



## The Gun Debate's New Mythical Number: How Many Defensive Uses Per Year?

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**THE GUN DEBATE'S NEW MYTHICAL NUMBER: HOW MANY DEFENSIVE USES PER YEAR?**

**Philip J. Cook, Jens Ludwig, and David Hemenway**

In 1986, Peter Reuter suggested that the Association for Public Policy Analysis and Management (APPAM) consider offering an annual award for the “most outrageous number mentioned in a policy discussion by an elected official or agency head,” with one of the criteria being that the number have “no reasonable basis” (pp. 811–812).

In this article, we discuss the candidacy of one of the more surprising numbers to surface in the course of America’s gun debate: that 2.5 million Americans use a gun defensively against a criminal attacker each year [Kleck and Gertz, 1995]. News items,<sup>1</sup> editorial writers,<sup>2</sup> even the Congressional Research Service [Bea, 1994] have mentioned the 2.5 million defensive gun uses (DGUs) as established fact. This number is considerably higher than our best estimate of the number of crimes committed each year with a firearm (1.3 million) [U.S. Department of Justice, Bureau of Justice Statistics, 1996b], and has been used as an argument against regulations that would restrict widespread firearms ownership. The implicit notion seems to be that if there are more legitimate uses than criminal uses of guns against people, then widespread gun ownership is a net plus for public safety.

<sup>1</sup> One article begins, “That’s right. Owning a gun, presuming you know how to use it, may be good for you” [Harper, 1996]. See also Witkin [1994].

<sup>2</sup> See Kumenta [1995].

For reasons documented in this article, we believe that the 2.5 million figure is an example of what Max Singer has termed a “mythical number” [Singer, 1971]. Singer notes, “[E]ven responsible officials, responsible newspapers, and responsible research groups pick up and pass on as gospel numbers that have no real basis in fact. . . . [B]ecause an estimate has been used widely by a variety of people who should know what they are talking about, one cannot assume that the estimate is even approximately correct” (p. 9).

Estimates for the number of defensive gun uses are likely to be substantially overstated because of the problem of “false positives” [Hemenway, 1996]. This source of bias is a common problem in survey estimates of rare events, but largely unrecognized or ignored. We recount the evidence which indicates that the 2.5 million DGU estimate is far too high, and suggest that implications for both the policy debate over gun regulation, and for survey research.

### Survey Results on Self-Defense

What distinguishes this remarkable statistic is the entirely respectable source and estimation method. We usually think of mythical numbers as coming from obviously flawed procedures, generated by advocates seeking attention for the problem of homelessness or heroin addiction or youthful predators or some other cause [Reuter, 1984, 1986].

In contrast, the DGU estimate was calculated by researchers affiliated with a major research university (Professors Gary Kleck and Marc Gertz of Florida State University), using widely accepted methods and published in a topflight, peer-reviewed criminology journal (Northwestern University Law School’s *Journal of Criminal Law and Criminology*). Although many mythical numbers may be debunked by simply probing beneath the press reports to identify the source, such is not the case with the DGU figure.

In particular, Kleck and Gertz conducted a telephone survey of almost 5000 American adults in 1993, with the specific intent of examining the defensive-gun-use issue. On the basis of the survey responses, Kleck and Gertz were able to generate a range of estimates depending on the exact definition and judgments concerning the credibility of responses. Their now-famous estimate of 2.5 million is at the conservative end of this array of possibilities.

Their survey appears to have been conducted according to current standards, and the results have been reproduced in several subsequent surveys.<sup>3</sup> In 1994, for example, the National Institute of Justice sponsored a telephone survey of 2600 American adults examining gun ownership and uses, including defensive gun uses [Cook and Ludwig, 1996]. This National Survey of Private Ownership of Firearms (NSPOF) incorporated a sequence of DGU questions very similar to that used by Kleck and Gertz. Each respondent was asked, “Within the past 12 months, have you yourself *used* a gun, even if it was not fired, to protect yourself or someone else, or for the protection of property at home, work, or elsewhere?” Respondents who reported experiencing a defensive gun use were then asked 30 additional questions concerning their most recent DGU. Two of us (Cook and Ludwig) have analyzed these data, and report on them here.<sup>4</sup>

<sup>3</sup> Three nationally representative random-digit-dial telephone surveys of adults have focused on the issue of self-defensive gun use, asking questions similar to those of Kleck and Gertz. In addition to the survey reported next, there was a survey of 800 gun owners and 400 nonowners in 1994 sponsored by the Centers for Disease Control [Hemenway and Azrael, 1996a] and a survey of 1905 adults in 1996 sponsored by the National Institute of Justice [Hemenway and Azrael, 1996b].

<sup>4</sup> For details concerning survey design and results, see Cook and Ludwig [1997].

When we follow the example of Kleck and Gertz and exclude all respondents whose most recent DGU was part of military or law-enforcement work, who did not report a specific crime or use of the gun as part of the incident, or who did not actually see a perpetrator, we estimate 1.5 million defensive gun users. (Because many of the relevant respondents said that they experienced more than one, we estimate a total of 4.7 million defensive gun uses per annum.) Thus, our estimate, based on the NSPOF, is in the same ballpark as that propounded by Kleck and Gertz. The difference could plausibly be due to sampling error. Kleck and Gertz's DGU estimates do not appear to be artifacts of any particular computational or weighting decisions made in their analysis. If there is a problem here, it is intrinsic to the method.

### Some Troubling Implications

One check on the credibility of these DGU estimates is made possible by the detailed follow-up questions included in both these surveys. In the NSPOF, respondents were asked whether they fired their guns, and if so, whether they managed to hit the mark. The responses to this item from our 19 "genuine" defensive gun users, multiplied by our sampling weights, imply that approximately 132,000 perpetrators were either wounded or killed at the hands of armed civilians in 1994. That number, it turns out, is just about the same as the total of all people who were shot and killed or received treatment for nonfatal gunshot wounds in an emergency room that year—yet we know that almost all of those are there as a result of criminal assault, suicide attempt, or accident.<sup>5</sup> There is no trace in these official statistics of the wounded assailants.

Respondents are also asked to report the circumstances under which they were provoked into using their gun. From the NSPOF, we estimate that 322,000 used a gun to defend against a would-be rapist. But that is more than the total number of rapes and attempted rapes estimated from the best available source, the National Crime Victimization Survey (NCVS)!<sup>6</sup>

Similar puzzles are found in Kleck and Gertz's findings [Hemenway, 1996]. Our closer examination of the DGU reports in the NSPOF suggests that almost half of the incidents appear to contain some internal inconsistency, or otherwise do not make sense. We are persuaded that surveys of this sort generate estimates that grossly exaggerate the true number of DGUs. The most likely explanation provides an important insight about the limitations of the survey method.

### Why Surveys Overestimate Defensive Gun Use

Surveys which include questions about DGUs are trying to estimate a rare event, in which even a small false-positive rate will lead to a relatively large overestimate. Medical epidemiologists have traditionally been much more alert to this problem than have survey researchers. As one of many possible examples, consider the Breast Cancer Screening Project conducted some years ago by the Health Insurance Plan of greater New York [Hennekens and Buring,

<sup>5</sup> About 100,000 people were nonfatally shot and treated in an emergency room or hospital in 1992 [Annest et al., 1995], and an additional 16,000 were shot and killed in criminal homicides [U.S. Department of Justice, Federal Bureau of Investigation, 1995].

<sup>6</sup> The NCVS is a large (48,000 households) survey that has been conducted by the U.S. Census Bureau since 1973. It is by far the most expensive and best-designed survey of its kind.

1987, p. 332]. In a total of almost 65,000 screening examinations (mammography plus physical exam), 1115 women were “positive” and followed up with biopsies. As it turned out, 983 (92 percent) of these positive tests were false, in the sense that they were not confirmed in the follow-up. Yet this result is not an indictment of mammography—indeed, the false-positive rate was only 1.5 percent. But that was sufficient, given the rarity of the true positives (less than 0.3 percent) to ensure that most positive results would be false, and that the estimated prevalence of breast cancer from this initial screen would far exceed the true prevalence.

Of course, in any survey there is a possibility of false negatives as well as false positives. Kleck and Gertz emphasize this possibility, arguing that because many respondents may worry that their defensive actions were somehow illegal, they will not admit to them during the survey interview. Kleck and Gertz argue that this effect should outweigh any other misreporting effects and lead to, if anything, an underestimate of the annual number of defensive uses.

Yet by any measure, including the Kleck–Gertz estimate, defensive gun use is a relatively rare event. If 0.5 percent of adults experience a DGU each year, in a survey of 1000 adults only about five would logically have the opportunity to provide a false negative. On the other hand, for 995 of the 1000 respondents, the only logically possible misclassification error is a false positive—and there are good reasons why some might falsely claim to have used a gun in self-defense. For one, using a gun defensively against a criminal may be a genuinely heroic act, and is often portrayed as such in movies and occasionally so in the nightly news.

Take, for example, the case of Dorothy Newton, who shot two robbers on the street in Richmond after having been wounded herself in a robbery one year earlier. The *Washington Post* reports that, although Newton had mixed feelings about the incident, the reaction of many in Richmond has been decidedly less ambiguous.<sup>7</sup> The *Richmond Times Dispatch* wrote in an editorial: “The thought of cocky young predators scurrying like scalded dogs is one decent people find immensely satisfying.”<sup>8</sup>

The falsehood may stem from real events, given that survey respondents typically wish to present themselves favorably to interviewers [Sudman and Bradburn, 1974]. The falsehood may also stem from confusion on the part of the respondent: memories fade, and they also distort. “Telescoping,” for example, is a common problem in survey research, where respondents who are asked to report about events occurring during the previous year will report an event that in fact happened 13 months or more earlier.<sup>9</sup> Actual experience may be revised in the telling, or may even elide with fiction. Given the prevalence of relevant mental disorders,<sup>10</sup> a nationally representative sample would include a number who were delusional, senile, or intoxicated—people unlikely to be reliable reporters in social science surveys.

<sup>7</sup> See Bowles [1996].

<sup>8</sup> See “Newton’s Law,” *Richmond Times-Dispatch*, June 7, 1996, p. A16.

<sup>9</sup> In the National Crime Victimization Survey, which questions the same households every six months concerning their experience with crime during the previous six months, rates of reported victimization in the first-time panel are typically over 50 percent higher than the bounded rates of subsequent surveys [Cantor, 1989].

<sup>10</sup> Recent estimates from the National Institute for Mental Health suggest that 51.3 million American adults aged 18 and over have “one or more mental or addictive disorders,” which includes 2 million adults with schizophrenic disorders and 4.9 million with what are classified as severe cognitive impairments [Bourdon et al., 1994].

An additional possible source of false DGU reports is strategic responses by gun owners. With around 3 million National Rifle Association (NRA) members [Kleck, 1993, p. 370], it would not be surprising to have as much as 1 percent of respondents who are both aware of the ongoing empirical debate on this topic and feel a vested interest in the perpetuation of high DGU estimates.<sup>11</sup>

### Is More Better?

About 40 percent of American households currently own a gun, and 14 million people routinely carry one when they go out [Cook and Ludwig, 1997]. Would we be better-off if these figures were, say, 80 percent and 28 million carriers? No doubt that would increase the number of DGUs, however defined or measured. But what would be the net benefit?

The difficulty in answering this question arises in part because of the ambiguous nature of many gun uses that are reported as "defensive" by respondents. Among the incidents in the NSPOF that meet the Kleck and Gertz-type criteria for "genuine" defensive gun uses, in almost one third the most serious crime reported by the respondent is a fight or attack. Assigning fault in a violent encounter can be a daunting problem even to a detective who has a chance to interview everyone involved, let alone a survey interviewer who is asking a few questions of just one of the combatants. In a recent telephone survey of 1905 adults [Hemenway and Azrael, 1996b], 13 respondents reported a defensive gun use against a criminal attacker. In contrast, 38 respondents indicated that a gun had been displayed against them in a hostile manner during an argument or some other circumstance. We suspect that many of the 38 gun users involved in these hostile brandishings would have claimed self-defense if they had been contacted by telephone.

Moreover, it is difficult in many cases to determine whether the gun use leads to an outcome that is better in some sense than what *would have* happened had a gun not been available. For the DGU reports in the NSPOF, a theft or trespass is the most serious crime reported in one out of every five cases. In such instances, is society necessarily made better-off when someone uses a gun rather than dials 911?

In our judgment, the most important effects of more guns would not show up in the DGU statistics at all. Some robbers or burglars, fearing the increased risk of confrontation with an armed victim, might retire (or switch to auto theft), and others might decide to arm themselves more heavily and act more aggressively in committing their crimes. Both of these effects, deterrence and escalation, are plausible, and the net effect is not obvious from armchair theorizing. One empirical study suggested that the murder rate in robbery tends to be higher in cities with many gun owners than in cities with relatively few [Cook, 1979]. In any event, these behavioral considerations, important as they may be, do not figure in the DGU calculus. Taking a broader view, we conclude that more guns may lead to more DGUs, but not necessarily to safer streets and homes.

### Some Concluding Thoughts

The survey is a well-developed measurement tool which performs satisfactorily for a variety of purposes. But something goes wrong in the effort to use surveys

<sup>11</sup> Thanks to David Kennedy for this observation.

to estimate defensive gun uses. False positives are always a problem, and if the event is rare enough, then they may swamp the truth. What is to be done?

One possibility has long been incorporated in the National Crime Victimization Survey (NCVS), conducted for the U.S. Department of Justice by the Census Bureau [U.S. Department of Justice, Bureau of Justice Statistics, 1996a]. In this survey the false-positive problem is minimized by the design of the questionnaire. The only respondents who are asked whether they attempted to defend themselves in a crime are those who indicated that they had been the victim of a crime in which they had direct contact with the perpetrator. Limiting the DGU question to this small group changes the false-positive arithmetic dramatically. The resulting estimate for the annual number of DGUs (1992–1994) is about 108,000, a small fraction of the Kleck–Gertz estimate.

Another approach is suggested by ordinary practice in medical screening: When an initial test comes out positive, a follow-up test is usually applied to distinguish “true” from “false” positives. If knowing the true prevalence is sufficiently important, then it is worthwhile devising systems for distinguishing true from false positives after the initial screen.

Determining the social value of reported gun uses will be at least as difficult as overcoming the false-positive problem. More detailed information about the entire sequence of events, including the respondent’s actions prior to using a gun, is necessary. Another interesting exercise would start with a sample of gun uses that are reported to the police, and interview each of the participants. Comparisons between these responses and the results of the police investigation may provide some sense of the ways in which survey reports are “shaded.”

Meanwhile, the myth that there are millions of legitimate DGUs each year influences public opinion and helps fuel the bandwagon to liberalize regulations on gun possession and carrying. With respect to gun regulation, 2.5 million is the wrong answer to the wrong question.

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