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The Costs and Benefits of Reducing Gun Violence

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Each year, approximately 30,000 people in the United States die as a result of gunfire and about 80,000 people are wounded. While nearly everyone agrees that these figures are too high, what exactly should be done about the problem? One informal slogan held by some advocates is that any intervention targeted against gun violence is worthwhile “so long as one life is saved.” But as a guide for improving the lives of Americans, this slogan is not helpful. Would those who adhere to it endorse a program that prevented a single firearm injury, but had an operating cost equal to the entire federal government’s annual budget? This program would meet the informal test of saving a life, but would deprive tens of millions of disadvantaged and elderly families of governmental assistance with housing, food, health care, and education upon which they desperately depend. Anyone who would be unwilling to support this program implicitly accepts the idea that benefits and costs are relevant for judging gun policies, and that some gun-oriented interventions are not worthwhile even if they would save lives. Thus, estimates for the costs of gun violence and the benefits of reducing it are crucial for identifying worthwhile interventions.

For some, calculating the costs of gun violence may conjure up a dry accounting exercise of totaling up medical expenditures and earnings lost due to injury. But in our view, an exercise of this sort misses the point (Max and Rice, 1993). The public concern with gun violence has little to do with the resulting burden on our healthcare system or the reduction in the size of the labor force due to death and disability.

Rather, especially for children and their families, the effects of gun violence have everything to do with concerns about safety. Avoiding and preventing gun violence is a costly enterprise in both the public and private spheres, but most people would be willing to pay more to reduce that threat. Thus, the cost of gun violence is the flipside of the value of safety, and that is the perspective that we develop further in the remainder of this essay.

Valuing Safety

The idea of conducting benefit-cost analysis in the area of crime and injury avoidance strikes many people as being disturbing since life should be priceless. Economists would agree up to a point, noting that human lives are “priceless” in the sense that they are not regularly bought and sold in the marketplace. It is usually true that no feasible sum of money can fully compensate the family and friends of the victims of fatal gunshot injuries. Nevertheless, courts do regularly place

a price on life in setting damages for personal injury suits; legislatures and regulatory agencies are routinely required to decide how much an increment in safety is worth.

When Congress established a national speed limit of 55 miles per hour in 1974, the highway fatality rate dropped dramatically (Clotfelter and Hahn, 1978). But much of the public, including the commercial trucking interests, eventually demanded a return to higher speed limits despite the likely increase in fatalities, and Congress complied. Individual consumers are also forced to make decisions in the face of what might be thought of as a “quality-quantity” tradeoff for our lives. Should we spend extra to obtain a car with anti-lock brakes, or save the money for our child’s college fund? Should we pay an extra \$10,000 to buy a house that is farther away from the local nuclear plant?

To be clear, policy makers and private citizens are making judgments about the value of ex ante reductions in the risk of injury, before the identity of those who will be injured is known. While most people would give up much of their net worth to save themselves or a loved one from certain death, their willingness to pay for small reductions in the risk of death is more limited. The “value of a statistical life” is the summation of what people will pay for small reductions in the probability of death, with values defined similarly for statistical injuries and other health hazards. If each person in a community of 100,000 is willing to pay \$50 to reduce the number of deaths in that community by one per year, then the value of a statistical life to those residents equals \$5 million.

The amount people will pay to reduce the risk of a gunshot injury will presumably depend on how it affects them, their families, and their communities. Sometimes the monetary value of greater safety comes directly from a spreadsheet. For example, the sharp decline in the rate of violent crime during the 1990s have brought widespread gains in property values to many homeowners in urban neighborhoods. But most of what is at stake are intangible commodities not traded in the marketplace, i.e. freedom from the threat of gun violence and relief from the need to take steps to reduce that threat.

The “willingness-to-pay (WTP)” approach leads to quite a different picture of the dollar cost of gun violence from the standard public health approach. This “cost of illness (COI)” approach defines the costs of gun violence as the medical expenses incurred by victims plus lost productivity. This method ignores most of what is captured in WTP: the subjective value of safety, concern about others’ welfare, and the costs of prevention and avoidance.

In our book, *Gun Violence: The Real Costs*, (Cook and Ludwig, 2000), we show that medical expenses and lost productivity actually make up very little of the societal burden of gun violence. For example, the costs of medical treatment to victims for all gunshot injuries in 1997 was on the order of \$1.9 billion. But this figure overstates the net effects of gun violence on total medical expenditures in the U.S., since gunshot victims would have required medical services at some point over their lifetime if they had not been shot. If one subtracts the estimated lifetime medical costs that victims would have incurred had they not been shot from the costs that they actually incurred as a result of their wounds, the net costs of gun violence to the medical system are on the order of \$400 million to \$1.2 billion. While this is not a trivial sum, these net medical

expenditures represent only a small share of the overall costs of gun violence. The lesson is that the cost-of-illness approach understates the benefits to society from reducing gunshot injuries.

Quantifying the Costs of Gun Violence: Willingness-to-Pay Estimates

One of the standard methods for estimating the value of reductions in the risk of injury is to examine people's marketplace behaviors. A number of studies have attempted to estimate the value that people place on the risk of workplace accidents by comparing the wage differences associated with jobs that have high versus low risks of injury (see for example Viscusi, 1992, 1993). This approach is impractical for estimating the costs of gun violence, in part because there are no good data available on the risks of gunshot injury for different occupations. And even if such data existed, isolating the effects of injury risks on wages from the effects of other job characteristics is quite difficult. In our view, the most promising approach for estimating what people would pay to reduce the volume of gun violence in society is to ask them directly. This "contingent valuation (CV)" approach attempts to infer people's preferences towards non-market goods, such as improvements to health and safety by creating hypothetical market scenarios within the context of a social science survey. The CV method has a long tradition within the area of environmental economics, where analysts are regularly confronted with the difficult problem of valuing improvements to the environment. While contingent valuation remains somewhat controversial within the broader economics profession (see for example Hanemann, 1994 versus Diamond and Hausman, 1994), for the purposes of studying the costs of gun violence, the CV method is an improvement over its alternatives.

Our own contingent valuation estimates represent the first attempt to use this method to estimate the costs of crime. We rely on data from a nationally representative telephone survey of 1,200 American adults conducted in 1998 by the National Opinion Research Center (NORC) at the University of Chicago, one of the nation's leading survey organizations. After a series of questions asking about their attitudes toward government and various current or proposed gun regulations, respondents were asked:

Suppose that you were asked to vote for or against a new program in your state to reduce gun thefts and illegal gun dealers. This program would make it more difficult for criminals and delinquents to obtain guns. It would reduce gun injuries by about 30 percent but taxes would have to be increased to pay for it. If it would cost you an extra [\$50 / \$100 / \$200] in annual taxes, would you vote for or against this new program?

The survey software randomly determines the size of the tax increase that the respondent is asked about, so that answers for each of the three dollar amounts are available for approximately one-third of the sample. Respondents are then asked a follow-up question where the dollar amount asked about in the initial referendum question is either doubled or halved, depending on whether the respondent's initial answer was positive or negative, respectively.

The survey results suggest that a broad cross-section of the public is affected by gun violence, as evidenced by the substantial proportion of households who are willing to pay more in taxes each year to reduce gunshot injuries. Seventy-six percent of all respondents report that they would pay \$50 more per year in taxes to reduce crime-related gunshot injuries by 30 percent, while 64 percent say they would pay \$200 more in taxes. A formal statistical analysis suggests that the

average American household would pay \$239 more per year in taxes to fund such a program.

Given the total number of households in the U.S. – equal to 102.5 million in 1998 (U.S. Bureau of the Census, 1999) – we estimate that all households together are willing to pay \$24.5 billion to reduce assault-related gunshot injuries by 30 percent. We can approximate the public's WTP to eliminate all crime-related gunshot injuries by multiplying the WTP for a 30 percent reduction by 3.33. The actual cost of a 100 percent reduction may exceed this approximation if some preventive behaviors are only eliminated in response to a complete elimination of gun violence (for example if airport metal detectors stay in place so long as there are any gun crimes). On the other hand, our approximation may be too low if the public derives diminishing marginal returns from additional reductions in gun violence. In any case, this approximation suggests that the value to society of eliminating crime-related gunshot injuries is approximately \$82 billion.

Since these estimates come from survey responses about a hypothetical program, it is understandable to wonder whether they are meaningful in any way. Fortunately, several external benchmarks suggest that these survey responses are reasonable. First, the results of the NORC survey can be used to generate estimates of the value per statistical life saved, which turn out to be quite consistent with other estimates derived from analyzing actual marketplace data in other contexts (Viscusi, 1992, 1993). Secondly, the general pattern of responses to the gun survey are in accord with our expectations. For example, households with more income are more likely to vote in support of the intervention. Households with more children are also more likely to vote to reduce gun violence, presumably because such households experience a greater benefit from the intervention (in the form of risk reductions to household members) than those families with fewer members. Lastly, Anderson (1999) finds that the average household currently spends around \$1,800 per year in taxes and consumption expenditures to fund the criminal justice system and private protective measures. Thus, it is implausible that the average household would spend an additional \$239 per year to reduce the threat of gunshot injury by 30 percent, particularly since the fear of crime in America appears to be driven largely by the threat of violent crime (Zimring and Hawkins, 1997, Hamermesh, 1998, Cullen and Levitt, 1999).

Generating an estimate for the total costs of gun violence, beyond the costs of a partial reduction in crime-related gunshot injuries, requires some additional assumptions. Since our survey only captures crime-related gun violence, in order to estimate the costs of gun suicides and unintentional injuries, we turn to previous economic studies of the costs of workplace injuries and fatalities. Our review suggests that the costs of gun suicides and accidents is on the order of \$10 to \$20 billion per year, bringing the total costs of all gunshot injuries in the U.S. to about \$100 billion. To put this number into perspective, \$100 billion could be used to cover nearly two-thirds of those in America who are currently without health insurance, or to pay college tuition at a good public university for 27 million people – roughly the entire population of New York and New Jersey combined. And this reflects the costs of gun violence for just one year.

Where to Next?

Past investments in reducing gunshot injuries have had modest effects. However, the net benefit to society of these modest effects offers possible direction when evaluating gun legislation.

Data from the Kansas City Gun Experiment suggest that police patrols targeted against illegal gun carrying may be effective in reducing gun violence (Sherman, Shaw and Rogan, 1995). Unfortunately the exact magnitude of the program's effects remain somewhat unclear. The treatment and comparison neighborhoods in the "experiment" may differ in other dimensions aside from receipt of the targeted police patrols. But under the most optimistic scenario, an investment of under \$200,000 in additional police resources may have produced a reduction in gun violence with benefits of up to \$22 to \$100 million to society.

Our review also suggests that sentence enhancements for crimes committed with firearms appear to produce benefits in excess of costs, and that new gun regulations need to have only modest effects in order to generate net benefits to society. For example, one of the more promising regulations is to require that all new handguns be manufactured and sold with "personalized" technology, which makes the weapon inoperable by unauthorized users. This technology has the potential to save lives by making guns inoperable to children, despondent teens, or the criminals who are responsible for around 500,000 gun thefts each year (Cook and Ludwig, 1996).

The idea of mandating personalized gun technologies has been criticized in part because they will add to the price of new handguns. But if the personalized gun technology adds \$100 to the purchase price of a new gun, this regulatory requirement will generate benefits that outweigh costs so long as the technology is able to prevent only one shooting per 10,000 units sold. Our best guess is that the effects of personalized gun technology should easily clear this bar, given that currently it appears that every 10,000 handguns sold are involved in about 3,000 robberies and assaults and 100 homicides (Roth and Koper, 1997).

Our bottom line is that we accept as a general principle the notion that some gun-oriented interventions may not be worthwhile even if they save lives. But in practice the costs of gun violence to society appear to be large enough to justify additional investments in reducing gunshot injuries.

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