FIREARMS LICENCE HOLDERS HALF AS LIKELY TO COMMIT A HOMICIDE

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Licenced Firearms Holders are more likely to commit homicide using a firearm than the average population. Hmm?

In 2012 Dr. Gary Mauser looked at the rate of firearms homicide by licensed individuals from 1997 to 2010 and found it to be 0.60 per 100,000 compared to a average national homicide rate of 1.85 per 100,000. From that he suggested that licensed individuals were 1/3 less likely to commit murder than an average Canadian.

Recently this finding has been criticized by people suggesting that since the national average homicide rate by firearm is 0.52 per 100,000, that licensed firearms owners are actually more likely to commit firearms homicide than the average population of Canada and that we should be looking specifically at firearms homicide only.

Now I agree with Dr. Mauser that we should be comparing overall homicide numbers, as the outcome, homicide, is what we really should be concerned about rather than the method. However lets address the pitfalls of this latter comparison.

First a word on the data I am going to use. The sources for data from 2005 – 2016 are from StatsCan and the RCMP via request. The data for the number of licenced firearm holders who commit firearms homicide is actually for the number charged, and not convicted and hence will exaggerate the numbers of actual homicides by this group as some are acquitted for reasons such as self defence. Unfortunately this is the best data I have at this time.

For Canada from 2006 to 2016 the average firearm homicide rate is 0.52 per 100,000. From 2006 to 2015 the average homicide rate by licenced firearms holders is 0.67 per 100,000 licenced firearm holders. As you can see this rate is higher than the average Canadian population's rate.

Is that right?

The main problem with making the statement that licenced holders are more likely to commit firearms homicide than the average population is that one is comparing two cohorts made up of entirely different components. The average Canadian population is made up of 49% men and 51% women and includes all people children to adults. The population of licensed gun owners is mostly men, at 87% male and 13% female, and are only adults as people under 18 years old cannot actually own a firearm even though they can obtain a youth license.

Males are much more likely to commit homicide than females, 90% of murderers in Canada are male. Adults are also much more likely to commit homicide than children. This means when one looks at the license firearms owner cohort, one is looking at a group that is more likely to commit murder due to the simple fact that they are both male and adults.

In statistics when one wants to compare groups, say for instance two groups of people one treated with a drug and another with a placebo, one needs to have each cohort divided up so that their underlying composition is identical so that the results from an intervention are due to the intervention only. Older adults might be affected more by a drug's side effects. Males might require a higher dose than females. Sicker people might respond differently than less sick people. If one cohort had sicker people in it, the whole results of the trial would be in error and the results would not be accurate.

In the same way if one performs a survey of Canadians and their political party of choice, and one has a survey group composed of mostly men it would be hard to apply the result of this survey to the actual Canadian population as males tend to vote differently than females.

In order to apply the results of the political survey to the actual country a statistician "weighs" the results of the survey to adapt the results so that it matches the actual population of the country. If a drug study has cohorts with different compositions one weighs the results differently to account for that as well.

Returning to what we are looking at, licenced firearms holders are disproportionately male and over the age of 18. We cannot compare this group to the average Canadian population and say anything because the reason the homicide rate might be higher in this group is because they are male and over 18 years old. We can do two possible adjustments. We can take a sample of Canadians who are mostly male and over 18 years old who do not have licenses and compare their perpetration of firearm homicide rate to the licenced holder rate or we can weight the licenced firearm holders rate and

adjust it to pretend that the licenced firearms holders are instead 49% male and 51% female and then compare them to the average Canadian population.

Lets do that instead.

First the average firearm homicide rate of the Canadian population over the age of 18 is 0.65 per 100,000. We'll compare that to our weighted licenced firearm homicide rate.

The rough calculation is $((49/87)*.67) = 0.375$ per 100,000.

So the weighted firearm homicide rate by licenced firearm holders is actually 0.375, approximately half that of the average Canadian population. This takes into consideration that most licenced firearms holders are male and males tend to commit homicide more than females. This takes out or controls for the male demographic.

This is not necessarily evidence that licensing works, rather this is merely an association in that the people who apply for licenses are a cohort of people who would pass a background check and thus less likely to commit a crime.

Fortunately the rate of firearm homicide by licenced Canadians is extremely low, in the order of less than 10 victims a year. Since a small fluctuation in this number can cause a large variability we need to test to see if the result of 0.375 is actually statistically significantly less than 0.65. Large variability could mean one year the number could be a lot higher. In order to test for an statistically significant difference between the two rates a T-test was constructed. The results of the T-test are in the figure below. The numbers are statistically significant. The mean rate for the Canadian population is 0.64 with an lower boundary of 0.57 and an upper boundary of 0.71. The firearm holder homicide rate is 0.375 with boundaries of 0.46 and 0.29 respectively.

As it turns out licensed firearms holders are half as likely to commit a homicide with a firearm than a similar group of Canadians when we adjust for the fact that they are mostly males.

In other words if one grabbed 50 males off of the streets of Canada and 50 males with firearms licenses, the licensed individuals are half as likely to commit a homicide even though they have easy access to firearms.

Moreover the actual homicide rate over 18 years is 2.12, and firearm license holders are much less likely to commit homicide than the average Canadian over the age of 18.

One-Sample Test

	Test Value = 0				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Canadian Firearm Homicide Rate	21.665	9	.000	.64006	.5732	.7069
PAL Firearm Homicide Rate	9.642	9	.000	.37539	.2873	.4635

Bootstrap for One-Sample Test

		Bootstrap[a]				
	Mean Difference	Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
Canadian Firearm Homicide Rate	.64006	.00036	.02813	.001	.58138	.69641
PAL Firearm Homicide Rate	.37539	-.00063	.03770	.001	.29870	.45053

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples