

Reducing Firearm Injuries and Deaths: A Data-Driven Approach

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Equality, freedom, and the security of a free state were key formative tenets that the founders of our nation sought to enshrine in its founding documents. Now it is once again time to act in the pursuit of these goals to address the profound impact of firearms. More than ever, we need open lines of discussion and communication that draw people together and help us find collective solutions that build on the ideals on which America was founded. The articles in this edition of the *NCMJ* demonstrate the breadth and depth of approaches to addressing the firearm injury and death crisis we all face.

Introduction

America's founders sought to create minimalist federal structures that would preserve the rights of individuals while building a system of government that would allow the young nation to prosper. The men who drafted the Declaration of Independence sought to reject tyranny by an overseas authority as well as a domestic government that lacked accountability to the people. Alexander Hamilton wrote in 1788: "if the persons entrusted with supreme power became usurpers ... The citizens must rush tumultuously to arms" [1]. A careful strategist, Hamilton often posited himself as determined in the defense of his ideals, but in reality, he strove to be tactical in conflict resolution. In the early years of the 19th century, Hamilton and his oldest son died as a result of firearm injuries sustained in duels, leaving behind his wife, Eliza Hamilton, and remaining children. In the same year that Eliza died in 1854, an Illinois-based lawyer named Abraham Lincoln began his rise to leadership. Deeply opposed to the cancerous spread of slavery beyond the southern states and known for his deliberative speeches and determined actions focused on life and liberty for all people, Lincoln too would die from a bullet.

We still have not made the leap from a nation dedicated to life and liberty for some to a nation that guarantees respect and safety for all people. How did a young nation that proclaimed its dedication to the pursuit of happiness become one in which children must repeatedly practice lockdown drills and active-shooter scenarios at school? The firepower of the muskets and pistols that were important to the authors of our founding documents as both tools and symbols of the ongoing providence of liberty in a free state is not comparable in real terms with the sophisticated

weapons available to American people in the 21st century. The escalation in our personal firepower has served to exacerbate disparities in justice and freedom that our forebears failed to resolve. These concepts now sometimes seem at odds with our ability to keep friends, family, and others safe from firearm injuries and deaths. Too many lives have been lost, and far too many excuses have been made for a nation with the resources and technical knowledge to prevent them. Our nation must and can do better. And North Carolina is starting to lead the way.

North Carolina faces similar trends around gun violence as the nation. In our state, five people die every day from a firearm-related death, and community violence is also increasing [2]. The effect is not just on adults; child deaths in North Carolina due to firearm injury increased 231% between 2020 and 2021, and more than 50% of suicides among youth involved a firearm in 2021 [3]. To that end, the state has recently elevated and amplified its desire to address these senseless and preventable injuries and deaths. Far too often, people and communities have expressed a sense of hopelessness, that these deaths are inevitable, and nothing can turn the tide. This issue of the *NCMJ* hopes to counter those arguments and shares several examples of work that is already happening in our state that must be shared, expanded, and supported. But North Carolina must also take additional actions, and these authors also suggest steps that can be taken to reduce firearm injuries and death in the future.

Why Focus on Firearms?

In early conversations with *NCMJ*, we thought a broader issue on injury and violence might be appropriate. The topic hasn't been addressed in more than a dozen years. But the more conversation and ideas we generated, the more those tended to be specific to firearm injury and violence, and it became obvious that we must make that our specific focus. As each author in this special issue will point out, firearm violence is one of the most pressing public health issues of our

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time. We have long glazed over the toll gun violence takes on society, but there are approaches, strategies, and actions that can be taken to prevent these injuries and deaths. Here we attempt to provide a venue for these to be shared. Many authors mention the fact that firearm deaths are now the leading cause of childhood death in the United States, overtaking motor vehicle fatalities [4]. And for many additional sub-populations or special groups (veterans, women, Black residents, and American Indians, to name a few) firearms are a leading cause of injury or death [5]. Our authors highlight the dire data, then focus on programs and actions they are taking, and how those could be expanded and replicated.

Firearm suicides far outnumber firearm homicides and unintentional firearm deaths [6], and our authors describe several examples of firearm suicide prevention. Yet, firearm homicides—particularly mass shootings—dominate media coverage and spur a call for action. The articles in this issue look at these intents (suicide/homicide/unintentional) differently, as they require different strategies and actions for response and prevention.

What Are State Leaders Doing?

We start with the head of our state, Governor Roy Cooper. Governor Cooper has made a priority of firearm injury prevention and safety. His commentary attests to his administration's desire to not get stuck in semantics or politics, but to take actions to keep people safe now and into the future [7]. In 2022, he convened several expert roundtables and has asked his Secretaries of the Department of Health and Human Services (DHHS) and the Department of Public Safety (DPS) to coordinate, lead, and take clear actions. He signed an executive order creating the Office of Violence Prevention, the first in a southern state, which will be housed in DPS [8]. DHHS Secretary Kody Kinsley and DPS Secretary Eddie Buffaloe, along with State Health Director Dr. Betsey Tilson and Deputy DPS Secretary Caroline Valand, expand on the DHHS white paper, "Keeping Families and Communities Safe: Public Health Approaches to Reduce Violence and Firearm Misuse Leading to Injury and Death," released in November 2022 [5]. Their article explains the context for using a public health approach to address this crisis and describes actions needed, common ground, steps taken, and the partnerships and opportunities that have grown in the months since the white paper's release [9].

What Do the Data Tell Us?

Epidemiologists like to start with the data. What are the data on intentional and self-inflicted firearm injuries and fatalities telling us about the people most impacted, what are the trends over time, and what are the different data collection systems the state uses to understand these issues? These firearm injuries and deaths affect many different populations and groups, and historically, no single data source captured all the information needed or desired

to better understand these violent deaths. That changed 20 years ago when North Carolina was funded by the Centers for Disease Control and Prevention (CDC) to start the North Carolina Violent Death Reporting System (NC-VDRS), which compares and connects primary data between three main sources: death certificates, medical examiner records, and law enforcement incident reports. Taken together, these data sources help us better understand and see a more complete picture of violent deaths, including firearm-related deaths.

NC-VDRS is expanding these data sources and helping to fill in critical gaps, but because of active law enforcement cases and investigations, it does have some lag time. For nonfatal firearm injuries, North Carolina was funded in 2020 to use its Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT) to provide more timely data and disseminate them more regularly. NC-FASTER, North Carolina's Firearm Injury Surveillance Through Emergency Rooms, now posts and sends out quarterly reports [10]. In this issue, Lautenschlager, Geary, and Waller share data from several public health surveillance systems, including NC-VDRS and NC-FASTER, that help us understand the scope, scale, and circumstances of these cases and inform response and prevention [11]. In particular, they look at the impact COVID-19 has had on firearm injuries and deaths, finding that unintentional firearm death rates increased 51.7% in 2020 and another 47.8% in 2021, while homicides increased 30% from 2019 to 2020 and 3.6% from 2020 to 2021 [11]. Similarly, firearm suicides increased 13% from 2019 to 2021. Waller and coauthors share a unique data linkage project, NC-LEADS, that linked NC-VDRS and NC-FASTER to see how many ED visits decedents of firearm deaths had in the year prior to their death. Interestingly, 29% of firearm deaths linked with past-year ED visit, with 14% of those having had multiple ED visits [12]. These ED visits can be viewed in retrospect from the lens of a "missed opportunity," where the individual had a health care encounter and might have been further assessed and identified as high risk and received additional resources, care, follow-up, and referrals. Public health is just now leveraging these historically siloed data to help us better understand where prevention and intervention might play a larger role.

Who is at Highest Risk?

Many of our contributing authors work with specific populations to prevent injuries and deaths from occurring here in North Carolina. For example, Kudler discusses opportunities to reduce service member and veteran firearm suicide and the unique challenges of working with this group. Service members and veterans have special needs and different risks than the general population, specifically around firearm access and use. Kudler points out that providers both inside the VA system and in the community need to keep veterans' unique considerations in mind when working with them, in order to impact those who might be at risk [13]. Next, Jameson discusses the rising rates of youth and

young adult suicide and the measures that need to be taken to protect this vulnerable group [14]. Access and time are key elements in keeping adolescents safe from firearm injuries. Jameson describes safety interventions that should be included in all treatment plans for those with heightened suicide risk, which has increased in light of the complications and challenges of COVID-19. Lastly, Rowe and colleagues point out the connections between domestic violence (DV) and firearm deaths, including mass shootings, many of which involve murder-suicides among families. The authors suggest three policy strategies: 1) increased implementation of existing firearm protections for DV survivors; 2) increased firearm removal in dangerous circumstances; and 3) preservation of existing firearms protections for DV survivors [15].

What are Hospitals, Health Care Systems, and Providers Doing?

Brown and Holder walk us through the proliferation of hospital-based violence intervention programs (HVIPs) and the growing role of health care systems in addressing firearm injury and prevention. They discuss the history and the role that health care systems can play, not only in treating and caring for those who have been injured in the moment but also offering long-term follow-up and care of patients and their families [16]. In a state with a strong and active trauma system, these HVIPs need to be located and hosted by every Level I Trauma Center (of which there are six in North Carolina) and extend through the regionally affiliated hospitals and their emergency departments. With 130 stand-alone emergency departments in the state, every gunshot wound injury should not only receive exceptional trauma care but receive follow-up post-intervention care to help prevent retaliation and self-harm. These HVIPs have an opportunity to reach beyond the walls of the trauma centers and into the communities that they serve to facilitate primary prevention activities.

O'Hare, Eichner, and Moses describe how practicing pediatricians are incorporating safety counseling into their workflow and having specific conversations with patients and their families about firearm access and storage [17]. Firearm safety counseling in pediatric primary care opens the doors to ensuring safety in the homes of young and curious children. While this has expanded within the Duke Health system, this work needs to move beyond pediatrics and be adopted by all practices, including general medicine, across North Carolina. In an interview in this issue, Toschlog points out the frontline role of trauma surgeons in the state and their potential to shape policy based on their experiences of the daily toll of gunshot wounds [18]. Toschlog also speaks from the perspective of a gun owner concerned with safe ownership, use, and storage.

What are Communities Doing?

Actions at the local level are likely to have a large impact on firearm injuries and safety. Pilgreen tells us about the

efforts in Pitt County to start a Gun Safety Team modelled after work based in Durham. Pitt County is a smaller, more rural county compared to Durham, Wake, and Mecklenburg, and Pilgreen shares insights from the Pitt Firearm Injury Prevention Coalition that can help other rural counties seeking to create community violence and safety coalitions [19]. The North Carolina Child Fatality Task Force and State Suicide Plan both have recommended that every county have a similar local coalition that aims to keep community members safe from firearms and injury-free [20]. Cities have partnered with their law enforcement agencies to help address firearm injury and safety. Annas describes the efforts in Thomasville, North Carolina, between the Thomasville Police Department, the local Safe Kids coalition, and other local prevention partners to provide trainings around safe storage and to educate youth and families about firearm safety and address preventable injuries [21]. Campbell and coauthors discuss the many local partnerships and steps that Mecklenburg County has taken to frame gun violence as a multisector public health problem. They have created a first-of-its-kind local Office of Violence Prevention, housed within public health, and drafted a multi-sector strategic plan that outlines objectives, priorities, and planned activities [22]. Mecklenburg has worked hard to create solutions by engaging directly with those populations most impacted, including implementing the national Cure Violence model in combination with working with multiple local partners. The Cure Violence model has been adopted by several North Carolina communities, including the city of Durham. Our interview with Johnson tells us about the day-to-day work of a community "violence interrupter" as part of Bull City United, a Cure Violence model that is now a city-funded program [23].

What's Next?

Authors in this issue of the *NCMJ* have shared and discussed viable strategies to reduce injuries and deaths from firearms and improve safety. We need broader adoption of programs that are evidence-based and continuing evaluation of programs that are promising. State leaders need to continue to push for actions that create the environment for common ground and common-sense measures. The newly created Office of Violence Prevention should help coordinate these activities.

Several key partners are leading the way by hosting a one-day, first-of-its kind "Future of Violence Prevention: The Next 20 Years" conference in partnership with the North Carolina Public Health Association's annual fall educational conference in Concord, North Carolina. That event will bring together national, state, and local leaders to discuss and explore these complex issues. The event will include trainings and workshops and share lessons learned from 20 years of collecting violent death data utilizing the NC-VDRS. Concurrently, DHHS and DPS are working with academic and research partners to create an agenda whereby state

priority areas related to firearm injury and death can be defined, funded, studied, and implemented. Public health and medical associations including the North Carolina Public Health Association, North Carolina Association of Local Health Directors, and North Carolina Medical Society have recently created or updated their policy statements regarding firearm injuries. These statements demonstrate growing consensus among professional organizations and highlight recommendations that each group thinks will make a difference in this area.

Everyone has a role to play in making North Carolina a safer place to live, work, and enjoy. Together we can turn the tide and reduce firearm injuries and deaths in our state. NCMJ.

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