

What Do CDC's Surveys Say About the Frequency of Defensive Gun Uses?

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Abstract

In 1996, 1997, and 1998, the Centers for Disease Control and Prevention (CDC) conducted large-scale surveys asking about defensive gun use (DGU) in four to six states. Analysis of the raw data allows the estimation of the prevalence of DGU for those areas. Estimates based on CDC's surveys confirm estimates for the same sets of states based on data from the 1993 National Self-Defense Survey (Kleck and Gertz 1995). Extrapolated to the U.S. as a whole, CDC's survey data imply that defensive uses of guns by crime victims are far more common than offensive uses by criminals. CDC has never reported these results.

Introduction

The Centers for Disease Control and Prevention (CDC) has often been criticized by gun owner organizations like the National Rifle Association (NRA) as being “antigun” and for awarding research grants on firearms and violence only to researchers with strong anti-gun or pro-gun control publication records (see remarks of the NRA chief lobbyist - Cox 2017). Belief in this anti-gun bias was so strong among pro-gun forces that the NRA got Congress to slash CDC’s budget by an amount exactly equal to the budget for its program that studied firearms violence, and to insert a rider in the funding bill that read: “Provided further that none of the funds made available for injury prevention and control at the Centers for Disease Control and Prevention may be used to advocate or promote gun control” (Jamieson 2013). Of particular relevance to the present topic, CDC has helped finance surveys on defensive gun use (DGU) by David Hemenway and others that their authors interpreted as indicating that DGU was rare (Hemenway and Azrael, 2000, p. 272; Hemenway Azrael and Miller, 2000, p. 267).

It is less widely known that CDC itself conducted surveys in which large representative samples of the adult population were asked about DGU, as part of their Behavioral Risk Factor Surveillance System (BRFSS), though the DGU questions were asked only in various subsets of four to six states as part of an optional module of firearms-related questions. To my knowledge, CDC never reported the results of those surveys, and does not currently report on their website any estimates of DGU frequency.

I only recently discovered that CDC had ever asked about DGU in their BRFSS surveys, stumbling across the DGU question while searching through the questionnaires used in the surveys for questions on other topics. Once I found the key question in the questionnaire for one year’s BRFSS, I searched through the questionnaires for all the other years, from 1984 through 2016, and found the DGU question had been asked in the 1996, 1997, and 1998 surveys. It was included as part of Optional Module 18 concerning firearms. Individual states could include

these questions in their surveys if they wanted to, but only six states chose to do so in the 1996 and 1997 surveys, and only four did so in the 1998 survey.

CDC had previously fielded a survey that included a question on a topic related to DGU but only in connection with what CDC personnel called “intruder-related firearm retrievals.” In a 1994 survey, researchers asked those who reported any guns in their household: “During the past 12 months, how many times did you or any other household member get a firearm because there might be an intruder in or trying to get into your home?” The researchers then established whether those retrieving a gun actually saw an intruder and believed “the intruder was frightened away because of the gun,” which presumably implies that the intruder saw the gun and was threatened by it. Of the 34% of Rs reporting household gun ownership, 6% contained at least one person who, in the previous 12 months, retrieved a gun, saw an intruder, and believed the intruder had been scared away because of the gun (Ikeda, Dahlberg, Sacks, Mercy, Powell 1997). The researchers estimated that there were 497,646 incidents in which an intruder was reportedly scared away by a gun. Kleck and Gertz (1995) found that 20.5% of DGUs were linked with burglaries, implying that the total number of DGUs is 4.88 times the number of burglary-linked DGUs ($1/0.205=4.88$). If CDC’s “intruder-related firearm retrievals are interpreted as burglary-linked DGUs, their results indicate that there were about 2.4 million total DGUs in 1994 among persons reporting a gun in their household. It is, however, unclear how many of these experiences constitute DGUs, since it was only established that the gun user “retrieved” a firearm, but not whether they actually used the gun to threaten the intruders. Consequently, it is debatable whether CDC generated any DGU estimates with this survey. In contrast, they clearly did generate DGU estimates with their 1996, 1997, and 1998 BRFSS surveys.

CDC’s Behavioral Risk Factor Surveillance System Surveys

The BRFSS surveys are high-quality telephone surveys of enormous probability samples of U.S. adults, asking about a wide range of health-related topics. Even just the subset of four to

six state surveys that addressed DGU asked 3,197-4,500 adults - more people than were asked about this topic than any other surveys, other than the National Self-Defense Survey conducted in 1993 by Kleck and Gertz (1995), who asked DGU questions of 4,977 people. Sample sizes were much smaller in all the rest of surveys on the topic (Kleck 2001).

The wording of the DGU question in the BRFSS surveys was also excellent, addressing many problems with the wording that afflicted the DGU questions used in other surveys. The exact wording was:

“During the last 12 months, have you confronted another person with a firearm, even if you did not fire it, to protect yourself, your property, or someone else?”

Respondents (Rs) had previously been instructed not to report firearm uses associated with an occupation that “requires and authorizes you to use a firearm.” Thus, the question excluded uses by military, police and others with firearm-related jobs. Further, the question appropriately excluded uses against animals (“...another person...”), asked about a specific, recent recall period (“during the last 12 months”), covered uses by any type of firearm (not just handguns), covered uses regardless of where they occurred (not just uses in the home), and explicitly told respondents that they should report uses even if they did not fire a gun. In sum, the surveys used an excellent, carefully worded DGU question, in contrast to the wordings used in so many other surveys (Kleck 2001).

The most important shortcomings of these surveys regarding DGUs was that (1) the DGU question was asked only in four to six of the 50 states, (2) the DGU question was asked only of Rs who had reported guns in their household at the time of the survey, and (3) interviewers did ask any follow-up questions about details of the purported DGUs to assess whether the reported uses really were DGUs.

The timing of CDC’s addition of a DGU question to the BRFSS is of some interest. Prior to 1996, the BRFSS had never included a question about DGU, as either a mandatory question

asked of the entire sample or an optional one. Kleck and Gertz (1995) conducted their survey in February through April 1993, privately circulated their estimates of DGU in early 1994, formally presented them at the annual meetings of the American Society of Criminology in November 1994, and published the results in the Journal of Criminal Law and Criminology in the Fall of 1995 (Kleck and Gertz 1995). CDC added a DGU question to the BRFSS the very first year they could do so after that 1995 publication, in the 1996 survey. CDC was not the only federal agency during the Clinton administration to field a survey addressing the prevalence of DGU at that particular time. The National Institute of Justice (NIJ) financed a national survey devoting even more detailed attention to estimating DGU prevalence. It was fielded in November and December 1994, just months after preliminary results of the 1993 Kleck/Gertz survey became known (Cook and Ludwig 1996). NIJ and CDC helped co-finance a national survey conducted by David Hemenway and Deborah Azrael, and fielded in the Spring of 1996 (Hemenway and Azrael 2000, pp. 259, 272). CDC then bankrolled a second national survey by Hemenway that attempted to correct some of the errors in his 1996 survey. This one was fielded in the Spring of 1999 (Hemenway, Azrael, and Miller 2000, pp. 263, 267).

Neither CDC nor NIJ had ever financed a single survey asking about DGU before 1994. Perhaps there was just “something in the air” that motivated the two agencies to suddenly decide in 1994 to address the topic. Alternatively, fielding of the surveys could have been triggered by the Kleck/Gertz findings that DGU was common. These Clinton administration agencies may have believed that new surveys would yield lower DGU prevalence estimates than those obtained by Kleck and Gertz. Low estimates would have implied fewer beneficial uses of firearms, results that would have been more congenial to the strongly pro-control positions of the Clinton administration.

Results - What Did CDC's Surveys Indicate About the Frequency of Defensive Gun Use?

I downloaded the BRFSS datasets for 1996, 1997, and 1998 from the BRFSS website (CDC 2018a) and obtained frequencies on the DGU question, for the purpose of comparing CDC's estimates of DGU prevalence with those of the National Self-Defense Survey (NSDS) (Kleck and Gertz 1995). Because the DGU questions were asked in the BRFSS in only some of the states, it was necessary to compare estimates based on the NSDS data for those same subsets of the states. Three different combinations of states asked the DGU question in the BRFSS surveys in the three years it was asked. Table 1 displays those combinations.

(Table 1 about here)

Table 2 reports the estimated prevalence of DGU for these subsets of states, comparing estimates based on the NSDS with those based on the BRFSS. The DGU percentages were weighted for both surveys, using the FINALWT for the BRFSS data (CDC 2018a) and the **fsw** weight for the NSDS (Kleck 1995). These weighted results are more meaningful than unweighted results because they adjust for different probabilities of selection of cases into the sample.

(Table 2 about here)

For each of the three years in which CDC fielded the BRFSS, there was no significant difference between the estimates of DGU prevalence produced by the BRFSS and those based on data from the NSDS - the 95% confidence interval estimates of the BRFSS-based estimates and the NSDS-based estimates overlap. Therefore, CDC's data confirm the estimates of Kleck and Gertz (1995). For one of the years, the NSDS-based point estimate is lower than the BRFSS-based estimate, and for the other two years, the NSDS-based estimate is higher, but not to a statistically significant extent.

The BRFSS estimates only pertain to six states in 1996 and 1997, and four in 1998. What, then, might they imply for the U.S. as a whole? We cannot directly apply these estimates

to the U.S. because the sets of states do not constitute a probability sample of the U.S. The NSDS, however, provides information that allows us to roughly extrapolate the six-states figure for 1997 to the U.S. as a whole, since we can derive from it both an estimate of DGU prevalence for the six states in Group A and an estimate for the U.S. For just the six states covered in the 1997, NSDS data indicate that 1.495% of U.S. adults had a DGU against a person in the previous 12 months (Table 2). For the U.S. as a whole, the NSDS imply that 1.326% of U.S. adults used a gun for self-protection against another person (Kleck and Gertz 1995, Table 2, past-year person-based all-guns estimate). Therefore, the national DGU prevalence was 0.887 of the six-states prevalence ($1.326/1.495=0.887$). If we multiply this adjustment ratio to each of the BRFSS-based estimates of DGU prevalence in Table 2, the implied prevalence for the U.S. as a whole is 1.179% for 1996, 0.788% for 1997, and 0.927% for 1998.

These figures are not quite comparable with the Kleck/Gertz results because the BRFSS only covered DGUs by people living in households that reported guns at the time of the interview. This excludes (1) DGUs by people who used a household gun that was no longer in the household by the time they were interviewed in the BRFSS, (2) DGUs by people who used a gun belonging to a person who was not a member of their household, and (3) DGUs by people who falsely denied having a gun in their household. This is not a trivial matter, since Kleck and Gertz (1995, p. 187) found that 21% (weighted) of persons reporting a DGU had denied having a gun in their household at the time of the interview. Hemenway, et al. (2000, p. 266) likewise found that 23.3% of those who reported a DGU denied household gun ownership. To adjust for this difference, the DGU prevalence estimates based on BRFSS surveys were multiplied by 1.266 ($1/0.79=1.266$). This yields adjusted BRFSS-based DGU prevalence estimates of 1.493% for 1996, 0.998% for 1997, and 1.173% for 1998. The average of these three estimates is 1.221%.

This average is statistically indistinguishable from the 1.326% figure obtained by Kleck and Gertz (1995). The figures, however, are still not completely comparable because Kleck and Gertz asked a detailed series of questions about claimed DGU incidents, to assess whether they actually fit the definition of a DGU. Did the person claiming a DGU either attack or threaten another person with their gun? Could they state a crime they believed was being committed against them? Was there an actual confrontation in which the defender could see the offenders? Of 202 initial claims of a DGU against another person, 16 were disqualified as DGUs, based on answers to subsequent questions about the details of the purported DGU. Thus, only 186 of the 202, or 92.1% of claims, could be tentatively regarded as genuine DGUs. To adjust for this difference, the BRFSS DGU prevalence needs to be multiplied by 0.921. This yields a final adjusted DGU prevalence estimate of 1.375% for 1996, 0.919% for 1997, and 1.080% for 1998. The average of these estimates is 1.125%.

These final adjusted estimate can be legitimately compared with the Kleck/Gertz prevalence estimate of 1.326%. The BRFSS estimates are close to the Kleck/Gertz estimate, and thereby provide strong confirmation for it. What little difference there is between the Kleck/Gertz estimate for 1992 and the BRFSS estimates for 1996-1998 could be due to declining rates of violent crime, the crime type that accounts for most DGUs. The U.S. murder rate was 9.3 per 100,000 population in 1992, but just 7.4 in 1996, 6.9 in 1997, and 6.3 in 1998 (Federal Bureau of Investigation 1999, p. 64). With fewer occasions for self-defense in the form of violent victimizations, one would expect fewer DGUs.

A prevalence of 1.125% may seem small, but it implies enormous absolute numbers of DGUs. The adult (age 18+) resident population of the U.S. in 1997 was 198,108,000 (U.S. Bureau of the Census 1998, p. 17). The final adjusted prevalence of 1.125% therefore implies that in an average year during 1996-1998, 2.23 million U.S. adults used a gun for self-defense against a person. This estimate confirms the 2.5 million past-12-months estimate obtained Kleck

and Gertz (1995). As a point of comparison, the National Crime Victimization Survey estimated that there were 680,391 violent crimes committed by offenders possessing (though not necessarily using) firearms in 1997 (U.S. Bureau of Justice Statistics 1999). CDC's results, then, imply that guns were used defensively by victims more than three times as often as they were used offensively by criminals.

The Potential Significance of the “Missing” Responses

I have presented an intentionally conservative interpretation of the BRFSS results, but it should be noted that the implied DGU prevalence could be considerably higher than indicated in Table 2, depending on how one interpreted “don't know” and “refused” responses to the DGU question. For example, in the six states asking the DGU question in the 1996 BRFSS, 1.329% answered the DGU question “yes,” but an additional 0.992% refused to answer the question or professed to not know whether they had used a gun for self-defense.

Given CDC's clearly worded question about a fairly dramatic sort of experience, it is hard to believe that adults would not know whether, in just the previous 12 months, they had defended themselves with a gun. The “don't know” response seems more reasonable as an evasive response by someone uncomfortable with discussing such a controversial behavior with a stranger over the phone. Refusals to even answer the question seem even more likely to be responses by people who had in fact used a gun defensively. If a person had *not* engaged in such an action, responding “No” would be not only be the accurate response, but also the least controversial one. If the truthful answer was the totally uncontroversial “No,” why not say so?

In the 1996 BRFSS, if one treated “don't know” or “refused” responses as indications that the respondents actually had DGU experiences, the DGU prevalence implied by the 1996 BRFSS results would rise from 1.329% to 2.321%. Alternatively, even if just half of those giving the “missing” responses actually had a DGU experience, the prevalence would rise to

1.825%. Nevertheless, since many would disagree about what these “missing data” responses mean, we do not treat any of them as reports of DGUs.

Errors in Surveys of Defensive Gun Use

There is no feasible way to measure the prevalence of DGU other than surveys. Certainly police data cannot provide adequate estimates given the unwillingness of most crime victims to even report their victimizations to the police (U.S. Bureau of Justice Statistics, 1999), never mind the controversial fact that they had threatened or attacked another person with a firearm. News accounts are even less useful because news outlets ordinarily would not know about DGUs if the police did not. All surveys are flawed, some more than others. The BRFSS surveys, however, are among the better ones, using large probability samples, carefully crafted question wordings, and skilled interviewers.

Is it nevertheless possible that even the BRFSS yields DGU estimates that are too high? There is no evidence that the people who respond to BRFSS surveys are unrepresentative of the U.S. adult population, so any bias in the estimate would have to come from response errors – respondents giving, intentionally or unintentionally, inaccurate answers to the DGU question. Critics of DGU surveys like David Hemenway (1997) have speculated about a long series of reasons why respondents in these surveys might give inaccurate answers, but their discussions are misleading because they are so one-sided. They address only flaws that might make DGU estimates too high, while completely ignoring well-established and serious flaws tending to make estimates of controversial behaviors too low. No one disputes that false positive responses occur – some people say “yes” to the DGU question when the accurate answer would have been “no.” Nevertheless, false positive responses cannot lead to an overestimate of DGU prevalence unless they outnumber false negative responses – people saying “no” to the DGU question when the accurate answer would have been “yes.” Hemenway and the other critics have had nothing to say about the frequency of false negative responses (reviewed in Kleck 2001).

There is no usable empirical evidence bearing directly on response errors in reporting DGUs in particular. There is, however, considerable evidence bearing indirectly on the issue. We can begin with the fact that most DGUs occur away from the victim's home (Kleck and Gertz 1995, p. 185). In 1993, it was unlawful for anyone to carry a gun off their own property unless they were among the few (under 1% back then – Kleck 1997, Chapter 6) who had a carry permit. Therefore, a survey respondent had to be willing to confess to a crime (unlawful possession of a firearm) if they wanted to report a DGU that occurred in a public place. Likewise, people forbidden to possess guns regardless of location, such as convicted criminals, would have to confess to a crime to even report DGUs that occurred in the home. The technical literature on self-report surveys of offending consistently indicates that few people report crimes that they did not commit, and many deny committing crimes that they did commit. That is, false negatives greatly outnumber false positives, and consequently response errors in surveys, on net, contribute to the underestimation of the prevalence of criminal offending (Kleck 2001).

Regardless of the location of the DGU, in order to report using a gun for protection, one must be willing to admit to possessing a gun. Research on survey reporting of gun ownership has consistently found that large shares of even law-abiding gun owners falsely deny having guns, i.e. give false negative responses. On the other hand, I am not aware of any evidence of any significant numbers of false positive responses regarding gun possession (Kleck 2001).

Finally, in order for survey respondents to be willing to report using a gun to protect themselves against crime, they must be willing to report the victimization attempt. Without a crime, there can be no defense against crime. Research on the reporting of victimization likewise indicates that substantial numbers of crime victims fail to report the victimization to surveyors (Kleck 2001).

To summarize, for a person who had experienced a typical DGU to be willing to report it to a surveyor, she or he must be willing to report (1) a crime they committed (unlawful carrying),

(2) possession of a gun, and (3) a crime victimization experience. Research consistently indicates that false negative responses are common in surveys asking about these topics, while false positives are rare. Therefore, as best we can tell at this point, the net effect of response errors in surveys asking about DGU is likely to be the *underestimation* of DGU prevalence.

Discussion

Why did the CDC not report their DGU results? The agency routinely reports results of the BRFSS regarding other topics on their website, including results pertaining to subareas of the nation (CDC 2018b) and even individual states (CDC 2018c). The agency clearly regarded the topic as sufficiently important to carefully craft DGU questions and make them available to states to use as optional parts of the very expensive BRFSS. On the other hand, CDC personnel evidently regarded DGU as a topic significant enough to ask about it in optional modules of questions that states could use if they liked, but not significant enough to ask about in the full national survey. They may have correspondingly regarded results pertaining to only four or six states as insufficiently important to report.

It is also possible that they decided not to report the DGU results because they believed there were problems with the research generating the results. All research has flaws, but this is not a legitimate justification for completely suppressing important results. A better practice is to report the findings, but accompanied by appropriate caveats about limitations and possible problems with the survey. This allows readers to judge for themselves whether the limitations were so severe that the findings must be discounted altogether.

Another factor, however, might also have played a role in the decision of CDC personnel to not report the DGU findings. For CDC's own surveys to generate high estimates of DGU prevalence was clearly not helpful to efforts to enact stricter controls over firearms, since it implies that some such measures might disarm people who otherwise would have been able to use a gun for self-protection.

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Table 1. Groups of States Analyzed

<u>Group</u>	<u>Survey Year</u>	<u>States Included</u>
A	1996	KY, LA, MD, NH, ND, WV
B	1997	CO, MS, NH, NJ, ND, OH
C	1998	LA, MT, NJ, PA

Table 2. Comparison of DGU Prevalence, NSDS and BRFSS

	<i>Group A, 1996</i>		<i>Group B, 1997</i>		<i>Group C, 1998</i>	
	<u>NSDS</u>	<u>BRFSS</u>	<u>NSDS</u>	<u>BRFSS</u>	<u>NSDS</u>	<u>BRFSS</u>
Weighted % DGU, Past Year	2.967	1.329	1.495	0.889	0.780	1.045
95% confidence interval	1.572-4.368	1.048-1.610	0.517-2.473	0.642-1.136	0.044-1.515	0.749-1.341
Unweighted sample size	399	4,500	417	3,898	387	3,197

Notes: DGU prevalence is the estimated percent of U.S. adults (age 18+) who used a gun for self-protection against a person, not including uses in connection with military, police, or security guard duties, in the 12 months before the date of the survey interview. NSDS=National Self-Defense Survey (Kleck and Gertz 1995). BRFSS= Behavioral Risk Factor Surveillance System.