LDI Issue Brief

Volume 11, Number 2
October/November 2005

Leonard Davis Institute of Health Economics

Jean Lemaire, PhD
LDI Senior Fellow,
The Julian Aresty Professor of
Insurance and Actuarial Science
University of Pennsylvania

The Effect of Firearm Deaths on Life Expectancy and Insurance Premiums in the United States

Editor's note: Despite recent gains, the U.S. remains behind most other affluent countries in life expectancy. Even within the U.S., the gap between the life expectancies of Caucasians and African-Americans remains significant. At the same time, firearm deaths in the U.S. far exceed peer nations, and disproportionately affect African-American males. In this Issue Brief, Dr. Lemaire explores whether deaths from firearms explain some of these international and racial disparities in life expectancy. He uses actuarial techniques to calculate the "cost" of firearm deaths in the U.S., both in terms of reduced life expectancy and increased life insurance premiums.

Among wealthy nations, U.S ranks near bottom in terms of life expectancy

Life expectancy at birth is a widely accepted measure of the quality of life in a society, summarizing in a single measure all the natural and man-made damages that can affect an individual. On this measure, the U.S. has consistently lagged behind other industrialized nations.

- In 2000, life expectancy in the U.S. reached a new high of 74.1 years for males and 79.5 years for females. However, the U.S. ranks 30th for males and 29th for females among the 35 most affluent nations.
- Many factors have been proposed to account for the relatively low U.S. life expectancy, including higher infant mortality, income inequality, and a lack of a strong primary care system. The role of firearm violence has been considered, because the U.S. has far more firearm deaths than other industrialized nations.
- Firearm violence may also play a role in explaining racial disparities in life expectancy. Within the U.S., the gap between the life expectancy of whites and blacks has remained essentially unchanged for the past 20 years. Life expectancy for black males is 68.2 years, compared to 74.8 years for white males; for black females, it is 74.8 years, compared to 80 years for white females.

Study assesses impact of firearm violence on U.S. life expectancy

Lemaire conducted an actuarial analysis to estimate the years of life lost to firearm deaths in the U.S., and the contribution of these deaths to international and racial disparities in life expectancy.

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- The author obtained data from the National Center for Health Statistics, the Centers for Disease Control and Prevention, and the U.S. Census Bureau on annual numbers and probabilities of deaths by cause, age, gender, and race.
- He used "multiple decrement" actuarial techniques to calculate life expectancy at birth when firearm deaths are removed. These techniques allow for examination of competing causes of death. In other words, the analysis accounts for the probability that those who would no longer die from firearm deaths might die of other causes.
- Based on the actuarial analysis, Lemaire also calculated the increased price of term and whole life insurance due to firearm deaths in the U.S.

For men, firearm deaths reduce U.S. life expectancy more than prostate and colon cancer combined

The results indicate that firearm deaths have a significant effect on overall U.S. life expectancy. To put these results in context, Lemaire compared the effect of firearm violence to the effects of other injuries and cancer deaths.

- Americans, on average, lose 104 days of life due to firearms deaths—46 days to homicide, 52 days to suicide, and the remainder to unintentional injury, legal intervention, or undetermined causes. As the table below shows, men are particularly hard-hit: white males, on average, lose 151 days, and black males, on average, nearly a full year. Homicide has a huge impact on life expectancy for black males (nearly 300 days), as does suicide for white males (102 days).

Reduction in life expectancies under different scenarios, in days

Population	Firearm Homicides	Firearm Suicides	All Firearm Deaths
U.S.	46	52	104
U.S. Males	73	85	167
U.S. Females	15	15	31
White Males	40	102	151
White Females	12	18	31
Black Males	297	50	362
Black Females	36	7	45

- The above results assume that firearm deaths are eliminated, and not replaced by homicides and suicides by other means. No evidence exists for a "substitution effect" for homicides, but such as effect may exist for suicides. However, the impact of firearm deaths remains large even if all firearm suicides are replaced by attempts using other, less fatal means. In that case, the number of days lost to firearms is reduced from 104 to 96.
- Among fatal injuries, only motor vehicle crashes, with 161 lost days, have a larger effect on life expectancy than firearm violence (see table on next page). For men, the effect of firearms deaths (167 lost days) is greater than the combined effect of all prostate and colon cancers.

Reduction in U.S. life expectancy, in days, by cause

Cause of death	Reduction
Lung cancer	197
Motor vehicle accidents	161
Breast cancer (Females)	145
Firearms	**104**
Colon cancer	67
Poisoning	66
Prostate cancer (Males)	47
Suffocation	39
Falls	25
Drowning	17
Fires	13

Firearm deaths partially explain international and racial disparities in life expectancy

Compared to the average in 34 other wealthy nations, the U.S. has a life expectancy gap of 1.7 years for males, and 2.6 years for females. Within the U.S., the racial gap is even greater: 6.6 years for black males, and 5.1 years for black females, compared to their white counterparts. Firearm deaths explain a significant proportion of these gaps for males.

- Firearm deaths account for about 27% of the U.S. males' excess mortality when compared to peer nations. Firearm deaths account for about 3.3% of the U.S. females' excess mortality.
- Within the U.S., 10.6% of the life expectancy gap between white and black males is due to firearm homicides. Only 1.3% of the gap between white and black females is explained by firearm homicide.
- Excess firearm suicides among U.S. whites reduce the racial disparity in life expectancy by 2.1% for males and 0.6% for females.

Excess life insurance premiums due to firearm deaths may total $2 billion annually

Americans spend more than $129 billion in life insurance premiums each year. Lemaire estimated the fraction of total premiums for term and whole life insurance due to firearm deaths.

- If all firearm deaths were eliminated, term life premiums for a 25-year-old could be discounted 9.78%, and whole life premiums could be discounted 1.89%. If these discounts were applied to current annual premiums, the annual insurance costs of firearms deaths would be $4.9 billion.
- However, excess premium costs are clearly less than this amount, because the mortality patterns of insured people differ markedly from the population as a whole. In addition, most policies exclude coverage for suicide in the first two years of issuance.
- Taking these factors into account, Lemaire suggests that the increased insurance costs due to firearms are of the same order of magnitude as previous estimates of total medical costs ($2-$2.3 billion) or criminal justice costs ($2.4 billion) of gun deaths.

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POLICY IMPLICATIONS

These findings suggest that the U.S. life expectancy would improve significantly with effective interventions to reduce firearm deaths.

- Firearms reduce U.S. life expectancy and may explain, in part, why U.S. life expectancy lags behind that of other industrialized nations.
- Although a casual link has not been proven, a body of U.S. and international studies has consistently shown a strong link between firearm availability and homicide. As policymakers seek to reduce racial and international disparities in life expectancy, the potential impact of reducing the availability of firearms should be considered.
- Firearms also significantly raise the costs of life insurance premiums for all Americans. The life insurance industry should consider using these estimates in its pricing and underwriting decisions, to more equitably distribute the costs of the risks associated with guns.

This Issue Brief is based on the following article: J. Lemaire. The cost of firearm deaths in the United States: reduced life expectancies and increased insurance costs. Journal of Risk and Insurance, September 2005, vol. 72, pp. 359-374.

This Issue Brief was supported by the Joyce Foundation, through a grant to the Firearm Injury Center at Penn (FICAP).

Published by the Leonard Davis Institute of Health Economics, University of Pennsylvania, 3641 Locust Walk, Philadelphia, PA 19104-6218.
Janet Weiner, MPH, Associate Director for Health Policy, Editor
David A. Asch, MD, MBA, Executive Director

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Published by the
Leonard Davis Institute
of Health Economics
University of Pennsylvania

Issue Brief

3641 Locust Walk
Philadelphia, PA 19104-6218
215.898.5611
fax 215.898.0229

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