

Cost Estimate of Federal Funding for Gun Violence Research and Data Infrastructure

July 13, 2021

Prepared for
Arnold Ventures and **The Joyce Foundation**



Overview

In 2019 and 2020, Arnold Ventures and the Joyce Foundation released separate yet complementary reports on the topic of gun violence in the United States. Both reports reflect the work of expert advisory panels tasked with identifying gaps in gun violence information, but each considers different challenges. Arnold Ventures engaged NORC at the University of Chicago to facilitate an Expert Panel to consider the existing gun violence data infrastructure. At the same time, the Joyce Foundation engaged an advisory panel of scientific experts (Expert Advisory Panel) to consider the gun violence research agenda.

Taken together, these reports: 1) frame the topic of gun violence as a common, widespread, and costly problem in urban, suburban, and rural areas; 2) provide evidence to support that gun violence affects adults and children and is among the leading causes of preventable death and injury; 3) assert that gun violence research and the data infrastructure supporting that work is under-funded by the federal government; and 4) recommend that policymakers take several actions to combat gun violence. Overall, the NORC Expert Panel and the Joyce Foundation's Expert Advisory Panel conclude that there are significant gaps in gun violence information which weaken the ability of policymakers to address the problem of gun violence in the United States.

Arnold Ventures and the Joyce Foundation commissioned Health Management Associates (HMA) to conduct a cost estimate of the federal government implementing the recommendations of these two reports. HMA conducted its cost estimate as an independent third-party with the autonomy to evaluate all aspects of the data infrastructure recommendations and research agenda dimensions. See Appendix 1 for related staff contact information.

The Reports of the NORC Expert Panel and the Joyce Foundation's Expert Advisory Panel

The NORC Expert Panel recommends 17 enhancements to the U.S. firearms data infrastructure, including 13 recommendations for the federal government and 4 for state and local governments. Overall, these recommendations include steps to improve existing data collections immediately and long-term changes in strategy to build a more robust and scalable infrastructure. We refer to these as the data infrastructure recommendations. The federal recommendations include: 1) improving existing databases, 2) increasing the frequency of nationwide surveys, 3) creating interagency task forces and working groups to coordinate data collection, 4) developing national guidelines, 5) creating resource centers to assist local law enforcement agencies with data collection, and 6) advancing other efforts. See the Appendix 2 for more detail.

The report from the Joyce Foundation's Expert Advisory Panel outlines a comprehensive national gun violence research agenda. The Expert Advisory Panel identified 100 research questions to guide future research funding. The report categorizes these questions into 10 dimensions of gun violence research: 1) firearm suicide, 2) community-based gun violence, 3) intimate partner violence with guns, 4) shootings by law enforcement, 5) mass shootings, 6) unintentional shootings, 7) impacts of lawful gun ownership and public carrying on safety, 8) limiting gun access to people during periods of high risk, 9) racial disparities and the role of the criminal justice system, and 10) firearm related technology. See the Appendix 2 for more detail.

Methodology

HMA was commissioned by Arnold Ventures and the Joyce Foundation to develop an independent federal cost estimate of: 1) implementing the 13 federal recommendations on gun violence data infrastructure and 2) carrying out a federally-funded research agenda built around the 10 dimensions of gun violence. HMA conducted its cost estimate as an independent third party with the autonomy to evaluate all aspects of the data infrastructure recommendations and research agenda dimensions. To estimate the cost to the federal government, HMA designed and implemented a multi-step research methodology consisting of:

- 1) Evaluating the two reports by validating the expertise of the contributing members of the panels and by reviewing the various sources cited as evidence.
- 2) Conducting a literature review to identify current research in gun violence and examples of similar data infrastructure and research program funding.
- 3) Conducting structured interviews with 12 experts who contributed to the two reports as well as other experts referred to us by the contributors.
- 4) Convening a panel of cost estimation experts at HMA to identify key variables and assumptions that should be used to calculate a federal cost estimate in the context of this topic.
- 5) Developing a novel cost estimate formula based on the assumptions gathered from the earlier methodological steps. See Appendix 3 for more detail.

Cost assumptions and estimates

Informed by the information gathered from HMA's expert interviews, literature search, and internal expert panel, HMA formed several assumptions to guide the cost estimations. The assumptions range from general to specific, but in all cases served as benchmarks for forming cost estimates. More detail is provided in Appendix 3, but the most critical assumptions include:

- a) Multiple federal agencies currently operate gun violence data infrastructure programs and research funding programs. These programs are largely disconnected from one another across agencies, which is likely to increase the costs of new programs.
- b) Using the federal government's general schedule (GS) as reference, HMA estimated an average cost of a full-time equivalent (FTE) employee to be \$140,000 per year. HMA assumed this average annual salary to be higher than the overall average of the GS-scale because the programs at hand will require FTEs for data experts and scientists who command relatively higher salaries.
- c) The number of years required to implement the data recommendations will vary between 1 and 5 years, while the research dimensions will be active across the entire 5-year period.
- d) The field of gun violence research lacks a robust full-time research workforce.¹ Experts asserted in interviews that this field of research includes fewer than 50 researchers. Therefore, to actualize the research dimensions federal funding will need to include workforce development.
- e) The relative costliness of gun violence research can be determined by assessing the nature (accidental, homicide and intentional non-fatal, suicide) of the gun violence. Experts asserted in interviews that homicide/intentional non-fatal research as the most expensive of the three topics to research and accident-based gun violence as the least expensive form of gun violence to research.
- f) Federal programs requiring multi-agency coordination and those lacking a foundational infrastructure can be more complex and have higher implementation and administration costs.
- g) Oversight and audit costs should be factored into all new or modified federal programs.

¹ Weir, Kristen. "A Thaw in the freeze on federal funding for gun violence and injury prevention. American Psychological Association. April 1, 2021 ([link](#))

- h) Federal funding to universities should include consideration of Facilities and Administrative (F&A) costs. Often referred to as indirect costs, F&A costs cover a portion of the university's infrastructure and operational costs related to federally funded research.
- i) Several existing federal programs may serve as reliable corollaries from which to benchmark HMA's cost estimates, such as: the creation of the Patient-Centered Outcomes Research Institute Trust Fund;² the budget of the U.S. Preventive Services Task Force;³ the budgets of the National Institute of Justice and Bureau of Justice Statistics within the U.S. Department of Justice;⁴ the budget of the Statewide Longitudinal Data Systems Grant Program within the U.S. Department of Education;⁵ and the budget of the Medical Expenditure Panel Survey.⁶

Based on these assumptions and information derived from our research process, HMA calculated cost estimates using a formulaic process. This process was applied to each individual recommendation or dimension, and varied slightly for the data infrastructure recommendations and research dimensions.

- 1) Staffing estimations for each program:
 - a. Data: We estimated the annual number of FTEs needed to complete each specific task named within the NORC report and applied an average annual cost of \$140,000 per FTE.
 - b. Research: Based on expert feedback, we estimated the number of small and large research studies required annually for each of the 10 research dimensions. We then estimated the average number of FTEs required for small and large studies. We then applied the average annual FTE cost of \$140,000 to each.
- 2) Oversight/audit: We estimated the number of additional FTEs required to oversee each program
- 3) Indirect University Facilities and Administrative (F&A) costs: For each research dimension, we estimated the additional costs associated with the federal governments common practice of paying universities for their research-related F&A costs. We assumed half of all research funding would go to universities rather than the research being conducted by federal agency staff.
- 4) Time period: We estimated the number of years each program was active over 5-years
- 5) Grant funding: If grant funding was included as a part of a data recommendation, an annual amount was included for that program.
- 6) Complexity adjustment: We applied a complexity adjustment to all programs to account for the relative level of complexity of each data or research program. HMA considered the depth of the data collection, the implementation readiness of the program, the presence of existing infrastructure from which to build, the need for research workforce development, the degree to which the program involved multiple agencies, the degree to which the program required qualitative versus quantitative data collections, and for the research programs the type of gun violence being studied (accidental, homicide, suicide)
- 7) Inflation adjustment: We applied an inflation adjustment to each program to account for inflation across the 5-year period.

Each of the steps identified above were multiplied for each program individually to generate a 5-year cost estimate. Finally, we validated the 5-year cost estimate (and 1-year cost estimate) of each program by comparing them to the budgets of existing federal programs with similar goals and challenges. See Appendix 3 for more detail.

² <https://www.irs.gov/affordable-care-act/patient-centered-outcomes-research-trust-fund-fee-questions-and-answers>

³ <https://www.ahrq.gov/cpi/about/mission/budget/2022/index.html>

⁴ <https://www.justice.gov/doj/budget-and-performance>

⁵ <https://www2.ed.gov/about/overview/budget/budget22/justifications/x-ies.pdf>

⁶ <https://www.ahrq.gov/cpi/about/mission/budget/2022/index.html>

We estimate federal legislation implementing the NORC Expert Panel's 13 federal gun violence data infrastructure recommendations and the Joyce Foundation's 10-dimension gun violence research agenda will range in cost between \$587 million and \$639 million over a 5-year federal budget window from federal fiscal year (FY) 2022 to 2026. Table 1 provides estimates for both cost components, and a total for both. Lower bound and upper bound cost estimates are shown to reflect the uncertainty around providing a point cost estimate. HMA estimates NORC's data infrastructure recommendations will range from \$137m to \$159m over five years, and Joyce Foundation's 10 dimensions of the gun violence research agenda will range from \$450m to \$480m. See Appendix 4 for more detail.

Table 1:

Five-year federal cost estimate of implementing gun violence data infrastructure recommendations and research agenda (2022 to 2026)

Legislative proposal	Lower bound (in \$ millions)	Upper bound (in \$ millions)
Data infrastructure (NORC Expert Panel)	\$137	\$159
Research agenda (Joyce Foundation Expert Advisory Panel)	\$450	\$480
Total (data infrastructure and research agenda)	\$587	\$639

Several important caveats apply to HMA's cost estimates: 1) Estimates are based upon the recommendations and parameters specified in the NORC and the Joyce Foundation reports. 2) Estimates are limited to the 5-year budget window of federal FY 2022 to 2026, excluding the outyears. 3) Estimates do not include state and local funding recommendations specified in the NORC report. 4) Estimates do not incorporate federal savings or spending increases that may result from the implementation of these programs or the policy changes that could be made as the result of these programs. However, it is reasonable to assume that if implemented, these programs could generate reductions in gun-related mortality and injury rates which could in turn generate various societal benefits that could reduce federal spending to some degree. For example, our estimates do not include the potential economic productivity gains that could result from reductions in workplace and school absenteeism or increased life expectancy.

Appendix 1: HMA Staff Contacts

- Zach Gaumer, Principal (zgaumer@healthmanagement.com),
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Other HMA staff contributing to this analysis include: Jay Shannon (Principal), Cindy Zeldin (Senior Consultant), and Yamini Narayan (Consultant). Special thanks to HMA's internal cost estimation expert panelists: Jonathan Blum (Managing Principal), Ellen Breslin (Principal), Eric Hammelman (Principal), and Sharon Silow-Carroll (Principal).

Arnold Ventures Contact

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The Joyce Foundation Contact

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Appendix 2: Summary of NORC and the Joyce Foundation Conclusions

The NORC Expert Panel report “A Blueprint for a U.S. Firearms Data Infrastructure” makes recommendations for changes to the U.S. firearms data infrastructure.⁷ Funded by Arnold Ventures, the report features recommendations that were generated by an expert panel of academics, government leaders, and data scientists and include steps to improve existing data collections that can be implemented immediately, as well as longer-term strategies to build a more robust and scalable infrastructure. The NORC Expert Panel report includes 17 recommendations, of which 13 target federal policymakers and 4 target state and local policymakers. HMA’s analysis pertains to the 13 federal recommendations. In addition, the NORC Expert Panel report identifies potential federal agencies associated with each of these recommendations, identified in the parentheses below.

1. Create valid and reliable administrative data systems for tracking nonfatal gunshot injuries (Agency for Healthcare Quality and Research (AHRQ), Federal Bureau of Investigation (FBI)).
2. Facilitate implementation of the National Incident-Based Reporting System creating a feasible, well-designed technical assistance and support system to law enforcement entities (the Bureau of Justice Statistics (BJS)).
3. Create specific guidance to improve timeliness of federal data (Office of Management and Budget’s Office of Information and Regulatory Affairs (OIRA) and the Statistical and Science Policy (SSP) Office).
4. Increase federal data accessibility (Interagency Council on Statistical Policy).
5. Annual survey of firearms ownership, acquisition, and storage practices. (Substance Abuse and Mental Health Services Administration and the Centers for Disease Control).
6. Set up an interagency working group around data to create federal partnerships to address specific infrastructure gaps (inter-agency working group to be created).
7. Create specific guidance to improve consistency and timeliness of criminal justice history reporting for use in background checks (FBI/BJS).

⁷ NORC, “A Blueprint for a U.S. Firearms Data Infrastructure”, October 2020 ([link](#))

8. Create specific guidance and recommended strategies for supporting the development and use of data collection/data use agreements based on best practice in implementation science (Bureau of Justice Assistance (BJA)).
9. Create resources and best practice guides for local and state governments to facilitate the integration of health, social service, criminal justice, and other data on victims and perpetrators of firearm injury and misuse (CDC and BJA).
10. Improvements to the firearm ownership and use datafiles (FBI, BJS, CDC, and the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF)).
11. Improve the Survey of Prison Inmates (BJS).
12. Integrate federal public health data and criminal justice data on firearms (inter-agency workgroup to be created).
13. Create a model firearms data sharing platform within the federal government (National Institute of Standards and Technology).

The Joyce Foundation's report "100 Critical Questions for Gun Violence Research" outlines key areas of focus for public and private sector efforts to build the science of gun violence prevention with actionable findings for policymakers and practitioners over the next five years.⁸ The report was written in collaboration with an advisory panel of scientific experts and includes input from dozens of researchers in the field. The report details the 100 key gun violence questions on which future research should focus. The report categorizes these questions into 10 dimensions of gun violence, which are the second focus of our analysis. The Joyce Foundation report suggests these 10 dimensions of gun violence research could be implemented through either or both the Centers for Disease Control (CDC) or the National Institutes of Health (NIH). The 10 dimensions are:

1. Firearm suicide
2. Community-based gun violence
3. Intimate partner violence with guns
4. Shootings by law enforcement
5. Mass shootings
6. Unintentional shootings
7. Impacts of lawful gun ownership and public carrying on safety
8. Limiting gun access to people during periods of high risk
9. Racial disparities and the role of the criminal justice system
10. Firearm related technology

⁸ Joyce Foundation, "100 Questions for Gun Violence Research", January 2020 ([link](#))

Appendix 3: Methodology

HMA was commissioned by Arnold Ventures and the Joyce Foundation to estimate the costs to the federal government of implementing the 13 recommendations on federal gun violence data infrastructure and a federal research agenda built around the 10 dimensions of gun violence. HMA conducted its cost estimate as an independent third-party with the autonomy to evaluate all aspects of the data infrastructure recommendations and research agenda dimensions. To arrive at our cost estimates we designed and implemented a multi-step methodology consisting of a literature review, structured interviews with experts who contributed to the two reports or were recommended by those contributors, and the convening of a panel of experts to assess the variables and assumptions relevant to this analysis. Information derived from each of these components of our methodology contributed to our cost estimate of implementing the 13 federal data infrastructure recommendations and the 10 dimensions of gun violence research if the U.S. Congress were to mandate these actions. HMA conducted its work over the course of 3 months and our team consisted of experts in the fields of policy analysis, public health, medicine, and community strategies.

LITERATURE REVIEW

HMA conducted an extensive search of academic literature about the costs of a gun violence data infrastructure program and a national gun violence research agenda. We identified relevant materials in academic journals, identified reports released by state and federal agencies, assessed white papers published by policy advocates and research organizations, studied policy proposals scored or considered by the Congressional Budget Office, and gathered examples of federal programs with similar goals or structures to those being proposed within the two gun violence reports. HMA identified over 50 sources to inform our understanding of gun violence as a public health issue, frameworks for implementing violence prevention initiatives, the current scope of gun violence research and data collection efforts, similar federal programs, and budget appropriations for stakeholder agencies.

The literature review provided insight into the extent to which US society struggles with gun violence, current levels of funding for gun violence research, the current state of the gun violence research workforce, and the existing data infrastructure for gun violence research. This information was used as context for making cost estimates and it was also used as corroborating evidence for interviews with experts. Specifically, literature suggested gun violence research is currently funded at low levels relative to other causes of death.^{9,10} Literature also suggested research funding related to gun violence prevention could be allocated across numerous agencies and organizations and this work could be conducted by professionals in the fields of social science, public health, criminology, economics, and public policy. In addition, literature suggests efforts must be made to enhance and align gun violence data repositories across federal agencies.

⁹ Stark, DE and Shah, NH. Funding and Publication of Research on Gun Violence and Other Leading Causes of Death. *Journal of the American Medical Association*, 2017.

¹⁰ Cunningham, RM et al. Federal Funding for Research on the Leading Causes of Death Among Children and Adolescents. *Health Affairs*. 2019.

INTERVIEWS

We conducted structured interviews with 12 experts who contributed to the NORC Expert Panel and Joyce Foundation reports on gun violence or had key strategic experience. These individuals were chosen from among dozens of other report contributors because of their background expertise with gun violence data infrastructure and research programs or with budgeting for federal agencies. In addition, we interviewed experts who were referred to us by the report contributors mentioned above if they had key strategic experience in areas such as research, data infrastructure, or budgeting. We structured our interviews to target the unique expertise of our interviewees. Specifically, experts on data infrastructure were asked questions related to the cost of implementing the NORC Expert Panel's 13 data infrastructure recommendations and experts on gun violence research were asked questions about assessing the costs of implementing the Joyce Foundation's national research agenda for gun violence.

Interviews with experts provided a rich array of information that was pivotal to HMA's cost estimates. These interviews were integral to: identifying a logic from which to assess the relative costs of the 10 research dimensions, identifying the number of studies required for each of the 10 dimensions, identifying cost benchmarks for agencies and research studies, and assessing the relative complexity of each of the 13 data recommendations and 10 research dimensions.

EXPERT PANEL ON FEDERAL COST ESTIMATES

We convened an internal panel of experts at HMA with professional experience administering federal programs, creating legislative cost estimates, and conducting social science research. This panel was tasked with identifying key variables and assumptions that should be used for estimating the costs of the recommendations of the two reports if they were mandated by the US Congress. This panel of experts had prior experience working the U.S. Congressional Budget Office, the U.S. Office of Management and Budget, the U.S. Government Accountability Office, the Medicare Payment Advisory Commission, within Capitol Hill committees, and in health care and management consulting. In addition, the panel included experts with extensive experience conducting health policy and social science research.

The expert panel on federal cost estimates was essential to forming HMA's cost estimates. These experts assisted with defining the research methodology for this analysis, forming assumptions about the cost of FTEs for this field of work, creating a complexity adjustment, considering the implications of existing data and administrative infrastructure, identifying federal agencies and programs which served as cost benchmarks, and thinking through potential agency costs such as oversight and audit and the inclusion of inflation in making 5-year cost estimates.

COST ESTIMATE

Informed by the information gathered through this research process, we estimated the individual costs to the federal government of each recommendation and dimension based on the descriptions contained in the two reports. HMA began this process by developing several key assumptions to guide our cost estimates. These assumptions provide relevant cost and budgeting benchmarks and were common themes or were accepted across our many interviews and panel discussions.

- a) Multiple federal agencies currently operate gun violence data collection and research funding programs. These programs are largely disconnected from one another across agencies, and this may increase costs of new programs. In previous reports NORC collected information on the scope of federal agency involvement on this topic.¹¹ However, below we highlight some of the most critical federal agencies that would be implicated by these gun violence recommendations.

- 1) Department of Justice:

¹¹ NORC at the University of Chicago, First Report of the Expert Panel of Firearms Data Infrastructure: The State of Firearms Data in 2019 ([link](#)).

- a. Federal Bureau of Investigation (FBI) (datasets: Uniform Crime Reporting program and Supplemental Homicide Report, National Use of Force Database, Summary Reporting System, National Instant Criminal Background Check System),
 - b. Bureau of Justice Assistance (BJA),
 - c. Bureau of Justice Statistics (BJS) (dataset: National Incident Based Reporting System, Survey of Prison Inmates),
 - d. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF),
 - e. National Institute of Justice (NIJ),
- 2) Centers for Disease Control (datasets: Behavioral Risk Factor Surveillance System, National Violent Death Reporting System, National Vital Statistics System, National Electronic Injury Surveillance System)
 - 3) Interagency Council on Statistical Policy (dataset: National Archive of Criminal Justice Data),
 - 4) Agency for Healthcare Research and Quality (dataset: Healthcare Cost and Utilization Project),
 - 5) Substance Abuse and Mental Health Services Administration (Dataset: National Household Survey on Drug Use and Health)
 - 6) US Department of Veterans Affairs (VA) and the Veterans Health Administration (VHA)
 - 7) Department of Defense (DOD) and the Defense Health Agency (DHS)
- b) Using the federal government's general schedule (GS) as reference, HMA estimated an average cost of a full-time equivalent (FTE) employee as \$140,000 per year (including salary and all benefits). HMA assumed this average annual salary to be higher than the overall average of the GS-scale because the programs at hand will require FTEs for data experts and scientists who command higher salaries.
- c) The number of years required to implement the data recommendations will vary between 1 and 5 years, while the research dimensions will be active across the entire 5-year period.
- d) The field of gun violence research lacks a robust full-time research workforce.¹² One expert asserted in interviews that this field of research includes fewer than 50 researchers. Another participant stated the pipeline of gun violence researchers is thin because there are very few fellowship programs for graduate degree students in this field. Therefore, to actualize the research dimensions federal funding will need to include workforce development.
- e) The relative costliness of gun violence research can be estimated by categorizing it into one of three broad causes: homicide/intentional non-fatal, suicide, or accidental. HMA ranked research related to homicide/intentional non-fatal gun violence as the most costly because experts asserted homicides have broad impact on the community which generates broad community-wide research needs, gun ownership in these cases can be difficult to track, and data on these cases can be difficult to gather because of ongoing legal processes. HMA ranked research related to suicide as the second most costly category of gun violence research because experts asserted relatively fewer individuals in the community are impacted the per case by suicide, gun ownership in suicide cases is easier to track, and the overall scope of research questions is slightly less than homicide. HMA ranked research related to accidental gun violence as the least costly category because it represents the smallest number of gun violence deaths, gun ownership in these cases is easier to track, and many of the research questions are tied to gun storage and technology issues.

¹² Weir, Kristen. "A Thaw in the freeze on federal funding for gun violence and injury prevention. American Psychological Association. April 1, 2021 ([link](#))

- f) Federal programs requiring multi-agency coordination and those lacking a foundational infrastructure can be more complex and have higher implementation and administration costs. Experts expressed this concern in interviews, as did members of HMA expert panel.
- g) Oversight and audit costs should be factored into all new or modified federal programs. Members of our expert panel noted these costs are at times overlooked by budget estimators.
- h) Federal funding to universities should include consideration of Facilities and Administrative (F&A) costs. Often referred to as indirect costs, F&A costs cover a portion of the university's infrastructure and operational costs related to federally funded research. Such shared costs encompass the maintenance of high-tech labs for cutting-edge research; utilities such as light and heat; telecommunications; hazardous waste disposal; and the infrastructure necessary to comply with various federal, state, and local rules and regulations.¹³
- i) Several existing federal programs may serve as reliable corollaries from which to benchmark HMA's cost estimates, such as: the creation of the Patient-Centered Outcomes Research Institute Trust Fund; the budget of the U.S. Preventive Services Task Force; the budgets of the National Institute of Justice and Bureau of Justice Statistics with the U.S. Department of Justice, and the budgets of the Statewide Longitudinal Data Systems Grant Program and the Medical Expenditure Panel Survey. Information for this analysis came from our literature review as well as interviews with experts, and HMA's expert panel.
- j) Cost inflation of 1 percent per year is likely to occur over the 5-year period. This assumption was validated by HMA's expert panel.
- k) Programs requiring the federal government to develop guidance will be updated once over the 5-year period after its initial development, for a total of 2 years of activity rather than 5 years.
- l) Federal agencies will also have costs of disseminating information developed through these programs to target audiences.
- m) The addition or revision of variables to existing datasets will have relatively low costs, while creating novel datasets and surveys will have relatively higher costs.
- n) The presence of existing infrastructure, such as an existing dataset or administration, will lower costs, while the absence of existing infrastructure will increase costs.

Based on these assumptions and information derived from our research process, HMA calculated cost estimates using a formulaic process. This process was applied to each individual recommendation or dimension and varied slightly for the data recommendations and the research dimensions.

1. Staffing estimations for each program:
 - a. Data: We estimated the annual number of FTEs needed to complete each specific task named within the NORC report and applied an average annual cost of \$140,000 per FTE.
 - b. Research: Based on expert feedback, we estimated the number of small and large research studies required annually for each of the 10 research dimensions. We then estimated the average number of FTEs required for small and large studies. We then applied the average annual FTE cost of \$140,000 to each.
2. Oversight/audit: We estimated the number of additional FTEs required to oversee each program
- 8) Indirect university Facility and Administrative (F&A) costs: For each research dimension, we estimated the additional costs associated with the federal governments common practice of paying universities for their research-related F&A costs. We assumed half of all research funding would go to universities rather than the research being conducted by federal agency staff.
3. Time period: We estimated the number of years each program was active over 5-years
4. Grant funding: If grant funding was included as a part of a data recommendation, an annual amount was included for that program.

¹³ National Association of College and University Business officers (<https://www.nacubo.org/>)

5. Complexity adjustment: We applied a complexity adjustment to all programs to account for the relative level of complexity of each data or research program. HMA considered the depth of the data collection, the implementation readiness of the program, the presence of existing infrastructure from which to build, the need for research workforce development, the degree to which the program involved multiple agencies, the degree to which the program required qualitative versus quantitative data collections, and for the research programs the type of gun violence being studied (accidental, homicide, suicide)
6. Inflation adjustment: We applied an inflation adjustment to each program to account for inflation across the 5-year period.

Each of the steps identified above were multiplied for each program individually to generate a 5-year cost estimate. Finally, we validated the 5-year cost estimate (and 1-year cost estimate) of each program by comparing them to the budgets of existing federal programs with similar goals and challenges.

Several important caveats apply to HMA's cost estimates:

- Estimates are based upon the recommendations and parameters specified in the NORC Expert Panel and the Joyce Foundation reports.
- Estimates are limited to the 5-year budget window of federal fiscal years (FY) 2022 to 2026, excluding the outyears.
- Estimates do not include state and local funding recommendations specified in the NORC Expert Panel report as the focus of this analysis is only on federal recommendations.
- Estimates do not incorporate federal savings or spending increases that may result from the implementation of these programs or the policy changes that could be made as the result of these programs. However, it may be reasonable to assume that if implemented, these programs could generate reductions in gun-related mortality and injury rates which could in turn generate various societal benefits that could reduce federal spending to some degree. For example, our estimates do not include the potential economic productivity gains that could result from reductions in workplace and school absenteeism or increased life expectancy.

Appendix 4: Cost estimate Results

Based on the methodology described above, HMA calculated cost estimates for each of the 13 gun violence data infrastructure recommendations and 10 research agenda dimensions. We developed an upper and lower bound cost estimate for each report to reflect the potential variability in interpretation of the reports and the complexity of making these estimates. HMA's estimates reflect our best estimate and we acknowledge that actual costs could vary for a wide variety of reasons, the most important of which are policymakers' priorities.

We estimate federal legislation mandating the implementation of the NORC Expert Panel's 13 federal gun violence data infrastructure recommendations and the Joyce Foundation's 10-dimension gun violence research agenda will range in cost between \$587 million and \$639 million over a 5-year federal budget window from federal FY 2022 to 2026. HMA estimates the costs of NORC Expert Panel's data infrastructure recommendations will range from \$137m to \$159m over five years. See Table 2 for individual cost estimates for each of the 13 data infrastructure recommendations. HMA estimates the costs of Joyce Foundation's 10 dimensions of the gun violence research agenda will range from \$450m to \$480m. See Table 3 for individual cost estimates of each of the 10 dimensions.

The federal agencies that could be tasked with implementing the programs recommended by the NORC Expert Panel and Joyce Foundation reports are not entirely clear and could be subject to the decisions of Congressional appropriators. The NORC Expert Panel identifies federal agencies that could be tasked with implementing each of the data infrastructure recommendations. These agencies are listed in Table 2, but other agencies could be required for implementation. With regard to research, several federal agencies currently provide funding for gun violence research but it is less clear which agencies would implement the research recommendations. In general, the research community appears to view the CDC and the NIH as the most likely clearinghouses for this proposed federal funding. However, the DOD, DOJ, and the VA also conduct research on this topic. Therefore, it may be reasonable to assume that funding for each of the 10 research dimensions, could be distributed across multiple agencies such as CDC, NIH, DOD, DOJ, VA and their various sub-agencies or bureaus.

Table 2:

Five-year federal cost estimate of the 13 federal gun violence data infrastructure recommendations and the federal agencies NORC's expert panel suggested for implementation (2022-2026)

Data Infrastructure Recommendation	Lower bound (in \$ millions)	Upper bound (in \$ millions)
Create valid and reliable administrative data systems to track nonfatal guns injuries (Agency for Healthcare Quality and Research, Federal Bureau of Investigation (FBI))	\$3	\$4
Facilitate implementation of the National Incident-Based Reporting System (NIBRS) creating a feasible, well-designed technical assistance and support system to law enforcement entities (Bureau of Justice Statistics (BJS))	\$32	\$34
Create specific guidance to improve timeliness of federal data. (OMB's Office of Information and Regulatory Affairs and the Statistical and Science Policy Office)	\$1	\$2
Increase federal data accessibility (Interagency Council on Statistical Policy)	\$5	\$6
Annual survey of firearms ownership, acquisition, and storage practices (Substance Abuse and Mental Health Services Administration and the Centers for Disease Control)	\$10	\$12
Set up an interagency working group around data to create federal partnerships to address specific infrastructure gaps (that are not just reporting mechanisms). (Inter-agency working group to be created)	\$3	\$5
Create specific guidance to improve consistency and timeliness of criminal justice history reporting for use in background checks. (FBI/BJS)	\$3	\$5
Create specific guidance and recommended strategies for supporting the development and use of data collection/data use agreements based on best practice in implementation science. (Bureau of Justice Assistance (BJA))	\$5	\$6
Create resources and best practice guides for local and state governments to facilitate the integration of health, social service, criminal justice, and other data on victims and perpetrators of firearm injury and misuse. (CDC and BJA)	\$16	\$18
Improvements to the firearm ownership and use datafiles (FBI, BJS, CDC, and the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF))	\$14	\$16
Improve the Survey of Prison Inmates (SPI) (BJS)	\$20	\$22
Integrate federal public health data and criminal justice data on firearms. (inter-agency workgroup to be created)	\$18	\$20
Create a model firearms data sharing platform within the federal government (National Institute of Standards and Technology)	\$7	\$9
Total	\$137	\$159

Table 3:

Five-year federal cost estimate of the 10 dimensions of the gun violence research agenda recommended by the Joyce Foundation's expert advisory panel (2022-2026)

10 Dimensions of the Research Agenda	Lower bound (in \$ millions)	Upper bound (in \$ millions)
Firearm suicide	\$51	\$54
Community-based gun violence	\$56	\$59
Intimate partner violence with guns	\$56	\$59
Shootings by law enforcement	\$51	\$54
Mass shootings	\$51	\$54
Unintentional shootings	\$31	\$34
Impacts of lawful gun ownership and public carrying on safety	\$41	\$44
Limiting gun access to people during periods of high risk	\$31	\$34
Racial disparities and the role of the criminal justice system	\$51	\$54
Firearm related technology	\$31	\$34
Total	\$450	\$480