

How do Abuse Allegations Affect the Religious Participation of Catholics?*

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Abstract

I explore the effects of people's attachment to religion on religious participation and on human capital, such as longer term health outcomes, by studying the sexual abuse scandal within the Catholic Church. Reporting by major media outlets in 2002 revealed a staggering amount of sexual abuse by clerics and its ongoing cover-up in the United States by the Church's hierarchy. This news shook many of the faithful's trust in the religious institution and led to a crisis of faith. The intensity of the scandal, as measured by the number of allegations against clerics, differed across the dioceses in the country. Exploiting this variation with a difference-in-differences strategy, I find that dioceses with a high number of allegations experienced diminishment in demand for religion across several different measures. Parents are less likely to have their children receive sacraments and attend parochial schools. Parish membership declines by more than 7.1 percent, and student enrollment falls by 13.2 percent. Additionally, this crisis had effects that extend beyond religious attachment. I present evidence that the clerical abuse scandal leads to worsening mortality rates related to deaths of despair. In particular, at the county level there is an increase in the incidence of high mortality rates of respectively 1.2 percent and 1.8 percent for accidental overdoses and suicides for middle aged men.

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1 Introduction

One would be hard-pressed to deny the influence that faith has had on both cultures and societies. Religious institutions have had varying impacts across key areas of civic life. For instance, whole education networks, hospital systems, and charitable organizations are sponsored (if not run) by religious entities. At the same time, faith plays an important role in many individuals' lives. As of 2014, 77 percent of Americans are religiously affiliated with 55 percent praying daily and 36 percent attending weekly services ([Pew Research Center \(2014\)](#)). Even with this prevalence, religion remains under-researched in the economic literature.¹

The Catholic sexual abuse scandal provides an opportunity to add to this relatively nascent literature and study how people react to a crisis of faith. In 2002, *The Boston Globe* broke the major story about sexual abuse of minors by clergy within in the Catholic Church. What started locally in the Boston area quickly spread throughout the United States. This ripple effect led to the number of allegations against priests to skyrocket. In a relatively short time, people learned not only about the abuse allegations but also about an extensive cover-up of these allegations by the hierarchy in the Catholic Church. This negative news led people to lose trust not only in the religious institution but also in the faith leaders who they had held up as being closest to God. Simply put, many Catholics questioned their faith. Beyond the general national news coverage, areas had different exposures to this scandal due to number of local offenders and due to the varying responses of the local Church leadership along with the perceived levels of its complicity to the scandal.

For a variety of reasons, this crisis of faith could move people to respond in ways that would decrease the demand for religion and affect human capital outcomes. First, one could hypothesize that the negative publicity of the abuse and associated cover-up might lead people to become disillusioned and leave the religion. Additionally, one would expect parents to pull their children from early religious education programs and schools to protect them.

¹[Iyer \(2016\)](#) reviews the literature and shows that in recent years there has been an increasing number of articles and interest in the economics of religion.

Third, the exploitation of minors and a violation of the people’s trust cut off a lifeline where people had social, emotional, and psychological support. In particular, those who availed themselves of a priest’s counsel no longer had that outlet to help process the challenges in their life. Abandoning the faith, a support structure, could lead individuals to despair.

My econometric strategy to examine how this crisis of faith affected the Catholic faithful is to exploit the variation in the exposure of the scandal, as measured by the number of public allegations, across dioceses, i.e., church juridical regions, in a difference-in-difference framework. I compare dioceses that had a high number of allegations in 2002, i.e., in the upper quartile, to those that did not.² To do this, I obtain allegation information from the nonprofit Bishop Accountability, and I utilize a new set of participation data from the *Official Catholic Directory*. Additionally, for health outcomes, mortality rate data comes from the CDC Wonder Database.

First, I find that demand for religion declines. Religious participation decreases across several different measures. The number of Catholics connected to a parish church decreases by 7.1 percent, and infant baptisms drops by 7.9 percent. This totals to about 2.5 million less parishioners for the fifty treated dioceses, or about 14.1 percent of the increase in the number of ex-Catholics since 2000 as measured by the Center for Applied Research in the Apostolate (CARA).

Second, school enrollment, both a secondary measurement of participation and an indicator of human capital accumulation, suffers. The number of students who attend diocesan sponsored elementary schools declines by 13.2 percent and high school enrollment by 17.1 percent. Together this is nearly 180,000 students which represents 60 percent of the total decline in all private school enrollment over the past two decades in the US. Additionally, while the demand for Catholic diocesan schools drops, the effect on other, both Catholic and non-Catholic, private schools differ. For instance, nonreligious private schools experience an increase in high school grade level enrollment.

²This threshold for the number of first time accused clerics is greater than 5. The results of this paper are robust to setting a higher or lower threshold as shown in Appendix B.

Third, with a decline in formal religious connection, there are increases in the incidence of higher mortality rates for accidental overdoses and suicides for adults aged 45 to 64. For men aged 55 to 64, the 1.8 percentage point effect for suicides represents 9.9 percent of the increase of the number of counties that have a suicide mortality rate greater than 10 per 100,000. Similarly, the 1.2 percentage point increase for accidental overdoses is 6.4 percent of the increase of the number of counties with a high overdose mortality rate.

This paper contributes to the larger literature on the economics of religion. In particular, the failures of the institution of the Catholic Church led people away, and I show that this change in the faith experience of Catholics is linked to larger issues affecting human capital outcomes like education and health. This is in a similar vein to [Clingingsmith, Khwaja and Kremer \(2009\)](#) which shows that the Hajj can be life changing for those who make the pilgrimage. Along the same lines, papers have shown other ways that religious institutions affect not only the demand for religion but also the well-being of people. For instance, religious leaders can influence followers behavior ([Bassi and Rasul, 2017](#)), and missionary work has long lasting, i.e., multigenerational, impacts on human capital (([Valencia Caicedo, 2018](#)); ([Calvi, Mantovanelli and Hoehn-Velasco, 2019](#))). Catholic education systems also have long term effects. Papers find that students at Catholic high schools have higher graduation rates and a greater chance to attend and finish college (([Evans and Schwab, 1995](#)); ([Neal, 1997](#))).

This paper contributes to an existing literature studying the impacts of the scandal. Studies have shown that the scandal negatively impacted religious giving, religious employment, and Catholic education (([Hungerman, 2013](#)); ([Bottan and Perez-Truglia, 2015](#)); ([Dills and Hernández-Julián, 2012](#))). The link between religiosity and state welfare has also been examined ([Dills and Hernández-Julián, 2014](#)). My paper complements these studies by bringing direct measures of religiosity and religious practice (parish membership, churches, sacraments) from the previously non digitized data of the *Official Catholic Directory* and a new level of detail at the level of schools to bear on the question. I find that the response

differs among the types of Catholic schools and other private schools. Finally, this paper is the first to show that the scandal pervades beyond the church by affecting mortality rates of behavioral diseases related to despair. Overall the contribution of this paper describes how a crisis of faith hurt religious participation, school enrollment, and, in general, people's health.

2 Background

2.1 The Scandal

In a pastoral letter, the Most Reverend J. Douglas Deshotel, bishop of the Diocese of Lafayette, recently lamented that the public first confronted the reality of the clerical sexual abuse back in 1984 when a Louisiana priest was accused and eventually plead guilty to molesting more than 30 children. Scandal would resurface again in the 1990s when some dioceses had to pay out millions of dollars in settlements.³ Even with these events, the scandal did not rise to the forefront of the public's consciousness until 2002 when *The Boston Globe* published the exposé on sexual abuse of minors by clerics. What prompted this investigative reporting was concern about actions taken by Church officials in response to a series of accusations of sexual abuse made against John Geoghan, a Boston priest. Bishops had allowed the priest to serve in many parishes despite his checkered history.

This reporting was a watershed event. There were growing reports throughout the United States about priests who sexually abused minors, and the news coverage correspondingly increased. The number of allegations against priests skyrocketed. The John Jay Report, commissioned by the US bishops, found that in 2002 dioceses received notification of 3,399 incidents of past abuse. While this scandalous behavior of priests had been documented

³For instance, an important case dealing with scandal before the Boston crisis dealt with the former Diocese of Dallas priest, Rudy Kos. In 1997 a lawsuit against the diocese and Kos, a jury initially awarded \$120 million to victims, but the case was eventually settled on appeal with the diocese agreeing to pay \$23.4 million. Kos was convicted and sentenced to life in prison in 1998.

before in isolated incidents⁴ across the country which resulted in some dioceses having to pay out millions of dollars in settlements, what became apparent was that the hierarchy of the church had previous knowledge of many of these accused priests.⁵ The public had been aware of past singular past incidents of abuse, but now a case could be made that the Church hierarchy was complicit or at least ignorant in how it handled abuse cases. Discoveries were made that bishops moved priests around after they underwent psychological treatment and did not report offenses to legal authorities. To many, it seemed that the leadership concealed the truth in order to avoid negative publicity.

For many the scandal was more than just a small group of clerics who had done the most abominable things to innocent children. What was just as repulsive was the appearance that those who were entrusted with their pastoral and spiritual care, i.e. the bishops, had acted recklessly by keeping credibly accused priests in ministry and seemingly had protected the abusers. The faithful's trust was shaken in those who they saw as closest to God. It is understandable that this scandal would lead some to doubt their religion's leaders and, in general, to enter into a crisis of faith.⁶ Anecdotally, there was much anger in the pews, and some people quit attending Sunday mass altogether.

While, at the national level, the whole Church was indicted by this scandal, there were local differences in the exposure of this crisis. There was widespread spatial variation in where the allegations were made against priests. Certain areas of the country, like the Northeast, were more barraged with accusations than other parts. The faithful depending on what diocese they lived in had different intensities of exposure to the scandal.

⁴The John Jay Report estimates that only about 10% of the eventually reported incidents of abuse from 1985 and before were reported to dioceses by 1985. The 2002 scandal brought several new allegations from the past to the forefront.

⁵In fact, journalists at *The Dallas Morning News* found at the time of the scandal that nearly two-thirds of US bishops had let accused priests to continue working after allegations were made.

⁶For instance, [Jones \(2019\)](#) reported that 22 percent of Catholics polled questioned whether to remain in the Catholic Church after the 2002 scandal.

2.2 The Church in the United States

The Church is separated into geographic, juridical areas known as archdioceses or dioceses.⁷ In the United States, there are 176 territorial dioceses. Currently, each state has at least one diocese while Texas has the most with fifteen. Furthermore, only four dioceses cross state borders.⁸

While some dioceses have more than one bishop, each is headed by a single bishop, who is also known as the ordinary. The ordinary has as his charge the pastoral and spiritual care of all the Catholics who reside in his diocese. To assist in this ministry, the bishop ordains priests and deacons and assigns them to their apostolic ministries, usually church parishes. The bishop is the only one who has the direct authority to move priests around within their own diocese. As mentioned above, many criticized bishops for moving around abusers from place to place.

A typical diocese is divided up into parishes so that the local church can more easily meet the pastoral and spiritual needs of its members. The norm is that each parish church is headed by a pastor appointed by the bishop who is in charge of caring for those who live in the parish boundary.⁹ The usual term of office for a pastor is six years, but it can be renewed by the bishop. However, a parishioner could come into contact with several different priests that serve the diocese over the years even if she never moved parishes. The overwhelming majority of parish boundaries are geographic and determined by the Catholic population in the area. As such, the boundary of an urban parish may be only several square city blocks while the jurisdictional reach of a rural parish could stretch several square miles.

Whom the bishop sends to a parish church is of utmost importance because the parish is the center of a practicing Catholic's faith experience. A Catholic can attend Sunday

⁷An archdiocese is usually just a diocese with a larger catholic population than other dioceses in the region. For the purpose of this paper, diocese will refer to both a diocese or an archdiocese.

⁸The Diocese of Gallup lies in the states of Arizona and New Mexico, the Diocese of Wilmington traverses the Delaware-Maryland border, the Diocese of Norwich in Connecticut has a small portion in New York, and the Archdiocese of Washington covers the District of Columbia along with a portion of southern Maryland

⁹Additionally, some parishes may have parochial vicars, or associate pastors.

and, possibly, daily mass, take religion classes, receive counseling from a minister, perform social outreach, and socialize all at the local church. Key to this faith experience are rituals centered around life events, and the most important are the Sacraments of Initiation.

The Sacraments of Initiation are received when someone enters the Catholic faith. They include Baptism, First Communion, and Confirmation. Baptism is the first sacrament that an individual receives when one comes into the Catholic Church. While people may be baptized if they convert later during adulthood, it is the norm that infants are baptized within the first year after birth. In the United States, it is usually the case that first communion chronologically follows Baptism. Baptized children are able to receive First Communion once they reach the age of seven, and they have the required preparation. After receiving this sacrament, the Catholic can fully participate in the mass. Finally, Confirmation is typically the last sacrament that a minor receives. Depending on the local diocese, children might receive this sacrament while they are in elementary school. However, the vast majority of dioceses have teenagers preparing to receive this sacrament when they are in middle school or high school. Upon receiving Confirmation, the person is fully initiated into the faith.

Another fundamental way that people experience the Catholic Church is through the Catholic school system. Enrollment informs us about religious participation because the faithful are encouraged to send their children to Catholic schools. In fact, it is a common practice that families who attend a parish church receive a discount on tuition at that particular parish's parochial school. Catholic schools not only educate their students according standard curricula but also aim to form them to be disciples and practitioners of the Catholic faith. Common practices during school time include theology classes, weekly mass or prayer services, and sacramental preparation for first reconciliation and communion. While all of these ways definitely speak to religious participation, looking at school enrollment also says something directly about the market for private schools. In particular, learning about how people react to the scandal in regards to their choice in education informs us about the demand curve for Catholic and other private schools. The predicted decrease in demand has

ramifications that potentially extend beyond the sphere of religion. When parents choose to forgo education in the Catholic school system for their children, one may question how this will affect the accumulation of human capital, not only in standard skill and knowledge acquisition but also in the many dimensions of human formation which religious schools emphasize.

Even with the similarity of mission, in the United States, there are generally speaking two different types of schools within the Catholic school system. The first, diocesan schools, are governed and receive curriculum direction from diocesan officials. Parochial schools, usually serving students in kindergarten through eighth grade, are tied to a particular parish, and the pastor has at least a minimum direct care of the school through the hiring of the school principal. Diocesan high schools tend to be regional. The other type, non-diocesan private Catholic schools, have a much more varied background. For instance, some of the schools are governed by a private lay board while others are sponsored by a religious congregation, such as the Jesuits. Under these circumstances, these schools operate under the auspices of local dioceses, but a diocese has no direct control of the school. These schools get their institutional identity not only by being Catholic but also from the charism of their sponsoring group. It seems plausible that the abuse scandal could affect enrollment differently at these types of schools.

3 Data and Methodology

3.1 Data

The main identification strategy relies on information gleaned from the non-profit Bishop Accountability. The mission of this organization is to hold the church leadership accountable for the handling of abuse allegations. Key to this is the transparency of these allegations against Catholic Church officials, including bishops, priests, deacons, brothers, and sisters. The organization provides a diocesan list of each church official who has been accused of sex-

ual abuse of a minor along with supporting public documentation of the allegation, including court documents, diocesan press releases, and news articles. As such, one can construct a data set in which for each accuser the date that an allegation was first publicly made known. From this, I can tally by year and by diocese the number of first-time allegations independent of when the alleged abuse occurred.

In conjunction with the allegation data, the *Official Catholic Directory* (OCD) is a primary source of data. Published annually by Kenedy and Sons, the OCD holds a wealth of information, including parish assignments, institution listings, individual priest assignments, and general statistics for each Catholic diocese in the United States. To my knowledge, I am the first to use this complete data source. For this analysis, I use data from 1991 to 2016. Key variables of interest deal with Catholic participation and identity. In particular, the OCD has information on the Catholic population, the number of baptisms, first communions, confirmations, and enrollment figures in religious education programs and Catholic schools in each US diocese. Additional diocesan school enrollment data for 1997-2018 comes from the National Catholic Educational Association (NCEA). I complement this with the biennial Private School Universe Survey (PSUS) from the National Center for Education Statistics (NCES) for the years 1991-2016 which has grade level enrollment at the school level.

Additionally, for the analysis of the effect on mortality rates, I retrieve county level death data from the publicly available compressed mortality data set through the CDC Wonder online database for the years 1991-2014. In particular, I utilize county level data on the number of deaths by year, gender, age group, and cause. I follow [Case and Deaton \(2017\)](#) to categorize underlying causes of death into accidental drug and alcohol overdose, suicide, and liver disease according to the International Classification of Diseases 9th Edition (ICD9) for the years 1991-1998 and the International Classification of Diseases 10th Edition (ICD10) for the years 1999-2014. One of the constraints working with the publicly available county level data is data suppression. If the number of deaths for any specific group is less than 10

then the number of deaths is suppressed.¹⁰

Intercensal demographic county level data, including race and age, comes from the US Census Bureau. Additionally, county level data on personal income comes from the Bureau of Economic Analysis (BEA). County level data is aggregated to the diocesan level by using a county to diocese cross walk.

3.2 Allegations and Treatment

In order to have a measure of the exposure of the sexual abuse scandal, I count the number of allegations that each diocese has. To have better understanding of this metric, it is best to first consider the type of allegations that will be counted. Similar to [Hungerman \(2013\)](#) and [Bottan and Perez-Truglia \(2015\)](#), a sexual abuse allegation is counted if it is publicly leveled against a Catholic Church official, such as bishop, priest, deacon, brother, sister, or seminarian. An additional requirement is that the allegation has to be the first-time that the official has been publicly accused. If a priest has served in multiple dioceses, the diocese where the accusation takes place is considered the primary diocese of record in the data. Furthermore, the year when the allegation is first made public (and not when the abuse occurred) is when one expects the negative news to effect the diocese. Under this framework, public allegations made in 2003 and 2005 against a priest that occurred in 1975 while he worked at a school in diocese x counts as an allegation for the diocese x in 2003 only. Finally, this paper does not distinguish between allegations that eventually result in settlements or convictions, those that are deemed credible, or those not considered unsubstantiated by church officials. This measure relies on the the negative shock that results from the public revelation that a Catholic official has been accused of sexual abuse.

Figure 1 presents the tally of first-time allegations levelled against Catholic clergy and religious for 1991 to 2018. As one might expect, the number of allegations are very low leading up to the 2002 reporting by *The Boston Globe*. At that time, the US Catholic

¹⁰For instance, if the number of heart disease related deaths for women, aged 35 to 44, in Brewster County, Texas in 2005 is less than 10, the CDC suppresses the actual count in the public data.

Church experienced a spike in first-time public allegations. In subsequent years, the number of allegations dropped but the level was higher than the years prior to the 2002 scandal. This year clearly stands out as when news about the sex scandal was publicly made known.¹¹

This paper exploits the difference in intensity of the publicity of the abuse scandal. I measure the intensity by counting the number of first-time allegations in each diocese that occurred in 2002 when news of the national scandal first broke.¹² One might wonder what is the impact of the scandal across the United States. As news spread, many people were affected, and anecdotally many people left the faith. This paper is unable to measure this aggregate effect of the scandal; rather, it looks at the local effect of a diocese’s susceptibility to the scandal on participation, i.e, the relative effect by comparing high allegation to low allegation dioceses.

I consider dioceses in the upper quartile of the number of allegations in 2002 as treated. The cutoff is more than five first-time allegations in 2002 as treated. Under this standard, fifty locales are considered high allegation dioceses. Figure 2 delineates the borders of the dioceses in the continental US and shows the high allegation and low allegation dioceses, and Table A.1 provides the number of allegations in each of the treated dioceses in 2002. The analysis and results which follow in this paper qualitatively hold when the cutoff is relaxed or tightened as this will be discussed in the robustness section.

Dioceses that have a much longer established history are more likely to have a large number of allegations. Many in the Northeast experienced a flood of first-time allegations in

¹¹Another spike also occurs in 2018 which is a result of new round of allegations resulting from two major news events that happened in the summer of that year. First, allegations against the former archbishop and cardinal, Theodore McCarrick, were deemed credible by the Archdiocese of New York in June. Second, the report from the Pennsylvania grand jury’s investigation into Catholic Church sexual abuse was released in August. A host of previously undisclosed allegations against priests were made public in the report. These two events led to a nationwide call for transparency. Dioceses and religious orders released historical lists of priests who had credible allegations leveled against them. The first of these entities began to roll out the credibly accused lists in the fall of 2018 and others followed suit throughout 2019. There are still some dioceses who have not released lists.

¹²The total number of allegations seems like a reasonable gauge of intensity because the publicity from even one allegation could be broadcast throughout the diocese by any number of media outlets. Yet, one may argue that the exposure of the scandal does not depend on the total number of allegations and suggest that the number of allegations per capita would be a better measure. When the paper uses the number per person, the results qualitatively hold and results for Sacraments of Initiation are included in Appendix B.

2002. Additionally, those with the most allegations tend to be those with the largest population. The dioceses of Baltimore, Boston, Chicago, Los Angeles, New York, and Philadelphia comprised about 21 percent of the US Catholic population in 2002. Additionally, the spread of the scandal reaches some Midwestern and Western dioceses. Table 1 provides summary statistics by high allegation and low allegation dioceses. The average high allegation diocese is larger than the average low allegation diocese on a number of key characteristics. Yet, in the robustness section, the results of this paper hold when I match on a set of covariates.

Inspecting how the number of allegations evolve between high allegation and low allegation dioceses, high allegation dioceses on average have more first-time annual allegations post 2002 than the low allegation dioceses. Figure 3 presents this information by year and treated group. The dashed line represents the average cumulative number of first-time allegations for high allegation dioceses while the corresponding solid line for low allegation dioceses. Before news of the scandal, high allegation dioceses had a slightly higher number of cumulative allegations. At the scandal in 2002, there is a steep jump and relatively much smaller one for low allegation dioceses. The stark difference in cumulative allegations between the two types of dioceses is maintained throughout the period of this paper’s analysis.

Due to the sudden jump in allegations, one might imagine that people react to the news of the scandal immediately. However, there is a distinct possibility that people may wait due to the way they process the information of the news. First, they may exhibit confirmation bias where they might be slow to update their opinion about the Church. For instance, an individual could chalk up news reports of the scandal to media bias.¹³ Second, a person may employ a heuristic of optimism. Individuals may be wary to think something so horrible could occur in their beloved religion. Under these circumstances, repeated news of allegations would budge someone to change their belief about the Church. Due to the cumulative effect

¹³In fact, Mancini and Shields (2014) through a 2010 national survey find that increased exposure to media reporting of the scandal is associated with increased public confidence in the Church in being able to handle future sexual abuse cases. They argue that this may be do to a boomerang effect which suggests that continual negative attention to one issue might backfire in shaping public opinion. In other words, people may question the bias of the reporting and form a defensive stance on the issue.

of the negative publicity that continued after the initial news in 2002, we may expect to see both delayed and lingering effects of the crisis on participation variables.

3.3 Empirical Strategy

The intensity of the sexual abuse scandal varied across different dioceses within the Church; as such, I can exploit that variation in a difference-in-differences framework. In order to measure the intensity of variation, I count the number of allegations as mentioned in the previous section. I have shown that the number of allegations vary across dioceses. This number of new allegations seems to be something that should be correlated with the scandal in a particular locality. For example, I assume that more allegations would be associated with more news reports and other public revelation clergy sexual abuse. What this paper then does is test for whether or not dioceses that had a greater exposure to the scandal are related to the outcomes of interest: (1) religious participation, (2) school enrollment, and (3) deaths of despair.

The paper estimates the causal impact of the scandal on the outcomes of interest using the estimating equation for the preferred specification that follows:

$$Y_{dt} = \beta_0 + \beta_1 Treat_d \times Post_t + \beta_2 X_{dt} + \eta_d + \nu_t + \varepsilon_{dt} \quad (1)$$

Y is the diocesan level outcome for diocese d in year t , such as the log number of infant baptisms. For this paper, the preferred specification will use the log of variables.¹⁴ $Treat_d$, an indicator variable, is 1 if the diocese d was a high allegation diocese in 2002. $Post_t$, the other indicator variable, is 1 if the year t is 2002 or later. β_1 is the coefficient of interest that will give the differential effect of having a experienced a higher volume of allegations in the diocese on the chosen outcome. X_{dt} is a vector of diocesan level specific characteristics, such

¹⁴Other specifications include per capita, levels, and an index level. The index is calculated as a ratio between the level in year t to the level in 2001 immediately before the abuse scandal, i.e. $Y_{dt} = \frac{level_{dt}}{level_{d,2001}}$. Results for the per capita measure are included in the robustness section.

as Hispanic percentage or per capita income. η_d is the difference in outcome due to diocesan effect, ν_t represents the common shocks to all dioceses for a specific year, and ε is the error term. This specification, while primarily for the diocesan level, will be modified for relevant county and school level outcomes.

In a particular note for the county level analysis on deaths of despair, a reasonable choice for the outcome variable Y_{ct} is the the county level mortality rate for a particular underlying cause, i.e. the number of deaths per 100,000 people. However, as mentioned the data section, data suppression does not allow for an accurate estimate of the effect on the rate. Instead, I create a new dummy variable, Y_{ct}^n , that is one if the mortality rate is greater than or equal to n . In other words, the outcome is whether a county’s mortality rate reaches a certain threshold n .¹⁵

The event study for the various outcomes of interest comes from modifying equation 1:

$$Y_{dt} = \beta_0 + \sum_{T \neq 2001} [\beta_{1T} Treat_d \times \mathbb{1}(t = T)] + \beta_2 X_{dt} + \eta_d + \nu_t + \varepsilon_{dt} \quad (2)$$

The treatment variable $Treat_d$ is interacted with a set of indicators, $\mathbb{1}(t = T)$, for each calendar year. As such, the yearly coefficients of interest are the β_{1Ts} . I normalize $\beta_{1,2001}$ to zero, so all coefficients are interpreted as changes relative to the year before the news of the scandal broke. The rest follows as above.

In order to make this functional, I made some assumptions about the model. Knowing that some of these are not testable, I conducted several robustness checks to try other assumptions that also seem reasonable. With these, the paper gets qualitatively similar results. They are further detailed in Appendix B. First, I find that the results are robust to contracting and expanding the threshold for a treated diocese, showing that the results do not come from cherry picking. The preferred specification includes approximately the upper quartile of dioceses in terms of number allegations. This check includes thresholds

¹⁵As this cutoff may seem arbitrary, I am in process of getting the restricted data in order to address this truncation problem.

that look at the top fifteen, twenty, and forty percents of dioceses. Second, the findings are also robust to changing the specification of the outcome variable. Instead of the log of participation variables, the paper uses outcomes per one million people. Third, I employ a parametric event study that controls for linear pre-trends, and qualitatively similar results hold. Finally, I use kernel propensity-score matching on covariates to get more comparable groups between the high and low allegation dioceses.

4 Results: Participation

4.1 Sacraments of Initiation

This paper looks at the effect of the crisis on religious demand. I am able to get at a more direct measurement of religious participation by utilizing the OCD data than previous literature. I have digitized a unique data set which provides the number of people who have received the Sacraments of Initiation, which are Baptism, First Communion, and Confirmation, in each diocese. Each of these give a unique perspective into the way that the sex abuse scandal has had on the Catholic faithful's religious participation.

Baptism is the first sacrament that someone receives when one comes into the Catholic Church. It is the norm that Catholic families have their children baptized within the first year after their birth. As such, the parents and the godparents profess the faith of the infant in the baptism ritual. One expects that parents wary from the abuse scandal to avoid baptizing their newborn infants.

Using similar reasoning, one would expect a drop in the number of children who receive First Communion. Baptized children are able to receive First Communion once they reach the age of 7. One of the requirements is that a child receives sacramental preparation through her parochial school (if she attends Catholic school) or through the parish's religious education program. If students are not enrolled in Catholic elementary schools, parents would have to take the initiative to enroll their children in religious education classes to

receive this sacrament. Again, the paper conjectures that parents would be less willing to have young children involved in these church programs.

Finally, a minor is confirmed only after being baptized and usually after receiving First Communion. In some cases, one may be confirmed at an early age around the same time as when one receives First Communion. For most of the dioceses in the United States, the norm is that children prepare for confirmation during their teenage years while in middle school or high school. Initially, one would also expect that there would be less who would want to be confirmed because of the scandal.

Overall, we can say that each of these measure religious participation in unique ways. Baptism captures purely the attitudes of the parents. Second, First Communion may additionally capture some concern about their children’s welfare during the actual participation for reception of the sacrament. Finally, Confirmation captures both of these concerns but also reflects a child’s attitude.

Figure 4 provides event study plots derived from Equation 2 of the effect of the scandal on the log number of infant baptisms on the left in Panel A and on the log number of first communions in Panel B. The difference in how the outcomes evolve by diocese type is evident in the respective coefficient plots. In the immediate years prior to the scandal of 2002, the coefficients for the infant baptism regression are close to zero. In the years following, the estimates become negative almost immediately and are statistically significant within five years of news of the scandal. The results are qualitatively similar for First Communion. The delay in the effects possibly may be attributed to four reasons. First, there may be a cumulative effect. While the crux of the scandal occurred in 2002, high allegation dioceses continue to have more first-time allegations than the control dioceses in the few years afterwards. Parents may not have updated their beliefs until after an accumulation of negative publicity. Second, the scandal could have driven young people away from the faith more easily, but it takes some time for these cohorts to become the dominant cohorts having children. Third, the data in the OCD is static as it relies on the administrative reports

of the dioceses that are reported in lags. Finally, with regards to the age requirement, we would expect the larger effects to happen beginning 7 years after the scandal. In this case, this captures all those who were not baptized initially and who now cannot receive First Communion.

The estimates based on Equation 1 of the effect of the abuse scandal on these sacraments is provided in Table 2. Results without incorporating diocesan controls are presented in the first and third columns. These estimates are negative and statistically significant. The magnitudes of the estimates, in the second and fourth columns slightly decrease when I include controls, which include the percentage of population that is Hispanic and per capita income for both the infant population percentage for Baptism. Yet, they remain statistically significant. With controls included, I interpret that the estimates imply that dioceses that had a high number of allegations in 2002 experience a 7.9% decline in infant baptisms and a 7.8% decrease in first communions. This amounts to 843 less baptisms and 698 less first communions for the average high allegation diocese based on the pre-scandal means of these dependant outcomes. This evidence shows that parents increasingly kept their infants and young children away from these rituals and incorporation into the Catholic Church.

The fifth and sixth columns of Table 2 present the estimates of the effect that the 2002 scandal has on the log number of confirmations. The magnitudes are much smaller than those of the other Sacraments of Initiation, and they are too noisy to definitively conclude their sign. Why would this sacrament, one in which minors predominantly receive, not experience the same declines as the other initiation sacraments? Since the recipients are usually older when they receive this sacrament, it seems sensible that both the potential recipients and their parents have spiritually and culturally invested more into the Catholic faith. As such, this paper posits that they would be less likely to end their training for this sacrament, which is key to their formal relationship to the Catholic Church. Additionally, similar to first communions, one needs to be baptized in order to be confirmed. The long term effect of the scandal may be only realized several years after 2002 if the main driver is

children not being baptized. Additionally, the farther out from 2002, one could expect the treatment to get much noisier because people could move and change dioceses. These are some possible reasons why there is not a discernible effect.

4.2 Catholic Population

Another key statistic for religious participation is the number of Catholics who are connected with a church parish through formal registration. The OCD reports the diocesan Catholic population based on this standard. This metric provides an overall sense of families and individuals who choose to register with their local parish. However, this variable does not include those who never register and still attend Sunday mass or participate in other parish sponsored activities. Additionally, it takes time for a parish to update their membership list when people move to another area or simply stop going to church. Finally, as mentioned before, due to confirmation bias and general optimistic thinking, some marginal Catholics might be slow to update their beliefs. As such, departures most likely will be realized in the data after a lag.

A time series of the evolution of the US Catholic population in the 176 geographical Latin Rite dioceses along with its corresponding proportion of the total US population is presented in Figure 5. Over the last four decades the, the Catholic population, represented by a solid line, has increased from around 47.8 million in 1980 to about 68 million in 2017. In the years preceding the 2002 abuse scandal, the population increased at a relatively constant rate to 61.8 million. Looking at the graph, it is evident that the slope of the population curve has decreased in the years afterward. In fact, just as [Hungerman \(2013\)](#) noted, immediately following the crisis, the slope either flattened or became negative. What is new to this paper is the plot of the dashed line, i.e. the percentage of the US population that is connected to Catholic parish, and this is more telling. Until the late 1990s, the percent hovered near 21.5 percent. The proportion increases to a peak of 22.3 percent right after the abuse crisis, then falls 1.2 percentage points through 2007, and hovers at this new level throughout the

rest of the timeline. While this time series is not part of the causal evidence that the crisis caused this substantial drop in the Catholic population, the figure informs descriptively what happened to the broad participation of the faithful during this time.

Comparing high allegation to low allegation dioceses, Figure 6 displays the plot of event study for the log of the total Catholic population in Panel A and provides us with this visual evidence. Prior to news of the scandal, the coefficients are statistically indistinguishable from zero. The estimates drop beginning in 2002 and become statistically significant 3 years after news of the scandal broke. The effect continues to get larger until the estimates plateau beginning around 2009.

The estimates for the difference-in-differences regression are presented in the first two columns of Table 3. Similar to the sacramental outcomes discussed above, the outcome is the log of the Catholic population in a diocese. Both estimates are negative and statistically significant. With controls added, the estimate -0.0741 is statistically significant at the 95 percent level. According to this specification, the 2002 abuse crisis causes about 7.1 percent decrease in the Catholic population which is nearly 50,000 for the average high allegation dioceses.

These results qualitatively hold if we use the per capita measure, i.e the percent of the total diocesan population that is Catholic. These corresponding estimates are in the third and fourth columns of Table 3. With controls added, there is an estimated 1.61 percentage point drop in Catholic percentage in the treated dioceses, corresponding to about 38,000 fewer people connected a Catholic parish in the average affected diocese.

4.3 Catholic Parishes

Next, the paper looks at the structural backbone of Catholicism. Most people experience their faith through their local parish church. It is through this unit that Catholics attend weekly services, participate in service organizations, socialize with fellow churchgoers, and engage their spiritual leaders. As mentioned in the background section, a territorial diocese

is divided up into parishes with their own geographical boundaries so that the local church and meet the pastoral and spiritual needs of its members. The growth in new parishes is largely determined by the number of Catholics in the area.

With the reduction of individuals who formally associate with a Catholic parish, what happens to the parishes? We might expect that the number of individual parish churches to decrease for a number of reasons. First, as people leave the faith, there is a reduction in demand.¹⁶ Second, the scandal led to lawsuits. This coupled with fewer members led financial troubles for dioceses. In order to cut budgets, parishes would close or be consolidated.

Panel B of Figure 6 offers the event study plot for parish churches. The plot provides no evidence of differing pre-trends, and a decline is apparent after news of the scandal broke. While the estimate of the year coefficient does not become significant until a few years after the scandal, this is in line with the timeline of closing of parishes.¹⁷

The estimates of the causal impact of the scandal on church parishes are presented in the fifth and sixth columns of Table 3. The paper finds that parish closures increase so the number of churches declines about 7.8 percent, or about 12.7 churches for the average high allegation diocese.

5 Results: Schools and Student Enrollment

5.1 Diocesan Schools

Among diocesan schools, I first look to the primary schools. The typical Catholic elementary school is parochial, i.e. it is attached to the a parish. In most cases, the school is on the same grounds as the parish church. A regular practice at these schools is to have the

¹⁶One might posit that it is the closing of parishes that may lead to people leaving the faith. I argue that this is not the main mechanism at work. When a parish is closed or consolidates, the people that were attached to the that parish are automatically assumed into another parish church.

¹⁷Several dioceses began consultation in the early 2000s about closing and merging certain churches due to population decline, lack of finances, and the shortages of priests. The decrees to actually close the parishes only were promulgated after enough time had passed for discernment and the affected communities to adapt.

parish priest(s) involved by, perhaps, teaching a weekly religion class, visiting class rooms, celebrating the school liturgy, and/or attending other school functions. It seems reasonable that news of a clergy scandal within the diocese would cause parents to avoid sending their children to these schools and decrease the demand for Catholic education.

In Figure 7, the coefficient plots for the log number of diocesan elementary schools and log student enrollment are presented. Both panels give positive visual evidence that there are parallel pre-trends. Immediately when the scandal breaks, declines manifest for both the number of schools and student enrollment. The estimates of the causal impact on diocesan elementary schools are presented in Panel A of Table 4. With controls included, the effect on the number of diocesan elementary schools and student enrollment are decreases of about 13.2 percent and 13.2 percent, respectively. The average high allegation diocese experiences declines of about 9.5 schools and 2,900 students.

The paper finds that diocesan secondary schools in high allegation dioceses also experienced negative effects due to the 2002 abuse scandal. The plots of the event studies for the log number of diocesan high schools and log student enrollment are presented in Figure 8. Panel A makes it evident that there is a rather quick decline in the number of high schools in the affected dioceses. As seen in Panel B, the effect on log enrollment takes awhile longer to manifest, around four years after it does for the log number of high schools. Since a major pipeline of diocesan high school students comes from the parochial school system, it is reasonable that this could simply represent the drop in elementary school enrollment that occurred in the immediate years following 2002. Panel B of Table 4 provides the estimates of the effect of the scandal on the number of diocesan high schools and enrollment when controls are included. A high allegation dioceses sees a negative effect on high schools and enrollment of about 15.2 percent, or 1.1 schools, and 17.1 percent, or 680 students. Together with the estimated number for elementary schools, this amounts to 180,000 total students, or about 8.0 percent of those enrolled in all diocesan schools in 2001.

As a robustness exercise, I move analysis of the effect on school enrollment from the OCD

data set to the constructed one from the PSUS of the NCES. Table 5 presents estimates of the effect of the scandal on elementary and high school enrollment using the biennial NCES data. In particular, we examine the log enrollment of first grade because this would mark the beginning of an average student’s stint at a parochial school. With similar reasoning for high schools, I measure the effect on the log of ninth grade enrollment.

The first column presents the estimates from the regression using a modified Equation 1 with county level controls included. In Panel A, I find that diocesan elementary schools in high allegation dioceses saw about a 6.7 percent decline in first grade enrollment. In the bottom panel, the estimate suggests that diocesan high schools experienced a 9.4 percent drop in ninth grade enrollment. While the magnitudes of these estimates are smaller than those presented from the diocesan level data, they are in the same direction and tell similar stories. The number of diocesan schools and school enrollment dropped due to the scandal.

5.2 Other Catholic Private Schools

As discussed above, one could expect that this scandal might affect Catholic private schools differently than diocesan schools since the former are not under direct control of their respective local diocese and get their identity from their sponsoring organization. The first sign that this may be the case is when I do not differentiate between diocesan and private schools in the analysis. Table 6 provides the estimates of the effect on all Catholic schools.¹⁸ The results for elementary schools are qualitatively similar to those of diocesan elementary schools shown in Table 4. What differs are the estimates for high schools in Panel B. In fact, the estimated effect on all Catholic high schools is less than half than that on diocesan high schools.

In order to get at the effect on private schools, I use the school level data from the NCES. The second column of Table 5 is dedicated to non diocesan catholic schools. In Panel A,

¹⁸Additionally, Table A.2 provides estimates on the log of these school variables utilizing data from the NCEA. This and Table 6 both tell a similar story that the effects are attenuated for high schools when both diocesan and private Catholic school data are combined.

the effect is positive for elementary schools with an estimate of 0.7 percent on first grade enrollment. The estimate is opposite sign of the one for diocesan schools although this estimate is not statistically significant. The corresponding estimate for secondary schools in panel tells that the average high allegation diocese experienced a negative effect of 3.2 percent on ninth grade enrollment, about one third of the one measured for diocesan schools. The estimate again is not statistically significant. However, with this caveat, the paper finds that in high allegation dioceses Catholic private schools fare relatively better than their diocesan counterparts.

5.3 Other Religious and Nonsectarian Schools

What naturally follows is to investigate whether the scandal has an impact on other private schools. I consider both other religiously affiliated schools and those that have no proper affiliation and considered secular. An effect seems plausible if parents of students that attend Catholic schools in high allegation dioceses want their children to continue their education at a private institution not affiliated with the sex abuse scandal.

Column 3 of Table 5 presents the estimates for the non Catholic religiously affiliated schools. In Panel A, the negative effect on first grade enrollment is almost 5.4% and statistically significant. Both diocesan and religiously affiliated schools suffered declines in elementary enrollment. The effect on religiously affiliated schools is about 80 percent of the diocesan estimate. For nonsectarian schools, the estimate in the fourth column is not statistically significant and translates to about a 0.1 percent decrease in first grade enrollment. Then Panel B of Table 5 provides further evidence that the scandal affected non Catholic private schools differently. Although the estimate is not statistically significant, secular schools experienced a 0.8 percent increase in ninth grade enrollment. Religiously affiliated and nonsectarian schools respectively have 5.9 and 10.4 percentage point differences in the effect on ninth grade enrollment when compared to their diocesan counterparts.

Figure 9 provides a plot of the estimates of the regressions from a modified Equation 1

on the different log grade level enrollments for diocesan, private Catholic, other religiously affiliated, and nonsectarian schools. In Panel A, the absolute value of the magnitude of the effect of the scandal on parochial school enrollment is largest at the first grade. We visually see that the effect weakens and goes to zero as we look at the later years in parochial school. A natural point for changing schools in the Catholic school system occurs in the ninth grade after a student graduates from a parochial school. The plots show that for each grade level of high school, diocesan school suffered declines in enrollment.

In Panel B, the point estimates are positive but not statistically significant for private Catholic elementary schools. For other religiously affiliate schools, the pattern of the estimates in Panel C for the early grade levels follow a similar pattern to diocesan schools. However, there appears to be no effect on grade level enrollment for eighth grade and above. Interestingly, in Panel D for nonsectarian schools, there is little to no effect of the scandal on grade level enrollment for grades that are at the parochial level. Yet, there is visual evidence of a positive effect and a clear difference from that on diocesan schools for grades at the secondary school level. Overall, the scandal had strong negative effects on diocesan Catholic schools, and there is mixed evidence of the effect on non-diocesan Catholic and other private schools.

6 Results: Mortality Rates for Deaths of Despair

A Catholic in a high allegation diocese was more likely to sever one's relationship to their church due to the sex abuse scandal. Evidence so far has been presented on the negative effect of this crisis on religious participation. I now transition to look at how the scandal might lead to behavioral changes that may lead to increasing occurrences of certain diseases related to despair.

Literature in psychology has identified a relationship between religion, depression, and suicide. Those who are highly religious are less likely to be depressed and less likely to

attempt suicide ([Koenig \(2012\)](#); [Van Praag \(2009\)](#)). With a decline in religiosity, I conjecture that diseases related to despair might increase due to a couple of mechanisms. One reason is when a Catholic is having personal difficulties, he or she has the option to see a priest or another minister for spiritual conversation or pastoral care. Those who leave the faith and experience such said challenges no longer avail themselves of that counseling. As a result the disaffected may never get the help that they desire and need. Another rationale is, for many people, faith is more than just a set of personal beliefs; it is an identity. If people are jarred by the scandal, this could lead to some having existential crisis. Finally, when a person leaves a religion, one also leaves his or her local parish community. The friends and acquaintances that had been a support are no longer as present nor as practically accessible to the person. This potentially could lead to social isolation. In an attempt to measure despair, the paper investigates the effect of the scandal on mortality rates related accidental overdoses, suicides, and alcoholic liver disease.

Following [Case and Deaton \(2017\)](#)'s categorization of behavior-related conditions related to despair, I analyze the effect of high allegations on the subgroups of men and women, aged 45 to 64.¹⁹ Due to the limitations of the public data, I estimate the effect of high allegations on the incidence of a county having a mortality rate greater than 10 deaths per 100,000 people for each subgroup. Table 7 has key mortality statistics for counties by whether they are in high allegation and low allegation dioceses for the specific subgroup of men aged 55 to 64. Similar to the summary statistics presented in Table 1, one finds that a county that lies in a treated diocese has a larger population on average than one that does not; however, the overall group mortality rate is similar across the two types of counties. Understanding that economic despair may be one of the drivers for these outcomes, I control for migration, income, unemployment and manufacturing employment.

Figures 10, 11, and 12 display the plots of the coefficients for the event studies for the

¹⁹I present in full the subgroup of men, aged 55 to 64 because the results are most comprehensive across the different underlying causes of deaths.

underlying causes: (1) suicide, (2) accidental drug overdose and alcohol poisoning,²⁰ and (3) alcoholic liver disease and cirrhosis. Each plot gives evidence of parallel pre-trends, and there is a clear increase in the effect after news of the abuse scandal broke. With both suicides and accidental overdoses, there is a statistically significant effect within four years of the news breaking of the scandal. There is a longer delay to see the effect in liver disease and cirrhosis. It takes twice as long for a discernible effect. According to the *Merck Manual*, alcoholic liver disease is more likely to occur in individuals who are chronic drinkers for at least eight years. These diseases take a much longer time to develop, and this could explain the delay of seeing the effect in the coefficient plot. These findings generally hold if we increase the threshold of the mortality rate to 20 or 30 deaths for 100,000.²¹

Column 3 of Table 8 presents the estimates of the causal impact that the scandal had on the incidence of a county having a high mortality rate for men, aged 55 to 64.²² The three different panels provide the estimates for the underlying causes discussed above. Panel A shows that a county in a high allegation diocese had about a 1.2 percentage point increase of having a overdose related mortality rate greater than or equal to 10 per 100,000. This represents about 6.4 percent of the increase in the number of counties that reached this threshold during the period of analysis. There are increases of 1.8 and 2.0 percentage points in the incidences of a treated county having a high mortality rate for suicide and liver disease related deaths which respectively represent 9.9 percent and 8.1 percent of the total increase in the number of counties having this mortality rate threshold. The estimated effects on female mortality rates are presented in the columns 2 and 4. The effects are smaller than the

²⁰A concern with regards to mortality rates related to drug overdoses is that the timing of the scandal occurs around the beginning of the opioid crisis in the US. In order to see that this paper's identification strategy differs from the geographic variation of the opioid crisis, I employ level data at the 3-digit zip code level on the annual shipment levels of the most popularly prescribed opioids, oxycodone and hydrocodone, from the Automated Reports and Consolidating System of the DEA. Figure 13 presents maps noting the quartiles of annual shipment of these opioids. We note the geographical variation of the treatment in figure 2 is different. In particular, areas of high annual shipments are in the Southern US while very few high allegation dioceses are located there.

²¹Figures A.1, A.2, and A.3 display the event study plots for these larger thresholds. We see that, in each, the shape of the plot remains relatively the same when the threshold is increased although the effects take a year or two longer to be statistically significant.

²²Results for both male and female, aged 45 to 54 are also located in the first two columns for reference.

estimates for males for each of the causes.²³ To put this in context, although there have been mixed results, [Kölves, Kölves and De Leo \(2013\)](#) review several non causal studies which correlate natural disasters with suicide rates. There are many that have shown increases. On the upper end of the list, the suicide rate of middle aged men in areas which have experienced earthquakes rises by about 45% in Taiwan. While the paper measures the effect on the incidence of high mortality rate rather than on the actual mortality, the estimated effects fall in line with this literature. The paper concludes that the scandal leads to an increase in the incidence of high mortality rates related to despair for middle aged men.

7 Conclusion

This paper has explored how the faith crisis resulting from the 2002 abuse scandal affected Catholics' attachment to the religion and subsequently other human capital outcomes, like education and long term health outcome. Exploiting the variation of the exposure of the scandal at the diocesan level, I use a difference-in-differences specification to estimate the causal impact of the scandal on religious participation. First, there generally is a decline in the demand for religion as people disconnect from their local parish and fewer parents initiate their children in the faith. There is a 7.1 percent drop in the Catholic population. Second, while, in general, Catholic schools hurt, the demand for diocesan controlled elementary and high schools experiences a steeper decline. About 180,000 students leave diocesan schools, and these departures represent nearly 60 percent of the decline in enrollment in all private schools since 2000. Finally, the paper finds that the effects of the scandal extend beyond religious institutions. The incidence of high mortality rates increases for accidental overdoses suicides. The scandal explains respectively 6.4 percent and 9.9 percent of the increases in the number of counties that have a high mortality rate for these causes.

One of the key results is that the demand for religious participation drops, and this

²³A concern is that the counties in which register 10 or more deaths in a single category are larger counties. Table [A.3](#) provides estimates when observations are restricted to counties who lie in the top half of the total population distribution. Results are qualitatively similar to those of the main specification.

potentially informs us of the potential effects of the current turmoil of the abuse scandal within the Church. Due to the recent revelation of past allegations in the 2018 Pennsylvania grand jury report coupled with new allegations against key leaders, many have expressed their displeasure with the governance of the Church. In response to this pressure, many dioceses began releasing lists of priests that have had credible accusations leveled against them. However, it was not a universal practice, and there are still a number of them that have not released any such list. This paper has argued that the lagged effects of the 2002 scandal were primarily due to one's hesitance to change one's beliefs until a sufficient accumulation of allegations was reached. Without full transparency, partially disclosing the names of previously accused but publicly unknown clerics might show a similar pattern in the decline in the demand for religion.²⁴

More significantly, the results of this paper demonstrate that a person's faith experience has ramifications for broader human capital outcomes. During this crisis of faith, when religious attachment falls, there is a corresponding drop in the number of parents choosing to educate their children in the diocesan school system. This decrease in demand for Catholic education should lead one to consider what effects this will have on human capital accumulation. Catholic schools historically have educated those in need and have a sound reputation in providing a solid education across all groups of students. Forgoing Catholic education might have long term effects on a person's labor outcomes. Additionally, there are consequences to long term health. Detachment from faith increases the likelihood of deaths related behavioral related diseases associated with despair. As such, these findings should encourage future research to consider how religion reaches beyond its own sphere and to take into account people's faith experience when studying topics related to well-being, including other human capital outcomes.

²⁴This paper clearly studied the effect of negative publicity resulting from public revelation of an accused cleric. Entangled with this is that with each newly accused cleric, there was a growing awareness that the local diocese had not been fully transparent about the knowledge they had of past allegations.

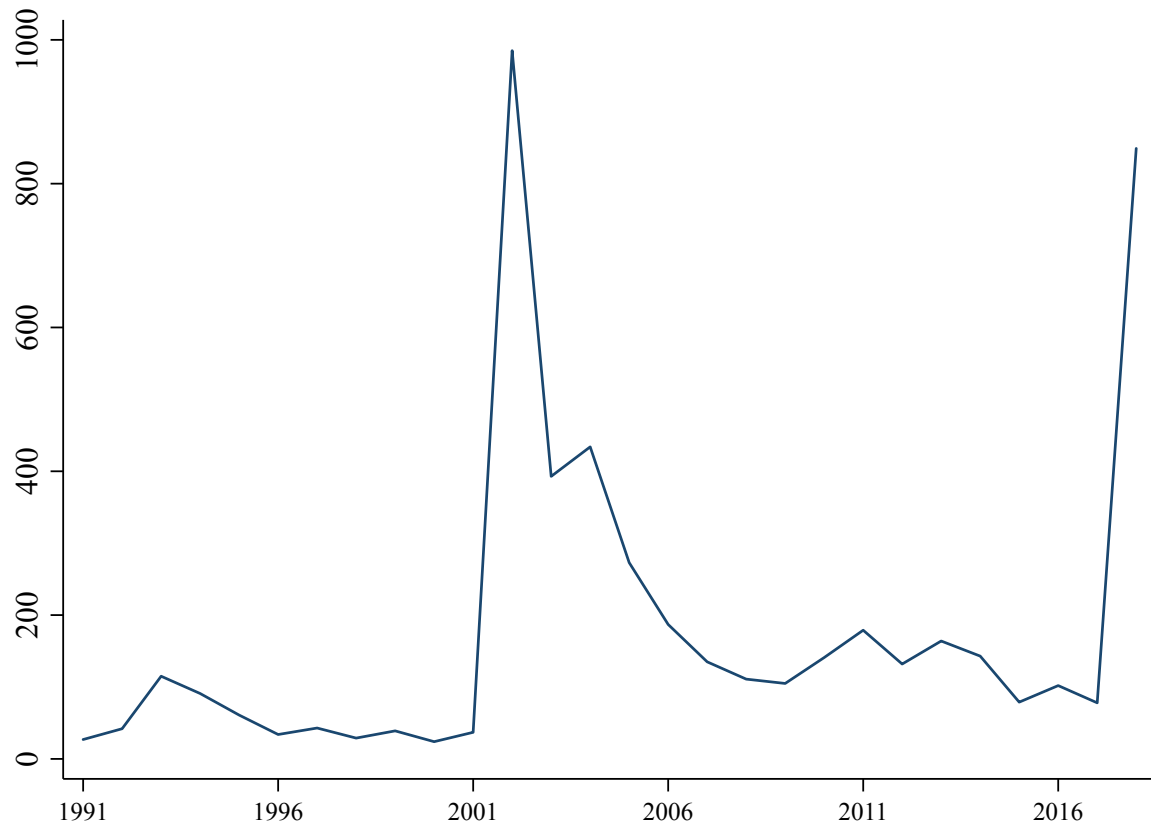
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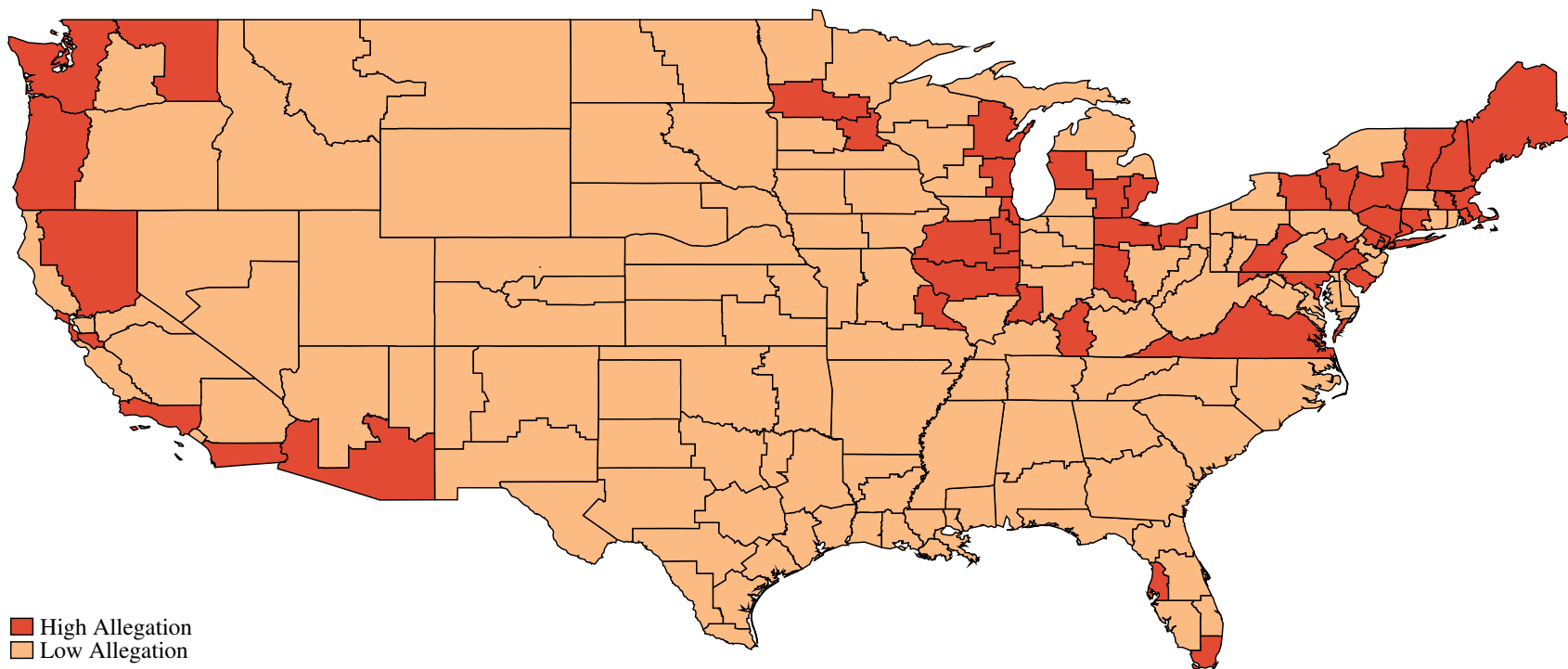
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Figure 1: First-time Allegations in US: Catholic Clergy and Religious



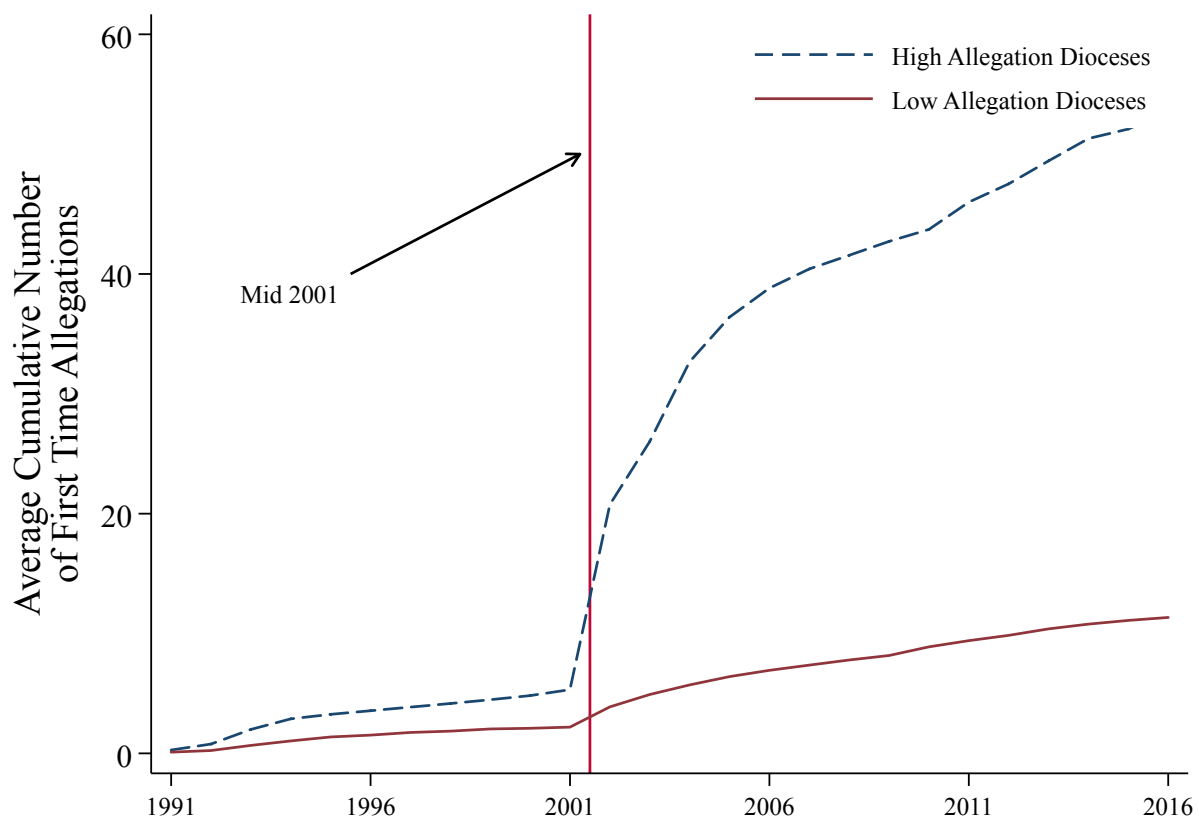
Note: This figure plots the total number of first-time allegations of Catholic bishops, priests, brothers, nuns, and seminarians by year for 1991 to 2018. Data comes from BishopAccountability.org

Figure 2: US Roman Catholic Dioceses by Treatment Status



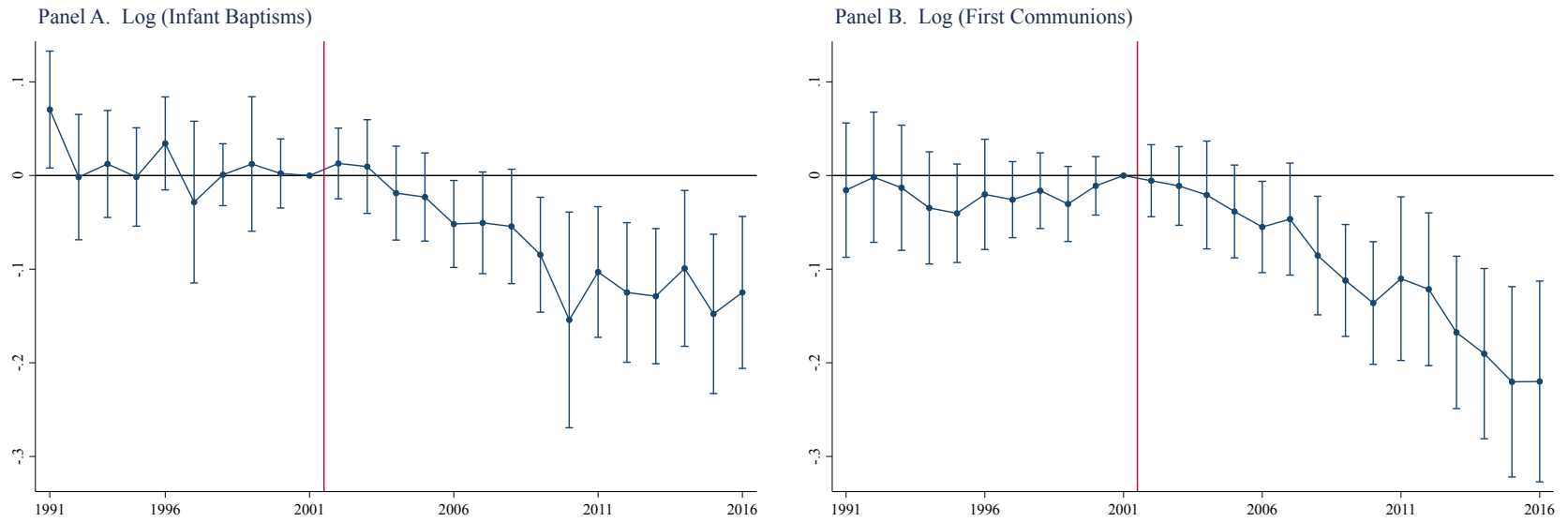
Note: This figure outlines the geographical boundaries of the 172 territorial Latin Rite dioceses in the continental US along with its high or low allegation status based on the number of first-time allegations in 2002. The territorial US Latin Rite dioceses not shown include the Alaskan dioceses (Anchorage, Fairbanks, and Juneau) and the Hawaiian diocese (Honolulu), and they are considered low allegation dioceses.

Figure 3: Cumulative First-Time Allegations in US by High and Low Allegation Dioceses



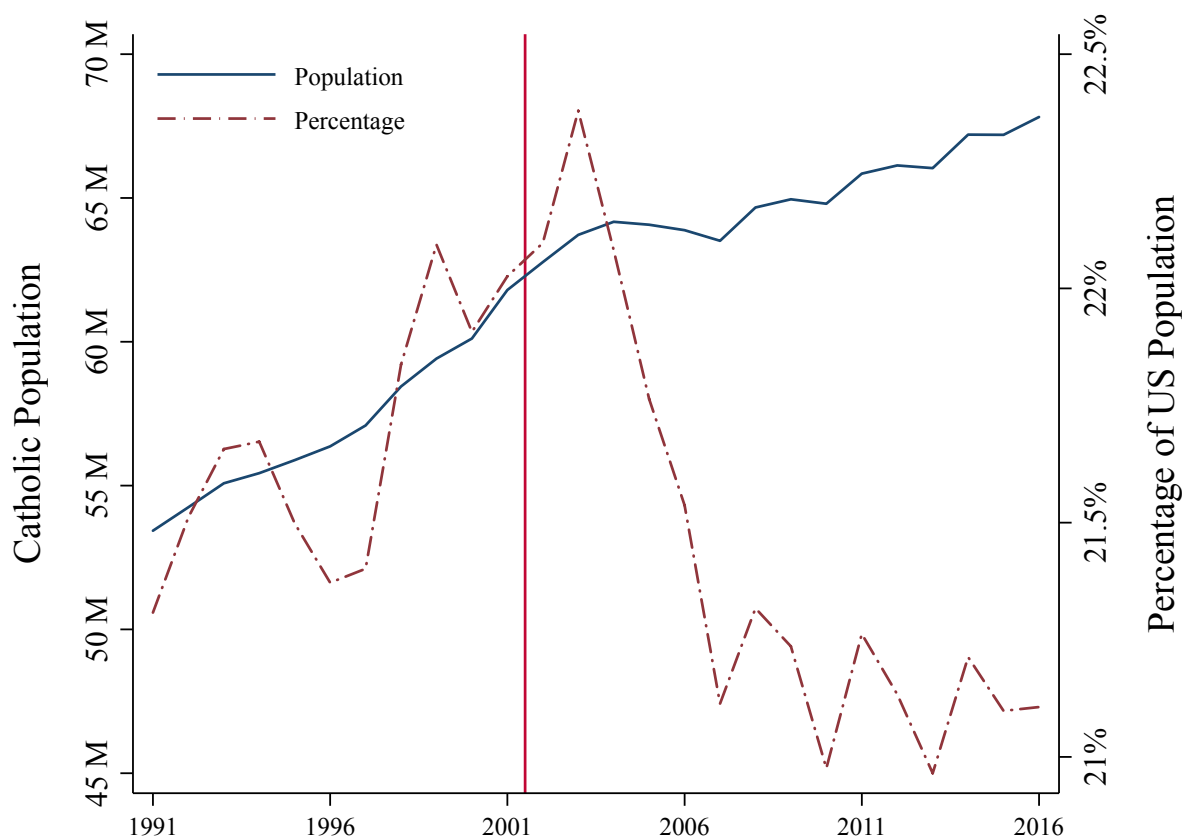
Note: This figure shows the average cumulative number of first-time allegations of Catholic bishops, priests, brothers, nuns, and seminarians by year and high allegation (dashed line) and low allegation (solid line) dioceses beginning in 1991 to 2016. The solid vertical line is immediately before 2002 when news of the abuse scandal first broke nationally. Data comes from BishopAccountability.org

Figure 4: Effect on Infant Baptisms and First Communions in the US



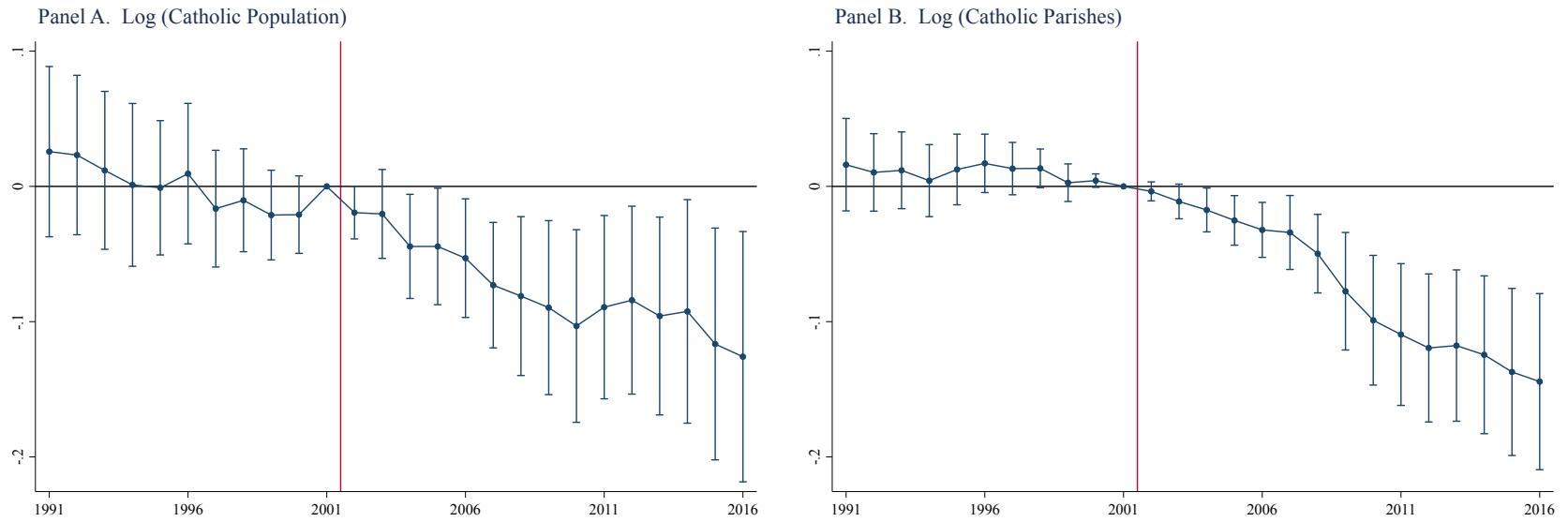
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the log number of infant baptisms. The right panel presents the coefficient plot for the log number of first communions. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal.

Figure 5: US Catholics: Population and Percentage



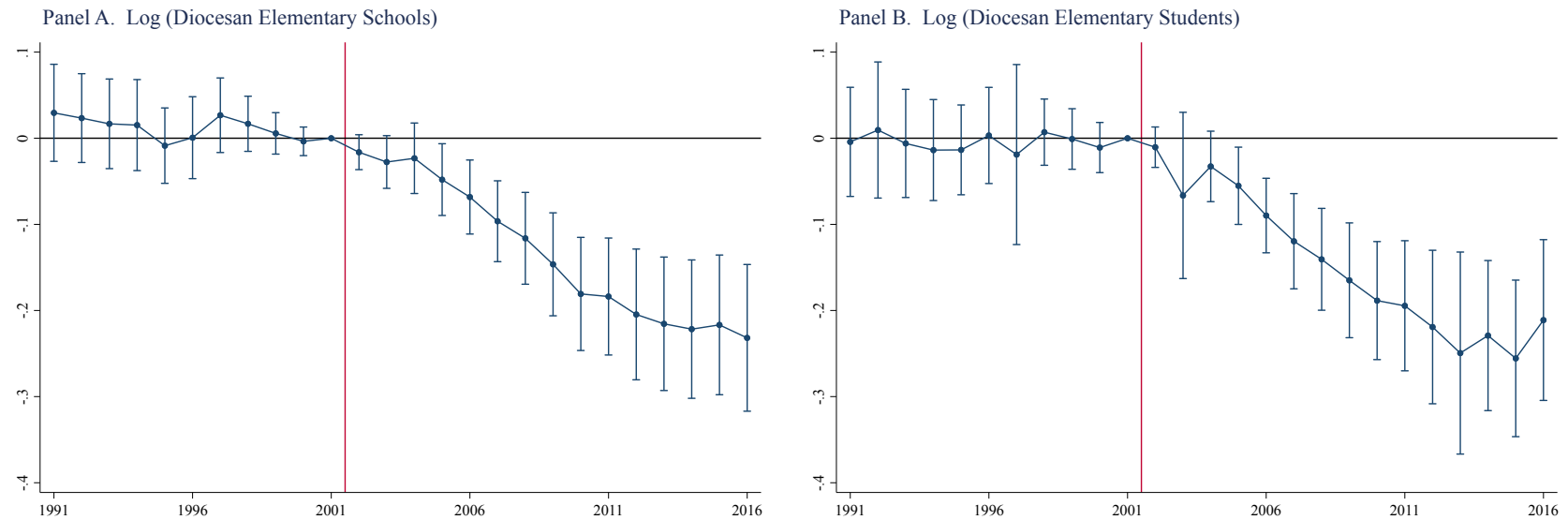
Note: This figure shows key metrics of the US Catholic population from 1980-2017 for the 176 geographical Latin Rite dioceses. The solid line plots the US Catholic population (left axis). The dot-dash line plots the percent (right axis) of the US population that is Catholic. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. Data comes from the OCD. While the number of Catholics generally increases throughout the time period, the percentage drops immediately after the 2002 abuse scandal. It hovers near the 21% mark from 2006 onward.

Figure 6: Effect on Catholic Population and Parish Churches in the US



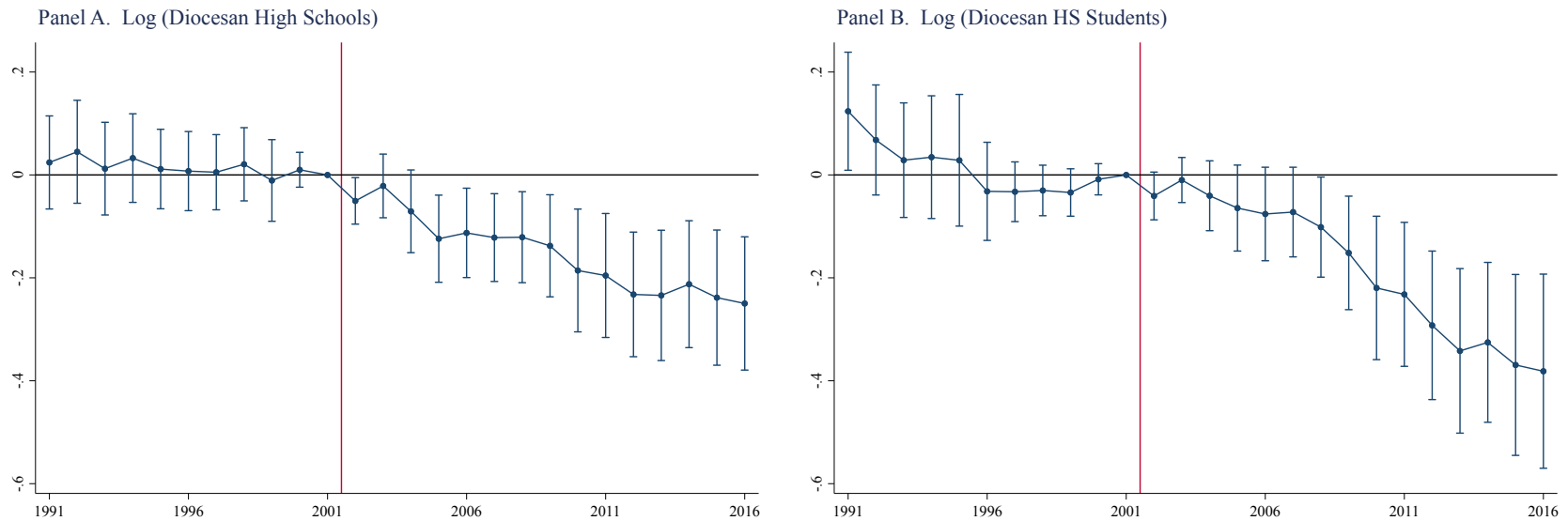
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the log number of total Catholics. The right panel presents the coefficient plot for the log number of Catholic parishes. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal.

Figure 7: Effect on Diocesan Elementary Schools and Students in US



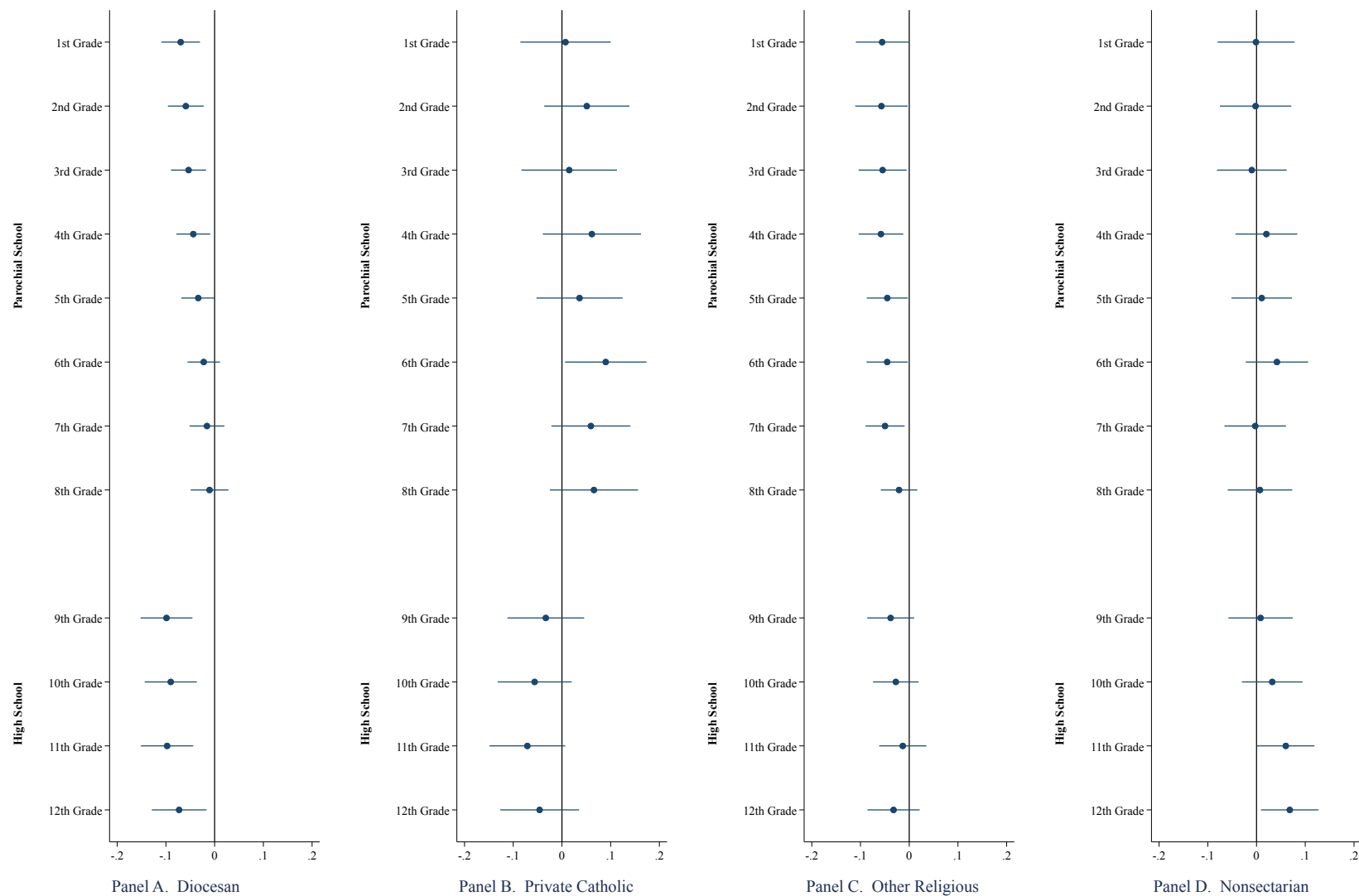
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the log number of elementary schools under diocesan control. The right panel presents the coefficient plot for the log total enrollment at diocesan elementary schools. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure 8: Effect on Diocesan High Schools and Student Enrollment in US



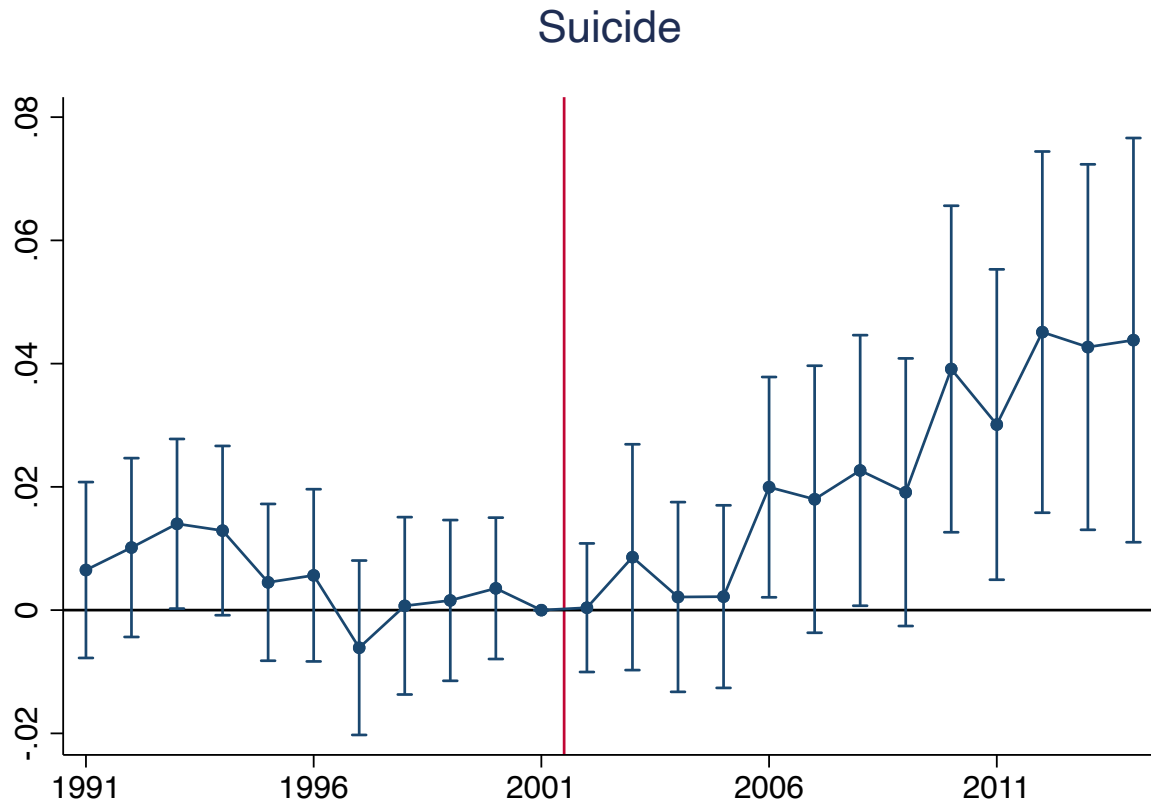
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the log number of high schools under diocesan control. The right panel presents the coefficient plot for the log total enrollment at diocesan high schools. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal.

Figure 9: Effect on Grade Level Enrollment Across Types of Schools



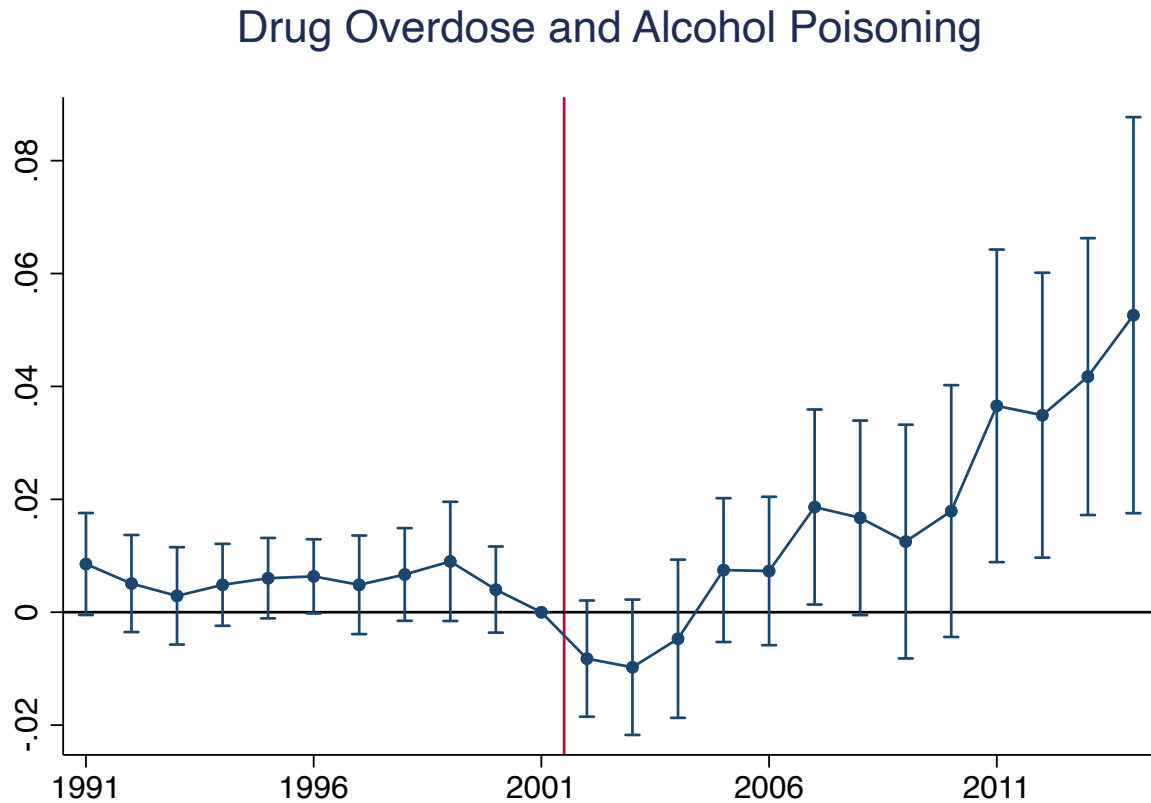
Note: The figure presents the coefficients for the effect of the scandal on enrollment grade level. The horizontal bars show 95% confidence intervals from standard errors clustered by diocese. From left to right, the panels graphically show estimates for diocesan schools, private Catholic schools, other religiously affiliated schools, and nonsectarian, i.e. non religiously affiliated, private schools. In each panel to the left of the y-axis, the grade levels are grouped together according to the usual diocesan school level. Children in first through eighth grade attend parochial schools while grades nine through twelve comprise high school. This breakdown provides a clearer way to see the effect of the scandal on the grade enrollment on the two different school levels. Data comes from the biannual PSUS from the NCES for the years 1991-2016.

Figure 10: Effect of High Allegations on Incidence of Mortality Rate Greater than 10 per 100,000 for Men, Aged 55 to 64



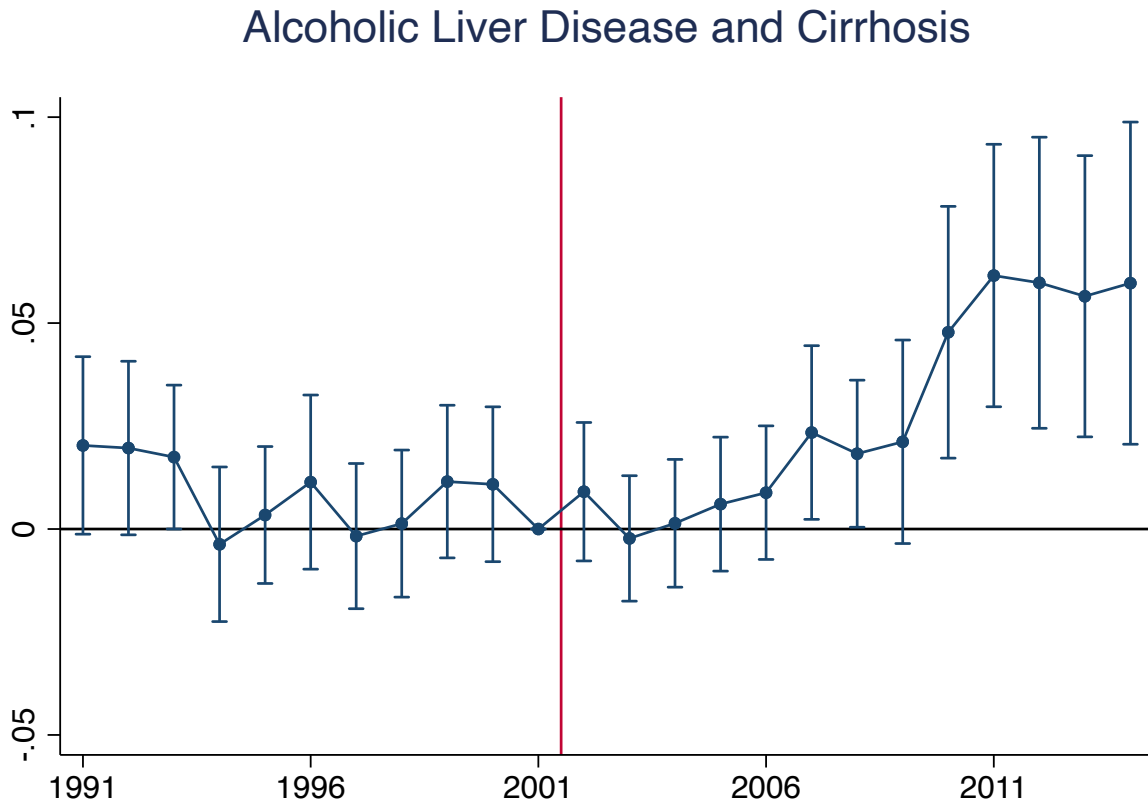
Note: This is the plot of the yearly coefficients for whether a county's mortality rate for deaths from suicide is greater than 10 per 100,000 from the analogous county level specification of equation 2. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal

Figure 11: Effect of High Allegations on Incidence of Mortality Rate Greater than 10 per 100,000 for Men, Aged 55 to 64



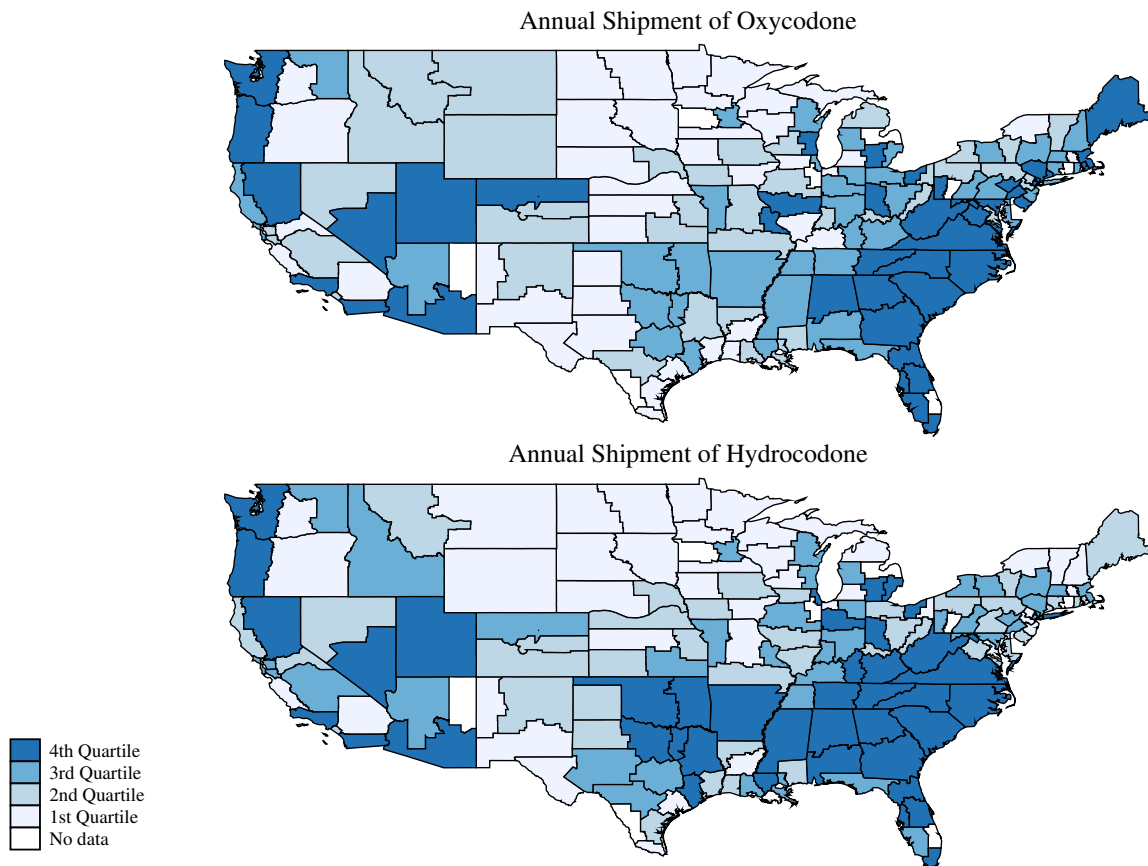
Note: This is the plot of the yearly coefficients for whether a county's mortality rate for deaths related accidental drug overdose and alcohol poisoning is greater than 10 per 100,000 from the analogous county level specification of equation 2. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal

Figure 12: Effect of High Allegations on Incidence of Mortality Rate Greater than 10 per 100,000 for Men, Aged 55 to 64



Note: This is the plot of the yearly coefficients for whether a county's mortality rate for deaths related to alcoholic liver disease and cirrhosis is greater than 10 per 100,000 from the analogous county level specification of equation 2. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the the two types of dioceses evolved after the scandal

Figure 13: Us Roman Catholic Dioceses by Annual Shipment Levels of Select Opioids in 2002



Note: The top panel presents the annual shipment level of oxycodone as reported to the DEA in 2002, and the bottom maps is of the annual shipment level of hydrocodone by US dioceses. It is clear to note that the geographical variation of the shipment level of these controlled substances differ from the paper's identification of high and low allegation dioceses in Figure 2. Data is from the ARCOS at the DEA for the year 2002.

Table 1: Averages of Key Church Variables by High and Low Allegation Dioceses in 2001

	High Allegation	Low Allegation
No. of Dioceses	50	126
No. of Allegations	0.50	0.11
No. of Baptisms	10,665	3,433
No. of First Communions	8,945	3,181
No. of Confirmations	6,335	2,251
No. of Elementary Schools	71.6	23.6
No. of Elementary Students	22,050	6,327
No. of High Schools	7.02	3.44
No. of HS Students	4,001	1,533
No. of Parish Churches	162.7	82.4
Catholic Population	713,630	212,644
Total Population	2,374,070	1,286,634

Note: The table shows the means of key participation variables in 2001, one year before the abuse scandal. The school and enrollment statistics are for Catholic diocesan schools. All high allegation dioceses had observations for the listed outcomes with the exception of the Boston and St. Louis for first communion. Fourteen low allegation dioceses did not have a high school and one did not have an elementary school. Allegation data comes from BishopAccountability.org. All other data is from the OCD.

Table 2: Effect of High Allegations on Sacraments of Initiation

	Log Baptism		Log Communion		Log Confirmation	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-0.1696*** (0.0388)	-0.0821** (0.0318)	-0.1128*** (0.0427)	-0.0812** (0.0338)	-0.0323 (0.0526)	-0.0023 (0.0465)
Mean						
Dep. Var.		<i>10,665</i>		<i>8,945</i>		<i>6,335</i>
Controls		X		X		X
No. of obs.	4,380	4,380	4,547	4,547	4,556	4,556

Note: Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls for all regressions include percentage of diocesan population that is Hispanic, per capita income, and, for Baptism, the percentage of the population that is infant aged. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 3: Effect of High Allegations on Catholic Population and Parish Churches

	Log Catholic Pop		Percent Catholic		Log Parishes	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-0.0980*** (0.0374)	-0.0741** (0.0325)	-1.862*** (0.7127)	-1.613** (0.6730)	-0.0823*** (0.0202)	-0.0813*** (0.0195)
Mean						
Dep. Var.		<i>713,630</i>		<i>28.29</i>		<i>162.7</i>
Controls		X		X		X
No. of obs.	4,561	4,561	4,560	4,560	4,563	4,563

Note: Diocesan and year fixed effects are included. Standard Errors are clustered at the diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 4: Effect of High Allegations on Diocesan Schools

	Log Number of Schools		Log Student Enrollment	
	(1)	(2)	(3)	(4)
<i>A. Elementary Schools</i>				
Treat X Post	-0.1394*** (0.0327)	-0.1415*** (0.0322)	-0.1421*** (0.0362)	-0.1418*** (0.0361)
Mean				
Dep. Var.		<i>71.6</i>		<i>22,050</i>
Controls		X		X
No. of obs.	4,539	4,539	4,541	4,541
<i>B. High Schools</i>				
Treat X Post	-0.1868*** (0.0444)	-0.1644*** (0.0380)	-0.2047*** (0.0611)	-0.1871*** (0.0564)
Mean				
Dep. Var.		<i>7.02</i>		<i>4,002</i>
Controls		X		X
No. of obs.	4,108	4,108	4,109	4,109

Note: Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 5: Effect of High Allegations on Private School Enrollment

	Diocesan (1)	Catholic Private (2)	Other Religious (3)	Nonsectarian (4)
<i>A. Log First Grade Enrollment</i>				
Treat X Post	-0.0697*** (0.0201)	0.0074 (0.0470)	-0.0556** (0.0274)	-0.0010 (0.0400)
Mean				
Dep. Var.	<i>34.20</i>	<i>27.62</i>	<i>18.00</i>	<i>18.04</i>
No. of obs.	227,260	227,260	227,260	227,260
<i>B. Log Ninth Grade Enrollment</i>				
Treat X Post	-0.0988*** (0.0240)	-0.0330 (0.0399)	-0.0381 (0.0244)	0.0084 (0.0335)
Mean				
Dep. Var.	<i>147.15</i>	<i>143.67</i>	<i>22.18</i>	<i>29.42</i>
No. of obs.	94,891	94,891	94,891	94,891

Note: Data comes from the biannual PSUS from the NCES for the years 1990-2016. School and year fixed effects are included. Standard Errors are clustered at the diocesan level. County controls include percentage of population that is Hispanic, percentage of population that is school aged, and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 6: Effect of High Allegations on Catholic Schools

	Log Number of Schools		Log Student Enrollment	
	(1)	(2)	(3)	(4)
<i>A. Elementary Schools</i>				
Treat X Post	-0.1237*** (0.0325)	-0.1272*** (0.0321)	-0.1305*** (0.0358)	-0.1306*** (0.0358)
Mean				
Dep. Var.		<i>74.7</i>		<i>22,870</i>
Controls		X		X
No. of obs.	4,561	4,561	4,562	4,562
<i>B. High Schools</i>				
Treat X Post	-0.0737** (0.0298)	-0.0615** (0.0380)	-0.0432 (0.0288)	-0.0360 (0.0342)
Mean				
Dep. Var.		<i>13.74</i>		<i>7,988</i>
Controls		X		X
No. of obs.	4,307	4,307	4,306	4,306

Note: Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 7: Key County Level Mortality Statistics for Men, aged 55 to 64, by High and Low Allegation Dioceses in 2001

	High Allegation	Low Allegation
No. of Counties	549	2,370
Average Group Population	10,364	4,088
Average Total Population	217,335	69,334
Average Group Overall Mortality Rate	1,193	1,429
<hr/> Number of Counties with Group Mortality Rates ≥ 10 per 100,000 <hr/>		
Suicide	17	14
Accidental Overdose	5	0
Liver Related	38	38

Note: The table shows key county level mortality statistics for the demographic group of men, aged 55 to 64, in 2001, one year before the abuse scandal. There is data for 2,919 out of 3,141 counties in the United States. All data comes from the compressed mortality files from the CDC Wonder database.

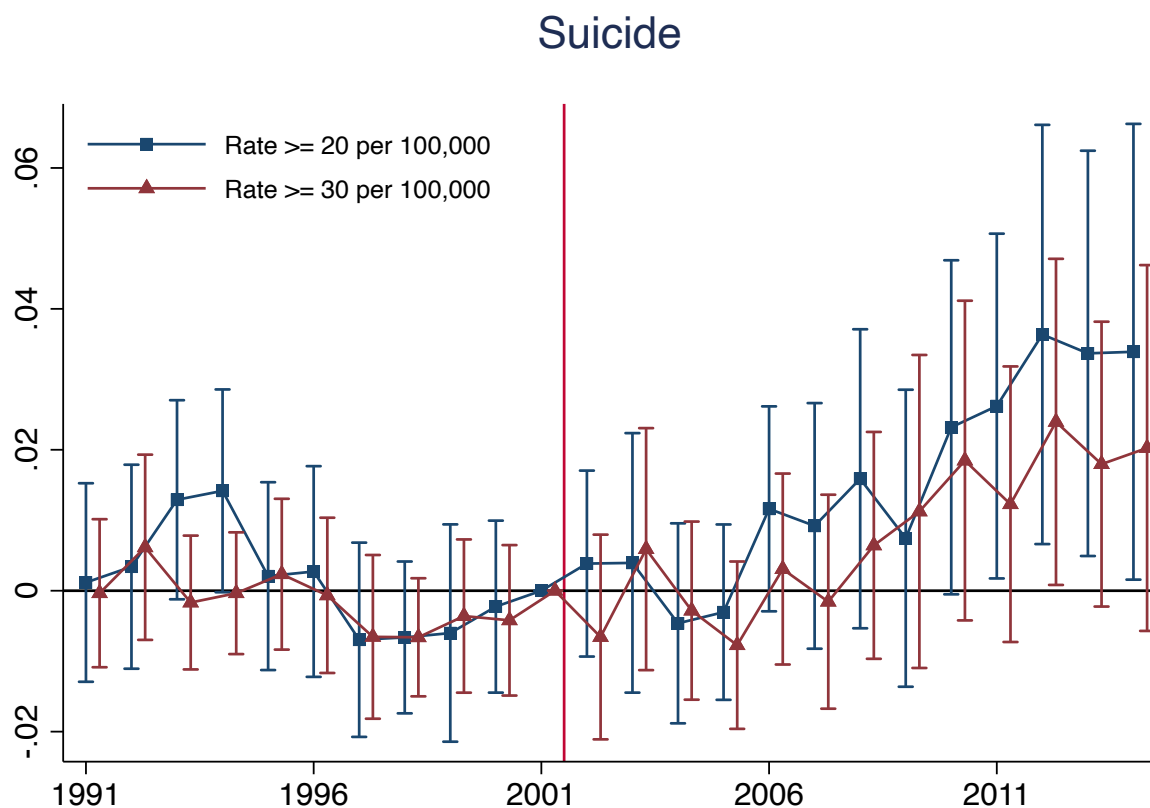
Table 8: Effect of High Allegations on Incidence of Counties with Mortality Rate ≥ 10 per 100,000

	Aged 45-54		Aged 55-64	
	Male (1)	Female (2)	Male (3)	Female (4)
<i>A. Accidental Overdose</i>				
Treat X Post	0.0412*** (0.0138)	0.0239** (0.0103)	0.0117* (0.0069)	0.0072 (0.0045)
No. of obs.	65,524	65,524	65,524	65,524
<i>B. Suicide</i>				
Treat X Post	0.0281*** (0.0081)	0.0050* (0.0029)	0.0175** (0.0071)	0.0008 (0.0018)
No. of obs.	65,524	65,524	65,524	65,524
<i>C. Alcoholic Liver Disease</i>				
Treat X Post	0.0090 (0.0063)	0.0023 (0.0042)	0.0200** (0.0082)	-0.0005 (0.0035)
No. of obs.	65,524	65,524	65,524	65,524

Note: The outcome variables are indicators whether a county experienced a mortality rate greater than 10 per 100,000 for each of the individual death categories. Data comes from the CDC Wonder database for the years 1991-2015. County and year fixed effects are included. Standard Errors are clustered at the diocesan level. County controls include percentage of population that is Hispanic, per capita income, manufacturing employment, and unemployment rate. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

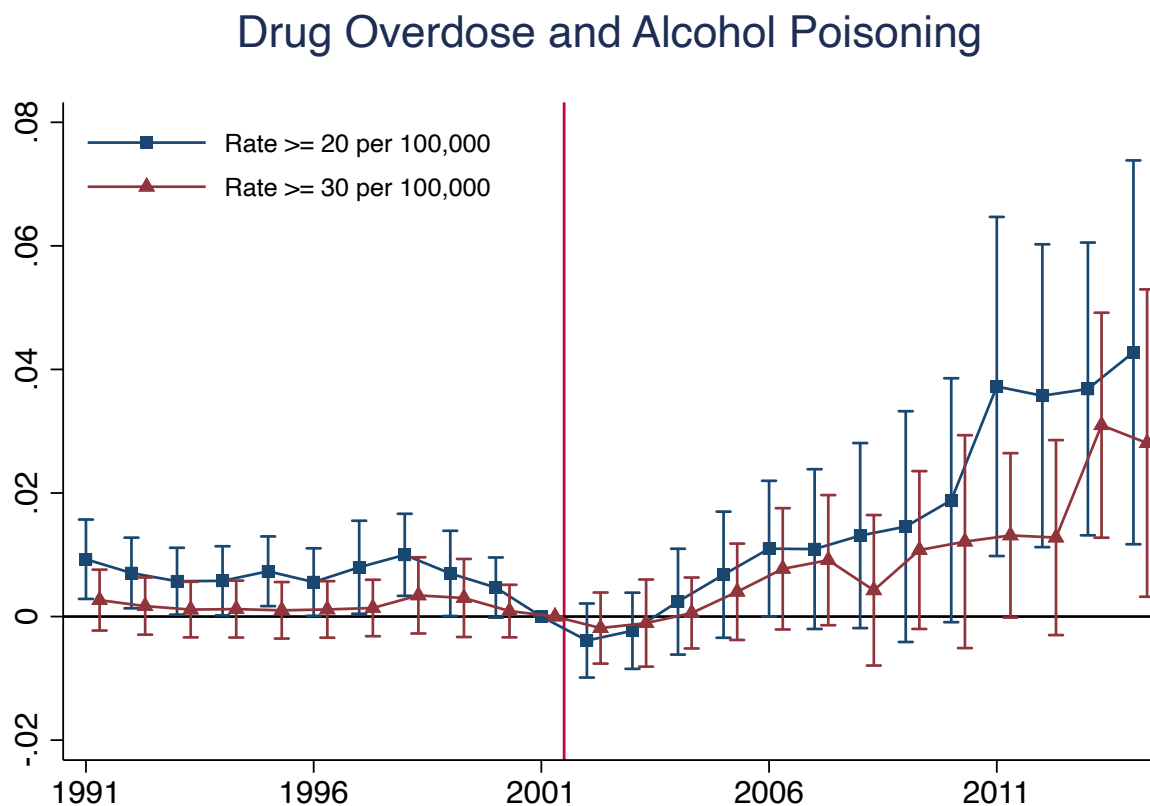
A Appendix

Figure A.1: Effect of High Allegations on the Incidence of Mortality Rate Greater than a Set Threshold for Men, Aged 55 to 64



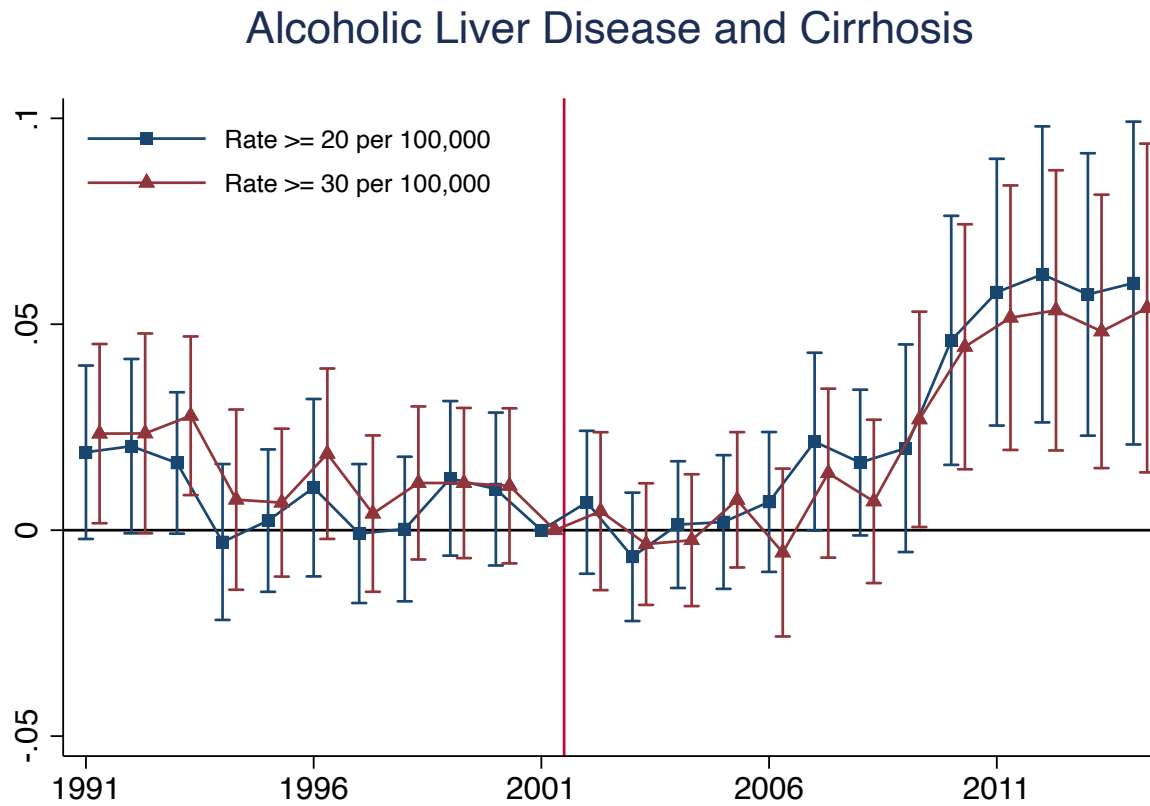
Note: These coefficient plots are for the mortality rate for suicide. The blue square is the coefficient plot for whether a respective underlying cause's mortality rate is greater than or equal to 20 deaths per 100,000. The red triangles are for the threshold of 30 deaths per 100,000. 95% confidence intervals are included. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. We see that the general pattern holds from when we used the baseline threshold of 10 deaths per 100,000 as presented in Figure 10.

Figure A.2: Effect of High Allegations on the Incidence of Mortality Rate Greater than a Set Threshold for Men, Aged 55 to 64



Note: These coefficient plots are for the mortality rate for accidental drug overdose and alcohol poisoning. The blue square is the coefficient plot for whether a respective underlying cause's mortality rate is greater than or equal to 20 deaths per 100,000. The red triangles are for the threshold of 30 deaths per 100,000. 95% confidence intervals are included. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. We see that the general pattern holds from when we used the baseline threshold of 10 deaths per 100,000 as presented in Figure 11.

Figure A.3: Effect of High Allegations on the Incidence of Mortality Rate Greater than a Set Threshold for Men, Aged 55 to 64



Note: These coefficient plots are for the mortality rate for alcoholic liver disease and cirrhosis. The blue square is the coefficient plot for whether a respective underlying cause's mortality rate is greater than or equal to 20 deaths per 100,000. The red triangles are for the threshold of 30 deaths per 100,000. 95% confidence intervals are included. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. We see that the general pattern holds from when we used the baseline threshold of 10 deaths per 100,000 as presented in Figure 12.

Table A.1: Allegations by High Allegation Dioceses in 2002

Diocese	State	Allegations	Diocese	State	Allegations
Boston	MA	103	Altoona-Johnstown	PA	10
Manchester	NH	45	Paterson	NJ	10
Baltimore	MD	34	San Diego	CA	10
Los Angeles	CA	34	Tucson	AZ	10
Louisville	KY	32	Grand Rapids	MI	9
Cleveland	OH	29	GreenBay	WI	9
Detroit	MI	25	Newark	NJ	9
Rockville Centre	NY	22	Springfield	MA	9
New York	NY	21	St. Petersburg	FL	9
Chicago	IL	20	Peoria	IL	8
Portland	OR	20	Sacramento	CA	8
Fall River	MA	19	Syracuse	NY	8
St. Cloud	MN	19	Camden	NJ	7
Toledo	OH	17	Hartford	CT	7
Brooklyn	NY	15	Portland	ME	7
Joliet	IL	14	Seattle	WA	7
Milwaukee	WI	14	St. Paul and Minneapolis	MN	7
Philadelphia	PA	14	Allentown	PA	6
St. Louis	MO	14	Burlington	VT	6
Bridgeport	CT	13	Cincinnati	OH	6
Rochester	NY	12	Evansville	IN	6
Worcester	MA	12	Lansing	MI	6
Miami	FL	11	Richmond	VA	6
San Francisco	CA	11	San Jose	CA	6
Albany	NY	10	Spokane	WA	6

Note: This table displays the number of Catholic officials who for first-time were accused of sexual abuse in the 50 high allegation dioceses in 2002. Data comes from the OCD.

Table A.2: Effect of High Allegations on Catholic Schools (NCEA)

	Number of Schools		Student Enrollment	
	(1)	(2)	(3)	(4)
<i>A. Elementary Schools</i>				
Treat X Post	-0.1197*** (0.0298)	-0.1208*** (0.0292)	-0.1370*** (0.0299)	-0.1338*** (0.0304)
Controls		X		X
No. of obs.	3,312		3,313	
<i>B. High Schools</i>				
Treat X Post	-0.0674** (0.0285)	-0.0588** (0.0277)	-0.0505 (0.0337)	-0.0441 (0.0318)
Controls		X		X
No. of obs.	3,144		3,144	

Note: The outcome variable is the log number of the labeled participation outcome for all Catholic schools, i.e. both diocesan and private. Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and median household income. Data comes from the NCEA for years 1997-2016. Using this secondary source of data, we find that the effects on enrollment are attenuated when we combine diocesan and private school data together. In order to get a clearer effect on the different types of schools, NCES data is used, and results are found in table 5. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.3: Effect of High Allegations on Incidence of Counties with Mortality Rate ≥ 10 per 100,000 Large Counties

	Aged 45-54		Aged 55-64	
	Male (1)	Female (2)	Male (3)	Female (4)
<i>A. Accidental Overdose</i>				
Treat X Post	0.0407*** (0.0151)	0.0258** (0.0124)	0.0121 (0.0084)	0.0086 (0.0057)
No. of obs.	34,192	34,192	34,192	34,192
<i>B. Suicide</i>				
Treat X Post	0.0265** (0.0090)	0.0054 (0.0038)	0.0162* (0.0083)	0.0003 (0.0024)
No. of obs.	34,192	34,192	34,192	34,192
<i>C. Alcoholic Liver Disease</i>				
Treat X Post	0.0058 (0.0081)	0.0013 (0.0057)	0.0165* (0.0099)	-0.0019 (0.0049)
No. of obs.	34,192	34,192	34,192	34,192

Note: The outcome variables are indicators whether a county experienced a mortality rate greater than 10 per 100,000 for each of the individual death categories. Data comes from the CDC Wonder database for the years 1991-2015. Only the upper half of counties in population are included in the regressions. County and year fixed effects are included. Standard Errors are clustered at the diocesan level. County controls include percentage of population that is Hispanic, per capita income, manufacturing employment, and unemployment rate. *** p < 0.01, ** p < 0.05, * p < 0.1

B Appendix: Robustness Checks

B.1 Alternative Thresholds for Treatment

One worry is whether the results rely on the specific threshold for a treated diocese in order to achieve the results of the paper. Figure B.1 shows the event study plots for log infant baptism for several different thresholds: greater than 3, 5, 7, and 9 allegations. Each of the plots follow a similar pattern to the preferred threshold of this paper, i.e. a high allegation diocese had more than 5 allegations in 2002. Additionally, Figure B.2 displays the coefficient plots for the log Catholic population, and a similar conclusion can be made.

In the appendix, Table B.1 presents the estimates of the effect on the Sacraments of Initiation with high allegation threshold of more than 3 allegations in the even columns. Under this new threshold, 73 of the 176 dioceses are treated. The estimates from the original specification are in the odd columns. The estimates from the altered threshold are slightly smaller but qualitatively similar to the those of the preferred specification. For instance, under this new specification, first communions drop by 6.9 percent as opposed to 7.8 percent. Additionally, Table B.2 similarly has the results for the effect on mortality related to despair for those aged 55 to 64. Again, there are qualitatively similar results for each cause of death although the estimates somewhat smaller. The incidence of a high suicide mortality rate rises by 1.2 percentage points under this specification as opposed to the 1.8 percentage points estimated using the original threshold. Overall, the analysis of this paper is robust when the threshold is changed.

Finally, Table B.3 presents the estimates of the effect on the Sacraments of Initiation when the measure of the intensity of the scandal is measured in terms of the per capita number of first time allegations. Under this measure, I consider the top 50 dioceses as being treated. The estimates on each increases when compared to the baseline specification. For instance, infant baptisms drop by 16.3 percent compared to 13.2 percent.

B.2 Alternative Outcome Specification

One concern with this identification of this paper is the specification of the outcome variables. For the preferred specification, I have used the log of outcomes. One suggestion is to use per capita measures because that will take in to account the different sizes of the dioceses which varies substantially.

As such, the paper does this for outcomes per one million people. I find qualitatively similar results to the preferred specification. Figure B.3 presents the corresponding plots of the year coefficients for infant baptisms and first communion. Table B.4 presents the pooled estimates for the effect on these sacraments. We recall that the mean total population for high allegation dioceses before the scandal was 2.37 million. Then, from columns 2 and 4, the average high allegation diocese had declines of about 776 infant baptisms and 673 first communions, which are very close to the previous estimates.

The pattern holds the for diocesan schools. Figures B.4 and B.5 display the respective coefficient plots for elementary and high schools. In Table B.5, the estimates in Panel A show that the average high allegation diocese experienced a loss of nearly 10.9 elementary schools, Similarly, the average affected diocese loses more than 3,573 students, which is 16.2 percent of the 2001 average enrollment. From Panel B, we find that the decline is about 0.64 high schools and 366 students.

B.3 Parametric Event Study

With respect to some participation variables, some might be concerned that there are existing trends that violate the standard parallel trends assumption of the difference-in-differences model. In order to remedy this, I follow Dobkin et al. (2018) and estimate a more parametric model that directly controls for pre-existing trends:

$$Y_{dt} = \zeta_0 + \sum_{T>2001} [\zeta_{1T} Treat_d \times \mathbb{1}(t = T)] + \sum_D [v_D \times \mathbb{1}(d = D) \cdot t] + \zeta_2 X_{dt} + \lambda_d + \psi_t + \omega_{dt} \quad (3)$$

The main differences between this and Equation 2 are twofold. Diocesan linear time trends are included as $\sum_D [v_D \times \mathbb{1}(d = D) \cdot t]$ and the coefficients on the interaction of $Treat_d$ with time fixed effects are only estimated for the post period. Under this model, the identifying assumption holds that absent the 2002 scandal, any pre-existing differential trends in the outcome variables across dioceses would have continued as before.

Since the only estimates the interaction terms for the post-period, the ζ_{1T} do not give any good indication of whether the linear pre-trend fits the data. As such, I follow Beheshti (2019) to rescale the β coefficients from Equation 2 to equal the ζ coefficients when presenting the results. One can then examine if there are any deviations from the linear pre-trend by seeing if the new β coefficients differ from zero in the pre-period.

Figure B.6 provides both the original and the parametric event study plots for the religious participation variables of infant baptism and first communion. Comparing the two event studies for infant baptism in Panels A and B, the reader finds that the coefficients deviate less from zero in the pre-period when controlling for a linear pre-trend. Additionally, while the effect may be attenuated, there are still statistically significant effects in the post-period. For instance, the estimate for the rescaled $\beta_{1,2006}$ implies a 7% decline in infant baptisms. Similarly, one can say the same about the parametric event study plot for log Catholic population in Panel B of B.7 when comparing it to the original plot in Panel A. Additionally, Figure B.8 presents the event study plots for the effect on the log number of diocesan schools and student enrollment at the high school level. In Panel D, the event study plot suggests that the effect on high school enrollment is attenuated and lags more than in the original specification. Overall, the paper finds that these plots closely resemble those resulting from the preferred specification of Equation 2.

B.4 Matching on Covariates

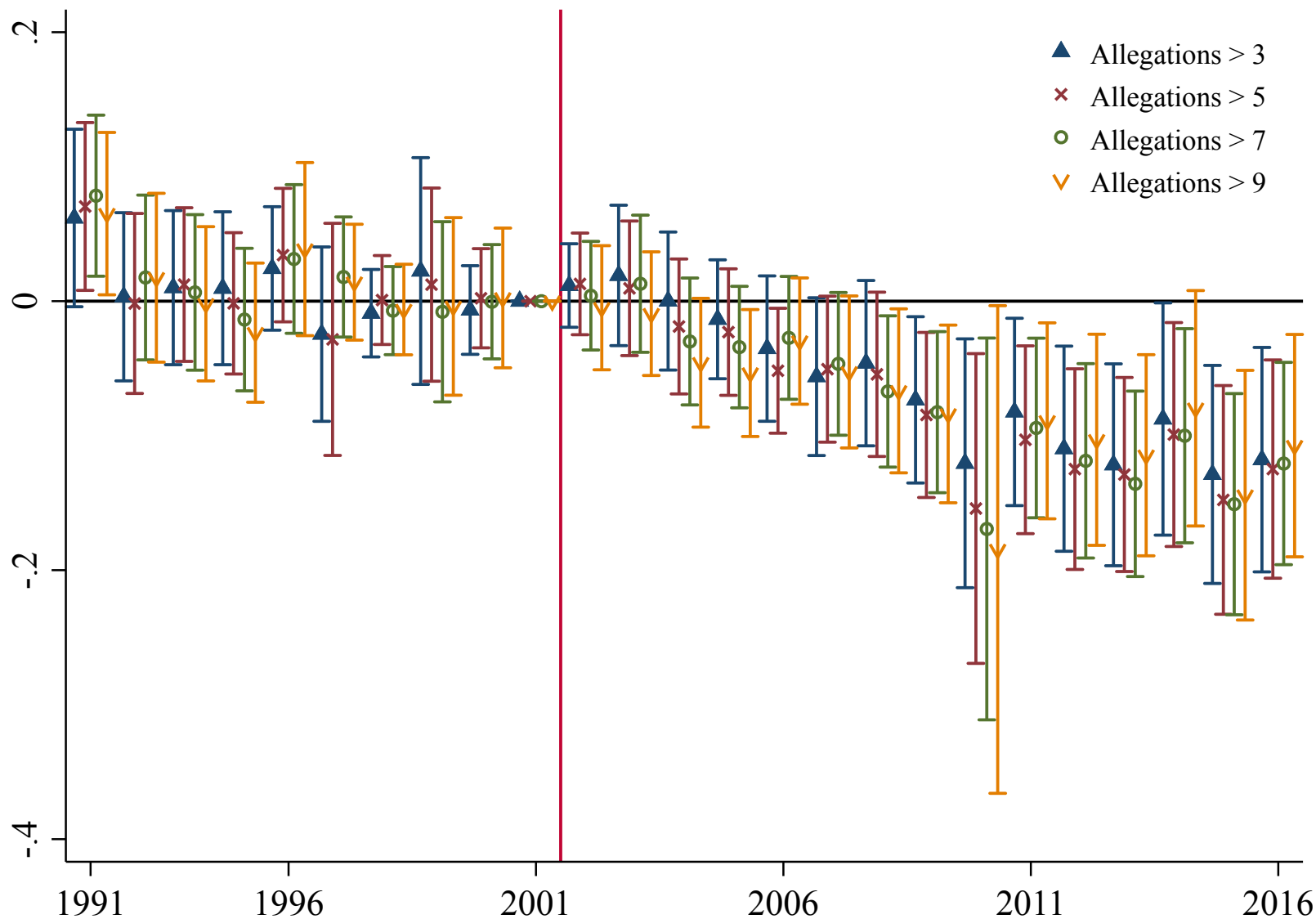
Another concern is that there is a a gulf when comparing the means of dependent variables between treated and control dioceses in 2001 (Table 1). In an effort to remedy this I use kernel

propensity-score matching on the common support.²⁵ I match on the following covariates: the number of first-time allegations, Hispanic percentage of the diocese, per capita income, and population size. Table B.6 provides a summary of the same statistics when propensity score matching is employed. Some of the largest treated dioceses are dropped, including Boston, Chicago, Los Angeles, and New York. Additionally, we find that the means of the dependent variables are more balanced between high and low allegation dioceses than previously. Tables B.7, B.8, and B.9 provide the estimates of the effect on the different participation outcomes. The estimates are largely similar to the original estimates. For instance, infant baptisms decline by 10.6 percent which is a slightly larger impact of the 7.9 percent estimated using the preferred specification.

Additionally, there are similar findings when matching on county characteristics for the despair analysis. Table B.10 shows a more comparable analysis when matching on the Hispanic percentage, Catholic percentage, per capita income, and unemployment rate. In Table B.11 the estimates are reduced but still statistically significant among men for causes related to accidental overdoses and liver disease.

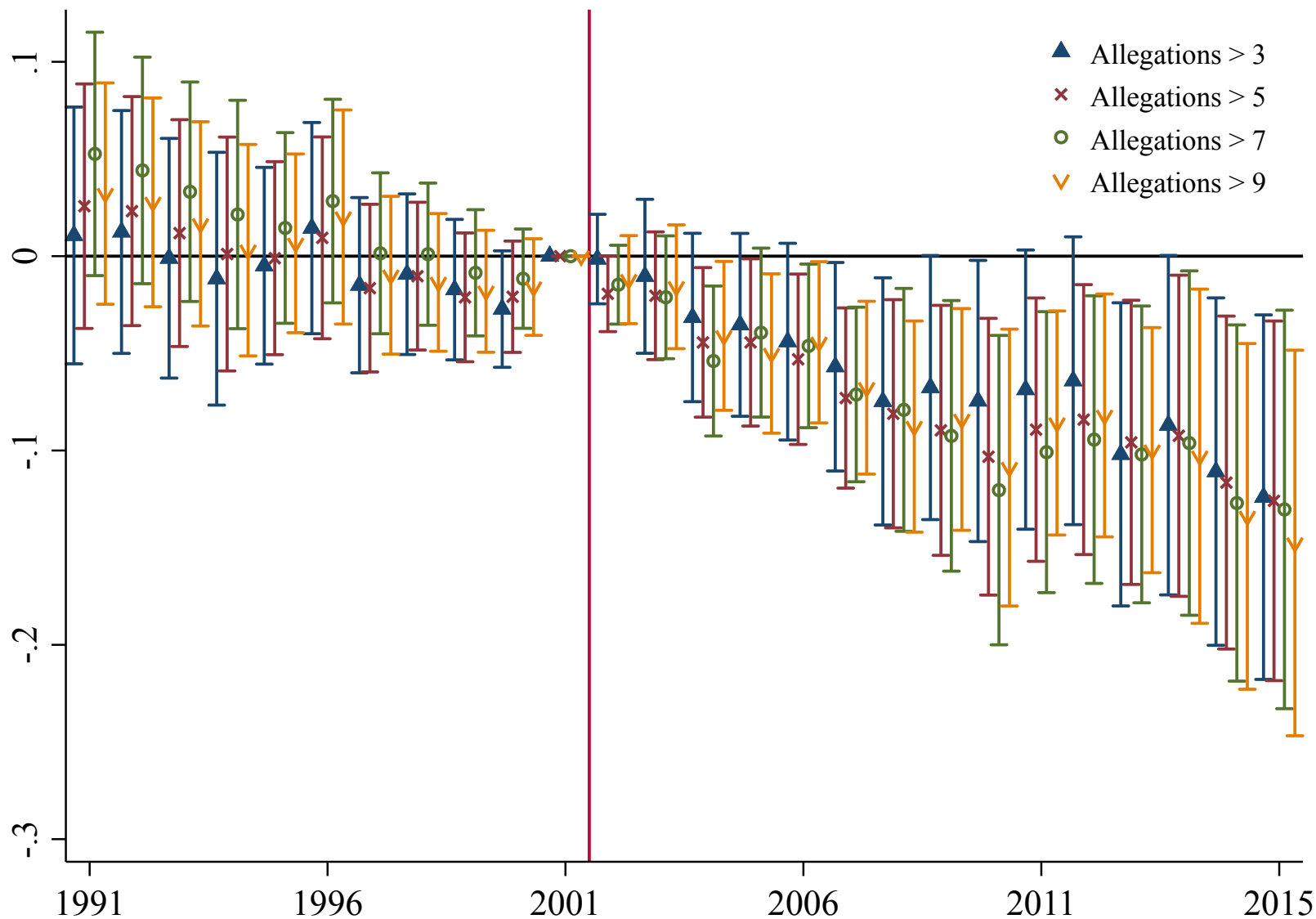
²⁵I use the epanechnikov kernel function and a kernel bandwidth of 0.06

Figure B.1: Effect on Log Infant Baptism (Various Thresholds)



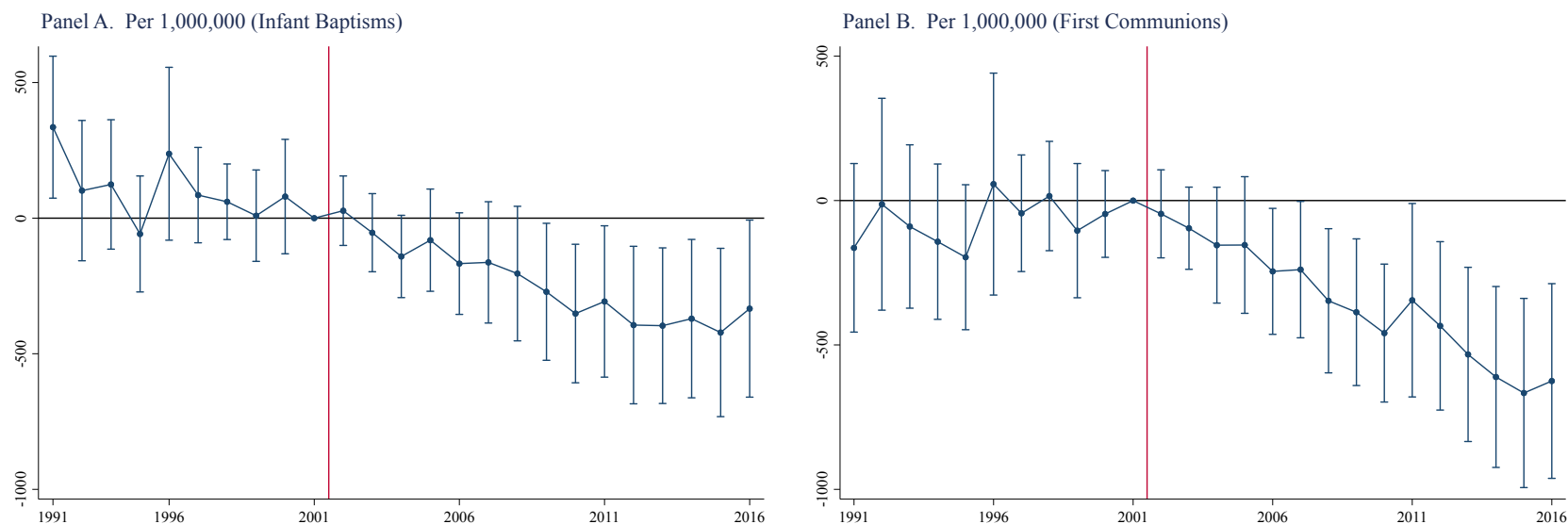
Note: Note: This is the plot of the estimated yearly coefficients from Equation 2 for the log number of infant baptisms using different treatment thresholds. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure B.2: Effect on Log Catholic Population (Various Thresholds)



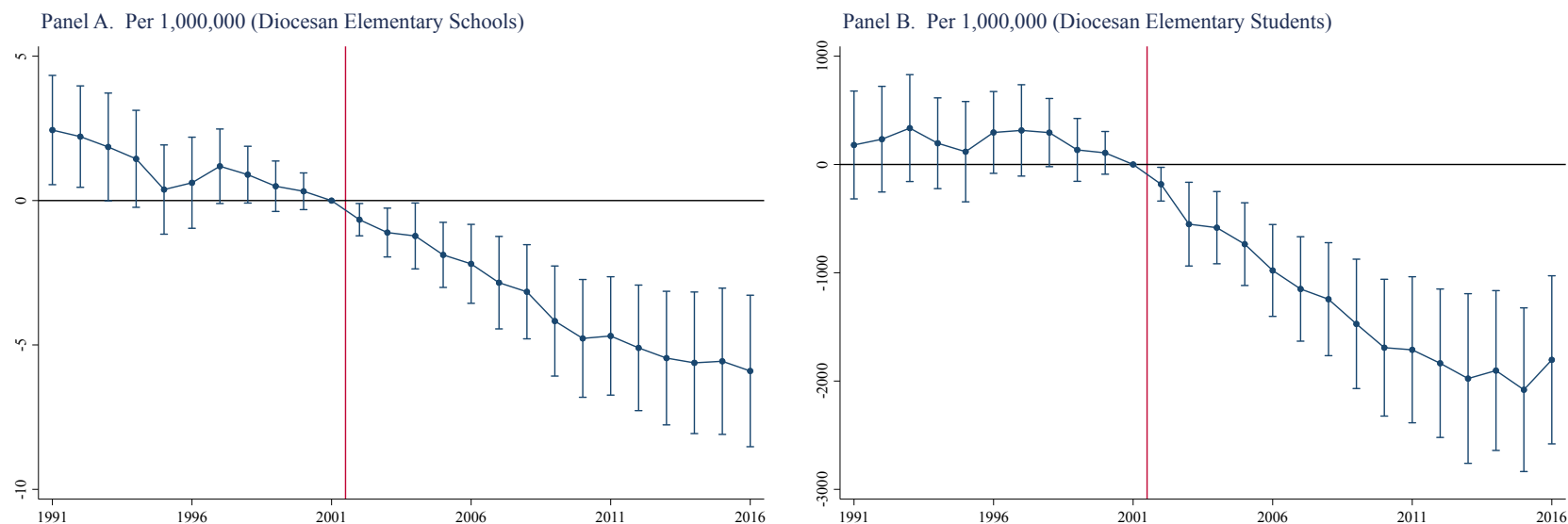
Note: Note: This is the plot of the estimated yearly coefficients from Equation 2 for the log number of infant baptisms using different treatment thresholds. The solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure B.3: Effect on Infant Baptisms and First Communions in the US



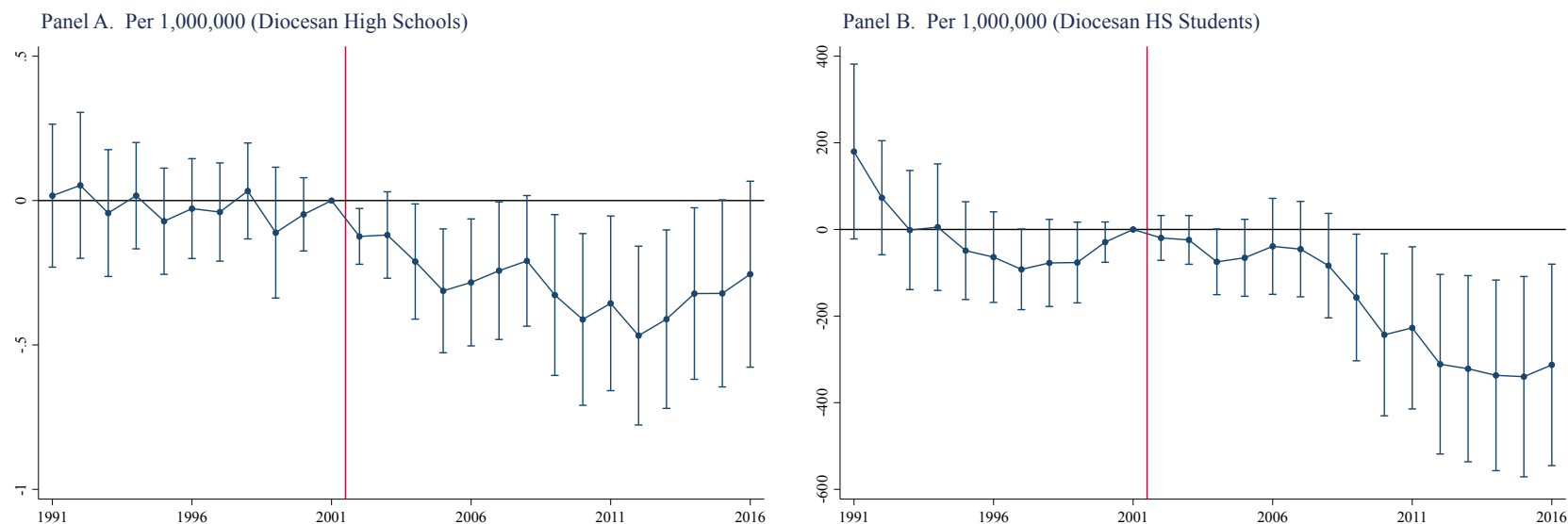
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the number of infant baptisms per 1,000,000. The right panel presents the coefficient plot for the corresponding measure of the number of first communions. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure B.4: Effect on Diocesan Elementary Schools and Students in US



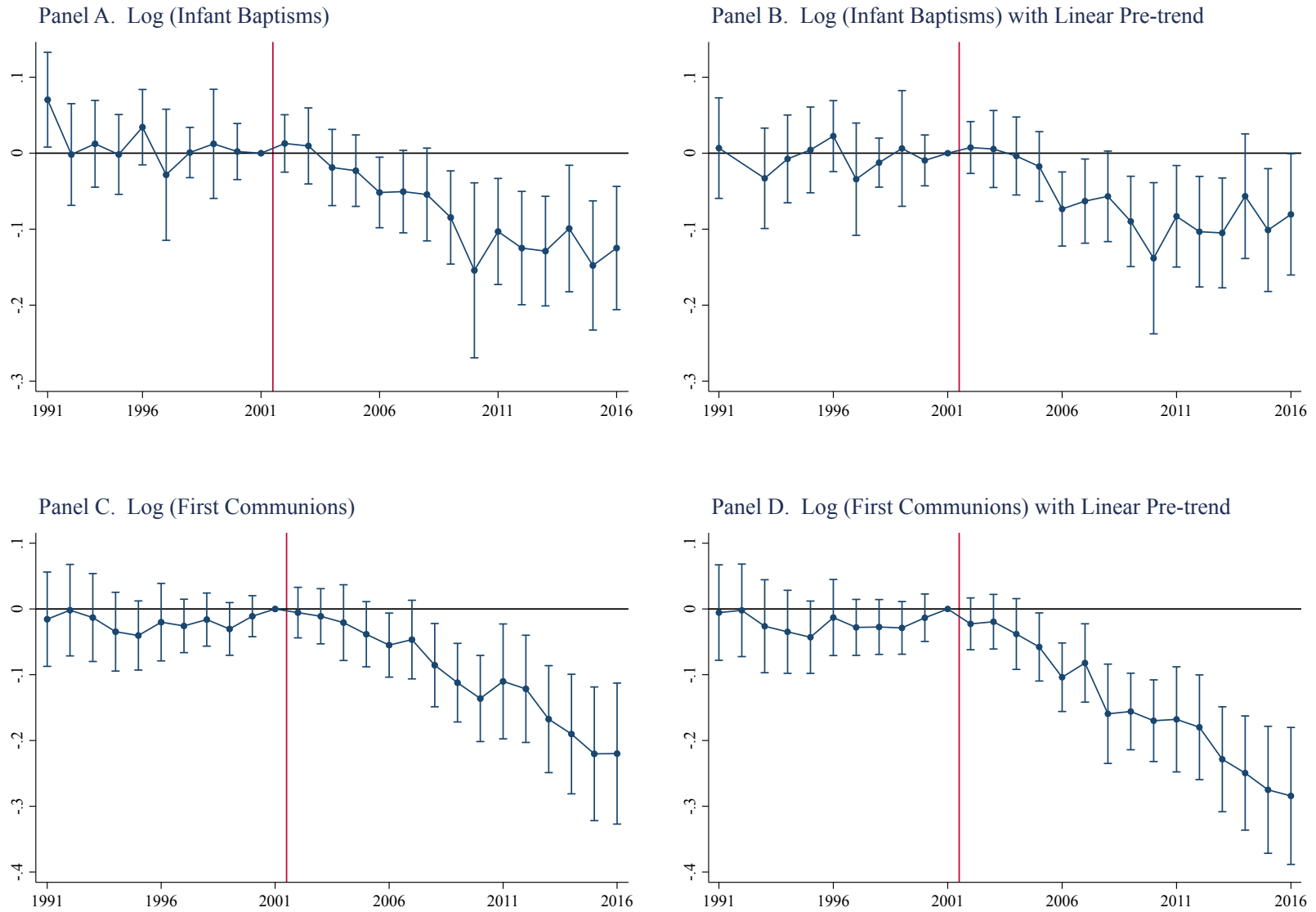
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the number of elementary schools under diocesan control per 1,000,000. The right panel presents the coefficient plot for the corresponding measure of enrollment at diocesan elementary schools. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure B.5: Effect on Diocesan High Schools and Student Enrollment in US



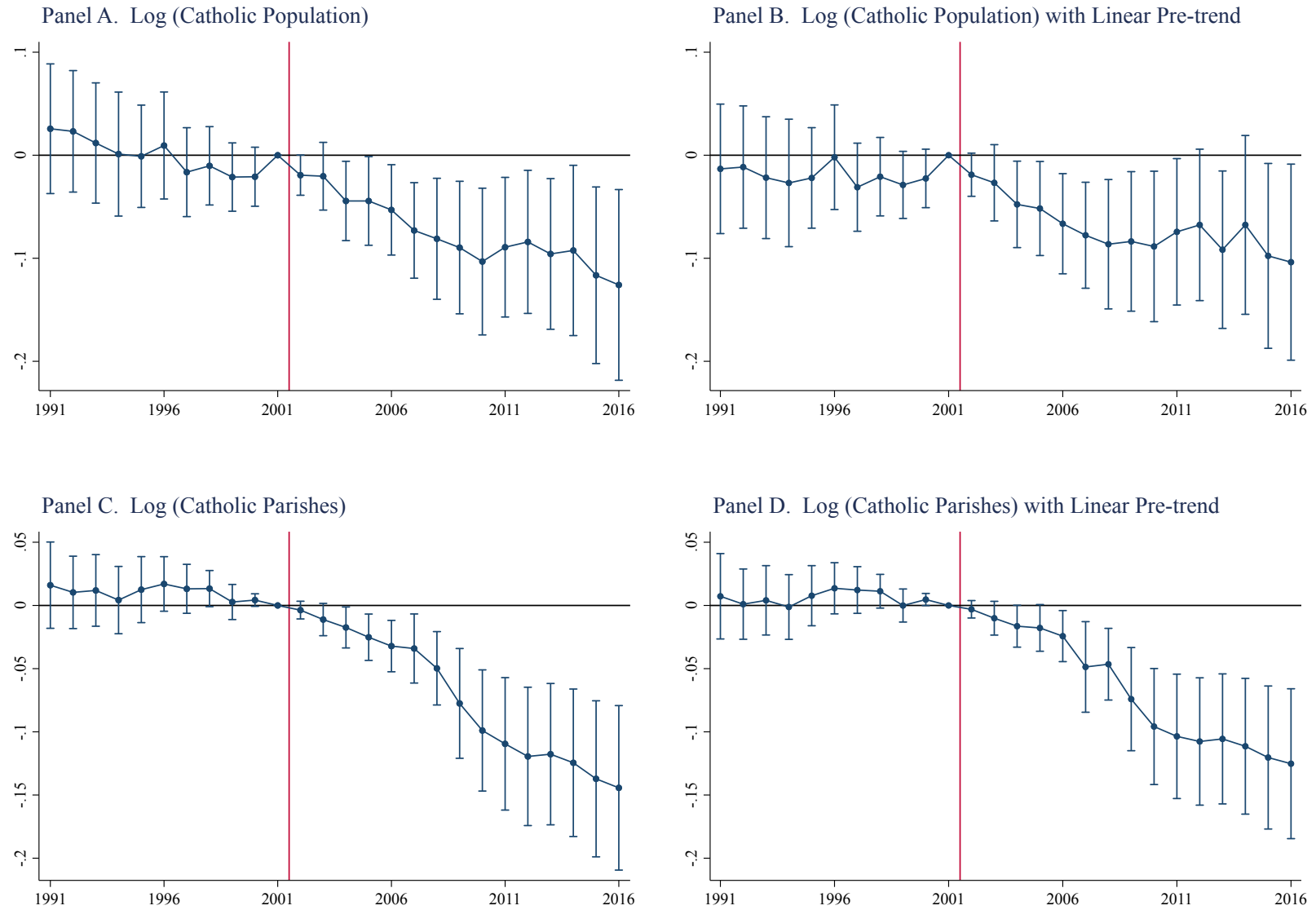
Note: The left panel provides the plots of the yearly coefficients from equation 2 for the number of high schools under diocesan control per 1,000,000. The right panel presents the coefficient plot for the corresponding measure of total enrollment at diocesan high schools. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. These plots provide evidence that the assumption of parallel pre-trends hold and that there is a difference in how the two types of dioceses evolved after the scandal.

Figure B.6: Effect on Infant Baptism and First Communion



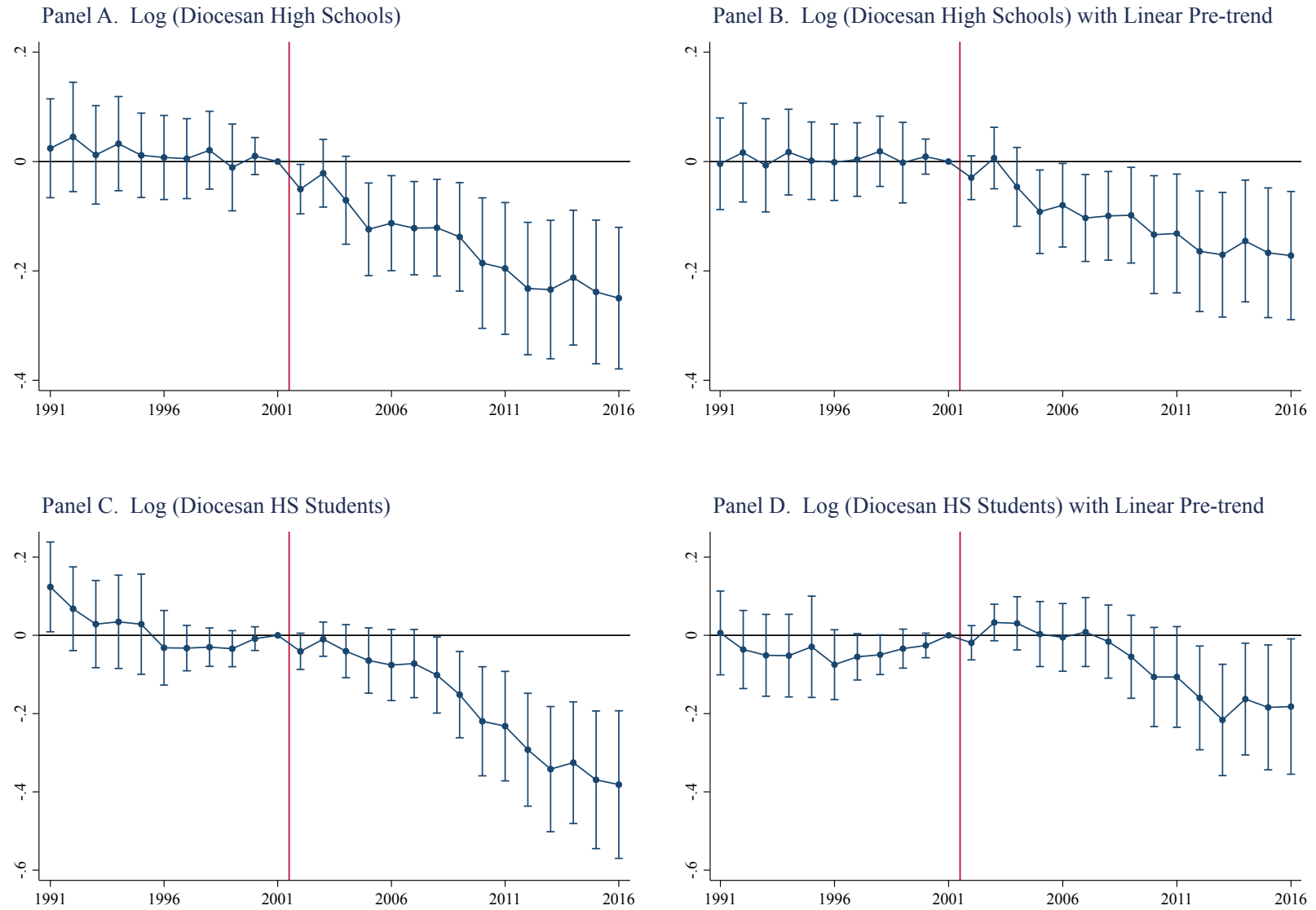
Note: The left column's event study plots are the same from Figure 4. The panels in the right column provide the plots of the yearly coefficients from equation 2 when controlling for a linear pre-trend. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. We see that in the post-period there are still statistically significant effects.

Figure B.7: Effect on Catholic Population and Parish Churches



Note: The left column's event study plots are the same from Figure 6. The panels in the right column provide the plots of the yearly coefficients from equation 2 when controlling for a linear pre-trend. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. We see that in the post-period there are still statistically significant effects.

Figure B.8: Effect on Diocesan High Schools and Student Enrollment



Note: The left column's event study plots are the same from Figure 8. The panels in the right column provide the plots of the yearly coefficients from equation 2 when controlling for a linear pre-trend. In each panel, the solid vertical line is immediately before 2002 when the abuse scandal first broke nationally. The capped vertical bars show 95% confidence intervals from standard errors clustered by diocese. We see that in the post-period there are still statistically significant effects.

Table B.1: Effect of High Allegations on Church Vitals (Threshold > 3 Allegations)

	Infant Baptism		First Communion		Confirmation	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-0.0821** (0.0318)	-0.0703** (0.0332)	-0.0812** (0.0338)	-0.0716** (0.0339)	-0.0023 (0.0465)	-0.0489 (0.0478)
>5 allegation	X		X		X	
>3 allegation		X		X		X
No. of obs.	4,380	4,380	4,547	4,547	4,556	4,556

Note: The outcome variable is log of the labeled participation outcome. Standard Errors are clustered at diocesan level. Diocesan controls for all regressions include percentage of diocesan population that is Hispanic, per capita income, and, for Baptism, the percentage of the population that is infant aged. *** p < 0.01, ** p < 0.05, * p < 0.1

Table B.2: Effect of High Allegations on Incidence of Counties with Mortality Rate ≥ 10 per 100,000 (Threshold > 3 Allegations), Aged 55 to 64

	Male		Female	
	(1)	(2)	(3)	(4)
<i>A. Accidental Overdose</i>				
Treat X Post	0.0117* (0.0069)	0.0085* (0.0047)	0.0072 (0.0045)	0.0043 (0.0029)
> 5 allegations	X		X	
> 3 allegations		X		X
No. of obs.	65,524	65,524	65,524	65,524
<i>B. Suicide</i>				
Treat X Post	0.0175** (0.0071)	0.0118** (0.0051)	0.0008 (0.0018)	0.0007 (0.0012)
> 5 allegations	X		X	
> 3 allegations		X		X
No. of obs.	65,524	65,524	65,524	65,524
<i>C. Alcoholic Liver Disease</i>				
Treat X Post	0.0200** (0.0082)	0.0181** (0.0062)	-0.0005 (0.0035)	0.0004 (0.0025)
> 5 allegations	X		X	
> 3 allegations		X		X
No. of obs.	65,524	65,524	65,524	65,524

Note: The outcome variables are indicators whether a county experienced a mortality rate greater than 10 per 100,000 for each of the individual death categories. Data comes from the CDC Wonder database for the years 1991-2015. County and year fixed effects are included. Standard Errors are clustered at the diocesan level. County controls include percentage of population that is Hispanic, per capita income, manufacturing employment, and unemployment rate. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table B.3: Effect of High Allegations on Church Vitals (Allegations Per Capita)

	Infant Baptism		First Communion		Confirmation	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-0.0821** (0.0318)	-0.1467*** (0.0294)	-0.0812** (0.0338)	-0.1431** (0.0339)	-0.0023 (0.0400)	-0.1175** (0.0545)
Number	X		X		X	
Per Capita		X		X		X
No. of obs.	4,380	4,380	4,547	4,547	4,556	4,556

Note: The outcome variable is log of the labeled participation outcome. The odd columns present the estimates for the baseline specification that uses the number of first time allegations as a measure of the exposure to the scandal. The even columns present the estimates when the level of the intensity is measured by the per capita number of first time allegations. Standard Errors are clustered at diocesan level. Diocesan controls for all regressions include percentage of diocesan population that is Hispanic, per capita income, and, for Baptism, the percentage of the population that is infant aged. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table B.4: Effect of High Allegations on Church Vitals (Per 1,000,000)

	Infant Baptism		First Communion		Confirmation	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-631.4*** (142.8)	-327.5** (135.9)	-351.6*** (112.8)	-284.1** (101.8)	-12.7 (114.8)	39.6 (107.4)
Controls		X		X		X
No. of obs.	4,379	4,379	4,545	4,545	4,554	4,554

Note: The outcome variable is the labeled participation outcome per capita scaled up by 1,000,000. The total annual population of those residing in the diocesan boundaries is taken from the OCD. Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls for all regressions include percentage of diocesan population that is Hispanic, per capita income, and, for Baptism, the percentage of the population that is infant aged *** p < 0.01, ** p < 0.05, * p < 0.1

Table B.5: Effect of High Allegations on Diocesan Schools (Per 1,000,000)

	Number of Schools		Student Enrollment	
	(1)	(2)	(3)	(4)
<i>A. Elementary Schools</i>				
Treat X Post	-4.78*** (1.14)	-4.62*** (1.16)	-1611*** (330.1)	-1508*** (328.9)
Controls		X		X
No. of obs.	4,537	4,537	4,539	4,539
<i>B. High Schools</i>				
Treat X Post	-0.3260*** (0.1259)	-0.2682** (0.1173)	-184.5*** (68.7)	-154.6** (69.1)
Controls		X		X
No. of obs.	4,106	4,106	4,107	4,107

Note: The outcome variable is is the labeled outcome per capita scaled up by 1,000,000. The total annual population of those residing in the diocesan boundaries is taken from the OCD. Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. *** p < 0.01, ** p < 0.05, * p < 0.1

Table B.6: Averages of Key Church Variables by Matched High and Low Allegation Dioceses in 2001

	High Allegation	Low Allegation
No. of Dioceses	43	76.1
No. of Allegations	0.26	0.23
No. of Baptisms	7,347	5,418
No. of First Communion	7,176	4,879
No. of Confirmations	5,317	3,397
No. of Elementary Schools	61.2	31.55
No. of Elementary Students	18,290	9,365
No. of High Schools	6.09	3.57
No. of HS Students	3,522	1,930
No. of Parish Churches	148.3	92.8
Catholic Population	534,857	319,398
Total Population	1,977,537	2,173,741

Note: The table shows the means of key participation variables in 2001, one year before the abuse scandal when using propensity score matching on the common support. Matched covariates include total population, percent Hispanic, per capita income, and number of allegations. Allegation data comes from BishopAccountability.org. All other data is from the OCD.

Table B.7: Effect of High Allegations on Church Vitals with Matching

	Infant Baptism		First Communion		Confirmation	
	(1)	(2)	(3)	(4)	(5)	(6)
Treat X Post	-0.0821** (0.0317)	-0.1159*** (0.0485)	-.0812** (0.0338)	-0.1505*** (0.0441)	-.0023 (0.0465)	-0.0788 (0.0505)
	<i>10,665</i>	<i>7,347</i>	<i>8,945</i>	<i>7,176</i>	<i>6,335</i>	<i>5,317</i>
Matched		X		X		X
No. of obs.	4,3880	2,956	4,547	3,102	4,556	3,108

Note: The outcome variable is log of the labeled participation outcome. This provides the estimates when I match the treated and control dioceses using a set of covariates including, the number of first-time allegations, the diocesan Hispanic population, the total population, and the diocesan per capita income. Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table B.8: Effect of High Allegations on Catholic Population and Parish Churches with Matching

	Catholic Population		Parish Churches	
	(1)	(2)	(3)	(4)
Treat X Post	-0.0741** (0.0325) <i>713,630</i>	-0.1121*** (0.0409) <i>534,857</i>	-0.0813*** (0.0195) <i>162.7</i>	-0.0702*** (0.0217) <i>148.3</i>
Matched		X		X
No. of obs.	4,562	3,114	4,563	3,114

Note: The outcome variables are the log of the Catholic population and the log of the number of parish churches. Diocesan and year fixed effects are included. Standard Errors are clustered at the diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table B.9: Effect of High Allegations on Diocesan Schools with Matching

	Number of Schools		Student Enrollment	
	(1)	(2)	(3)	(4)
<i>A. Elementary Schools</i>				
Treat X Post	-0.1415*** (0.0327) <i>71.6</i>	-0.1731*** (0.0409) <i>61.2</i>	-0.1418*** (0.0362) <i>22,050</i>	-0.1712*** (0.0441) <i>18,290</i>
Matched		X		X
No. of obs.	4,539	3,106	4,541	3,108
<i>B. High Schools</i>				
Treat X Post	-0.1644*** (0.0380) <i>7.02</i>	-0.1888*** (0.0522) <i>6.09</i>	-0.1871*** (0.0564) <i>4,001</i>	-0.1658** (0.0646) <i>3,522</i>
Matched		X		X
No. of obs.	4,108	2,898	4,109	2,898

Note: The outcome variable is log of the labeled participation outcome. This provides the estimates when I match the treated and control dioceses using a set of covariates including, the number of first-time allegations, the diocesan Hispanic population, the total population, and the diocesan per capita income. Diocesan and year fixed effects are included. Standard Errors are clustered at diocesan level. Diocesan controls include percentage of diocesan population that is Hispanic and per capita income. Pre-scandal (2001) means of the dependant variables from high allegation dioceses are in italics. *** p < 0.01, ** p < 0.05, * p < 0.1

Table B.10: Key County Level Mortality Statistics for Men, aged 55 to 64, by Matched High and Low Allegation Dioceses in 2001

	High Allegation	Low Allegation
No. of Counties	546	670.2
Average Group Population	10,147	6,530
Average Total Population	212,855	115,311
Average Group Overall Mortality Rate	1,194	1,276
<hr/> Number of Counties with Group Mortality Rates ≥ 10 per 100,000 <hr/>		
Suicide	17	14
Accidental Overdose	4	0
Liver Related	36	38

Note: The table shows key county level mortality statistics for the demographic group of men, aged 55 to 64, in 2001, one year before the abuse scandal. There is data for 2,919 out of 3,141 counties in the United States. All data comes from the compressed mortality files from the CDC Wonder database.

Table B.11: Effect of High Allegations on Incidence of Counties with Mortality Rate ≥ 10 per 100,000 for People Aged 55 to 64

	Male		Female	
	(1)	(2)	(3)	(4)
<i>A. Accidental Overdose</i>				
Treat X Post	0.0117* (0.0069)	0.0110 (0.0072)	0.0072 (0.0045)	0.0074 (0.0047)
Matched		X		X
No. of obs.	65,524	65,235	65,524	65,235
<i>B. Suicide</i>				
Treat X Post	0.0175** (0.0071)	0.0181** (0.0071)	0.0008 (0.0018)	0.0010 (0.0019)
Matched		X		X
No. of obs.	65,524	65,235	65,524	65,235
<i>C. Alcoholic Liver Disease</i>				
Treat X Post	0.0200** (0.0082)	0.0157* (0.0089)	-0.0005 (0.0035)	-0.0016 (0.0037)
Matched		X		X
No. of obs.	65,524	65,235	65,524	65,235

Note: The outcome variables are indicators whether a county experienced a mortality rate greater than 10 per 100,000 for each of the individual death categories. This provides the estimates when I match the treated and control dioceses using a set of covariates including, the county Hispanic population, the proportion of the county total population that is Catholic, and the county per capita income. Data comes from the CDC Wonder database for the years 1991-2015. County and year fixed effects are included. Standard Errors are clustered at the diocesan level. County controls include percentage of population that is Hispanic, per capita income, manufacturing employment, and unemployment rate. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$