Methodology

This analysis examines U.S. Google search activity related to guns and compares it with federal data that capture the number of firearm background checks nationwide. To conduct the analysis, researchers used the Google Trends API to measure keyword searches for more than 400 specific gun types (including specific manufacturers). Next, they compared this search activity with the number of gun background checks conducted by the FBI through the National Instant Criminal Background Check system. The analysis was conducted in March 2018.

Background

Previous work by Pew Research Center suggests that Google Trends data can provide a proxy measure of the public's interest, concerns or intentions. While it isn't clear why individuals may search on Google for particular terms, researchers can detect meaningful shifts in search activity by using a large collection of related terms. Google Trends data can also be supplemented with outside data related to the same subject.

List of search terms

For this analysis, researchers did not attempt to assemble a list of every gun model or manufacturer. Instead, they relied on existing lists of guns published by two outside sources: gunbroker.com (which included 255 types) and americanfirearms.org (which included 164). Researchers checked for exact duplicates across the two lists and found three; the final search term list excluded the duplicates, resulting in a total of 416 search terms.

While neither of the two lists in this analysis represents a comprehensive accounting of firearms or possible gun-related search terms, they do provide a broad array of potential search terms. The two sources were chosen because their lists were extensive; a smaller number of guns (and, therefore, potential search terms) might provide a less reliable account of gun search behavior. Because the list of search terms used in this analysis is not exhaustive, it is possible that replicating the study with a completely different set of terms would yield different results.

The complete list of search terms used by the Center is available upon request at info@pewresearch.org.

Google Trends data

To examine how Google searches for the 416 guns in this analysis changed over time and across states, researchers used the Google Trends API, which provides an index of search activity and scales results from 0 to 100.

The index does not capture the actual volume or magnitude of individual searches over time. Instead, it provides a measure of search activity *relative to the month or week with the highest level of search volume within period examined*. For example, an analysis of monthly search activity over the course of a year would express each month's search activity relative to the month with the highest level of search activity. The month with the highest level of relative search activity is given a score of 100. An analysis of weekly search activity uses the same approach, but with weeks as the unit of comparison instead of months.

The same principle applies to geography. When comparing Google search activity across different U.S. states, the index is constructed so the state with the highest level of relative search activity has a score of 100.

It is important to remember that these measures of search activity do not reveal the actual search volume for the terms included in the study. For example, while the results show that Alaska had higher search activity for the specific terms in the study than other states in 2017, Google Trends does not provide the actual number of searches that occurred in Alaska or any other state.

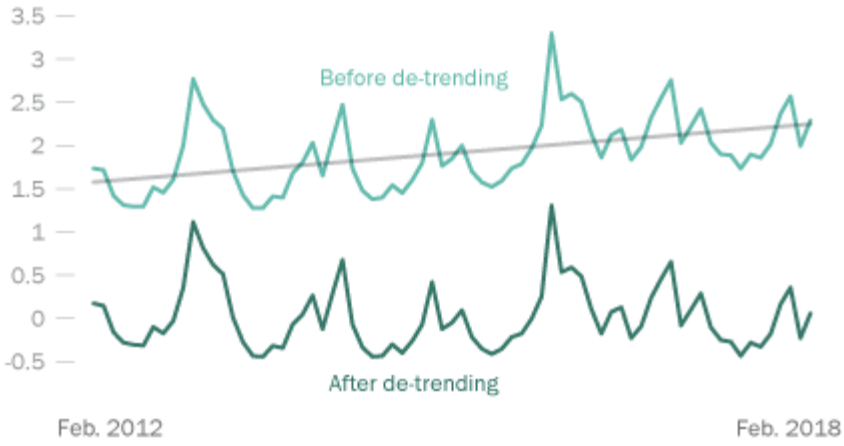
FBI background check data

To compare the Google Trends data with a commonly used measure of gun sales in the United States – background checks initiated at the time of sale – researchers used national and state-level firearm background check data from the FBI's National Instant Criminal Background Check database.

There was an overall increase in the number of background checks during the period analyzed. In order to better identify fluctuation in the number of background checks over time – while at the same time accounting for this absolute overall increase – researchers used a common statistical adjustment. They first estimated a linear trend across the number of background checks over time. Next, they subtracted the fitted line from the actual number of background checks. The remainder represents the fluctuation in background checks over time, holding constant the cumulative increase.

National Instant Criminal Background Checks

Number of background checks by month, before and after adjustment (in millions)



Note: The adjusted version of the line removes the cumulative increase in the total number of background checks.
Source: Google Trends API.

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The Pearson correlation between the monthly Google Trends index and the adjusted number of FBI background checks was 0.80. (A previous study has examined the correlation between the search term "buy gun" and adjusted background checks between 2008 and 2015 and reported a correlation of 0.71.) Researchers also calculated the correlation between a version of the Google Trends index that was lagged – meaning, shifted backward in time – by one month and the adjusted number of background checks. The correlation using this approach was 0.62, which suggests that the lagged Google Trends index does not have as strong of a correlation with the adjusted number of background checks as the contemporaneous Google Trends index does.

State-level analysis

In one section of this analysis, researchers compared the population-adjusted number of background checks in each state in 2017 with the state-level Google Trends search activity for the same year. The correlation between the two was 0.69.

Researchers obtained each state's population from the U.S. Census Bureau, using 2017 estimates. To calculate the population-adjusted number of background checks, researchers divided the number of firearm background checks conducted in each state in 2017 by each state's population.

The state-level search activity measure provides each state's search activity across the full list of firearms used in this analysis, relative to the state with the most search activity in 2017 (Alaska).

Kentucky was excluded in the state-level analysis because of the abnormally large number of background checks it reported to the FBI in 2017 (and in prior years). This high number is partly explained by a state policy that requires automatic monthly background checks on every holder of concealed-carry permits in the commonwealth. Kentucky appears to be the only state with such a policy.