d) Studies with respect to the relationship between the 1994 Federal Assault Weapons Ban and the frequency of mass homicide events in the United States are largely inconclusive and studies have been unable to demonstrate a relationship between the Federal Assault Weapons Ban and the probability of an assault weapon being used in a mass shooting or the number of fatalities [7, 9, 16, 17].

30. What has been shown is that legal firearms owners in Canada are less likely to engage in firearms violence than average citizens [2]. There is no evidence to suggest that targeting this group in legislating the acquisition and possession of firearms will result in reduction of firearms violence, homicide, or suicide.

31. According to my research and analysis, there are a number of factors that may be associated to homicide and suicide rates. None of these factors are related to whether a particular firearm was legally accessible.

32. There are a number of alternative actions that a government may take that have shown promising results in reducing the rates of homicide and suicide [2, 18]. For example, by

targeting offenders through gang deterrence, intervention, and collaboration, there is a reduction in gang violence and activity. Social programs which reduce poverty, income inequality and unemployment rates and provide a focus on education have also been shown to reduce firearms violence.

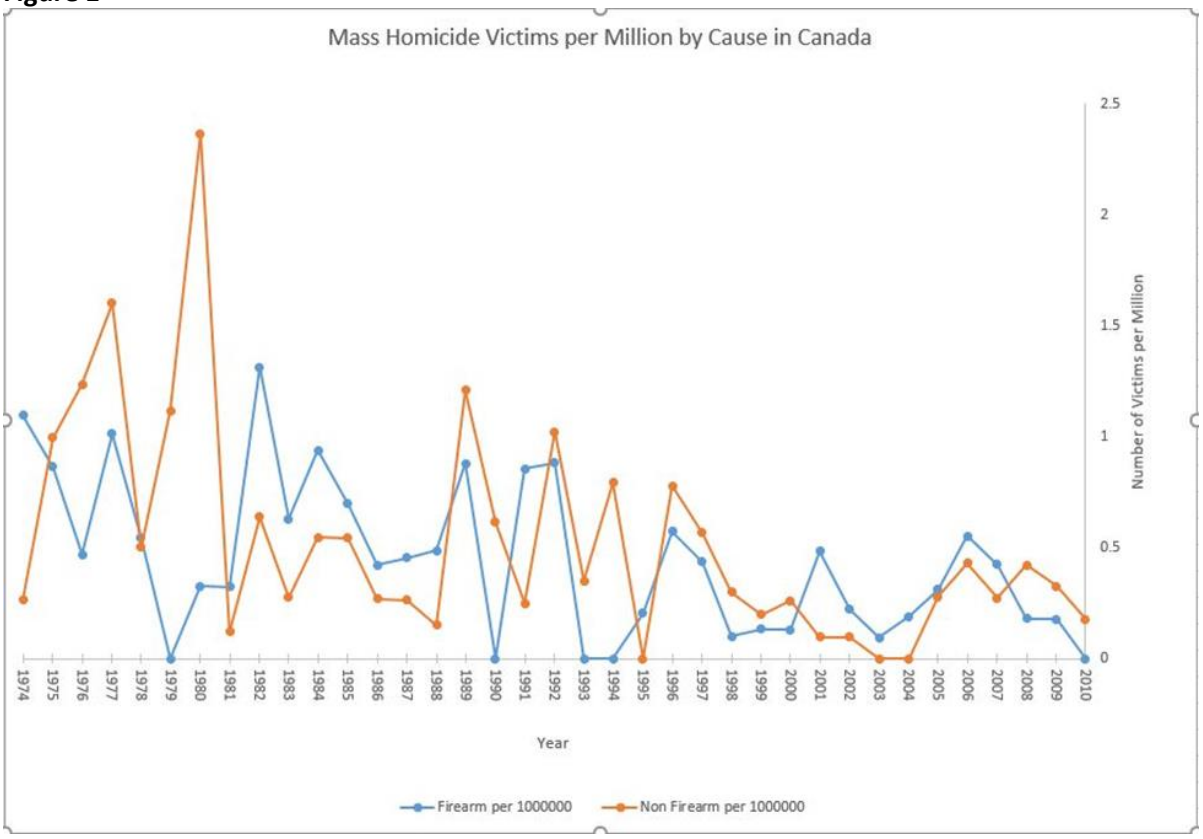
33. Methods that have been shown to be more effective in reducing firearms homicides involves targeting the demand side of firearms prevalence in criminal activity. As demonstrated by StatsCan a significant percentage of firearms homicide involves gangs, major cities, and recent fluctuations in the rates largely involves Toronto Ontario.

34. In 1995 as youth violence increased, Boston launched Operation Ceasefire, which involved reducing the demand for weapons by targeting gangs specifically in terms of warning and legal interventions as well as working with community groups and workers to reduce youth membership in gangs. The other arm of Operation Ceasefire involved reducing the supply of weapons by legal interventions to decrease weapons trafficking and availability.

35. Braga et al. 2001, examined both aspects of Operation Ceasefire and found that the demand side had significant effects on reducing violence and homicide while the supply side had no statistically significant effect on reducing violence [19].

36. To reduce violence that is currently occurring in Canada's cities the evidence suggests that you need to act early to reduce youth involvement in gangs and gang activity not just with legal interventions but also by deterring youth from entering gangs at a precontemplation stage. A research report by Public Safety Canada 2012, gathered evidence from a number of programs operating in Canada to reduce youth gang participation and demonstrated beneficial effects in the ranges of 50% reduction in gang participation [20].

Figure 1



Mass Homicide Victims by method of homicide, 1974 – 2010. A difference in difference model was constructed to compare mass homicide with firearm against the control group of mass homicide without firearm. The model shows a sudden drop in the 1990s in both rates of mass homicide (with and without firearm) but the drop and the decline is similar in both groups suggesting a possible cause other than gun control. SPSS Binomial Regression method.

ln (homicide rate) = i + B1Year + B2Firearm_Non_Firearm + B3Step_Function + B4YearxFirearm_Non_Firearm + B5Firearm_Non_FirearmxStep_Function +B6YearxStep_Function + B7YearxFirearm_Non_FirearmxStep_Function

B7 measures the additional change in trend in firearm mortality relative to non firearm mortality

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	3.119	.2935	2.544	3.695	112.910	1	.000
Year_Count	-.024	.0203	-.063	.016	1.344	1	.246
Firearm_Yes_No	-.132	.4162	-.948	.683	.101	1	.751
C68	-4.005	1.8202	-7.573	-.437	4.841	1	.028
Year_Count * Firearm_Yes_No	-.008	.0288	-.064	.049	.072	1	.789
Firearm_Yes_No * C68	3.301	2.5493	-1.696	8.297	1.676	1	.195
Year_Count * C68	.114	.0615	-.006	.235	3.455	1	.063
Year_Count * Firearm_Yes_No * C68	-.091	.0864	-.260	.079	1.103	1	.294
(Scale)	13287655.4[a]						
(Negative binomial)	1[b]						

Dependent Variable: Victims
Model: (Intercept), Year_Count, Firearm_Yes_No, C68, Year_Count * Firearm_Yes_No, Firearm_Yes_No * C68, Year_Count * C68, Year_Count * Firearm_Yes_No * C68

a. Computed based on the Pearson chi-square.

b. Fixed at the displayed value.

References

1. Langmann, C., *Canadian Firearms Legislation and Effects on Homicide 1974 to 2008.* Journal of Interpersonal Violence, 2012. **27**(12): p. 2303-2321.
2. Langmann, C., *Effect of firearms legislation on suicide and homicide in Canada from 1981 to 2016.* PLoS One, 2020. **15**(6): p. e0234457.
3. Langmann, C., *Suicide, firearms, and legislation: A review of the Canadian evidence.* Prev Med, 2021. **152**(Pt 1): p. 106471.
4. Leenaars, A.A. and D. Lester, *The impact of gun control (Bill C-51) on homicide in Canada.* Journal of Criminal Justice, 2001. **29**(4): p. 287-294.
5. Mauser, G.A. and R.A. Homes, *An Evaluation of the 1977 Canadian Firearms Legislation.* Evaluation Review, 1992. **16**(6): p. 603-617.
6. McPhedran, S. and G.A. Mauser, *Lethal Firearm-Related Violence Against Canadian Women: Did Tightening Gun Laws Have an Impact on Women's Health and Safety.* Violence and Victims, 2013. **28**(5): p. 875-883.
7. Koper, C. and J. Roth, *The Impact of the 1994 Federal Assault Weapon Ban on Gun Violence Outcomes: An Assessment of Multiple Outcome Measures and Some Lessons for Policy Evaluation.* Journal of Quantitative Criminology, 2001. **17**(1): p. 33-74.
8. Guis, M., *An examination of the effects of concealed weapons laws and assault weapons bans on state-level murder rates.* Applied Economics Letters, 2014. **21**(4): p. 265-267.
9. Webster, D.W., et al., *Evidence concerning the regulation of firearms design, sale, and carrying on fatal mass shootings in the United States.* Criminology and Public Policy, 2020. **19**: p. 171-212.
10. Chapman, S., P. Alpers, and M. Jones, *Association Between Gun Law Reforms and Intentional Firearm Deaths in Australia, 1979-2013.* JAMA, 2016. **316**(3): p. 291-9.
11. Lee, W. and S. Saurdi, *The Australian Firearms Buyback and its Effect on Gun Deaths.* Contemporary Economic Policy, 2008. **28**(1): p. 65-79.
12. McPhedran, S. and J. Baker, *Australian homicide: no significant impact of gun laws.* Med Sci Law, 2008. **48**(3): p. 270.
13. Gilmour, S., K. Wattanakamolkul, and M.K. Sugai, *The Effect of the Australian National Firearms Agreement on Suicide and Homicide Mortality, 1978-2015.* Am J Public Health, 2018. **108**(11): p. 1511-1516.
14. Fleegler, E., et al., *Firearm Legislation and Firearm-Related Fatalities in the United States.* Journal of American Medical Association Internal Medicine, 2013. **173**(9): p. 732-740.
15. Santaella-Tenorio, J., et al., *What Do We Know About the Association Between Firearm Legislation and Firearm-Related Injuries?* Epidemiol Rev, 2016. **38**(1): p. 140-57.
16. Blau, B.M., D.H. Gorry, and C. Wade, *Guns, laws and public shootings in the United States.* Applied Economics, 2016. **48**(49): p. 4732-4746.
17. Kleck, G., *Large-Capacity Magazines and the Casualty Counts in Mass Shootings: The Plausibility of Linkages.* Justice Research and Policy, 2016. **17**(1): p. 28-47.
18. Langmann, C., *Canadian firearms legislation and effects on homicide 1974 to 2008.* J Interpers Violence, 2012. **27**(12): p. 2303-21.
19. Braga, A.A., et al., *Problem-Oriented Policing, Deterrence, and Youth Violence: An Evaluation of Boston's Operation Ceasefire.* Journal of Research in Crime and Deliquency, 2001. **38**(3): p. 195-225.
20. Smith-Montcrieffe, D., *Youth Gang Prevention Fund Projects What did we learn about what works in preventing gang involvement*, Public Safety Canada, Editor. 2013, National Crime Prevention Centre: Ottawa.