



Testimony by Dr. Chethan Sathya before the Joint Economic Committee of the United States Congress

Hearing: “The Economic Toll of Gun Violence: How Our Nation Bears the Costs”

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Introduction

Chairman Beyer, Vice-Chair Henrich, Ranking Member Lee, and members of the committee, thank you for inviting me to speak with you today. My name is Chethan Sathya and I am a pediatric trauma surgeon at Northwell Health, the largest private employer and largest hospital system in New York State, with 21 hospitals, more than 850 outpatient facilities, and nearly 16,000 physicians.

In addition, I am an assistant professor of pediatrics and surgery and an NIH-funded firearm injury prevention researcher. And over the last three years, I have led Northwell Health’s Center for Gun Violence Prevention, which is a first-of-its-kind convener of hospitals nationwide that conducts research and promotes a public health approach to gun violence.

I am here this afternoon to talk to you about the enormous toll that gun violence takes. First and foremost, gun violence affects victims and their families. Before we discuss the economic impact, it’s important we acknowledge that.

Over the course of my career I have treated gunshot victims in my hometown of Toronto, Chicago, and now New York City. I will never be able to describe the pain that I have seen and continue to see on a regular basis – on the faces of my patients and in their families’ eyes. And I would not even try to quantify the sense of loss mothers, fathers, siblings, and partners feel when their loved one loses their life or has their life altered forever.

I also want to emphasize that when we do talk about the financial cost of firearm injuries, the studies that do exist are retroactive; they obviously capture costs already incurred. While it’s important to have as much information as possible about those costs, minimizing the economic burden that firearm injuries put on the health system is not enough. We must reduce the potential

for firearm injuries in the future, through more research, better care, and evidence-based policy changes.

Overall, I believe in a public health approach to address the gun violence epidemic. That means our singular goal must be to reduce gun violence, and we must approach that challenge from every possible angle, with data and evidence as our north star. Only a multi-faceted strategy that addresses every risk factor – for every type of gun violence, including homicide, suicide, and accidental discharge – at the individual level, the neighborhood level, and the population level can help us make progress.

Today I would like to advance the discussion by talking to you about the economic cost of gun violence on the health system as a whole. I hope my testimony will inform your approach to taking real action to reduce gun violence and firearm injuries overall.

In particular, while there are a number of different steps Congress should take, I hope my testimony underscores the need for significantly more funding for research on gun violence and funding to prevent and treat firearm injuries.

For example, one recently released Harvard Medical School study of the cost of medical care after non-fatal firearm injuries “emphasize[d] the importance of screening for firearm safety by frontline clinicians” as one underutilized measure to save lives.¹ The concept of universal screening, or assessing many or all patients who interact with the healthcare system for firearm injury risk, has not been widely studied.

Thanks to Congress’ decision to lift the two-decade, de-facto freeze on government funding for gun violence research, Northwell Health is in fact leading a \$1.4 million universal screening pilot within our health system.^{2 3} As part of that pilot, clinicians in our health system are counseling patients who have access to firearms on safe storage practices, providing them with gun locks, and connecting those at risk of gun violence to support services.

We need much more innovative research, because no matter your views on specific policy solutions, I strongly believe that the comparative lack of funding for research is undermining our collective mission to reduce firearm injuries.

We do have some rigorous analyses of the financial cost of gun violence to the healthcare system, and I will discuss some of them. But overall, this is an under-researched issue; last year, the Government Accountability Office (GAO) concluded that “there is no complete information on the health care costs of gun injuries. National data allow for estimates of the costs of initial

¹ Zirui Song *et al.*, “Changes in Health Care Spending, Use, and Clinical Outcomes After Nonfatal Firearm Injuries Among Survivors and Family Members,” *Annals of Internal Medicine*, [June 2022](#).

² American Psychological Association, “A thaw in the freeze on federal funding for gun violence and injury prevention research,” [April 1, 2021](#).

³ Northwell Health, “Northwell receives \$1.4M NIH grant to establish gun violence prevention screening,” [September 22, 2020](#).

hospital treatment and some first-year costs, but less is known about costs the more time passes from the injury.”^{4 5}

Generally, those of us in the healthcare space identify three types of financial costs associated with gun violence: immediate, long term, and quality-of-life estimates, or estimates of how gun violence affects other outcomes, like education and earning potential. Beyond healthcare, experts have argued that the cost of the criminal justice system and law enforcement can also be counted as a consequence of gun violence.⁶ For this testimony, I will focus on the immediate and long term costs associated with providing medical care to victims of gun violence.

Overview of the Financial Cost of Firearm Injuries to the Healthcare System

Despite the lack of complete data on the healthcare costs of firearm injuries, we do have a range of estimates available from discharge data, insurance data, and other sources. Within the existing literature, individual studies often can only tell a sliver of the whole story, but they are revealing parts of the story that should incentivize us to uncover the full picture.

Public Funding Covers the Majority of Initial Medical Costs for Firearm Injuries

It may be helpful to begin with some of the broad strokes. According to the federal government’s latest analysis, there are about 51,000 visits to emergency departments for firearm injuries, and separately, 33,000 inpatient stays, meaning 230 people go to the hospital every day because they are shot. That excludes victims who don’t make it to the hospital.⁷

Total initial hospital costs for those 84,000 patients are estimated to be about \$1.1 billion, with \$1 billion going towards inpatient stays. It is important to note that figure does not include ambulance transportation costs or costs of physicians’ time; the Centers for Disease Control has estimated in the past that the cost of physicians’ time increases healthcare costs by about twenty percent.⁸

⁴ Government Accountability Office, “Firearm Injuries: Health Care Service Needs and Costs,” [June 2021](#).

⁵ Ted Alcorn, “Trends in Research Publications About Gun Violence in the United States, 1960 to 2014,” *JAMA Intern Med.* [2017](#)

⁶ Mother Jones, “The True Cost of Gun Violence in America,” [April 15, 2015](#).

⁷ Government Accountability Office, “Firearm Injuries: Health Care Service Needs and Costs,” [June 2021](#).

⁸ Cora Peterson et al., “Professional Fee Ratios for US Hospital Discharge Data,” *Med Care*, vol. 53, no. 10, [2015](#)

Accessible Data for Figure 3: Estimated Annual Initial Hospital Costs of Firearm Injuries in the United States, by Expected Payer, 2016-2017

n/a	Inpatient Stays for firearm injuries 2016-2017		Ed-only visits for firearm injuries 2016-2017	
Category	Percentage of annual cost	Annual average cost per patient	Percent annual cost	Annual average cost per patient
Medicare	6	\$28,998	5	\$1,256
Medicaid	52	\$35,862	30	\$1,523
Other public payers	7	\$29,702	7	\$1,576
Private Insurance	19	\$29,193	20	\$1,333
No Charge	1	\$22,864	1	\$1,697
Self-pay	15	\$22,735	37	\$1,543
Annual total	\$1,003,572,760	NA	\$75,465,103	NA

Source: Government Accountability Office, “Firearm Injuries: Health Care Service Needs and Costs,” [June 2021](#).

In terms of the payor mix, or who pays for that initial healthcare, the analysis found that Medicaid and other public coverage paid for the majority of the initial costs.

The Initial Costs of Firearm Injuries are Three Times More Expensive than Other Injuries

For inpatient stays, the data shows that the average cost per patient is \$30,711, which is nearly triple the average overall inpatient hospital stay, which costs \$11,700.⁹ The same 3-to-1 ratio exists for patients who only visit the emergency department, whose average cost is \$1,478 compared to \$539 for other emergency department patients.¹⁰

That recent government analysis, which covered 2016 to 2017, is largely consistent with other studies. Researchers at the Stanford University School of Medicine analyzed cost of care data from more than 250,000 patients over eight years, between 2006 and 2014. They found that for patients who were hospitalized, their initial hospitalizations cost \$6.6 billion, or about \$734 million per year and \$25,000 per patient.¹¹ That figure did not include emergency room visits, readmissions, long term care, or costs for patients who were treated but died before technically being admitted. The studies’ authors also note that because of gaps in available data, their calculations “substantially underestimate true health care costs.”¹²

The Stanford study also found some notable differences between patients hospitalized for firearm injuries and people killed by firearms: “Although suicide is the biggest cause of mortality from firearms, accounting for 60.7% of all firearm deaths in 2015, they accounted for only 8.4% of patients initially hospitalized for firearm injuries. Suicide patients typically do not survive long

⁹ Lan Liang *et al.*, “National Inpatient Hospital Costs: The Most Expensive Conditions by Payer,” Agency for Healthcare Research and Quality, [2017](#).

¹⁰ Government Accountability Office, “Firearm Injuries: Health Care Service Needs and Costs,” [June 2021](#).

¹¹ Sarabeth A. Spitzer *et al.*, “Costs and Financial Burden of Initial Hospitalizations for Firearm Injuries in the United States, 2006–2014,” *American Journal of Public Health*, [2017](#)

¹² *Ibid.* For example, the authors used the Healthcare Cost and Utilization Project Nationwide Sample from the Agency for Healthcare Research and Quality, which is the largest inpatient care database. They specify that it’s possible their analysis excluded patients whose firearm injuries were miscoded, and their cost estimates for Medicaid may be too low because uninsured patients get enrolled in Medicaid during their hospital stays.

enough to be admitted and, thus, do not incur as many hospital costs. Furthermore, assault victims that survive long enough to be admitted typically survive; many assault victims die before hospitalization. Assault injuries accounted for 56.5% of initial hospitalizations and thus are associated with the highest costs.”

Unsurprisingly, treating gunshot wounds is far more expensive than treating for other kinds of violent injuries, such as stab wounds. While recent data on this is lacking, a 1997 study co-authored by Ted Miller, a recognized researcher in the field, identified the average cost of treating gunshot and stab wounds as \$154,000 and \$12,000 per patient, respectively. Those figures include extended treatment and rehabilitation. This study is decades old, another reason we desperately need federal funding for research, but it does provide a general scale of the comparative costs of care.¹³

Firearm Injuries are Five Times More Expensive than Motor Vehicle Injuries

A recent study compared the cost of providing care for child victims of gun violence to caring for children injured in motor vehicle collisions. The study examined the costs of care across 35 different hospitals from 2013 to 2017 for children who arrived at emergency departments. For children who appeared with gunshot wounds, 49% required additional, inpatient care, compared to only 14% of those who were injured in motor vehicle accidents. Children with gun injuries were also more likely to need expensive medical imaging than those with motor vehicle injuries: 83% compared to 49%. That makes a big difference in cost. The average cost of emergency care per child with gun injuries was \$3,816 — more than five times the cost of treating a child with motor vehicle injuries at \$685.¹⁴

Firearm Injuries Cause Health Care Costs to Skyrocket After Initial Care – For Victims Insured by Both Public and Private Payors

Patients who require long term care because of their firearm injuries see skyrocketing costs, and the cost is borne by both public and private insurers. Two recent studies shed light on the scale of these costs.

First, the Harvard Medical School study published last month looked at public and private insurance claims from 2008 to 2018. It compared changes in healthcare spending for firearm injury victims and their families from pre-injury through one year post-injury, and the results were striking but not surprising. After a non-fatal firearm injury, victims’ medical spending increased by \$2,495 per month (402%) compared to a control group; those costs included significant increases in psychiatric diagnoses and substance use disorders.¹⁵

When you extrapolate that per month cost to all survivors of firearm injuries in America, an estimated 85,000 people, healthcare spending “attributable to nonfatal firearm injuries nationally

¹³ Ted R. Miller, Mark A. Cohen, “Costs of gunshot and cut/stab wounds in the United States, with some Canadian comparisons,” *Accident Analysis & Prevention*. Volume 29, Issue 3, [1997](#)

¹⁴ Kiesha Fraser, Doh. MD, *et al.*, “Comparison of cost and resource utilization between firearm injuries and motor vehicle collisions at pediatric hospitals” *Academic Emergency Medicine*, [February 18, 2021](#)

¹⁵ Zirui Song, MD, PhD, *et al.*, “Changes in Health Care Spending, Use, and Clinical Outcomes After Nonfatal Firearm Injuries Among Survivors and Family Members,” *Annals of Internal Medicine*, [June 2022](#)

would exceed \$2.5 billion in the first year for new survivors alone. Long-term medical spending for traumatic brain injuries, disabilities, and other clinical consequences of nonfatal firearm injuries would augment these costs, as would any downstream spending from the increased psychiatric burden borne by family members.”¹⁶

The Harvard study also tried to rigorously determine whether a firearm injury victim’s family experienced a tangible change in overall wellbeing, finding that family members “had a 12% increase in psychiatric disorders relative to their control participants.”¹⁷ That evidence of negative health effects for family members of firearm injury victims builds on prior research showing that families often absorb significant out-of-pocket healthcare costs for their loved ones.¹⁸

Second, a Brown University study similarly looked at healthcare costs for firearm injury victims with private insurance in five states between 2015 and 2017 – both initial costs and costs for six months post-injury. The study found that compared with six months pre-injury, victims saw healthcare costs spike from \$3,984 to \$17,806 (347%) for those discharged from emergency departments, and from \$4,118 to \$92,151 (2,138%) for those who were hospitalized.

One author noted that, given the population they observed maintained private insurance throughout the study period, the study demonstrated that, “higher-income individuals [can] also be gunshot victims, [and] that injuries happen outside of high-crime neighborhoods. She went on to say that, “data collection and availability can lead to data-driven solutions to help us properly treat gunshot wounds and hopefully prevent future injury.”¹⁹

These costs can be thought of as the “hidden costs” of firearm injuries within the healthcare sector, and of course the costs can extend far beyond the first year or six months post-injury.²⁰ It is also worth reiterating that quality-of-life costs are borne by victims, their families, and society as a whole. Though they are beyond the scope of this testimony, they are significant and deserve serious attention from policymakers.

More Victims Need More Expensive Surgeries – But Thankfully More Patients are Surviving

Healthcare professionals go to every possible length to save patients’ lives, and while research into gun violence prevention is lacking, the medical community continues to pioneer life-saving technology and techniques that keep more and more patients alive when they arrive at the hospital. We’re seeing this when it comes to gun violence as well, and we should celebrate the fact that more people are surviving.

We should also recognize that the cost of care for serious gunshot wounds is increasing. In 2020, researchers published what is likely the first national, retrospective analysis of the cost of surgeries for serious gunshot wounds. They studied the costs associated with treating about

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Everytown for Gun Safety, “The Economic Cost of Gun Violence,” [February 27, 2021](#).

¹⁹ Brown University News, “Firearm injuries cost a health insurer \$8.2 to \$41.2 million to treat, study finds,” [September 28, 2020](#).

²⁰ Rishi Rattan MD, *et al.*, “Hidden Costs of Hospitalization After Firearm Injury,” *Annals of Surgery*, [May 2018](#).

260,000 gunshot victims between 2005 and 2016 who underwent at least one major surgery. They found that by 2016, 23,500 patients required surgery for their wounds, an 18% increase compared to 2005. The costs of those patients' hospitalizations went up by about 27%, from \$15,100 to \$19,200, after adjusting for a number of factors. Over the same period of time, fatalities after surgery declined from 8.6% to 7.6% – despite the increase in admissions for gunshot wounds.^{21 22}

The Healthcare System Should Not be Asked to Sustain the Unrivaled Amount of Gun Violence in America

Even without a fully funded effort to research the causes, effects, and treatments for gun violence, it's clear that gun violence is incredibly expensive in the short and medium term, that the expense burdens public and private payors, and that costs to treat the most serious injuries are going up.

There is no comparison when it comes to America's peers. One study looked at mortality data in two dozen high income countries and found that: the gun homicide rate in the United States was 25.2 times higher than its peers; the suicide rates from firearms were 8 times higher; and unintentional firearm deaths were 6 times higher. And among all twenty three countries, more than 80% of all firearm deaths happened in America.²³

Conclusion

As a pediatric trauma surgeon, I routinely see some of the worst scenes one can imagine. We are trained to follow a routine if we want to save a child's life when a bullet pierces her neck: secure the airway, rapidly apply pressure to stop the bleeding, and do whatever you can to repair damaged tissues, nerves, and blood vessels.

As other parents are helping their kids get ready for school in the morning, picking them up from soccer practice in the afternoon, and cooking them dinner at night, my fellow doctors and I will still be here, rushing to meet ambulances. We'll continue to do everything in our power to save as many children as possible, one surgery at a time.

But even without all of the data and the research that we want, the evidence we do have clearly shows that we can begin to reduce the number of victims now. The recently concluded Harvard Medical School study of ongoing healthcare costs for firearm injury survivors, referenced earlier, included a gut-wrenching fact that should drive all of us to act – no matter our policy preferences. Of the 6,498 survivors in the study, 71% were injured in unintentional shootings.

²¹Dobaria, Vishal BS *et al.*, "National Trends and Cost Burden of Surgically Treated Gunshot Wounds in the US, Journal of the American College of Surgeons" [October 2020](#), Volume 231 - Issue 4

²² Science Daily, "New study documents increasing frequency, cost, and severity of gunshot wounds," [August 10, 2020](#).

²³ Erin Grinshteyn, PhD David Hemenway, PhD, "Violent Death Rates: The US Compared with Other High-income OECD Countries, 2010," American Journal of Medicine, [March 1, 2016](#).

Surely, that should tell us that whatever disagreements we have over certain policy solutions, we can at least make progress by trying to prevent those shootings through things like safe storage laws, improvements to firearm safety technology, and universal screening. While I personally believe Congress should go much further, I embrace a public health approach that allows us to make progress on areas of broad agreement.

Last week, I had the chance to meet with a few of the families who lost children at Robb Elementary School in Uvalde, Texas. What struck me most, beyond the pain and suffering they were experiencing, was how familiar it felt. I have met hundreds of those families, most of whom suffer quietly beyond the spotlight.

There is no one solution to address the epidemic of gun violence, which costs us billions of dollars and immeasurable pain every year. But if we begin to build consensus based on our common mission to keep our children safe and a common commitment to following the evidence, I know we will save lives and prevent our fellow Americans from ending up on the operating table in the first place.

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