

There are many problems with Gary Kleck's 2004 article "Measures of Gun Ownership Levels of Macro-Level Crime and Violence Research" *Journal of Research in Crime and Delinquency*, 2004; 41:3-36. Here we list a few, focusing on our own research.

See David Hemenway, *Private Guns Public Health*, 2004, University of Michigan Press, for a full discussion of these and many other issues.

1. Claim: Kleck states (p. 29) that Hemenway and Miller (2000) "found no significant association between the percentage of suicides with a gun (a valid measure without artifactual association problems) and homicide rates across 26 nations, they found significant associations twice as large when using the Cook measure, and based their conclusions on the latter finding."

The Truth: Kleck is factually wrong. We did find a statistically significant association between the percentage of suicide with a gun and homicide across 26 nations. This relationship held whether we used the crude homicide rate (significant at 0.000) or the natural log of the homicide rate (significant at 0.001). This is a main finding of our paper and is shown clearly in Table 2. The first sentence of the Discussion states: "Results from our simple regressions of 26 developed nations show a highly significant positive correlation between total homicide rates and both proxies for gun availability."

2. Claim: Kleck states (p. 19). "Some analysts have performed test of gun indicators' cross-sectional validity, and simply assumed that they must also be valid as indicators of changes in gun levels over time. For example, Miller, Azrael and Hemenway (2001: 478) used a multiple time series design to estimate the effect of gun levels on the incidence of fatal gun accidents...Unfortunately, none of the proxies that are valid indicators of cross-sectional variation in gun levels, including the percentage of suicides with guns, are valid indicators of cross-temporal variation"

The Truth: We analyzed whether there was an association between gun prevalence and unintentional firearm deaths across states. We used data for 19 years, but also did lots of sensitivity tests, including pure cross-sectional analyses. "Lastly, the data were collapsed over the 19 years of the study (reducing the data to a purely cross-sectional array). Results produced again statistically significant and quantitatively similar to those based on modeling each of the 19 years separately." In other words, we showed that our conclusion did not require any assumption about the validity of our gun prevalence measures over time.

3. Claim: p. 29 "...if the percentage of suicides with a gun is used as a predictor of suicide rates (as was done in Miller et al, 2002a), it not only will have the common components problem but will also reflect the average level of suicidal intent in the population, assuming that suicidal intent...is on average higher among people who kill themselves with guns that those who, perhaps accidentally, kill themselves with usually nonlethal methods such a swallowing a few prescription pills."

The Truth: The percentage of suicides with a gun is so highly correlated with survey measures of gun ownership that it does not matter which proxy is used. For 2001, for example, we have data for all states using both methods (survey measures or the percent of suicides that are gun suicides), and find that both measures provide virtually identical

results. The conclusion is that in states with more guns there are more suicides due to more gun suicides.

In addition, there is no common components problem. Using random number for the population, the number of firearm suicides and the number of non-firearm suicides, we generated samples of 10,000 observations, 1000 times, and ran Monte Carlo-type simulations. There was zero correlation between the percentage of suicides with a firearm and the overall suicide rate. The null hypothesis in our analyses is that there is no relationship between the level of gun ownership and the suicide rate—in other words that guns only affect the method of suicide, not the total number of suicides (Miller et al 2002b).

Finally, there seems to be no evidence that people residing in states with more guns are more suicidal, or have greater intent to kill themselves, than people in states with fewer guns. For example, data from the National Comorbidity survey show no relationship across regions rates of lifetime major depression or serious suicidal thoughts with rates of household handgun ownership (Hemenway & Miller 2002).

4. Claim p. 19 “None of the proxies that are valid indicators of cross-sectional variation in gun levels...are valid indicators of cross-temporal variation. Table 5 displays correlations among gun indicators using national-level annual data for the period 1972 through 1999. Variables were expressed as the percentage change from the previous year. The criterion measures were once again direct survey measure of household gun prevalence...(p. 23) Part of the reason for the lack of support for the cross-temporal validity of these various indicators may simply be that gun prevalence has not actually varied much over the past 40 years.”

The Truth: Kleck cannot determine whether any of the proxies are good temporal measures of firearm ownership levels because the “gold standard” measure that he compares them against is essentially worthless. Guns are highly durable, and household gun ownership levels seemingly did not change much between 1972 and at least 1990. Kleck’s gold-standard measure, the GSS national survey has a sample error of about plus-or-minus 2%. On top of that it has an additional error due to non-responses and inaccurate responses. Year-to-year changes in the GSS national measure of gun ownership, particularly between 1972-1990, are probably almost entirely “noise.” That changes in no other firearm proxy are highly correlated with this “noise” does not mean these other measures are bad (or good) proxies.

When we examine the relationship between absolute firearm ownership levels as determined by the GSS surveys and the percentage of suicides that are firearm suicides for the years 1990-2001, we find a highly significant positive association. During this period the GSS measure fell substantially as did the percentage of suicides with a firearm. These trends are large enough to be discernable over and above the inherent year-to-year noise in both variables (Azrael et al 2001; Azrael et al 2004; recent analyses).

5. Claim (p. 32): “Discounting this voluminous body of uninterpretable work, the best available research indicates that there is no net effect of general (criminal and non-criminal combined) gun ownership on violence rates (cites three articles by Gary Kleck).

The Truth: Most crimes do not involve guns (e.g., assaults, auto theft) and there probably is little association between gun prevalence and these crimes. However, there is strong evidence on the association of gun prevalence and homicide, suicide and unintentional gun deaths. All twelve U.S. case-control studies find that a gun in the home is a risk factor for

homicide, suicide or unintentional gun death. Cross-sectional US studies using either Kleck's preferred proxy (the percentage of suicide that use firearms) or actual survey measures of firearm ownership (the CDC sponsored such state surveys in 2001 and in 2002) find a large, positive statistically significant relationship between gun prevalence and homicide, suicide and unintentional firearm death (Miller et al 2002c; Hepburn & Hemenway 2004; Hemenway 2004).

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