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ABSTRACT

How Do Mass Shootings Affect Community Wellbeing?*

Over the past four decades, more than 2,300 people have been the victims of mass shootings involving a firearm in the United States. Research shows that mass shootings have significant detrimental effects on the direct victims and their families. However, relatively little is known about the extent to which the impacts of these tragedies are transmitted into communities where they occur, and how they influence people beyond those directly affected. This study uses nationally representative data from the Gallup-Healthways survey to assess the spillover effects of mass shootings on community wellbeing and emotional health outcomes that capture community satisfaction, sense of safety, and levels of stress and worry. We leverage differences in the timing of mass shooting events across counties between 2008 and 2017. We find that mass shootings reduce both community wellbeing and emotional health. According to our results, a mass shooting is associated with a 27 percentage point decline in the likelihood of having excellent community wellbeing and a 13 percentage point decline in the likelihood of having excellent emotional health four weeks following the incident. The effects are stronger and longer lasting among individuals exposed to deadlier mass shootings. Furthermore, the reductions in wellbeing are greater for parents with children below age 18. Our findings suggest that mass shootings have significant societal costs and create negative spillover effects that extend beyond those immediately exposed.

JEL Classification: I12, I18, K42

Keywords: mass shooting, gun, crime, violence, happiness, wellbeing, mental health, depression, homicide

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1. Introduction

The United States is experiencing a gun violence epidemic. A particularly tragic aspect of this epidemic is the incidents of mass shootings occurring in communities throughout the country. Although there is no universally accepted or official definition of mass shooting, the general criteria used to categorize an event as a mass shooting incident is the murder of four or more people (not including the shooter) with a firearm in a single incident that is not related to more conventionally motivated crimes such as armed robbery, gang shootings, or drug violence.[1] Despite the lack of an official definition, the general perception is that the frequency of high-fatality indiscriminate killings in public has risen significantly in recent years (Agnich, 2014; Lowe & Galea, 2015, 2017; Webster, 2017; Lin et al., 2018).[2] Moreover, the coverage of mass shootings in the media has increased substantially over time, which has then led to a greater public awareness of these tragic events (Roeder, 2016; Jetter & Walker, 2018).[3] Recent evidence shows that mass shootings also evoke high policy interest, despite the fact that they account for less than one percent of firearm deaths annually in the United States (Luca et al., 2020).[4]

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[1] This definition is consistent with those in two recent reports produced by the Congressional Research Services (Bagalman et al., 2013; Krouse & Richardson, 2015) and a classification report commissioned by the Federal Bureau of Investigation (Morton & Hilts, 2008).

[2] Given the differing opinions on what constitutes a mass shooting and the period over which to observe trends, there is a disagreement about whether the frequency of mass shootings has risen or remained steady. For example, focusing on a period between 2006 and 2019 and relying a database compiled by USA Today, Ferguson (2019) argues that the frequency of mass shooting incidents has not increased. Similarly, Fox & DeLateur (2014) conduct a visual inspection of the mass murders between 1976 and 2011 compiled from the FBI's Supplementary Homicide Reporting (SHR) and conclude that the number remained stable over that period. However, it is important to note that both these studies rely on a more comprehensive definition of mass shooting that does not distinguish between public and non-public venues and includes mass shootings related to gang activity, domestic violence, and drug deals. Some argue that mass shootings that stem from domestic violence, gang activity, organized crime, or drug deals are contextually distinct from indiscriminate killings in public venues, and therefore should be classified separately (e.g., Duwe et al., 2002; Gius, 2015). More restrictive definitions (e.g., Mother Jones) that focus on higher-profile events motivated by mass murder in public venues point to a clear upward trend in recent years.

[3] According to LexisNexis, the number of news stories mentioning "mass murder" has increased from a little over 1,000 to almost 38,000 annually between 2010 and 2019.

[4] Luca et al. (2020) show that a single mass shooting leads to a 15 percent increase in the number of firearm bills introduced within a state in the year after a mass shooting. Furthermore, the political party controlling the state legislature appears to matter. Republican-controlled legislatures pass significantly more laws loosening gun

Despite the attention that mass shootings galvanize in the public, the media, and among policymakers, rigorous investigations of their health effects on survivors and their communities have been limited.[5] There is particularly little research on whether mass shootings have an impact on the mental health of indirectly exposed individuals, such as those who are not direct witnesses, but live within the communities where these shootings occur. While the direct victims and their families arguably suffer the most serious consequences of mass shootings, and accordingly receive the most attention, the overall effects may be more pervasive and extend far beyond those directly exposed, resulting in adverse consequences on community wellbeing. Given the enormous societal costs associated with poor mental and emotional health, it is therefore critical to understand the effects of mass shootings on emotional wellbeing of populations in order to assess the overall welfare consequences.[6] Evidence that these incidents indeed have negative spillovers that extend beyond those immediately exposed could influence the costs and benefits of policies to prevent or reduce the harmful consequences of mass shootings. Relatedly, asking which groups of populations would suffer the worst repercussions in terms of community and emotional wellbeing could have important implications for the optimal targeting of public resources following incidents of mass shootings.

In this paper, we examine the effects of mass shootings on the community and emotional wellbeing of American adults, using data from the restricted-access Gallup-Healthways survey

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restrictions, while Democrat-controlled legislature do the opposite, but the effect for Democrat-controlled legislatures is insignificant.

[5] The urgent need for additional research on the health effects of mass shootings has also been articulated in recent studies across disciplines (e.g. Iancu et al., 2019; Rowhani-Rahbar, Bellenger, & Rivara, 2019; Travers, McDonagh, & Elkit, 2018).

[6] Mental disorders top the list of the most costly health conditions by a substantial margin, with spending at $201 billion annually (Roehrig, 2016).

between 2008 and 2017. To our knowledge, our analysis represents the first nationwide investigation of the impact of mass shootings on emotional health of people living in communities where these tragedies occur. Our primary source of data on mass shootings is Mother Jones, an investigative news organization that maintains an open-source database documenting high-profile, indiscriminate rampages in public places resulting in four or more victims killed by the attacker.[7]

We identify the causal effects of mass shootings by exploiting the county-specific variation in exposure to such events over time using a difference-in-differences research design. Our identification strategy is based on the premise that, conditional on residing in a county that experiences a mass shooting, whether the incident of the shooting occurs during the weeks before or after an individual is interviewed by Gallup is as good as random. Specifically, we compare the community and emotional wellbeing of individuals who are interviewed by Gallup right after a mass shooting with those who are interviewed right before in counties where shootings occur relative to other counties. We control for month-by-year and county fixed effects in all specifications, thereby separating out the impacts of the mass shootings from other existing trends in wellbeing.

Our paper contributes to a growing literature on the effects of mass shootings on individual and community health. Two notable and recent examples are Rossin-Slater et al. (2019) and Dursun (2019) who study the impact of mass fatal shootings on health outcomes. Rossin-Slater et al. (2020) examine the impact of fatal school shootings on the mental health of local youth, as measured by the use of prescription antidepressants. They find that local exposure

[7] The Mother Jones database excludes shootings stemming from more conventionally motivated crimes such as armed robbery or gang violence.

to school shootings increases youth antidepressant use by about 21 percent in the following two years. Dursun (2019) studies the impact of in utero exposure to mass shootings on infant health and shows that women who experienced a mass shooting in their county during pregnancy are more likely to have very low birthweight and very premature babies. These studies are relevant for our analysis not only because they consider health impacts of mass gun violence, but also because they use an identification strategy similar to ours.

In addition to the economic studies mentioned above, there is a sizeable literature in epidemiology, psychiatry, and psychology that studies the mental health impacts of mass shootings. Many studies in this literature suggest a negative association between exposure to mass shootings and psychological health, as measured by posttraumatic stress symptoms, depression, anxiety, fear, and decline in perceived safety.[8] However, these are typically case studies that consider single events and suffer from several methodological limitations, such as reliance on small samples, lack of control groups or pre-shooting data, and challenges to generalizability from decades-old single events. Selective response bias is another important problem in some of these studies, as individuals who come forward to share their feelings in the aftermath of shootings are unlikely to reflect the sentiments of the entire community.

Our results provide consistent evidence that mass shootings have adverse effects on the emotional and community wellbeing of American adults. Specifically, we find that a mass shooting reduces the probability of having excellent community wellbeing by 27 percentage points and the probability of having excellent emotional health by 13 percentage points four

[8] For example, one widely cited study interviewed 135 survivors after a mass shooting and found that 20 percent of the men and 36 percent of the women met criteria for PTSD (North et al., 1994). However, this study suffers from limitations such as small sample size and the lack of a control group. See Shultz et al. (2014) and Lowe & Galea (2017) for reviews of this literature.

weeks following the incident. Furthermore, the effects are stronger and longer lasting for those exposed to mass shootings with more victims (e.g. for those exposed to shootings with 10 or more victims). Our results are robust to alternative definitions of mass shootings and are not driven by any particular subset of shootings.

The rest of this paper is laid out as follows. We discuss the data in Section 2 and describe the estimation strategy in Section 3. The results are presented in Section 4, and Section 5 concludes the paper with a summary of the overall findings and a discussion of the implications.

2. Data

Mass Shooting Data

Our list of mass shooting events comes from Mother Jones, an investigative news organization that maintains an open-source database of mass shootings (Follman et al., 2020).[9] According to the criteria used by Mother Jones, an incident is defined as a mass shooting if the perpetrator took the lives of at least four people, excluding himself or herself, the shooting occurred using a firearm in a public place, and it was not related to gang activity, armed robbery, or domestic violence.[10] Based on these criteria, Mother Jones identified 47 mass shootings that had occurred between 2008 and 2017, in which a total of 426 individuals were killed and 898 individuals were wounded.[11] The Mother Jones's definition is consistent with the FBI's classification of mass murder (Morton & Hilts, 2008) and two recent reports produced by the

[9] Mother Jones (https://www.motherjones.com) provides news, commentary, and investigative reporting on topics including politics, the environment, human rights, health, and culture and has a readership of more than 10 million people each month.

[10] Since January 2013, Mother Jones included mass shootings that took the lives of at least three people, excluding the perpetrator. Four of the 47 mass shootings used in our analysis have only three victims, but our results do not change when we restrict the list of shootings to those with at least four victims.

[11] There are four counties that had multiple mass shootings over our study period between 2008 and 2017. Treatment assignment for these counties was made based on the first shooting.

Congressional Research Services (Bagalman et al., 2013; Krouse & Richardson, 2015). The Mother Jones database is commonly used by researchers studying questions related to mass shootings (e.g., DiMaggio et al., 2019; Gius, 2015; Lin et al., 2018; Pappa et al., 2019; Porfiri et al., 2019; Wallace, 2015).

Figure 1 illustrates the distribution of mass shootings across counties in the U.S. As shown in the figure, mass shootings are fairly sporadically distributed, with 26 states having at least one mass shooting between 2008 and 2017. Figure 2 shows the number of mass shootings over time along with a list of states where the incidents occur in each year. It is clear from the figure that the number of mass shootings has trended upward over time, increasing from three mass shootings in 2008 to eleven incidents in 2017. Furthermore, California has the highest number of mass shootings with nine incidents during the analysis period, followed by four incidents in Washington, and three shootings each in Colorado, Florida, and Texas.

It is important to note that there are databases compiled by other news and research organizations tracking mass shootings (e.g., USA Today, Gun Violence Archive, and Stanford University's Mass Shootings in America database). These databases have larger counts of mass shooting as they are based on different criteria, such as inclusion of incidents with non-firearm weapons, victim counts including those either killed or wounded, shootings that occur in non-public venues, and inclusion of more conventionally motivated crimes. While these larger listings are useful for investigating the broader problem of violence, we believe our definition of random, nonsensical, and indiscriminate shootings captured by Mother Jones is best suited for

the purposes of our study, since it is exactly these characteristics that we argue are the source of community-wide mental health repercussions.[12]

In sensitivity analyses, we estimate our models using the USA Today database. Our results are robust to using this alternative measure. We did not perform sensitivity analyses with the Gun Violence Archive (GVA) and Stanford's Mass Shootings in America (MSA) databases because the data collection started in 2014 for GVA and in 2012 for the MSA database. Furthermore, GVA differs from other datasets in that gang- and drug-related incidents are included. The MSA database relies solely on online media sources to identify mass shooting events, The records in the MSA span a time period that includes the transition from traditional media to digital media in reporting, and therefore, the numbers of incidents per year partially reflect the collection methodology and not just changes in incident frequency. For example, the more than threefold rise in mass shooting incidents from 2014 to 2015 shown in the Stanford data likely reflects increased online reporting and not necessarily a true increase in the frequency of mass shootings (Smart, 2018).

Data on Community and Emotional Wellbeing

The data on community and emotional wellbeing come from the restricted-access Gallup-Healthways survey (Gallup hereafter). The daily poll covers all 50 states and Washington D.C. and surveys more than 500 American adults on their perceptions of their own physical and mental health (e.g. health conditions, self-assessed health, and experiences of stress, worry, and joy), financial wellbeing, social relationships (e.g. having supportive relationships), and

[12] Taking a conservative approach also ensures that, if anything, our results would be a lower bound of the true effect of mass shootings on community and emotional wellbeing.

community wellbeing (e.g. liking where they live, feeling safe, and having pride in the community). Gallup data have been used in past research to study the effects of public policies on social, mental, and physical wellbeing (e.g., Flavin, 2018; Sommers et al., 2015).[13] Importantly for our analysis, the restricted-access micro data provide the exact date of the interview and respondents' county of residence, which allows us to identify respondents who were exposed to a mass shooting in their community. The data also contain rich demographic information, including respondents' age, sex, marital status, parental status, race/ethnicity, and educational attainment. Gallup weights the data daily to mitigate potential selection and nonresponse bias. With the use of sampling weights, the data are nationally representative.

We use the Gallup data to construct eight main outcome variables of interest – three measures of community wellbeing (community wellbeing index, an indicator for excellent community wellbeing, and an indicator for poor community wellbeing), three measures of emotional wellbeing (emotional wellbeing index, an indicator for excellent emotional health, and an indicator for poor emotional health), an indicator for overall excellent community and emotional wellbeing, and an indicator for overall poor community and emotional wellbeing.

We identify four questions in the Gallup related to community wellbeing. Specifically, respondents are asked to report on a scale from 1 to 5 how strongly they agree with the following statements: 1) I am proud of my community or the area where I live; 2) I always feel safe and secure; 3) The city or area where I live is a perfect place for me; and 4) I am satisfied with the

[13] Although the data in Gallup are self-reported, studies have shown that self-reported measures of wellbeing are strongly suggestive of actual wellbeing. For example, those who report higher levels of satisfaction are also more likely to laugh, smile, and demonstrate other behavioral characteristics indicative of happiness (Watson & Clark, 1991; Myers, 1993; Myers & Diener, 1995). Self-reported measures of wellbeing also correlate strongly with assessments from peers, friends, family, and professional clinicians (Myers & Diener, 1995).

city or area where I live.[14] For each of these four questions, we create indicator variables equal to 1 for those who responded "agree" (4 on the 1 to 5 scale) or "strongly agree" (5) and equal to 0 for those who responded "neither agree nor disagree" (3), "disagree" (2), or "strongly disagree" (1). We then construct an index measure ("Community Wellbeing Index") equal to the sum of the four indicator variables. For ease of interpretation, we standardize the index by subtracting the mean and dividing by the standard deviation. A higher "Community Wellbeing Index" value suggests that the respondent has a greater level of community wellbeing. We also create an indicator of "Excellent Community Wellbeing," which takes on the value of 1 if the respondent answered "agree" or "strongly agree" to *all* four of the above statements relating to community wellbeing, and 0 otherwise. Similarly, a measure of "Poor Community Wellbeing" is constructed as binary indicator, which is equal to 1 if the respondent did not answer "agree" or "strongly agree" to *any* of the four statements, and 0 otherwise.

To measure emotional wellbeing, we use a series of questions in which the respondents are asked to report whether they experienced certain emotions yesterday: 1) Did you smile or laugh a lot yesterday?; 2) Did you experience a lot of enjoyment yesterday?; 3) Did you experience a lot of happiness yesterday?; 4) Did you experience a lot of worry yesterday?; 5) Did you experience a lot of sadness yesterday?; 6) Did you experience a lot of stress yesterday?[15] For the first three questions, we create indicator variables equal to 1 if the respondent replied "Yes" to the question and equal to 0 if the respondent replied "No." The next three questions inquire about negative emotions, so we create indicator variables equal to 1 if the response was "No" and equal to 0 if the response was "Yes." We then construct an index measure ("Emotional

[14] These variables are consistently available for the years 2014 through 2016.
[15] These variables are consistently available for the years 2008 through 2016.

Wellbeing Index") equal to the sum of the six indicator variables. We standardize the Emotional Wellbeing Index for ease of interpretation. A higher "Emotional Wellbeing Index" suggests that the respondent has a greater level of current emotional health. We also create a measure of "Excellent Emotional Health," an indicator variable equal to 1 if all six of the above indicator variables equal 1, and a measure of "Poor Emotional Health," an indicator variable equal to one if three or more of the above indicator variables equal zero.

Finally, we construct two measures of overall community and emotional wellbeing. "Excellent Community and Emotional Health" is a binary indicator that takes on the value of 1 if *both* the "Excellent Community Wellbeing" and "Excellent Emotional Health" variables are equal to 1, and 0 if either indicator is 0. Similarly, "Poor Community and Emotional Health" is an indicator that takes on the value of 1 if *both* the "Poor Community Wellbeing" and "Poor Emotional Health" variables are equal to one, and 0 otherwise.

We control for a number of individual characteristics in our models, including age, sex, marital status, parental status, race/ethnicity, and educational attainment. Table 1 presents summary statistics for these variables separately for the treatment and control groups. As shown in the table, there are no statistically significant differences between respondents interviewed within a period 28 days prior to and after a shooting. The only exception to this pattern is age, where those interviewed post-shooting are on average one year older ($p<0.05$) than those interviewed pre-shooting. We control for all these demographic variables in our regression models. In supplementary analysis, we examine whether the impact of exposure to a mass shooting is affected by several observable characteristics of the individuals by estimating our models separately by sex, parental status, race/ethnicity, and educational attainment. In Table 2, we present the non-regression adjusted means of each outcome separately for the pre-shooting

and post-shooting periods; all but one of the differences are not statistically significant between the treatment and the control groups.

3. Estimation Strategy

Our goal is to estimate the causal impact of mass shootings on the measures of community and emotional wellbeing among persons living in communities where these incidents occur. We restrict our Gallup sample to respondents who lived in a county that ever experienced a mass shooting and who were interviewed up to 28 days before or up to 28 days after the shooting.[16] We exclude those who were interviewed on the exact day of the shooting because we cannot identify whether the interview occurred prior to or after the shooting on that day.

We use a difference-in-differences (DD) research design to compare measures of community and emotional wellbeing after mass shootings occurred for individuals living in the counties where these tragedies occurred, relative to individuals living in counties where mass shootings had not yet occurred. Formally, the DD research design can be specified as follows:

$$Y_{ict} = \beta_0 + \beta_1 \, PostShooting_{ict} + X_{ict}\beta_2 + \delta_c + \tau_t + \varepsilon_{ict}, \qquad (1)$$

where Y_{ict} is an outcome variable of interest for respondent *i* in county *c* at time *t*; $PostShooting_{ict}$ is an indicator that is equal to 1 if the respondent was interviewed after the shooting in his/her county, and 0 otherwise; X_{ict} is a vector of demographic variables including age, sex, marital status, parental status, race/ethnicity, and educational attainment. We also

[16] This approach is similar to the one used by Dursun (2019), who studies the impact of intrauterine exposure to mass shootings on birth outcomes using monthly data at the county level.

include a vector of county fixed effects, δ_c, to control for all time-invariant differences across counties, and month-by-year fixed effects, τ_t, to account for common time trends. Furthermore, all regressions are weighted by sampling weights provided by Gallup, and the standard errors are clustered at the county level using the wild cluster bootstrap method. The parameter of interest in equation (1) is β_1, which captures the impact of the county-level exposure to a mass shooting on adults' emotional and community wellbeing.

The specification in equation (1) is restrictive in that it imposes the relationship between a mass shooting and the outcomes of emotional and community wellbeing to be constant over time. This may especially be unlikely in our context if, following incidents of mass shootings, people go through multiple phases of coping, during which they exhibit particular emotions, behaviors, and other reactions (Alexander & Klein, 2005; Freedy & Simpon, 2007; Goldmann & Galea, 2014).[17] Standard DD estimates may be biased if the treatment effect is not constant over time (Goodman-Bacon, 2018). Therefore, we next specify a more flexible, non-parametric model, in which the $PostShooting_{ct}$ indicator is replaced with a vector of variables indicating the number of weeks after the shooting:

$$Y_{ict} = \alpha + \sum_{j=1}^{4} \vartheta_j 1(Weeks\_After\_Shooting_{ict} = j) + \gamma X_{ict} + \delta_c + \tau_t + \varepsilon_{ict}. \quad (2)$$

[17] A report by the Substance Abuse and Mental Health Services Administration (SAMSHA) characterizes these stages of healing as an acute phase immediately after the event, an intermediate phase several days to weeks afterward, and the long-term phase. The acute phase is typically characterized by denial, shock, and disbelief. The intermediate phase is manifested by fear, anger, anxiety, transient panic, retaliatory attacks, difficulty paying attention at work or school, depressed feelings, and disturbed sleep. Finally, the long-term phase is characterized by coming to terms with realities with alternate periods of adjustment and relapse (SAMHSA, 2017). Most survivors develop resilience or an ability to successfully adopt to stresses in the long-term phase (Goldmann & Galea, 2014; Haglund et al., 2007). Some individuals may even feel greater self-worth and sense of life purpose, expressing feelings of gratitude for having survived the mass shooting (Novotney, 2018).

In equation (2), $1(Weeks\_After\_Shooting_{ict} = j)$ is a binary variable taking on the value of 1 if the respondent was interviewed *j* weeks after a mass shooting where j=[1,4]. The ϑ_j terms capture the impact of the shooting on the outcome *Y* in week *j*, relative to the entire pre-shooting period. All other terms in Equation (2) are defined as in Equation (1). Equation (2) represents our preferred model.

The reliability of estimates in the difference-in-differences design hinges upon the assumption that the outcome variables would have trended similarly across counties in the absence of a mass shooting. To assess the validity of this parallel trends assumption, we perform an event study analysis that enables us to trace out the differences in the outcomes of wellbeing in the weeks leading up to and following a mass shooting. The event study analysis is implemented by estimating an augmented version of equation (2), which includes binary indicators of exposure to a mass shooting both in the weeks prior to or following an incident. If the parallel trends assumption is valid, then we would expect the estimated coefficients for the weeks prior to the shooting to be statistically indistinguishable from zero.

The estimates from the event-study analysis, along with the 95 percent confidence intervals, are presented in Figure 3.[18] As shown in the figure, for each of the nine outcome variables, not a single pre-shooting coefficient is statistically significant. Moreover, for the majority of cases, the coefficients pertaining to weeks prior to a shooting are close to zero in magnitude and do not exhibit visible trends in a specific direction. Taken together, the evidence

[18] In the event study analysis, the week immediately preceding the shooting is omitted as the base category. However, in a recent paper, Borusyak & Jaravel (2017) show that the event-study specification suffers from an under-identification problem in contexts where all units are eventually treated. To overcome this problem, they recommend excluding two pre-treatment periods as omitted categories in a linear event-study. Following their suggestion, we re-estimate the event-study models omitting two periods prior to a mass shooting. As shown in Appendix Figure 1, the pre-shooting indicator variables are all statistically insignificant.

presented in Figure 3 supports the validity of the parallel trends assumption. Accordingly, our estimates from the DD model likely represent the causal effect of exposure to mass shooting incidents and are not due to pre-existing differential trends between county residents who were interviewed before versus after the shooting.

4. Results

Table 3 presents results from the model specified in equation (1). The estimates from the models pertaining to community wellbeing are presented in the first three columns, while the estimates from the models capturing emotional wellbeing are shown in columns 4-6. The last two columns display the estimates obtained from the models that combine the two domains of outcomes. We find that exposure to a mass shooting in past 28 days leads to a 13.6 percentage point ($p<0.10$) decline in the probability of having excellent community wellbeing. To put this estimate into context, about 50 percent of respondents had excellent community wellbeing in the pre-shooting period. Thus, our estimated treatment effect is equivalent to a 27 percent decline in excellent community wellbeing. We find no statistically significant impact of mass shootings on the intensive measure of the community wellbeing index or the probability of having poor community wellbeing. According to the point estimate shown in column (1), a mass shooting causes a 0.09 standard deviation decline in the overall community wellbeing captured by our composite index, though the estimate is not statistically significant.

Turning to the estimates for emotional wellbeing presented in columns 4-6 of Table 3, we find a 6.5 percentage point ($p<0.10$) decline in the probability of having excellent emotional health caused by exposure to a mass shooting. This estimate translates into a 15 percent drop in the likelihood of having excellent emotional health compared to pre-shooting levels. The

estimate for the intensive measure of emotional wellbeing (emotional wellbeing index) is negative, and the estimate for poor emotional health is positive – though these estimates are not statistically significant at conventional levels. Finally, the last two columns reveal that mass shootings reduce the probability of having excellent overall social and emotional health by 13.3 percentage points ($p<0.05$) or 47 percent. The estimate on the likelihood of reporting poor community and emotional wellbeing is positive, though again, the estimate is statistically insignificant at conventional levels.

Table 4 presents our estimates from equation (2). In this specification, we disaggregate the post-shooting indicator and assess the impact of exposure to a mass shooting separately week-by-week following the incident. These results are quite revealing of the dynamic impact of mass shootings on emotional and community wellbeing. For example, living in a community where a mass shooting had occurred appears to have a gradually increasing negative effect on the composite index of community wellbeing in the four weeks following the event. By the fourth week, the effect is statistically significant ($p<0.10$) and substantial in magnitude (0.7 standard deviation). With respect to the likelihood of reporting excellent community wellbeing, there is a noticeable drop in the week immediately after the shooting, and this effect seems to persist until four weeks post-shooting. The treatment effect grows over time from -12.9 percentage points ($p<0.10$) one week post-shooting to -27.4 percentage points ($p<0.05$) four weeks post-shooting. The estimates on the likelihood of reporting poor community wellbeing are statistically insignificant.

Similarly, the negative effect on the composite index of emotional wellbeing grows during the weeks following a mass shooting from 0.04 standard deviation in the first week, to 0.09 standard deviation in week two, to 0.17 standard deviation in week three, and 0.21 standard

deviation in the fourth week. However, only the estimate on the third week indicator is statistically significant ($p<0.05$). Furthermore, declines in the probability of having excellent emotional health grow over time from an imprecisely estimated 6.1 percentage point drop one week post-shooting to a statistically significant 12.6 percentage point ($p<0.05$) decline four weeks post-shooting. Finally, the estimates shown in column 6 pertaining to the likelihood of being in poor emotional health follow a pattern consistent with the results presented in columns 4 and 5, though the estimate is only significant for the indicator of three weeks post-shooting. Finally, the estimates on the indicators of combined wellbeing in community and emotional dimensions shown in columns 7 and 8 are consistent with the pattern obtained in the earlier columns of Table 4. The probability of reporting excellent community and emotional health declines consistently from week 1, a 14.7 percentage point decrease ($p<0.05$), to week 4, a 22.8 percentage point decrease ($p<0.01$). However, the indicators in column 8 are not statistically significant.

As mentioned earlier, there is evidence to suggest that mass shootings are not only becoming more frequent, but also getting deadlier (Berkowitz et al., 2019; Lankfort & Silver, 2020). This could be an especially alarming development if the community and emotional toll of mass shootings were increasing with the severity of the incident. To shed light on this possibility, we estimate our models separately for mass shootings with 10+ victims. There are 24 mass shootings with 10+ victims in our data that occurred between 2008 and 2017. The results from this analysis are presented in Table 5. In the top panel, we present results from our baseline model specified in equation (1). A comparison between the estimates shown in Table 3 and the upper panel of Table 5 suggest that the estimates based on mass shootings involving 10+ victims are stronger, both economically and statistically, than the estimates obtained from mass

shootings with 4+ victims. This suggests that more severe mass shootings have also more severe consequences for community and emotional wellbeing.

The bottom panel of Table 5 displays the results obtained from the estimation of equation (2), which splits the post-shooting period into four separate weeks are shown in the bottom panel. Again, these estimates point to large declines in excellent emotional wellbeing and excellent community wellbeing, as well as increases in poor emotional wellbeing. Furthermore, not only the estimates reflecting the effects of mass shootings with 10+ victims are larger in size than those of shootings with 4+ victims shown in Table 4, but they are also estimated with more precision, despite the reduced variation due to a smaller number of counties with events with 10+ victims. Taken together, these results suggest that the impacts of mass shootings on community and emotional wellbeing become worse as the incidents become more violent as measured by the number of victims.

In our baseline analysis, we include respondents interviewed up to 28 days before and up to 28 days after the shooting. A relevant question to consider is whether the effects of mass shootings on community and emotional wellbeing discussed above are short-lived or persist in the long run. Identifying whether the effects of these events are transient or long-lasting can help inform calculations of the costs and benefits of interventions to prevent mass shootings. To address this question, we next present results from a set of regressions, in which we gradually expand our sample to include respondents interviewed up to 365 days before and 365 days after the shooting. In light of our finding that more severe mass shootings, i.e., those with 10+ victims, have a disproportionately stronger effect on community wellbeing than relatively less deadly shootings, we perform this analysis for mass shootings with both 4+ and 10+ victims.

As shown in Table 6, the declines in community and emotional wellbeing appear to persist up to 35 days post-shooting when focused on mass shootings with 4+ victims. In a sample that includes respondents interviewed up to 35 days pre- and 35 days post-shooting, there is a 6.6 percentage point ($p<0.10$) decrease in the probability of excellent emotional health and a 9.9 percentage point ($p<0.10$) decline in the probability of having excellent community and emotional health. These effects gradually dissipate over time, both in terms of magnitude and statistical significance.

When we consider more severe mass shootings, i.e., those with 10+ victims, the impacts on community wellbeing appear to persist for much longer, especially for the outcomes of emotional wellbeing. As illustrated in Table 7, the probability of reporting excellent community wellbeing is lower among individuals living in a community where a mass shooting with 10+ had occurred than other communities, though the estimates are statistically significant only up to 35 days post-shooting. In contrast, the impacts on emotional health shown in columns 4-6 are much stronger and more persistent. Similar to community wellbeing, the effects on emotional wellbeing reach a maximum at around one month after the shooting and begin to decline gradually afterwards. Furthermore, all three measures point to a reduction in emotional wellbeing and remain statistically significant until at least 365 days post-shooting.

The results discussed so far are obtained from a sample that only includes counties that experienced a mass shooting during the estimation period. Next, we incorporate into our analysis the set of border counties that never experienced a mass shooting as a control group. Note that in our baseline analysis, we implement a wild cluster bootstrap to correct for error correlation within clusters (Cameron & Miller, 2015). However, after including border counties as a control group in this robustness analysis, we have a sufficient number of counties to cluster our standard

errors without bootstrapping. We perform this analysis for both the mass shootings with 4+ victims and those with 10+ victims.[19]

The results from the estimation of equations (1) and (2) for a sample incorporating never-treated border counties are shown in Appendix Table 1 for mass shootings with 4+ victims and in Appendix Table 2 for those with 10+ shootings. In both tables, the upper panel presents the estimates from the standard difference-in-differences specification, and the bottom panel shows the results from the specification that splits the post-shooting into four separate weeks. As shown in the tables, a mass shooting still has a negative and statistically significant effect on the composite community wellbeing index as well as the likelihood of having excellent community wellbeing. These negative effects are lasting and statistically significant through 4 weeks post shooting in both models. The treatment effects for excellent emotional health are similar in magnitude to our preferred model, but they are imprecisely measured.

Analysis with USA Today Database

The results presented above provide support for the notion that mass shootings take a toll on the community and emotional wellbeing of people living in the communities where they occur. In our main analysis, we used the Mother Jones database to identify mass shootings for several reasons. First, it uses a set of criteria consistent with the FBI's classification of mass murder as well as recent reports of Congressional Research Services. Second, the list compiled by Mother Jones focuses on incidents which occurred using a firearm in a public place and

[19] The event study estimates with 4+ mass shootings including never-treated border counties are illustrated in Appendix Figure 2. As shown in the figure, there is no evidence of any significant pre-trends. The pattern is very similar, and again shows no evidence of pre-trends when we perform the event-study analysis with the 10+ mass shootings. To economize on space, we do not show these estimates in the paper, but they are available from the authors upon request.

excludes shootings related to gang activity, armed robbery, or domestic violence. These criteria leave us with mass shootings that are random, nonsensical, indiscriminate, which, we argue, may trigger the kind of community and emotional reactions by people that we focus on in our study. Third, given its inclusion criteria, the Mother Jones database is less comprehensive than the other available sources. Therefore, the results obtained from the analysis of the Mother Jones database would likely constitute a lower bound for actual effects.

However, given the lack of an official definition of a mass shooting, we assessed the sensitivity of our results to the use of another mass shootings database published by USA Today.[20] USA Today includes mass "killings" where four or more individuals are killed in a single incident. It also covers a broad range of incidents including public killings, family-related killings, and those involving a robbery or a burglary. Furthermore, it makes a distinction among the weapons used in the killing (e.g., shooting, stabbing, blunt force, etc.). Focusing on the USA Today database, we complied the incidents which took place in public and were committed by a firearm and excluded any robbery or burglary related killings. This gave us a list of 59 shootings during our study period.

Figure 4 shows event study estimates for the USA Today regressions. As illustrated in the figure, there is no evidence of any systematic changes in the outcome measures at the county level in the period prior to a mass shooting. The regression results obtained from the analysis of the USA Today database are presented in Table 8. At first glance, the effect patterns shown in Table 8 appear to be similar to those obtained from the analysis using the Mother Jones data. In fact, the USA Today results are, if anything, stronger, which is consistent with the notion that the

[20] The USA Today database is available at http://www.gannett-cdn.com/GDContent/mass-killings/index.html#title

results from the Mother Jones analysis would constitute a lower bound. As shown in the upper panel of the table, the exposure to a mass killing results in a 0.29 standard deviation decrease ($p<0.10$) in the composite community wellbeing index. Furthermore, the likelihood of reporting excellent community wellbeing goes down by 17.1 percentage points ($p<0.01$). For outcomes related to emotional wellbeing, all three estimates are statistically significant and point in the same direction. Specifically, a mass killing causes the composite emotional wellbeing to decrease by 0.16 standard deviation ($p<0.05$), the likelihood of reporting excellent emotional wellbeing to decrease by 5.4 percentage points ($p<0.05$), and the likelihood of reporting poor emotional wellbeing to increase by 6.6 percentage points ($p<0.05$). Furthermore, the likelihood of having excellent emotional and community wellbeing decreases by 10.5 percentage points ($p<0.05$) in response to a mass killing. Overall, these results lend further support to the results obtained from the analysis with the Mother Jones database.

Placebo Analysis

The validity of our findings hinges on the assumption that there are no changes in the counties occurring simultaneously with mass shootings. We conduct a placebo analysis to explore whether our results are driven by potential confounding factors. To do this, we identify several outcome measures in Gallup that should theoretically be unaffected by mass shootings including diagnosis of chronic health conditions such as diabetes and asthma, and measures of access to health care such as insurance coverage and dental visits. Any effects on any of these outcomes would suggest that other unobserved changes may be biasing our main set of results.

As shown in Table 9, these estimates are small and statistically insignificant, which increases our confidence in the causal interpretation of our main results.

Next, we test whether our results are driven by any particular shooting. To perform this test, we estimate regressions for each outcome, omitting a different shooting each time. As shown in Figure 5, the treatment effect exhibits a stable pattern, where the vast majority of the estimates are either equal or very close to the coefficient estimate obtained from the model with no shootings omitted. Taken together, the evidence emerging from this analysis lends further support to the notion that the reductions in emotional and community wellbeing obtained in our analysis are driven by mass shootings, and not by some other confounding factor.

Heterogeneity

The results from our heterogeneity tests are presented in Appendix Table 3. The first panel of the table shows that the reductions in social wellbeing are larger both in magnitude and in terms of statistical significance for parents than for childless adults. For example, parents experience a 25.4 percentage point ($p<0.05$) or 51 percent reduction in the probability of having excellent community wellbeing, versus a statistically insignificant 6.9 percentage point or 14 percent reduction for childless adults. This pattern is consistent with the notion that declines in community and emotional wellbeing in the aftermath of a shooting by adults reflect, at least partially, their concern over the safety and wellbeing of not only themselves, but also their children.

The second panel of Appendix Table 3 shows that after mass shooting events, men experience larger reductions in the probability of having excellent community and emotional

health than women. Men experience a 23.5 percentage point ($p<0.05$) decline, compared to women's 10.9 percentage point decline which is statistically insignificant.

When the estimates are stratified by race and ethnicity in the third panel, a clear negative effect appears to exist for Hispanics for both the social and emotional wellbeing domains, and the estimates are more precisely estimated for this group of adults than for Whites or Blacks. The pattern is less clear for Whites and Blacks. However, we note that the sample sizes become smaller as we break down the analysis by race and ethnicity, and the majority of the estimates are not statistically different from each other.[21]

Finally, the fourth panel of Appendix Table 3 describes the breakdown by education status. Individuals with education less than high school are more likely to have a decline in overall community wellbeing than the other educational categories; however, indicators of this outcome are not statistically significant. Those with a high school education experience a 28 percentage point ($p<0.05$) decrease in the probability of having excellent community and emotional health, while those with a college degree or more experience an 18.4 percentage point ($p<0.10$) decrease.

5. Discussion

This paper provides evidence on the harmful spillover effects of mass shootings on community wellbeing. Our analysis of individuals living in 47 counties that experienced mass shootings from 2008 through 2017 shows that a mass shooting reduces the probability of having excellent community wellbeing by 27 percentage points and decreases the probability of having

[21] Of the four race and ethnicity categories, all results for Black, non-Hispanic and Other, non-Hispanic were not statistically significant. All but two emotional health outcomes for White, non-Hispanic were not statistically significant.

excellent emotional health by 13 percentage points four weeks after the incident occurs. These effects are larger and they last longer for more violent shootings. For instance, for mass shootings with 10 or more victims, the ramifications on community and emotional wellbeing in the community last up to 365 days after the shooting occurred.

While a large body of medical studies has already demonstrated the psychological damage that shootings and other violent events inflict on survivors, our study shows that this damage extends to other adults in the community, even those who may not have been present at the shooting location. The declines in community wellbeing are of concern, given that it is considered to represent an important indicator of people's quality of life (e.g., Helliwell & Putnam, 2004; Flavin, 2018). For example, Helliwell & Putnam (2004) argue that a case can be made that, "…the ultimate dependent variable in social science should be human wellbeing, and in particular, wellbeing as defined by the individual herself." Since promoting greater human wellbeing is one of the primary aims of government policymaking, it follows that policy efforts to scale back the incidence of random shooting events would be one way to achieve this goal.

We also observe that mass shootings reduce the emotional wellbeing of adults in the community. Several studies have established strong links between emotional distress and health (Stewart-Brown, 1998). For example, research has shown that stress – one of the components of our emotional wellbeing index – can lead to depression and hypertension (van Praag, 2004; Sparrenberger et al., 2009). By reducing emotional wellbeing, mass shooting events thus have deleterious consequences for overall health of people in the community. For example, some people may turn to smoking as a means to cope with the emotional stress in the aftermath of mass shootings (Cameron & Jones, 1985; Choi et al., 2015). Indeed, an analysis for the smoking behavior using the Gallup data indicates that residing in a county with a mass shooting in the

past 28 days is associated with a 4.2 percentage points ($p<0.10$) or 28 percent increased likelihood of current smoking. Furthermore, the probability of smoking increases over the course of four weeks following a shooting.[22] Our finding of increased smoking in the weeks after a mass shooting may reflect a behavioral response to the stress and worry produced from the shootings. The high medical and social costs associated with cigarette smoking (CDC, 2019; US Department of Health and Human Services, 2014; Levine et al., 1997; Zafeiridou et al., 2018) represent additional economic and health damage inflicted by mass shootings.

Our findings are consistent with two recent economic studies evaluating the health effects of mass shootings. Rossin-Slater et al. (2020) find that local exposure to school shootings increases antidepressant use among youth by 21 percent in the following two years, implying that shootings reduce mental health among youth in the communities where these tragedies occur. Dursun (2019) studies the effects of mass shootings on infant health outcomes and finds that those infants who were exposed to shootings in-utero are more likely to be born very premature and with a very low birth weight. The analysis presented in this current paper supplements these two existing studies by studying how mass shootings affect a different demographic group – US adults – and a different set of health outcomes – community and emotional wellbeing.

[22] For brevity, we exclude our analysis of the effects of mass shootings on smoking behavior from the main paper. The complete results of this analysis are available upon request.

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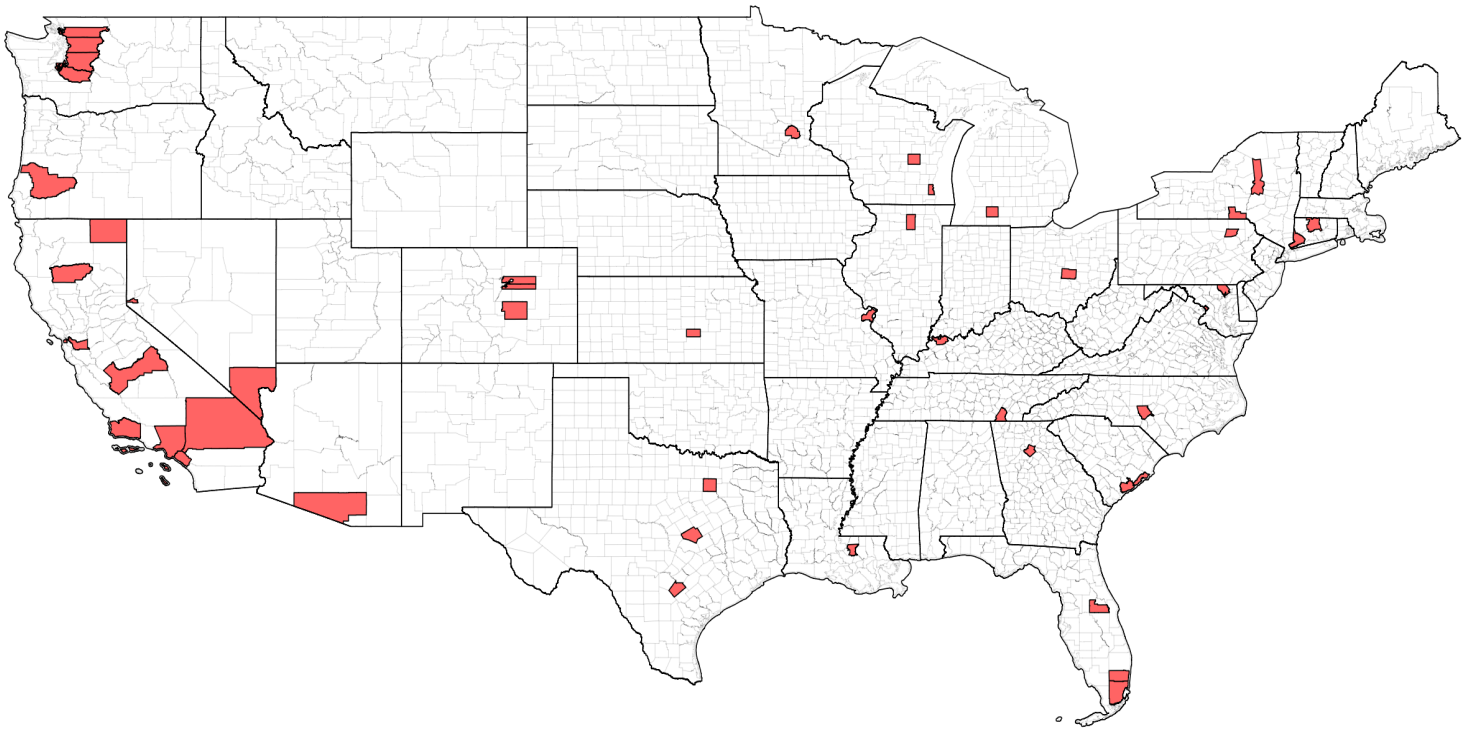
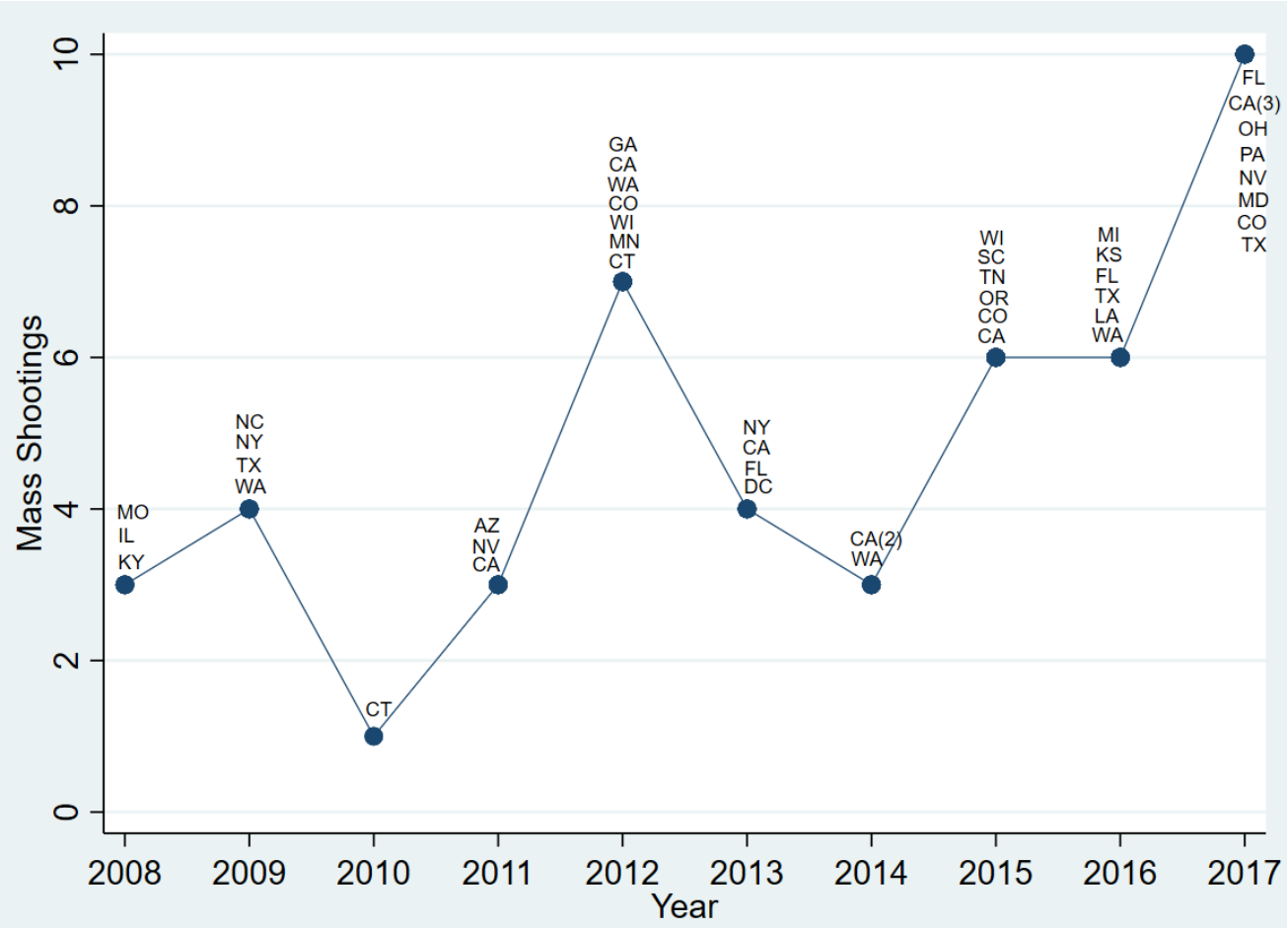
Figure 1: Geographic Distribution of Mass Shootings in the United States between 2008 and 2017



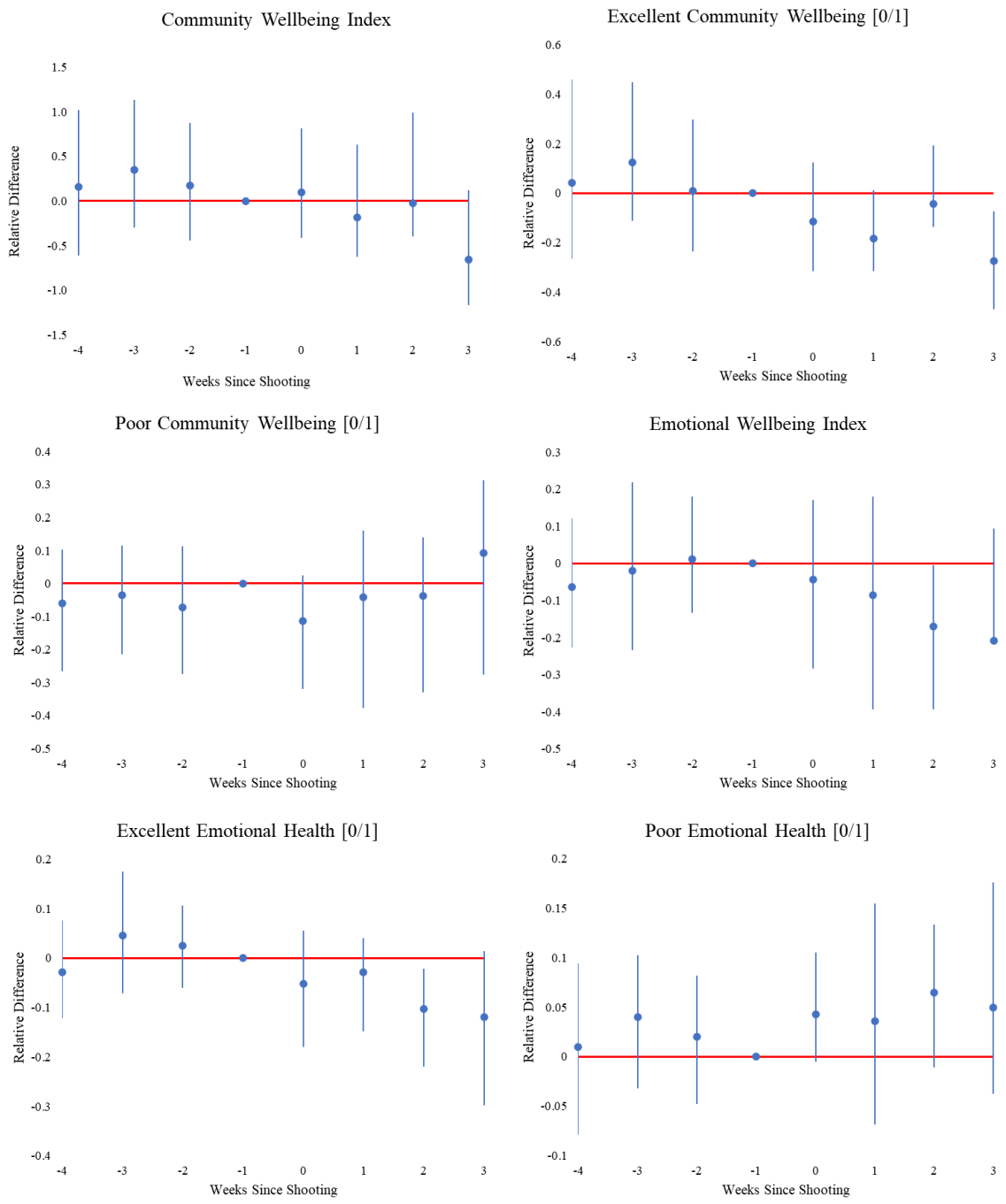
Notes: The 47 areas highlighted in red are counties that experienced a mass shooting between 2008 and 2017, according to the Mother Jones database of mass shootings.

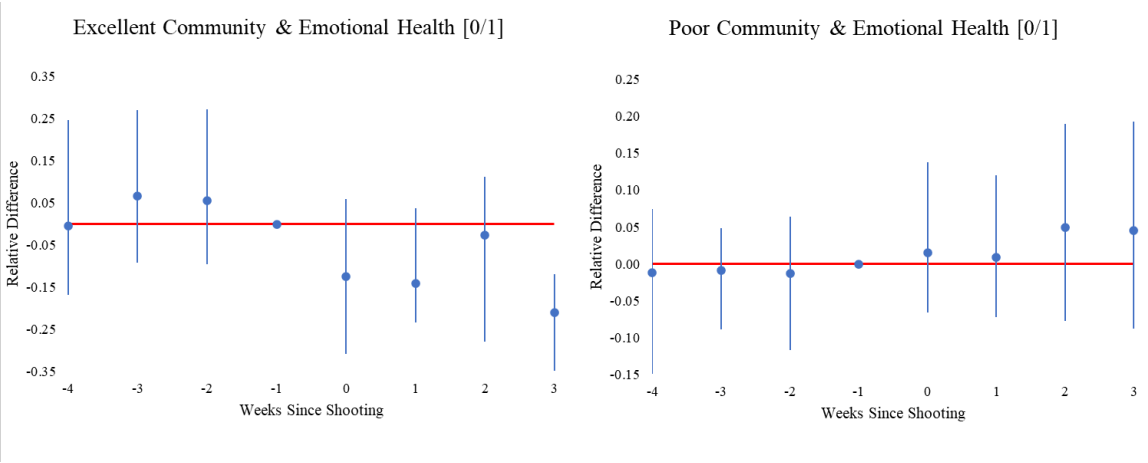
Figure 2: Mass Shootings in the United States between 2008 and 2017



Source: The Mother Jones database of mass shootings. Figure displays the number of mass shootings each year and the states in which these shootings occurred.

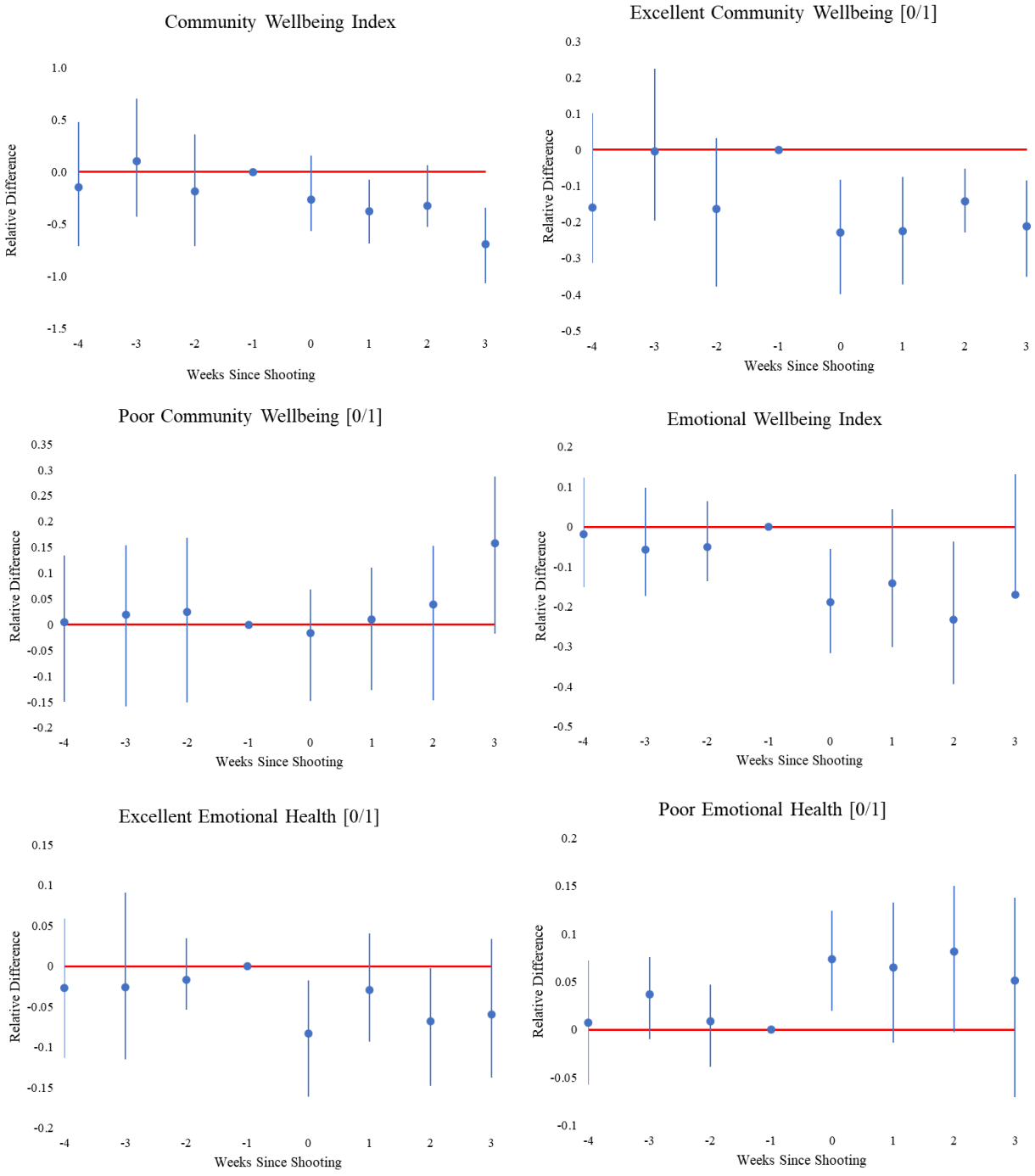
Figure 3: Event Study Results Using the Mother Jones Database of Mass Shootings

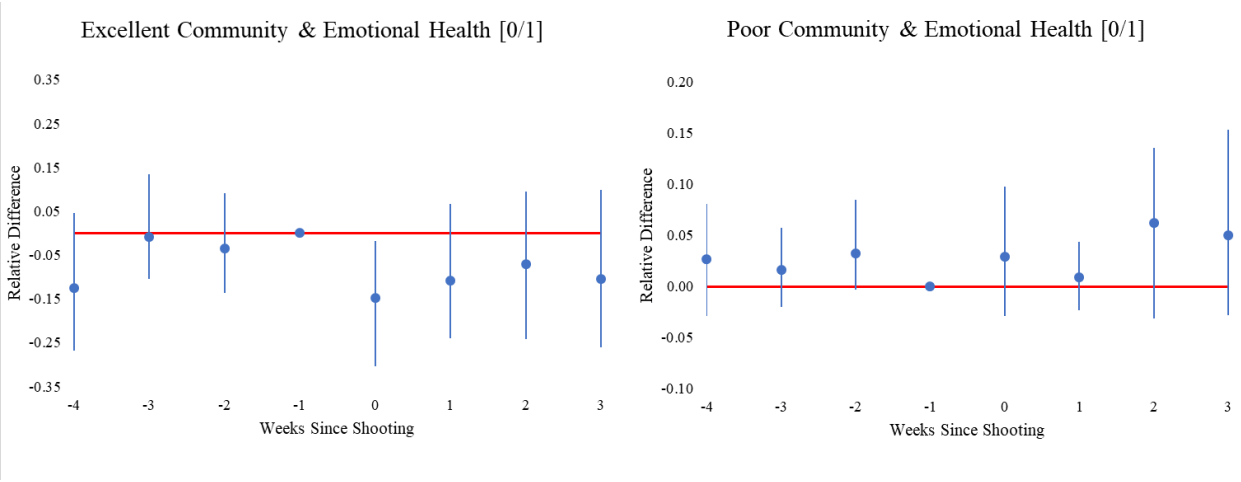




Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. Figure displays coefficient estimates and 95% confidence intervals for a vector of variables indicating the number of weeks since the shooting; the week immediately preceding the shooting is omitted as the base. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method, and estimates include Gallup sampling weights.

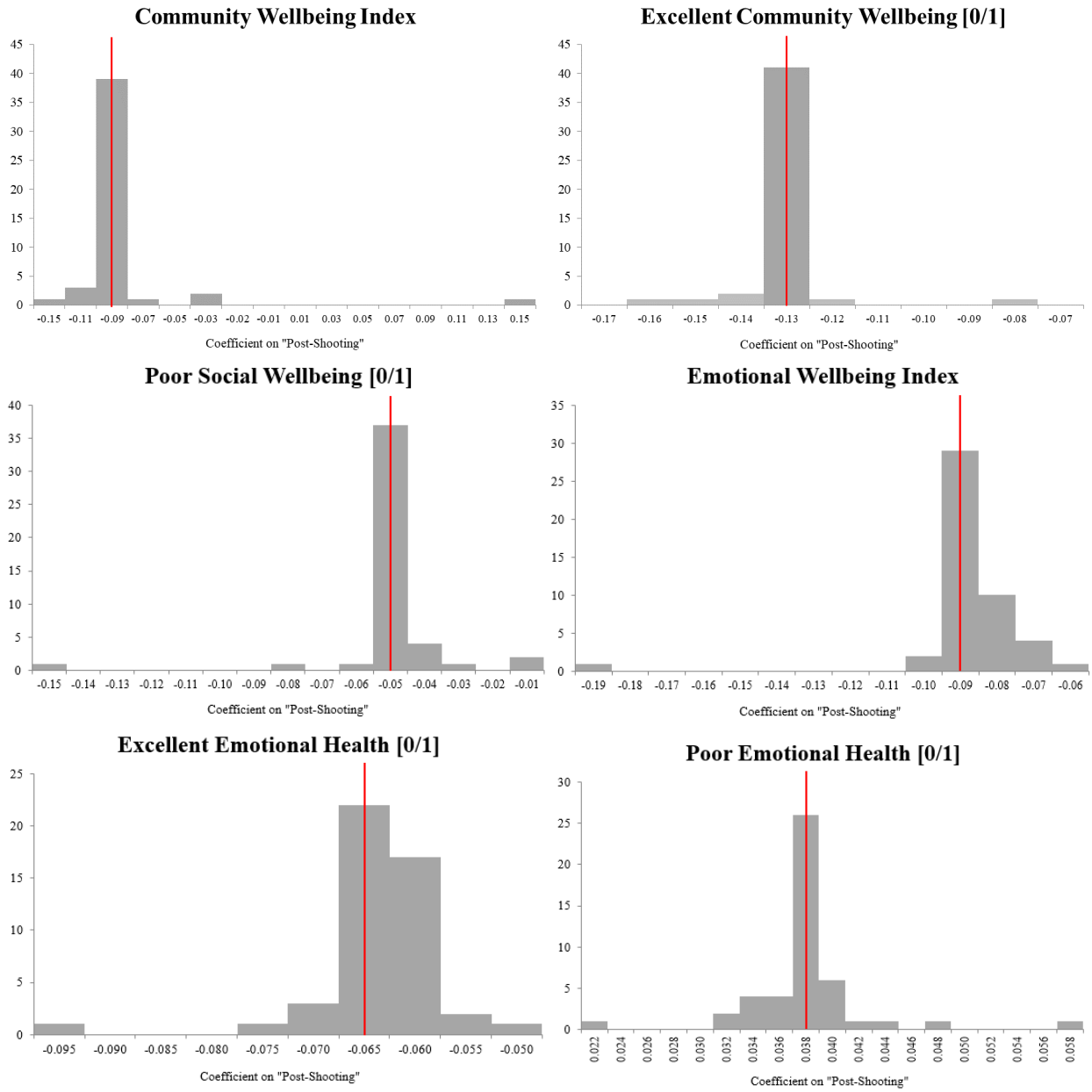
Figure 4: Event Study Results Using the USA Today Database of Mass Shootings

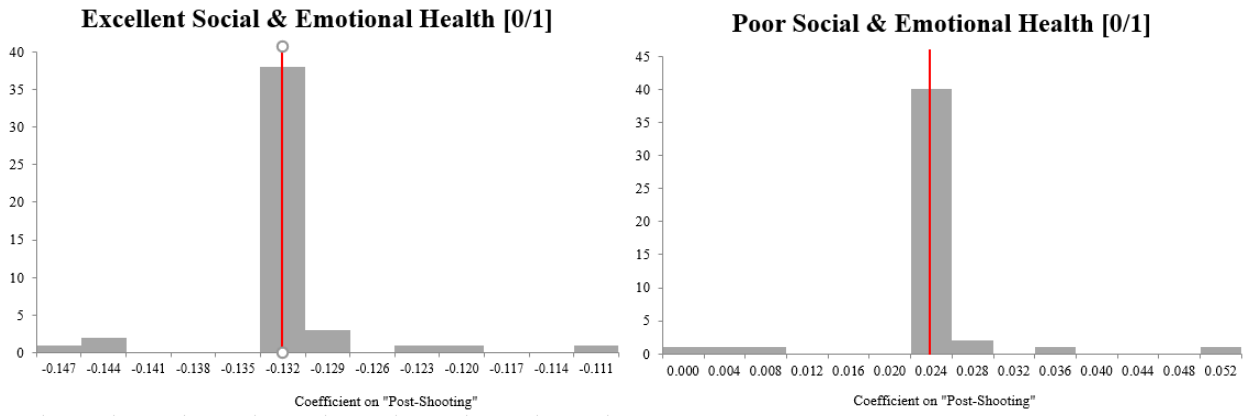




Notes: Authors' analysis based on USA Today's mass shootings database and Gallup 2008 to 2016. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 59 mass shootings occurred during the study period. Figure displays coefficient estimates and 95% confidence intervals for a vector of variables indicating the number of weeks since the shooting; the week immediately preceding the shooting is omitted as the base. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are clustered using the wild cluster bootstrap method, and estimates include Gallup sampling weights.

Figure 5: Estimates from Regressions Omitting One Shooting at a Time





Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. We estimated 47 regression models omitting one shooting at a time from analysis. Figure displays histogram of coefficient estimates for "post-shooting" from the 47 regression models. The vertical line (red) represents the coefficient estimate for the baseline model in which no shootings are omitted. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are clustered using the wild cluster bootstrap method, and estimates include Gallup sampling weights.

Table 1: Demographic Characteristics of Analytical Sample

	Pre-Shooting	Post-Shooting	Difference
	(1)	(2)	(3)
Age	44.47	45.45	0.98**
Male	0.49	0.48	-0.01
Married	0.46	0.48	0.01
Any children	0.38	0.37	<0.01
Race/ethnicity			
White, non-Hispanic	0.57	0.55	-0.02
Black, non-Hispanic	0.12	0.12	<0.01
Other race, non-Hispanic	0.06	0.06	<0.01
Hispanic	0.25	0.27	0.02
Educational attainment			
Less than high school	0.13	0.13	<0.01
High school	0.25	0.24	-0.01
Some college	0.27	0.28	0.01
College or more	0.36	0.36	<0.01
Sample size	3,232	3,084	

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. Table displays means for respondents interviewed before the shooting in their county (pre-shooting) and respondents interviewed after the shooting in their county (post-shooting). Estimates include Gallup sampling weights. Asterisks denote statistically significant difference between the two groups with * p<0.10, ** p<0.05, *** p<0.01.

Table 2: Means of Outcome Variables

	Years of Data Available	Number of Shootings	Pre-Shooting	Post-Shooting	Unadjusted Difference
	(1)	(2)	(3)	(4)	(5)
Community Wellbeing Index	2014-16	16	-0.11	-0.23	-0.12
Excellent Community Wellbeing [0/1]	2014-16	16	0.50	0.44	-0.07*
Poor Community Wellbeing [0/1]	2014-16	16	0.09	0.11	0.02
Emotional Wellbeing Index	2008-16	37	-0.06	-0.05	0.01
Excellent Emotional Health [0/1]	2008-16	37	0.43	0.43	<0.01
Poor Emotional Health [0/1]	2008-16	37	0.20	0.21	<0.01
Excellent Community & Emotional Health [0/1]	2014-16	16	0.28	0.27	-0.01
Poor Community & Emotional Health [0/1]	2014-16	16	0.03	0.03	<0.01

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. Table displays means for respondents interviewed before the shooting in their county (pre-shooting) and respondents interviewed after the shooting in their county (post-shooting). Estimates include Gallup sampling weights. Asterisks denote statistically significant difference between the two groups with * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 3: Mass Shootings and Community and Emotional Wellbeing - Baseline Results

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post-Shooting	-0.093 (0.703)	-0.136* (0.059)	-0.050 (0.606)	-0.091 (0.436)	-0.065* (0.072)	0.038 (0.166)	-0.133** (0.012)	0.023 (0.545)
Sample Size	735	735	735	3,781	3,781	3,781	726	726
Pre-Shooting Mean	-0.11	0.50	0.09	-0.06	0.43	0.20	0.28	0.03

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 4: Mass Shootings and Community and Emotional Wellbeing - Split Post Period

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Week Post-Shooting	0.010	-0.129*	-0.085	-0.043	-0.061	0.034	-0.147**	0.020
	(0.962)	(0.051)	(0.250)	(0.762)	(0.270)	(0.113)	(0.011)	(0.615)
2 Weeks Post-Shooting	-0.260	-0.195*	-0.015	-0.087	-0.037	0.029	-0.162*	0.014
	(0.268)	(0.095)	(0.895)	(0.553)	(0.305)	(0.581)	(0.075)	(0.680)
3 Weeks Post-Shooting	-0.083	-0.048	-0.015	-0.171**	-0.111***	0.059*	-0.046	0.053
	(0.750)	(0.437)	(0.863)	(0.035)	(0.002)	(0.090)	(0.642)	(0.381)
4 Weeks Post-Shooting	-0.700*	-0.274**	0.112	-0.211	-0.126**	0.045	-0.228***	0.048
	(0.073)	(0.016)	(0.473)	(0.192)	(0.049)	(0.345)	(0.001)	(0.413)
Sample Size	735	735	735	3,781	3,781	3,781	726	726
Pre-Shooting Mean	-0.11	0.50	0.09	-0.06	0.43	0.20	0.28	0.03

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 5: Mass Shootings and Community and Emotional Wellbeing - Mass Shootings with 10+ Victims

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post-Shooting	-0.269	-0.167*	-0.017	-0.348***	-0.202***	0.101*	-0.136*	0.027
	(0.403)	(0.099)	(0.855)	(0.001)	(0.001)	(0.062)	(0.058)	(0.627)
Sample Size	541	541	541	1,603	1,603	1,603	534	534
1 Week Post-Shooting	-0.185	-0.180***	-0.048	-0.234**	-0.199***	0.061	-0.182**	0.037
	(0.555)	(0.008)	(0.640)	(0.014)	(0.006)	(0.229)	(0.022)	(0.637)
2 Weeks Post-Shooting	-0.411**	-0.201	0.020	-0.410***	-0.173***	0.139**	-0.160	0.008
	(0.040)	(0.299)	(0.808)	(0.004)	(0.001)	(0.016)	(0.205)	(0.804)
3 Weeks Post-Shooting	-0.228	-0.078	-0.011	-0.400***	-0.239***	0.095*	0.008	0.049
	(0.534)	(0.306)	(0.909)	(0.001)	(0.001)	(0.099)	(0.943)	(0.425)
4 Weeks Post-Shooting	-0.759**	-0.249*	0.115	-0.615***	-0.305***	0.187***	-0.193**	0.038
	(0.035)	(0.054)	(0.689)	(0.001)	(0.001)	(0.006)	(0.030)	(0.659)
Sample Size	541	541	541	1,603	1,603	1,603	534	534
Pre-Shooting Mean	-0.03	0.54	0.07	-0.03	0.44	0.19	0.31	0.02

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting with 10 or more victims and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 24 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.

* p<0.10, ** p<0.05, *** p<0.01.

Table 6: Mass Shootings and Community and Emotional Wellbeing - Alternate Time Horizons

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7 days	0.271	-0.017	-0.129*	-0.057	-0.064	0.045	-0.077	0.020
	(0.364)	(0.873)	(0.099)	(0.661)	(0.308)	(0.134)	(0.153)	(0.634)
	N=163	163	163	881	881	881	160	160
14 days	0.034	-0.124	-0.105	-0.047	-0.046	0.022	-0.151**	-0.011
	(0.899)	(0.161)	(0.200)	(0.794)	(0.280)	(0.532)	(0.011)	(0.751)
	N=362	362	362	1,823	1,823	1,823	357	357
21 days	-0.046	-0.135*	-0.072	-0.091	-0.060*	0.040	-0.116**	0.027
	(0.814)	(0.057)	(0.394)	(0.408)	(0.090)	(0.119)	(0.011)	(0.568)
	N=547	547	547	2,819	2,819	2,819	541	541
28 days	-0.093	-0.136*	-0.050	-0.091	-0.065*	0.038	-0.133**	0.023
	(0.703)	(0.059)	(0.606)	(0.436)	(0.072)	(0.166)	(0.012)	(0.545)
	N=735	735	735	3,781	3,781	3,781	726	726
35 days	-0.110	-0.112	-0.027	-0.096	-0.066*	0.036	-0.099*	0.019
	(0.650)	(0.126)	(0.762)	(0.404)	(0.062)	(0.175)	(0.092)	(0.624)
	N=913	913	913	4,761	4,761	4,761	904	904
42 days	-0.035	-0.087	-0.030	-0.071	-0.048	0.034	-0.053	0.011
	(0.847)	(0.217)	(0.678)	(0.472)	(0.124)	(0.167)	(0.318)	(0.713)
	N=1,082	1,082	1,082	5,653	5,653	5,653	1,070	1,070
90 days	-0.074	-0.087	-0.010	-0.012	-0.016	0.012	-0.069	0.007
	(0.673)	(0.220)	(0.847)	(0.874)	(0.603)	(0.519)	(0.280)	(0.827)
	N=2,340	2,340	2,340	12,028	12,028	12,028	2,316	2,316
180 days	-0.077	-0.044	0.004	-0.031	-0.026	0.021	-0.043	-0.006
	(0.417)	(0.390)	(0.913)	(0.580)	(0.336)	(0.220)	(0.409)	(0.761)
	N=4,723	4,723	4,723	23,651	23,651	23,651	4,676	4,676

270 days	-0.030	-0.032	0.001	-0.031	-0.016	0.019	-0.010	-0.013
	(0.646)	(0.203)	(0.985)	(0.406)	(0.409)	(0.111)	(0.714)	(0.332)
	N=7,550	7,550	7,550	35,564	35,564	35,564	7,475	7,475
365 days	-0.012	-0.023	-0.000	-0.023	-0.016	0.013	-0.000	-0.012*
	(0.730)	(0.311)	(0.986)	(0.236)	(0.142)	(0.119)	(0.987)	(0.093)
	N=10,800	10,800	10,800	47,759	47,759	47,759	10,691	10,691

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to *x* days before or up to *x* days after the shooting (where the value of *x* is indicated in the row header); the day of the shooting is excluded. 47 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.

* $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 7: Mass Shootings and Community and Emotional Wellbeing – Mass Shootings with 10+ Victims and Alternate Time Horizons

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
7 days	0.078	-0.018	-0.061	-0.242**	-0.222**	0.046	-0.071	0.004
	(0.759)	(0.924)	(0.673)	(0.036)	(0.029)	(0.428)	(0.524)	(0.881)
	N=107	107	107	372	372	372	105	105
14 days	-0.119	-0.137	-0.061	-0.331***	-0.188***	0.098*	-0.106	-0.004
	(0.821)	(0.308)	(0.487)	(0.003)	(0.008)	(0.066)	(0.144)	(0.861)
	N=251	251	251	743	743	743	248	248
21 days	-0.208	-0.156*	-0.034	-0.337***	-0.194***	0.098*	-0.113**	0.023
	(0.532)	(0.097)	(0.701)	(0.001)	(0.001)	(0.066)	(0.036)	(0.677)
	N=396	396	396	1,197	1,197	1,197	392	392
28 days	-0.269	-0.167*	-0.017	-0.348***	-0.202***	0.101*	-0.136*	0.027
	(0.403)	(0.099)	(0.855)	(0.001)	(0.001)	(0.062)	(0.058)	(0.627)
	N=541	541	541	1,603	1,603	1,603	534	534
35 days	-0.310	-0.167*	-0.002	-0.342***	-0.199***	0.104*	-0.149*	0.031
	(0.245)	(0.099)	(0.970)	(0.001)	(0.001)	(0.065)	(0.051)	(0.634)
	N=687	687	687	2,029	2,029	2,029	680	680
42 days	-0.255	-0.146	0.004	-0.292***	-0.174***	0.090*	-0.115*	0.032
	(0.238)	(0.102)	(0.963)	(0.001)	(0.001)	(0.078)	(0.056)	(0.520)
	N=823	823	823	2,453	2,453	2,453	815	815
90 days	-0.239	-0.116	0.035	-0.274***	-0.162***	0.073*	-0.125*	0.036
	(0.247)	(0.240)	(0.611)	(0.002)	(0.001)	(0.099)	(0.076)	(0.417)
	N=1,802	1,802	1,802	5,373	5,373	5,373	1,790	1,790
180 days	-0.179	-0.076	-0.005	-0.210***	-0.127***	0.078***	-0.087	-0.005
	(0.424)	(0.462)	(0.918)	(0.001)	(0.001)	(0.003)	(0.300)	(0.895)
	N=3,602	3,602	3,602	10,605	10,605	10,605	3,573	3,573

270 days	-0.053	-0.030	0.023	-0.119***	-0.069***	0.041***	0.006	-0.009
	(0.437)	(0.192)	(0.489)	(0.003)	(0.008)	(0.002)	(0.833)	(0.493)
	N=5,124	5,124	5,124	15,344	15,344	15,344	5,080	5,080
365 days	-0.038	-0.032	0.012	-0.082*	-0.045**	0.033*	0.001	-0.016*
	(0.340)	(0.201)	(0.579)	(0.057)	(0.040)	(0.074)	(0.970)	(0.094)
	N=6,899	6,899	6,899	20,403	20,403	20,403	6,834	6,834

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting with 10 or more victims and were interviewed up to *x* days before or up to *x* days after the shooting (where the value of *x* is indicated in the row header); the day of the shooting is excluded. 24 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.

* p<0.10, ** p<0.05, *** p<0.01.

Table 8: Mass Shootings and Community and Emotional Wellbeing - USA Today Database of Mass Shootings

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post-Shooting	-0.285*	-0.171***	-0.002	-0.164**	-0.054**	0.066**	-0.105**	0.017
	(0.091)	(0.001)	(0.962)	(0.015)	(0.039)	(0.013)	(0.026)	(0.526)
Sample Size	906	906	906	5,769	5,769	5,769	895	895
1 Week Post-Shooting	-0.224	-0.182***	-0.024	-0.170***	-0.076**	0.068***	-0.131**	0.018
	(0.185)	(0.003)	(0.567)	(0.007)	(0.016)	(0.008)	(0.022)	(0.536)
2 Weeks Post-Shooting	-0.343**	-0.185**	0.003	-0.125	-0.023	0.061*	-0.096	0.001
	(0.025)	(0.030)	(0.940)	(0.129)	(0.477)	(0.086)	(0.163)	(0.979)
3 Weeks Post-Shooting	-0.292	-0.107	0.033	-0.218**	-0.063*	0.077**	-0.061	0.054
	(0.167)	(0.119)	(0.597)	(0.018)	(0.077)	(0.050)	(0.488)	(0.298)
4 Weeks Post-Shooting	-0.661***	-0.183***	0.153*	-0.156	-0.055	0.047	-0.099	0.043
	(0.002)	(0.007)	(0.074)	(0.229)	(0.150)	(0.351)	(0.188)	(0.330)
Sample Size	906	906	906	5,769	5,769	5,769	895	895
Pre-Shooting Mean	-0.03	0.52	0.06	-0.07	0.42	0.21	0.29	0.02

Notes: Authors' analysis based on USA Today's mass shootings database and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 59 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.

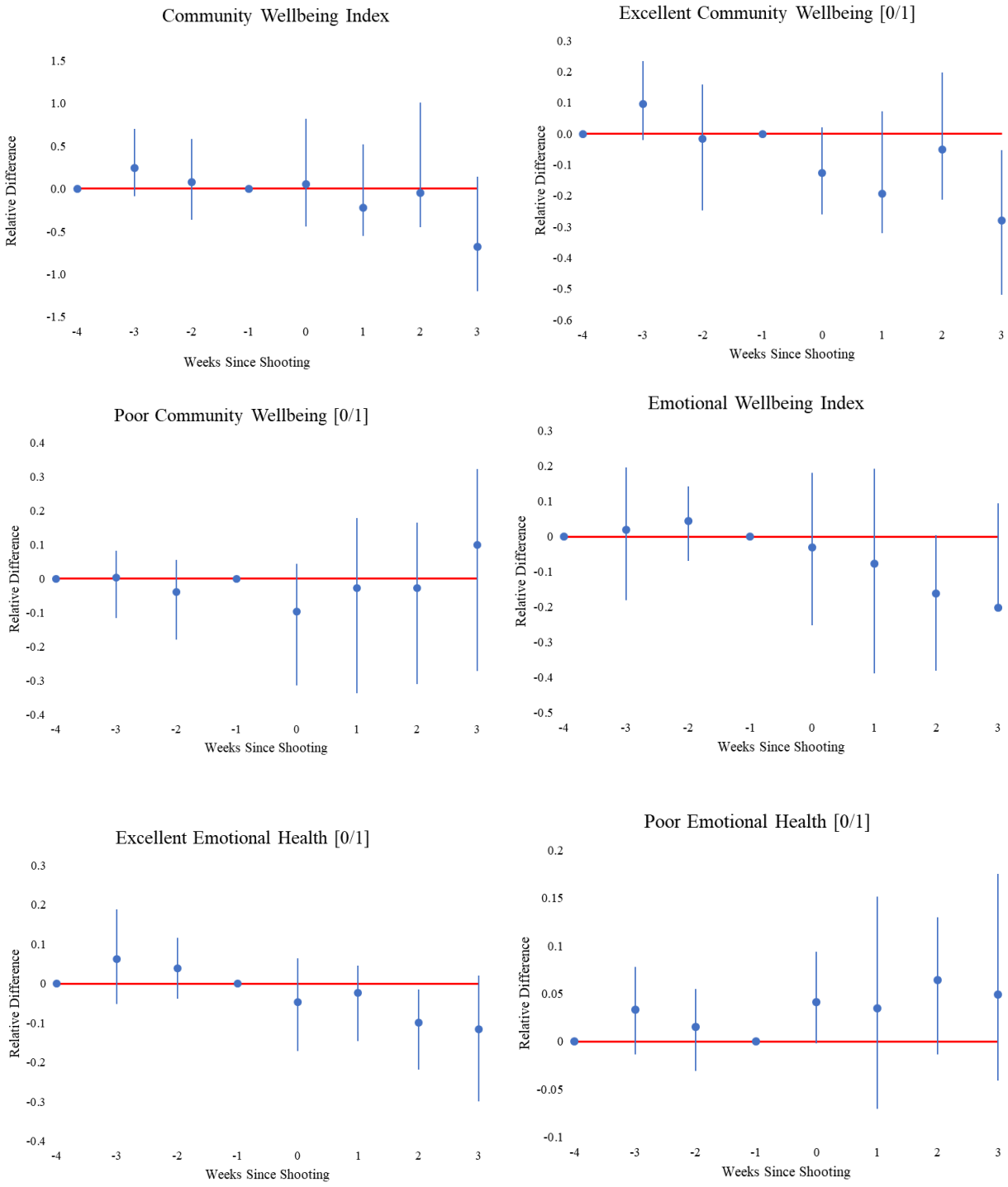
* p<0.10, ** p<0.05, *** p<0.01.

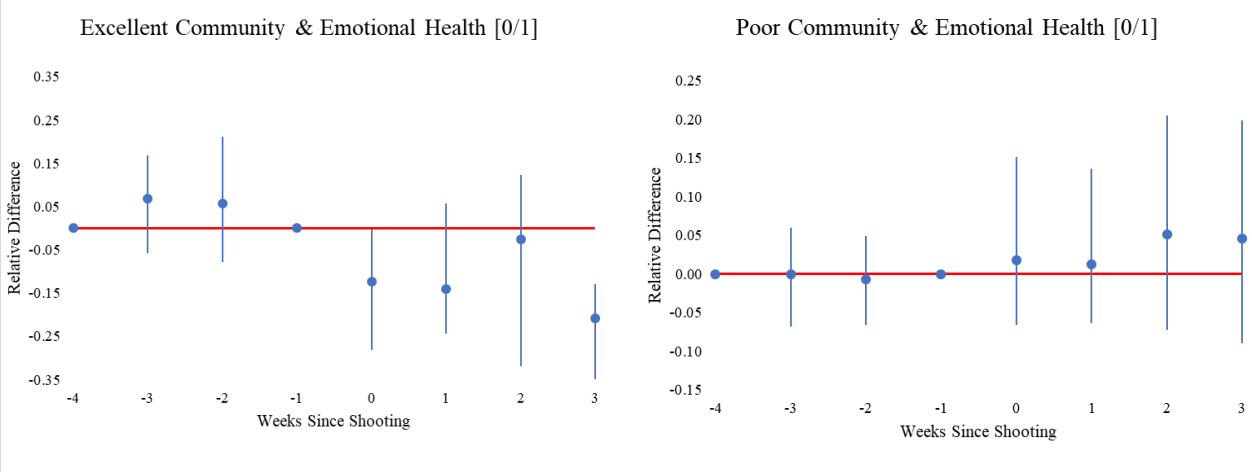
Table 9: Placebo Analysis

	Diabetes diagnosis ever [0/1]	Asthma diagnosis ever [0/1]	Dentist visit in past 12 months [0/1]	Insurance coverage [0/1]
	(3)	(4)	(5)	(6)
Post-Shooting	-0.015 (0.300)	0.019 (0.434)	0.047 (0.169)	-0.017 (0.498)
Sample Size	4,175	3,822	3,867	4,211

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses. Estimates include Gallup sampling weights.
* p<0.10, ** p<0.05, *** p<0.01.

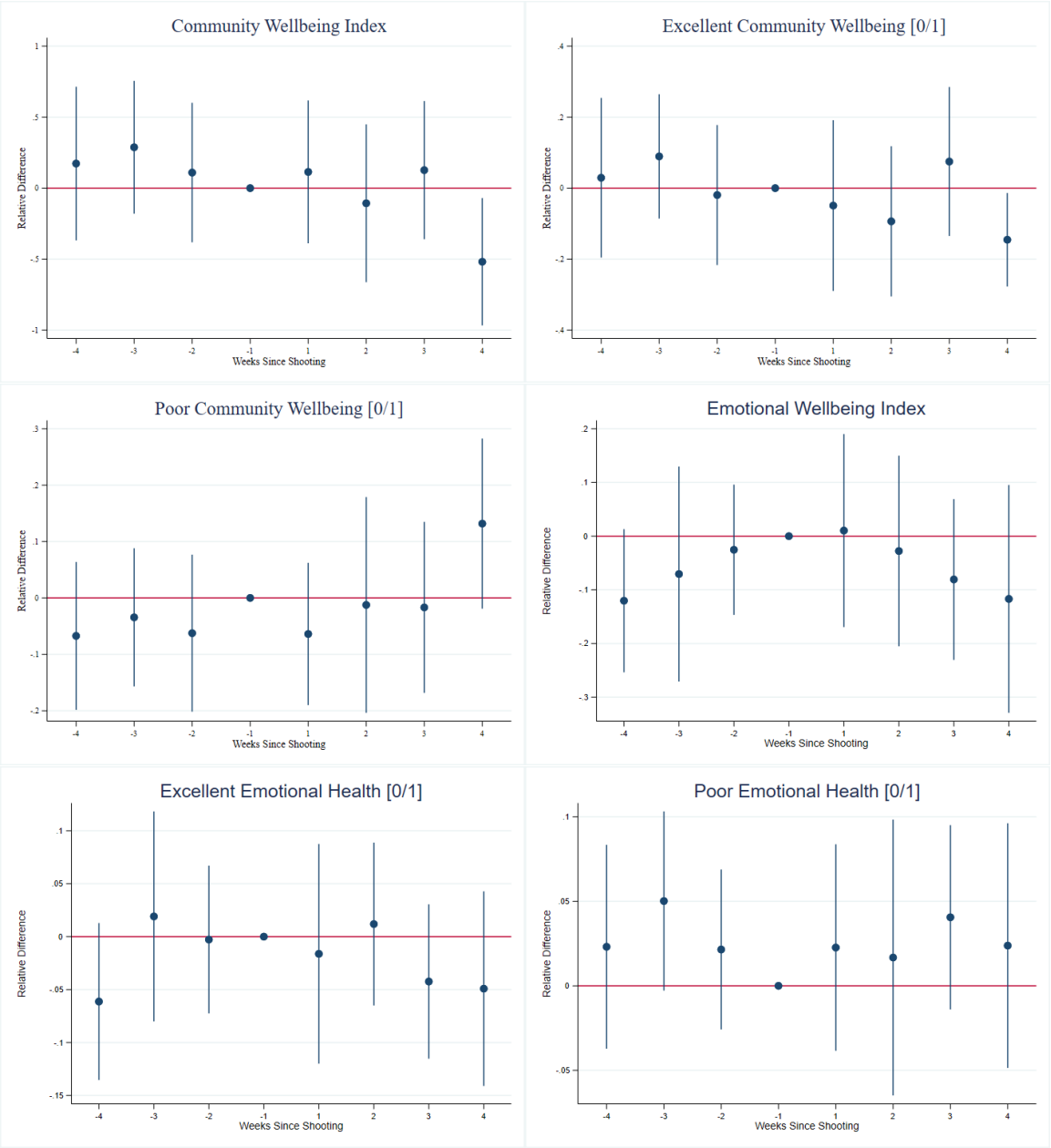
Appendix Figure 1: Event Study Regression Results Omitting Two Pre-Shooting Periods

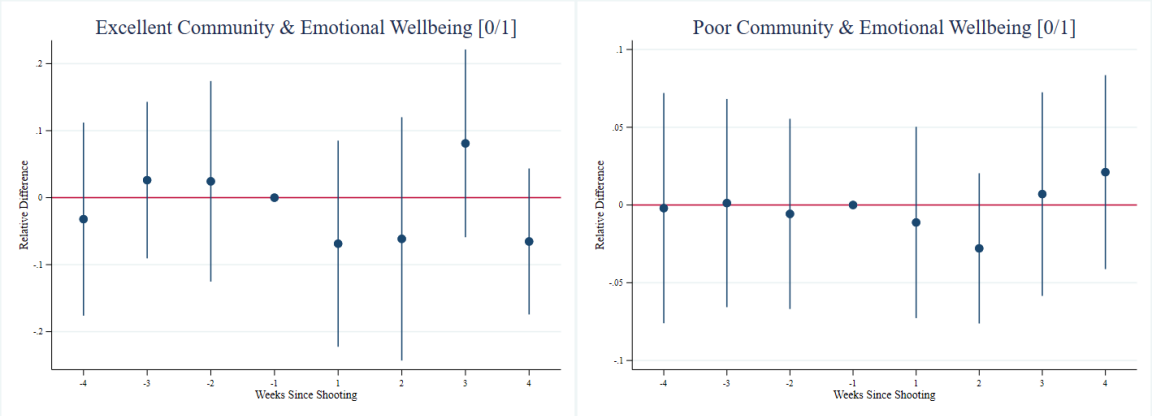




Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. Figure displays coefficient estimates and 95% confidence intervals for a vector of variables indicating the number of weeks since the shooting; the periods indicating the week immediately preceding the shooting and 4 weeks before the shooting are both omitted. All regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method, and estimates include Gallup sampling weights.

Appendix Figure 2: Event Study Regressions Including Never-Treated Border Counties





Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to respondents who lived in a county that had a mass shooting (Treatment = 1) and those who lived in counties that bordered counties that had mass shootings (Treatment = 0). Sample is further restricted to those who were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. Figure displays coefficient estimates and 95% confidence intervals for a vector of variables interacting the Treatment indicator with indicator variables for the number of weeks since the shooting; the week immediately preceding the shooting is omitted as the base. All regressions control for the Treatment indicator, Post-Shooting indicator, age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are clustered by county, and estimates include Gallup sampling weights.

Appendix Table 1: Mass Shootings and Community and Emotional Wellbeing - "Never-Treated" Border Counties Included (4+ Victims)

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment X Post-Shooting	-0.217**	-0.073*	0.046	-0.001	-0.012	0.003	-0.032	-0.004
	(0.108)	(0.039)	(0.039)	(0.043)	(0.020)	(0.016)	(0.029)	(0.018)
Sample Size	3,413	3,413	3,413	14,182	14,182	14,182	3,376	3,376
1 Week Post-Shooting	-0.029	-0.072	-0.020	0.064	-0.005	-0.001	-0.072	-0.009
	(0.142)	(0.068)	(0.030)	(0.071)	(0.038)	(0.027)	(0.053)	(0.024)
2 Weeks Post-Shooting	-0.249*	-0.116**	0.031	0.025	0.023	-0.006	-0.065	-0.026*
	(0.127)	(0.056)	(0.057)	(0.063)	(0.029)	(0.032)	(0.066)	(0.015)
3 Weeks Post-Shooting	-0.012	0.053	0.026	-0.028	-0.031	0.018	0.078	0.009
	(0.140)	(0.061)	(0.040)	(0.053)	(0.025)	(0.023)	(0.062)	(0.030)
4 Weeks Post-Shooting	-0.651***	-0.166***	0.173***	-0.064	-0.038	0.001	-0.069	0.023
	(0.126)	(0.045)	(0.050)	(0.078)	(0.034)	(0.027)	(0.043)	(0.022)
Sample Size	3,413	3,413	3,413	14,182	14,182	14,182	3,376	3,376
Pre-Shooting Mean	-0.11	0.50	0.09	-0.06	0.43	0.20	0.28	0.03

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to respondents who lived in a county that had a mass shooting (Treatment = 1) and those who lived in counties that bordered counties that had mass shootings (Treatment = 0). Sample is further restricted to those who were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. Table displays coefficient estimates for the interaction of Treatment (indicating whether respondent lived in a county that experienced a mass shooting) and Post-Shooting (indicating whether the interview occurred after the mass shooting). All regressions control for the Treatment indicator, Post-Shooting indicator, age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. County-clustered standard errors are in parentheses. Estimates include Gallup sampling weights. Last row displays the pre-shooting mean for respondents in the treatment group.
* p<0.10, ** p<0.05, *** p<0.01.

Appendix Table 2: Mass Shootings and Community and Emotional Wellbeing - "Never-Treated" Border Counties Included (10+ Victims)

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment X Post-Shooting	-0.271**	-0.099**	0.063	-0.062	-0.038	0.015	-0.022	-0.008
	(0.103)	(0.041)	(0.040)	(0.075)	(0.039)	(0.029)	(0.035)	(0.017)
Sample Size	2,666	2,666	2,666	7,397	7,397	7,397	2,638	2,638
1 Week Post-Shooting	-0.109	-0.111	-0.013	0.080	-0.021	-0.034	-0.056	-0.017
	(0.111)	(0.074)	(0.028)	(0.096)	(0.060)	(0.032)	(0.061)	(0.014)
2 Weeks Post-Shooting	-0.320**	-0.144**	0.061	-0.090	0.003	0.044	-0.063	-0.031**
	(0.131)	(0.061)	(0.058)	(0.089)	(0.050)	(0.034)	(0.076)	(0.013)
3 Weeks Post-Shooting	-0.014	0.045	0.023	-0.043	-0.051	-0.007	0.107	0.006
	(0.165)	(0.075)	(0.049)	(0.082)	(0.042)	(0.030)	(0.075)	(0.034)
4 Weeks Post-Shooting	-0.671***	-0.179***	0.194***	-0.204	-0.086	0.062	-0.068	0.026
	(0.145)	(0.054)	(0.055)	(0.137)	(0.065)	(0.049)	(0.045)	(0.026)
Sample Size	2,666	2,666	2,666	7,397	7,397	7,397	2,638	2,638
Pre-Shooting Mean	-0.05	0.53	0.07	-0.04	0.44	0.20	0.29	0.03

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to respondents who lived in a county that had a mass shooting with 10 or more victims (Treatment = 1) and those who lived in counties that bordered counties that had mass shootings (Treatment = 0). Sample is further restricted to those who were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. Table displays coefficient estimates for the interaction of Treatment (indicating whether respondent lived in a county that experienced a mass shooting) and Post-Shooting (indicating whether the interview occurred after the mass shooting). All regressions control for the Treatment indicator, Post-Shooting indicator, age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. County-clustered standard errors are in parentheses. Estimates include Gallup sampling weights. Last row displays the pre-shooting mean for respondents in the treatment group.
* p<0.10, ** p<0.05, *** p<0.01.

Appendix Table 3: Heterogeneity Tests

	Community Wellbeing Index	Excellent Community Wellbeing [0/1]	Poor Community Wellbeing [0/1]	Emotional Wellbeing Index	Excellent Emotional Health [0/1]	Poor Emotional Health [0/1]	Excellent Community & Emotional Health [0/1]	Poor Community & Emotional Health [0/1]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Parents	-0.609*	-0.254**	0.024	-0.183	-0.070	0.090	-0.228	0.087
	(0.067)	(0.014)	(0.904)	(0.204)	(0.290)	(0.183)	(0.137)	(0.292)
	N=223	223	223	1,099	1,099	1,099	222	222
	[μ=-0.10]	[μ=0.50]	[μ=0.08]	[μ=-0.05]	[μ=0.41]	[μ=0.19]	[μ=0.27]	[μ=0.03]
Childless Adults	0.078	-0.069	-0.028	-0.017	-0.046	-0.001	-0.065	-0.009
	(0.624)	(0.221)	(0.778)	(0.954)	(0.485)	(0.990)	(0.198)	(0.835)
	N=512	512	512	2,682	2,682	2,682	504	504
	[μ=-0.11]	[μ=0.51]	[μ=0.09]	[μ=-0.07]	[μ=0.44]	[μ=0.22]	[μ=0.29]	[μ=0.04]
Men	-0.184	-0.168**	-0.035	-0.093	-0.095**	0.030	-0.235**	0.028
	(0.528)	(0.030)	(0.788)	(0.362)	(0.015)	(0.412)	(0.013)	(0.743)
	N=380	380	380	1,919	1,919	1,919	374	374
	[μ=-0.12]	[μ=0.46]	[μ=0.08]	[μ=0.04]	[μ=0.46]	[μ=0.17]	[μ=0.29]	[μ=0.03]
Women	-0.078	-0.129*	-0.045	-0.055	-0.035	0.030	-0.109	0.027
	(0.791)	(0.056)	(0.741)	(0.683)	(0.552)	(0.400)	(0.108)	(0.712)
	N=355	355	355	1,862	1,862	1,862	352	352
	[μ=-0.10]	[μ=0.55]	[μ=0.10]	[μ=-0.17]	[μ=0.40]	[μ=0.24]	[μ=0.27]	[μ=0.04]
White, non-Hispanic	0.139	-0.034	-0.117	-0.089	-0.096**	0.017	-0.107**	-0.019
	(0.574)	(0.543)	(0.237)	(0.404)	(0.025)	(0.653)	(0.019)	(0.693)
	N=504	504	504	2,735	2,735	2,735	497	497
	[μ=-0.22]	[μ=0.46]	[μ=0.11]	[μ=-0.06]	[μ=0.42]	[μ=0.20]	[μ=0.25]	[μ=0.03]
Black, non-Hispanic	-0.435	-0.201	0.075	-0.154	-0.040	0.134	-0.138	0.167
	(0.487)	(0.345)	(0.633)	(0.586)	(0.746)	(0.213)	(0.326)	(0.263)
	N=100	100	100	343	343	343	100	100
	[μ=-0.14]	[μ=0.52]	[μ=0.10]	[μ=-0.10]	[μ=0.46]	[μ=0.25]	[μ=0.34]	[μ=0.05]

Other, non-Hispanic	-0.050 - N=18 [μ=0.25]	-0.237 - 18 [μ=0.60]	0.000 - 18 [μ=0.00]	0.114 (0.360) 229 [μ=0.09]	0.094 (0.313) 229 [μ=0.47]	0.010 (0.886) 229 [μ=0.14]	1.000 - 18 [μ=0.32]	0.000 - 18 [μ=0.00]
Hispanic	-0.806 (0.331) N=113 [μ=0.22]	-0.551** (0.045) 113 [μ=0.62]	0.011 (0.772) 113 [μ=0.03]	-0.164 (0.119) 474 [μ=-0.08]	-0.059* (0.055) 474 [μ=0.42]	0.127** (0.041) 474 [μ=0.21]	-0.183 (0.339) 111 [μ=0.35]	0.015 (0.624) 111 [μ=0.03]
Less than High School	-0.280 (0.361) N=39 [μ=-0.17]	-0.469 (0.342) 39 [μ=0.59]	-0.044 (0.246) 39 [μ=0.18]	-0.058 (0.802) 202 [μ=-0.19]	-0.104 (0.429) 202 [μ=0.41]	0.095 (0.383) 202 [μ=0.24]	0.281 (0.678) 38 [μ=0.34]	-0.160 (0.460) 38 [μ=0.11]
High School	-0.188 (0.692) N=158 [μ=-0.07]	-0.274 (0.276) 158 [μ=0.50]	-0.224 (0.236) 158 [μ=0.09]	0.092 (0.672) 581 [μ=-0.07]	0.006 (0.950) 581 [μ=0.43]	-0.009 (0.873) 581 [μ=0.20]	-0.280** (0.045) 155 [μ=0.23]	0.023 (0.787) 155 [μ=0.02]
Some College	0.018 (0.945) N=222 [μ=-0.26]	-0.075 (0.540) 222 [μ=0.43]	-0.025 (0.643) 222 [μ=0.10]	-0.189 (0.368) 1,088 [μ=-0.08]	-0.079 (0.285) 1,088 [μ=0.42]	0.086 (0.262) 1,088 [μ=0.22]	0.031 (0.599) 220 [μ=0.25]	-0.050 (0.745) 220 [μ=0.02]
College or More	-0.060 (0.827) N=316 [μ=0.02]	-0.029 (0.822) 316 [μ=0.54]	0.033 (0.771) 316 [μ=0.06]	-0.064 (0.298) 1,910 [μ=-0.01]	-0.068* (0.082) 1,910 [μ=0.43]	0.001 (0.975) 1,910 [μ=0.18]	-0.184* (0.089) 313 [μ=0.34]	-0.009 (0.877) 313 [μ=0.03]

Notes: Authors' analysis based on Mother Jones and Gallup 2008 to 2017. Sample is restricted to include respondents who lived in a county that had a mass shooting and were interviewed up to 28 days before or up to 28 days after the shooting; the day of the shooting is excluded. 47 mass shootings occurred during the study period. Table displays coefficient for "post-shooting"; all regressions control for age, sex, marital status, parental status, race/ethnicity, educational attainment, county fixed effects, and month-year fixed effects. Standard errors are calculated using the wild cluster bootstrap method; p-values are in parentheses; pre-shooting means are in brackets [μ]. Estimates include Gallup sampling weights.

* p<0.10, ** p<0.05, *** p<0.01.