

# The Epidemiology of Firearm Injuries in the Pediatric Population: How has COVID-19 Affected Rates?

Arakua Welbeck, Rishi Gonuguntla, David A Momtaz<sup>1</sup>, Mehul Manoj Mittal<sup>1</sup>, Beltran Torres-Izquierdo<sup>2</sup>, Jesse Hu, Daniel Pereira, Ndeye Guisse, Pooya Hosseinzadeh

<sup>1</sup>Orthopedic surgery, <sup>2</sup>Washington University School of Medicine

## INTRODUCTION:

Ballistic injuries, particularly among pediatric populations, have become a significant public health crisis in the United States. The surge in the number of firearm injuries among children has outpaced other causes of death, especially during the COVID-19 pandemic. This study aims to assess the trend in pediatric gunshot wounds (GSWs) over the last decade and investigate the impact of the pandemic on GSWs statistics.

## METHODS:

A comprehensive analysis was conducted using a national database, which identified 15,267,921 children without GSWs and 6,261 children with GSWs between 2018 and 2023. Statistical comparisons were made to evaluate the incidence proportions of GSWs among different demographics. Additionally, the incidence proportions per 100,000 for accidental, assault, fatal, injuries resulting in patients being wheelchair-bound, and fracture-related GSWs were analyzed.

## RESULTS:

The incidence proportions per 100,000 for GSWs, accidental GSWs, assault GSWs, fatal GSWs, wheelchair-bound cases, and fracture-related GSWs were found to increase significantly from 2018 to 2023 going from 11.7 to 22.8 ( $p < 0.001$ ). Overall increase was mostly a result of accidental GSW when compared to non-accidental (incidence proportion 25.8 vs. 1.7  $p < 0.001$ ) in 2021 at the height of the pandemic. In patients with an accidental GSW, the incidence proportion per 100k between 2018-2023 increased from 10.519 to 21.108 ( $p < 0.001$ ). Yet, disproportionate impact on Black children in assault related GSWs is noted when compared to white children with a non-accidental GSW (non-accidental proportion ratio of 12.102 vs. 9.728 in White children,  $p = 0.012$ ). Non-Hispanic/Latino patients had a significantly higher incidence proportion of GSWs than Hispanic/Latino patients (36.913 vs. 24.125,  $p < 0.001$ ).

## DISCUSSION AND CONCLUSION:

The study confirms the shift in the leading cause of death among children from motor vehicle accidents to GSWs, especially at the height of the COVID-19 pandemic. Accidental injuries constituted the majority of GSWs, indicating the need for enhanced gun safety measures. The study emphasizes the substantial morbidity and socioeconomic burden associated with pediatric GSWs. Comprehensive efforts are required to address this public health crisis. Strategies may include limiting gun accessibility, implementing stricter gun safety measures, and increasing parent education on safe firearm storage. Pediatricians play a vital role in counseling and educating families on firearm safety to mitigate the risk of pediatric GSWs.

