The Effect of Women's Health Clinic Closures on Community STI Rates

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Abstract

Women's health clinics are healthcare providers that provide a safety net for women's care as many women can receive discounted services from these providers. Many women also feel most comfortable receiving preventive services testing, including sexually transmitted infection (STI) testing, from these clinics. STIs, like chlamydia, cost the United States billions of dollars each year in medical costs and lost productivity and can result in permanent health conditions and infertility. Women's clinics receive public funding on the federal and State level and are subject to funding cuts due to their relationship with abortion services. This paper explores the impact that closing these clinics has on the STI rates in the community.

Introduction & Literature Review

Women's health clinics provide a wide range of services to women from across the socioeconomic spectrum, including contraceptive services, gynecological exams, cancer screenings, pregnancy-related services, abortion services, general health screenings, and sexually transmitted infection (STI) testing. Women's clinics serve women regardless of insurance status and often offer discounted publicly-funded services. These clinics are also preferred by many women because they feel comfortable with the staff and believe they have expertise in women's health (Frost et al., 2012).

As mentioned, some women's health clinics also provide abortion-related services (Frost et al., 2012). Because a priority for many state legislatures over the past decades has been to restrict abortion access, many have sought to accomplish this by restricting funding for women's clinics. In 2011, 36 states enacted 135 laws related to reproductive health, a nearly 51% increase from 2010. Most of these provisions restrict access to abortion service directly by restricting when abortions are legal, implementing waiting periods and other prerequisites to treatment, and limiting abortion coverage in state insurance plans (Guttmacher Institute, 2012). Nine states cut funding for family planning services in their state budgets: Florida (FL), Georgia (GA), Michigan (MI), Minnesota (MN), Washington (WA), Wisconsin (WI), Montana (MT), New Hampshire (NH), and Texas (TX) (White et al., 2012).

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Although the intention of cutting funding is to limit abortions, funding cuts also reduce access to the other services that clinics provide and, in some cases, clinics are forced to close (Bailey, 2012). Previous literature has shown that limiting access to women's health clinics can reduce the use of preventive services (Lu & Slusky, 2016) and increase fertility (Darney et al., 2022; Lu & Slusky, 2019). Because these funding cuts are unrelated to the prevalence of STIs in a community, this environment can be used to evaluate the impact of clinic closures on STI rates in a community.

Much of the focus of services provided by these clinics centers around contraception and abortion. However, these clinics provide other services that bolster community health. For instance, STI testing is a critical tool in limiting the spread of infection, especially for infections like chlamydia, a STI that is often accompanied by no symptoms or symptoms that present weeks after the initial infection. Although the infection can be asymptomatic, if left untreated, it can cause pelvic inflammatory disease, ectopic pregnancy, and infertility in both women and men. Chlamydia cases cost the United States $500 million annually in direct medical costs (Kumar et al., 2021) and has been on the rise for the past two decades (Figure 1). Given the characteristics of this infection and that chlamydia is the most common STI, the rate of this infection in a community provides an indicator for the safety net role that these clinics play.

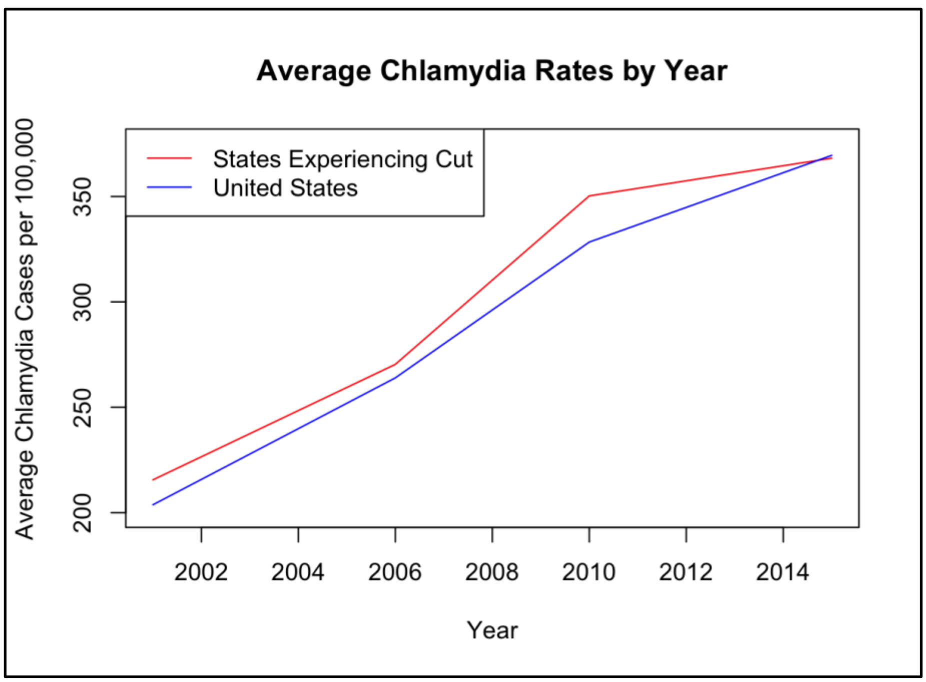

Figure 1: Chlamydia cases per 100,000 people averaged across counties in the entire United States and states that enacted family planning budget cuts in 2011.

Data Sources

This paper uses data from two main sources. The Guttmacher Institute offers county-level aggregate data of publicly funded women's clinics in the United States for 2001, 2006, 2010, and 2015. The county-level chlamydia rates per 100,000 people come from the Center for Disease Control and Prevention's (CDC) Atlas Plus for the same years.

Although this data spans the entire United States, this paper focuses on states that experienced funding cuts in 2011. Of the states listed above, only Florida, Georgia, Michigan, Minnesota, Montana, and Texas are included in the analysis. Wisconsin was omitted because it enacted legislation to expand access to STI treatment during this period and Washington was omitted because it expanded Medicaid eligibility for family planning simultaneously. Finally, New Hampshire was omitted because it reversed its funding cuts in 2013. I also utilize county-level median household income data and county-level unemployment rate data from the St. Louis Federal Reserve.

Methods

This paper attempts to measure the causal effect of women's clinic closures in a county on chlamydia rates in the area using the difference-in-differences regression model below:

$$y_{ct} = \beta_0 + \beta_1 C_c + \beta_2 Post_t + \beta_3 (C*Post)_{ct} + \beta_4 UE_c + \beta_5 Inc_c + \alpha_c + \gamma_t + \varepsilon_{ct}$$

The dimensions of this model are *c* counties over *t* time periods. The counties in this analysis are those within the states that experienced budget cuts, where the treated counties are those that experienced a women's clinic closure in the time period and the control counties are the counties in the affected states that did not experience a closure. The chlamydia rate per 100,000 people is represented by *y*, the outcome variable. The model includes *C* as a binary indicator variable for the closure of a women's health clinic in the county and *Post* as a binary indicator variable for the post-treatment period, 2015. The interaction term, *C*Post*, represents the average treatment effect on the treated (ATT), which indicates the difference in chlamydia rates between the treatment and control groups after accounting for pre-existing trends.

The model also controls for the unemployment rate in each county measured in December of the year through the term UE_c and median household income in each county for each of the included years through the Inc_c term. The terms $\alpha_c + \gamma_t$ represent county and year fixed effects, respectively.

Assumptions

The two assumptions needed to show a causal effect using the difference-in-differences design, no anticipation and parallel trends, hold in this setting. Given that a person cannot take a chlamydia test to screen for future infection and the likelihood that a test taken immediately before clinic closure affects the 2015 rate is limited, the no anticipation assumption for this setting reasonably holds. [Getting better data to show parallel trends with Figure 2].

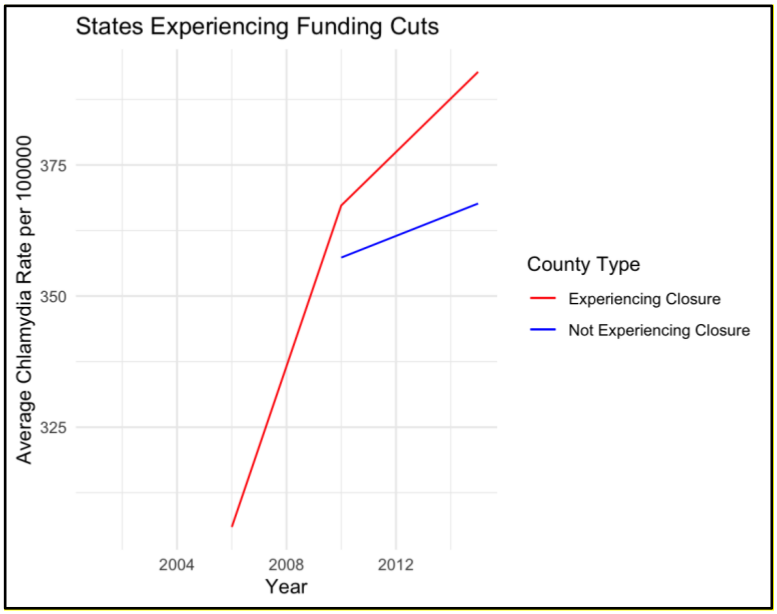

Figure 2: Chlamydia cases per 100,000 people averaged across counties in states that enacted family planning budget cuts in 2011.

Hypothesis and Threats to Validity

Given the safety net role women's health clinics play in communities, it is my hypothesis that counties that experience clinic closures will have higher chlamydia rates per 100,000. The nature of this study and data limitations pose multiple threats to validity. For instance, the long time period between the laws' enactment in 2011 and the outcomes in 2015 can mute the phase-in effects and fail to capture more extended effects. The nature of chlamydia reporting may also influence the results in that clinic limitations can result in fewer tests leading to fewer reported results. Both of these problems can be solved with better data including women's clinic data spanning more time periods and electronic health records to measure how often STI tests are performed.

Results

Table 1 shows the results of the above DiD regression. The average treatment effect on the treated is small and in the expected direction, but not significant. The post period sees a significant increase in chlamydia rates per 100,000 as trends dictate. The unemployment rate leads to a relatively small but significant increase in the rate and the median household income has a near zero, but significant effect. Although a clinic closure has a large significant effect, the sign is in the opposite direction of what one would expect which could be an indication of the testing difference mentioned above.

Table 1: Impact of Clinic Closures on Chlamydia per 100,000 People

	Dependent variable:
Clinic Closure:Post	3.497747
	(15.04443)
Clinic Closure	-256.5***
	(68.21)
Post	67.89***
	(14.04)
UE	7.131***
	(1.938)
Inc	−0.004586***
	(0.00103)
Constant	394.1***
	(58.32)
Observations	1,716
R^2	0.862
Adjusted R^2	0.807
Residual Std. Error	92.309 (df = 1230)
F Statistic	15.795*** (df = 485; 1230)
Note:	*p<0.1; **p<0.05; ***p<0.01
Regression includes county and year fixed effects.	

Falsification Tests and Extending Results

I performed the following falsification test to determine whether women's clinic closures were indirectly determined by chlamydia rates in the county directly before the funding cuts were enacted. The results in Table 2 show that a county's chlamydia rate in 2010 had near zero statistically insignificant effect on clinic closures between 2010 and 2015.

Table 2: Impact of 2010 Chlamydia Rate on Closures

	Dependent variable:
	Clinic Closure after Cut
2010 Chlamydia Rate per 100,000	0.00004
	(0.0001)
UE	0.004
	(0.006)
Inc	0.00000
	(0.00000)
Constant	−0.030
	(0.119)
Observations	480
R^2	0.004
Adjusted R^2	−0.003
Residual Std. Error	0.322 (df = 476)
F Statistic	0.578 (df = 3; 476)
Note:	*p<0.1; **p<0.05; ***p<0.01

Counties in states that experienced funding cuts also share many characteristics regardless of whether they experienced a clinic closure, including median household income, unemployment rates, and chlamydia rates. Counties that experienced a clinic closure have more clinics and higher populations on average.

Table 3: Summary Statistics by County with Clinic Closure

Variable	**Clinic Closure**	**No Clinic Closure**
Clinics per 100,000	15.78009	10.29285
	(15.78009)	(10.29285)
Median Income	42815.11	41593.81
	(12244.11)	(10390.64)
Population	201988.6	135294.6
	(364055.9)	(350273.8)
Unemployment	6.872727	6.803318
	(3.372795)	(3.161375)
Chlamydia Cases per 100,000	331.4115	318.7027
	(208.4874)	(210.4290)
Observations	56	424

The results of this study are indicative of the impacts counties in other states could face under similar policies. Table 4 shows the similarities between counties in treated and untreated states. Both share similar numbers of clinics per 100,000, median household incomes, unemployment rates, and chlamydia rates. The populations in counties outside of the states experiencing funding cuts are, on average, much larger.

Table 4: Summary Statistics by County

Variable	Experiencing Funding Cut	Not Experiencing Cut
Clinics per 100,000	9.594991	9.079180
	(13.13465)	(12.27291)
Median Income	42241.75	41340.20
	(11777.05)	(10581.68)
Population	90838.44	128555.06
	(224883.0)	(331694.2)
Unemployment	6.277686	6.636382
	(2.799507)	(3.114201)
Chlamydia Cases per 100,000	290.4777	305.5776
	(244.4253)	(206.4739)
Observations	606	1,831

Conclusion

This study aimed to investigate the impact of women's health clinic closures on community sexually transmitted infection (STI) rates, specifically focusing on chlamydia, in states that experienced funding cuts for family planning services in 2011. Though the analysis did not produce significant results, it could yield insights about the U.S. healthcare system. For instance, the existing health infrastructure may be more adaptable than previously believed.

This suggests that, within the context of this study, the closure of women's health clinics in response to funding cuts did not have a measurable impact on chlamydia rates. It is more likely that this analysis is limited in multiple dimensions. First, the analysis relied on aggregated county-level data, which may obscure underlying heterogeneity within counties and potential spillover effects across neighboring areas. Second, the study period may not capture immediate effects of clinic closures. It may also be limited in assessing the long-term effects of clinic closures, but future research could explore longer time horizons to assess delayed impacts. The data limitations that obscure testing rates could be ameliorated with better data. Additionally, other unobserved factors, such as changes in sexual behaviors or access to alternative healthcare services, may have influenced chlamydia rates independently of clinic closures.

Despite these limitations and the lack of statistically significant results, this study can contribute to the growing women's healthcare literature. In the future, I would like to expand this study by differentiating states by composition of funding sources, looking at effects on chlamydia rates in the intervening period, incorporating more county-level characteristics into the analysis including health care accessibility and demand for services, and using electronic health records to measure the use of STI tests.

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