



HEALTHCARE COSTS OF GUN VIOLENCE

IN ALBUQUERQUE, NEW MEXICO

2017 - 2022

PRIMARY AND SECONDARY ANALYSIS

RESEARCH CONDUCTED BY

HMA Strategy and Transformation Team | April 2024

HMA

EXECUTIVE SUMMARY

This public health research project describes the healthcare costs of gun violence in Albuquerque, New Mexico. Specifically, it compares the healthcare costs—incurred by payers (health insurers)—of those who did not experience an episode of gun violence to those that did, while also exploring the difference in cost before and after an incident of gun violence. Researchers placed particular emphasis on understanding the impact of gun violence on young individuals in Albuquerque, though costs represented in this report span all age groups.

The Health Management Associates (HMA) Strategy and Transformation Team conducted this public health research project with funding from the W.K. Kellogg Foundation and support from the Albuquerque Community Safety Department, Greater Albuquerque Chamber of Commerce, Gun Violence Task Force, New Mexico Office of the Attorney General, University of New Mexico (UNM) Health Sciences Center, and University of New Mexico Hospital (UNMH).

From June 2021-July 2022, the city of Albuquerque, NM, experienced 653 incidents of gun violence.¹ Leveraging demographic trends from 2016-2020, approximately 260 of these incidents are estimated to have happened among individuals ages 15-34 in a 12-month period. The disproportionate toll of gun violence on young people in Albuquerque reverberates across individual, familial, and community well being and prosperity. Moreover, it results in high healthcare expenses, imposing a heavy long-term burden on the individuals involved, their families, and the communities in which they live.

Gun violence incidents and costs are challenging to measure, largely due to limited federal funding for research and inconsistent data collection, coding, and information sharing practices. For this public health research project, researchers primarily used Medicare claims data to analyze healthcare utilization and costs among beneficiaries with and without firearm injuries in Albuquerque. They also reviewed Medicaid data as part of

the analysis; however, this information was ultimately excluded due to lack of appropriate coding and overall reliability. Lastly, the analysis included local and national data from the Centers for Disease Control and Prevention (CDC) and the Indicator-Based Information System (IBIS).

The findings highlight the significant excess healthcare costs resulting from gun violence in Albuquerque, disproportionately experienced among young individuals and in marginalized communities. The applied methodology and its limitations underscore the need to improve the local and national gun violence data infrastructure. Improving gun violence infrastructure and sharing practices will require partnership and buy-in from community leaders, law enforcement, hospital leadership, and other stakeholders.

1 - CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) WIDE-RANGING ONLINE DATA FOR EPIDEMIOLOGIC RESEARCH (WONDER)

METHODOLOGY: COST ANALYSIS

The research team implemented a comprehensive methodology to analyze firearm-related injuries and their effects on healthcare costs, integrating data from various sources. Public sources included various datasets from the Centers for Disease Control and Prevention (CDC) and the Indicator-Based Information System (IBIS). These data sources were used to identify various demographic indicators and hospitalization rates.

Researchers reviewed Medicare claims data to analyze healthcare utilization and costs associated with firearm injuries among Medicare beneficiaries in Albuquerque. For the analysis, researchers identified cost and utilization patterns among firearm-related injury cases using codes from the 10th revision of the International Classification of Diseases (ICD-10) as well as current procedural terminology (CPT) codes related to the clinical journey of a gunshot victim.

METHODOLOGY: COST ANALYSIS CONTINUED

ICD-10 and CPT codes are part of standardized systems that healthcare professionals use to classify and code diagnoses, symptoms, and procedures for billing, analysis, and other clinical purposes. This involved calculating the direct medical costs incurred by Medicare and included reviewing the data along the following population cohorts:

- Population without any matching ICD-10 code for firearm-related injury (Non-Gun Violence)
- Population with a matching ICD-10 code for firearm-related injury for whom the data was then analyzed for the 18-month window pre (Pre-Gun Violence) and post (Post-Gun Violence) incident.

The research team extrapolated these figures across all payers leveraging a publicly available multiplier to identify the overall cost burden.

FROM JUNE 2021-JULY 2022 THERE WERE 653 INCIDENTS OF GUN VIOLENCE IN ALBUQUERQUE. THIS RESULTS IN AVERAGE EXCESS COST INCURRED BY PAYERS OF:

**\$71 MILLION
TOTAL** | **\$108,000
PER VICTIM**



METHODOLOGY: QUALITATIVE INTERVIEWS

Members of the research team conducted 6 virtual interviews with various community stakeholders that included representation from UNMH and City leadership. The purpose of these interviews was to contextualize gun violence in Albuquerque and to seek information about Albuquerque's current healthcare infrastructure and data accessibility.

OVERALL DATA FINDINGS

Gunshot violence disproportionately affects individuals in New Mexico aged 15-34, with nearly **40 percent of all firearm injury deaths in the state from 2016 – 2020.**

In June 2021 – July 2022, there were **653 incidents** of gun violence in Albuquerque.

Based on Medicare data from 2017 – 2019, gun violence in Albuquerque resulted in excess costs of **\$108,000 per victim**, ranging from about \$84,000 - \$133,000.

Adjusted with appropriate ratios across all payers, this results in an excess average cost of **\$71 million** (ranging from \$55 - \$87 million) in a 12-month period.

Gun violence victims' healthcare costs are about **18x higher** than the average cost of an individual who did not experience gun violence.

INTERVIEW FINDINGS

Interview themes contextualize the quantitative findings. Overall, experts shared the following observations:

1. Data accessibility and usage pose significant challenges.
2. It is important to recognize the vulnerability and marginalization of communities susceptible to gun violence.
3. A collective community effort is necessary to effectively measure and respond to gun violence.



RECOMMENDATIONS

Recommendations are intended to address key findings; first, the disproportionate impact of gun violence on young individuals in Albuquerque aged 15–34 as well as the burden on marginalized communities. They also are intended to address the crucial community partnerships and support to create better gun violence data collection and sharing infrastructure. The following recommendations should be implemented by entities with strong community presence and relationships.

1. Conduct workshops with clinicians, leading researchers, the Albuquerque police department, and other stakeholders to further clarify and identify the appropriate application of relevant gun violence data sources.
2. Conduct additional research to understand the impact and contributing factors of gun violence on historically marginalized communities.
3. Identify community leaders and other stakeholders to champion the continued research of the healthcare impacts and costs of gun violence.

LIMITATIONS

Researchers faced a number of challenges in collecting data and conducting the analysis for this report. General limitations include data underreporting, data bias, lack of correlation with non-incident related healthcare, and limited data access. Limitations regarding the use of public data sources include inconsistent reporting practices, lack of granularity and lack of standardization.

Limitations related to the application of claims data include privacy restrictions, inconsistent coding practices, lack of contextual information, and others. Researchers worked to intentionally address these limitations through complementary approaches, such as combining data across sources (e.g., public sources, claims data, hospital records etc.) and utilizing advanced analytical methods to mitigate biases and limitations inherent in the data.

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INTRODUCTION

This public health research project was guided by the sole goal of quantifying the healthcare costs of gun violence in Albuquerque and Bernalillo County, NM for the state's only level one trauma hospital. The analysis was conducted by the Health Management Associates (HMA) Strategy and Transformation Team with funding from the W.K. Kellogg Foundation and support from the Albuquerque Community Safety Department, Greater Albuquerque Chamber of Commerce, Gun Violence Task Force, New Mexico Office of the Attorney General, University of New Mexico (UNM) Health Sciences Center, and University of New Mexico Hospital (UNMH).

Gun violence incidents and costs are challenging to measure largely because of limited federal funding for research and inconsistent data collecting, coding, and sharing practices. For this public health research project, researchers primarily used Medicare claims data to analyze healthcare utilization and costs among beneficiaries with and without firearm injuries in Albuquerque. They also used reviewed Medicaid data as part of the analysis, however this information was ultimately excluded due to lack of appropriate coding and overall reliability. Lastly, the analysis included local and national data from the Centers for Disease Control and Prevention (CDC) and the Indicator-Based Information System (IBIS).

Though the costs identified in this report are significant, it does not account for the many indirect costs of gun violence, including law enforcement and criminal justice costs, diminished economic development opportunities, and behavioral health costs, such as community trauma. Further, this report does not account for the significant costs that may happen throughout the lifetime of a gunshot victim.

CDC	The Centers for Disease Control and Prevention provides national and local demographic data.
IBIS	The Indicator-Based Information System, New Mexico's public health data system, provides state level information on various public health indicators.
CLAIMS DATA	Administrative information generated by healthcare professionals to track appointments, bills, insurance information, and other patient-provider communication.
ICD-10 CODES	The 10th revision of the International Classification of Diseases; medical codes that are uniformly applied in clinical settings to allow for national and international comparability in the collection and classification of statistics; they explain why the person sought medical attention.
CPT CODES	Current Procedural Terminology codes are used for medical billing and directly translate into medical costs.
CARE CATEGORIES	Researchers grouped ICD-10 and CPT codes related to the clinical journey of a gunshot victim. They include Behavioral Health, Emergency Department (ED), Home Care, Physical Therapy, and Wound Care (specific examples of each provided in Findings section).
CLAIMS CATEGORIES	The organization of claims data provided in the Medicare dataset, determined by the Center for Medicare & Medicaid Services (CMS); the categories used in this report include Professional, Outpatient, Inpatient, Home Health, Skilled Nursing Facility, Hospice, and Durable Medical Equipment (DME) (specific examples of each provided in Findings section).

BACKGROUND

In 2011, New Mexico had the seventh highest firearm-related death rate in the country.² Ten years later, this rate increased by 87% to 27.8 per 100,000 residents, 90% higher than the national average rate. With 117 homicides in 2021, Albuquerque moved into the top 10 most violent cities with populations of over 100,000 people, accounting for more than half of New Mexico's annual homicide count.³ While the national average rate of homicides reported by police departments increased by 7% from January to October 2021, Albuquerque's homicide count grew by 30% in the same timeframe.⁴



90%
HIGHER

IN 2021, NEW MEXICO'S FIREARM-RELATED DEATH RATE WAS 90% HIGHER THAN THE NATIONAL AVERAGE

• ALBUQUERQUE,
NEW MEXICO

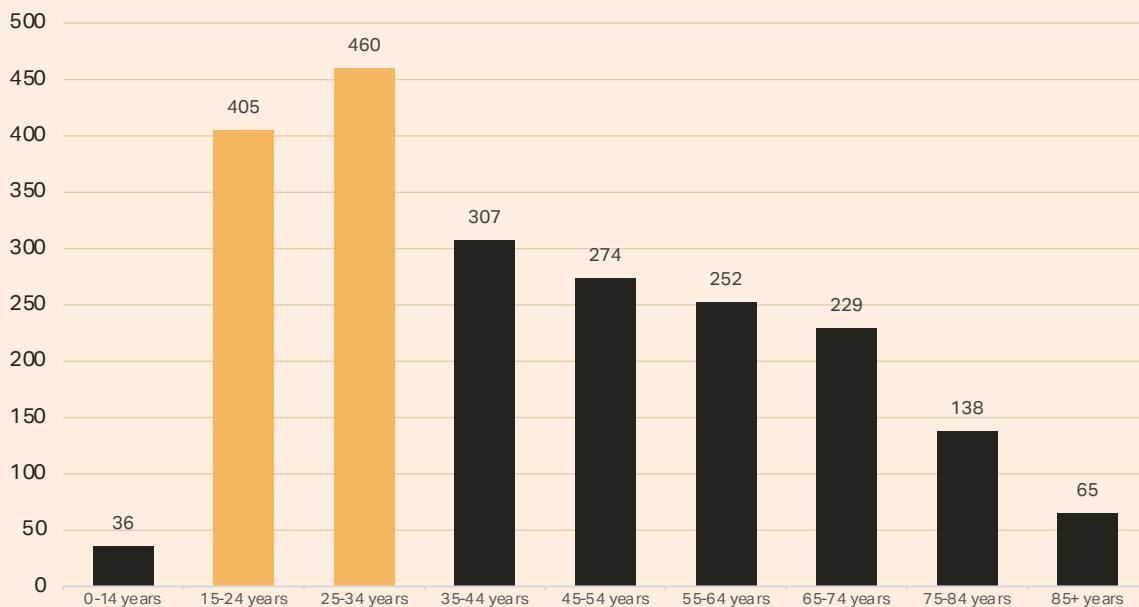
**OVER
50%**

MORE THAN HALF OF NEW MEXICO'S 2021 HOMICIDES OCCURRED IN ALBUQUERQUE

GUNSHOT VIOLENCE DISPROPORTIONATELY AFFECTS INDIVIDUALS IN NEW MEXICO AGED 15-34, WITH NEARLY 40% OF ALL FIREARM INJURY DEATHS IN THE STATE FROM 2016-2020.

FIREARM INJURY DEATHS BY AGE

Gun violence deaths by age, New Mexico, 2016 - 2020



2 - CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) WIDE-RANGING ONLINE DATA FOR EPIDEMIOLOGIC RESEARCH (WONDER)
3 - SEGARRA, 2021
4 - SEGARRA, 2021B

BACKGROUND

THOUGH THE STATEWIDE POPULATION DISTRIBUTION IS NEARLY EQUAL (51.6% MALE AND 48.4% FEMALE), FIREARM INJURY CASES SHOW A SIGNIFICANT GENDER IMBALANCE.



MALES ACCOUNT FOR 85% OF GUN VICTIMS

GUN VIOLENCE DEATH BY GENDER, NEW MEXICO, 2016-2020

According to the IBIS, nearly 83% of homicide victims in New Mexico are identified as White, with 61% of Hispanic origin. Although IBIS is the best available data source for race and ethnicity, the ways in which the data are categorized and collected are limited, as Hispanic individuals may be identified as White, and therefore, not reflective of the population. Additionally, based on expert interviews, data on race and ethnicity are reported out inconsistently and perceived to have low levels of accuracy.

	AMERICAN INDIAN / ALASKAN NATIVE	ASIAN / PACIFIC ISLANDER	BLACK	WHITE		HISPANIC	NON-HISPANIC
HOMICIDE / ASSAULT	9.0%	0.9%	7.3%	82.8%	HOMICIDE / ASSAULT	61.2%	38.3%
INTENTIONAL SELF-HARM	4.7%	0.7%	2.1%	92.5%	INTENTIONAL SELF-HARM	30.2%	69.8%
LEGAL INTERVENTION	9.1%	0%	0.0%	90.9%	LEGAL INTERVENTION	74.0%	26.0%
UNDETERMINED	3.3%	0%	10.0%	86.7%	UNDETERMINED	43.3%	56.7%
UNINTENTIONAL	3.7%	0%	0%	96.3%	UNINTENTIONAL	55.6%	44.4%
GRAND TOTAL	6.1%	0.7%	3.7%	89.5%	GRAND TOTAL	41.9%	58.1%

GUN VIOLENCE IN ALBUQUERQUE LOCAL PERSPECTIVE

On July 16, 2021, Mayor Timothy M. Keller launched the Albuquerque Metro Crime Initiative with a goal of bringing elected officials, agency staff, and behavioral health leaders together to collectively decide on a set of shared actions to close gaps in the criminal justice system and improve the region's ability to prevent and fight crime.

Following months of meetings and recommendations from the Metro Crime Initiative, Mayor Keller signed an executive order establishing a Gun Violence Prevention and Intervention Taskforce on October 6, 2021. The Task Force would be administratively supported by the Violence Intervention Program and composed of 10–15 representatives from community-based organizations, City departments, and people directly impacted by gun violence.



BACKGROUND

“ON THE GROUND” QUALITATIVE FINDINGS

Members of the research team conducted six virtual interviews with various community stakeholders that included representation for the University Hospital and City leadership. The purpose of these interviews was to contextualize gun violence in Albuquerque and to seek information about Albuquerque’s healthcare infrastructure and data accessibility.

LIST OF INTERVIEWEE ORGANIZATIONS

Albuquerque Community Safety Department

Greater Albuquerque Chamber of Commerce

Gun Violence Task Force

New Mexico Office of the Attorney General

University of New Mexico (UNM) Health Sciences Center

University of New Mexico Hospital (UNMH)

Several themes emerged from the interviews. Interviewees discussed challenges around data accessibility and usage, as ‘entities may be reluctant to share data if not clear about the intended use.’ Although UNMH was highlighted as the best source of data for identifying the total number of gunshot victims as the sole Level 1 trauma center in the entire state, it is challenging for them to process external data requests due to the high volume of other data requests received on a regular basis. Similar sentiments were shared about Albuquerque Police Department (APD) as a useful data source that would also capture victims who died on the scene, but potentially difficult to access as well. In terms of usability, interviewees expressed concern over race and ethnicity data, noting ‘**how we track data is a problem**’ and that ‘**the race data is very inaccurate**’, particularly with claims data. Overall, data is collected by different organizations and departments that are informative yet challenging to access and present certain limitations for interpretation. However, current work is focused on rebuilding infrastructure to streamline data collection and utilization.

Interviewees emphasized that the vulnerable populations they serve, ‘communities of color, poor, low education, rural areas, [with]

challenges to access care,’ highlight the importance for additional resources and interventions to address their needs.

They discussed factors they perceived to be related to gun violence, including substance abuse, as well as the lack of juvenile justice interventions and resources for gun violence victims and perpetrators. One interviewee noted, “**The same population that is pulling the trigger can also be the ones who are victimized.**” With an increasing number of younger people involved in gun violence, interviewees shared the desire for clear protocols to properly manage a gun violence incident and taking the appropriate actions.

Interviewees indicated that a collective effort among city and statewide is imperative to assess and address the alarming rise of gun violence in Albuquerque and across the state. One interviewee described **how “things are siloed, so information needs to be better communicated,”** as different groups and departments are diligently working in tandem to understand what is driving the increase, identify those at greatest risk of gun violence, and determine how to best mitigate risk factors and serve those most affected. With a range of important issues to consider, from “the need to address adverse childhood experiences and not enough resources for people with addiction” to ‘managing accountability within the legal system as well as communities’ expectations,’ interviewees shared that the continuum of gun violence is vast, complex, and requires collaboration across the board.



METHODOLOGY

The analysis on firearm-related injury and its impact on healthcare utilization and costs in Albuquerque followed a comprehensive methodology, leveraging datasets from multiple sources. The sections below provide an overview of the methodology followed.

DATA COLLECTION

Public Sources: CDC⁵ and IBIS⁶ data were collected. These datasets provided information on firearm-related injuries, mortality rates, and population health indicators at a national and regional level.

DATASETS ANALYZED INCLUDED THE FOLLOWING:

IBIS

- Firearm Injury Death by Age Group and Injury Intention, 2016-2020
- Firearm Injury Death by Age Group and Sex, New Mexico, 2016-2020
- Firearm Injury Death by County of Residence, New Mexico, 2016-2020
- Firearm Injury Death by Race, Ethnicity and Injury Intention, New Mexico, 2016-2020
- Firearm Injury Death by U.S. States, 2020
- Firearm Injury Death by Year and Injury Intention, New Mexico, 1999 to 2020
- Firearm Injury Death by Year, New Mexico and U.S., 1999 to 2020
- Bernalillo hospitalizations for firearm injury, 2018 – 2020

CDC

- Underlying Cause of Death, 2018-2021, Age and Race
- Underlying Cause of Death, 2018-2021, Place and Cause
- Underlying Cause of Death, 2018-2021, Year and Month
- Underlying Cause of Death, 2018-2021, Intent
- CDC WISQARS
- NM-IBIS

Claims Data: Researchers reviewed Medicare claims data to analyze healthcare utilization and costs associated with firearm injuries among Medicare beneficiaries in Albuquerque. To adjust for the age bias of the Medicare data and to allow for comparisons across payers, the researchers applied multipliers. A multiplier is a numerical factor used to adjust for differences in costs among different payers. It is derived by comparing average costs and the subsequent average variation between them, resulting in the multiplier value. Medicaid claims data also were assessed but, the reliability of these data were found to be compromised due to lack of appropriate coding. Therefore, the Medicaid dataset was excluded from the analysis to maintain data integrity and reliability.

The following criteria were used to retrieve claims data for this analysis:

Time Period: 2017 – 2022

Demographics: All ages, gender, race/ethnicity

Region: Albuquerque, New Mexico

ICD-10 codes:

X32–X34 (accidental discharge of firearms)

X72–X74 (suicide by discharge of firearms)

X93–X95 (homicide by discharge of firearms)

Y22–Y24 (discharge of firearms, undetermined intent)

Y35.0 (legal intervention involving firearm discharge)

U01.4 (terrorism involving firearms)

The research team then organized firearm ICD-10 codes cost findings by a number of categories identified based on research related to the clinical journey of a gunshot victim. These included ICD-10 codes and CPT codes related to physical therapy, home health, behavioral health, occupational therapy, wound care, and other codes related to surgery and follow-up care.

DATA PREPARATION

Researchers compiled and prepared data from public sources and claims data for analysis. This involved standardizing variables, addressing missing values, and ensuring data compatibility across different sources as needed. They correlated datasets from public sources and claims data to create a comprehensive perspective that allowed for a holistic analysis of firearm-related injuries and their impact on healthcare utilization and costs.

ANALYSIS

TRENDS

Basic statistics and visualizations were used to characterize firearm-related injuries, including trends over time, demographic patterns, and geographical distribution within Albuquerque.

UTILIZATION

Researchers analyzed Medicare claims data to examine the healthcare services utilized by beneficiaries with firearm-related injuries. This included hospitalizations, ED visits, outpatient services, home healthcare, skilled nursing facility, and prescription drug utilization.

COST

Costs associated with healthcare utilization for firearm-related injuries were assessed using Medicare claims data. This involved calculating the direct medical costs that Medicare incurred and included reviewing the data along the following population cohorts:

- Population without any matching ICD-10 code for firearm-related injury (Non-Gun Violence)
- Population with a matching ICD-10 code for firearm-related injury for whom the data was then analyzed for the 18-month window pre- (Pre-Gun Violence) and post- (Post-Gun Violence) incident

QUALITY ASSURANCE

The research team implemented rigorous quality assurance measures to ensure the accuracy and reliability of the analysis results. This process involved conducting sensitivity analyses, validating findings against existing literature, and consulting with subject matter experts.

TIMESPAN AND REGION

This public health research project uses multiple data sources, leading to variations in time spans and regional scopes. Figures may represent trends over several years, a single year, or averages over multiple years. Demographic insights are provided at the state, county, and city levels based on data availability and relevance. Each finding is clearly associated with the corresponding years and regions to ensure clarity and contextual relevance.



FINDINGS

The following sections outline costs of gun violence in Albuquerque presented in two ways:

- 1. Pre and post-firearm injury claims:**
These data represent the same population of individuals. The pre-firearm related claims cost represents claims/costs incurred 18 months before the firearm incident; the post represent claims/costs incurred 18 months after the incident.
- 2. No firearm injury vs. post-firearm injury:**
These data compare those in the post-firearm claim with individuals who do not have a firearm injury associated claim/cost.

The findings are categorized by claims categories (e.g. pharmacy, home health, inpatient care) and through grouped ICD-10 codes (e.g. firearm, wound care, behavioral health, etc.). Categories were identified and grouped based on research related to the clinical journey of a gun violence victim. A full description of the categorization can be found in the Methodology section.

OVERALL COST BREAKDOWN

The per member per month costs (PMPM) were calculated based on a 12-month average from 2017-2019 across the three categories (non-gun violence, pre-gun violence, post-gun violence).

The PMPM cost for post-gun violence victims in Albuquerque is 1,680% higher than for those who do not have a gun violence claim. Comparing pre to post, costs rise on average 147% for individuals who experience an incident of gun violence.

AVERAGE PER MEMBER PER MONTH (PMPM)
COSTS BY CATEGORY, ALBUQUERQUE,
2017 - 2019

NON-GUN VIOLENCE AVERAGE PMPM

\$660.24

PRE-GUN VIOLENCE AVERAGE PMPM

\$4,761.69

POST-GUN VIOLENCE AVERAGE PMPM

\$11,754.18

THE TOTAL EXCESS COST OVER A
12-MONTH PERIOD RANGES FROM
NEARLY \$55 MILLION (PRE TO
POST-GUN VIOLENCE POPULATION)
TO NEARLY \$87 MILLION (NON-GUN
VIOLENCE TO POST-GUN VIOLENCE
POPULATION).

The average PMPMs were used to calculate the total excess cost over a 12-month period.



FINDINGS

This cost burden is distributed across a number of payers. To determine this burden, researchers leveraged public data from the CDC and IBIS to identify distribution, hospitalizations, and total number of firearm-related visits. Multipliers were used to determine relative costs for each payer (for further information, see the Methodology section).

The table below presents the percentage of hospitalizations by payer, the applied multiplier, and the total number of firearm-related visits. It also provides comparisons of costs, explained below:

- 12-month cost for all members with incidents; total cost of care for individuals experiencing gun violence in a 12-month period
- Excess from pre-incident for same population; difference in costs (or the excess cost) from 18 months before an incident of gun violence compared to 18 months after the incident
- Excess from non-gun violence populations; difference in costs (or the excess cost) between those who never experienced an incident of gun violence and those who did

AVERAGE AND EXCESS COSTS ACROSS PAYERS, ALBUQUERQUE, 2017-2019

PAYER	PERCENTAGE OF HOSPITALIZATIONS	MULTIPLIER	12-MONTH COST FOR ALL MEMBERS WITH INCIDENTS	EXCESS FROM PRE- INCIDENT FOR SAME POPULATION	EXCESS FROM NON- GUN VIOLENCE POPULATIONS
MILITARY	2%	1	\$1,665,996	\$991,091	\$1,572,415
COUNTY INDIGENT FUNDS	6%	1	\$5,235,986	\$3,114,856	\$4,941,877
MEDICAID	70%	0.93	\$64,735,827	\$38,510,949	\$61,099,574
MEDICARE	6%	1	\$5,473,985	\$3,256,441	\$5,166,508
OTHER GOVERNMENT	12%	1	\$10,709,971	\$6,371,297	\$10,108,385
PRIVATE INSURANCE	3%	2	\$3,093,992	\$1,840,597	\$2,920,200
SELF PAY	1%	1	\$475,999	\$283,169	\$449,262
WORKERS' COMPENSATION	1%	1	\$713,998	\$424,753	\$673,892
TOTAL			\$92,105,754	\$54,793,152	\$86,932,114



FINDINGS

COST COMPARISONS - NO FIREARM INJURY VS. POST-FIREARM INJURY

The following figures represent percentage paid toward specific categories of claims. Each individual figure represents a proportion of the total cost by year. **Average ER costs increase about 37%** after a firearm-related claim. (ER costs are inclusive of the firearm injury in addition to any other ER visits that happen over an 18 month period.) The proportion of costs related to firearm related procedures and wound care also increased. Behavioral health and physical therapy related expenses varied in trend year over year but overall, behavioral health showed an increase while physical therapy decreased.

PROPORTION OF TOTAL CLAIMS COSTS AMONG POPULATION WITH NO FIREARM INJURY

ALBUQUERQUE, 2017-2022

	2017	2018	2019	2020	2021	2022	Total
BEHAVIORAL HEALTH	17.0%	16.9%	16.9%	17.8%	16.3%	16.4%	16.9%
ER	17.4%	16.9%	17.0%	17.1%	17.2%	16.7%	17.0%
HOME CARE	9.0%	9.5%	9.1%	9.7%	8.2%	7.6%	8.8%
PHYSICAL THERAPY	9.3%	9.0%	9.1%	8.2%	8.7%	9.0%	8.9%
WOUND CARE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

PROPORTION OF TOTAL CLAIMS COSTS AMONG POPULATION POST-FIREARM INJURY

ALBUQUERQUE, 2017-2022

	2017	2018	2019	2020	2021	2022	Total
BEHAVIORAL HEALTH	14.0%	24.1%	17.4%	12.9%	10.1%	48.9%	25.5%
ER	46.9%	50.8%	55.5%	37.6%	64.1%	47.3%	54.2%
FIREARM	2.9%	2.3%	2.1%	2.1%	9.1%	0.2%	4.0%
HOME CARE	0.3%	0.3%	0.1%	0.4%	0.2%	0.0%	0.2%
PHYSICAL THERAPY	21.3%	12.8%	15.0%	19.7%	3.7%	1.4%	6.9%
WOUND CARE	6.9%	0.0%	1.5%	0.8%	0.0%	0.0%	0.6%

The bars in these figures represent the proportion of claims costs.

CATEGORIES OF CARE EXAMPLES

- | | |
|--------------------------|---|
| BEHAVIORAL HEALTH | - Psychotherapy session; psychiatric evaluation; medication management |
| ER | - Medical screening examination; diagnostic test ;administration of medications or intravenous fluids |
| HOME CARE | - Skilled nursing care; home health aide services |
| PHYSICAL THERAPY | - Therapeutic exercises; manual therapy techniques; gait training balance exercises |
| WOUND CARE | - Wound debridement; fluid drainage; negative pressure wound therapy |

FINDINGS

There is a discernible difference in the distribution of proportion of costs across various claim categories when comparing populations without firearm injury-related claims to those monitored for 18 months post-firearm injury. Specifically, a noteworthy increase in claims can be attributed to professional outpatient, and inpatient services, juxtaposed with a decrease in expenditures related to home health and SNF (Skilled Nursing Facility) services.



PROPORTION OF TOTAL CLAIMS COSTS ACROSS POPULATIONS BY AGE WITH NO FIREARM INJURY

ALBUQUERQUE, 2017-2022

	PROFESSIONAL	OUTPATIENT	INPATIENT	HOME HEALTH	SNF	HOSPICE	DME
15-24	26%	27%	38%	1%	0%	4%	4%
25-34	21%	31%	42%	1%	1%	1%	3%
35-44	22%	32%	39%	2%	2%	1%	3%
45-54	20%	29%	41%	2%	3%	2%	4%
55-64	20%	27%	39%	3%	4%	4%	3%
65-74	30%	25%	32%	3%	4%	5%	2%
75-84	26%	18%	31%	5%	5%	13%	2%
85+	15%	9%	25%	7%	7%	36%	1%
GRAND TOTAL	24%	21%	32%	4%	4%	12%	2%

PROPORTION OF TOTAL CLAIMS COSTS ACROSS POPULATIONS BY AGE POST-FIREARM INJURY

ALBUQUERQUE, 2017-2022

	PROFESSIONAL	OUTPATIENT	INPATIENT	HOME HEALTH	SNF	HOSPICE	DME
15-24	48%	32%	19%	0%	0%	0%	2%
25-34	77%	9%	14%	0%	0%	0%	1%
35-44	65%	2%	31%	1%	0%	0%	1%
45-54	48%	11%	25%	2%	0%	0%	14%
55-64	72%	6%	19%	2%	1%	0%	1%
65-74	72%	5%	20%	0%	2%	0%	1%
75-84	16%	73%	7%	1%	0%	2%	0%
85+	31%	3%	16%	8%	0%	24%	18%
GRAND TOTAL	67%	6%	25%	1%	1%	0%	1%

CLAIM CATEGORY SERVICE EXAMPLES PROVIDED ON THE NEXT PAGE

FINDINGS

CLAIM CATEGORY SERVICE EXAMPLES

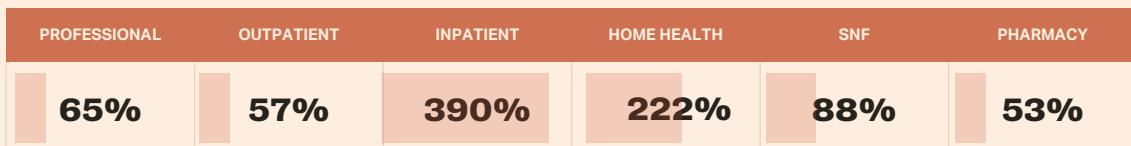
PROFESSIONAL	- Consultations; Procedures; Surgeries
OUTPATIENT	- Outpatient Surgeries; Infusion Therapy; Radiology Services
INPATIENT	- Provision of medical care; monitor in a hospital setting to address acute illnesses and/or injuries
HOME HEALTH	- Skilled nursing services such as wound care or medication management; therapy services such as physical therapy or occupational therapy
SKILLED NURSING FACILITY	- Skilled nursing services such as wound care or medication management; rehabilitation services from licensed PTs or OTs
HOSPICE	- Skilled Nursing Care; Physician Services; Nursing Care
DURABLE MEDICAL EQUIPMENT	- Wheelchairs; Walkers; Crutches

COST COMPARISON - PRE AND POST-FIREARM INJURY

A significant increase in claims related to inpatient care (a 390% rise) and home health services (a 222% increase) occurs during the post-injury period for the post-firearm injury population. Additionally, other categories such as professional services, SNF care, outpatient services, and pharmacy expenses exhibited notable increases.

DIFFERENTIAL BETWEEN PRE AND POST-FIREARM INJURY

ALBUQUERQUE, 2017-2022



LIMITATIONS

Described below are some of the limitations that were encountered during this research process. Addressing these limitations required complementary approaches, such as combining data across sources (e.g., public sources, claims data, hospital records, etc.) and use of advanced analytical methods to mitigate biases and limitations inherent in the data.

GENERAL OBSERVATIONS

While recent years have seen multiple widespread attempts to improve data collection and reporting for significant population health-related concerns and conditions, including firearm injury reporting, this remains an area with challenges and limitations such as:

- **Underreporting of Data:** Data sources may not capture all instances of firearm injuries, as not all incidents result in documentation or a report being filed under the appropriate code. This can lead to underestimation of the true burden of firearm-related healthcare utilization.
- **Bias in Reporting:** Reporting of firearm-related injuries may be subject to bias, with certain types of injuries, intent, and other related aspects being over- or underrepresented in the data, potentially skewing analyses.
- **Lack of Correlation with Non-Incident Related Healthcare:** Due to the siloed nature of these data sources, they typically focus on medical care utilization and costs, but may not capture broader impacts such as long-term care, related mental and behavioral health visits, and disability associated with firearm injuries.
- **Limited Access and Availability:** Data are not always readily accessible or available, limiting research that needs to be done in a meaningful and timely manner. For example, the researchers were unable to include Medicaid data in the analysis because of inconsistencies and lack of reliability.
- **Age distribution:** Researchers primarily used a Medicare dataset to gather key figures.

Medicare typically covers an older population (65 years and older), which is older than the average age of gun violence victims. Though a multiplier was applied across payers to account for this, it is still important to note that the utilization of Medicare data might have led to an inflation of certain figures, as older populations generally incur higher healthcare costs.

PUBLIC DATA SOURCES

In addition to the general observations mentioned above, limitations encountered specific to public data sources included:

- **Inconsistent Reporting Practices:** Public data sources rely on voluntary reporting and different jurisdictions have varying reporting requirements and practices, leading to inconsistencies in data collection and making it challenging to compare trends across regions.
- **Lack of Granularity:** Public data sources lack detailed information on perspectives such as region, nature, and severity of firearm injuries, making it difficult to assess their impact on healthcare resources accurately.
- **Lack of Standardization:** Public data sources lack standardization in terms of data collection methods, definitions, and coding practices, hindering comparability across studies and jurisdictions.

CATEGORIES OF GUN VIOLENCE

The data used in the analysis includes all forms of gun violence, irrespective of intent. This encompasses incidents of self-harm and accidental injuries. This approach was selected because experts noted that injuries are often categorized with low levels of accuracy in clinical settings due to factors such as limited or insufficient patient screening. Therefore, researchers were not able to disaggregate the data to specifically account for intentional gun violence inflicted by another individual.

LIMITATIONS

CLAIMS DATA

Analyzing claims data related to firearm injuries can be valuable for understanding trends and patterns, but it comes with several limitations, including:

- **Restrictions Due to Privacy Concerns:** Privacy regulations restrict access to detailed claims data, limiting researchers' ability to perform in-depth analyses.
- **Inconsistent Coding Practices:** Firearm injuries may be inconsistently coded across different healthcare providers and systems, making it challenging to accurately identify and analyze cases.
- **Limited Demographic Information:** Claims data often lack reliable and detailed demographic information such as age, race, and socioeconomic status, which are important factors in understanding disparities in firearm injuries.
- **Difficulty in Longitudinal Analysis:** Claims data may not always provide sufficient longitudinal information to track patients' outcomes over time, limiting the ability to assess the long-term impact of firearm injuries and interventions.
- **Lack of Contextual Information:** Claims data typically lack contextual information about the circumstances surrounding firearm injuries, such as intent (e.g., self-harm, intentional), which can hinder comprehensive analysis.

These individuals can serve as champions for raising awareness about the public health implications of gun violence within their communities and mobilizing support for research initiatives. These partnerships can facilitate the development of culturally competent and community-driven research strategies that prioritize the needs and perspectives of people most affected by gun violence.



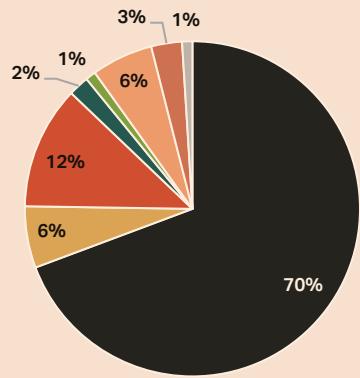
DISCUSSION

In 2021, the city of Albuquerque experienced 653 incidents of gun violence. Leveraging demographic trends from 2016–2020, likely nearly half or approximately 260 of these incidents are estimated to have happened among individuals aged 15–34 in a 12-month period.

Based on Medicare data in 2017–2019, gun violence in Albuquerque resulted in an excess cost of \$108,000 per victim (ranging from \$84,000–\$133,000). Adjusted with appropriate ratios across all payers, this results in a total average excess cost of \$71 million (ranging from \$55 million to \$87 million) in a 12-month period. Gun violence victims' healthcare costs are about 18x higher than the average cost of an individual who did not experience gun violence. Gun violence victims in Albuquerque consistently incur high costs related to ED visits, inpatient stays, behavioral health needs and related wound care.

This cost is experienced among multiple payers. Among Medicaid covered lives, which represents 70% of victims, the average excess cost averaged \$38–\$61 million. Other government insurance (12% of victims) had a total excess cost of \$6–\$10 million. Medicare, which accounts for 6% of the victims, experienced a total excess cost of \$3–\$5 million. County Indigent Funds experienced the same excess cost. Other payers: Military, Private Insurance, Self Pay/Uninsured, and Workers' Compensation, each had excess costs that ranged from \$283,000 to nearly \$3 million.

Excess costs encompass a broad spectrum of risks. In 2022, New Mexico's Medicaid had a 79.5% FMAP (Federal Medical Assistance Percentage), primarily covering federal costs against state and Managed Care expenses. Medicare costs were borne by Managed Medicare entities and directly by Centers for Medicare & Medicaid Services. Commercial plans shared risk among their pool and through employer premiums. Uninsured care costs are shared by individuals, hospitals, and the state government. County Indigent funds are financed through a combination of local taxes, state funding allocations, and sometimes federal grants. Therefore, although total excess costs amounted to \$71 million, the burden on any single entity is lower, and vary in distribution and impacted entities/individuals.



PROPORTION OF TOTAL EXCESS COST ACROSS PAYERS

ALBUQUERQUE, 2021-2022

%	PAYER APPROXIMATE EXCESS COST
70%	Medicaid \$49 Million
12%	Other Government \$8 Million
6%	Medicare \$4 Million
6%	County Indigent Funds \$4 Million
3%	Private Insurance \$2 Million
2%	Military \$1 Million
1%	Workers Compensation \$700K
1%	Self Pay/Uninsured \$700K

NATIONAL GUN VIOLENCE DEMOGRAPHICS AND TRENDS

When interpreting these findings, it is important to note the disproportionate impacts among marginalized communities and the likely contributing societal factors.

Gun violence victims in Albuquerque are most likely to be teenagers and young adults. On a national level, gun violence disproportionately impacts Black Americans,⁷ American Indian, Alaskan Native and Latinx communities. In 2023, Latinx communities experienced the second-highest increase in gun homicide rates (45%), since 2019. Victims are likely to live in historically underfunded neighborhoods, often in urban areas.⁸ In the United States, more than half of individuals who survive a firearm assault reside in large cities, even though these cities represent only one-third of the total population. Further, these communities are more likely to experience structural disadvantages and systemic racism.

Understanding the social factors influencing health trends in communities most affected by gun violence is crucial for interpreting healthcare costs and usage. Living in an underfunded or disadvantaged neighborhood is associated with higher healthcare costs and utilization.⁹ Because that's the case, those who experience an incident of gun violence are more likely to have higher baseline healthcare costs and utilization than those who do not experience an incident of gun violence.

RECOMMENDATIONS

The findings highlight the significant excess healthcare costs resulting from gun violence in Albuquerque, disproportionately experienced among young individuals aged 15–34 and marginalized communities. The applied methodology and its limitations underscore the need to improve local and national gun violence data infrastructure. Improving gun violence data collecting, organizing, and sharing practices will require partnership and buy-in from community leaders, police representation, hospital leadership and other key stakeholders.

THE FOLLOWING RECOMMENDATIONS SHOULD BE IMPLEMENTED BY ENTITIES WITH STRONG COMMUNITY PRESENCE AND RELATIONSHIPS:

- 1. Conduct workshops with clinicians, leading researchers, the Albuquerque Police Department, and other community stakeholders to further clarify and identify the appropriate application of relevant gun violence data sources.**

By bringing together diverse expertise and perspectives, these workshops can facilitate a comprehensive understanding of appropriate data analysis and interpretation related to clinical, claims, police, emergency medical services (EMS) and other pertinent data sources.

This process of conducting workshops and establishing partnerships can also play a critical role in fostering relationships necessary for facilitating the regular exchange of data. Such collaboration is essential to enable ongoing measurement of the impact of gun violence on communities.
- 2. Conduct additional research to understand the impact and contributing factors of gun violence on historically marginalized communities.**

Exploring the impact on affected communities will result in a more thorough understanding of the primary manifestations of gun violence, leading to a more informed process for measuring its healthcare impact.
- 3. Identify community leaders and other stakeholders to champion the continued research of the healthcare impacts and costs of gun violence.**

These individuals can serve as champions for raising awareness about the public health implications of gun violence within their communities and mobilizing support for research initiatives. These partnerships can facilitate the development of culturally competent and community-driven research strategies that prioritize the needs and perspectives of people most affected by gun violence.

CONCLUSION

This report reviews the significant excess healthcare cost of gun violence in Albuquerque. It is important to note that the average excess costs—\$108,000 per victim and \$71 million in a 12-month period—is an underestimate of total costs to the Albuquerque community; it does not account for diminished economic opportunity, behavioral health costs outside of a clinical setting, community trauma, among others. These findings aim to galvanize local support for better data collection and sharing practices, additional research on the impact of gun violence, and an enduring commitment to ongoing measurement and dialogue regarding its public health ramifications.

AUTHORS & ACKNOWLEDGEMENTS

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The HMA Strategy and Transformation Team has a comprehensive blend of knowledge and experience in public health and research methodologies, with backgrounds in epidemiology, biostatistics, health promotion, social determinants of health, and healthcare management. As a healthcare consulting division of HMA, the team has deep expertise across its two practice areas: 1) market growth and 2) operational transformation. They have worked with many of the largest healthcare organizations in the US including dozens of providers, payers, and healthcare services companies on market access, growth, and revenue creation.

HMA focuses on providing consulting services to healthcare and social service providers, payers, government policymakers, and other stakeholders. As trusted advisors, the firm offer insights and technical assistance, gained from real-world experience and ongoing work at the forefront of healthcare and social service reform and improvement. www.healthmanagement.com.



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