

# Confronting the Firearm Injury Plague

Eliot W. Nelson, MD

Firearm injuries are an all-too-common way of death for children and youth in the United States. As Fowler et al<sup>1</sup> report in the current issue, firearm injuries are the third leading cause of death for all children aged 1 to 17 years. Although firearm injury mortality rates for these children declined gradually from 2006 to 2013, they have risen again over the past 2 years, now accounting for over 10% of all deaths among these ages in 2014 and 2015.<sup>2</sup> An even grimmer picture appears if we extend the age range through the teen-aged years to age 19, because firearm injury rates rise steeply in late adolescence; among children and youth aged 1 to 19, firearm injuries accounted for over 14% of all deaths in 2015. Thus, more than 1 out of every 7 children aged 1 to 19 who died of anything died of a gunshot wound. Only motor vehicle traffic injuries claim more of these lives, and those rates have fallen ~50% since 2000, whereas firearm mortality dropped only 10%.<sup>2</sup>

The value of Fowler's report lies not only in its updating of basic statistics on child firearm deaths but also in providing deeper insight into circumstances and factors involved with these deaths than we have had from past reports<sup>3,4</sup> by using information from the National Violent Death Reporting System. By including a focus on nonfatal firearm injuries treated in emergency rooms, the authors also remind us of the fuller scope of these injuries and the toll they exact.

Some points may warrant further discussion or clarification. Unintentional injury (UI) deaths, although only a small portion of the

total, have indeed been undercounted in vital statistics data, as the authors suggest. Authors of a recent study use National Violent Death Reporting System analyses to estimate that UI firearm death rates in children less than age 15 are ~80% higher than they have been reported because of misclassifications of some UIs as homicides.<sup>5</sup>

The tragedy of UI deaths among young children is widely appreciated (and underscored by narrative descriptions provided in this recent study<sup>5</sup>), but perhaps what is underappreciated by many is that UI gun deaths occur at even higher rates among older adolescents than among young children. Still, the marked disparity between adolescent and younger children firearm death is due mostly to homicide and suicide. These intentional deaths account for the vast majority of pediatric firearm mortality, and they result in our nation's shameful lead over other high-income countries in gunshot fatalities.<sup>6</sup> Our high rates of such violent death are inextricably linked to firearm ownership and availability.<sup>7-15</sup> Adolescents' access to and carrying of firearms is well documented.<sup>16-19</sup>

While Fowler's report states that firearm suicide is "dispersed" across the United States, the relatively short time span examined has led them effectively to overlook persistently high suicide rates (over longer spans) in some rural states whose small populations yield low annual death counts. Other research has convincingly shown youth firearm suicide to predominate in rural counties nationwide<sup>20</sup>; this is crucial for pediatricians and policy-makers

FREE

*Department of Pediatrics, University of Vermont Children's Hospital, Burlington, Vermont*

Opinions expressed in these commentaries are those of the author and not necessarily those of the American Academy of Pediatrics or its Committees.

**DOI:** <https://doi.org/10.1542/peds.2017-1300>

Accepted for publication Apr 18, 2017

Address correspondence to Eliot W. Nelson, MD, UVM College of Medicine, Pediatric Primary Care, 353 Blair Park Rd, Williston, VT 05495. E-mail: [eliot.nelson@uvmhealth.org](mailto:eliot.nelson@uvmhealth.org)

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

Copyright © 2017 by the American Academy of Pediatrics

**FINANCIAL DISCLOSURE:** The author has indicated he has no financial relationships relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** The author has indicated he has no potential conflicts of interest to disclose.

**COMPANION PAPER:** A companion to this article can be found online at [www.pediatrics.org/cgi/doi/10.1542/peds.2016-3486](http://www.pediatrics.org/cgi/doi/10.1542/peds.2016-3486).

**To cite:** Nelson EW. Confronting the Firearm Injury Plague. *Pediatrics*. 2017;140(1):e20171300

to recognize. Both long guns and handguns are used for suicide in rural areas.<sup>21</sup> The current report's analyses confirm that suicides often occur in response to short-term crises. The availability of a firearm may be especially critical for an impulsive teenager in such moments of crisis.<sup>22–25</sup>

Recognizing the prevalence of guns in homes and the potential dangers of easy access to them makes it both reasonable and wise to ask and talk about firearms as part of our injury prevention guidance. Our right to do so, stifled somewhat by political assertions that this might somehow infringe on gun-owners' rights, has been recently reaffirmed in courts.<sup>26,27</sup> Still, although we may legitimately support our American Academy of Pediatrics policy's assertion that the safest home is one without firearms,<sup>28</sup> we should be mindful that this message may be off-putting to parents who keep guns for hunting or self-protection, and who are part of a widespread and deeply rooted social gun culture in our country, especially in rural states.<sup>29</sup> We do need to try to engage those gun owners.<sup>30</sup> It may help to remind ourselves and our parents that our message on safe gun storage in homes with children is similar to that of gun rights and sport shooting groups.<sup>31,32</sup> We can point out that parents may underestimate kids' propensity to handle guns unsafely, even when they've been taught.<sup>33–36</sup> Excellent information can be shared on safe storage and locking methods that still allow quick access to a handgun if it were ever needed.<sup>37</sup> And finally, given the impulsivity, risk-taking, and unpredictability of adolescence, we should promote safe storage as a routine measure rather than only when a concern or crisis arises.

Studies demonstrate that counseling parents of young children about safe gun storage can be effective, especially when parents are provided with tools such as gun locks.<sup>38,39</sup>

Though we lack research on counseling adolescents or their parents in primary care, a recent excellent review of this problem offers detailed guidance.<sup>40</sup> We pediatric clinicians tend not to discuss firearm injury prevention much<sup>41</sup>; such guidance may help us to do more.

Beyond our roles in clinical practice, we can work at the community level, supporting public education or advocating for legislation to protect children from gun violence. Child access prevention laws and comprehensive background check statutes most importantly aim to work upstream to prevent guns from getting into the wrong hands before crises or violent encounters occur. Such laws have been associated with reductions in UI deaths, teen suicides, and domestic violence homicides.<sup>42–44</sup> We should be encouraged that public support for such legislation has remained strong since Newtown.<sup>45</sup> If Congress remains incapable of acting, state legislatures may do better.<sup>30</sup> Finally, the underfunding of research on gun violence remains inexcusable<sup>46,47</sup>; we must continue to demand support commensurate to the huge public health burden.

However difficult it may be to confront the problem of firearm injuries in our children, youth, and families, we cannot ignore the magnitude of this ongoing public health crisis. Our time-honored role in preventive medicine, central to our pediatric mission, compels us to act. As Hemenway has reminded us, work in public health differs from much of medical endeavors in that the lives saved are anonymous, unknown statistical lives saved in the future<sup>48</sup>; we won't likely know when the safely stored unloaded gun was what made a difference. Our efforts matter nonetheless.

## ABBREVIATION

UI: unintentional injury

## REFERENCES

1. Fowler KA, Dahlberg LL, Haileyesus T, Gutierrez C, Bacon S. Childhood firearm injuries in the United States. *Pediatrics*. 2017;140(1):e20163486
2. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS). Available at: <https://www.cdc.gov/injury/wisqars/fatal>. Accessed April 11, 2017
3. Eber GB, Annett JL, Mercy JA, Ryan GW. Nonfatal and fatal firearm-related injuries among children aged 14 years and younger: United States, 1993–2000. *Pediatrics*. 2004;113(6):1686–1692
4. Srinivasan S, Mannix R, Lee LK. Epidemiology of paediatric firearm injuries in the USA, 2001–2010. *Arch Dis Child*. 2014;99(4):331–335
5. Hemenway D, Solnick SJ. Children and unintentional firearm death. *Inj Epidemiol*. 2015;2(1):26
6. Grinshteyn E, Hemenway D. Violent death rates: the US compared with other high-income OECD countries, 2010. *Am J Med*. 2016;129(3):266–273
7. Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide and homicide among 5–14 year olds. *J Trauma*. 2002;52(2):267–274; discussion 274–275
8. Dahlberg LL, Ikeda RM, Kresnow MJ. Guns in the home and risk of a violent death in the home: findings from a national study. *Am J Epidemiol*. 2004;160(10):929–936
9. Grossman DC, Mueller BA, Riedy C, et al. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *JAMA*. 2005;293(6):707–714
10. Hemenway D. Risks and benefits of a gun in the home. *Am J Lifestyle Med*. 2011;5(6):502–511
11. Anglemeyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a

- systematic review and meta-analysis. *Ann Intern Med.* 2014;160(2):101–110
12. Stroebe W. Firearm possession and violent death: a critical review. *Aggress Violent Behav.* 2013;18(6):709–721
  13. Siegel M, Ross CS, King C III. The relationship between gun ownership and firearm homicide rates in the United States, 1981–2010. *Am J Public Health.* 2013;103(11):2098–2105
  14. Siegel M, Rothman EF. Firearm ownership and suicide rates among US men and women, 1981–2013. *Am J Public Health.* 2016;106(7):1316–1322
  15. Brent DA, Perper JA, Moritz G, Baugher M, Schweers J, Roth C. Firearms and adolescent suicide. A community case-control study. *Am J Dis Child.* 1993;147(10):1066–1071
  16. Schuster MA, Franke TM, Bastian AM, Sor S, Halfon N. Firearm storage patterns in US homes with children. *Am J Public Health.* 2000;90(4):588–594
  17. Okoro CA, Nelson DE, Mercy JA, Balluz LS, Crosby AE, Mokdad AH. Prevalence of household firearms and firearm-storage practices in the 50 states and the District of Columbia: findings from the Behavioral Risk Factor Surveillance System, 2002. *Pediatrics.* 2005;116(3). Available at: [www.pediatrics.org/cgi/content/full/116/3/e370](http://www.pediatrics.org/cgi/content/full/116/3/e370)
  18. Loh K, Walton MA, Harrison SR, et al. Prevalence and correlates of handgun access among adolescents seeking care in an urban emergency department. *Accid Anal Prev.* 2010;42(2):347–353
  19. Johnson RM, Miller M, Vriniotis M, Azrael D, Hemenway D. Are household firearms stored less safely in homes with adolescents?: analysis of a national random sample of parents. *Arch Pediatr Adolesc Med.* 2006;160(8):788–792
  20. Nance ML, Carr BG, Kallan MJ, Branas CC, Wiebe DJ. Variation in pediatric and adolescent firearm mortality rates in rural and urban US counties. *Pediatrics.* 2010;125(6):1112–1118
  21. Zwerling C, Lynch CF, Burmeister LF, Goertz U. The choice of weapons in firearm suicides in Iowa. *Am J Public Health.* 1993;83(11):1630–1632
  22. Miller M, Azrael D, Barber C. Suicide mortality in the United States: the importance of attending to method in understanding population-level disparities in the burden of suicide. *Annu Rev Public Health.* 2012;33:393–408
  23. Lewiecki EM, Miller SA. Suicide, guns, and public policy. *Am J Public Health.* 2013;103(1):27–31
  24. Shain B; Committee on Adolescence. Suicide and suicide attempts in adolescents. *Pediatrics.* 2016;138(1):e20161420
  25. Rivara FP. Youth suicide and access to guns. *JAMA Pediatr.* 2015;169(5):429–430
  26. Fleegler EW, Monuteaux MC, Bauer SR, Lee LK. Attempts to silence firearm injury prevention. *Am J Prev Med.* 2012;42(1):99–102
  27. Jenco M. Federal court strikes down “physician gag law” on guns. AAP News release. Available at: [www.aapnews.org](http://www.aapnews.org). Accessed February 16, 2017
  28. Dowd MD, Sege RD; Council on Injury, Violence, and Poison Prevention Executive Committee; American Academy of Pediatrics. Firearm-related injuries affecting the pediatric population. *Pediatrics.* 2012;130(5). Available at: [www.pediatrics.org/cgi/content/full/130/5/e1416](http://www.pediatrics.org/cgi/content/full/130/5/e1416)
  29. Kalesan B, Villarreal MD, Keyes KM, Galea S. Gun ownership and social gun culture. *Inj Prev.* 2016;22(3):216–220
  30. Branas CC, Flescher A, Formica MK, et al. Academic public health and the firearm crisis: an agenda for action. *Am J Public Health.* 2017;107(3):365–367
  31. National Rifle Association. Eddie Eagle Gunsafe program. Available at: <https://eddieeagle.nra.org/faqs/>. Accessed April 15, 2017
  32. National Shooting Sports Foundation. Project ChildSafe. Available at: [www.nssf.org/safety/](http://www.nssf.org/safety/). Accessed April 15, 2017
  33. Hardy MS, Armstrong FD, Martin BL, Strawn KN. A firearm safety program for children: they just can’t say no. *J Dev Behav Pediatr.* 1996;17(4):216–221
  34. Himle MB, Miltenberger RG, Gatheridge BJ, Flessner CA. An evaluation of two procedures for training skills to prevent gun play in children. *Pediatrics.* 2004;113(1 pt 1):70–77
  35. Baxley F, Miller M. Parental misperceptions about children and firearms. *Arch Pediatr Adolesc Med.* 2006;160(5):542–547
  36. Jackman GA, Farah MM, Kellermann AL, Simon HK. Seeing is believing: what do boys do when they find a real gun? *Pediatrics.* 2001;107(6):1247–1250
  37. King County. *Lok-It-Up: Promoting the Safe Storage of Firearms.* Washington: King County. Available at: [www.kingcounty.gov/depts/health/violence-injury-prevention/violence-prevention/gun-violence/LOK-IT-UP.aspx](http://www.kingcounty.gov/depts/health/violence-injury-prevention/violence-prevention/gun-violence/LOK-IT-UP.aspx). Accessed April 15, 2017
  38. Barkin SL, Finch SA, Ip EH, et al. Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial. *Pediatrics.* 2008;122(1). Available at: [www.pediatrics.org/cgi/content/full/122/1/e15](http://www.pediatrics.org/cgi/content/full/122/1/e15)
  39. Rowhani-Rahbar A, Simonetti JA, Rivara FP. Effectiveness of interventions to promote safe firearm storage. *Epidemiol Rev.* 2016;38(1):111–124
  40. Sigel E. Addressing firearm violence in the primary health care setting. *Adolesc Med State Art Rev.* 2016;27(2):323–340
  41. Roszko PJD, Ameli J, Carter PM, Cunningham RM, Ranney ML. Clinician attitudes, screening practices, and interventions to reduce firearm-related injury. *Epidemiol Rev.* 2016;38(1):87–110
  42. Webster DW, Vernick JS, Zeoli AM, Manganello JA. Association between youth-focused firearm laws and youth suicides. *JAMA.* 2004;292(5):594–601
  43. Santaella-Tenorio J, Cerdá M, Villaveces A, Galea S. What do we know about the association between firearm legislation and firearm-related injuries? *Epidemiol Rev.* 2016;38(1):140–157

44. Webster DW, Wintemute GJ. Effects of policies designed to keep firearms from high-risk individuals. *Annu Rev Public Health*. 2015;36(1):21–37
45. Barry CL, McGinty EE, Vernick JS, Webster DW. Two years after Newtown—public opinion on gun policy revisited. *Prev Med*. 2015;79:55–58
46. Stark DE, Shah NH. Funding and publication of research on gun violence and other leading causes of death. *JAMA*. 2017;317(1):84–85
47. Kellermann AL, Rivara FP. Silencing the science on gun research. *JAMA*. 2013;309(6):549–550
48. Hemenway D. Why we don't spend enough on public health. *N Engl J Med*. 2010;362(18):1657–1658

## Confronting the Firearm Injury Plague

Eliot W. Nelson

*Pediatrics* originally published online June 19, 2017;

### Updated Information & Services

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/early/2017/06/15/peds.2017-1300>

### References

This article cites 42 articles, 9 of which you can access for free at:  
<http://pediatrics.aappublications.org/content/early/2017/06/15/peds.2017-1300#BIBL>

### Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):  
**Injury, Violence & Poison Prevention**  
[http://www.aappublications.org/cgi/collection/injury\\_violence\\_-\\_poison\\_prevention\\_sub](http://www.aappublications.org/cgi/collection/injury_violence_-_poison_prevention_sub)  
**Firearms**  
[http://www.aappublications.org/cgi/collection/firearms\\_sub](http://www.aappublications.org/cgi/collection/firearms_sub)  
**Public Health**  
[http://www.aappublications.org/cgi/collection/public\\_health\\_sub](http://www.aappublications.org/cgi/collection/public_health_sub)

### Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<http://www.aappublications.org/site/misc/Permissions.xhtml>

### Reprints

Information about ordering reprints can be found online:  
<http://www.aappublications.org/site/misc/reprints.xhtml>

# American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## Confronting the Firearm Injury Plague

Eliot W. Nelson

*Pediatrics* originally published online June 19, 2017;

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2017/06/15/peds.2017-1300>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2017 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

## American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

