RESEARCH LETTER

Scientific Publications on Firearms in Youth Before and After Congressional Action Prohibiting Federal Research Funding

In January 1996, Congress passed an appropriations bill amendment prohibiting the US Centers for Disease Control and Prevention (CDC) from using “funds made available for injury prevention . . . to advocate or promote gun control.” This provision was triggered by evidence linking gun ownership to health harms, created uncertainty among CDC officials and researchers about what could be studied, and led to significant declines in funding. We evaluated the change in the number of publications on firearms in youth compared with research on other leading causes of death before and after the Congressional action. We focused on children and adolescents because they disproportionately experience gun violence and injury.

Methods | We identified 10 leading causes of death among children and adolescents aged 1 to 17 years using CDC data on mortality between 1991 and 2010. Each cause was then matched to a Medical Subject Heading, and PubMed was searched from 1991-2010 using causes of death and child or adolescent to determine the annual number of publications. Publications of all types and on all outcomes were included for each cause. To explore funding trends, we identified federal and private or nonfederal funding sources for firearms studies as reported by PubMed.

To quantify the change in annual publications, we used a quasi-experimental differences-in-differences design implemented with log-linear regression models. This approach assessed change in the volume of firearms publications before and after a year, relative to the change in volume of publications on other causes before and after the same cut-point year. The null hypothesis was that the percentage change in volume of firearms publications would have been the same as the percentage change in volume of nonfirearms publications despite the events of 1996.

Because the Congressional action may have had a delayed effect on publications, we allowed for a lag between the amendment and changes in annual firearms publications of 1 to 6 years. For each year, our model was specified as: publication volume = f(causes of death, firearms, post-cut-point year, firearms × post-cut-point year), in which post-cut-point year is an indicator variable for whether the data were drawn from before or after the year in question. The interaction term coefficient was the parameter of interest. Funding trends were categorized into prelag, perilag, and postlag periods.

Analyses were conducted using Stata version 12.0 (StataCorp Inc). Two-tailed P value of less than .05 was considered significant.

Results | Between 1991 and 2010, there were 310,203 deaths among youth from the 10 leading causes and 301,475 publications. Firearms accounted for 12.6% of deaths, but less than 0.3% of publications. There were 25 publications on firearms in 1991, 43 in 1993, 38 in 1994, 49 in 1995, 49 in 1996, 45 in 1997, 48 in 1998, 46 in 1999, 47 in 2000, 39 in 2001, and 33 in 2002. In contrast, publications on neoplasms, which are responsible for approximately the same number of deaths, increased from 5519 to 9707. Using the differences-in-differences model and 1999 as the cut point, the volume of publications on firearms was 24.5% (P = .001) lower than it may have otherwise been compared with publications not on firearms (Table). Using different lag times did not significantly alter the results. The estimate was...
Similar when considering only publications associated with a single cause of death (87%; differences-in-differences estimates, −19.9%; P = .03). In 1991-1996, 1997-2002, and 2003-2010, 33, 43, and 41 firearms publications reported federal funding, respectively; 25, 63, and 86 reported private or nonfederal funding.

Discussion | We only found modest increases in the number of scientific publications on firearms between 1991 and 2010, in contrast to other leading causes of death in youth. The change in number of publications on firearms was lower than anticipated compared with publications not on firearms. There was not a discrete point identified at which the pattern of publications changed. Therefore, whether the Congressional action or other events were responsible is unclear. Important limitations include use of a single database (PubMed) and lack of information on study inception. The effect on publications after President Obama’s January 2013 memorandum directing the CDC to conduct or support research on the causes of gun violence and approaches to prevent it should be evaluated.

Table. Average and Percentage Change in Annual Volume of Firearms Publications

<table>
<thead>
<tr>
<th>Modela; Cut-Point Yearb</th>
<th>Publication Topic</th>
<th>No. of Publications by Publication Year</th>
<th>Regression Model Estimates for Annual Volume of Publicationsc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1991  1995  2000  2005  2010</td>
<td>Average From 1991 to Cut-Point Year</td>
</tr>
<tr>
<td>1; 1997 Firearms</td>
<td></td>
<td>25   49   46   54   33</td>
<td>38</td>
</tr>
<tr>
<td>2; 1998 Firearms</td>
<td></td>
<td>40   44   9.1</td>
<td>40</td>
</tr>
<tr>
<td>3; 1999 Firearms</td>
<td></td>
<td>41   43   4.7</td>
<td>41</td>
</tr>
<tr>
<td>4; 2000 Firearms</td>
<td></td>
<td>44   41  −7.3</td>
<td>44</td>
</tr>
<tr>
<td>5; 2001 Firearms</td>
<td></td>
<td>44   41  −7.3</td>
<td>44</td>
</tr>
<tr>
<td>6; 2002 Firearms</td>
<td></td>
<td>43   41  −4.9</td>
<td>43</td>
</tr>
<tr>
<td>3; 1999 Unintentional injury</td>
<td>301  374  450  541  607</td>
<td>363</td>
<td>524</td>
</tr>
<tr>
<td>3; 1999 Neoplasms</td>
<td></td>
<td>5519 6320 6774 8202 9707</td>
<td>6230</td>
</tr>
<tr>
<td>3; 1999 Homicide</td>
<td></td>
<td>86   106  107  117  128</td>
<td>99</td>
</tr>
<tr>
<td>3; 1999 Suicide</td>
<td></td>
<td>286  341  321  570  622</td>
<td>317</td>
</tr>
<tr>
<td>3; 1999 Congenital anomalies</td>
<td>2701 2916 3410 4094 4902</td>
<td>3038</td>
<td>3998</td>
</tr>
<tr>
<td>3; 1999 Heart disease</td>
<td></td>
<td>1930 2046 2168 2664 3004</td>
<td>1994</td>
</tr>
<tr>
<td>3; 1999 Influenza or pneumonia</td>
<td>370 361 439 591 1391</td>
<td>355</td>
<td>657</td>
</tr>
<tr>
<td>3; 1999 Chronic lower respiratory disease</td>
<td>623 879 1247 1374 1378</td>
<td>841</td>
<td>1341</td>
</tr>
<tr>
<td>3; 1999 Septicemia</td>
<td></td>
<td>236  390  403  542  594</td>
<td>337</td>
</tr>
<tr>
<td>3; 1999 Cerebrovascular disease</td>
<td>482 592 703 835 975</td>
<td>584</td>
<td>799</td>
</tr>
</tbody>
</table>

a Model 3 uses a cut-point year of 1999 (the approximate midpoint of a period at which the US Centers for Disease Control and Prevention funding for firearms research decreased sharply) and is the primary model. Models using other cut-point years (models 1-6) are presented for comparison.
b The cut-point year separates the before and after periods, taking into account a likely lag between the events of 1996 and changes in publication volume. The cut-point year is the first year of the after period.
c Models used a log-linear differences-in-differences design with cause-of-death fixed effects.

d This represents the average annual change in publications not on firearms during the same period, despite the events of 1996.
e This represents the average annual change in firearms publications after the cut-point year, relative to the average annual change in publications not on firearms during the same period. It assumes that the change in firearms publications would have been the same as the change in publications not on firearms during the same period, despite the events of 1996.

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Author Contributions: Dr Ladapo had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Ladapo, Rodwin. Acquisition of data: Ladapo, Rodwin. Analysis and interpretation of data: Ladapo, Ryan, Trasande, Blustein. Drafting of the manuscript: Ladapo, Blustein.
negative outcomes emerged from a recent study, in which the wide. The authors concluded that the retrospective cohort of 1849 patients from 13 centers world-

relation disappeared. Therefore, the way the data were de-

omestic factor because it was significantly associated with ag-

殖isation with mortality, which likely occurs through

how to specifically use the prog-

nificant association with mortality, which likely occurs through

sion of mortality with

V600E has no role in the aggressiveness of PTC because of its
development on tumor behaviors, including local and distant

metastases and invasion. It is clear that PTC would not cause

death without aggressive tumor behaviors.

Our study demonstrated a strong synergy between

V600E and aggressive clinicopathological behaviors, as re-
lected by the strong synergy indices and the fact that the
association of mortality with

V600E or clinicopatholog-
ical behavior alone was only moderate but increased when the 2 were considered jointly. Thus, V600E does have a sig-
nificant association with mortality, which likely occurs through

promoting aggressive tumor behaviors and would be misleading-
ly lost using conventional multivariable models. Further ef-

orts are needed to define how to specifically use the prog-
nostic value of V600E clinically.

Some studies have not shown an association of

V600E with aggressive behaviors of PTC. However, most have,
as shown in large meta-analyses. Almost all factors could bias the

conclusion about the prognostic value of V600E. For ex-

ample, in a large study of 631 patients with PTC that failed to

show an association of aggressiveness of PTC with

V600E, many patients (41.5%) had only partial thyroidecto-

mey, making thorough pathological characterization diffi-
cult. In addition, the majority of the patients in this study did

not receive radioiodine ablation, potentially masking an ef-
fact of V600E on clinical outcomes given that

mutation–negative PTC is more sensitive to radioiodine ablation. Ciarrocchi and colleagues’ statement that a previous study showed no aggressive role of V600E in PTC confirms our study is incorrect. However, the 2 studies are not compa-
rable; the former was a single institution study focused on a

small number of highly selected cases and the latter was a large multicenter study of consecutive cases.

The study by Sancisi et al selected patients with distant

metastases who only had well-differentiated primary cancer;