

Long-Term Effects of 9/11 on the Political Behavior of Victims' Families

In this exercise, we examine a hypothesis that individuals who lost someone in the terrorist attacks of 9/11, whether a family relative or a neighbor, will have become more politically engaged.

This exercise is based on: Hersh, E. D. 2013. "Long-Term Effect of September 11 on the Political Behavior of Victims' Families and Neighbors." *Proceedings of the National Academy of Sciences* 110(52): 20959–63.

We will examine this hypothesis using several different estimation techniques, focusing throughout on the effect of the attacks on the victims' families rather than their neighbors. The CSV data file, `victims9-11.csv`, contains the following variables:

Name	Description
<code>voter.id</code>	Unique identifiers of relatives and neighbors of the victims
<code>treatment</code>	Families and neighbors of actual victims (1) vs control group (0)
<code>victim.status</code>	Families (2) vs neighbors (3) of victims and controls
<code>ge20xx</code>	Voting in the 20xx general election (Y=at the polls, A=absentee, E=early, M=by mail)
<code>fam.members</code>	Number of family members living with voter at their address
<code>age</code>	Voter's age
<code>party</code>	Voter's party affiliation (D=Democrat, R=Republicans, N=no affiliation)
<code>sex</code>	Voter's sex
<code>pct.white</code>	Proportion of non-Hispanic white voters living on the same block
<code>median.income</code>	Median income of voters living on the same block

Voters were included in the data on the basis of their relationship to actual victims - these constitute the two treatment groups - or if no such relationship existed but they were, otherwise, sufficiently similar to voters in the treatment groups - this constitutes the control group.

Question 1

We begin by reformatting the data to facilitate our analysis. The three variables that contain non-numerical values are sex, party, and voting records. Rewrite these variables using the following coding rules: for the party variable, assign the value of 1 to all Democrats, -1 to all Republicans, and 0 for all other parties and non-affiliated citizens; for the sex variable, assign the value of 1 to all female citizens and 0 to all male citizens; finally, for each of the seven voting record variables, assign the value of 1 if the individual voted in a given election, and 0 otherwise.

Question 2

We will now test the hypothesis. Calculate the sample Average Treatment Effect of the terrorist attacks on voter turnout separately for each of the seven general elections between 2000 and 2012. Focus on families of victims as the treatment, and disregard the neighbor category. For each of the seven point-estimates, compute the corresponding standard error. Assume that both the treatment and control groups form two random samples, and that the two samples are statistically independent. Then, using the quantiles of the standard normal distribution, calculate the 95% confidence intervals for each of the seven point-estimates.

Plot the results where the horizontal axis represents the elections. Provide a brief interpretation, with a particular focus on the meaning of the confidence intervals you computed.

Question 3

To examine the validity of the cross-sectional comparisons conducted in Question 2, check whether possible confounders are balanced between the treatment and control groups. Compare the means of the last six variables in the table above across the two groups along with their 95% confidence intervals. Provide a brief interpretation of the results. What can you conclude about the validity of the cross-sectional comparisons?

Question 4

Now, focus on the treatment group only. Compute the before-and-after estimate of the effect of the terrorist attacks on voter turnout for families of the victims by using the 2000 general election as a baseline for each of the subsequent six general elections. Next, calculate the standard errors corresponding to the six point-estimates. Using the standard errors, compute the 95% confidence intervals for each of the six point-estimates. Plot the results. Provide a brief interpretation of your findings. **Hint:** Since you are now tracing the same sample evolve through time, you can no longer assume the independence of sample means in calculating the standard errors; take care to incorporate the covariance between voter turnout in 2000 and a subsequent election into your calculations.

Question 5

We will now repeat the same analysis as in Question 4, but now using voters in the control group only. As before, be sure to restrict your analysis to family relatives of control victims rather than their neighbors. What does this analysis imply about the validity of the analysis in the previous question?

Question 6

Calculate the difference-in-differences estimate for the general elections immediately surrounding the attacks, 2000 and 2002. Calculate the standard error for your estimate, and provide the 95% confidence interval. Once again, you are allowed to use the quantiles of the standard normal distribution in calculating the confidence interval. Provide a brief interpretation of the result.

Question 7

Repeat the previous difference-in-differences analysis for all six elections following the attacks. Throughout this analysis, use the 2000 election as the baseline as done in the previous question. Plot the results with the horizontal axis representing different elections. Provide a substantive interpretation of the results.