

# The Health & Economic Consequences of Firearm Injuries in Children on Survivors & Families

## CONVERSATION WITH THE RESEARCHER

*"Survivors of firearm injury are often forgotten, as are family members who share in the trauma. This evidence shows that the health and economic reach of firearm injuries extends well beyond the already striking number of fatalities."*



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### Q: How does your study inform the need for increased support for the families & survivors of firearm injuries?

**A:** Anticipating the clinical needs of survivors and families may help the health care community improve counseling for firearm safety, adopt trauma-informed approaches to care, and strengthen its clinical and social services for the aftermath of firearm injuries. The population of survivors grows each day. There are concrete opportunities for clinical education, skill-building, and advocacy for providers to consider.

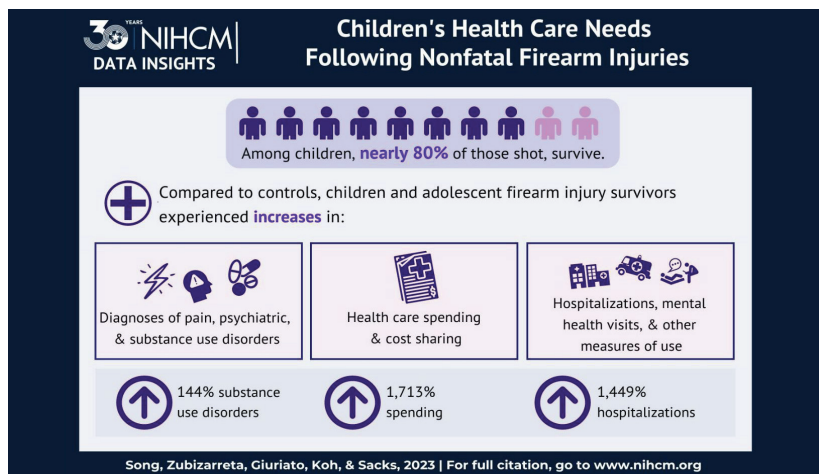
### Q: What can policymakers & providers do to address the implications of firearm injuries?

**A:** For these families with employer-sponsored health insurance, the self-insured employers and payers—but ultimately workers themselves through their wages—bear the brunt of the roughly \$35,000 in direct medical spending per survivor in the first year alone. Indirect costs are also large, such as through losses in productivity. As over 550 CEOs and executives of U.S. companies wrote in an open letter last summer, gun violence in America is not only a public health issue but also an economic issue.

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## SYNOPSIS

This groundbreaking study found that following firearm injury, child and adolescent survivors, their families, and the families of decedents experienced substantial increases in physical and mental health disorders, health care use, and spending. With children and adolescents increasingly exposed to firearms in the U.S., these findings show the direct toll and ripple effects that reverberate from firearm injuries through families. Survivors and their families are deeply impacted; parents and siblings of children and adolescents who died from gunshots fare even worse. These findings inform clinicians, payers, and policymakers about the substantial economic and health burden of firearm injuries.



## NONFATAL FIREARM INJURY IMPACTS HEALTH CARE OUTCOMES, SPENDING, & USE

Firearms are now the leading cause of death among children and adolescents nationwide, but earlier data suggest that nearly 80% of those who are shot, survive. This study found that among child and adolescent survivors, there was a dramatic increase in pain, psychiatric, and substance use disorders following injury. There was also a large (17-fold) rise in health care spending driven by hospitalizations, outpatient care, and other types of care. Most of that (95%) was paid by self-insured employers and insurers, ultimately coming out of workers' wages, with the rest by patients out-of-pocket. For family members of survivors, psychiatric disorders also increased while routine medical care declined, suggesting a shift in the burden of need or crowd-out of routine care. For families of decedents, mental health effects were much larger.

This is one of the first studies to assess the impact of firearm injuries on youth survivors and the parents and siblings of both survivors and decedents using detailed claims data. Its novelty also comes from comparing each affected child or family member to nearly five matched control individuals. It thus provides rigorous evidence of the magnitude of health- and economic-related consequences for both nonfatal and fatal firearm injury victims and their families.

Findings illustrate the substantial health care needs following nonfatal firearm injury, highlighting the profound health and economic toll, which is informative for payers, employers, and policymakers. This evidence is also important for the clinical community. It encourages efforts to improve trauma-informed care, anticipate the needs of families in the aftermath of firearm injuries, and ensure that people directly or indirectly impacted by firearm injuries have access to needed care.

## RESEARCH INSIGHTS

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### MORE ABOUT THIS STUDY

This observational study analyzed MarketScan commercial claims data from 2007 - 2021, which specifies family relationships. Individuals were matched with up to five unexposed controls - in total, this study accounted for 49,649 individuals. All individuals were continuously enrolled in an insurance plan from one year before to one year after the injury. Exposure was defined using several injury codes for firearm injuries and death was defined by premature disenrollment from their family's insurance plan. Over 50% of children in the U.S. are covered by private insurance but these findings may not be generalizable to children covered by Medicaid, other forms of insurance, or who are uninsured.

### CITATION

Song, Z., Zubizarreta, J. R., Giuriato, M., Koh, K. A., & Sacks, C. A. (2023). Firearm Injuries In Children And Adolescents: Health And Economic Consequences Among Survivors And Family Members. *Health Affairs*, 42(11), 1541–1550. <https://doi.org/10.1377/hlthaff.2023.00587>

## KEY FINDINGS

This analysis examined three cohorts of individuals exposed to firearm injuries - children and adolescent survivors (0 - 19 years old), family members of survivors, and family members of decedents - from one year before injury through one year after injury. Findings include:

### Health Outcomes:

- Survivors experienced increases in pain disorders (117%), psychiatric disorders (68%), and substance use disorders (144%). Female survivors experienced a larger percentage increase in substance use disorders than males, explained by a lower baseline prevalence among females.
- Mothers and fathers of survivors experienced increases in documented psychiatric disorders (~30%). Siblings did not experience such an increase, though that may be explained by a lack of presentation for needed care.
- Psychiatric disorders increased substantially more among decedents' mothers (358%), fathers (532%), and siblings (227%). Parents also exhibited a rise in psychiatric visits and medications.

### Health Care Use:

- Survivors experienced increases in office visits (89%), emergency department visits (253%), mental health visits (32%), and hospitalizations (1,449%). Procedures, imaging, labs, and other testing also rose by substantial amounts.
- Prescription pain medication days (411%) and psychiatric medication days (35%) rose among survivors.
- Mothers of survivors increased their mental health visits by 75%. Fathers' health care use did not change significantly. Siblings also had reductions in routine medical visits.
- Parents and siblings of decedents showed substantially larger increases in psychiatric disorders (2- to 5-fold) and mental health visits.

### Health Care Spending:

- Survivor's health care spending increased by 17-fold, for an average of \$34,884 annually. Per month, this increase amounts to \$2,907 and is higher among males, compared to \$170 before injury.
- Insurers, predominantly self-insured employers, paid 95% of the additional spending and the remainder was paid through cost sharing, which also increased by \$132 per survivor per month.
- Siblings of decedents had no differential changes in their health care spending.