



Insurance, Life Expectancy and the Cost of Firearm Deaths in the U.S.

Published : June 15, 2005 in [Knowledge@Wharton](#)

Despite its status as an advanced industrial nation, the United States has some unusual characteristics. For example, while its health care system is the most expensive in the world, its citizens are neither healthier nor do they live longer than citizens in other countries. In addition, while the U.S. is considered among the safest countries, deaths from gunshot wounds are staggeringly high. In 2000, the U.S. recorded close to 11,000 firearm homicides and more than 16,000 firearm suicides. The European Union -- an area with a population approximately 25% higher than that of the U.S. -- reported fewer than 1,300 firearm homicides for the same year. In Japan, the number was 22. [The EU figures pre-date the 10-country expansion which took place on May 1, 2004.]



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[Jean Lemaire](#), a professor of insurance and actuarial science at Wharton, argues that these facts should be looked at in tandem. In a recent paper entitled, "The Cost of Firearm Deaths in the United States: Reduced Life Expectancies and Increased Insurance Costs," to be published in the September 2005 issue of *The Journal of Risk and Insurance*, Lemaire works through the medical and financial impact of firearms on American society. The results are eye opening.

Researchers who study firearm violence in the U.S. come at their subject from a number of perspectives, including the most obvious -- medical costs. Yet it is the other costs that are "more difficult to quantify," Lemaire writes. "They include the cost of public resources devoted to law enforcement, private investment by individuals in protection and avoidance, lost productivity of victims and changes in the quality of life, limits on freedoms to live or work in certain places, restrictions on residential and commercial location decisions, limitations in hours of operations of retail establishments, emotional costs to the forced adaptation to increased risk, and the cost of pain and fear."

Reduced Life Expectancy

The flashpoint in the long-running argument in the U.S. over the regulation of firearms is the Second Amendment to the Constitution of the United States, which states: "A well regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed." Gun control advocates read the amendment as permitting regulation of firearms possession; gun rights advocates read it as enshrining in law an individual's unfettered right to own guns.

While sensitive to the political context of the gun control versus gun rights debate, Lemaire stresses that what his work provides is data. For example, he cites a study from 2000 which estimates that the aggregate cost of gun violence in the U.S. is approximately \$100 billion annually, or about \$360 for every American. Given his background as an actuary, Lemaire has focused his research on life expectancy and insurance costs. His paper is based "on facts. It's an exact calculation designed to bring some more light into the debate.... I am providing figures that no one can disagree with," he says, acknowledging, however, that people "can certainly disagree about what we do with these figures."

Lemaire calculates how much time Americans lose off their lives as a result of gun violence and how much more they pay in insurance costs as a result. What is striking about both costs is how unevenly they

are distributed throughout the population. According to Lemaire, all firearm deaths in 2000 -- that is, both homicides and suicides -- reduced life expectancy by an average of 103.6 days. Broken down by race and gender, however, there are notable gaps in how various groups fare. Men lose between five and six times more days than women: 166.8 versus 30.5. African-American men lose more than twice as many days as white men: 361.5 versus 150.7. The most significant gap, logically enough, combines these racial and gender differentials: There is more than a tenfold difference between days lost by African-American men (361.5) versus days lost by white women (31.1).

Lemaire calculates the annual insurance costs which can be ascribed to firearm-related deaths at billions of dollars. He cites statistics from a 2001 study by the American Council for Life Insurance which suggest that, at the end of 2000, there were 148 million group and 35 million individual term life insurance policies in force in the United States, as well as 125 million group and 8 million individual whole life policies, yielding a combined total annual premium income of just under \$130 billion.

Having previously calculated the discounts for both term (9.87%) and whole life (1.89%) policies if firearm deaths were eliminated from the equation, Lemaire estimates that the annual insurance cost of firearm violence in the U.S. is \$4.9 billion. However, "this calculation overstates costs," he writes, "as the mortality of insured lives markedly differs from population mortality." Lemaire goes on to note that since homicide disproportionately impacts the young, and since life insurance is rarely purchased by or for people under 25, the current actuarial tables already "discount" homicide simply by virtue of demographics.

Even paring the increased insurance costs down to compensate for those factors, he continues, they are probably still in the same general range as the estimated \$2 billion to \$2.3 billion in total annual medical costs for gun-related injuries or the increased cost of administering the criminal justice system due to gun deaths -- including incarceration costs -- estimated at some \$2.4 billion.

To put things in an epidemiological context, Lemaire points out that "among all fatal injuries, only motor vehicle accidents have a stronger effect [than firearm deaths]." Further, the numbers show that "the elimination of all firearm deaths in the U.S. would increase the male life expectancy more than the total eradication of all colon and prostate cancers."

The Substitution Effect

One objection to the idea that reducing firearm deaths would increase life expectancy and reduce insurance costs is the argument that guns are simply a means to an end -- and that people who are intent on violence, either toward themselves or others, will find a way to achieve that objective with whatever tools are available. This is called the substitution effect. "I don't believe that Americans are necessarily more violent than the Japanese or the Europeans," Lemaire says, "and certainly the history of the 20th century shows a lot of violence in other countries. I don't think violence is in the genes of the American people."

Japan "certainly provided more than its share of violence in the 20th century," he continues, "but at the dawn of the 21st century, Japan is among the safest countries in the world: Zero guns in Japan means zero crimes. It bears mention that Japan also has an extremely low rate of thefts, burglaries, etc., a counterweight to the argument by pro-gun people that guns at home reduce burglaries."

He cites a number of studies which show that, in the area of homicides, there is little or no substitution effect. One such study done in 1988 contrasts Seattle, Wa., and Vancouver, British Columbia - two cities nearly identical in terms of climate, population, unemployment level, average income and other demographic characteristics. But as a result of far stricter gun laws in Canada he writes, only 12% of Vancouver's inhabitants own guns, compared to an estimated 41% of Seattle residents.

The study finds "that the two cities essentially experience the same rates of burglary, robbery, homicides and assaults without a gun," Lemaire writes. "However, in Seattle the rate of assault with a firearm is 7 times higher than in Vancouver, and the rate of homicide with a handgun is 4.8 times higher. The authors conclude that the availability of handguns in Seattle increases the assault and homicide rates with a gun, but does not decrease the crime rates without guns, and that restrictive handgun laws reduce the homicide rate in a community."

In the case of suicide, Lemaire notes, there is greater evidence of a substitution effect. "Reduced availability of one method," he writes, "may prompt an increase in other methods. Some despondent individuals contemplating suicide may attempt to take their life by another means if a firearm is unavailable. Indeed, in [places like] Japan and Hong Kong, suicide rates exceed the U.S. rate despite strictly limited access to firearms. Less than 1% of suicides in these countries are committed with a firearm" Lemaire goes on to say that "the introduction of assumptions that I believe are appropriate to estimate the substitution effect hardly change the number of days lost due to guns: from 103.6 to 95.8 for the average U.S. citizen."

Future Lines of Inquiry

Lemaire is not clear what use will be made of his data. Japan, he notes in his paper, has approximately 50 handguns, mostly the property of athletes who compete in international shooting competitions. The best estimate is that there are more than 250 million guns in America. It is extremely unlikely that the U.S. is going to move to confiscate guns, he says.

He does see potential opportunities, however, in the area of how insurance companies can better price, and perhaps more equitably distribute the cost of, the risks associated with guns. "There is some evidence," Lemaire says, "including evidence from the Penn School of Medicine, that just owning a gun significantly increases your chance of dying -- even when you control for variables like neighborhood, education, and so on."

He also sees room for further work in this area, both in academia and also within the insurance industry. One logical thread to pursue concerns the risk calculations that insurance companies make in pricing life insurance policies. Demographics and lifestyle choices are the bread and butter of those kinds of calculations, but -- given recent personal experience -- Lemaire is a bit puzzled by the questions asked of policy applicants. "I just applied for life insurance last week," he says. "I am a scuba diver. [The insurance company] asked me 25 questions about my scuba diving habits. This is a sport that kills 100 people annually worldwide. Nobody asked me whether I have a gun in my house, yet guns kill 30,000 people every year just in the U.S. It is bizarre that no one thought to ask that question."

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