Insurance Parity Laws and Reducing Suicides: Are mandates effective?

Daniel Ownby

2021 Fall Causal Inference- Dr. Carattini

2021

Abstract:

Over the past two decades, despite effort from psychologists and mental health professional alike, the United States has seen a steady growth of suicides despite nearly all other western countries experiencing the contrary. Health policy has reacted in turn with nearly all 50 states insurance parity laws after the passing of the Federal Mental Health Parity Act of 1996. There have been several economic studies detailing mental health policy outcomes and, in this study, I attempt to replicate and build upon results from Lang (2013) using additional data and propensity score matching methods.

## Introduction:

Over the past 20 years, several medical breakthroughs in their respective fields have transformed how patients live their lives, however, the US government along with the medical field at large has struggled to properly implement effective mental health policy. According to 2019 Survey for Drug use and Health, it was estimated that at least 51.5 million adults in the United States had some sort of mental illness. In the same year, 13.1 million were estimated to have a serious mental illness that resulted in serious functional impairment or interferes with at least one or more major life activity. Only 65.5% of those 13.1 million received any sort of mental health treatment in the past year. According to the Center for Disease Control’s WISQARS Leading Causes of Death Report, Suicides are the second leading cause of death amongst people aged 10-34 and the fourth from 35-44 in the United States. Suicide rates have gradually increased over the past two decades, starting with 10.5 per 100,000 people to 14.2 per 10,000 in 2018. Suicide rates vary from state to state with both east and west coasts supporting low rates such as 7.4 per 100,000 while mid-western states suffer from rates as high as 25 per 100,000. Several Sources outline the negative effects not only through statistical life projections and productivity losses but more generally how devastating the arguably preventable loss of life has on communities. (Klick & Markowitz, 2006; Lang, 2013)

The Federal Mental Health Parity Act of 1996, signed into office by then President Clinton, prevented group health plan and insurance issuers from offering less mental health or substance abuse coverage benefits compared to regular surgical/medical coverage. If a provider gave mental health services, they couldn’t offer benefit limitations that they wouldn’t otherwise give to their same medical/surgical coverage. Most states by 2002 have since instated mental health parity laws and further stipulations alongside that with varying degrees of restrictiveness and exemptions. My seminal paper, (Lang, 2013) attempts to identify causal effects using difference-in-difference methods and fixed effects using two policy shocks, the aftereffects of the Federal Health Parity Act of 1996 and The Affordable Care Act of 2008. (Lang, 2013) showed a statistically significant effect of a 4-7% decrease in suicide rate after policy implementation. I draw the same data detailed in the study but add years spanning from 1990 to 2016, 36 years of data in total. I run my difference in difference using regression unlike (Lang, 2013) addition to conduct propensity score matching methods to better match control and treatment states.

## Mental health parity:

It should be noted that mental health parity laws are not homogenous and, as it such the case with polices, come in different flavors that states have adopted. In the case of the wave of policy legislation following the Federal Mental Health Parity Act of 1996, which was an inert piece of legislation,(Pacula & Sturm, 2000) states implemented mental health parity laws in 3 strains depending on their voter preferences.

Parity laws:

Any state implementing a law that requires insurance packages to include access to mental health services and to have those services at parity with any other physical service is flagged as a parity state. This type of law is the strongest type amongst the ones implemented and is the type expected to create an effect this study investigates. A less strict version of the parity law is the “mandated offering” law, which does not force insurance package providers to provide mental health services in the first place. This can be a crucial difference when it comes to further analysis but for the purposes of this study both are lumped together as a Parity state.

### Non-parity laws:

Non-parity laws include two situations one, the first being “mandated if offered” and a “minimum mandated benefit”. “Mandated if offered” law states that so long as a provider offers mental health coverage, the lifetime and annual limits must equal psychical care. Minimum mandated benefit laws state that mental health care and physical care do not need to be equal however mental health care still needs to be offered. For the analysis, these types of states are grouped together are flagged as 0 under our treatment variable.

## Methodology:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Treat  (Parity States) | Labor  Force  Participation Rate | Employment  Population Ratio | Unemployment Rate | Total  Filings  of Bankruptcy | Population |  |  | Crude Rate  of Suicide  per 100,000 |
| 0 | 66.17 | 62.39591 | 5.748402 | 24896.684 | 6094259 |  |  | 13.40713 |
| 1 | 69.66 | 66.20489 | 4.987346 | 8762.759 | 2452204 |  |  | 11.72956 |
| diff | -3.49 | -3.8 | 0.76 | 16,133.925 | 3,642,055 |  |  | 1.67757 |

In this study I draw upon data from various sources. To begin with, my main dependent variable, the crude suicide rate, is drawn from the CDC’s WISARQ database from their compressed mortality tables. Suicides here are defined by both International Classification of Diseases Codebook (ICDC) versions 9 and 10, the change between them occurring in 1999. Suicide rates are drawn from 1990 to 2016. Information regarding the policies of each state is shown in the appendix of (Lang, 2013) and are drawn from there. Labor force participation, unemployment and employment population ratio were obtained through the Bureau of labor statistics along with each state’s population. Total Filings were obtained through the uscourts.gov tables for each state’s number of bankruptcies during that year.

### Summary statistics:

To establish difference in difference parallel trends assumptions pre-treatment control and treated states must be similar enough in the covariates to assume the counterfactual had the policies not gone into effect their trends would remain the same. In Figure 1, we can see our summary statistics for our treatment variable as well as the difference between the means of each variable used in the model. Our main dependent, crude rate of suicides had a difference of 1.68 points while Labor participation returned a 3.49 difference. Employment population ratio and unemployment had a -3.8 and .76 respectively. Bankruptcy filings and population variables sport even more striking differences with 16,133 more filings in control states than in treatment and 3,642,055 more people in control states than not.

### Difference in Difference:

We use Ordered Least Squares to build our difference in difference, using 1997 our point of division between the pre and post period. My model is defined as follows:

(2)

Where S is the logged crude rate of suicides per 100,000 people in a state and my Treat variable is a Boolean vector flagging states that had mental health parity laws enacted by 1997. The Post variable similarly flags for any observations past 1997 and my third beta, (Treat\*Post) is the interaction between the two. The fourth beta contains the covariates explored earlier and the epsilon serves the model’s error term.

Results and Discussion:

|  |  |  |
| --- | --- | --- |
| Figure (3): DiD regression and Propensity score matching | | |
|  | Dependent variable: | |
|  |  | |
|  | log (Crude Rate) | |
|  | (1) | (2) |
|  | | |
| Labor force participation rate | -0.089 | 0.296 |
|  | (0.092) | (0.295) |
|  |  |  |
| Employment population ratio | 0.087 | -0.300 |
|  | (0.098) | (0.311) |
|  |  |  |
| Unemployment rate | 0.058 | -0.193 |
|  | (0.065) | (0.214) |
|  |  |  |
| Total Bankruptcy Filings | -0.00000 | 0.000 |
|  | (0.00000) | (0.00000) |
|  |  |  |
| Population | -0.00000\*\*\* | -0.00000\*\*\* |
|  | (0.000) | (0.000) |
|  |  |  |
| Post | 0.028 |  |
|  | (0.017) |  |
|  |  |  |
| Treat | -0.168\*\*\* | -0.185\*\*\* |
|  | (0.042) | (0.028) |
|  |  |  |
| Treat\*Post | 0.025 |  |
|  | (0.050) |  |
|  |  |  |
| Constant | 2.802\*\*\* | 2.964\*\*\* |
|  | (0.403) | (1.139) |
|  |  |  |
|  | | |
| Observations | 1,377 | 324 |
| R2 | 0.140 | 0.215 |
| Adjusted R2 | 0.135 | 0.200 |
| Residual Std. Error | 0.270 (df = 1368) | 0.254 (df = 317) |
| F Statistic | 27.881\*\*\* (df = 8; 1368) | 14.444\*\*\* (df = 6; 317) |
|  | | |
| Note: | \*p\*\*p\*\*\*p<0.01 | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

(Lang, 2013) managed to arrive at consistent estimates of the mental health parity policy arriving at the conclusion that somewhere in between 4-7% of the crude rate of suicides are reduced when states implement the policy using tabular difference in difference and two-way fixed effects. In my analysis, we see both the difference in difference regression and the matching to be insufficient methods of arriving at a treatment effect. Several studies have been consistent on that 4-7% treatment effect however, for my seminal paper, it’s difficult to arrive at a more precise method using difference in difference since the staggered policy implementation from the different states. From my two models, insignificant treatment effects using the difference in difference, and the matching method implies there is 18% reduction in suicides. Despite the matching shown in figure 5, I am extremely skeptical of this estimating considering the difference in difference model reports the same effect on the treatment beta as well, meaning while the regression may have identified an effect, it’s likely biased. (5)

### Limitations and further research:

My analysis could use some touching up. First and foremost, I was not able to fully replicate the Lang (2013) two-way fixed effects regression or Difference in Difference since I did not obtain the total firm size variable that was used to close off any political or policy feedback channels that could affect the analysis or passing of the legislation itself. In addition, I was not able to use two-way fixed effects for the difference in difference, which might have controlled for enough variation for our interested policy channel to show. While we attempted to match treatment and controls to run better data, however based on the number of states treated in 1997, 6, they still may not be comparable. For further research, I have a heavy interest in evaluating whether new difference in difference literature could show us a breakdown of each year policy rollout, and the implications between the years 1997 and 2002, 2002 being the year where most states have adopted a policy.

Conclusion:

In conclusion, the analysis we ran was at best incomplete however, preliminary results from other earlier paper still mark the bar at 4-7% treatment effect. Using a traditional regression difference in difference, we did not find a significant treatment effect. Using matching we estimated 18% treatment effect; however, we are still skeptical of results judging from difference in difference estimates and how big the estimated magnitude is.

# References

Klick, J., & Markowitz, S. (2006). Are mental health insurance mandates effective? Evidence from suicides. *Health economics*, *15*(1), 83-97.

Lang, M. (2013). The impact of mental health insurance laws on state suicide rates. *Health economics*, *22*(1), 73-88.

Pacula, R. L., & Sturm, R. (2000). Mental health parity legislation: much ado about nothing?. *Health Services Research*, *35*(1 Pt 2), 263.

Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2005) [2021 December (Dec) Sunday ]. Available from URL: [www.cdc.gov/injury/wisqars](https://www.cdc.gov/injury/wisqars)

#### Appendix:

|  |  |  |  |
| --- | --- | --- | --- |
| State | Year | Parity | Late Year |
| Arkansas | 1997 | Yes | 1 |
| California | 2000 | Yes | 0 |
| Colorado | 1998 | Yes | 0 |
| Connecticut | 2000 | Yes | 0 |
| Delaware | 1999 | Yes | 0 |
| Hawaii | 1999 | Yes | 0 |
| Illinois | 2002 | Yes | 0 |
| Kansas | 2002 | Yes | 0 |
| Louisiana | 2001 | Yes | 0 |
| Maine | 1996 | Yes | 0 |
| Maryland | 1995 | Yes | 0 |
| Massachusetts | 2002 | Yes | 0 |
| Minnesota | 1995 | Yes | 1 |
| Montana | 2000 | Yes | 0 |
| New Hampshire | 1995 | Yes | 0 |
| New Jersey | 2000 | Yes | 0 |
| New Mexico | 2000 | Yes | 1 |
| North Dakota | 1996 | Yes | 0 |
| Oklahoma | 2000 | Yes | 0 |
| Rhode Island | 1995 | Yes | 0 |
| South Dakota | 1998 | Yes | 0 |
| Texas | 1998 | Yes | 0 |
| Vermont | 1998 | Yes | 0 |
| Virginia | 2000 | Yes | 0 |
| West Virginia | 2002 | Yes | 0 |
| California | 1974 | MMB | 0 |
| Colorado | 1992 | MMB | 0 |
| District of Columbia | 1999 | MMB | 0 |
| Florida | 1992 | MMB | 0 |
| Hawaii | 1988 | MMB | 0 |
| Illinois | 1991 | MMB | 0 |
| Kansas | 1998 | MMB | 0 |
| Massachusetts | 1996 | MMB | 0 |
| Michigan | 2000 | MMB | 0 |
| Mississippi | 2002 | MMB | 0 |
| Nevada | 2000 | MMB | 0 |
| Oregon | 2000 | MMB | 0 |
| Pennsylvania | 1999 | MMB | 0 |
| South Carolina | 1995 | MMB | 0 |
| Tennessee | 1999 | MMB | 0 |
| Wisconsin | 1998 | MMB | 0 |
| Arizona | 1998 | MIO | 0 |
| Indiana | 2000 | MIO | 0 |
| Kentucky | 2000 | MIO | 0 |
| Missouri | 2000 | MIO | 0 |
| Nebraska | 2000 | MIO | 0 |
| Ohio | 1985 | MIO | 0 |
| Alabama | 2001 | MIO | 0 |
| Georgia | 1998 | MIO | 0 |
| New York | 1999 | MIO | 0 |
| Utah | 2001 | MIO | 0 |
| Alaska | NA | NO | 0 |
| Iowa | NA | NO | 0 |
| Idaho | NA | NO | 0 |
| North Carolina | NA | NO | 0 |
| Washington | NA | NO | 0 |
| Wyoming | NA | NO | 0 |