Milestone 6

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4/3/2020

Overview

This replication paper takes a look at gun sales, background checks, and google search data in the aftermath of the Sandy Hook school shooting that took place on December 14th, 2012. It is hard for one to not know about the atrocities that took place in Newtown, Connecticut that day, as innocent school children and their teachers were murdered at school. Since then, many reforms have been put in place for gun control and school safety alike. In the immediate aftermath, however, gun sales and spiked and google searches about buying and cleaning guns soared. People knew that the number of background checks were going to increase to prevent further events like this from happening. This paper analyzes, specifically, whether there was an increase in the number of accidental gun deaths in the five-month period following this event, which could then be attributed to the increase in gun sales. The authors also took a look at accidental firearm deaths by state, so that they could see whether states with a larger increase in firearm sales also had an increase in the accidental deaths. To run this analysis, they calculated death rates among children and among adults and ran regressions, controlling for trends and seasonal patterns. In the end, the authors concluded that "an additional 60 deaths overall, including 20 children, resulted from unintentional shootings in the immediate aftermath of Sandy Hook" (Levine et al. 1).

Appendix

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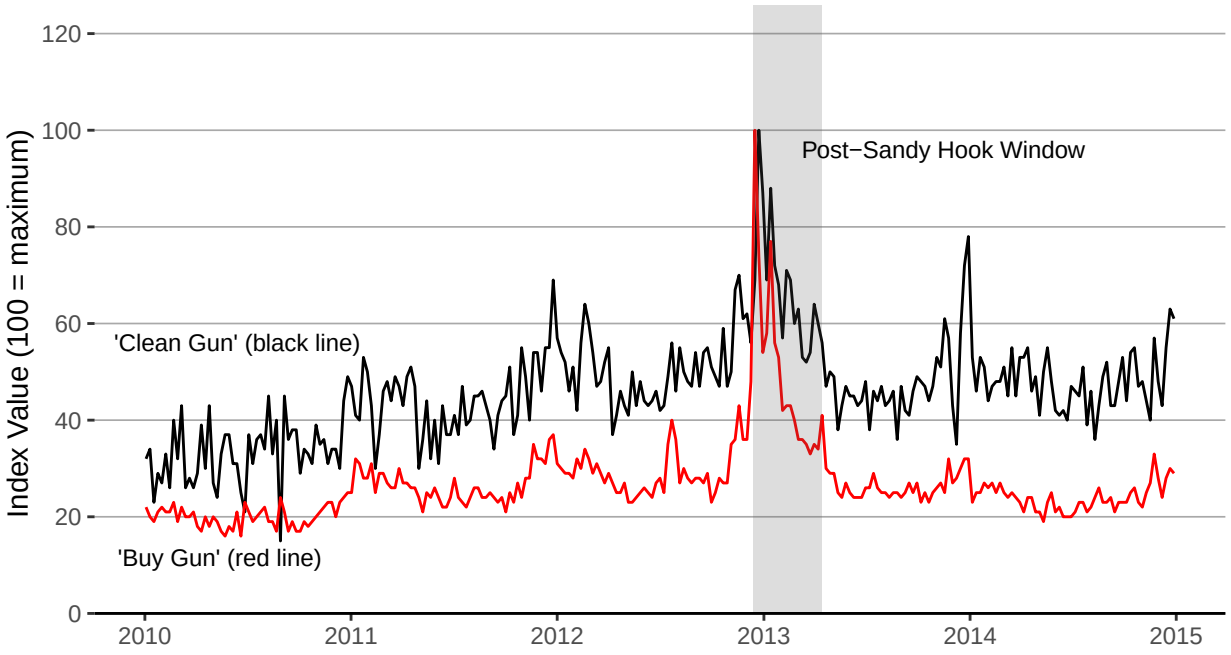

Fig. 1. Relative frequency of weekly Google searches that included the terms ...clean gun... and ...buy gun... between 2010 and 2014. This graph uses data from Google Trends (http://trends.google.com/) to track weekly patterns in search activity that included each set of words. The week with maximum search volume is indexed to equal 100 and values below 100 reflect relative search activity in proportion to the week with the maximum value.

Figure 3

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <80>

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## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <93>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## sales in each state is' in 'mbcsToSbcs': dot substituted for <93>

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## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <93>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <e2>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' population in the post-Sandy Hook period. The spike in
## sales in each state is' in 'mbcsToSbcs': dot substituted for <93>
```

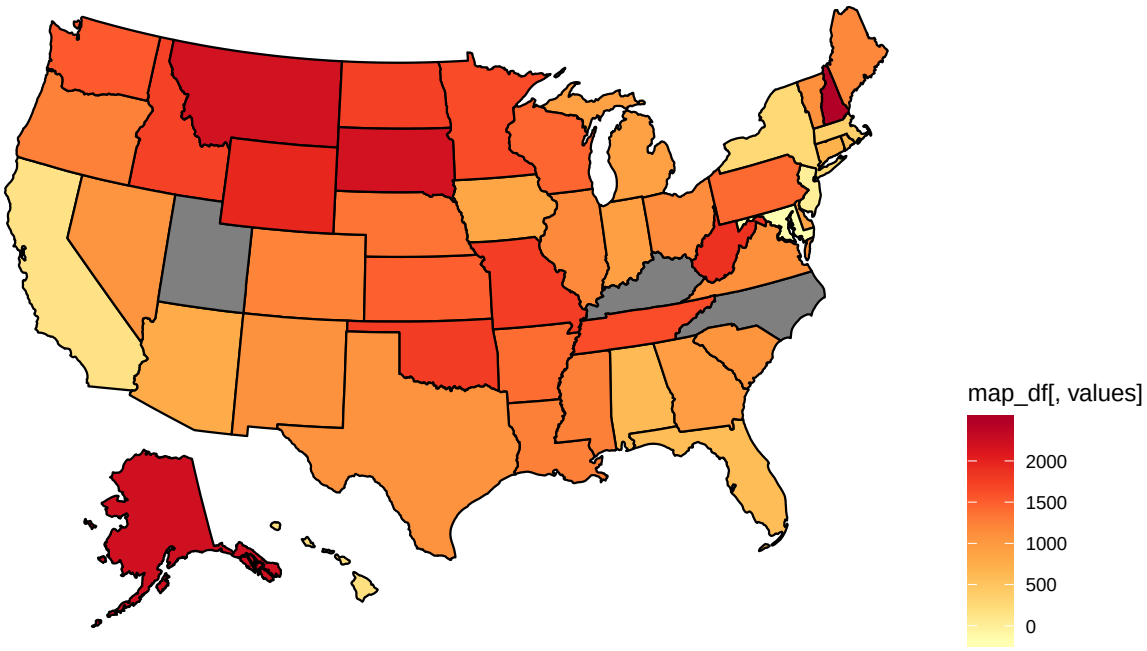

Fig. 3. Variation across states in the increase in firearm sales per 100,000 population in the post...Sandy Hook period. The spike in sales in each state is estimated as the seasonally adjusted and detrended increase in background checks in the months within the Sandy Hook window. The legend numbers represent the increase in firearm sales per 100,000 population.

For this milestone, I have been able to replicate Figures 1 and 3 of the paper. I have not yet been able to recreate the table or Figures 2 and 4. The datasets for these figures and tables requires compiling data from the CDC website. To do this, I need to download nine .zip files but when unzipped, each file becomes over 1GB in size. This has overwhelmed my storage, and when trying to do this my computer's disk space filled up. In addition, the files are in an extremely unusual format that needs to somehow be changed into a

different format before it can be processed, which I have not yet found out how to do. I have been in contact with the author and my next step is to ask for the compiled dataset or try to compile my own through the CDC Wonder website.

Extension

To test the merits of this paper, I intend to analyze the data from the map above and change the regression model used to create this increase in firearm sales map. I intend to add an interaction term between the month and the number of sales, to see if that changes the coefficient that was used to create these statistics. I also would like to try to extend the time window of the map and the regression to see if these "increase in sales" could be extended throughout the year before Sandy Hook as well, suggesting that the event may not have been the catalyst for the increase.

Footnote

This is a PDF document for my Gov 1006 final project Milestone 5. I have a GitHub repo with all relevant materials for this milestone. [1]

References

[@R-ggplot2] [@R-knitr] [@knitr2015] [@knitr2014] [@R-ggplot22016] [@R-haven] [@levine2017firearms] [@CDC]

[1] My GitHub repo can be found following this url: https://github.com/h-valencia/1006-milestone-4