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Federal Funding For Research On The Leading Causes Of Death Among Children And Adolescents

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Abstract

Firearm injuries are the second-leading cause of death for US children and adolescents (ages 1–18). This analysis quantified the federal dollars granted to research for the leading US causes of death for this age group in 2008–17. Several federal data sources were queried. On average, in the study period, \$88 million per year was granted to research motor vehicle crashes, the leading cause of death in this age group. Cancer, the third-leading cause of mortality, received \$335 million per year. In contrast, \$12 million—only thirty-two grants, averaging \$597 in research dollars per death—went to firearm injury prevention research among children and adolescents. According to a regression analysis, funding for pediatric firearm injury prevention was only 3.3 percent of what would be predicted by mortality burden, and that level of funding resulted in fewer scientific articles than predicted. A thirtyfold increase in firearm injury research funding focused on this age group, or at least \$37 million per year, is needed for research funding to be commensurate with the mortality burden.

Firearm injuries are the second-leading cause of death for US children and adolescents (ages 1–18).¹ They were responsible for approximately 2,500 deaths in 2017.² Fatal firearm injuries have been increasing since 2013, with homicides increasing 44 percent and suicides up 48 percent.^{2,3} Numbers of mass school shootings have also increased in the past ten years, raising public awareness of and concern about this public health problem.¹

For prior US disease and injury epidemics, directed research investment by the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) stimulated a robust scientific response, generating solutions and improving health outcomes. For example, the creation of the President's Emergency Plan for AIDS Relief in 2003, with \$15 billion of investment in research and prevention science, led to dramatic decreases in pediatric HIV transmission and AIDS deaths. Similarly, the creation of the National Highway Traffic Safety Administration (NHTSA) in 1970 and the National Center for Injury Prevention and Control in 1992 contributed to a 76 percent decline in motor vehicle crash deaths from 1969 through 2017.^{4,5} The development of the science of injury prevention⁶ continues to inform improvements in US motor vehicle safety and decrease the burden of injury and disability. Such successes are due to the rigorous application of science to the prevention and management of these diseases and injuries, made possible through the substantial research funding provided by federal agencies.

A 2017 article demonstrated that overall funding for firearm injury prevention lagged behind funding for other diseases with a similar mortality burden.⁷ However, little attention has been given to understanding the funding for firearm injury research among pediatric populations specifically. Given increased attention to the rising rate of firearm deaths among children and adolescents, updated data on funding focused on the pediatric population are needed. Research solutions for children and adolescents may differ from those for adults, necessitating a specific and independent focus of scientific inquiry. The objective of this study was to analyze patterns of federal research funding for the leading US pediatric causes of death, to guide policy makers in understanding the specific funding allocation that may be required for the nation to decrease firearm injury mortality among children and adolescents.

Study Data And Methods

DATA SOURCES AND SEARCH STRATEGY

First, the CDC Wide-ranging Online Data for Epidemiologic Research (WONDER) database was reviewed to identify and quantify the leading causes of mortality for US children and adolescents (ages 1–18) in the period 2008–17. Four of the leading causes¹ (motor vehicle crashes, firearm-related injuries, malignant neoplasms [hereafter referred to as cancer], and congenital abnormalities) and six other causes (opioid overdoses, meningitis, tetanus, sepsis, diabetes, and HIV) that have current or historically high rates of death in this age group were reviewed.

Second, the Federal Research Portfolio Online Reporting Tools (RePORTER),⁸ a searchable database of scientific research awards from US federal agencies—the Departments of Agriculture, Defense, Health and Human Services (including the NIH and CDC), and Veterans Affairs; National Science Foundation; National Aeronautics and Space Administration; and Environmental Protection Agency—was queried to identify research awards funded in the study period for each cause of death. Medical Subject Headings, including descendant terms, that corresponded to the disease entities were used as keywords for identifying awards associated with each disease.⁹ For injury-related causes of death (for example, motor vehicle crashes), Medical Subject Headings were not sufficient to identify all funded research awards. Therefore, they were supplemented with additional keywords

identified through literature review, review of known funded grants, and expert opinion. To identify relevant keywords, ten seminal research articles were reviewed for each injury cause of death. To identify grants focused on children and adolescents, qualifiers were added to search logic strings (see the online appendix).¹⁰ We limited the search using keyword terms to only those appearing in the title or abstract of the grant. Only parent projects, not subprojects, were included. The National Institute of Justice's web page on funding¹¹ was also queried for the corresponding time period, and the results were independently reviewed by two study authors (Sonia Kamat and Jessica Roche) to determine which grants were relevant to children and adolescents. Finally, to estimate pediatric-specific funding from NHTSA, the agency's total funding was multiplied by the percentage of motor vehicle crash deaths during the study period attributable to children and adolescents.

Third, PubMed was queried to identify research publications during the study period on each cause of mortality, using the same search terms as were used to query the Federal RePORTER database (again, limited to abstract and title only). Peer-reviewed publications were used as a proxy measure for new scientific knowledge generated.

METHODS

Initial search results from the Federal RePORTER database were compiled and duplicates removed. To assess eligibility for inclusion, two authors (Roche and Kamat) independently reviewed the titles and abstracts of all articles identified in the search that focused on mortality causes with fewer than 600 research awards (motor vehicle crashes, firearm injuries, opioid overdoses, meningitis, tetanus, sepsis, and diabetes). Discrepancies between the two authors' reviews were resolved by consensus or third-party review. Research awards were included if they had relevant keywords in the title or abstract and were focused on research among a US population ages 1–18. For mortality causes with more than 600 research awards (cancer, congenital abnormalities, and HIV), the same two authors independently reviewed a random 100 awards (random 10 selected per year) to identify a relevant correction factor to be applied to the corpus of results, as it was not feasible to review all of the relevant articles. The correction factor was applied during analysis to determine the final analytic sample of research awards for those disease entities. For each research award included in the analysis, abstracted data elements included funding agency, funding amount, and years of funding. Data for each research award were abstracted for the study period. For the PubMed search, descriptive results were tabulated for each cause of mortality.

ANALYSIS

Descriptive statistics, including number of research awards, total funding amount, and funding dollars per death, were calculated for each cause of mortality. We descriptively analyzed the relationship between funding and mortality graphically, using a log-log plot with a linear regression line superimposed. We also graphically displayed the difference between actual and predicted levels (based on mortality) of funding and publications.

LIMITATIONS

Our analysis had several limitations. First, it focused on understanding the federal funding and publication history for common causes of pediatric mortality (ages 1–18), recognizing that children and adolescents are different from adults and require dedicated research and solutions specific to their biology and behavioral development. However, this analysis did not account for the fact that some funding for adult disease research may inform pediatric treatment and prevention. For example, some cancers will be treated the same regardless of patient age, and thus the funding noted for pediatric cancer is likely a conservative estimate.

Second, NHTSA awards over \$900 million each year to improve transportation safety and reduce injuries related to motor vehicle crashes. Our calculation of the portion of the funding that contributes to reducing deaths among children and adolescents—9 percent—was very conservative. Thus, our model for what is needed for adequate investment in firearm research funding is likely an underestimate.

Third, our model did not account for initial or one-time investments typically made at the onset of disease research, such as the \$15.0 billion allocated to the President's Emergency Plan for AIDS Relief in 2003 or the \$1.1 billion allocated to opioid research via the Helping to End Addiction Long-term Initiative¹² in 2018. Such initial large investment funding is often needed at the start or peak of a health crisis to jump-start the field and was not included in our estimates or modeling.

Study Results

Federal research dollars focused on leading US causes of death among children and adolescents ranged from \$597 per death for firearm injury to \$25 million per death for HIV (exhibit 1). Specifically, to address cancer, the leading non-injury cause of death among children and adolescents, the US invested over \$3 billion in research dollars during the study period, according to the Federal RePORTER database.⁸ Over 50,000 articles detailing new cancer research knowledge related to children and adolescents were generated by this investment. To address HIV, \$2 billion was invested, generating over 16,000 articles. The national opioid epidemic claimed the lives of over 3,000 children and adolescents, and the US spent \$114 million for research on this topic. Fifteen federal research awards (totaling more than \$4 million) were directed to study tetanus, which resulted in zero deaths. To address motor vehicle crashes, the leading cause of death among children and adolescents, over \$67 million in research funding was invested. For this latter mortality cause, NHTSA research funds focused on reducing motor vehicle crash deaths among children and teens were estimated to amount to an additional \$810 million.

In comparison, federal spending on firearm injury prevention research, the second-leading cause of child and adolescent death, was \$12 million in the study period (exhibit 1). Mean annual spending was \$1 million, with a low of \$135,102 in 2010 that increased to \$136,224 in 2012, \$3,699,150 in 2016, and \$4,507,067 in 2017 (data not shown). The thirty-two federal research awards for firearm injury research in the study period generated 540 articles (exhibit 1).

Exhibit 2 displays the relationship between investment in treatment and prevention research and mortality for the pediatric population. Causes of mortality among children and adolescents that were funded at levels above the upper bound of the 95% confidence interval (that is, above what would be predicted based on mortality) for the regression line during the study period were cancer and HIV, while firearm injuries were funded at a level below the 95% confidence interval. Based on this model, research on firearm injury prevention among children and adolescents would need to be funded at approximately \$37 million per year to be on par with the level of funding allocated to the other leading causes of death when considering the pediatric mortality burden associated with each cause. The model suggests that research on firearm injury prevention is 96.7 percent underfunded, or funded at roughly one-thirtieth of the predicted amount—given the typical US research funding response to disease and injury epidemics.

The majority of funds for firearm injury prevention research granted in the past decade have been from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) (exhibit 3). Although suicide accounts for 38 percent of deaths by firearm among those ages 1–18,² the National Institute of Mental Health funded only two grants (totaling \$483,135) on firearm injury prevention in this age group.

Exhibit 4 shows the standardized residuals (that is, standardized differences between predicted and actual values) for both funding and publication totals, when predicted by mortality level. Notably, firearm injuries were more than 1.5 standard deviations below the predicted level for both funding and publication, based on mortality levels. No other cause of death that we examined was more than 1.0 standard deviations below the predicted value for either of those two outcomes, which demonstrates a lack of science-based solutions generated to address mortality from firearm injuries.

Discussion

Federal support for research has been part of the US fabric dating back to the start of the republic in the 1700s.¹³ In the past seventy years alone, the role of federal funding in “game-changing” innovations has been tremendous. The development of the Global Positioning System (GPS), supercomputing, and the internet, as well as public health breakthroughs in polio prevention, were made possible because of the prioritization of federal research dollars. The current health of US children is largely the result of a century’s worth of investment in improved living standards, public health, science and technology, and advancements in the practice of medicine. Average US life expectancy since 1900 has increased over 67 percent, due in considerable measure to the marked reduction in child and adolescent mortality rates.¹⁴ With this success, there has also been a shift among the leading causes of death. Injury-related causes of death, including motor vehicle crashes, firearms, and the emerging issue of opioid-related overdoses, have replaced infectious diseases and childhood cancers as leading causes of death, due to advancements in early diagnostic medicine, vaccinations, antibiotics, and chemotherapy. The evolution of the science of injury prevention during the latter half of the twentieth century has led to a growing recognition that injury—including violence—should be viewed using a public health lens¹⁵ and that injury deaths are preventable using evidence-based medical and public health approaches.

This shifting landscape of threats to the health of children and adolescents in the US is in part attributable to the success of the US biomedical research enterprise and the investment of federal dollars in biomedical and behavioral research. No serious health threat in the past hundred years has been solved without such federal investment.

The substantial investment in research during the past several decades has improved outcomes for many diseases. For example, HIV was once seen as almost certainly fatal but is now considered a chronic disease that can be managed—and a cure may be found within the next decade. And childhood leukemia was routinely fatal in 1970 but is now often curable. These successes are celebrated as demonstrations of the innovative nature of the US research enterprise and a willingness to mobilize the scientific community to generate innovative solutions. However, this mobilization of the scientific workforce and these successes also result from a prioritization of federal resources, with over \$3 billion invested in research on the treatment and prevention of childhood cancers and over \$2 billion invested for childhood HIV research during the past ten years alone. There is no plausible argument that these gains would have been made without this federal prioritization and investment.

This is true not only for infectious diseases and cancer but also for injury-related causes of mortality. In 1965, with the publication of Ralph Nader's seminal *Unsafe at Any Speed*,¹⁶ there was a public outcry over the lack of automotive safety, and federal resources were mobilized to address this preventable cause of death. The Highway Safety Act of 1966 and the National Traffic and Motor Vehicle Safety Act of 1966 were passed, resulting in the formation of the National Highway Safety Bureau.¹⁷ Today there is an entire federal agency (NHTSA) directed toward motor vehicle safety, as well as a substantial CDC and NIH research focus on improving driver behaviors—especially among high-risk populations. This does not include auto industry funding on safety, which has also become a major marketing theme for the industry.¹⁸ Federal funding dictates research priorities for the nation's scientists, and over the past ten years more than 2,000 scientific publications detailing new knowledge on decreasing injury and death by motor vehicle crash have been generated. As a result, the rate of death from this cause was cut in half from about 10 per 100,000 people in 2000 to 5 per 100,000 people in 2016,¹ even though US residents drive more miles every year. Thus, the improvement in motor vehicle safety is a direct result of over thirty years of prioritization and federal research investment in crash prevention, safer cars, traffic death surveillance systems, improved road safety engineering, behavioral research, and policy analysis.

By contrast, pediatric firearm injury prevention is substantially underfunded in relation to the magnitude of the public health problem. According to our analysis, federal funding for this leading cause of pediatric mortality is 3.3 percent of what would be needed for it to be commensurate with the funding for other common causes of pediatric death. Not surprisingly, new scientific knowledge has also lagged behind, with fewer articles detailing new knowledge, solutions, and examinations of cost-effective strategies to inform the science of pediatric firearm injury prevention than would have been expected had funding been commensurate with that for other causes of pediatric death. This lack of an evidence base for firearm safety prevention has likely contributed to the lack of progress on, and recent increase in, firearm deaths among children and adolescents since 2013.^{1,3} In 2017, the

most recent year for which data were available, US high school students were more likely to die as a result of a firearm injury than from any other cause.^{2,3} As families, communities, and policy makers look for effective measures that should be implemented to address this alarming trend, they are met with a large gap in research knowledge resulting from two decades of reduced federal research investment. Answers to a wide array of basic scientific questions about firearm injury prevention are simply not available.³ Indeed, even accurate counts of the number of nonfatal firearm injuries every year are unavailable.¹⁹

This lack of knowledge does not result from the scientific questions or data being more difficult to research than they were for research on the molecular basis of cancer, polio prevention, or motor vehicle crash prevention. Instead, it is because federal agencies have not invested in scientists seeking to discover answers to the key research questions about firearm injuries. There is no theoretical reason why the science of firearm injury prevention would differ from that of other types of violence and injury prevention that led to substantial reductions in mortality when an injury prevention framework such as the Haddon Matrix (a paradigm for injury prevention)²⁰ or a socioecological model was used.²¹ A research agenda—a road map of twenty-six priority areas with sample questions that can be examined with standard hypothesis-driven research—was recently published by the NICHD-funded Firearm Safety Among Children and Teens Consortium.²² A recent exhaustive set of scoping reviews on the current state of knowledge in regard to firearm injury among children and teens^{23–27} noted that even many of the most basic research questions on firearm injury in this age range have not been answered. Indeed, given how little scientific investigation there has been to date, it is likely that a dollar spent on firearm research would yield more reduction in deaths than a similar dollar invested in another field that has been extensively examined. In this field, the low-hanging scientific fruit has not been detailed, and the generation of this knowledge might save a substantial number of lives. It is critical to note two things: first, that seeking knowledge and data on firearm safety in no way counters the US constitutional right to firearm ownership, and second, that motor vehicle safety has been improved even while there are more cars on the road today and more miles driven than in 1970.²⁸

Following the tragedy in Newtown, Connecticut, federal funding for research on firearm prevention increased modestly from \$136,224 in 2012 to \$4.5 million in 2017. Notably, the NICHD, the NIH agency whose mission includes ensuring “that all children have the chance to achieve their full potential for healthy and productive lives,”²⁹ recognized this critical research gap and in 2017 funded the above-mentioned Firearm Safety Among Children and Teens Consortium^{30,31} with an \$8 million investment. This grant represents the largest federal investment in creating new knowledge about keeping the pediatric population safe from firearm injury in over twenty years. Foundations have also increased their investment in this issue.³² Finally, state governments have sought to address the issue—for example, with locally focused investments of \$2 million by New Jersey and \$5 million by California.³³

If one looks to the history of other major diseases as a guide, one will note that state and private-sector foundation response is important and can be synergistic to federal funding—but it is not sufficient on its own to address a major disease burden. Private foundation grants represent 6 percent of overall research and development funding in the US, while the federal

government and research institutions account for 55 percent and 24 percent, respectively.³⁴ While foundation funding can contribute meaningfully to disease reduction, it rarely drives research on the same scale as federal funding. Furthermore, although many foundations are apolitical, federal investment in research has a mandate to remain free of political bias that foundations do not have. Thus, in this area that remains politically charged, federal funding has an even larger role to play and a responsibility to drive apolitical research solutions. Historically, most foundations have a focus on late-stage implementation research, moving evidence-based science to practice or programs. In contrast, the NIH has often been the creator of the basic biological and behavioral research that underpins a cure or solution and of definitive trials to evaluate whether an intervention works or not.³⁴ In a similar manner, state and foundation funding has the potential to bring focus and knowledge to local context but is unlikely to develop generalizable knowledge or data in areas such as epidemiology that will serve the entire nation. Indeed, in the 1960s the need for national epidemiological data was part of the justification for the creation of NHTSA. In 2019 there is an urgent need for accurate and recent epidemiological data on firearm injury.

Our analysis demonstrates the paucity of federal grant funding from 2008 to 2017 for research on pediatric firearm injury prevention. As noted by Ted Alcorn and coauthors,³⁵ in 2014 fewer than forty-five scientists maintained a dedicated focus on firearm injury. A secondary outcome of the lack of funding and focus by senior research scientists, often disregarded outside of academic circles, is the effect that scarce federal funding has on the career path of early scientists. Promotion up the academic ranks (for example, to professor) is most often based on the receipt of federal grants. Without a successful independent line of scientific inquiry, as achieved by the common metric of federal funding, promotion in rank and career advancement in the sciences is very difficult. Knowing that this career pathway does not exist, many junior scientists who would have pursued this line of research over the past twenty years have chosen alternative scientific disciplines. Thus, the paucity of federal funding noted here had a tremendous negative influence on the career choices of young scientists considering becoming experts in the prevention of firearm injuries, as demonstrated by the small numbers of publications and faculty members with careers focused on this topic. There are no senior scientists at the NICHD or CDC who currently focus solely on firearm injury prevention. In contrast, there are over 150 senior cancer researchers employed at the National Cancer Institute (NCI)³⁶ campus alone. There are currently seventy NCI-Designated Cancer Centers that form the backbone of the institute's programs for studying and controlling cancer³⁷ and employ hundreds more cancer scientists to conduct research funded by the NCI. Thus, federal funding is needed not only to conduct the research but also to fully engage and mobilize the power of scientists and research universities' talent to generate innovative solutions to decrease firearm injuries and deaths.

Conclusion

To decrease death rates among US children and adolescents, a substantial increase in research funding for firearm injury prevention is required. Our analysis, using other major diseases and the country's history of federal funding as a guide, demonstrates that approximately \$37 million per year over the next decade is needed to realize a reduction in pediatric firearm mortality that is comparable to that observed for other pediatric causes of

death. The NICHD has historically been the largest funder of pediatric firearm injury prevention. Most of the funding for childhood cancer comes from the NCI, which started in 1938 with \$0.4 million and in 2017 had annual total allocation of \$5.6 billion. The majority of research funding on diabetes is from grants from the National Institute of Diabetes and Digestive and Kidney Diseases, founded in 1947, which had a discretionary appropriation of \$1.9 billion in 2017. This figure does not include the Special Type 1 Diabetes appropriation of \$140 million that the institute oversees on behalf of the Department of Health and Human Services.³⁸

Despite the data demonstrating that injury is the leading cause of death for Americans ages 1–44 and responsible for 60 percent of deaths among children and adolescents,¹ there is currently no national institute for injury. NHTSA was created to address the national public health crisis of death by motor vehicle crash. Our analysis suggests that to see similar success in the reduction of firearm injuries, one path would be to follow the precedent of NHTSA and fund the creation of a National Firearm Safety Institute. Such an institute, funded at the \$37 million annual level suggested by this analysis, could begin to address the large gaps in foundational epidemiological and multidisciplinary behavioral research that the nation needs. It could have a transformational impact on the reduction of firearm injuries among children and adolescents parallel to what has been seen for other major causes of pediatric death in the US. ■

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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NOTES

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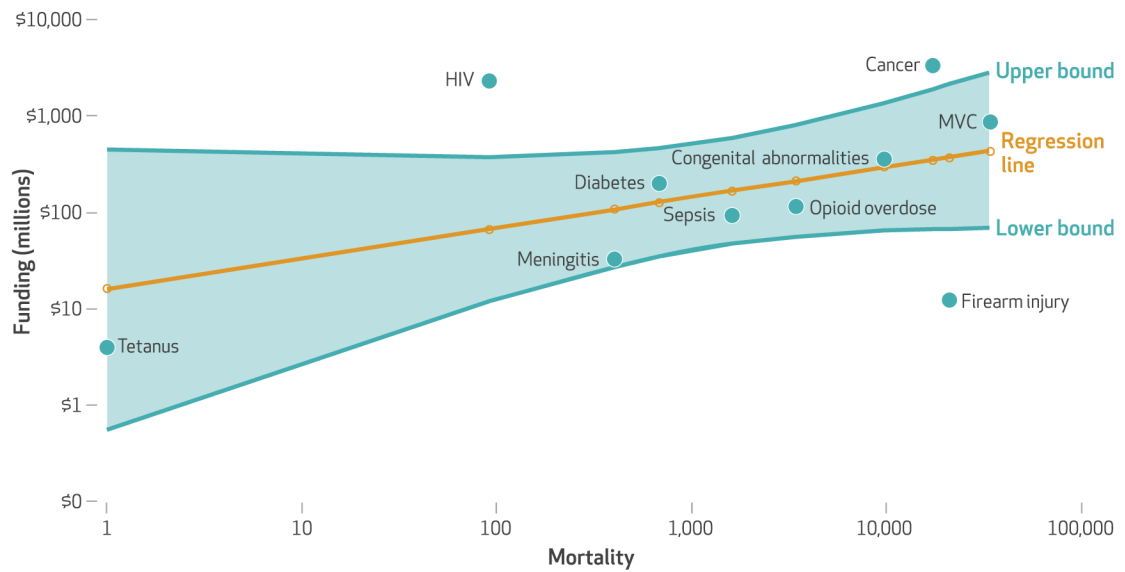


EXHIBIT 2. Relationship between research funding and mortality in children and adolescents ages 1–18, 2008–17

SOURCE Authors' analysis of data from the following sources: (1) Star Metrics. Federal RePORTER (see note 8 in text). (2) Office of Justice Programs. Expired funding opportunities (see note 11 in text). (3) Centers for Disease Control and Prevention. About underlying cause of death, 1999–2017 [Internet]. Atlanta (GA): CDC; [cited 2019 Jul 18]. Available from: <http://wonder.cdc.gov/ucd-icd10.html>. **NOTES** The exhibit shows the log of funding and that of mortality. The dots represent observed data. The upper and lower bounds refer to 95% confidence intervals for the relationship between death rates and research funding. Dollars are not adjusted for inflation. Research funding for motor vehicle crashes (MVCs) is explained in the notes to exhibit 1.

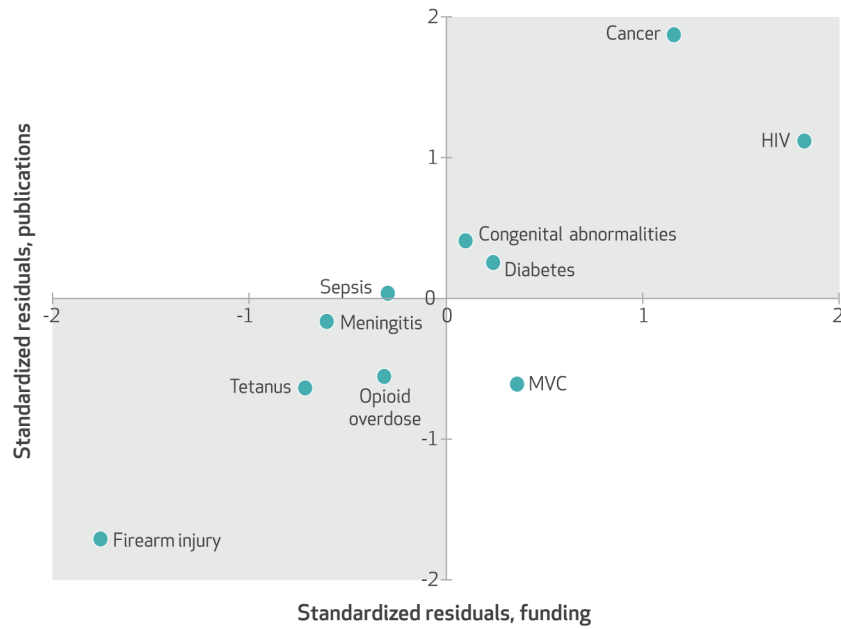


EXHIBIT 4. Standardized differences between observed and predicted funding and publication totals based on mortality in children and adolescents ages 1–18, 2008–17

SOURCE Authors' analysis of data from PubMed, plus authors' analysis of data from the following sources: (1) Star Metrics. Federal RePORTER (see note 8 in text). (2) Office of Justice Programs. Expired funding opportunities (see note 11 in text). (3) Centers for Disease Control and Prevention. About underlying cause of death, 1999–2017 [Internet]. Atlanta (GA): CDC; [cited 2019 Jul 18]. Available from: <http://wonder.cdc.gov/ucd-icd10.html>. **NOTES** The upper-right quadrant indicates causes of death for which both funding and publication levels exceeded predictions, and the bottom-left quadrant indicates causes for which both levels were less than predicted. The upper-left and lower-right quadrants show causes for which only publications levels or only funding levels, respectively, exceeded predictions. MVC is motor vehicle crash.

EXHIBIT 1

Federal research awards and corresponding peer-reviewed publications in PubMed focusing on selected causes of mortality among children and adolescents ages 1–18, 2008–17

Cause of mortality	Deaths	Research awards ^a	Funding for research (\$)	Mean funding per year (\$ millions)	Research dollars per death (\$)	Publications
Motor vehicle crash ^b	33,577	186 ^a	877,589,272	88	26,136	2,223
Firearm injury ^c	20,719	32	12,368,889	1	597	540
Cancer	17,111	5,168	3,345,352,670	335	195,508	50,235
Opioid overdose	3,385	234	114,354,067	11	33,782	2,193
Congenital abnormalities	9,627	759	357,597,201	36	37,145	7,716
Sepsis	1,602	213	94,179,634	9	58,788	4,514
Diabetes	697	396	201,424,461	20	288,987	5,781
Meningitis	400	64	33,094,457	3	82,736	3,316
HIV	91	1,996	2,310,475,179	231	25,389,837	16,087
Tetanus	0	15	4,029,047	0.4	4,029,047 ^d	1,480

SOURCE Authors' analysis of data from the following sources: (1) Star Metrics. Federal RePORTER (see note 8 in text). (2) Centers for Disease Control and Prevention. About compressed mortality, 1999–2016 [Internet]. Atlanta (GA): CDC; [cited 2019 Jul 18]. Available from: <https://wonder.cdc.gov/cmif-icd10.html>.

NOTE Dollars are not adjusted for inflation.

^aEach year of funding was counted as one award in the Federal RePORTER database (for example, a five-year project that received funding for each year would count as five awards).

^bResearch funding includes the \$67,589,272 in federal funds in the Federal RePORTER database, with 186 grants (not including National Highway Traffic Safety Administration [NHTSA] grants), and 9 percent of the \$900 million per year and \$810 million over ten years in the NHTSA budget that we calculated addressed people ages 1–18 (NHTSA funds are not specifically designated for age groups).

^cIncludes National Institute of Justice funds.

^dTotal funds, as there were no deaths from tetanus in this period.

EXHIBIT 3

Funding for firearm injury prevention among children and adolescents ages 1–18, by federal agency, 2008–17

Agency	Awards	Years	Dollars
National Institutes of Health			
Eunice Kennedy Shriver National Institute of Child Health and Human Development	11	2011 and 2015–17	5,128,917
National Institute on Alcohol Abuse and Alcoholism	6	2008–13	1,308,525
National Institute on Drug Abuse	5	2015–17	2,460,193
Office of the Director	3	2013–15	165,000
National Institute of Mental Health	2	2016 and 2017	483,135
Centers for Disease Control and Prevention			
National Center for Injury Prevention and Control	1	2009	37,583
Department of Justice			
National Institute of Justice	4	2013, 2016, and 2017	2,785,536
All	32	2008–17	12,368,889

SOURCE: Authors' analysis of data from Star Metrics. Federal RePORTER (see note 8 in text). **NOTE:** Dollars are not adjusted for inflation.