

Federally-Funded Community Mental Health Centers and Suicide

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Abstract

This paper analyzes the effect of the Federally Funded Community Mental Health Center (CMHC) Act of 1963 on county-level suicides. The passage and enactment of the CMHC Act came at a time when mental health treatment in the U.S. was experiencing a transition away from large mental hospitals and towards community-level treatment. Using data on *when* and *where* federally funded CMHCs were established, this paper finds that the presence of operating centers is associated with a reduction in suicides by 2.5 percent. Strongest effects are found for males aged 15 to 34 and males over 65 which experienced 4.5% and 5.4% fewer suicides when there was an operating CMHC in a county, respectively. This study presents empirical evidence suggesting that operational CMHCs and the services they provided increased the availability and utilization of treatment for mental illness, leading to fewer male suicides than there would have been without the centers.

1 Introduction

In 1963, President John F. Kennedy delivered a message to congress asking for a “bold new approach” to treating mental illness in the United States. This message led to the passing of the Community Mental Health Centers Act of 1963 (Public Law 88-164) with the intention to provide federal assistance to the creation of centers that would provide treatment for the mentally ill and prevent mental illness in local communities. The passage and enactment of the CMHC Act came at a time when the U.S. was experiencing a regime switch regarding how mental illness was treated and funded in the U.S. The goal of the Act was to create between 1,500 and 2,500 centers across the country, serving more than 41 million Americans in their home communities, to compensate for the treatment that was lost with the downsizing of large mental health institutions. The CMHCs were also established with the ambition of providing higher quality and more comprehensive care to mentally ill person living in their communities.

Beginning in the mid 1950s the social and political consensus in the U.S. was that the treatment of mentally ill persons in large and mostly rural institutions was inhumane and an inconvenient drain on state and federal budgets. This sentiment led to policies and actions that resulted in the number of patients treated in mental hospitals falling from approximately 560,000 in 1955 to 160,000 in 1985. The primary intention of downsizing large mental hospitals (commonly termed “deinstitutionalization”) was to replace the institutions with community-based mental health care (Rochefort 1984). A debate still remains, however, about whether adequate funds were ever allocated to support the community-based mental health care required to compensate for the downsizing of mental hospitals (Rochefort 1997; Yoon and Buckner 2009; Lamb, Weinberger and Gross 2004). The key (*ex ante*) argument behind this deinstitutionalization (other than decreasing government spending) was that mentally ill patients needed to be treated outside of large institutions where they were subjected to poor living conditions and were mistreated. The general (*ex post*) argument against deinstitutionalization has been that it severely limited the availability of mental

health treatment in the U.S. and resulted in worse outcomes for the mentally ill.

The 1963 Act allocated federal funds to states based on three criteria: (1) population, (2) the need for community mental health services, and (3) the financial need of each state. States were required to develop a comprehensive mental health plan, a list of priorities regarding mental health activities, and provide assurance that CMHC services would be available to all, including indigent persons. Originally, the CMHC Program was designed to provide “seed” money for communities and states to construct and initially operate centers, but the need for further funding led to amendments that increased the Federal share of costs. Additional amendments authorized new and extended existing grants, increased federal spending for high poverty areas, and included funding for projects related to drug addiction and alcoholism treatment (NIMH 1978). Grants were continually awarded and new CMHCs were established up until 1981 when the Omnibus Budget Reconciliation Act (OBRA 1981) repealed the CMHC program and lumped all federal funding for mental health into state block grants. Although there were no new CMHCs funded under the CMHC Act after 1981, previously funded centers were required to continue providing service for the next 20 years.

This paper contributes to the literature relating the provision and availability of mental health care to mental health by investigating the effect federally funded CMHCs had on suicide rates. The time period of this analysis (1973-1988) makes it relevant to prior work looking at the effects of the deinstitutionalization of mental health care in the U.S. Existing work has shown that deinstitutionalization increased the probability that the mentally ill, on average, failed to receive proper mental health care as well as faced poor economic and social resources (Rochefort 1997). While prior research has linked mental illness and poor economic conditions to suicide, and linked suicides to the prevalence of mental hospital beds from the 1980s on, there has been little empirical work aimed at identifying the relationship between the emergence of federally funded community-level mental health treatment and suicides. For the U.S., two of the more comprehensive studies on the topic have been Gibbons, et

al. (2017), and Yoon and Bruckner (2009). Gibbons et al. (2016) look at state level data from 1999 to 2013 and find a clear inverse relationship between the number of mental health hospital beds and suicides when considering between-state differences. Yoon and Bruckner (2009) look at state mental hospital bed reductions, state spending on community treatment, and suicides from 1982 to 1998. They conclude that the downsizing of inpatient mental health services may increase suicides, and that increases in community mental health funding at the state-level may offset this effect.

This paper uses the rollout of federally funded CMHCs between 1973 and 1980 to provide evidence of their effects on mental health, more generally, the impact of access to a CMHC on suicide. The main results suggest that the establishment of CMHCs is associated with declines in male suicide rates, specifically for younger males, aged 15 to 34, and older males, over 65. From 1973 to 1988, CMHCs are estimated to be related to a 4.5% decrease in the suicide rate for younger males and a 5.4% decrease for older males. There is little evidence that suicide rates for men aged 35 to 64 were significantly impacted, and female suicide rates are uncorrelated with the rollout of CMHCs. A simple translation of the intention-to-treat effects into average effects on the treated implies that CMHCs reduced the suicide rate of the males they treated by 61 per 100,000, which translates to roughly 180 male suicides in treated counties annually. Focusing on males over 65 that were treated, CMHCs reduced their suicide rate by 482, or 62 less suicides annually.

The remainder of the paper is organized as follows. Section 2 presents the data for the analysis. Section 3 gives some background on the 1963 Act and CMHCs, as well as describe the sample of counties used in the analysis. Section 4 describes the empirical strategy and section 5 presents the main results. The paper concludes in section 6 with a discussion of the findings and future work that stems from this analysis.

2 Data

2.1 Data on CMHC Timing and Location

Information on location and operational status of Community Mental Health Centers (“CMHCs”) come from the U.S. Department of Health, Education, and Welfare’s “Directory of Federally Funded Community Mental Health Centers.”¹ These directories list all CMHCs that ever received federal grants through the Community Mental Health Center Act of 1963. For each center, or proposed center, receiving federal funding through the 1963 Act, the directories list the address (including city), whether a center was operational at the time of the publication, and the number and type of grants awarded to the specific center.

These directories were published every other year from 1973-1981, and each directory lists all CMHCs that had received federal funding by a specified month.² The data includes the years and counties in which each CMHC was operating. This allows each center to be linked to county-level suicide rates and characteristics.

Federally funded CMHCs were required to provide or work towards providing an array of mental health services. The five key areas of services that needed to be made available were inpatient care, outpatient care, partial hospitalization, around-the-clock emergency services, as well as consultation and educational services for community agencies regarding mental illness and the mentally ill (DHEW).

Figure 1 maps the rollout of the CMHC program between 1973 and 1981 by county. Counties with operating CMHCs as of 1973 are shaded in the map in panel A. The map in panel B additionally shades counties with operational CMHCs by 1980. All US regions had operating CMHCs in 1973, and all were impacted by the expansion of centers between 1973 and 1980. Figure 1 shows that there is both between and within state variation in the location and timing of CMHCs.

¹These directories were also compiled by the National Institute of Mental Health.

²The 1973 directory lists all CMHCs as of September 1973. The 1975 directory lists all CMHCs as of July 1975. The 1977 directory lists all centers as of April 1977. The 1979 directory lists all CMHCs as of September 1978. The 1981 directory lists all CMHCs as of September 1981.

2.2 Mortality Data

Overall and age-specific suicide counts by county are the outcome variables of interest. County-level suicide counts come from the Compressed Mortality files produced by the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (“NCHS”). Annual county-level suicide counts are compiled for all residents in each county as well as for subpopulations for the years 1968 to 1988. The main subpopulations considered in the analysis are males and females aged 15 to 34 years, 35 to 64 years, and 65 years and older.

Figure 2 graphs the suicide rates for the gender and age subpopulations from 1968 to 1988. Male and female suicide rates (number of suicides per 100,000 persons in the relevant subpopulation) are plotted separately and suicide rates by age are plotted for all genders and males and females separately. Female suicide rates are much lower than male rates, and tend to decline overtime, while male suicide rates appear to increase overtime. Suicide rates by age are largest for females aged 34 to 64 and for males aged 65 and over.

The main analysis utilizes county suicide counts for years 1973 through 1988. Since 1973 is the first year in which the DHEW directories were published, suicides cannot be linked to the location and opening dates of CMHCs for earlier years. Beginning in 1989, all mortality data is suppressed, in publicly available data, for any subnational area having less than 10 deaths in a given category. Given that suicide is an extreme and rare event, many counties have suppressed suicide data after 1988 due to low numbers of deaths.

2.3 County Characteristics

County demographic and economic characteristics are included to control for time varying county-level characteristics that might impact mental illness and the locations of centers. Although reliable county-level data on demographic and economic variables is difficult to find for the time period of this analysis, I am able to use annual per-capita measures of government transfers to each county from the Bureau of Economic Analysis Regional Information System

(REIS). These transfers include public assistance such as Aid to Families with Dependent Children, SSI payments and General cash assistance; medical spending such as Medicare, Medicaid and military health care; and retirement and disability payments.

For other covariates, I follow Bailey Goodman-Bacon (2015) and interact county-level variables with linear time trends. These variables come from 1960 County and City Data-books (Haines and ICSPR 2005) and Area Resource Files (US DHHS 1994), and include the proportion of 1960 residents living urban areas, rural or farm areas, those that are nonwhite, under the age of 5 years, over the age of 20 years, over the age of 65 years, in households with annual income less than \$3,000, in households with more than \$10,000, with less than 4 years of education, with more than 12 years of education, and the number of active medical doctors per 1,000 residents.

3 Community Mental Health Centers

In October 1963, President John F. Kennedy signed into law the Community Mental Health Centers Act (Public Law 88-164), which aimed to change the way mental health treatment was delivered in the U.S. and usher in “a bold new approach” to the problem of mental illness. The 1963 Act allocated federal funds to states based on three criteria: (1) population, (2) the need for community mental health services, and (3) the financial need of each state. States were required to develop a comprehensive mental health plan, a list of priorities regarding mental health activities, and provide assurance that CMHC services would be available to all, including indigent persons. Originally, the CMHC Program was designed to provide “seed” money for communities and states to construct and initially operate centers, but the need for further funding led to amendments that increased the Federal share of costs. Additional amendments authorized new and extended existing grants, increased federal spending for high poverty areas, and included funding for projects related to drug addiction and alcoholism treatment (NIMH 1978).

When applying for grants, communities and groups had to prove that they would be able to build, staff and provide an array of mental health services long after construction was completed. To be eligible for federal funding, centers needed to provide inpatient and outpatient care, partial hospitalization, and around-the-clock emergency services, as well as consultation and education to community agencies (DHEW). Given that the allocation of grants was not only based on need but also population and communities' ability to provide their own funding and resources, the location of CMHCs was correlated with measurable county characteristics. Because of this correlation and the resulting limited overlap in the covariate distribution between the treated and control counties, I follow Crump et al. (2009) and trim the full sample of counties based on the propensity that each county would ever have an operational center. This propensity score trimming strategy involves calculating the probability that each county receives a CMHC and focusing the analysis on counties with estimated probabilities between 0.10 and 0.90.

To construct the propensity scores, I use a probit regression to estimate the probability of treatment based on pre-1963 county-level characteristics. I regress a binary dependent variable equal to 1 if a county had an operating CMHC between 1973 and 1980 on the following covariates: (1) *variables measured in 1960*: population density and population density squared, population growth from 1950 to 1960, percent urban, percent rural, percent nonwhite, percent of population younger than 5, percent of population older than 21, percent of population older than 65, total housing units per 1,000 population, civilian labor-force participation, the unemployment rate, share of the labor force that is male, fraction of the population 25 and older with less than 4 years of schooling, fraction of the population 25 and older with more than 12 or more years of schooling, number of MDs per 1,000 population, (2) *variables measured in 1959*: fraction with family income below \$3,000, fraction with family income above \$10,000, (3) *variables measured in 1957*: local government expenditures per 1,000 population. I also include U.S. Census region dummy variables. Trimming the sample based on these estimated propensity scores leaves 416 out 488 treated counties and 970 out

of 2,562 control counties in the main analysis sample.

Table 1 displays summary statistics for the trimmed sample of treated and control county groups, as well as the differences between the two groups. Table 1 shows that counties receiving CMHCs tended to have lower suicide rates, to have larger populations, to be more urban, to be more affluent (larger proportion of households with higher incomes, and higher levels of education), and have more active physicians per capita. Statistically, the groups only differ on prior suicide rates and the proportion of the population aged 21 to 64. Although the treated counties had statistically lower suicide rates on average, the general demographic differences are consistent with communities meeting the criteria for federal funding through proposals submitted on behalf of the general population.

4 Empirical Strategy

The paper’s empirical strategy uses variation on *when* and *where* CMHCs were operational to estimate their effects on suicide. The key identification assumption is that the timing and location of observed operational CMHCs is uncorrelated with unobservable, time-varying county-level determinants of changes in suicide. Using county-level data from 1973 to 1988, the variation in the location and timing of CMHCs is exploited within a poisson count model.

$$Suicide_{it} = \beta_1 * PostCMHC_{it} + \ln(population_{it}) + \mathbf{X}'_{it}\boldsymbol{\beta}_2 + \delta_i + \gamma_t + \epsilon_{it} \quad (1)$$

where $Suicide_{it}$ is the number of suicides in county i in year $t= 1973, \dots, 1988$. $PostCMHC_{it}$ is a treatment indicator which is equal to 1 for treated counties beginning the first year they are listed as having at least one operational center. The log of the relevant county population or subpopulation, $\ln(population_{it})$, is included as an exposure variable. δ_i are county fixed effects, which capture time-invariant differences in both ob-

servable and unobservable characteristics. γ_t are year fixed effects that capture time-varying national changes. \mathbf{X}'_{it} includes the interaction of 1960 characteristics (described above and in Table 1) interacted with linear time trends, and annual county-level per-capita measures of government transfers. The error term, ϵ_{it} , is clustered at the county-level.

With the inclusion of both county and year fixed effects, the identification of the of the model requires that the timing of CMHCs be uncorrelated with unobservable county characteristics that change overtime. To address the potential of time-varying and location specific characteristics being correlated with the establishment of centers and mental health, I also include either year-by-region³ or year-by-urban⁴ fixed effects. These fixed effects will more closely be able to control for variations in advancements in mental health treatments and differential diffusion of the use of antipsychotics across different regions and with varying levels of urbanization.

5 Results

5.1 Estimates of the Relationship between CMHCs and Suicides

Table 2 presents the estimated incident rate ratios (“irr”) comparing suicides in treated counties and suicides in control counties overall (column 1) and by age group (columns 2-4). The estimated irr of 0.975 in column 1 shows that the establishment of a CMHC in a county is associated with 2.5% fewer suicides for all persons aged 15 and older relative to control counties.⁵ The reported coefficients in columns 2 and 3 suggest that although suicide rates for people aged 15 to 34 and 35 to 64 were not statistically different between treated and control counties, they were lower. Column 4 shows that the effect of CMHCs was strongest

³These are defined as year dummies interacted with the census region categories: Midwest, Southeast, South, and West (the Northeast category is left-out).

⁴These are defined as year dummies interacted with four categories of a county’s population share in urban areas: less than 25%, 25 to 50%, 50 to 75% and over 75%.

⁵There were only a negligible number of reported suicides for persons younger than 15 in the mortality data between 1968 and 1988 so this group is excluded.

for people aged 65 and older, and that the centers were associated with 6% lower suicides for this age group. With a mean suicide rate of 20.8 in the sample, this suggests that operating centers are associated with 1.2 less suicides per 100,000 people over 65 than there would have been without a center.

Given that female suicides were roughly two-thirds lower than male suicide rates of the analysis period, it is important to explore the effects of CMHCs on males and females separately. Table 3 reports the estimated effects of CMHCs on male suicides in Panel A and female suicides in Panel B. Focusing on Panel A, Column (1) estimates the effect of CMHCs on suicides for all males aged 15 and older. The estimated irr is 0.966, which means that an operational CMHC in a county is associated with 3.4% fewer male suicides, or approximately one less suicide per 100,000 males. This effect is driven by males ages 15 to 34 years and those over 65. Column 2 shows that the establishment of a CMHC is associated with a 4.5% decrease in suicides for males aged 15 to 34, and a 5.4% decrease for males over 65. These estimates translate into a decrease of one suicide from a mean of 22 per 100,000 males ages 15 to 34, and more than 2 suicides from a mean of 42 per 100,000 men aged 65 and older. The results in Panel B show that operating CMHCs had no impact on female suicides, which makes sense due to the rarity and low numbers of female suicides.

Table 4 presents analogous results to Table 3 for males, with the inclusion of year-by-region and year-by-urban fixed effects instead of year fixed effects. One key threat to identification is if the utilization of antipsychotics to treat the mentally ill, and the dispersion of such use, varied across the country. The top panel of Table 4 presents the results for males from Table 3 with year-by-region fixed effects in the top panel and year-by-urban fixed effects in the bottom. The estimated effects are consistent with those in Table 3, with the exception that statistical significance is lost for the effect on males over 65 when controlling for regional trends. These results suggest that the estimated effects are not being driven by differences in antipsychotic use and advancements in mental health treatment across regions and among more and less urbanized areas. Although there may still be differences in how mental illness

is treated and how well it is treated, these results suggests that CMHCs likely increased the availability and utilization of treatment for mental illness in a way that led to fewer male suicides than there would have been in the absence of the centers.

5.2 Heterogeneity Analysis

The results so far present consistent evidence that counties with operating CMHCs experienced lower male suicide rates than they likely would have without the centers. However, the effect of CMHCs on suicides may have varied across the country and between more and less urbanized locations. To evaluate possible heterogeneity in the estimated effect of CMHCs, Tables 5 and 6 estimate the main regression separately for counties in different census regions and split up by each county's 1960 level of urbanization. Table 5 estimates the equation 1 separately by Census Region and shows that the effects of CMHCs on male suicides were strongest in states in the South and Southeast.⁶ Each row in Table 5 is a separate regression focusing on counties in each census region. The first row in Table 5 reports the effect of CMHCs in the Northeast⁷ and shows that although decreases in male suicide rates were seen for all males, the effect was only statistically significant for the oldest males. The second and fifth rows show that CMHCs did not have a statistically significant effect on suicides on the Midwest or West. Results for the Southeast and South are reported in rows 3 and 4 and show that these areas are driving the significance of the main results. These results suggest that CMHCs in southern states may have been more successful in filling in the gap in mental healthcare resources brought about by deinstitutionalization.

Table 6 shows the effects of CMHCs estimated for counties with different levels of urbanization. The four rows report estimates for counties with less than 25% of their population living in urban areas, 25 to 50% living in urban areas, 50 to 75%, and over 75%, respectively. The results in the first row (for counties with less than 25% living in urban areas) suggest

⁶States classified as South are AL, AR, KY, LA, MS, OK, TN, and TX. States classified as Southeast are DE, FL, GA, MD, NC, SC, VA, and WV.

⁷States classified as Northeast are CT, ME, MA, NH, RI, VT, NJ, NY, PA.

that the most rural counties with CMHCs may have experienced higher suicide rates for men aged between 35 and 64 than in rural counties without a center. The third row reports the estimates for the 490 counties with 50 to 75% living in urban areas, and show that these CMHCs decreased suicides by 5.6% for all males and by 11.7% for males over 65. These results suggest that CMHCs may have been more successful in providing mental health services in relatively urban areas where there was likely more resources for the mentally ill and more medical resources in general.

5.3 Translation of ITT Effects to ATT

These intention-to-treat estimates (ITT) average the effect of CMHCs over all county residents in gender-by-age groups regardless of whether they benefited from CMHC services. I use two approaches to approximate the implied average treatment effect on the “treated” (ATT)–effect on persons that received direct treatment from CMHCs, which they may not have otherwise received. Both approaches narrowly assume that CMHCs only benefited their *patients*. Using a DHEW publication of the results from a 1974 survey of all federally funded CMHCs, I use the number of patients, by gender and age, treated at CMHCs to approximate the potential suicides that were avoided. According to the publication, there were 771,821 client additions to CMHCs in 1974, of which 372,809 were male. The first approach looks at all males over the age of 15, which implies that out of the 24 million males (15 years and older) living in treated counties, roughly 1.5% received treatment at CMHCs. Dividing the reduction in the male suicide rate (roughly 1 per 100,000: Table 3 panel A) by the rate of men receiving CMHC treatment yields an ATET of 61 fewer male suicides per 100,000. This translates into 180 fewer male suicides among the 293,000 men over the age of 15 treated in 1974.

The second approach focuses on males over the age of 65, of which there were 2.75 million living in treated counties in 1974, and 12,910 (0.47%) receiving treatment from CMHCs. Dividing the reduction in the older male suicide rate (roughly 2.2 per 100,000: Table 3 panel

A) by the rate of men over 65 obtaining treatment from CMHC yields an ATET of 482 fewer suicides per 100,000. This translates into 62 fewer male suicides among the 13,000 men over 65 treated in 1974. These estimates likely understate the true annual effect of CMHCs due to the fact that 1974 was still quite early for the CMHC program, and sources estimated that the number of people treated by CMHCs more than doubled by 1977 (DHEW 1981).⁸

6 Conclusion

Since the 1960s, the experiment of federally funding CMHCs has been an important yet understudied part of the transition of mental health care in the US from large institutions to community-based treatment. Even more recent social and political support for publicly funded community treatment of mental illness relates, in part, to CMHC's role in expanding the availability of mental health care. An important lesson from this analysis is that public investments in community mental health care may yield large returns for the mentally ill and underinsured population - even to those that are eligible for public insurance like Medicare and Medicaid. Exploiting the CMHC program's rollout from 1973 to 1980 presents the opportunity to quantify the effects of changes in access to community-level mental health treatment during a time when the provision of treatment through the large institutions of the past was diminishing.

This study provides evidence that the establishment of federally funded CMHCs was associated with decreased male suicide rates. Specifically, counties with CMHCs experienced 3.4% less male suicides than similar counties without centers. This finding implies that the establishment of CMHCs in treated counties led to 180-240 fewer male suicides annually in treated counties from 1973 to 1988. These same counties experienced 4.5% fewer suicides for males under 34 and 5.4% fewer suicides for males over 65. These estimates imply that there were approximately 93-130 fewer young male suicides and 57-70 fewer older male suicides annually in treated counties than there would have been without CMHCs.

⁸Approximately 1,881,798 people were under care at CMHCs in 1977.

The results of the paper suggest that CMHCs may have achieved their primary objective of improving mental health by providing mental health services to people within their own communities. Whether the benefits of CMHCs remain today and whether CMHCs statistically benefited females and middle-aged males remain important questions for future research. Further, whether the quality and cost-effectiveness of treatment provided by CMHCs was superior to that provided by large institutions continues to be a question regarding the success of deinstitutionalization in the U.S.

7 References

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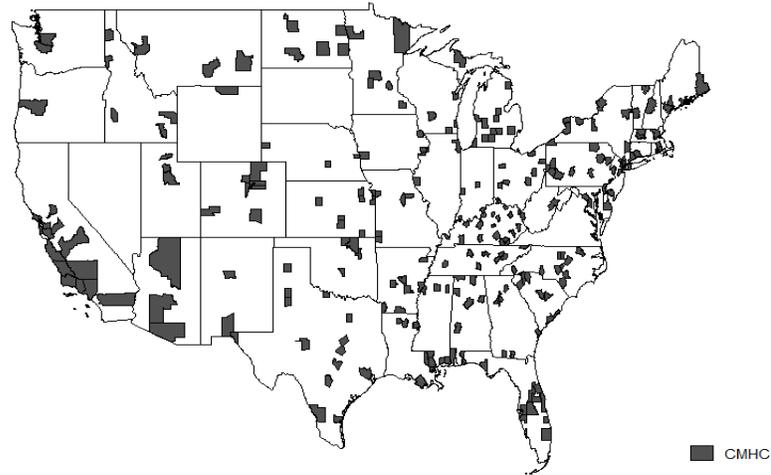
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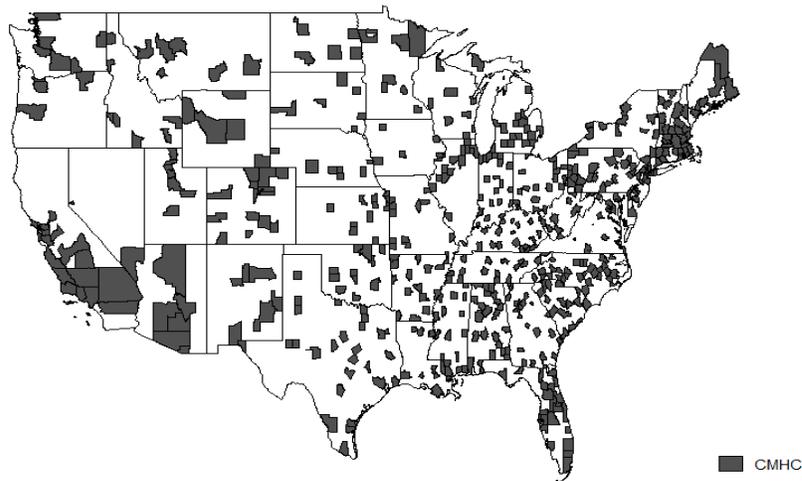
8 Figures and Tables

Figure 1: Establishment of Operational CMHCs

A. Operational CMHC as of September 1973



B. Operational CMHC as of September 1980



Source: Directory of Federally Funded Community Mental Health Centers (1973, 1975, 1977, 1979, 1981)

Figure 2: Suicide Rates: 1968-1988

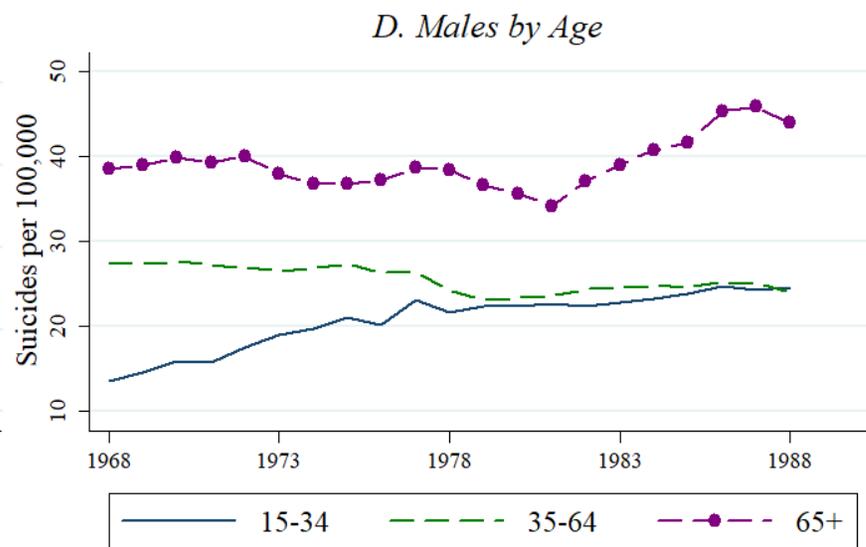
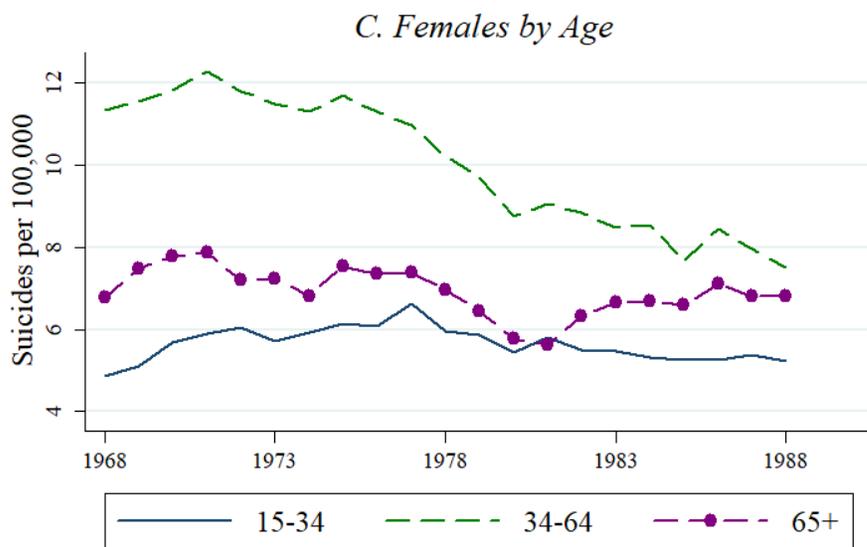
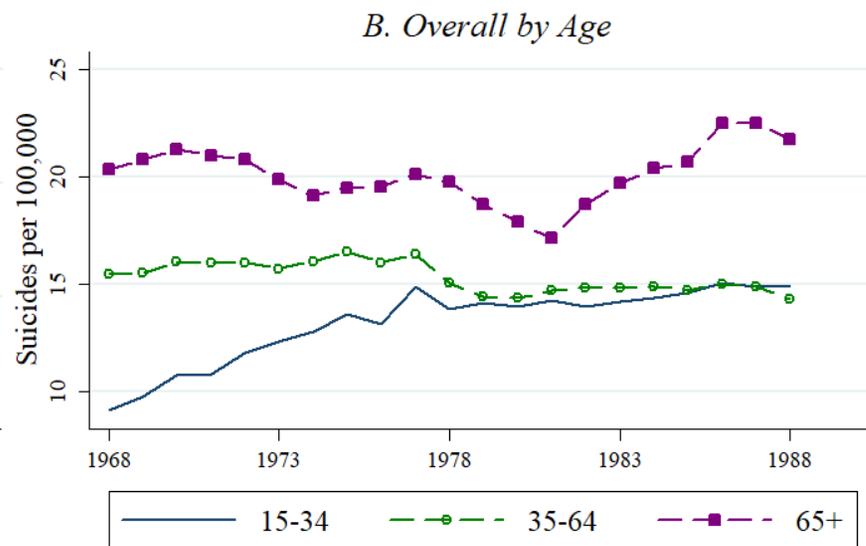
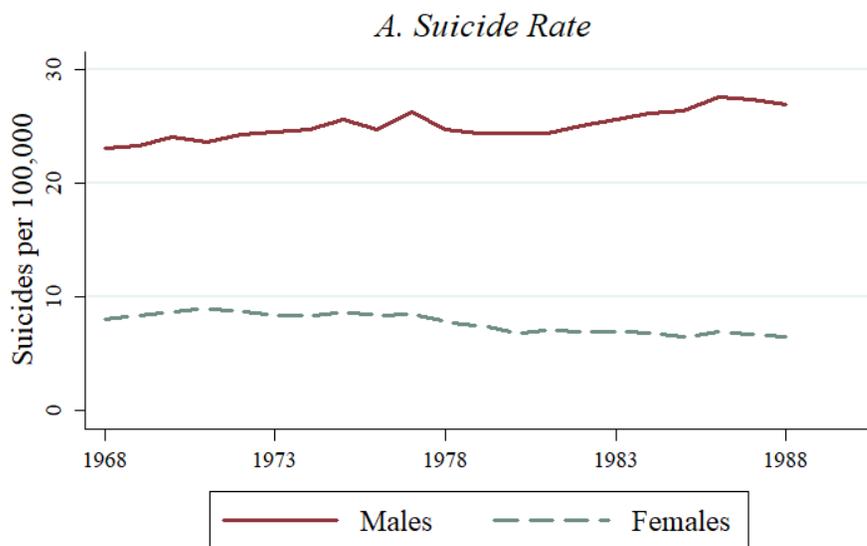


Table 1: Summary Statistics

	CMHC by 1980	No CMHC	Difference	<i>p</i> -value on <i>t</i> -test of difference
<i>Death Rate per 100,000 in 1968</i>				
Suicide Total	10.93	11.28	-0.35	0.46
Suicide 15+ years	15.53	15.94	-0.41	0.55
Male Rate	24.12	25.91	-1.80	0.14
Female Rate	7.64	6.65	1.00	0.07
1960 Population	104,860	33,530	71,331	0.00
<i>Percent of 1960 Population</i>				
in urban area	60.98	44.97	16.02	0.00
in rural area	8.43	14.84	-6.41	0.00
Nonwhite	10.24	11.99	-1.75	0.07
Age <5	11.70	11.34	0.36	0.00
Age >20	58.27	58.20	0.07	0.78
Age >64	9.07	10.13	-1.07	0.00
household income ≤\$3K	25.72	32.68	-6.95	0.00
household income ≥\$10K	11.53	8.44	3.10	0.00
≤ 4 years education	9.37	11.84	-2.47	0.00
≥ 12 years education	40.41	35.36	5.05	0.00
Gov. expenditures (\$1,000s)	122.62	127.96	-5.35	0.06
Active MDs (per 1k)	0.93	0.70	0.23	0.00
Number of Counties	416	970		

Notes: County characteristics are not weighted by 1960 populations so they can be interpreted as shares for the average county in each group. The table/estimation sample contains 416 treated and 970 control counties.

Sources: 1960 County and City Data Books (Haines and ICPSR 2005) and 1990 Area Resource Files (US DHHS 1994).

Table 2: Relationship between CMHCs and Suicides

SUICIDE	(1) Total ≥ 15	(2) Age 15-34	(3) Age 35-64	(4) Age ≥ 65
Post CMHC	0.975* (0.0139)	0.966 (0.0205)	0.999 (0.0175)	0.940** (0.0239)
Observations	22,176	22,160	22,176	21,984
Number of counties	1,386	1,385	1,386	1,374
Mean suicide rate	16.6	14.0	17.7	20.8
Loglikelihood	-45417	-33335	-35465	-26312

Standard errors clustered at county level

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: All regressions include county and year fixed effects. All regressions weighted by county population. Sample based on the propensity that a county ever has a CMHC. Counties with propensity scores between 0.1 and 0.9 are included. 72 out of 488, or 14.8%, of treated counties are dropped. Post CMHC equals one once the first CMHC is operational in a county. Post CMHC always equals one for counties with a CMHC in 1973. Covariates are percent non-white, young, old, urban, rural, with educ income, age, number active MDs per 1,000 and gov expenditures.

Table 3: Relationship between CMHCs and Suicides: By Gender

SUICIDE	(1) Total ≥ 15	(2) Age 15-34	(3) Age 35-64	(4) Age ≥ 65
<i>Panel A: Males</i>				
Post CMHC	0.966** (0.0134)	0.955** (0.0210)	0.988 (0.0193)	0.946** (0.0261)
Observations	22,176	22,128	22,176	21,968
Number of counties	1,386	1,383	1,386	1,373
Mean suicide rate	27.2	22.7	27.3	42.2
Loglikelihood	-42489	-30943	-32029	-24429
<i>Panel B: Females</i>				
Post CMHC	1.005 (0.0235)	1.016 (0.0377)	1.023 (0.0300)	0.933 (0.0451)
Observations	21,984	20,256	21,424	18,048
Number of counties	1,374	1,266	1,339	1,128
Mean suicide rate	6.67	5.13	8.77	5.47
Loglikelihood	-27329	-16102	-20605	-10217

Standard errors clustered at county level

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: All regressions include county and year fixed effects. All regressions weighted by county population. Sample based on the propensity that a county ever has a CMHC. Counties with propensity scores between 0.1 and 0.9 are included. 72 out of 488, or 14.8%, of treated counties are dropped. Post CMHC equals one once the first CMHC is operational in a county. Post CMHC always equals one for counties with a CMHC in 1973. Covariates are percent non-white, young, old, urban, rural, with educ income, age, number active MDs per 1,000 and gov expenditures.

Table 4: Relationship between CMHCs and Male Suicides: Different Fixed Effects

MALE SUICIDE	(1) Total ≥ 15	(2) Age 15-34	(3) Age 35-64	(4) Age ≥ 65
<i>Year-by-Region Fixed Effects</i>				
Post CMHC	0.969** (0.0138)	0.952** (0.0210)	0.993 (0.0194)	0.955 (0.0279)
Observations	22,176	22,128	22,176	21,968
Number of counties	1,386	1,383	1,386	1,373
Mean suicide rate	27.2	22.7	27.3	42.2
Loglikelihood	-42431	-30896	-31987	-24388
<i>Year-by-Urban Fixed Effects</i>				
Post CMHC	0.963*** (0.0134)	0.951** (0.0208)	0.987 (0.0194)	0.945** (0.0259)
Observations	22,176	22,128	22,176	21,968
Number of counties	1,386	1,383	1,386	1,373
Mean suicide rate	27.2	22.7	27.3	42.2
Loglikelihood	-42459	-30913	-32012	-24407

Standard errors clustered at county level

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Notes: All regressions include county and year fixed effects. All regressions weighted by county population. Sample based on the propensity that a county ever has a CMHC. Counties with propensity scores between 0.1 and 0.9 are included. 72 out of 488, or 14.8%, of treated counties are dropped. Post CMHC equals one once the first CMHC is operational in a county. Post CMHC always equals one for counties with a CMHC in 1973. Covariates are percent non-white, young, old, urban, rural, with educ income, age, number active MDs per 1,000 and gov expenditures.

Table 5: Relationship between CMHCs and Male Suicides: By Census Region

MALE SUICIDE	(1) Total	(2) Age <35	(3) Age 35-64	(4) Age 65+
Post NE	0.965 (0.0253)	0.975 (0.0403)	0.977 (0.0408)	0.903* (0.0492)
Post MW	0.971 (0.0312)	1.054 (0.0553)	0.933 (0.0444)	0.898 (0.0682)
Post SE	0.963 (0.0275)	0.907** (0.0349)	0.991 (0.0391)	1.026 (0.0550)
Post South	0.926** (0.0357)	0.807*** (0.0476)	1.035 (0.0584)	0.960 (0.0979)
Post West	0.994 (0.0221)	0.977 (0.0383)	1.030 (0.0327)	0.965 (0.0480)
Northeast counties	171	171	171	170
Midwest counties	347	347	347	344
Southeast counties	253	252	253	251
South counties	387	385	387	383
West counties	228	228	228	225

Standard errors clustered at county level

*** p<0.01, ** p<0.05, * p<0.1

Notes: All regressions include county and year fixed effects. All regressions weighted by county population. Sample based on the propensity that a county ever has a CMHC. Counties with propensity scores between 0.1 and 0.9 are included. 72 out of 488, or 14.8%, of treated counties are dropped. Post CMHC equals one once the first CMHC is operational in a county. Post CMHC always equals one for counties with a CMHC in 1973. Covariates are percent non-white, young, old, urban, rural, with educ income, age, number active MDs per 1,000 and gov expenditures.

Table 6: Relationship between CMHCs and Male Suicides: By Urbanization

	(1)	(2)	(3)	(4)
MALE SUICIDE	Total	Age <35	Age 35-64	Age 65+
Post CMHC				
0-25% Urban	1.178 (0.1750)	0.914 (0.2712)	1.489** (0.2524)	1.196 (0.2602)
25-50% Urban	0.973 (0.0293)	0.905** (0.0397)	1.037 (0.0455)	0.981 (0.0597)
50-75% Urban	0.944** (0.0236)	0.978 (0.0401)	0.946* (0.0302)	0.883*** (0.0385)
75-100% Urban	0.966* (0.0199)	0.955* (0.0267)	0.981 (0.0306)	0.956 (0.0412)
0-25% counties	161	161	161	159
25-50% counties	554	552	554	551
50-75% counties	494	493	494	489
75-100% counties	177	177	177	174

Standard errors clustered at county level

*** p<0.01, ** p<0.05, * p<0.1

Notes: All regressions include county and year fixed effects. All regressions weighted by county population. Sample based on the propensity that a county ever has a CMHC. Counties with propensity scores between 0.1 and 0.9 are included. 72 out of 488, or 14.8%, of treated counties are dropped. Post CMHC equals one once the first CMHC is operational in a county. Post CMHC always equals one for counties with a CMHC in 1973. Covariates are percent non-white, young, old, urban, rural, with educ income, age, number active MDs per 1,000 and gov expenditures.