*Effects of Expanding Contraceptive Choice: New Evidence from Virginia's Contraceptive Access Initiative**

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Abstract

In 2018, the Virginia Department of Health implemented the Contraceptive Access Initiative (CAI) to increase access to long-acting reversible contraceptives (LARCs). We use encounter-level data on contraceptive choice in participating CAI clinics and county-level natality data from 2014–2021 to estimate relative changes in LARC take-up and childbearing rates before and after the CAI. Difference-in-differences estimates indicate that the CAI reduced birth rates in participating counties by 1.6–3.5 percent, or less than half of the effect size of other similar, state-level programs. We show that this smaller effect is likely due to existing high LARC take-up and contraceptive substitution.

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I. Introduction

A recent body of work has shown that increasing access to long-acting reversible contraceptives (LARCs), including subdermal implants and intrauterine devices, can reduce unintended childbearing, with larger effects for teenagers and younger women (Bailey and Lindo, 2018; Lindo and Packham, 2017; Kelly, Lindo, and Packham, 2020). Between 2007 and 2009, several states, including Colorado, Iowa, and Missouri, launched initiatives to provide LARCs at publicly funded clinics for free, with varying degrees of success (Flynn, 2023). Overall, the results of such programs have been encouraging, indicating that providing free LARCs can reduce birth rates by up to 20 percent, suggesting that there is scope for other state and local governments to increase funding for LARC provision (Kelly, Lindo, and Packham, 2020).

One important caveat to consider when determining whether to increase funding for LARCs is that these LARC-focused interventions were implemented prior to expansions in Medicaid as well as legislation requiring contraceptive coverage by the Affordable Care Act (ACA). This is especially important given that effectiveness of LARC access is largely dependent on existing clinic access and baseline rates of LARC take-up. In this study, we test whether the effects of LARC-focused interventions are more muted in a policy environment with greater health care access and private coverage of contraceptives. In other words, we ask the question: in a setting of high relative LARC usage and mandated LARC coverage for privately insured women, to what extent does offering free LARCs and other types of contraceptives at publicly funded clinics affect client caseload, contraceptive choice, and unintended childbearing? In doing so, we provide new evidence on the effectiveness of contraceptive interventions in the relevant current-day policy context.

We focus on the setting of the Virginia Contraceptive Access Initiative (CAI), which provided funding for Title X and other family planning clinics to offer no-cost LARCs and other contraceptive devices to women in Virginia from 2018 to 2023.[1] Using data on contraception prices and clinic-level take-up, we first show that when offering a wide array of contraceptive devices for free, women

[1]Title X family planning clinics receive federal funding to provide low-income individuals with comprehensive family planning and preventative health services.

choose options with a higher up-front price. Moreover, we show that when more Virginia clinics had funding to provide free contraceptive devices as a result of the CAI, LARC take-up increased.

Then, using natality data, we test whether the CAI affected childbearing for women living near participating clinics. To do so, we compare trends in birth rates in Virginia counties with participating CAI-funded clinics to trends in birth rates in counties in neighboring states outside of Virginia with publicly funded clinics that provide low-income women with low-cost contraceptives (i.e., Title X clinics). We focus on counties with Title X clinics given the recent evidence that providing access to more common forms of contraceptives, like oral contraceptives, at such clinics reduces teen and unintended childbearing (Bailey, 2012). Estimates indicate that implementing the CAI in Virginia, a state with existing low consumer-facing prices and high baseline LARC take-up rates, reduced birth rates by approximately 2.2 percentage points, or 3.5 percent, with larger effects for women over the age of 25, married women, and college educated women. Our baseline estimate corresponds to a reduction of 250 births per year across the state. Because reducing unintended pregnancies can improve infant health, we also study whether the CAI changed measures of infant health, such as low birth weight. We find no significant effect of CAI on measures of infant which corresponds with the heterogeneity analysis showing that the change in fertility is driven by older women with higher education and likely higher existing access to oral contraceptives.

Importantly, our sample period spans a time of large state (and national) policy changes, which may affect fertility (Bailey, Bart, and Lang, 2022). To account for the fact that the state expanded Medicaid coverage in 2019 and that the COVID-19 pandemic may have affected fertility and contraceptive decisions in 2020, we additionally conduct a within-state analysis both at the county and zip code levels, comparing CAI areas in Virginia to other areas in Virginia. Although less precise than our county-level estimates, these within Virginia county-level estimates indicate a decrease in birth rates of about 2 percent, similar to our main effects. We then use a distance-based approach, using zip code information for women visiting CAI clinics, and show that the effects are most binding for women living closest to a CAI clinic.

Because the CAI operated in addition to existing Title X programs, to get a better sense of price sensitivity for LARCs among low-income women, we then analyze how offering LARCs for no cost in some Virginia clinics, but not others, led to substitution of clients across clinics and substitution of contraceptives within clinic. We find that, on net, LARC insertions increased, although we find evidence of some client substitution from Title X clinics to CAI clinics. We provide evidence that the composition of clients does not appear to change over time. We also show that clients choose to substitute towards LARCs but away from oral contraceptives, which have relatively higher typical use failure rates and lower upfront costs. We posit that low-income women in our setting may indeed be price sensitive, but that prices are likely less salient for those already visiting publicly funded clinics. This may be especially important from a public finance perspective, as LARCs are more expensive to provide to clients than oral contraceptives, at least in the short term.

These findings speak to the effectiveness of providing no-cost contraceptives in publicly funded clinics across the U.S. While previous studies have found large effects of LARC-focused initiatives on teenage childbearing and unintended childbearing, we find no effects for the younger cohort and estimate null effects on infant health. This is especially important as our findings indicate that the existing literature might not be as relevant in a current policy environment of expanded healthcare access and LARC take-up. Our findings thus additionally have cost implications. In particular, while Colorado's LARC-focused family planning initiative, the CFPI, was privately funded, the Virginia CAI was publicly funded and cost $5,000 *more* per birth avoided than the CFPI.[2] Put another way, even in a setting with high baseline LARC usage and federally mandated LARC coverage for private insurers, such programs can still reduce unintended childbearing, albeit at a diminishing rate.

Our findings contribute to a broad literature on the effectiveness of contraceptives access on unintended pregnancies, providing new evidence of how offering newly available contraceptives can affect childbearing in the recent policy environment. Much of the existing literature focuses on the historical legal access to oral contraceptives, showing that the rollout of the birth control pill in the U.S. in the 1960s had large impacts on fertility (Bailey, 2006; Guldi, 2008; Bailey, 2009;

[2] In comparison, the Missouri CHOICE program averted less than 500 births and cost over $8,000 per birth Madden, Barker, Huntzberry, Secura, Peipert, and McBride (2018).

Bailey, Guldi, and Hershbein, 2013). This mirrors the substantial body of evidence that access to abortion also plays a major role in unintended childbearing and women's outcomes (Myers, 2012, 2017; Lindo, Myers, Schlosser, and Cunningham, 2019; Lindo, Pineda-Torres, Pritchard, and Tajali, 2020; Jones and Pineda-Torres, 2023; Kelly, 2023; Dench, Pineda-Torres, and Myers, 2024).

We additionally build on other work showing that not only legal access, but also physical access, to contraceptives through publicly funded clinics plays an important role in women's health. In particular, there is a growing literature showing that expansions in Medicaid-funded clinics reduces childbearing to newly eligible women by 9 percent, while family planning clinic closures increase teen childbearing and reduces preventative care screenings (Kearney and Levine, 2009; Lu and Slusky, 2016, 2019; Packham, 2017; Fischer, Royer, and White, 2018). Moreover, since we are studying access to contraceptives in a post-Affordable Care Act (ACA) policy environment, we expand on recent work showing that the 2012 ACA contraceptive mandate led to reductions in unintended childbearing and risky sex (Willage, 2020).

Our study also contributes to a growing literature measuring to what extent offering LARCs at low or no cost increases take-up of these devices and reduces childbearing. It is well-documented that high upfront costs act as a barrier for LARC take-up. For example, nearly half of all residents in obstetrics/gynecology training programs use LARCs, and evidence showing that a majority of clinic participants choose a LARC when offered at no cost (Zigler, Peipert, Zhao, Maddipati, and McNicholas, 2017; Secura, Allsworth, Madden, Mullersman, and Peipert, 2010). Privately funded initiatives have experienced past success in increasing LARC take-up at Title X clinics. In particular, Lindo and Packham (2017) and Kelly, Lindo, and Packham (2020) estimate effects of the Colorado Family Planning Initiative (CFPI), a LARC-focused program spanning 2009–2015, and show that the CFPI led to a reduction in teen birth rates of 5–20 percent, with largest effects for women living in zip codes within 7 miles of a clinic. And in a more recent study, Boudreaux, Gifford, McDuffie, McColl, Kim, and Knight (2022) show that expanding LARC access at Title X clinics in Delaware increased take-up for teenage women.[3]

[3]Moreover, in a randomized controlled trial at Planned Parenthood clinics in Michigan, Bailey, Lang, Vrioni, Bart, Eisenberg, Fomby, Barber, and Dalton (2021) calculate an elasticity of LARC take-up for participating women and

However, we note that it is unclear if the Virginia CAI should be expected to yield the same results as programs run in other states, due to the timing and implementation of the program. At the start of the CAI, take-up of LARCs at Virginia Title X clinics was already over 20 percent, higher than both the post-CFPI take-up rate at Title X clinics in Colorado and at treated Planned Parenthood facilities in Michigan, and higher than the national average LARC take-up rate.[4] Moreover, the Virginia CAI was implemented after the ACA contraceptive mandate, in contrast to Colorado's FPI.[5] Therefore, many women exposed to the CAI may have already faced an effective price of zero for such devices.

Our findings that LARC-focused initiatives are still effective in today's context, but may be more costly than previously thought, has several policy implications. First, we note that although low-income women may be price sensitive towards contraceptives, substituting from free or low-cost effective methods like oral contraceptives towards more highly effective methods could have relatively minimal effects on unintended pregnancies, as compared to those switching from no method. Second, there are diminishing returns to increasing LARC access in circumstances where take-up is already high. This provides some support for the notion that increasing new client caseload may be a more effective avenue to reduce unintended pregnancies compared to offering existing clients more effective devices.

II. Virginia's CAI

In 2018, the Virginia Department of Health designed the Contraceptive Access Initiative (CAI) to increase access to hormonal contraceptives and LARCs to women up to 250 percent of the Federal Poverty Line (FPL), with stated priority access for uninsured and underinsured women. LARCs, which include intrauterine devices and subdermal implants, are contraceptives that must be inserted by a clinician. As a result, they are not prone to user error and have failure rates of less than 1

show large reductions in the probability of pregnancy in the following two years.

[4]The national average LARC take-up rate is 17.8 percent, according to the 2015–2017 survey wave from the National Survey of Family Growth.

[5]In particular, the ACA contraceptive mandate was a 2012 policy in which insurance companies were required to cover contraceptives with zero out-of-pocket cost to consumers.

percent. In comparison, more commonly used contraceptives, like birth control pills, injectables, patches, rings, and condoms have typical use failure rates of 6–21 percent (Trussell, 2011).

From 2018–2021, 18 health care agencies across Virginia received funds primarily for LARC insertions and removals, with some funds for other methods, like injections and oral contraceptives. The types of public health clinics participating in the program include Federally Qualified Health Centers, private women's health clinics, hospital systems, free clinics, and Planned Parenthood Affiliates. Health providers applied for CAI funding through a competitive process, although all applicants were funded. Agencies were eligible based on a set of criteria, and were not required to be a Title X facility.[6] This process led to 41 clinic sites receiving funds during this time period.[7] The General Assembly appropriated $3 million for the first two years of the program from the Temporary Assistance for Needy Families (TANF) block grant. For the first 15 months of the program, VDH fully funded nearly 3,000 patient encounters.[8]

Prior to the CAI, many of these clinics had no family planning services or did not have options for patients with no insurance coverage, and only health departments offered LARCs at no cost. Notably, while Title X clinics bill clients on a sliding scale, with some devices priced higher than zero, depending on income, the CAI provided all devices at no cost, regardless of reported income. The sticker prices of LARC devices in Virginia clinics range from $832–$1,030, while procedure costs from $53–$86. In comparison, a one-year supply of oral contraceptives costs approximately a quarter of the price of a LARC. However, given that such devices last 5–12 years, these total costs equal up to $223 per year, on average, which are similar to that of oral contraceptives. Even so, without insurance coverage or clinic subsidies, the high upfront costs of LARCs may be prohibitively expensive for some women. The CAI allowed for low-income women at participating

[6] Eligibility requirements included being a licensed health care provider, having the ability to insert and remove LARCs, already serving women below 250 percent of the FPL, having the ability to bill third party payers, and having experience and expertise in providing contraceptive counseling. Of the participating clinics, only 4 of the clinics were existing Title X agencies. Title X clinics that are not CAI may not offer LARCS, but do provide other free or low-cost contraceptives.

[7] Although there are 18 funded health agencies, some of these agencies have multiple clinic sites, leading to 41 total treated clinic locations.

[8] We note that clients include women of all ages, including teenagers. In Virginia, minors can give consent for birth control and reproductive care without parental approval.

clinics to receive these devices at no cost.

III. Data and CAI Take-Up

The Virginia Department of Health (VDH) facilitated the disbursement of CAI funds starting in 2018. To study the take-up of the program, we use both clinic and client data from the VDH for Title X clinics and CAI clinics from 2018 to 2021. These data contain visit-level information, including date of service, CAI clinic visited, and contraceptive method at exit. Encounter data for clinic visitors also contain the demographic characteristics of each client, including age, race, and county of residence. On average, female CAI visitors are 29 years old. Nearly 41 percent of CAI visitors identify as White, 13 percent are Black, and 24 percent as more than one race. Almost all visitors (95 percent) self-report as low-income, earning less than 250 percent of the federal poverty line.[9] Less than 3 percent of CAI visitors report an out-of-state zip code.

To show how the CAI affected LARC take-up at active CAI sites, in Figure 1 we display the number of total LARC insertions at CAI-participating clinics from 2018–2021. In total, the CAI was responsible for over 7,000 insertions over this four-year period. In the first year of the program, CAI clinics covered only LARCs. However, in the years that followed, the CAI also funded other devices as well. We show the trends in contraceptives take-up in Figure 2. This figure presents the contraceptive methods chosen at CAI clinics. Nearly all CAI clients received a LARC in 2018; however, by 2021 less than 40 percent of clients received a LARC–the same take-up rate as other methods like oral contraceptives and injections. We note that part of the reason for this shift is the increase in other funded devices by CAI clinics during this period. While in 2018 and 2019 the primary CAI goal was LARC access, in later years the program funded oral contraceptives at nearly the same rate as LARCs.

On net, LARC take-up across the state increased during this period, likely due to the increase in insertions at CAI clinics. For example, according to data on Title X clinics between 2016 and 2022, LARC usage by Virginia women visiting publicly funded family planning clinics increased

[9] Although we can observe self-reported income, we cannot observe a client's insurance status.

from 15 percent to over 22 percent, mirrored by a decrease in the percent of women choosing oral contraceptives (U.S. Department of Health and Human Services, 2021). Yet, one remaining question is whether these high rates of LARC usage in Virginia affect rates of childbearing. To address this question, we focus on women residing in areas near CAI clinics, based on the fact that family planning programs have been shown to be most effective for women living 5–10 miles from a clinic (Kelly, Lindo, and Packham, 2020). We use data on CAI clinic locations from the Virginia Department of Health and match clinic addresses to corresponding counties, which serve as the treatment group for our main analysis.[10] For our comparison group to consist of counties that are similar to counties within Virginia that have a CAI clinic, we use data from the Health Resources and Services Administration 340B database to identify counties in the bordering states that contain Title X clinics.[11,12] In sum, this yields 22 counties serving as our treatment group and 358 counties in the comparison group.[13]

To estimate effects on childbearing we use county-level restricted-use natality data from the Center for Disease Control and Prevention from 2014 to 2021 for Virginia and its neighboring states. These birth certificate data contain demographic information about the mother, such as age, race, insurance status, and county of residence, as well as information about infant health status and birth weight. We use population data from the National Cancer Institute's Surveillance, Epidemiology, and End Results Program (SEER) to calculate birth rates (the number of births per 1000 females aged 15–44) and weight our estimates by county population of females aged 15–44. We also use SEER and Bureau of Labor Statistics (BLS) data to control for time-varying county characteristics such as percent Black, percent Hispanic, and unemployment rate, respectively. For a secondary analysis, we use restricted-use Natality data from Virginia, which contain individual-level birth counts with information on the zip code and county of residence. These data allow us to

[10]Counties may contain more than one CAI. For our treatment group, we consider each county in Virginia with at least one CAI clinic.

[11]The database can be found at `https://www.hrsa.gov/opa/eligibility-and-registration`.

[12]Title X clinics receive federal and state funds to provide free or low-cost contraceptives to women earning less than 250 percent of the poverty level. However, unlike CAI clinics, Title X clinics may not offer LARCs; in fact 20 percent of clinics did not offer a copper IUD and nearly 15 percent offered no hormonal IUD in 2018 (Wood, Strasser, Sharac, Wylie, Tran, Rosenbaum, Rosenzweig, Sobel, and Salganicoff, 2018).

[13]See Figure 3 for a map of clinic locations in Virginia.

additionally compare trends in births for areas within Virginia with CAI clinics to areas in Virginia without CAI clinics.

We present summary statistics in Table 1. In Columns 1 and 3 we present pre-period means for treatment and comparison counties, respectively; Columns 2 and 4 display standard deviations. Treatment counties (i.e., Virginia counties with participating CAI clinics) and comparison counties (i.e., counties in Virginia border states with Title X clinics) have similar birth rates both before and after the initiative– around 62 births per 1,000 women. Counties with CAI clinics have slightly larger populations, on average, with a smaller percentage of White women.[14]

IV. Empirical approach

Our preferred approach for estimating the effects of the Virginia CAI is a difference-in-differences (DD) design that uses counties with Title X clinics in states bordering Virginia as the comparison group for Virginia counties with clinics receiving CAI funding. For our primary analysis, we focus on Virginia and its bordering states (plus D.C.), in an attempt to compare counties that are more similar on observables.[15] Because the CAI began in 2018, we consider this to be the first and only treatment year for all CAI-participating counties so there is no variation in treatment timing, and estimate effects for the four years that the program was operational.[16] Formally, we estimate models of the following form using ordinary least squares:

$$y_{it} = \alpha_i + \alpha_t + CAI_{it}\delta + \beta x_{it} + \epsilon_{it} \quad (1)$$

where y_{it} is the birth rate in a given county i in year t. α_i and α_t represent county and year fixed effects, respectively. CAI_{it} is a dummy variable equal to one if a county i has a participating CAI

[14] We additionally present summary statistics for counties only within Virginia in Table A1. Population patterns between treatment and comparison groups are similar to our nationwide sample, although we note that CAI clinics tend to be located in areas with slightly lower unemployment rates.

[15] These states include Maryland, North Carolina, Tennessee, Kentucky, West Virginia, and D.C.

[16] In doing so, estimates will be comparable to Lindo and Packham (2017), which estimates effects of the CFPI up to four years after the program's start and use counties with Title X clinics outside of Colorado as the main comparison group.

clinic after 2017 and zero if a non-Virginia county has a Title X clinic. In some specifications we include time-varying covariates for county-level demographics and economic conditions (x_{it}).

Importantly, because of the delayed nature of childbearing, effects are unlikely to be immediate. Therefore, we also consider how effects change over time. To estimate dynamic effects, we extend Equation (1) to allow the effect of the CAI to vary 4 years before and 4 years after the program implementation as follows:

$$y_{it} = \alpha_i + \alpha_t + \sum_{k=-4 \mid k \neq -1}^{4} (\tau_k \cdot CAI_{it})\delta_k + \beta x_{it} + \epsilon_{it} \quad (2)$$

where $\tau_k = 1\{t = k\}$ indicates years relative to the start of the CAI initiative with $t = -1$ as the base period in 2017, and the post-CAI coefficients $(\delta_0, \ldots, \delta_4)$ give estimated differences in y between Virginia counties with a participating CAI clinic and those counties in bordering states with a Title X clinic.

In our main specifications, we weight counties by the number of women of childbearing age (i.e. women aged 15–44) to improve efficiency. However, because birth data is discrete, we also report estimates from Poisson models. We cluster standard errors at the county level.

Identification of the above difference-in-differences models rests on the assumption that fertility outcomes for women with access to the CAI would have continued along the same trend as those in other counties, absent the initiative. In the next section we present visual and statistical evidence in support of this assumption. We also present estimates from other approaches, including from an approach that uses only zip codes within Virginia, to show that our conclusions do not only hinge on the sample restrictions and models specified above and to account for state-level policy changes after 2018.

V. Results

V.1. Effects of the CAI on Childbearing

Before discussing our preferred estimates of the effects of the CAI on childbearing, we first present graphical evidence to support our main results and the validity of our research design. In Figure 4 we plot raw average yearly birth rates from 2014 to 2021 to display suggestive evidence of the effects of the CAI on childbearing. The solid line represents trends in birth rates in Virginia CAI counties and the dashed line presents average birth rates for other Title X counties in neighboring states. Births rates, or births per 1,000 women aged 15–44, in both treatment and comparison groups are falling over time. However, these averages appear to track each other both before the program's start. While this simple comparison provides some useful first evidence on the effects of the CAI, below our main analysis addresses whether these trends in childbearing are diverging in a statistically meaningful way.

In Figure 5 we present the difference-in-differences coefficients and their corresponding 95% confidence intervals from the WLS model in Equation (2), controlling for county and year fixed effects. Our main outcome variable is the birth rate for all childbearing-aged women (15 to 44). In estimating these dynamic effects, the year prior to the CAI, 2017, serves as the omitted category.

First, we note that estimates in the first year after the initiative are statistically similar to zero, which is unsurprising, given the delayed nature of births. In the following years, birth rates fall. Estimates indicate that the CAI reduced birth rates by 1.6–2.5 percentage points, or 2.6–4.0 percent, in the 2–4 years after the initiative. For direct comparison, in their WLS analyses, Lindo and Packham (2017) report a 6.1 percent average reduction in teen birth rates in the 2–4 years after the introduction of the Colorado FPI, while Kelly, Lindo, and Packham (2020) show an average effect of 6.1 percent on total births for these post-period years.

We also note that childbearing falls differentially in CAI counties, relative to other counties with family planning clinics, before 2021, when the global pandemic may have directly affected childbearing. This difference in the immediate corresponding effects from 2019–2021 provides direct evidence that the more muted effect we find in Virginia is not a mechanical result of reduction in childbearing or clinic visiting due to COVID-19. We discuss this in greater detail below when presenting within-state estimates of the CAI.

More formally, Table 2 reports WLS estimates from analogues of Equation (1). Column 1 includes no controls, while Column 2 adds county-level economic and demographic controls. In Column 3 we omit counties with less than 100,000 population, in an attempt to compare more similar treatment and control areas, as suggested by Kahn-Lang and Lang (2020). Across columns, difference-in-differences estimates indicate that the CAI reduced childbearing, on average by 2.1–2.3 births per 1,000 women aged 15–44, or 3 percent.[17] Taking the estimate from Column 2 that shows that the CAI reduced birth rates by over 2.2 percentage points, our effects correspond to approximately 1,000 fewer births in Virginia during our sample period, or less than one-third the number of averted births calculated from Colorado's 2009 FPI (Kelly, Lindo, and Packham, 2020).[18,19]

V.2. Identifying Heterogeneous Effects

Above, we present evidence that the CAI was successful in reducing childbearing by approximately 2.2 percentage points, or over 3 percent. However, these average effects may mask important heterogeneity. In particular, if younger women or teenagers face especially high barriers to effective contraceptives or are exceptionally price sensitive, we may expect such initiatives to have larger effects for these groups. Indeed, in other LARC-focused settings during a time in the US when the baseline teen birth rate was much higher, effects on births have been shown to be largest for those

[17] When using bootstrapped standard errors to account for the fact that we have only 22 treated counties, estimates are statistically similar to our baseline estimates at the 1 percent level, indicating a 1.9 percentage point drop in birth rates. We do not present these in the main table as they cannot account for population weighting as used in the main specification.

[18] This number of births comes from the fact that the change in the birth rate, calculated by births per 1,000 females aged 15-44, estimate is 2.156 (Column 2). Given that the average female population in a county is 116,754, we calculate $2.156x116{,}754$ divided by 1,000 to get approximately 250 births averted per year.

[19] We also consider effects by USDA-defined urbanicity, instead of our population size cutoff, and present these results in Appendix Table A2. Our main estimates are statistically similar for metro counties, non-rural counties, and counties with populations over 100,000. We do not estimate statistically significant effects for rural areas, consistent with the existing literature (e.g., Lindo and Packham (2017).

aged 15–24, with reductions ranging from 5–20 percent (McNicholas, Madden, and Peipert, 2014; Lindo and Packham, 2017; Kelly, Lindo, and Packham, 2020).

In Table 3 we present effects for birth rates by age group.[20] Rates are calculated using the population of relevant ages for age group. In other words, birth rates for 15–24 year olds are calculated as the number of births to women aged 15–24 per 1,000 women aged 15–24. In Column 1 we present our baseline estimates controlling for county and year fixed effects and time-varying covariates from Table 2 Column 2. In Columns 2–4 we additionally present estimates for 15–24 year olds, 25–34 year olds, and 35–44 year olds, separately. For women over the age of 25, we estimate negative effects of the CAI on births, ranging from 1.4–4.1 percent. Estimates are statistically insignificant for 15–24 year olds, indicating that younger women are not driving the drop in birth rates, reflected by lower LARC take-up rates at CAI clinics. Importantly, we find that women aged 25–34 are driving our reductions in birth rates. Estimates indicate a 4.1 percent decline in childbearing for this group, which makes up approximately one-third of total CAI and Title X clients.[21]

Next, we present effects for White, non-White, and Hispanic mothers, noting again that a large proportion of CAI visitors are White. In Table A4 we show that the decrease in childbearing is not particularly driven by women of any one race/ethnicity. Estimates in Columns 1–2 indicate a decline in birth rates of 2.2–2.6 percentage points for White and Nonwhite women, which is statistically similar to our baseline result. Estimates for Hispanic mothers in Column 3 indicate a drop of 2.0 percentage points, but are less precise.

Moreover, estimates in Table A5 and Table A6 provide some further insights on what types of women were most affected by the CAI, in terms of family structure and opportunity costs. Table A5 shows that married women have the largest reduction on childbearing, while estimates for unmarried women are statistically insignificant and close to zero. When we estimate the effects

[20]For corresponding event study figures, see Figure A1 in the appendix.

[21]We note that one concern for identification may be that the CAI occurs simultaneously with population migration or compositional change; in other words, at the time of the CAI more women are moving to Virginia counties with CAI clinics, relative to other areas. We do not find evidence for this phenomenon. See Figure A2 for event-study style figures of population trends over time for women aged 15–44. See also estimates by age groups for large counties with populations above 100,000 in Table A3 and Figure 6.

by education status, which may provide a proxy for household income, our main effects are driven by women who attended college (e.g., Table A6).[22] These results, combined with our results on age, suggests that the CAI had smaller effects on younger, poorer, and unmarried women, i.e., those that may have the highest rates of unintended pregnancies, as these women may have already had access to contraceptives prior to the CAI. While this is a slight departure from existing studies, which generally show larger effects on younger women and teenagers (e.g., Lindo and Packham (2017)), we note that the CAI may have affected a different group of women for two reasons. First, CAI clinics do not require proof of income. Second, Title X clinics may have already been serving lower-income women and/or women enrolled in Medicaid. Therefore, CAI likely "filled in the gaps" of women seeking IUDs that may have incomes near the 250% threshold but are uninsured. We also note that CAI clinics are more likely to be located in areas that are above the Virginia median family income, and 40 percent of clients reported having a household income above the federal poverty line.

Motivated by these results, in Table A7 we also present effects by parity. We do so given the evidence from other LARC-focused interventions that while the average number of births for women aged 24–39 does not change, there are significant effects on non-first births for these mothers (Flynn, Stevenson, Yeatman, Genadek, Menken, and Mollborn, 2023). Our results indicate consistent decreases in birth rates across parity, suggesting the composition of mother's receiving LARCs is not shifting with the increased access in our setting, and that the CAI did not only affect first-time mothers. We note that together, these findings point to the fact that the CAI was most effective for a different population than the Colorado FPI; we find that the CAI reduced childbearing for women with potentially fewer financial or personal hurdles for obtaining contraception. Below, we discuss whether the CAI attracted new clients to obtain a LARC that would not have otherwise, or if CAI clients are primarily comprised of women that would have otherwise received a LARC elsewhere at cost.

Finally, we estimate the effects for women in counties that have multiple clinics. We do so

[22] While the results are less precise, we also find suggestive evidence the reduction of births is for births that are not covered by Medicaid.

given the fact that in such counties there may be greater access to LARCs than counties with more constrained supply. In Table A8, we present these effects, which are larger than the main estimates shown in Table 2. Estimates indicate a larger effect on childbearing in areas with access to more CAI clinics. We investigate this relationship below using more granular data to analyze effects by distance to a clinic.

VI. Supplemental Analyses

In this section, we consider additional effects of the CAI beyond childbearing. First, we analyze effects on infant health in an effort to measure whether the CAI yielded broader benefits for children. Next, we test the extent to which our estimates are sensitive to state-level trends and explore the role of client substitution.[23]

VI.1. Effects on Infant Outcomes

To start, we present results on infant outcomes. Because LARCs may reduce unintended pregnancies, we analyze effects on births that typically are associated with higher hospital costs. To do so, we estimate effects of the CAI on low birthweight, a measure also highly correlated with low-income status and birth complications, very low birthweight, and gestational age. Estimates in Table A9 are statistically insignificant across columns and are precise enough to rule out a 2.8 percent drop in low birthweight infants. This provides further evidence that CAI did not reduce the amount of high-cost births or otherwise improve infant health.

[23]We have also considered that the program may have broader effects on abortion. Yearly county-level abortion counts do not exist nationwide; however, annual abortion rates at the state level are available for reporting states from the CDC. State-level difference-in-differences estimates for Virginia are statistically insignificant and relatively imprecise; we can rule out decreases larger than 21 percent and increases of 51.1 percent. Figure A3 shows that the abortion rate in Virginia remains stable around 10 percent from 2016 to 2020. Similarly, when we use county-level CDC data to consider the effects of the CAI on gonorrhea infection rates, we find no evidence that the CAI increased risky sexual behavior.

VI.2. Sensitivity Checks

Furthermore, we test whether our estimates are sensitive to functional form or mask potential spillover effects from nearby counties. To do so, we first present estimates from alternative models, then additionally show effects from a within-Virginia specification.

In Table A10 we show estimates from a Poisson fixed effects model. We note this model can alternatively be expressed as one that estimates the natural log of the expected count of births while controlling for the county-level population of childbearing-aged females and constraining its coefficient to be equal to one. Therefore, estimates from the above model will be comparable to estimates from the main WLS model. Across columns estimates in Table A10 are similar to our baseline results and indicate that the CAI reduced births by 3.9–4.5 percent.

Additionally, for a secondary analysis, we use restricted-use Natality data from Virginia, which contain individual-level Virginia birth certificate data. These more granular data allow us to compare trends in births for areas within Virginia that have CAI clinics to areas without CAI clinics. In doing so, we are able to account for statewide trends, including Medicaid expansion in January 2019 and abortion restrictions. This design, coupled with the fact that our estimates are not fully driven by relative childbearing declines in 2021, also assuages concern about differential state exposure and state-level responses to COVID-19. To provide estimates that more closely mirror the main county-level approach, we additionally estimate the main specification defining the treatment again at the county level and using counties within Virginia that do not receive a CAI clinic as the comparison group. Table A1 shows that Counties with CAI clinics in Virginia are larger and have less unemployment than counties within Virginia that do not have CAI. We display the difference-in-differences results in the top panel of Table 4. Estimates indicate that the CAI reduced birth rates by 2.3 percentage points, or 3.8 percent. Figure A4 shows the event study estimates, which broadly correspond to the main specification and follow a similar pattern to those in the baseline figure (Figure 5).[24] As Columns 2-5 show, the reduction in fertility is driven by

[24]To account for the fact that areas within Virginia may still have nuanced differences relevant for interpretation, we have also considered a synthetic difference-in-differences analysis in which the comparison group is created by matching on pre-treatment trends. The synthetic difference-in-difference estimate remains negative and but is

counties with income and population above the county median. This result corresponds with the heterogeneity analysis from our base specification, which shows the reduction in births is driven by older, college educated, and married women.

While the within-Virginia specification should account for any differences in fertility due to state-level differences in Medicaid enrollment following Virginia's Medicaid expansion, there may still be concern that Medicaid expansion affected counties across Virginia differentially. To address this potential source of bias, we first put Medicaid enrollment on the left-hand side of our within-Virginia county specification, which we show in Table A11. We see no effect of CAI on Medicaid enrollment, which alleviates the concern that heterogeneous enrollment in Medicaid across Virginia may be affecting fertility. Furthermore, in Figure A5 we display that the share of Medicaid births in Virginia remains relatively stable during this period, providing evidence that an increase in Medicaid births is not biasing our results towards zero.

We then use the more granular nature of the restricted-use Natality data from Virginia to estimate the extent to which distance to the nearest clinic matters. To do so, we consider a woman is treated if the centroid of the zip code is within 6 miles of the nearest CAI clinic. The comparison group consists of all zip codes in Virginia that have a clinic further than 6 miles of the centroid. We use 6 miles as the cutoff because it is the median distance to the nearest CAI clinic from each zip code.[25] We provide these results in bottom panel of Table 4. We find that expanding contraceptive access for low-income women reduces birth rates by 4.5 percentage points for women living within 6 miles of a CAI clinic, relative to women living in other zip codes further than 6 miles. These point estimates are slightly larger than the base specification, implying that women living closest to CAI clinics may benefit most from the expansion in such services, consistent with findings in Kelly, Lindo, and Packham (2020). In Table A12, we additionally provide other distance cutoffs, for robustness. Point estimates are statistically significant and similar in magnitude to our main results.

statistically insignificant when using bootstrapping to conduct inference.

[25]Estimates are not statistically different when choosing 7 miles, which is the preferred distance chosen in Kelly, Lindo, and Packham (2020).

VI.3. Exploring the Role of Client Substitution Between Clinic Types

Lastly, we ask: to what extent is the relatively small effect on births driven by the fact that women receiving free LARCs in CAI clinics would have been willing to pay for them elsewhere? In other words, is there substitution away from other publicly funded (Title X) clinics in which a client may have to purchase a LARC to CAI clinics where they are offered for free? To address this question, we analyze the substitution in client caseload between CAI clinics and Title X clinics within Virginia. In doing so, we provide new insight on elasticities of low-income women that use contraceptives.

We first estimate the extent to which client caseload drives the increase in LARC insertions at CAI clinics. Figure 7 provides evidence of some substitution between clinic types for low-income women. In 2018, there are 329 CAI clients, and the number of clients at CAI clinics grows until 2021. The number of Title X clients decreases as the number of CAI clients increases, suggesting potential substitution between the two clinics for some women. While we cannot track clients to determine which type of clinics they have visited, the drop in Title X clients and the increase in CAI clients is evidence that some women may be switching from a Title X clinic to CAI clinics where LARCs are available and free when they become available.[26]

Alternatively, we may estimate small effects on birth rates if women switch to LARCs from more highly effective contraceptives, like oral contraceptives, rather than more ineffective methods, like condoms. Although we have no data on what method each client had before receiving a LARC, we can observe trends in contraceptive take-up by clients over time. We show above in Figure 2 that as more options are offered at CAI clinics, take-up of other contraceptives also increases, although LARCs remain the most popular devices over our sample period. These trends in contraceptive choice are mirrored across the state when looking at the broader population of Title X clients, where we also can observe pre-program data. In particular, as shown in Figure A6, oral

[26]We note that the decrease in Title X clients over this time is part of a broader national trend. In March 2019, the Trump Administration placed new regulations of Title X clinics which resulted in some Title X grantees withdrawing from the program and stop receiving federal funds. No Title X clinics in Virginia withdrew, so there is no change in the number of Title X clinics in Virginia receiving federal funds during the time period of this study (KFF, 2019).

contraceptive take-up at Virginia Title X clinics falls slightly over time, hovering between 30–40 percent. However, we show in Figure 8 that the percent of Virginia Title X clients using LARCs has increased in recent years, peaking at 20 percent in 2019 and then again above 20 percent in 2021. These LARC take-up rates are approximately ten percentage points larger than the percent of female Title X clients across the U.S., and are likely partially driven by the no-cost offerings at CAI clinics. Overall, these trends provide some suggestive evidence that some CAI clients were existing Title X clients and that CAI clients are largely substituting away from oral contraceptives towards LARCs.

VII. Discussion and Conclusion

In this paper, we estimate the effects of expanding access to highly effective contraceptives through clinics participating in the Virginia CAI, which provided free LARCs, among other devices, to low-income women at participating publicly funded clinics. From 2018–2021, the CAI was responsible for funding over 7,000 LARC insertions. Using county-level Natality data, we show that the initiative reduced childbearing by 2.2 percentage points, or 1,000 births over four years. Effects are largest for women aged 25–34. Furthermore, we provide some suggestive evidence that the CAI had no economically meaningful effects on infant health.

While the CAI achieved its intended goal of increasing contraceptive take-up, we note that the program was less successful than other states at reducing both teen childbearing and childbearing generally. However, we also note that our findings shed new light on the effectiveness of contraceptive access initiatives in a recent setting and context where LARC take-up is relatively high. Therefore, such schemes can still be effective in spite of other public expansions in contraceptive access and can target different groups of women. In particular, take-up rates for Virginia Title X clinics prior to the program's initiations exceeded 20 percent. For comparison, the Colorado FPI, a similar initiative to the CAI, started with LARC take-up rates of less than 5 percent and exceeded 21 percent by the end of the program. Moreover, the fact that we estimate larger drops for older women and married women may be explained by the fact that other factors appear to be driving declines in births to young women across the U.S. (Buckles, Guldi, and Schmidt., 2022). Alternatively, new CAI clinics may reach low-income women that may not qualify, or are not familiar with the Medicaid program or Title X clinics.

These statistics point to the fact that at high levels of LARC take-up, there can be diminishing returns to LARC-focused initiatives, but that such programs can still be effective at reducing unintended pregnancy. Additionally, since the CAI was rolled out after the ACA contraceptive mandate and simultaneously was serving low-income women in 2019 when Virginia expanded Medicaid, publicly funded clinic clients were likely already facing an effective price of zero for contraceptives. Thus, women at participating CAI clinics may have large price elasticities, as suggested by Bailey, Lang, Vrioni, Bart, Eisenberg, Fomby, Barber, and Dalton (2021). That being said, even when contraceptives access for low-income women is sufficiently high, we observe some switching from less effective devices to highly effective devices, on the margin. We emphasize that investigating these relationships further in other U.S. states and contexts should serve as a fruitful avenue for future research, especially in a post-Dobbs policy landscape.

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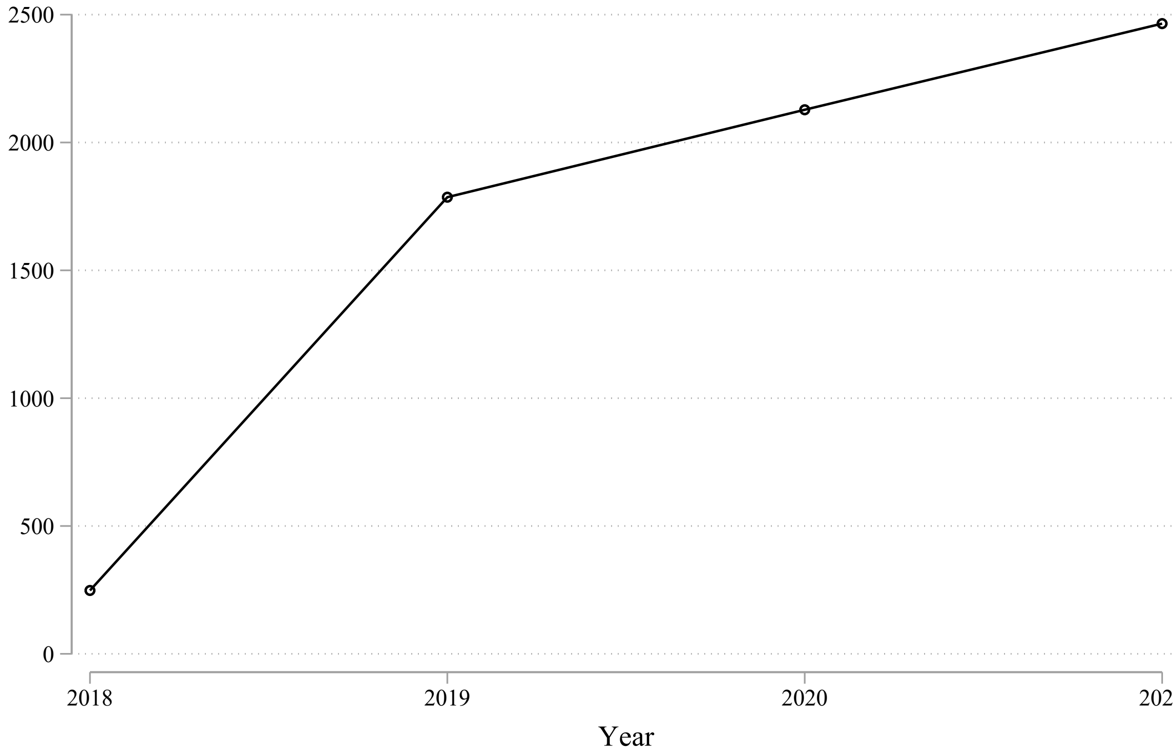
A. Figures and Tables

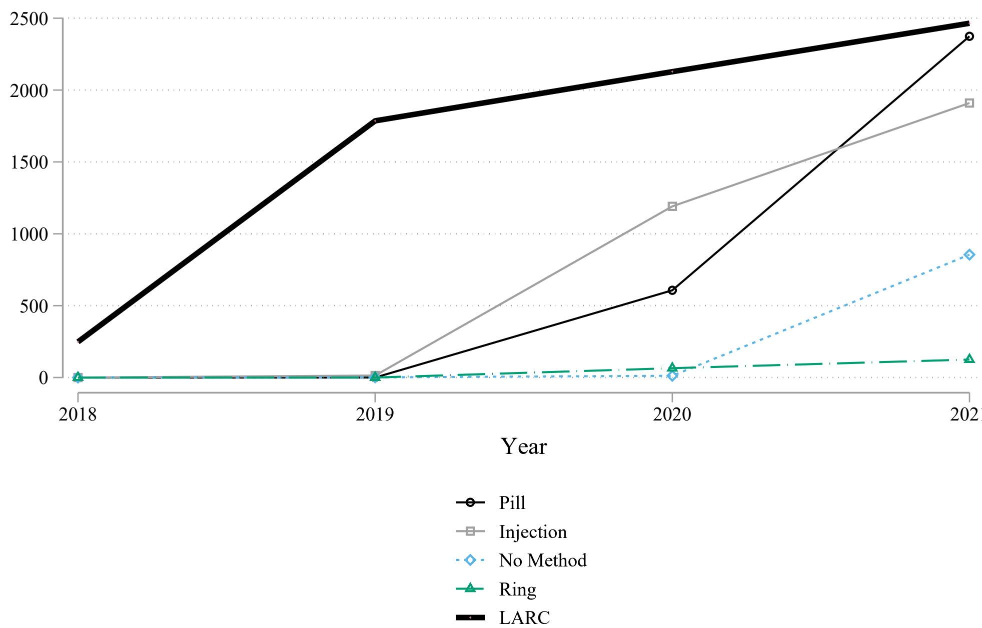
Figure 1 — Number of LARC Insertions



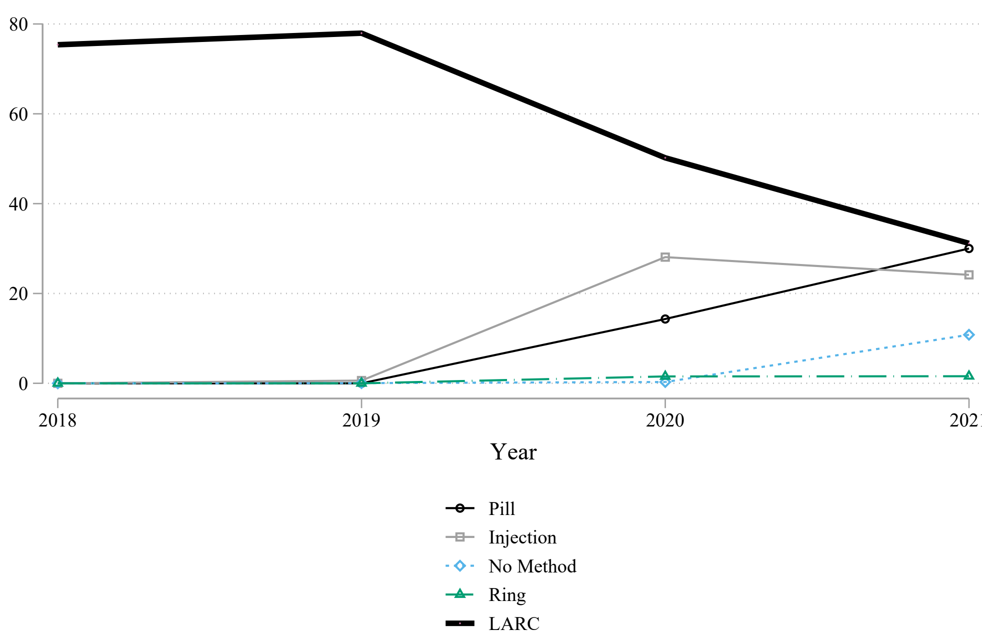
Notes: Scatters represent the number of LARC insertions at CAI clinics between 2018–2021. Data on insertions at CAI clinics is from the Virginia Department of Health.

FIGURE 2 — Contraceptive Take-Up at CAI Clinics

Panel A. Total Methods Chosen by CAI Clients Over Time

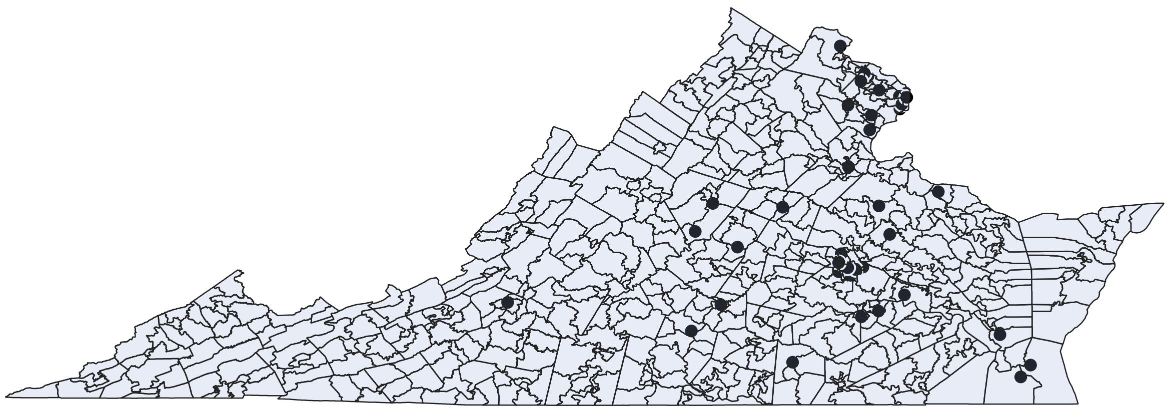


Panel B. Percent of Methods Chosen by CAI Clients Over Time



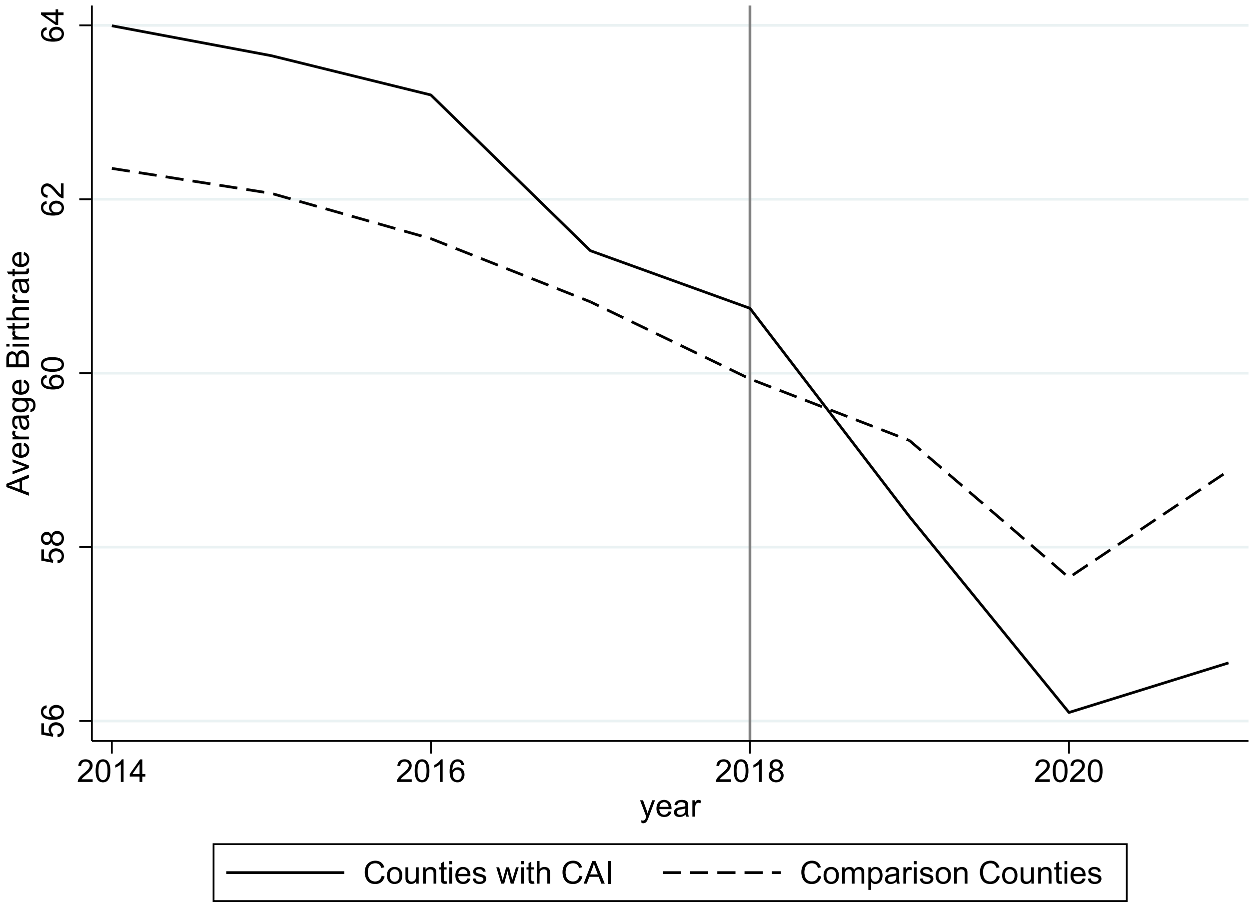
Notes: Scatters in the top panel (Panel A) represent the number of CAI clinic clients choosing the listed contraceptive. Scatters in the bottom panel (Panel B) represent the percent of CAI clinic clients choosing the listed contraceptive between 2018–2021 (i.e., the years of the CAI initiative). Data on contraceptive usage is from the Virginia Department of Health.

Figure 3 — Map of Contraceptive Access Initiative Clinics



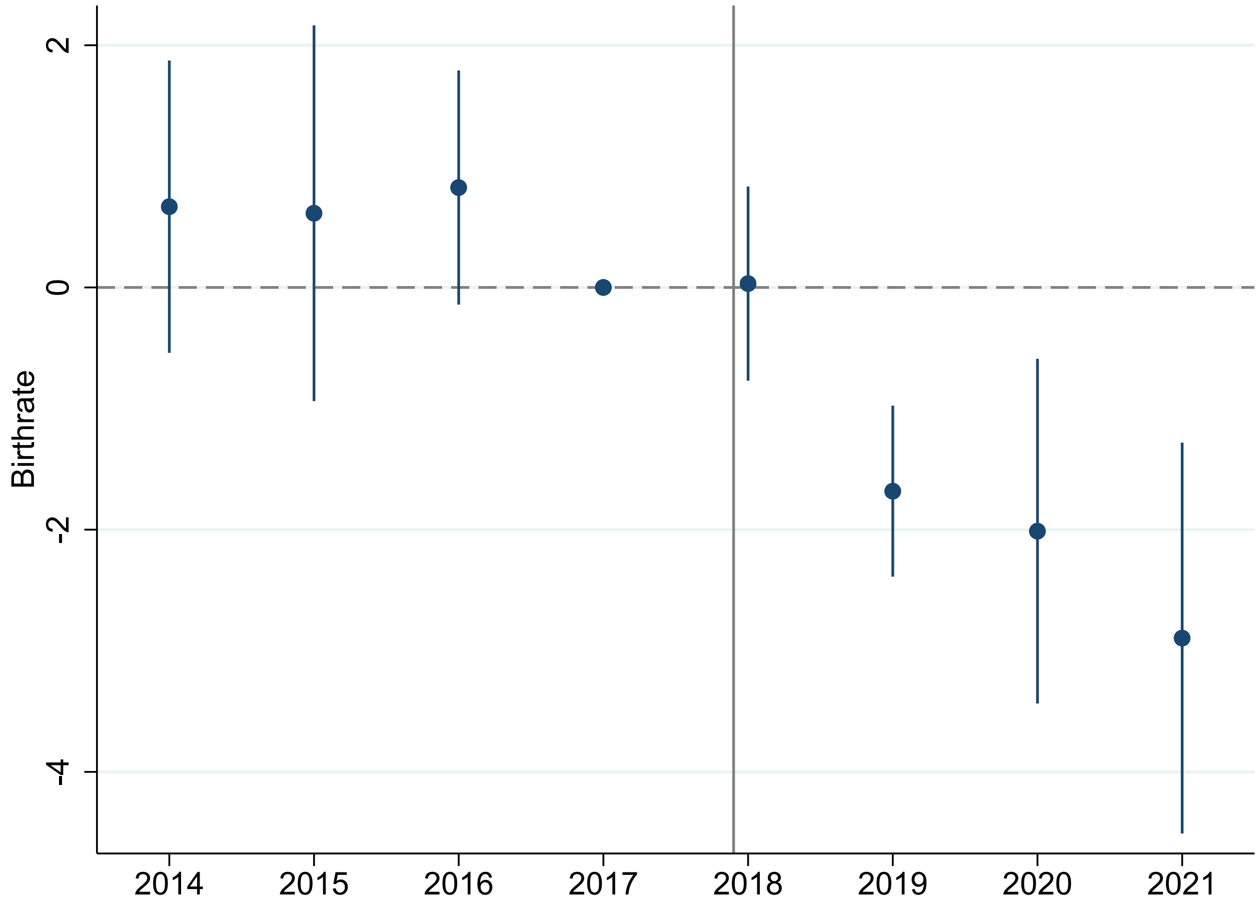
Notes: Points represent locations of with CAI clinics in Virginia.

FIGURE 4 — Average Birth Rates for Counties with CAI and Comparison Counties



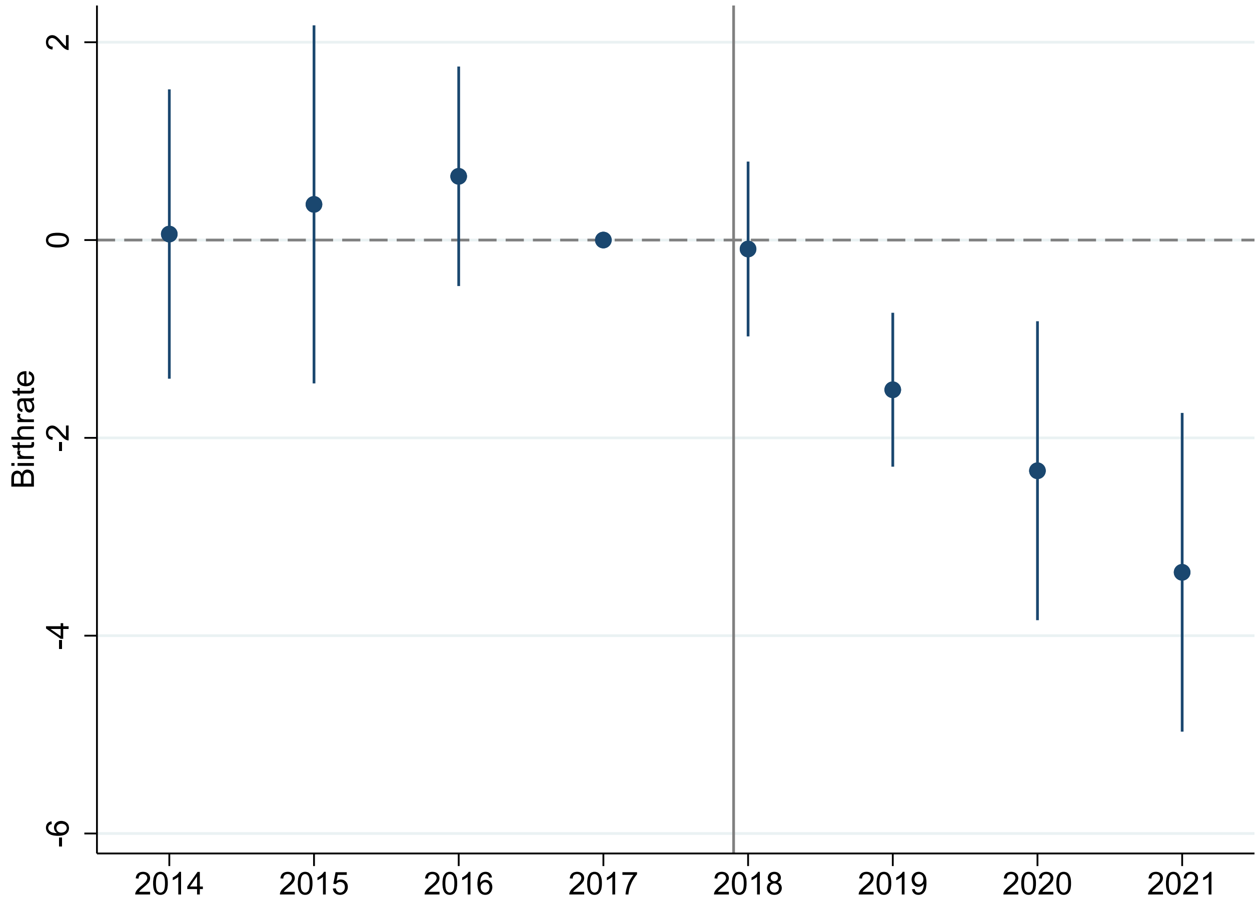
Notes: Data on insertions at CAI clinics and total clients is from the Virginia Department of Health. Natality data is from the Centers for Disease Control and Prevention from 2014–2021.

Figure 5 — Effects on Childbearing, Weighted by County Female Population



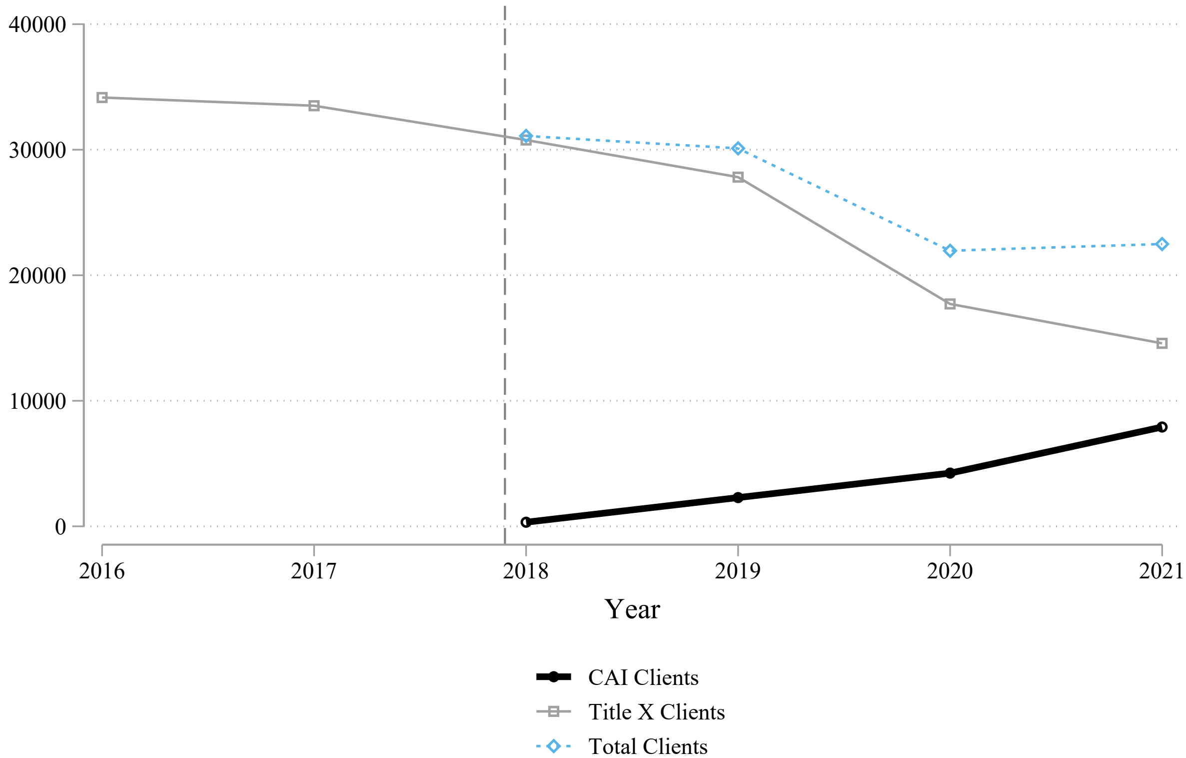
Notes: Natality data is from the Centers for Disease Control and Prevention from 2014–2021. The panel plots DD estimates and their respective 95% confidence intervals from Equation (2). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics.

FIGURE 6 — Effects on Childbearing, Omitting Counties with Populations Less than 100,000



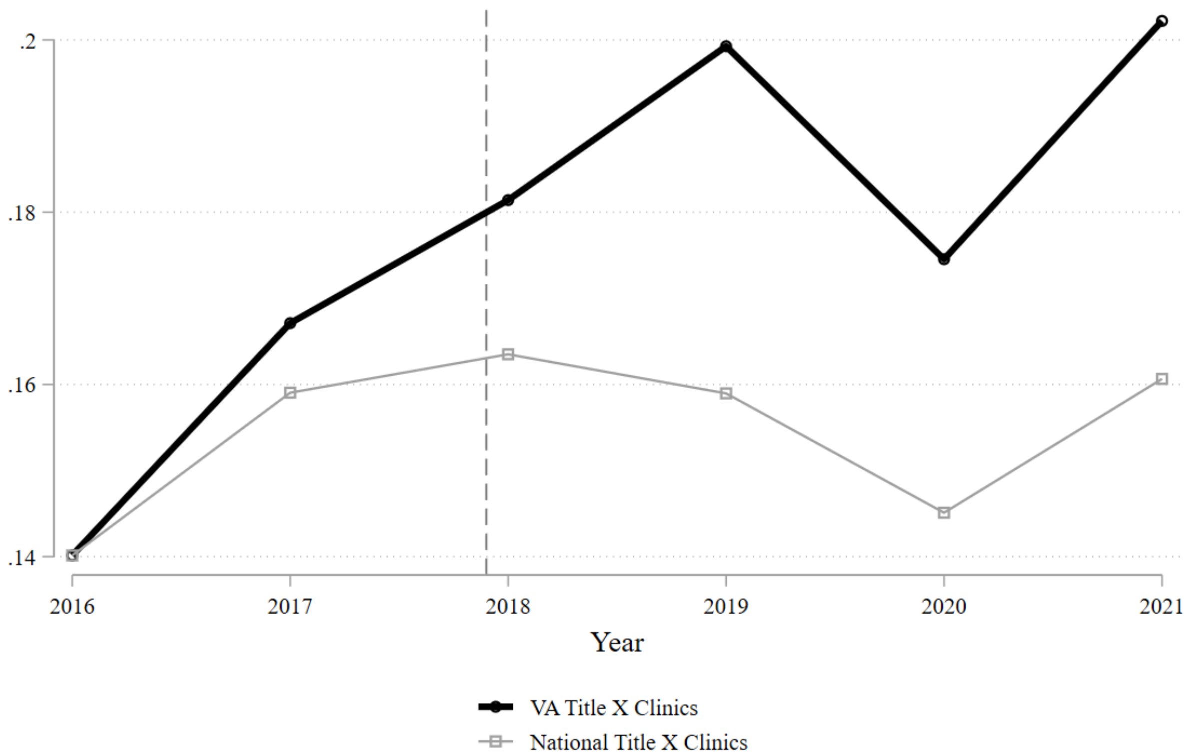
Notes: Natality data is from the Centers for Disease Control and Prevention from 2014–2021. The panel plots DD estimates and their respective 95% confidence intervals from Equation (2). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. The sample is restricted to counties with populations over 100,000.

Figure 7 — Client Caseload at Publicly Funded Clinics in Virginia



Notes: Scatters represent the number of female clients at each of the listed mutually exclusive clinic categories. The bolded black line represents the number of female clients per year at clinics participating in the CAI, the gray squares represent the number of female clients per year at Title X clinics, and the blue circles represent the total number of clients for both types of clinics. Data on total clients is from the Virginia Department of Health.

Figure 8 — Share of Title X Clinic Clients Choosing a LARC



Notes: Scatters represent the share of Title X clients receiving a LARC in Virginia and the US between 2016–2021. Data on highly effective contraceptive usage at Title X clinics is from the Family Planning Annual Reports.

Table 1 — Descriptive Statistics for Treatment and Control Counties

	CAI Counties (N = 22)		Comparison Counties (N = 358)	
	Mean	Std. dev.	Mean	Std. dev.
Births per 1,000 females aged 15-44	63.060	7.454	61.696	8.133
County Population	550731	406689	385860	366234
State Population	8296863	57733	7105569	2479785
Percent White	0.651	0.096	0.740	0.192
Percent Black	0.220	0.142	0.215	0.176
Percent Hispanic	0.124	0.059	0.072	0.047
Percent Females aged 15-19	0.031	0.006	0.032	0.004
Percent Females aged 15-44	0.212	0.022	0.199	0.023
County Unemployment Rate	3.984	0.949	5.276	1.482

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Descriptive statistics include the means and standard deviations for the listed variable. Columns (1) and (2) present means and standard deviations for the 22 treatment counties for each listed variable, and Columns (3) and (4) present means and standard deviations for the comparison counties.

Table 2 — Effect of CAI on Birth Rates

	(1)	(2)	(3)
CAI in Effect	-2.364***	-2.156***	-2.085***
	(0.543)	(0.544)	(0.615)
Mean	62.198	62.198	59.793
Observations	3040	3040	577
County and Year FEs	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes
Sample	All Counties	All Counties	Large Counties

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Protection from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents results without control variables. Columns (2)–(3) include time varying county-level controls for the percent Hispanic, percent Black, and unemployment rate. Column (3) omits counties with populations smaller than 100,000 from the estimation.

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

Table 3 — Effect of CAI on Birth Rates by Age Groups

	(15–44)	(15–24)	(25–34)	(35–44)
CAI in Effect	-2.156***	1.307	-4.068***	-1.453***
	(0.544)	(0.846)	(1.271)	(0.417)
Mean	62.198	69.158	98.666	20.689
Observations	3040	3040	3040	3040
County and Year FEs	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents the main specification for birth rates for women aged 15–44. Column (2) presents effects for birth rates to women aged 15–24, Column (3) presents effects for birth rates to women aged 25–34, and Column (4) presents effects for birth rates to women aged 35–44.

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

Table 4 — Effect of CAI on Birth Rates, Within-Virginia Analysis

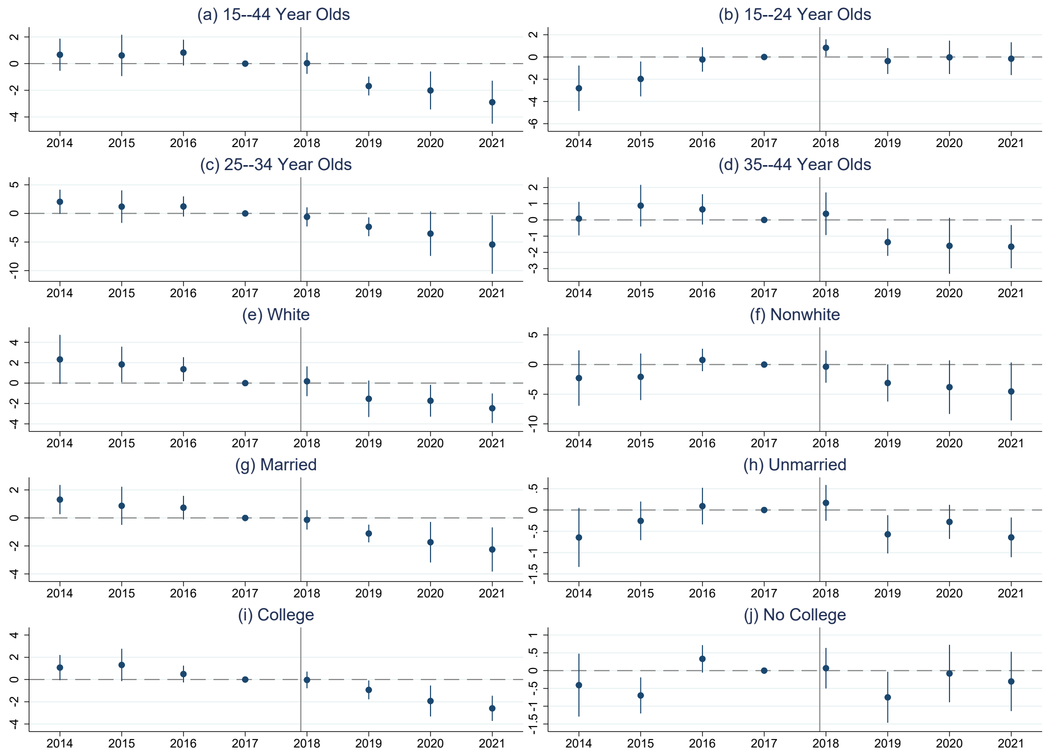
	(1)	(2)	(3)	(4)	(5)
Counties					
CAI in Effect	-2.281***	-2.672***	1.293	-1.999***	1.459
	(0.729)	(0.830)	(1.010)	(0.750)	(2.097)
Mean	59.699	59.293	60.124	60.391	60.391
Observations	1032	528	504	516	516
Zip Codes					
CAI in Effect	-4.441***	-7.241***	-0.204	-4.299***	-5.108***
	(0.834)	(1.244)	(0.864)	(1.093)	(1.136)
Mean	61.838	60.284	63.408	60.606	63.078
Observations	765413	384654	380759	383909	381504
Sample	All	Above Med. Inc	Below Med. Inc	Above Med. Pop	Below Med.Pop

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. The top panel presents a county-level difference-in-differences estimate from an equation analogous to Equation (1) for all counties codes within the state of Virginia. Comparison counties are counties within Virginia that do not have a CAI clinic.The bottom panel presents the difference-in-differences estimate where the treatment group includes women residing in zip codes with a CAI clinic at within at least 6 miles of the zip code centroid, and the comparison group includes women in zip codes inside VA further than 6 miles from a clinic.

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

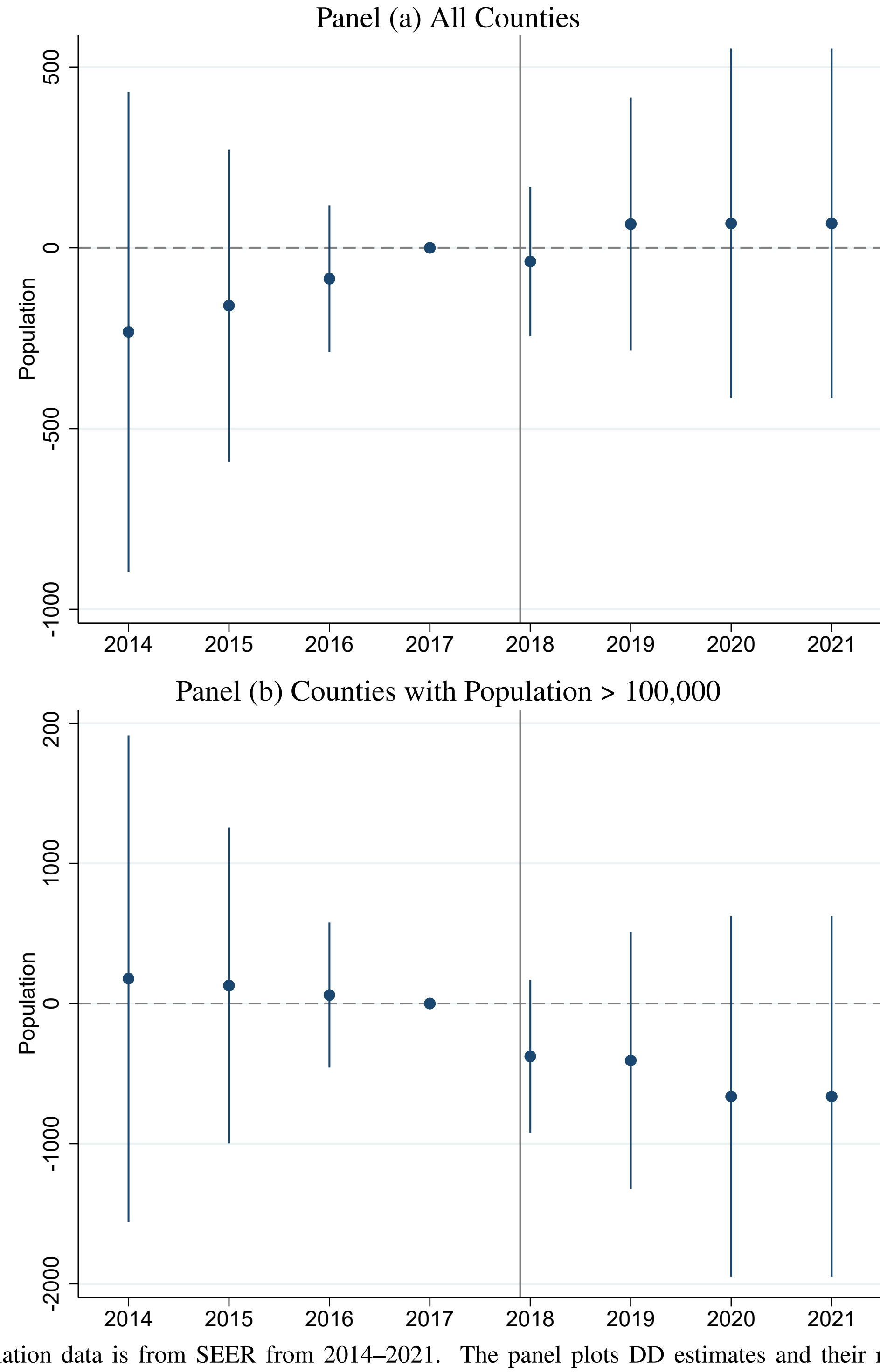
Appendix

Figure A1 — Heterogeneous Effects on Childbearing, Weighted by County Female Population



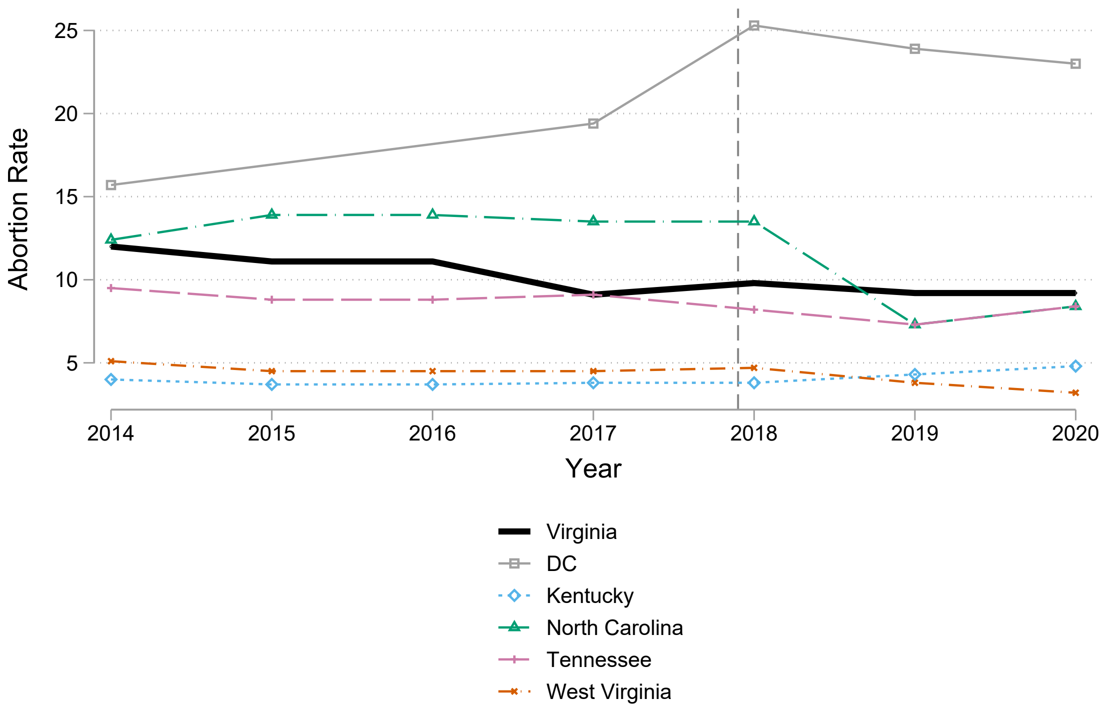
Notes: Natality data is from the Centers for Disease Control and Prevention from 2014–2021. The panel plots DD estimates for the listed subgroups and their respective 95% confidence intervals from Equation (2). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics.

Figure A2 — Effects of the CAI on Population for Females Aged 15–44



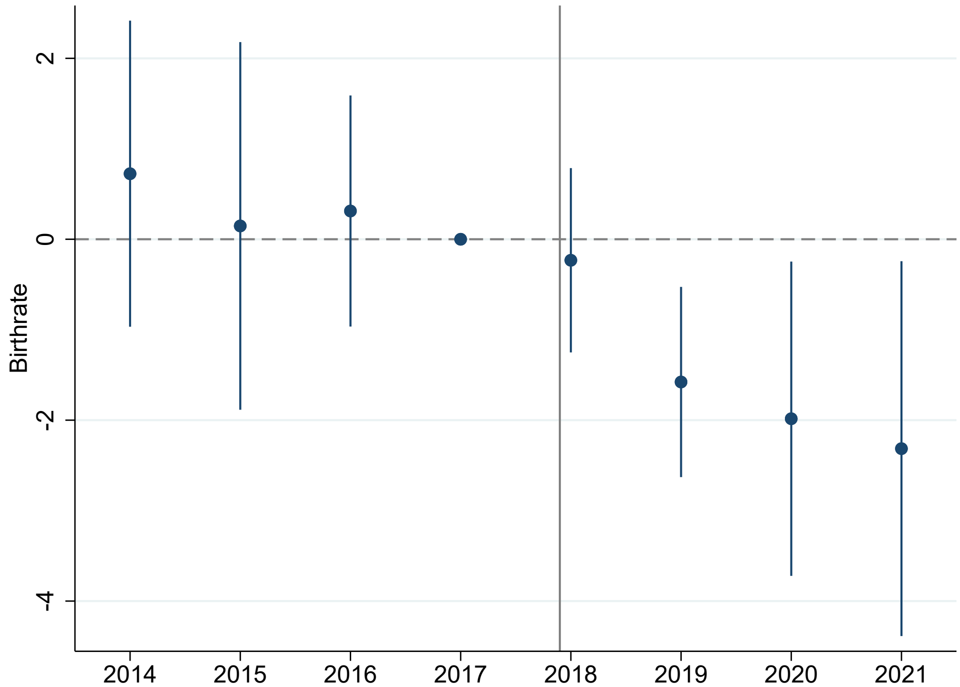
Notes: Population data is from SEER from 2014–2021. The panel plots DD estimates and their respective 95% confidence intervals from Equation (2). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics.

Figure A3 — Abortion Rate in Virginia and Border States



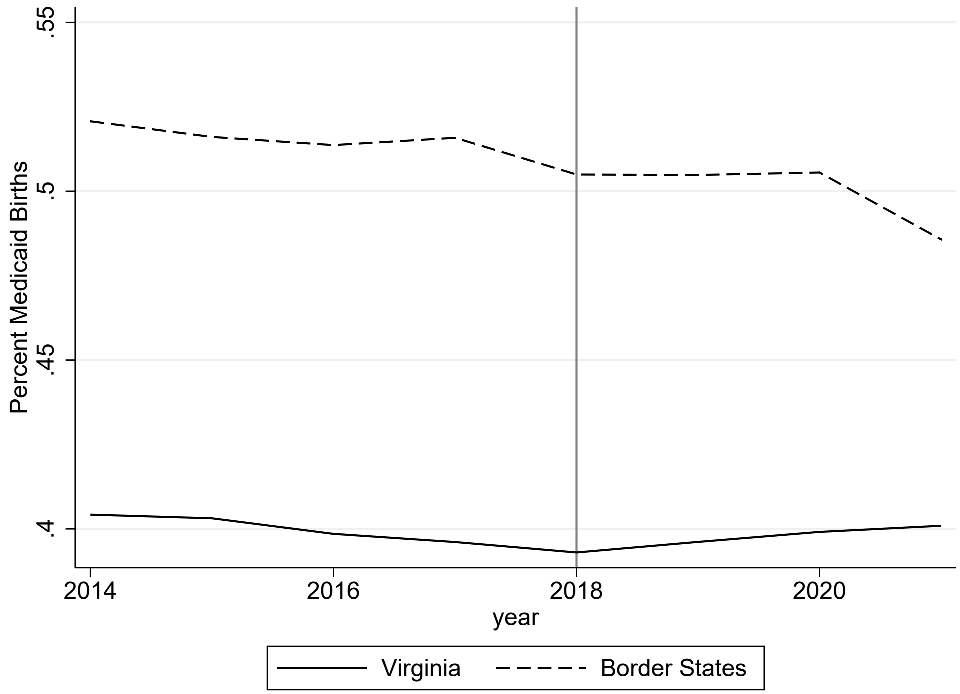
Notes: Abortion data is from the Centers for Disease Control and Prevention from 2014–2020. The figure plots rates of abortion for Virginia and bordering states.

FIGURE A4 — Effects of Virginia's CAI on Birth Rates, Within-Virginia County Level Analysis



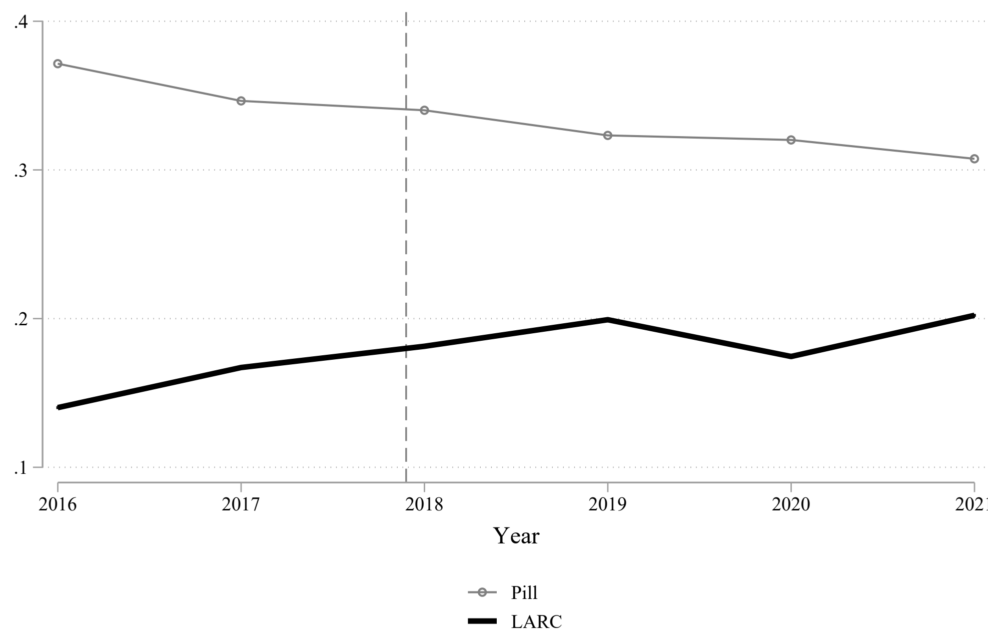
Notes: Natality data is from the Centers for Disease Control and Prevention from 2014–2021. The panel plots DD estimates and their respective 95% confidence intervals from Equation (2). The treatment group includes counties with a CAI clinic and the comparison group consists of counties within Virginia that do not have a CAI clinic.

Figure A5 — Share of Medicaid Births



Notes: Natality data is from the Centers for Disease Control and Prevention from 2014–2021. Figure plots the share of births paid for by Medicaid in Virginia and bordering states.

Figure A6 — Percent of Virginia Title X Clients Choosing a LARC or Oral Contraceptive



Notes: Scatters represent the take-up rates of oral contraceptives and LARCs separately at Virginia Title X clinics between 2016–2021. Data on highly effective contraceptive usage at Title X clinics is from the Family Planning Annual Reports.

Table A1 — Descriptive Statistics for Counties within Virginia

	CAI Counties (*N* = 22)		Comparison Counties (*N* = 107)	
	Mean	Std. dev.	Mean	Std. dev.
Births per 1,000 females aged 15-44	63.060	7.454	59.469	13.712
County Population	550730.923	406689.347	119326.929	98859.156
Percent White	0.651	0.096	0.754	0.153
Percent Nonwhite	0.349	0.096	0.246	0.153
Percent Females aged 15-19	0.031	0.006	0.033	0.012
Percent Females aged 15-44	0.212	0.021	0.199	0.039
County Unemployment Rate	3.984	0.949	4.636	1.222

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Descriptive statistics include the pre-period means and standard deviations for the listed outcomes. Columns (1) and (2) present means and standard deviations for the 22 treatment counties for each listed outcome, and Columns (3) and (4) present means and standard deviations for the comparison counties.

Table A2 — Effect of CAI on Birth Rates, by Urbanicity

	Metro (1)	Non-Metro (2)	Rural (3)	Non-Rural (4)	Pop > 100,000 (5)
CAI in Effect	-2.003***	-0.089	-0.739	-2.168***	-2.085***
	(0.573)	(1.978)	(2.503)	(0.548)	(0.615)
Mean	60.486	63.598	65.202	61.578	59.793
Observations	1368	1672	520	2520	577
County and Year FEs	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes
Sample	Metro	Non-metro	Rural	Non-Rural	Pop > 100000

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic, while the comparison group includes women in counties outside of Virginia in bordering states with publicly funded (Title X) clinics. Columns 1–4 present estimates for the sample of only metro counties, non-metro counties, rural counties, and non-rural counties respectively, as defined by the USDA. Column 5 presents estimates for counties with populations over 100,000.

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

Table A3 — Effect of CAI on Birth Rates by Age Groups, Omitting Counties with Populations Less than 100,000

	(15–44)	(15–24)	(25–34)	(35–44)
CAI in Effect	-2.085***	0.857	-3.880***	-1.519***
	(0.615)	(0.928)	(1.353)	(0.465)
Mean	62.198	69.158	98.666	20.689
Observations	577	577	577	577
County and Year FEs	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic that are larger than 100000 population. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics that are larger than 100000 population. Column (1) presents the main specification for all childbearing ages, 15–44. Column (2) restricts the estimates to women aged 15–24, Column (3) restricts to women aged 25–34, and Column (4) restricts to women aged 35–44.

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

Table A4 — Effect of CAI on Birth Rates by Race and Ethnicity

	White (1)	Non-White (2)	Hispanic (3)
CAI in Effect	-2.630***	-2.203**	-1.998
	(0.841)	(0.890)	(1.481)
Mean	62.041	57.728	69.939
Observations	3040	3040	3040
County and Year FEs	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Controls for unemployment rate are included. Column (1) presents estimates on birth rates for White women. Column (2) presents estimates for non-White women. Column (3) presents estimates for Hispanic women. The denominator for each birth rate is the population of females 15–44 for each race.

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

Table A5 — Effect of CAI on Birth Rates by Marital Status

	Married (1)	Unmarried (2)
CAI in Effect	-2.024***	-0.132
	(0.492)	(0.196)
Mean	34.868	27.329
Observations	3040	3040
County and Year FEs	Yes	Yes
Demographic Controls	Yes	Yes

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents estimates for married women. Column (2) presents estimates for unmarried women.

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

Table A6 — Effect of CAI on Birth Rates by Education Level

	College (1)	No College (2)
CAI in Effect	-2.078***	-0.078
	(0.519)	(0.299)
Mean	32.970	29.227
Observations	3040	3040
County and Year FEs	Yes	Yes
Demographic Controls	Yes	Yes

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents estimates for women with a college education. Column (2) presents estimates for women without a college education.

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

Table A7 — Effect of CAI on Birth Rates, by Parity

	(1)	(2)	(3)
First Births			
CAI in Effect	-0.779***	-0.741**	-0.813**
	(0.281)	(0.294)	(0.343)
Mean	23.163	23.163	23.279
Observations	3040	3040	577
Non-First Births			
CAI in Effect	-1.585***	-1.415***	-1.272***
	(0.431)	(0.437)	(0.473)
Mean	39.034	39.034	36.514
Observations	3040	3040	577
County and Year FEs	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes
Sample	All Counties	All Counties	Large Counties

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. The top panel reports estimates for first births and the bottom panel reports estimates for non-first births. Column (1) presents results without control variables. Columns (2) and (3) include time varying county-level controls for the percent Hispanic, percent Black, and unemployment rate. Column (3) omits counties smaller than 100,000 from the estimation.

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

Table A8 — Effect of CAI on Birth Rates, Omitting Counties with Only One Clinic

	(1)	(2)	(3)
CAI in Effect	-2.536***	-2.257***	-1.902**
	(0.631)	(0.669)	(0.774)
Mean	62.198	62.198	59.793
Observations	3040	3040	577
County and Year FEs	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes
Sample	All Counties	All Counties	Large Counties

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with more than one CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents results without control variables. Columns (2)–(3) include time varying county-level controls for the percent Hispanic, percent Black, and unemployment rate. Column (3) omits counties smaller than 100,000 from the estimation.

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

Table A9 — Effect of CAI on Infant Health Outcomes

	Birth Weight	Low Birth Weight	Very Low Birth Weight	Gestation
	(1)	(2)	(3)	(4)
CAI in Effect	-2.0971	-0.0004	-0.0001	0.0501
	(2.7452)	(0.0011)	(0.0005)	(0.0389)
Mean	3248.152	0.091	0.015	38.521
Observations	3040	3040	3040	3040
County and Year FEs	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes
Sample	All Counties	All Counties	All Counties	All Counties

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1). The treatment group includes women residing in counties with a CAI clinic and the comparison group includes women in counties inside VA without a CAI clinic. Columns presents estimates of the average birthweight, probability of an infant born low birthweight infants (< 3,500 grams), very low birthweight (< 1,500 grams), and gestation length.

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

Table A10 — Effect of CAI on Birth Rates, Poisson Estimates

	(1)	(2)	(3)
CAI in Effect	-0.042***	-0.039***	-0.045***
	(0.012)	(0.012)	(0.012)
Mean	1013.900	1013.900	3823.383
Observations	3040	3040	577
County and Year FEs	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes
Sample	All Counties	All Counties	Large Counties

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Each column presents a DD estimate from Equation (1) using Poisson estimation where the outcome of interest is number of births and each estimate is controls for female population. The treatment group includes women residing in counties with a CAI clinic. The comparison group includes women in counties outside of Virginia with publicly funded (Title X) clinics. Column (1) presents results without control variables. Columns (2)–(3) include time varying county-level controls for the percent Hispanic, percent Black, and unemployment rate. Column (3) omits counties smaller than 100,000 from the estimation.

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

Table A11 — Effect of CAI on Share of Medicaid Enrollment Virginia

	(1)	(2)	(3)
CAI in Effect	0.0070	0.0014	0.0013
	(0.005)	(0.005)	(0.006)
Mean	0.151	0.151	0.120
Observations	1161	1161	153
County and Year FEs	Yes	Yes	Yes
Demographic Controls	No	Yes	Yes
Sample	All Counties	All Counties	Large Counties

Notes: County level share of Medicaid enrollment is from the 1-year estimates from the American Community Survey from 2014–2022. Each column presents a DD estimate from Equation (1) where the outcome of interest is the share of medicaid enrollment at the county level. The treatment group includes counties with a CAI clinic and the comparison group consists of counties within Virginia that do not have a CAI clinic.Column (1) presents results without control variables. Columns (2)–(3) include time varying county-level controls for the percent Hispanic, percent Black, and unemployment rate. Column (3) omits counties smaller than 100,000 from the estimation.

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

Table A12 — Effect of CAI on Birth Rates, Within-Virginia Analysis Distance Analysis

	(1)	(2)	(3)
CAI distance within 25th percentile	-2.948***		
	(1.043)		
CAI distance within 50th percentile		-4.475***	
		(0.834)	
CAI distance within 75th percentile			-3.110***
			(0.866)
Mean	61.838	61.838	61.838
Observations	765413	765413	765413

Notes: Individual-level natality data is from the Virginia Department of Health and the Centers for Disease Control and Prevention from 2014–2021. Column 1 presents the difference-in-differences estimate from Equation (1). In Row 1, the treatment group includes women residing in zip codes with a CAI clinic within at least the 25th percentile or 3 miles of the zip code centroid, and the comparison group includes women in zip codes inside VA further than 3 miles from a clinic. In Row 2, the treatment group includes women residing in zip codes with a CAI clinic at within at least the 50th percentile or 6 miles of the zip code centroid and the comparison group includes women in zip codes inside VA further than 6 miles from a clinic. In Row 3 the treatment group includes women residing in zip codes with a CAI clinic at within at least the 75th percentile or 17 miles of the zip code centroid and the comparison group includes women in zip codes inside VA further than 17 miles from a clinic.

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