

Statiscal Misgivings and Lies

A look at the gun control debate

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Introduction

In 1986¹ and again in 1993², author Dr. Arthur L. Kellerman and Donald Reay published a controversial study and paper in the New England Journal of Medicine which attempted to demonstrate an increased risk to homicides in the home due to gun ownership. In his 1986 paper, Kellerman was widely credited and criticized for jumping to a conclusion that people are “43 times more likely” to be murdered in their own home if they own and keep a gun in their home. To arrive at the 43 to 1 figure in his 1986 paper, Kellerman included suicides as “unjustifiable homicides” which amounted to nearly all of the 43 unjustified deaths that Kellerman and Reay cited. In his 1993 NEJM publication, he removed suicides from his study. To count guns in the homes as the cause of a suicide, the researcher would have to ascertain whether the gun or a gun in the home actually contributed to or facilitated a successful suicide that otherwise would not have occurred. Kellerman and Reay provided no such documentation or research in their paper. Most research suggests that guns do not cause suicide.

Florida State University Criminologist Gary Kleck found that no method of gun control had any impact on the number of suicides. Controlling guns did somewhat temper suicide through the use of a gun, but not the overall suicide rate.⁵

The 1993 Kellerman study was equally flawed although Kellerman backed away from the 43 times figure and concluded that a person who had a gun in their home was 2.7 times more likely to be the victim of a homicide than one who did not.

The paper suffered many flaws as later pointed out by many authors including the likes of Henry E. Schaffer M.D., J. Neil Schuman, and Criminologists Gary Kleck, Don Kates and others. Most significant is that Kellerman’s study and paper never underwent a

peer review, which is regarded as the final treatment to any work or so called scientific study. Kellerman refused to release the raw data of his study on publication and to this day has refused to release the raw numbers. Relying instead on overall group numbers (control and case groups – see Figure 1).²

Methods

Kellerman relied on the case control methodology in his study. The case group was apparently chosen from police reports about a homicide at a certain address within a certain locale and time frame. The control group was, made up of subjects of the same age, race, and sex as victims in the case group, but outside of the control group's locale. How far out of the control group demographic area is unknown (i.e. one block? Two blocks?) As Kellerman omitted that information from his published study.³

Author Henry E. Schaffer M.D. published a rebuttal paper in December 1993 to Kellerman's 1993 publication.⁴ In that paper, Schaffer notes several flaws in the case control method (CCM) of analysis.

First and foremost, Schaffer points out that the CCM, cannot demonstrate causation. It is the biggest flaw according to Schaffer that Kellerman could make (relying on a method that cannot show causation to infer causation from one subgroup of data to another subgroup.)

According to Schaffer, CCM finds associations between studied factors and the outcome, which defines the cases. These associations can then be used to justify further studies of the casual relationships of the subgroup data, but should not be used to jump to a conclusion of causation.⁴

Further, Schaffer points out that CCM is susceptible to biases in case selection and with confounding factors that can affect the choice of controls.⁴ CCM further assumes homogeneity for all relevant variables. If this assumption is violated then one may be led to a wrongful conclusion of an “apparent association”. When the opposite may actually be true.

CCM is used in medicine and medical studies quite frequently as it is considered to be an inexpensive way to look at data of a specific local and compare it to a control group for associations. Other methods are used in criminology and sociology, which are better suited to this type of study than by elevating, gun ownership to a public health issue.³

The flaws in Kellerman’s study can be summarized as:

- No peer review
- No release of raw data has ever been made
- Sampling and bias errors
 - 65% of subjects in subgroups were black
 - Does not consider positive aspects of gun ownership by asking if a weapon was used to frighten off an intruder, or if the homicides were even justified (i.e. justifiable homicides by homeowner or police). Kellerman merely asked: “In this household where a homicide was committed, was there a gun, any gun in the house?” Kellerman intentionally limited his study group to cases where people were murdered in their own homes.³

- Error introduced due to failure of subjects to respond honestly was not treated in Kellerman's study.
- Improperly grouped subgroups into populations using the chi-square Mantel-Haenszel analysis for matched pairs without giving an analysis, which leads to errors due to the stratification of the data.
- Only three counties were used in his study thereby making application of even casual associations within the data to the entire population of the U.S. a farce.
- 52.7% of Kellerman's subjects had a family member with an arrest record
- 31.3% had a history of drug abuse
- 31.8% had a household member hurt in a family fight
- Given the above is this representative of a "typical" American household?

Schaffer's Anti-Proof

Schaffer used several treatments to disprove Kellerman's conclusions based on the Case Control Method. ⁴

In order to extrapolate or infer data found within a subgroup to the overall population, Kellerman wrongly used a case group of minorities, career criminals and dysfunctional family units, then applied those "associations" to the population as whole which is generally law abiding. Schaffer used a 10%/90% for the subgroup sizes from cited sources in his paper.

In one treatment, Schaffer uses the following data to show there is no casual relationship between homicide and gun ownership in either subgroup.

Gun Ownership	High Risk		Low Risk	
	dead	alive	dead	alive
Own gun	165	665,000	27.5	2,992,500
No gun	165	665,000	82.5	8,977,500
Totals	330	1,330,000	110	11,970,000

(Population 13,300,000 total dead in home 440)

When the subgroups are entered into a population:

Gun Ownership	Total Population	
	dead	alive
Own gun	192.5	3,657,500
No gun	247.5	9,642,500

The odds ratio would be: $a*d / b*c$

$$(192.5 * 9,642,500) / (247.5 * 3,657,500) = 2.05$$

Schaffer shows that the odds ratio is a measure of gun ownership with homicide due to a confounding effect or variable in the subgroup.

Schaffer further demonstrates the effects of stratification of data on Kellerman's subgroups. Shaffer notes that the data in Kellerman is presented as terms of overall group numbers and cannot therefore be reworked through the chi-square Mantel-Haenszel analysis that Kellerman claims to have used. By relying a subgroup that contains an unusually high incident of homicide whether they own a gun or not, and then to extrapolate this subgroup or stratify and apply the conclusions to the overall population of the U.S. without accounting for the confounding variables of the subgroup, leads to errors and wrong "casual associations" of the data. ⁴ Schaffer's odds ratio, which is

shown here, as is Kellermans', is therefore a spurious association and not a true association.

Bias

Schaffer now turns his attention to Kellerman's inability or desire not to explain the biases inherent in the Case Control Method and the particular questions he asked of the control and case groups. In particular, when you have a sample group where 61% are black and 52.7% of the members of the households have arrest records, how honest will they be if asked if they also have a gun, "any gun" in their house. If the majority is prone to break the law to begin with, will they honestly answer the question? Or is it in their interest to answer no when they do indeed have a gun registered or not in the house?

Schaffer points out that Kellerman refers to a pilot study of registered gun owners and their homes. Kellerman states that the pilot study was "generally" valid. Schaefer then explains what "generally" means to Kellerman.

In the pilot study 75 homes were chosen known to be the residences of registered gun owners. But only 55 of the homes could be found and of those only 35 of the homeowners could be or consented to be interviewed. The only conclusion that can be drawn is that 31 of 55 homes or 56.4% admitted to having a gun in the home or 31 out of 75 homes (41.3%) admitted to gun ownership. Recall however, that the list was of 75 homes where REGISTERED gun owners resided.

Those that were not available for interviewing may have been legitimate registered owners, but criminals or owners of illegal guns may have been reluctant or even refused the interview. Kellerman's casual reference to the pilot study does nothing

to explain the bias. Schaffer notes also that the control and not a proxy was interviewed 51.7% of the time in Kellerman, leaving a very compelling personal interest not to tell the truth when asked.

According to Schaffer, this particular bias is important as gun ownership was cited as being lower in the controls than in the cases. As he points out, “ This is the root ‘association’ which is claimed to exist between gun ownership and homicide. It would take only 37 controls who possessed guns but denied possession, to make the control ownership exactly equal to the cases (and produce a crude odds ratio of 1.0.)”

A 1.0 odds ratio would not be significant to even suggest a casual association between gun ownership and homicide.

Selection Bias

Kellerman also misleads readers when he states in his paper that: “Although case-control studies offer many advantages over ecologic studies, they are prone to several sources of bias. To minimize selection bias, we included all cases of homicide in the home and rigorously followed an explicit procedure for randomly selecting neighborhood control subjects. High response rates among case proxies (92.6 percent) and matching controls (80,6 percent) minimized non-response bias”¹ Kellerman’s released data shows that he used only 388 matched pairs rather than 444 that met his studies criteria. For a variety of reasons, Kellerman et al rejected 12.6% of the total homes meeting his criteria, and of those complete data were only collected on 316 matched pairs or 71.2% of the 444 homicides. Still Kellerman claims, “...We included all cases of homicide in the home...”

Conclusion

Releasing a study or research paper without releasing the raw data and only releasing group totals as Kellerman used in his chi-square Mantel-Haenszel analysis, leaves other researchers without a method to rework the analysis and treatment. This amounts to junk science.

Kellerman's misleading and misrepresentation of possible biases is equally reprehensible. Though Kellerman's own study finds gun ownership to be the 5th out of 6 possible factors to contribute to an in-home homicide, his conclusions mislead the public.

Kellerman may have intentionally "baked" his numbers, refusing to release his data years after the paper was published. He certainly misleads readers in both bias and selection bias inherent in the Case Control Method, which he chose to use in his study. Extrapolating a small sample of three counties, or that of a subgroup that contains such a large demographic bias is not appropriate as seen by the analysis provided by Schaffer.

Other studies such as those conducted by Gary Kleck, a Criminologist at the University of Florida, demonstrated the exact opposite of Kellerman's voodoo science. Kleck's study demonstrated that firearms kept in the home are used over 600,000 times a year to thwart crime. The notable difference between Kleck's study and Kellerman's is that Kleck released all the data and underwent peer reviews of his data.⁹ Kleck also includes suicides and guns. Kleck studied every American city with a population over 100,000. Kleck found there was no evidence of gun control having any effect on the overall suicide rate in those cities.

Gun control, he found, sometimes did drop the suicide rates by gun, but not the overall suicide rate. Those intent on suicide found other methods to reach their goals.

Kellerman in 1986 included suicides going so far as categorizing them as *'unjustifiable suicides'*.

There are many more flaws in Kellerman. For example, one of the flaws in his study was to count only dead bodies, whether or not the shooting was justified. Kellerman should have differentiated between a homicide where the victim was shot by a homeowner or police officer or by another party, but where the taking of a life was deemed justified and appropriate. But to Kellerman, if there was a gun in the home (whether or not used) and a homicide occurred (whether justified or not), then it was counted. These questions are never explored nor explained in Kellerman's 1986, or 1993 studies.

On a final note... Kellerman noted in 1986 that gun ownership was "43 times" more likely to result in the homeowners' death. In 1993 when he published a similar paper, that number fell to 2.7 times more likely to result in the homeowners death. Which are we to believe? Or perhaps we should believe neither. In 1994 (after the publication of both papers), Kellerman was taped giving a presentation at a seminar. This time he states on the tape that a person is 18 times more likely to be murdered if they keep a gun in the home! In the audience was Janet Reno who was quite fond of quoting Kellerman when speaking about gun control in her capacity as Attorney General during the Clinton years.⁶

In 1996, Congress eventually stopped funding the Kellerman junk science through the CDC. It was about time.

Citations

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3. Buckner, H. Taylor, Associate Professor of Sociology, Concordia University, Comments on Kellerman – Huns in the Home, retrieved from <http://www.shadeslanding.com/firearms/kellerman-buckner.html>, on August 25th, 2002
4. Schaefer, Henry E., Ph. D., Serious Flaws in Kellerman, et al (1993) NEJM, Retrieved from <http://www.shadeslanding.com/firearms/kellerman-schaffer.html>, on August 25th 2002
5. Kleck, Gary, Ph. D., Professor of Criminology at Florida State University, Point Blank: Guns and Violence in America, Aldine de Grueter, 1991, ASIN: 0202304191

6. Gallant, Paul and Eisen, Joanne, Arthur Kellerman: The Teflon Doc, retrieved from <http://www.ssaa.org.au/SLICK.HTML>, on August 29th, 2002

Figures

Figure 1:

CHARACTERISTIC	CASE SUBJECTS	CONTROLS
Sex (%)		
Male	63.1	63.1
Female	36.9	36.9
Race or ethnic group (%)		
White	32.9	34.5
Black	62.1	61.6
Native American, Eskimo, Aleut	1.0	0.5
Asian or Pacific Islander	2.8	2.8
Other	1.0	0.5
Age group — yr (%)		
15–24	13.1	13.1
25–40	40.2	40.5
41–60	26.0	26.0
≥61	20.6	20.4
Median years of education of household head	12	12
Median socioeconomic status of household head†	4	4
Type of dwelling (%)		
House	54.6	60.3
Other	45.4	39.7
Rented	70.4	47.3
Owned	29.6	52.7
Median no. of residents/room	0.5	0.6
Lived alone (%)	26.8	11.9
Telephone interview (%)	40.2	12.6
Proxy respondents in- terviewed	100	48.2

*Because of rounding, not all percentages total 100.

†Socioeconomic status was measured according to the Hollingshead score on a scale of 1 to 5, with 1 as the highest score.¹²

Captions

Figure 1: Shown is an example of how Kellerman presents data in his papers. Kellerman does not provide raw data or observations used in his studies. Here he shows only percentages. Despite repeated requests by other researchers, Kellerman has steadfastly refused to provide anything but overall group percentages or numbers which make repeating his analysis impossible.