

Gaining Insight: Data Needs for Firearm Injury Prevention Researchers

Million, A. J.
Gidakovic, Sanja
Bossaller, Jenny

University of Michigan, USA | millioaj@umich.edu
University of Missouri, USA | sg6kn@missouri.edu
University of Missouri, USA | bossallerj@missouri.edu

ABSTRACT

Between 1996 and 2018, there was little federally funded research on gun violence, even though it remains a perennial issue, resulting in considerable loss of life. Advocacy and academic groups piece together data to conduct their research, but the U.S. firearms data infrastructure is limited. A current National Institute of Health (NIH)-funded coordinating center led by researchers at the University of Michigan aims to help confront that problem. This Quality Improvement (QI) study seeks to uncover the information needs of researchers in firearm injury prevention and community-based interventions through interviews with public health, medical, and criminal justice researchers. Interviews reveal problems associated with existing databases and infrastructures, as well as what researchers need to support their research. We find fragmented data resources and a lag in public health data availability create obstacles to obtaining many datasets. The researchers also describe problems and opportunities for data harmonization across intervention-focused studies.

KEYWORDS

Research infrastructure, public health research, data reuse

INTRODUCTION

In 1996, the United States (U.S.) Congress passed an *Omnibus Consolidated Appropriations Bill* containing a provision that “none of the funds made available for injury prevention and control at the Centers for Disease Control and Prevention (CDC) may be used to advocate or promote gun control” (p. 245). Similarly, the *Consolidated Appropriations Act Of 2012* stated that no National Institutes of Health (NIH) funding under the National Research Service Awards for primary care researchers could “be used, in whole or in part, to advocate or promote gun control” (p. 301). The direct result of these policies was that until 2018 there was very little federally-funded medical or public health research examining firearm-related injuries and fatalities in the U.S. In 2019, Congress clarified that the NIH and CDC may grant funding to study firearm-related injuries (Poitras, 2024). Today, research teams are trying to make up for a lost generation of research (Galea, 2018). A related and understudied topic pertains to data documenting gun violence and injuries, and the use of secondary data (i.e., data not collected by researchers themselves) is central to this research.

In 2018, researchers at the University of Michigan established the Firearm Safety Among Children and Teens (FACTS) Consortium to study firearm safety among children and teenagers (Cunningham et al., 2019). That NIH-funded project supported project-specific data archiving, and it precipitated the creation of a coordinating center supporting six funded research teams. The Community Firearm Violence Prevention Network (CFVP) collaborates with the Inter-university Consortium for Political and Social Research (ICPSR) to document, index, and curate datasets produced by research teams and is actively documenting data and resources housed elsewhere. This poster presents the state of research in this area and preliminary findings from a Quality Improvement (QI) project conducted through semi-structured interviews with researchers. We conceptualize the technical and social systems available to researchers as knowledge infrastructures and seek to support ICPSR in meeting future firearm researcher data needs.

LITERATURE REVIEW

Data on gun violence and injuries is fragmented and is located across diverse sites, including, but not limited to, the Rand Corporation, Boston University, the Gun Violence Archive, the Centers for Disease Control and Prevention (CDC), state administrative systems, and the American College of Surgeons (ACS). During years when public health and medical firearm-related research was unfunded, data was often collected by advocacy groups. A quintet of reports written by authors at the National Opinion Research Center (NORC) (NORC, 2020a, 2020b, 2020c, 2021) recently explored America’s firearm data infrastructure, stating that “[W]hile there are numerous data sources describing particular elements of the relationship between firearms and accidental harm, suicides, and criminal violence, the current firearms data environment is disordered and highly segmented... In summary, existing data are mainly useful only for narrow studies to inform national policy and for use in local operational decision-making” (p. 2). NORC subsequently presented a blueprint for improving the U.S. firearm data infrastructure; however, this report focused on national solutions. This study examines the data needs of physicians, public health scholars, and criminal justice researchers, specifically focusing on information systems and data resources. We conceptualize

these systems and resources as knowledge infrastructures with the goal of employing infrastructural inversion in a future research study (Edwards, 2010).

Infrastructural inversion provides insight into ways to improve systems related to collecting, storing, and disseminating data for firearm injury prevention researchers. Simonsen, Karasi and Hertzum (2020) describe infrastructure inversion as a sort of “gestalt switch of shifting attention from the activities invisibly supported by an infrastructure to the activities that enable the infrastructure to function and meet desired needs” (p. 115). Karasti et al. (2016) note that infrastructural inversion focuses on background infrastructure functions (formation, upgrade, breakdown, repair) rather than front-end considerations. That said, we only study firearm data infrastructure from the perspective of researcher data and information needs.

METHOD

This QI project describes the experiences of physicians, public health, and criminal justice researchers using and creating many kinds of data about firearms-related injuries and fatalities. In semi-structured interviews, we identified researchers’ information needs and ongoing work at CFVP in creating a harmonized dataset that contains data from six funded intervention studies. Three study sites are preparing to collect data on interventions, while another three are working with the CFVP to harmonize data collection and establish a shared descriptive framework. We interviewed researchers at the three active research sites and others at the coordinating center in Michigan, as well as criminal justice researchers through a research contact at the National Archive of Criminal Justice Data. Unlike in public health, criminal justice researchers have studied firearm-related issues for decades without interruption, largely because they depend on already-existing administrative datasets and can conduct research without grant funding. Our interviews asked researchers to describe their preferred research methods and data sources, impediments to their work (e.g., unavailable or problematic data), and an ideal dataset for their research projects.

FINDINGS

Preliminary findings show that the researchers we interviewed are deeply concerned with firearms violence and preventing resulting fatalities and injuries. Researchers mentioned mining many sources of data, including the Gun Violence Archive, which is compiled by a nonprofit organization to offset problems associated with state, local, and federal statistics, the CDC, the ACS National Trauma Databank, state and local-level administrative data, medical charts, and data from the University of Michigan’s Institute for Firearm Injury Prevention. Researchers seek information about (1) the granular geographic distribution of firearms violence to develop preventative interventions in at-risk communities, (2) coinciding social risk factors, including poverty and food insecurity, substance abuse, and mental health, and (3) current information about injuries and fatalities. Criminal justice researchers seek state and local datasets that are difficult to obtain without established partnerships.

Participants described multiple impediments to obtaining data, including (1) a lag in the availability of public health data, (2) scattered and unevenly collected data due to varied requirements for injury reporting across states, which sometimes leads to (3) low count reporting meaning it becomes impossible to draw generalizable conclusions about populations and targeted interventions. Participants described an ideal database for their research as “current, comprehensive, and linked,” meaning that it would link social and economic factors to both injuries and fatalities.

CONCLUSION

Although work is ongoing, one conclusion we have drawn is that preventing firearm-related injuries and fatalities likely requires a diversity of data resources and disciplinary approaches to study the issue. For example, public health researchers noted that their work requires collecting data to study behavioral and medical interventions, but the historic prohibition on using federal funding made collecting this data impossible. One participant said that the CFVP Network “is giving us an opportunity to rebuild what we lost... it is like a catalyst to rebuild this research area that was totally demolished.” Criminologists, on the other hand, have been able to continue research uninterrupted, because they rely heavily on large-scale administrative datasets, but they also observed limitations to currently available data infrastructure. Moving forward, we will make recommendations to the CFVP network about how ICPSR can take our findings and use them to support researcher needs (regardless of discipline), as well as raise awareness about the data infrastructure used by researchers to study gun violence. This QI project does not aim to produce generalizable data, but we anticipate its findings will apply more broadly to problems in public health research and to create harmonized data projects used by interdisciplinary research teams in instances where administrative datasets alone cannot meet researcher needs.

GENERATIVE AI USE

AI was not used during any part of this project.

ACKNOWLEDGMENTS

We thank the support of ICPSR and all the researchers who donated their time to this research.

REFERENCES

- Budhathoki, N. R., & Haythornthwaite, C. (2013). Motivation for open collaboration: Crowd and community models and the case of OpenStreetMap. *American Behavioral Scientist*, 57(5), 548-575.
- Case, D. O., & Given, L. M. (2016). *Looking for information: A survey of research on information seeking, needs, and behavior* (4th ed.). Emerald.
- Community-Academic Partnerships for Firearm Violence Prevention (CFVPP). <https://endfirearmviolence.org>
- Consolidated Appropriations Act of 2012, Pub. L. No. 112-74. <https://www.congress.gov/112/plaws/publ74/PLAW-112publ74.pdf>
- Cunningham, R. M., Carter, P. M., & Zimmerman, M. (2019). The Firearm Safety Among Children and Teens (FACTS) Consortium: defining the current state of the science on pediatric firearm injury prevention. *Journal of Behavioral Medicine*, 42(4), 702–705. <https://doi.org/10.1007/s10865-019-00077-6>
- Edwards P. N. (2010) *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. Cambridge, MA: MIT Press.
- Edwards, P. N. (2017). Knowledge infrastructures for the Anthropocene. *The Anthropocene Review*, 4(1), 34-43.
- Galea, S., Branas, C. C., Flescher, A., Formica, M. K., Hennig, N., Liller, K. D., Madanat, H. N., Park, A., Rosenthal, J. E., & Ying, J. (2018). Priorities in recovering from a lost generation of firearms research. *American journal of public health*, 108(7), 858–860. <https://doi.org/10.2105/AJPH.2018.304436>
- Jamieson, C. (2013, February). *Gun violence research: History of the federal funding freeze*. American Psychological Association. <https://web.archive.org/web/20130218012644/http://www.apa.org/science/about/psa/2013/02/gun-violence.aspx>
- Karasti, H., Millerand, F., Hine, C. M., & Bowker, G. C. (2016). Knowledge infrastructures: part I. *Science & Technology Studies*, 29(1), 2-12.
- NORC. (2020a). *A blueprint for a U.S. firearms data infrastructure* [PDF]. https://www.norc.org/content/dam/norc-org/pdfs/A%20Blueprint%20for%20a%20U.S.%20Firearms%20Data%20Infrastructure_NORC%20Expert%20Panel%20Final%20Report_October%202020.pdf
- NORC. (2020b). *A conceptual framework for a firearms data infrastructure* [PDF]. <https://www.norc.org/content/dam/norc-org/documents/standard-projects-pdf/A%20Conceptual%20Framework%20for%20a%20Firearms%20Data%20Infrastructure.pdf>
- NORC. (2020c). *The state of firearms data in 2019: First report of the expert panel on firearms data infrastructure* [PDF]. <https://www.norc.org/content/dam/norc-org/pdfs/State%20of%20Firearms%20Research%202019.pdf>
- NORC. (2021). *Improving data infrastructure to reduce firearms violence* [PDF]. https://www.norc.org/content/dam/norc-org/pdfs/Improving%20Data%20Infrastructure%20to%20Reduce%20Firearms%20Violence_Final%20Report.pdf
- Omnibus Consolidated Appropriations Act, Pub. L. No. 104-208 (1996).
- Poitras, C. (2024.). *Lifting of federal funding ban tied to increase in gun violence research*. Yale School of Public Health. <https://ysph.yale.edu/news-article/lifting-of-federal-funding-ban-tied-to-increase-in-gun-violence-research/>
- Simonsen, J., Karasti, H., & Hertzum, M. (2020). Infrastructuring and participatory design: Exploring infrastructural inversion as analytic, empirical and generative. *Computer Supported Cooperative Work (CSCW)*, 29, 115-151. <https://doi.org/10.1007/s10606-019-09365-w>