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The Effects of Expanding Long-Acting Reversible Contraception on Female High School Graduation Rates

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THE EFFECTS OF EXPANDING LONG-ACTING REVERSIBLE CONTRACEPTION ON FEMALE HIGH SCHOOL GRADUATION RATES

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ABSTRACT

The Colorado Family Planning Initiative (CFPI) expanded resources for long-acting reversible contraception (LARCs) across Title X clinics in Colorado in 2009; the policy aimed to target low-income and teen women to reduce unintended pregnancy throughout the state. Using a difference-in-differences design, I estimate the differential impacts of the policy on high school graduation rates. I use Colorado school districts with a Title X clinic as the treated group and Colorado school districts without Title X clinics as the control group to compare female graduation rates before and after the implementation of the CFPI. Overall, the Colorado Family Planning Initiative's effect on White female high school graduation rates was positive, increasing 1.2 percentage points at a 5 percent significance level. White male graduation rates showed a similar effect, which may indicate that males and females are both impacted or that other trends are driving the estimates. This study also suggests that LARCs used in the CFPI did not yield improved high school educational outcomes for Black and Hispanic women; therefore, future research should investigate why these differences exist between different groups.

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INTRODUCTION

An abundance of research studies the birth control pill's effects on women's life outcomes; however, there is less research on the effects of newer, slowly adopted, forms of contraception, such as long-acting reversible contraception (LARC), such as intrauterine devices and contraceptive implants. Bailey and Lindo (2017) chronicled the innovations in contraception and women's outcomes; they explained that the increased use in LARCs is an important area in need of further research (Bailey and Lindo, 2017). Understanding how expanding access to LARCs affects women's outcomes, such as women's education, is important for future policies that aim to improve women's high school education outcomes.

Colorado secured funding to implement the Colorado Family Planning Initiative (CFPI), explained in further detail below, to expand LARC inventory, training, and employment to increase LARC users and decrease unintended pregnancies for low-income and teen women throughout the state. Research has shown that the CFPI had a positive effect on increasing the number of women using LARCs and decreasing teen pregnancies (Ricketts et al. 2014; Goldwaite et al. 2015; Lindo and Packham 2017; and Kelly et al. 2019). The increased usage of long-acting reversible contraception and the decrease in teen pregnancy as a result of the Colorado Family Planning Initiative proposes that these teen women could have had an improved opportunity to graduate from high school because they did not have a child as a teen. This paper analyzes whether the Colorado Family Planning Initiative affected female high school graduation rates.

High school graduation is an important step in one's educational career because many jobs and secondary schooling require a high school degree in order to apply.

This study is the first to analyze the effects of the CFPI on women's high school graduation rates. I examined Colorado high school district level graduation rates by gender and by race and ethnicity. To analyze the effects of the initiative on women's high school graduation rates, I compared high school graduation rates from school districts with a Title X clinic to school districts without a Title X clinic before and after the initiative. If the policy positively affected teen women's high school graduation rates, we would expect the women's high school graduation rates in school districts with a Title X clinic to have a differential increase after the policy compared to school districts without a Title X clinic. My preferred specification includes controls for free and reduced-price lunch rates across districts and population size; fixed effects for year and school districts, and weights. This study found the Colorado Family Planning Initiative increased White female high school graduation rates 1.2 percentage points at a 5 percent significance level. White male graduation rates showed a similar effect, which may indicate that males and females are both impacted or that other trends are driving the estimates. Moreover, it showed that the CFPI did not significantly improve high school educational outcomes for Black and Hispanic women; therefore, future research should investigate why these differences exist between different groups.

BACKGROUND

1. Long-Acting Reversible Contraceptive Background

LARCs include intrauterine devices (IUDs), "small, T-shaped devices that are put into a uterus to prevent pregnancy" and implants, "a thin, matchstick-sized plastic rod inserted under the skin of your upper arm" (Planned Parenthood, 2018). LARCs are the most effective, reversible contraceptive methods and are promoted by researchers to be recommended as first-line contraception for women (Stoddard, McNicholas, and Peipert, 2011). LARCs are over 99% effective, last three to ten years, safe for all age groups, and require no further action once inserted except for removal. LARCs are the most reliable contraceptives because they have little-to-no human error, unlike the pill or condoms. LARCs can cost anywhere between $500 to $1000, excluding the fees for implantation and removal. Free LARCs break down the financial barriers to the most effective, easy to use, safest contraception for teen and low-income women (CDPHE, 2017). LARCs have had a slow adoption rate. Bailey and Lindo explain LARCs have had to overcome a misconceived "bad reputation" due to lack of awareness, safety controversy from previous devices, and high up-front costs (Bailey and Lindo, 2017).

2. Colorado Family Planning Initiative Background

In 2008, Colorado received a private donation of 23 million dollars to the Colorado Department of Public Health and Environment (CDPHE) to implement the Colorado Family Planning Initiative (CFPI). The CFPI officially started in January 2009 and funds from the donor ended in 2015; however, Colorado State Congress agreed to fund the program in 2016. The donated funds were used over five years and provided training for employees, operational support, improved equipment, and, most importantly, low-or-no cost LARCs to teen and low-income women in Colorado (CDPHE, 2017). Employees were trained on how to counsel patients, and insert LARCs. CDPHE chose to use Title X Clinics as the homes for the CFPI because the infrastructure and basic principles were already in place. Besides, Title X clinics were used for the CFPI because of the dedication to low-income women which would increase access to the CFPI's target group. "The Title X Family Planning program is the only federal grant program dedicated solely to providing individuals with comprehensive family planning and related preventive health services. By law, priority is given to persons from low- income families" (CDPHE, 2017).

In addition to the LARC access, the private donor wanted to introduce a campaign in Colorado to enhance the initiative's efforts. The CDPHE supported the awareness campaign called Beforeplay.org in 2012. "Beforeplay.org was a public awareness campaign for young people to encourage them to make healthy sexual decisions" (CDPHE, 2017). Beforeplay.org provided advertising across the state and a website for men and women to gain information on sexual health and reproductive services (CDPHE, 2017).

The CDPHE created a CFPI report that stated their version of the CFPI's impact. The report prefaced that their results did not control for unobservable factors when analyzing the changes before and after the CFPI. The report also did not specify statistical significance or any economic methodology to the research. The report claimed that the CFPI was able to provide LARCs to 36,000 women between 2009 and 2014. The report also claimed that unintended pregnancies rates fell by 40% among teens and 20% among women in their early 20's, and the overall birth rate fell by 48%. The teen birth rate decreased by 50%, the teen abortion rate fell by almost 50%, and women giving births without a high school degree decreased by 38%. The birth rate of women between the ages of 20-24 decreased by 20% and the abortion rate fell by 18%. The average age of first pregnancy increased by 1.2 years, and rapid repeat births declined by 12% for all women.

In the literature review I will discuss Lindo and Packham's (2017) research on the CFPI in more detail. The difference between the CDPHE report's estimation and Lindo and Packham's findings exist because this report did not account for trends; the report simply looked at the teen pregnancy rate before and after the implementation of the CFPI. Whereas, other research by Lindo and Packham found a more accurate decrease in the teen pregnancy rate using a difference-in-differences model accounting for trends across the state.

The CDPHE report used a Decision-Analytic (Markov) Model and a Difference-in-Differences approach to estimate the cost avoidance effects of the CFPI. The report found that LARCs are responsible for decreasing the amount of money Colorado spent on federal assistance programs. The state of Colorado avoided almost 70 million dollars ($66.1-$69.6 million) worth of entitlement program costs. This does not include other potential costs such as the Colorado Preschool Program which estimates LARCs helped avoid almost $3,342,538. "The Colorado state health department estimated that every dollar spent on the long-acting birth control initiative saved $5.85 for the Colorado state's

Medicaid program, which covers more than three-quarters of teenage pregnancies and births" (CDPHE, 2017).

The literature below documents that the Colorado Family Planning Initiative had various effects on women's lives in the state of Colorado. Researchers found that unintended pregnancies decreased, teen pregnancy decreased, and abortion rates decreased as LARC usage increased; however, research has not studied whether the CFPI has any effect on women's high school graduation rates. This paper begins to fill that gap.

LITERATURE REVIEW

Women have not always had hormonal technology available or the legal right to use contraception. All women in the United States, regardless of marital status, were legally able to use the birth control pill in 1974 (Eisenstadt v. Baird, 2020). Research has illuminated that improving women's access to family planning and contraceptives led to positive changes in women's educational and labor force outcomes (Goldin and Katz, 2002; and Bailey, 2006). Both the technological innovation of the birth control pill and the legal changes (i.e., Supreme Court Cases from 1965 and 1974) that followed increased women's fertility control and women's contribution to the economy. As more young women were able to obtain the pill, more young women invested in themselves. The pill increased the returns to labor force participation and investments in human capital; therefore, the cost of having children at a young age increased and women had greater incentives to control their fertility. When young women can control their fertility, more women can delay marriage, delay their first birth, invest in their human capital, and increase their labor force participation (Goldin and Katz, 2002; and Bailey, 2006).

I emphasize "young women" specifically because both Goldin and Katz and Bailey illustrated that the effects are a result of the birth control pill and the passing of the 26th Amendment which lowered the "age of majority" from 21 to 18. They both showed that obtaining the birth control pill before age 21 was critical to women's education and economic outcomes. Teen women benefited from contraception the most, and teen women, specifically high school teen women, is the group my analysis focuses on to understand the effects of expanding LARCs on female high school graduation rates.

However, the birth control pill created a paradox. In the previous literature stated above, the pill was found responsible for increasing women's labor force participation and educational attainment; however, more recent literature found that not all women had these same positive effects from the pill. The pill reduced the cost of nonmarital sexual activity; increased extramarital sexual activity; and thus increased the number of births to non-married parents due to imperfect contraceptive use and failure. The birth control pill was responsible for helping increase nonmarital births to poor and working-class women in the 1960s and 1970s. In addition, the invention of the pill also decreased the number of women graduating from high school. This research demonstrated that the birth control pill could have had heterogeneous effects across various groups of women in the 1960s and 70s. Some women were able to increase their human capital investments with the use of the pill, while others, mostly poor and working-class women, were decreasing their human capital investments (Beauchamp and Pakaluk, 2019).

Previous literature on teen childbearing described teen childbearing as a cause of socioeconomic disadvantages that resulted in worse long-term life outcomes for teen mothers. Geronimus and Korenmen (1992) questioned this previous research and hypothesized that the lack of control of background characteristics in the populations of teen childbearing has led to biased, overstated results. The authors used samples of sisters who had births at different ages to control for heterogeneity in family backgrounds. The analysis found that women who had births as teenagers were different from women who had births later in age; most teen mothers came from disadvantaged family backgrounds. When comparing their cross-sectional estimates to the within-family estimates, the authors found that not controlling for family backgrounds led to biased results. Overall, the authors' findings suggest the cross-sectional approach used in previous research resulted in overstated effects of teen childbearing on socioeconomic consequences. Moreover, teen childbearing is more of a consequence of low socioeconomic status, rather than a cause of socioeconomic disadvantages (Geronimus and Korenman, 1992).

Additional studies have built upon Geronimus and Korenman's research by comparing teen women who had a miscarriage and those who had a live birth. Researchers were able to estimate the effects of teen childbearing on women's life outcomes by using the "natural experiment" of a miscarriage as an instrument variable for teen childbearing. Like Geronimus and Korenman, these additional studies found that the effects of teen childbearing had been exaggerated in previous research (Hotz, McElroy, and Sanders, 2005; Ashcraft and Lang, 2006; Fletcher and Wolfe, 2009; and Gorry, 2019). However, when controlling for community-level factors, the research demonstrated that teen childbearing had a modest, negative impact on the probability of graduating high school (-0.08) and a significant $2,200 to $2,400 reduction of income (Fletcher and Wolfe, 2009). Furthermore, the heterogeneous consequences of teen childbearing were expanded by comparing the effects of teen childbearing across socioeconomic status and race. This research demonstrated that teenage childbearing from high-income counties resulted in lower educational attainment, less income, and increased use of government welfare; however, there were no statistically significant negative effects on teenage childbearing from low-income counties. White teenage childbearing resulted in statistically significant negative consequences, whereas, there were no statistically significant effects for Black or Hispanic teenage childbearing (Gorry, 2019).

This literature demonstrates that the effects of teen childbearing are not as devastating to women's life outcomes as previously thought. The research even suggests that teen women from low-socioeconomic groups are more likely to have worse long-term outcomes regardless or not if they had a child as a teen. Moreover, teen childbearing does not significantly, negatively affect Black, Hispanic, and low-income women, but negative consequences are apparent for White and high-income women. Therefore, these results suggest that policies aimed to decrease teen pregnancy and teen childbearing may not have a significant effect on women's outcomes, such as high school graduation rates. It also suggests that the impacts of decreasing teen pregnancy may not impact all women the same based on race and socioeconomic status.

On the other hand, some literature found significant effects of teen childbearing on women's education outcomes (Schulkind and Sandler, 2019 and Kane, Morgan, Harris, and Guilkey, 2013). When comparing teen mothers who had a baby within their last six months of their senior year of high school and teen mothers who had a baby within six months after they graduated high school, the disruption of having a child in the final six months of a woman's senior year caused the likelihood of attaining a high school diploma to decrease 5.4 percentage points. The disruption to the woman's education had no statistical effects of long-term earnings; however, these women were more likely to live below the poverty line (Skulkind and Sandler, 2019). By examining the educational costs of teen childbearing using four different statistical methods, the research demonstrated the effect of teen childbearing on women's educational outcomes more accurately. Kane et al.'s (2013) research found that teen childbearing decreased schooling between 0.7 and 1.9 years for teen mothers (Kane et al., 2013). These two papers indicate that teen childbearing does have an effect on education outcomes and that decreasing teen birth rates would have a positive effect on high school graduation rates; especially for 15-17-year-old women who may be in their senior year of high school.

Research on school-based health centers that offer high school women contraception found significant effects on decreasing the teen birth rate. School-based health centers caused a 30% decrease in the birth rate for girls 15 years old and under and reduced 16-19-year-old birth rate by 11-15%. However, this research found no significant effects of the school-based health centers on high school dropout rates. Even though the school-based health centers were responsible for decreasing teen pregnancy, this effect did not influence more women to stay in high school (Lovenheim, Reback, and Wedenoja, 2015). This research suggests that expanding contraception access to high school women does not significantly cause less women to dropout of high school.

Hicks-Courant and Schwartz (2016) examined the effects of geographic access to family planning services on female high school dropout rates. The authors conducted a cross-sectional study using 2013 and 2014 Title X and Planned Parenthood clinic locations along with the 2012-2013 American Community Survey limiting the sample to 16-to 22-year-old females. The study compared Planned Parenthood and Title X clinics separately because not all Planned Parenthood clinics and Title X clinics are considered the same; therefore, the authors wanted to assess the differences between the clinics' effects on female high school dropout rates. The authors found a consistent, and significant relationship between the presence of Planned Parenthood clinics with a reduction in female high school dropout rates; however, the authors did not find the same consistency for Title X clinics overall (Hicks-Courant and Schwartz 2016). This research highlights that Title X clinics do not have the same effect as Planned Parenthood clinics on female education outcomes. This could impact the CFPI's effect on women's high school education outcomes.

There has been some research conducted on different effects of the CFPI. Ricketts, Klingler, and Schwalberg (2014) compared Colorado's Title X clinic caseload rates, fertility rates, abortion rates, high-risk women birth rates, and rates of births by women receiving government services to Colorado's expected trends. They found that LARC usage increased from 5% to 19% for 15-24-year-olds between 2008 and 2011, as you can see from their Table 2 below:

TABLE 2. Percentage distribution of 15–24-year-old female clients of Title X–funded clinics, by contraceptive method used, 2008 and 2011

Method	2008 (N=22,410)	2011 (N=26,330)
LARC	4.5	19.4***
Implant	0.8	9.0***
IUD	3.7	10.4***
Hormonal	74.1	61.9***
Pill	49.3	36.4***
Injectable	15.4	15.4
Patch/ring	9.4	10.1**
Condom	9.0	9.5
Other	2.5	3.0***
None/unknown	9.9	6.1***
Total	100.0	100.0

**p<.05. ***p<.001. *Notes:* Pregnant clients and those desiring pregnancy were excluded. Percentages may not add to 100.0 because of rounding. LARC=long-acting reversible contraceptive.

Table 1. Percentage distribution of 15-24-year-old female clients of Title X-funded clinics by contraceptive method used. Reprinted from "Game Change in Colorado," by Ricketts, Klingler, and Schwalberg, 2014. *Perspect Sex Reprod Health, 46(3):125-132.*

The authors pointed out that the increase in LARCs usage is almost equal to the decrease in pill usage. This would suggest that the patients using LARCs were already using the pill. The impacts of the CFPI could have be greater if the policy increased LARC usage among women not previously using contraception. Also, fertility rates declined for low-income teens aged 15-19 years old by 28% in 2011 compared to 2009 at a statistically significant level. The article's Figure 1 shows the comparison between the expected trends in teen fertility and the actual results.

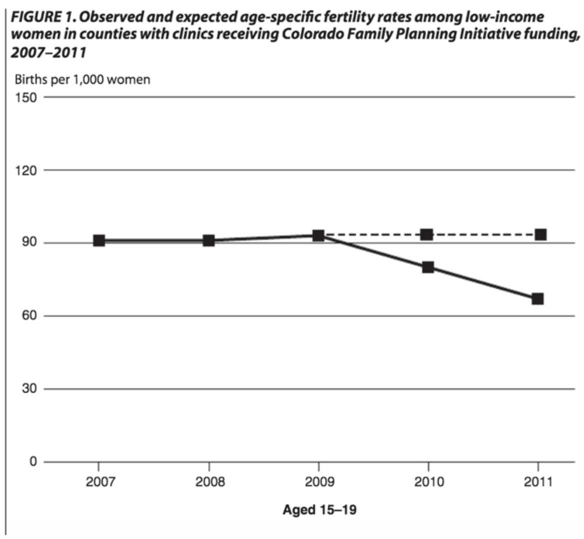


Figure 1. Observed and expected age-specific fertility rates among low-income women in counties with clinics receiving Colorado Family Planning Initiative Funding. Reprinted from "Game Change in Colorado," by Ricketts, Klingler, and Schwalberg, 2014. *Perspect Sex Reprod Health, 46(3):125-132.*

This research demonstrates that teens were using LARCs at an increasing rate and low-income teen fertility was declining in counties with Title X clinics. (Ricketts et al., 2014). Also, research has shown that the CFPI helped decrease adverse birth outcomes. A study found that women in Title X counties had lower odds of preterm birth in 2012 than in 2008 and LARC usage increased. This research suggests that the CFPI's increased usage of LARCs is associated with decreased risk of PTB (Goldthwaite, Duca, Johnson, Ostendorf, and Sheeder, 2015).

Lindo and Packham analyzed the CFPI's impact on reducing the teen birth rate in Colorado. The authors established teen pregnancy rates as important statistics to analyze because teens are not normally able to provide for or afford a pregnancy; therefore, teen

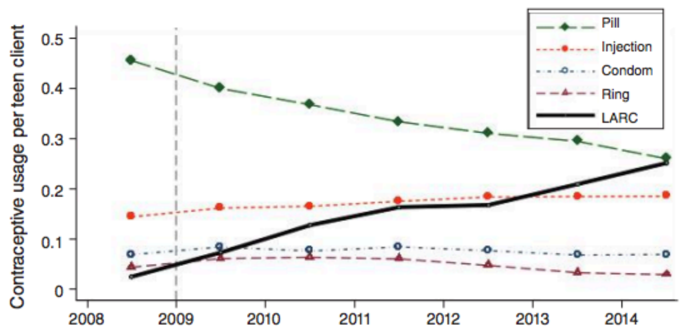


Figure 1. Primary Form of Contraceptive Used by Teens Visiting Title X Clinics in Colorado

Note: The vertical line, drawn at 2009, represents the year Colorado's Family Planning Initiative was implemented.
Source: Authors' calculation based on annual data on Colorado Title X contraception usage by age and method provided by the Colorado Department of Public Health and Environment.

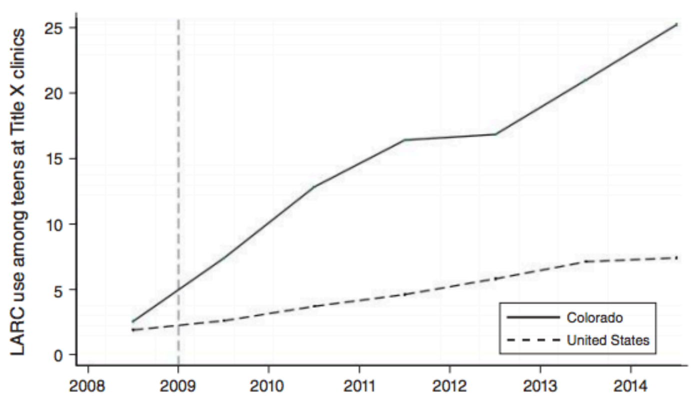


Figure 2. LARC Use among Teens Visiting Title X Clinics, Colorado versus United States Overall

Notes: Note that this figure shows LARC use in Colorado in 2014 for readers' information but the analysis of outcomes only extends through 2013. The vertical line, drawn at 2009, represents the year Colorado's Family Planning Initiative was implemented.

Source: Numbers for Colorado are authors' calculation based on annual data on Colorado Title X contraception usage by age and method provided by the Colorado Department of Public Health and Environment. Numbers for the United States overall are taken from the Title X Family Planning Annual Report, United States 2013.

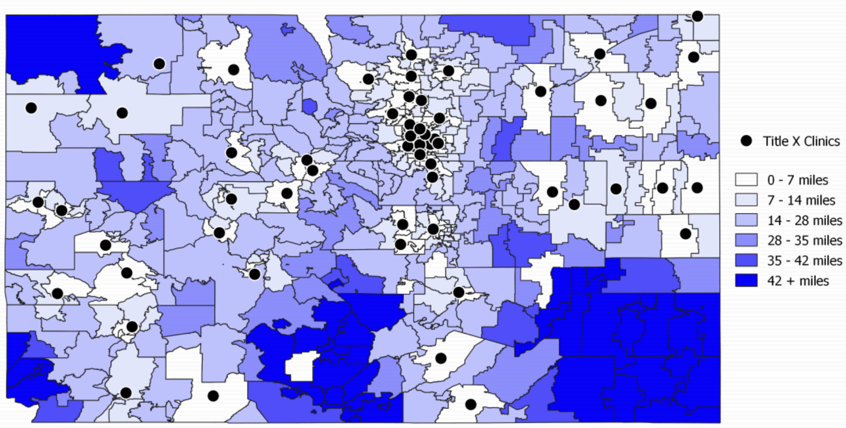
Figure 1. Primary Form of Contraceptive Used by Teens Visiting Title X Clinics in Colorado
Figure 2. LARC Use Among Teens Visiting Title X Clinics, Colorado versus US Overall.
Reprinted from "How Much Can Expanding Access to Long-Acting Reversible Contraceptives Reduce Teen Birth Rates?" by Lindo and Packham, 2017. *American Economic Journal: Economic Policy Vol. 9, No. 3.*

childbearing resulted in adverse outcomes that created social and personal costs. In addition, the increase in access to LARCs was substantial given that 20 out of 28 agencies had previously not offered IUDs and 16 offered implant for the first time. The authors showed the increased use of LARCs among Colorado teen women. To estimate the effect of the CFPI on teen birth rates, Lindo and Packham used county-level Title X clinic data; counties with a Title X clinic were used as their treated group. Next, they identified counties outside Colorado with Title X facilities in 2008 using geocoding and used these counties as the control. Their treated group consisted of 37 counties and their control group consisted of 1,717 counties. To identify teen birth rates, Lindo and Packham used restricted-use natality files from 2002-2013. This data included the mother's age and county of birth; the authors appointed the births based on the year of conception. Lindo and Packham used a difference-in-differences design comparing Colorado county Title X clinics with other US county Title X Clinics. The main conclusion from the authors was that the CFPI prevented 1,478 teen births and decreased the teen birth rate by 6.4% between 2009 and 2013. The initiative was most effective during the second-fifth years and most impactful in counties with high poverty rates. This paper helps us to understand that the CFPI may have overstated its success in reducing teen pregnancy; however, the initiative still had an effect on teen birth rates (Lindo and Packham, 2017).

Kelly, Lindo, and Packham (2019) found that the effects of the CFPI in reducing births were greatest for teenagers both in and out of high school who lived within 7 miles of a Title X Clinic. They used the Colorado Department of Public Health and

Environment's (Colorado DPHE) family planning agency-level data to identify LARC users from 2008 to 2015 and zip-code-level Natality data. The authors geocoded the addresses of each Title X clinic in Colorado using the archived directories of Colorado clinics from 2009-2012. The authors mapped the Title X clinics across the state of Colorado and classified zip-code areas according to the distance to the nearest Title X clinic. This map below gives some perspective on Colorado population density across the state.

Figure 5
Distance from Population Centroid to Nearest Title X Clinic



Notes: "Distance" indicates travel distance, in miles. Authors' calculation of zip-code centroid distance to the nearest clinic is based on geocoded data of Title X clinics from the Colorado Department of Public Health and Environment directory.

Figure 5. Distance from Population Centroid to Nearest Title X Clinic. Reprinted from "The Power of the IUD: Effects of Expanding Access to Contraception Through Title X Clinics" by Kelly, Lindo, and Packham, 2019. *NBER Working Paper No. 25656.*

Kelly et al. performed a difference-in-differences analysis using zip codes within 7 miles of a Title X Clinic as the treatment group; and zip codes greater than 7 miles of a Title X clinic were the control groups. The authors found that expanding access to contraception through Title X Clinics reduced births by 20 percent for women 15-17 and 18-19 years old whose zip codes were within 7 miles of a Title X clinic. These effects increased for 15-17-year-olds after media coverage promotions of the CFPI increased in 2014 and 2015; therefore, indicating that the spread of information about the CFPI and LARCs extended the effects. They found no effects for women living farther than 12 miles from a clinic even though extensive media coverage widened the reach of impact (Kelly, Lindo, and Packham, 2019).

DATA

The data include Colorado high school graduation rates and Title X clinic school district locations. The district-level high school graduation statistics are broken down by gender, race, and ethnicity from the Colorado Department of Education (CDE) from the graduating class of 2004 through the graduating class of 2019. The data include 178 school districts. Between Class of 2004 and Class of 2009, the graduation rate was calculated based on all students who graduated in the year rather than an anticipated four-year on-time graduation rate (i.e. those who took longer than four years to graduate were calculated in the rate). In the 2009-2010 school year, Colorado adopted the four-year on-time graduation rate that only includes students who would have graduated "on-time" (ie. the 4-year graduation rate would only calculate those who graduated in the Class of 2014 if they entered high school in fall of 2010). Both rates use the graduating student base (all students eligible for graduation) as the denominator and students who actually graduate as the numerator. This data allows me to analyze trends in graduation rates by district, gender, race, and ethnicity. I look specifically at White, Black, and Hispanic data because the other races and ethnicities had very little data available. I look at the male and female graduation rate because I wanted to compare rates across gender and to account for trends if they exist. The CDE reported education facts and figures for some school years. In the 2015-2016 school year, the CDE reported 148 out of the 178 school districts met the definition of small rural and rural. "These 148 (80 percent of total districts) rural districts comprise only 16 percent (just more than 136,000) of the total student population in the state" (CDE 2016). They also reported that 88 districts have less than 500 students.

Secondly, I obtained the Colorado Title X clinic locations from 2009-2012 from Lindo and Packham. Lindo and Packham used Colorado Family Planning Service Directories from 2009, 2010, and 2012 which are no longer available through the Colorado Department of Public Health and Environment (CDPHE). The data aggregates the total number of Title X clinics between 2009, 2010, and 2012. The 2009-2012 Colorado Title X clinic data includes 67 clinics across the state. Next, I located the school district where each Colorado Title X clinic was located by using the Niche website and double-checking with the Home Town Locator website to record whether a district had a clinic and how many clinics were in each district[1,2]. From Kelly et al. we know that there were 67 Title X clinics across the state and all 67 Title X clinics received the CFPI funding from 2009-2015 and state funds in 2016 (Kelly et al., 2019).

Next, I include data on free and reduced-price lunch rates across Colorado school districts to control for differential changes in poverty across school districts. Free and reduced-price lunch rate is a good measure of poverty in each school district because students on free and reduced-price lunch are only eligible if they are below a certain poverty line (differing based on school district criteria). It is important to control for poverty in case poverty rates are changing differentially over time because this could create biased results. I aggregated the Colorado Department of Education's (CDE) district-level data on free and reduced lunch percentages. The data includes the rate of

[1] https://www.niche.com/k12/schools-near-you/
[2] https://colorado.hometownlocator.com/

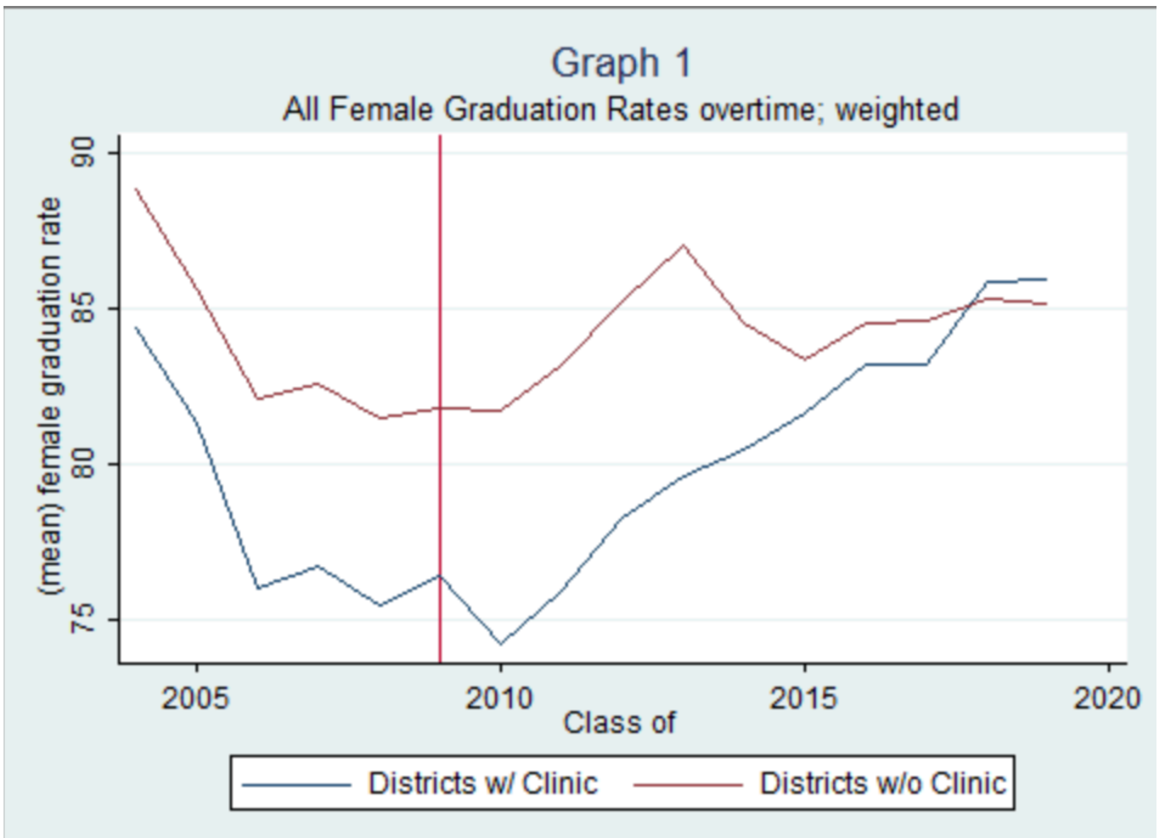
free and reduced-price lunch for grades kindergarten-12th grade by school district from 2004-2005 through 2018-2019 school years.

Table 1 provides summary statistics for the graduating student bases and graduation rates by gender and race, Title X clinic frequency, and free and reduced lunch rate. These summary statistics show the mean and standard deviations for each variable from 2004 to 2019. Column (1) provides data for all school districts; Column (2) provides data for school districts with a Title X clinic, and Column (3) provides data for school districts without a Title X clinic. Observing the graduating student base means for all students in all school districts, the mean is 339.87 students; however, school districts with a Title X clinic have a mean of 849.07 students. School districts without a Title X clinic have a mean of 157.88 students. This would suggest that most of the school districts with a Title X clinic are in more densely populated areas which was shown in the map from Kelly et al. This trend is the same for gender and race; school districts with a Title X Clinic have higher graduating student bases than school districts without a Title X clinic. However, when comparing graduation rates, school districts without a Title X clinic have a slightly higher mean graduation rate than school districts with a Title X clinic. This is the trend across gender. But, when comparing race, school districts without a Title X clinic have lower average graduation rates for Black and Hispanic students. The data summary shows that only 26 percent of school districts have a Title X clinic; this indicates that the overwhelming majority of school districts do not have Title X clinics. The school districts with a Title X clinic have 1.40 clinics in the district on average. Lastly, the free and reduced lunch rate summary shows that the average free and reduced lunch rate across all school districts is 45.74 from 2005 to 2019. School districts with a Title X clinic have a slightly lower average free and reduced lunch rate than school districts with a Title X clinic. This is a relatively low rate because the U.S. defines public schools with a 25.1 to 50.0 percent of the students eligible for free and reduced-price lunch as mid-low poverty schools (U.S. Department of Education 2020). As the summary statistics illustrate, school districts with Title X clinics are very different than school districts without Title X clinics. These differences make causal interpretation difficult because these districts may trend differently due to these underlying characteristics. In my methodology, I plan to control for these characteristics; however, there could be other underlying characteristics that I am unable to control for.

Table 1. Summary Statistics			
	(1) All School Districts	(2) School Districts w/ Clinic	(3) School Districts w/o Clinic
Student Base			
All	339.87	849.07	157.88
	(879.6)	(1440.3)	(428.4)
Female	165.97	414.72	77.06
	(430.2)	(702.5)	(212.1)
Male	173.90	434.35	80.82
	(449.6)	(738.2)	(216.5)
Black	18.53	46.15	8.66
	(94.10)	(161.4)	(48.47)
Hispanic	92.73	243.51	38.84
	(281.3)	(489.4)	(104.3)
White	207.78	509.77	99.85
	(561.2)	(930.7)	(271.9)
Graduation Rate			
All	83.36	80.25	84.48
	(14.87)	(13.00)	(15.33)
Female	85.04	83.18	85.71
	(17.76)	(13.30)	(19.06)
Male	80.62	77.35	81.79
	(17.73)	(14.77)	(18.54)
Black	33.41	46.49	28.43
	(42.19)	(40.17)	(41.89)
Hispanic	69.12	69.19	69.09
	(31.14)	(22.25)	(33.82)
White	84.98	83.70	85.43
	(15.72)	(12.12)	(16.80)
Other Variables			
Title X clinic	0.26	1.00	0.00
	(0.441)	(0)	(0)
Number of Clinics	0.37	1.40	0.00
	(0.975)	(1.469)	(0)
Free & Reduced Lunch Rate	45.74	42.66	46.85
	(18.57)	(18.46)	(18.49)
N	2856	752	2104

mean coefficients; sd in parentheses

Below is a graph illustrating the trends of female graduation rates in school districts with a Title X clinic and school districts without a Title X clinic. Graph 1 shows the trends of the female graduation rates in school districts with a clinic continuously increasing from 2010 and surpassing the school districts without a clinic closer to 2020. However, Graph 1 also demonstrates how the data is extremely noisy and it is difficult to discern any real effect of the policy on female graduation rates by strictly using this graph.



METHODOLOGY

I use a difference-in-differences design that uses school districts with no Title X clinics before and after the CFPI as the comparison group for school districts with Title X clinics before and after the CFPI as the approach for estimating the effects of the CFPI on graduation rates. I analyze graduation rates overtime because the nature of family planning policy implementation would suggest that the effects grow over time, as Kelly et al. pointed out in their paper (2019). I used the 2009-2012 Title X clinic location data to identify school districts with and without a clinic during the time of the CFPI. School districts with a Title X clinic were defined as the treatment group and the school districts without Title X clinic were defined as the control group.

Assigning school districts with a Title X clinic as the treatment group is an appropriate approach because Kelly et al. (2019) found the greatest effects of the CFPI on reducing teen pregnancy was concentrated for women closest to Title X clinics. Therefore, this reduces the concern that all students had similar access because they could travel to a clinic. To analyze the effect of the CFPI on female high school graduation rates before and after the initiative, I used Classes of 2004-2008 as the years before the CFPI and Classes of 2009-2019 as the years after the CFPI.

The identifying assumption rationalizing this approach is that the school districts with Title X clinics would have access to the CFPI and therefore, access to LARCs. Another identifying assumption is that nothing else changed between the treated and control school districts during this time period.

I began my analysis by estimating Ordinary Least Squares (OLS) models of the following form:

$$\text{Grad\_Rates} = \beta_0 + \beta_1 \textit{Treated}_d + \delta_0 \textit{Post}_t + \delta_1 \textit{Post}_t \bullet \textit{Treated}_d + u_{it}$$

Grad_Rates measures the changes in graduation rates. The dummy, Treated, captures the differences between the treatment (districts with a clinic) and control (districts without a clinic) groups before the CFPI. The subscript d (*Treated*$_d$) reminds us that this varies across school districts. The time dummy, Post, captures the changes in Grad_Rates after the CFPI had been implemented. The subscript t (*Post*$_t$) reminds us that this varies over time. Coefficient δ_1 estimates the causal effect of the policy if the identifying assumptions hold.

Next, I use weights based on the graduating student base within the school districts to adjust for school districts with extremely low graduating student bases. I repeated the regression technique using weights. The weighted and non-weighted regressions are shown in Tables A1-A6.

After adding weights, I include fixed effects for the year (i.e., Class of 2009) and school districts to my estimation to remove the effect of omitted variable bias. The fixed effects hold constant the average effects of year and school districts. The fixed effect regressions are shown in Tables B1-B6 use the following specification:

$$\text{Grad\_Rates} = \beta_0 + \delta_1 \textit{Post}_t \bullet \textit{Treated}_d + \textit{YearFixedEffects} + \textit{SchoolDistrictFixedEffects}.$$

Lastly, I added the CDE's district-level free and reduced-price lunch data to control for differences in poverty across districts to see if poverty was influencing the effect of the CFPI. I also added a population base control variable to control for differences in population sizes across districts that may be changing overtime. This is the preferred specification because it prevents the most omitted variable bias; therefore, it controls for unobservable characteristics that would influence the high school graduation rates other that the treatment. The regressions with control variables, shown in Tables C1-C6, are specified as follows:

$$\text{Grad\_Rates} = \beta_0 + \delta_1 Post_t \bullet Treated_d + \beta_1\text{Free\&ReducedLunch} + \beta_2\text{PopulationBase} + YearFixedEffects + SchoolDistrictFixedEffects.$$

RESULTS

Tables A1 through A6 show some statistical significance for changes in graduation rates; however, without the fixed effects and controls, it is difficult to discern between correlation and causation (see Appendix for tables). Table A1 shows that Hispanic graduation rates are the only statistically significant group with a 5.7 percentage point increase in graduation rates at a 5 percent significance level. When weighted, the results show all graduation rates increasing 1.9 at a 10 percent significance; Black graduation rates decreasing 2.99 percentage points at a 10 percent significance level; Hispanic graduation rates increasing 2.6 percentage points at a 10 percent significance level, and White graduation rates increasing 2.0 percentage points at a 5 percent significance level. Tables A3 and A4 show female graduation rates for all females and females by race and ethnicity. In Table A3, the unweighted regression shows a 6.7 percentage point increase for Hispanic female graduation rates at a 5 percent significance level. When weighted, Table A4 shows Black female graduation rates decreasing on 4.2 percentage points at a 5 percent significance level and White female graduation rates increasing 1.9 percentage points at a 5 percent significance level. Tables A5 and A6 show male graduation rate effects for all males and males based on race and ethnicity. In Table A5, the unweighted regression shows a 7.9 percentage point increase for Hispanic male graduation rates at a 5 percent significance level. When weighted, Table A6 shows no statistically significant changes in male graduation rates. The weighted effects for Black and White female graduation rates indicate the policy is associated with the changes in graduation rates; however, we are unable to state the policy caused these effects without analyzing the fixed effects and control variables. The results could be due to unobservable factors.

Tables B1 through B6 repeat the same DID regressions with the fixed effects of year and school districts. Table B1 results show a 7.0 increase in all Black graduation rates at a 5 percent significance level and a 4.2 percentage point increase in all Hispanic graduation rates at a 5 percent significance level. However, when weighted, Table B2 shows a 1.99 percentage point increase in all graduation rates at a 5 percent significance level and a 1.9 percentage point increase in White graduation rates at a 1 percent significance level. Table B3 shows Black female graduation rates increasing 6.6 percentage points at a 5 percent significance level; Hispanic female graduation rates increasing 4.8 percentage points at a 10 percent significance level, and White female graduation rates increasing 2.1 percentage points at a 5 percent significance level. However, when weighted, Table B4 shows all female graduation rates increasing 1.7 percentage points at a 10 percent significance level and White female graduation rates increasing 1.8 percentage points at a 1 percent significance level. Table B5 shows Black male graduation rates increasing 6.0 percentage points at a 10 percent significance level and Hispanic male graduation rates increasing 5.8 percentage points at a 5 percent significance level. Whereas when weighted, Table B6 shows all male graduation rates increasing 2.3 percentage points at a 1 percent significance level; Hispanic male graduation rates increasing 2.5 percentage points at a 1 percent significance level; and White male graduation rates increasing 2.0 percentage points at a 1 percent significance level.

Tables C1 through C6 repeat the same DID regressions with poverty and population control variables using free and reduced lunch rate mean percentages and the population base along with the fixed effects of year and school districts. Table C1 shows a 7.1 percentage point increase in all Black graduation rates at a 5 percent significance level and a 4.5 percentage point increase in Hispanic graduation rates at a 5 percent significance level. Table C2 shows a 1.3 percentage point increase in White graduation rates at a 5 percent significance level. Table C3 shows Black female graduation rates increasing 6.7 percentage points at a 5 percent significance level; Hispanic female graduation rates increasing 5.1 percentage points at a 5 percent significance level; and White female graduation rates increasing 2.5 percentage points at a 5 percent significance level. When weighted, Table C4 shows White female graduation rates increasing 1.2 percentage points at a 5 percent significance level. Table C5 shows Black male graduation rates increasing 6.0 percentage points at a 10 percent significance level and Hispanic male graduation rates increasing 5.99 percentage points at a 5 percent significance level. Table C6 shows all male graduation rates increasing 1.5 percentage points at a 1 percent significance level; Hispanic male graduation rates increasing 1.9 percentage points at a 5 percent significance level; and White male graduation rates increasing 1.3 percentage points at a 1 percent significance level.

DISCUSSION

As I previously mentioned, Kelly et al. (2019) found that the largest effects of the CFPI were found for 15-19-year-old women. The authors found that births reduced by 20 percent for women 15-17 and 18-19 years old whose zip codes were within 7 miles of a Title X clinic. Lindo and Packham (2017) determined teen pregnancy decreased 6.4% as a result of the CFPI Also, Lindo and Packham found extended effects of the media coverage as the effects of the initiative were beginning to be realized in 2014 and 2015. This indicates that the spread of information about the CFPI and LARCs enhanced the impact; therefore, we would expect that reducing teen pregnancy could have potential positive consequences for women's high school graduation rates. This study found a significant effect of the expansion of LARCs on White female high school graduation rates. The effects on Black and Hispanic women are considered insignificant and less accurate due to large standard errors and insignificant p-values.

Lindo and Packham suggested that the greatest reductions in teen births were in counties with high poverty rates. Moreover, Gorry found that most of the negative effects of teen childbearing impact high-income counties; therefore, decreasing teen childbearing would have more positive impacts on high-income teen populations rather than low-income teen populations. Like these authors, I wanted to include a control variable for poverty in the school districts to analyze if differential changes in poverty were affecting the results. When examining the preferred specification for female and male free and reduced-price lunch mean percentages, the results show that a percent increase in the free and reduced-price lunch significantly decreases the high school graduation rate for all females and males, expect for Black female high school graduation rates. It is interesting that an increase in poverty does not negatively affect Black female high school graduation rates. This difference could be due to an unobservable factor influencing black high school females or possibly due to Blacks being the smallest percentage of the Colorado population compared to White and Hispanics even with a population control and separating effects by race (U.S. Census Bureau QuickFacts: Colorado, n.d.)

The preferred specification, using controls, fixed effects and weights, shows statistically significant changes for all White graduating students; White female students; and all male students, Hispanic male students, and White male students. The most important finding is that White female graduation rates increased by 1.2 percentage points at a 5 percent significance level.

However, the male graduation rate estimates also saw significant effects on graduation rates; White male graduation rates also increased by 1.3 percentage points at a 1 percent significance level. These results indicate that the effects on White female graduation rates could be a trend in high school graduation rates rather than a clear causal relationship using the placebo effect. But this placebo effect is imperfect because the initiative could have affected male high school graduation rates. The significant effects of the CFPI on male graduation rates could argue that the CFPI helped male students graduate from high school. This argument would suggest that female long-acting reversible contraceptive expansion also impacts male outcomes. Fletcher and Wolfe (2012) analyzed the effects of teenage fatherhood on male outcomes by comparing males whose female partner gave birth and those whose partners had a miscarriage. The authors found that teenage fatherhood decreases years of schooling, decreases high school graduation rates, and increases GED receipts (Fletcher and Wolfe 2012). This research provides economic reasoning for arguing that the CFPI also impacted male graduation rates.

It makes economic sense that policy did not significantly impact Black and Hispanic female high school graduation rates because Gorry (2019) found that Black and Hispanic women had no significant negative effects of teen childbearing. Therefore, decreasing teen childbearing would not impact these women significantly. Differences in cultural attitude and stigma surrounding teen pregnancy between different races could have played a role in the support surrounding teen pregnancy (Gorry 2019). Overall, the Gorry explained that policies aiming to reduce teen pregnancy for minority and low-income women should target socioeconomic factors that complement teen pregnancy because targeting teen pregnancy alone does not generate significant positive changes in women's long-term outcomes (Gorry, 2019). This study complements Gorry's assertion by finding that Black and Hispanic women's graduation rates were not significantly affected by the expansion of LARCs and the decrease in teen pregnancy. It is concerning that expanding LARCs through the CFPI and the consequential decrease in teen pregnancy did not significantly impact Black and Hispanic women's high school graduation rates because Black and Hispanic women have the highest rates of teen pregnancy (Child Trends, 2019).

The results do provide valuable insight for policy implications. If a policy is aiming to increase minority women's high school graduation rates, then expanding contraceptive methods may not be the answer because Black and Hispanic female graduation rates did not have significant effects. In addition, Ricketts et al. and Lindo and Packham's suggestions that the increase in LARCs was mainly a result of switching from the pill, indicates that policies might need to specifically target high school girls not already using contraception.

CONCLUSION

The Colorado Family Planning Initiative had many effects on unintended pregnancies for women across the state which was the initiative's goal. Understanding how the initiative affects teen women's high school graduation rates help policymakers know how certain reproductive policies affect education; therefore, policymakers aiming to increase Black and Hispanic female graduation rates would know that this expansion of LARCs may not be the correct policy for that desired outcome.

This study found that it is difficult to discern a causal effect between the CFPI and female graduation rates. The preferred specification shows statistically significant changes for all graduating students, female students, and male students; therefore, these results could indicate a trend in high school graduation rates rather than a causal relationship. Overall, the Colorado Family Planning Initiative's effect on White female high school graduation rates was positive, increasing 1.2 percentage points. Male high school graduation rates may have also been positively impacted by the Colorado Family Planning Initiative. Black and Hispanic female graduation rates were not significantly impacted by the Colorado Family Planning Initiative.

This study could be improved by using Title X clinic distances from high schools and more detailed high school education information. Further research on women's higher levels of education, career attainment, and earnings is also needed to understand the full effects of the policy on women's long-term outcomes.

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APPENDIX

Table A1
All Graduation Rates
(no weights)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	0.336	5.395	5.684**	0.372
	(1.208)	(4.109)	(2.351)	(1.152)
Post	-0.542	-11.73***	-0.146	-1.681**
	(0.691)	(2.334)	(1.602)	(0.745)
Treated	-4.462***	13.91***	-3.841**	-1.989**
	(0.971)	(3.533)	(1.929)	(0.892)
Constant	84.85***	37.11***	69.20***	86.59***
	(0.551)	(2.061)	(1.319)	(0.586)
Observations	2,855	2,528	2,780	2,853
R-squared	0.016	0.049	0.002	0.005

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2
All Graduation Rates
(weighted)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	1.878*	-2.985*	2.613*	2.018**
	(1.099)	(1.660)	(1.374)	(0.867)
Post	-0.425	2.776**	5.435***	-0.989
	(0.893)	(1.360)	(1.153)	(0.697)
Treated	-6.347***	-13.74***	-9.033***	-3.596***
	(0.919)	(1.384)	(1.200)	(0.708)
Constant	81.18***	77.38***	66.22***	85.65***
	(0.749)	(1.145)	(1.011)	(0.570)
Observations	2,839	1,161	2,500	2,826
R-squared	0.036	0.273	0.104	0.013
Weighted	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3
Female Graduation Rates
(no weights)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	0.828	3.788	6.691**	2.130
	(1.300)	(4.290)	(2.845)	(1.306)
Post	-0.706	-9.827***	-0.702	-2.483***
	(0.845)	(2.271)	(1.906)	(0.938)
Treated	-3.149***	16.51***	2.102	-1.244
	(1.021)	(3.719)	(2.366)	(0.990)
Constant	86.24***	28.53***	63.61***	87.88***
	(0.665)	(2.036)	(1.569)	(0.715)
Observations	2,840	2,457	2,721	2,835
R-squared	0.004	0.055	0.008	0.003

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A4
Female Graduation Rates
(weighted)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	1.648	-4.211**	2.408	1.868**
	(1.050)	(2.025)	(1.484)	(0.827)
Post	0.186	3.850**	5.913***	-0.540
	(0.853)	(1.656)	(1.245)	(0.666)
Treated	-5.437***	-11.61***	-7.823***	-3.073***
	(0.878)	(1.676)	(1.297)	(0.675)
Constant	84.00***	81.03***	70.06***	88.21***
	(0.715)	(1.383)	(1.092)	(0.543)
Observations	2,806	851	2,241	2,776
R-squared	0.031	0.224	0.091	0.011
Weighted	YES	YES	YES	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5
Male Graduation Rates
(no weights)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	0.195	3.683	7.905***	0.232
	(1.407)	(3.992)	(2.774)	(1.389)
Post	-0.907	-8.810***	-3.689**	-2.577***
	(0.833)	(2.161)	(1.842)	(0.934)
Treated	-4.617***	14.34***	-2.963	-1.241
	(1.136)	(3.458)	(2.282)	(1.067)
Constant	82.46***	27.63***	62.85***	83.99***
	(0.665)	(1.922)	(1.524)	(0.723)
Observations	2,841	2,483	2,744	2,834
R-squared	0.013	0.047	0.003	0.004

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6
Male Graduation Rates
(weighted)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	2.099	-1.814	2.845	2.112
	(2.513)	(3.593)	(2.898)	(1.725)
Post	-1.111	2.119	4.982***	-1.368
	(1.552)	(2.368)	(1.827)	(1.209)
Treated	-7.196***	-15.77***	-10.20***	-4.075***
	(2.083)	(3.252)	(2.434)	(1.408)
Constant	78.56***	73.64***	62.53***	83.20***
	(1.261)	(2.126)	(1.440)	(0.968)
Observations	2,836	951	2,294	2,794
R-squared	0.039	0.264	0.104	0.014
Weighted	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B1
All Graduation Rates w/Fixed Effects
(no weights)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	0.287	7.019**	4.154**	0.347
	(0.756)	(3.373)	(2.041)	(0.829)

Table B2
All Graduation Rates w/Fixed Effects
(weighted)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	1.994**	-1.117	2.140	1.927***
	(0.971)	(1.954)	(1.548)	(0.723)

Table B3
Female Graduation Rates w/Fixed Effects
(no weights)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	0.934	6.608**	4.767*	2.146**
	(1.005)	(3.114)	(2.462)	(1.087)

Table B4
Female Graduation Rates w/Fixed Effects
(weighted)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	1.666*	-2.139	1.698	1.794***
	(0.954)	(2.118)	(1.648)	(0.668)

Table B5
Male Graduation Rates w/Fixed Effects
(no weights)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	0.183	6.014*	5.793**	0.158
	(0.940)	(3.128)	(2.454)	(1.068)

Table B6
Male Graduation Rates w/Fixed Effects
(weighted)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	2.281***	-0.362	2.540***	2.003***
	(0.510)	(1.451)	(0.939)	(0.468)

Table C1
All Graduation Rates w/Fixed Effects
Poverty and Population control
(no weights)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	0.668	7.060**	4.477**	0.681
	(0.738)	(3.374)	(2.032)	(0.818)
Free & Reduced Lunch Mean Percentage	-0.617***	-1.740***	-0.892***	-0.419***
	(0.0727)	(0.235)	(0.102)	(0.0715)
Population Base	-0.0122***	-0.00110	-0.0155***	-0.00945***
	(0.00162)	(0.00262)	(0.00200)	(0.00147)

Table C2
All Graduation Rates w/Fixed Effects
Poverty and Population Control
(weighted)

VARIABLES	(1) All Graduation Rate	(2) Black Graduation Rate	(3) Hispanic Graduation Rate	(4) White Graduation Rate
Treated*Post	1.190	-1.440	1.491	1.263**
	(0.815)	(1.453)	(1.339)	(0.617)
Free & Reduced Lunch Mean Percentage	-0.410***	-1.471**	-0.591***	-0.247***
	(0.0560)	(0.700)	(0.0853)	(0.0519)
Population Base	-0.00635***	-0.00939***	-0.00924***	-0.00458***
	(0.00102)	(0.00115)	(0.00164)	(0.000784)

Table C3
Female Graduation Rates w/Fixed Effects
Poverty and Population Control
(no weights)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	1.319	6.625**	5.076**	2.457**
	(0.990)	(3.116)	(2.455)	(1.079)
Free & Reduced Lunch Mean Percentage	-0.606***	-2.059***	-0.805***	-0.418***
	(0.0830)	(0.150)	(0.135)	(0.0706)
Population Base	-0.0122***	-0.00181	-0.0146***	-0.00893***
	(0.00170)	(0.00301)	(0.00228)	(0.00148)

Table C4
Female Graduation Rates w/Fixed Effects
Poverty and Population Control
(weighted)

VARIABLES	(1) Female Graduation Rate	(2) Female Black Graduation Rate	(3) Female Hispanic Graduation Rate	(4) Female White Graduation Rate
Treated*Post	0.887	-2.288	1.062	1.175**
	(0.816)	(1.707)	(1.479)	(0.579)
Free & Reduced Lunch Mean Percentage	-0.387***	-0.121	-0.545***	-0.246***
	(0.0618)	(0.0798)	(0.111)	(0.0504)
Population Base	-0.00638***	-0.00927***	-0.00934***	-0.00443***
	(0.00104)	(0.00145)	(0.00181)	(0.000718)

Table C5
Male Graduation Rates w/Fixed Effects
Poverty and Population Control
(no weights)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	0.550	6.044*	5.998**	0.470
	(0.927)	(3.127)	(2.448)	(1.059)
Free & Reduced Lunch Mean Percentage	-0.622***	-1.585***	-0.916***	-0.398***
	(0.0788)	(0.237)	(0.145)	(0.0897)
Population Base	-0.0118***	-0.00126	-0.0133***	-0.00887***
	(0.00160)	(0.00275)	(0.00201)	(0.00150)

Table C6
Male Graduation Rates w/Fixed Effects
Poverty and Population Control
(weighted)

VARIABLES	(1) Male Graduation Rate	(2) Male Black Graduation Rate	(3) Male Hispanic Graduation Rate	(4) Male White Graduation Rate
Treated*Post	1.461***	-0.869	1.891**	1.304***
	(0.478)	(1.367)	(0.892)	(0.450)
Free & Reduced Lunch Mean Percentage	-0.426***	-1.336**	-0.638***	-0.241***
	(0.0715)	(0.602)	(0.109)	(0.0693)
Population Base	-0.00623***	-0.00936***	-0.00897***	-0.00465***
	(0.000319)	(0.000918)	(0.000597)	(0.000305)