# Health Insurance and Fertility Decisions: Evidence from Affordable Care Act Young Adult Provision

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**Abstract**

This study provides evidence of the impact of health insurance on fertility decisions in the context of young adults. The Affordable Care Act young adult provision has been shown to expand private health insurance coverage for the intended age group. Having health insurance improves access to family planning services and could reduce unintended pregnancy. The provision may also improve health insurance access during pregnancy and encourage child births. Using birth certificate data and a difference-in-differences study design, we examined the impact of the provision on fertility rates, prenatal care and birth outcomes by comparing the targeted group to slightly older adults. We found that the young adult provision reduced fertility rates by about 5% in the first 3 years following the policy change and increased the share of children born to unmarried, minority, or less educated mothers. The evidence also suggests that the provision encouraged earlier initiation of prenatal care and reduced maternal smoking and pregnancy complications. However, birth weight and gestational age seems to be non-responsive to the provision.

**Keywords:** Health Insurance, Young Adults, Fertility, Birth Outcome, ACA.

**JEL Classification Numbers:** I13, I18.

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# 1 Introduction

Fertility decisions have profound implications on outcomes of young women including marriage, education, and labor market participation decisions (Bailey [2006], Goldin and Katz [2002]), and outcomes of children such as infant health and socioeconomic conditions of the families they are born into (Ananat and Hungerman [2012]). Figure 1 shows the age distribution of mothers in the years 2009 to 2013. Fertility decisions are the most relevant to young women age 20 to 30.

However, a large fraction of births result from unintended pregnancy. Data from the 2002 National Survey of Family Growth suggest that about one-third of births are unintended (Chandra et al. [2005]). Young adults are at particularly high risk of unintended pregnancy; the unintended pregnancy rate of women in their early 20s is more than twice the national rate. Improved access to family planning services for this age group can potentially reduce unintended pregnancy and births.

The Affordable Care Act (ACA) young adult provision was introduced in 2010 to reduce the uninsurance rate among young adults by allowing them to stay on their parents' health insurance plans until their 26th birthday. Studies have shown that this provision improved insurance coverage for the targeted 19-25 age group (Antwi et al. [2013], Sommers and Kronick [2012], and Cantor et al. [2012b]). Although the policy intention was to insure this population against medical risks, it could also change incentives for other activities including fertility decisions. This study focuses on the effect of expanded private insurance for young adults on fertility decisions, prenatal care and birth outcomes, providing new evidence on health insurance and fertility.

The expanded health insurance improves the access to family planning services and thus can reduce unintended births. Moreover, it decreases the price of avoiding a child by detaching fertility decisions from decisions of marriage and sexual activities. On the other side, health insurance pays for prenatal care and delivery which can reduce the price of a child and encourage fertility. However, uninsured women can generally gain Medicaid coverage once they become pregnant and Medicaid already pays for over 40% of childbirths. Considering the role of Medicaid in covering childbirths before the provision, it is more likely that the effect of improved access to family planning would dominate and fertility is reduced as a result.

Using birth certificate data and a difference-in-differences framework, we compared adults 23-25 years old to slightly older adults age 27-29, before and after the provision to identify its causal impact on fertility decisions. The treatment group is narrower in age than the standard 19-25 year-old used in the literature to ensure more similar labor market trends with the 27-29 year-old control group. We found that the provision reduced fertility by 5%, which is about 4 births per 1000 women. Based on the number of women in the treatment group in 2009 $(6,218,541)$, $24,874.164$ fewer babies are born. The reduction in fertility is concentrated among married and white mothers. This result is consistent with the expectation that the effect of improved access to contraceptives would be more prominent than that of the price reduction of having children. Our previous study[1] found an almost one-on-one crowd-out from Medicaid to private insurance for targeted mothers.

We also examined the change in maternal characteristics due to the provision. The provision increased the share of children born to unmarried, minority mothers, or mothers receiving welfare benefits. The mother of the marginal baby is also less likely to have college education. These results suggests that women who are potential mothers of babies of "higher-than-average" outcomes disproportionately selected into delay or avoidance of childbirth.

These observations have a number of implications. The delay or avoidance of childbirth can be a result of women choosing education or work over childbearing in the early adulthood. The cohort could thus benefit through higher education and stronger labor market experience because of this provision. However, if the higher investment in education or work experience is concentrated among advantaged women, the socioeconomic gap between advantaged women and disadvantaged women can widen as a result.

[1]"Medicaid Coverage for Births after ACAs Dependent Coverage, with Yaa Akosa Antwi, Aaron Carroll, and Kosali Simon, *New England Journal of Medicine* (research letter, forthcoming)

In addition to fertility, the young adult provision could intensify prenatal care and improve birth outcomes through better health insurance during pregnancy. In our examination, we found evidence for earlier initiation of prenatal care but birth weight and gestational age were non-responsive. One natural explanation is that the change in prenatal care is not substantial enough or that prenatal care is not effective in improving birth outcome in this situation.

However, another possible explanation is that the heterogeneous response in fertility where the marginal child born into more disadvantaged mothers result in worse birth outcomes. To isolate the effect on birth outcomes of the improvement of insurance coverage during pregnancy from changes in mother's composition, we study the transition period from March 2010 to October 2010 where the insurance substitution had already begun while the mother's composition was fixed because the conception happened before the enactment of ACA. We employed an instrumental variable approach using the policy as an instrument of private insurance. We found suggestive evidence that having private insurance other than Medicaid increased birth weight, although the result lacked statistic power. The insurance change might not be substantial enough in this period since it was before the official implementation date of September 2010. Even for insurance companies who responded before September, potential recipients would sign up only gradually.

This paper is structured as following. Section 2 discusses details of the ACA young adult provision and previous literature. Section 3 first sets up a basic model to capture the interaction between health insurance and fertility decisions and extracts theoretical hypotheses, and introduces the empirical methods used to test those hypotheses, and reports the data used in the study. Section 4 reports and discusses the results; robustness checks using alternative models are also included. Section 5 summarizes the paper and provides additional discussions.

# 2 Background

## 2.1 The ACA Young Adult Provision

Young adults are at the highest risk of being uninsured. The full-year uninsurance rate among 19-25 years old young adults, was 37 percent based on Current Population Survey (CPS) 2008 data, compared to 18 percent for those aged 12-18 years and 25 percent for those aged 26-35 years.

The ACA young adult provision requires health insurance plans with dependent coverage to allow young adults to be kept on or added to a parent's plan until they turn 26 years old. The eligibility is regardless of marital status, student status, even if they are not living with their parents, claimed as a dependent on their parents' tax return, or eligible to enroll in their own employer's plan. The ACA was signed into the law on March 23, 2010 and the young adult provision was implemented on September 23, 2010.

However, the exact implementation date of the provision is hard to pin down. On one hand, plans are only required to comply with the provision from the next renewal dates. Renewal dates vary across plans and about two thirds of the plans renew in January [2]. On the other hand, the secretary of Health and Human Services called on leading insurance company to start covering eligible young adults, especially to avoid the gap between graduation in May and plan renewal date. A number of insurance companies responded to the call and start enrolling young adults before September [3].

The one exception of the provision is for grandfathered plans which are group plans created or individual plans purchased before March 23, 2010. Grandfathered plans are exempted from the young adult provision. According to Kaiser Employer Survey fifty-four percent of firms offering health insurance benefits had at least one grandfathered plan in 2013, which was 58% in 2012, and 72% in 2011.

Figure 2 shows the private insurance coverage for age 15-30 in 2009 and 2011. While the

[2] Depew [2012]'s calculation using Form 5500 tax records from firm welfare plans in 2009

[3] See a list of the companies at $https://www.cms.gov/CCIIO/Resources/Files/adult_child_faq.html$.

private insurance rate was lower in 2011 for adults older than 26 than that in 2009, it was similar for the targeted 19-26 group; in another word, a relative increase in private insurance for the targeted group.

The provision has been examined by several papers about its effect on the insurance status of the target group and they all found significant increase in young adults' insurance coverage. Antwi et al. [2013] found that the implementation of the provision increased health insurance coverage for 19-25 age group by 3.18%. For women, the health insurance coverage increased by 1.96%. I included the effect by subgroups from Antwi et al. [2013] in Table 1 to provide a reference of "treatment intensity" for later analysis.

## 2.2 Motivation and Literature Review

Fertility as an economic decision was first examined by Becker [1960]. In Becker's initial model, parents face trade-off between having children and consumption of other goods. They make decisions on the number of children to maximize the total utility derived from raising children and consuming other goods. This framework was later adopted to analyze the economics of fertility decisions. [4] Studies on how health insurance changes fertility decision follow the framework of Becker's pioneering work. Health insurance changes the cost of familiy planning services and the price of a child through paying for delivery and prenatal care, and could potentially affect fertility decisions.

Empirical evidence concentrated on Medicaid expansion from mid 1980s to mid 1990s. During that period, Medicaid greatly expanded the income eligibility for pregnant women and their children. Between 1987 and 1992, the eligibility of pregnancy-related services more than doubled among women of childbearing age. The proportion of children eligible for full Medicaid coverage rose by 50% (Currie and Gruber [1996a]). Though the take-up rate was far from one hundred percent and approximately 50% of the increase was associated with a

[4] Because children are regarded as normal goods, to explain the trend that wealthy countries have lower birth rates, Becker and Lewis [1973] separates fertility decisions into the combination of quality and quantity, and suggests that higher income induces parents to invest in the quality of children. So the birth rate could be actually lower.

reduction in private insurance coverage, the expansion has been shown to increase insurance coverage for the eligible group. Medicaid now plays an essential role in birth-related medical expense: more than one third of births are paid by Medicaid because women gained Medicaid coverage during pregnancy. 12% of women of reproductive age are covered by Medicaid and among women of reproductive age below poverty, 37% are covered by Medicaid (Gold and Richards [2007]).

However, the effect of Medicaid expansion on fertility remains unclear. Joyce et al. [1997] suggested that Medicaid expansion was associated with a 5% increase in the birth rate among white women. The increase is likely due to the forgone abortion. Joyce and Kaestner [1996] showed that Medicaid expansion reduced abortion among unmarried nonblack women with less than a higher school degree. However, Bitler and Zavodny [2010] and DeLeire et al. [2011] found little evidence to support that women changed their fertility decisions due to Medicaid expansion. One thing to note here is that Medicaid did cover lower income women with dependent children, but its coverage for childless adults was rather minimal before the recent 2013 expansion, which leaves 20% women of reproductive age (15-44) uninsured.

The ACA young adult provision provides another chance to understand the effect of insurance coverage on fertility. The provision has been shown to increase coverage among the targeted 19-25 age group (Antwi et al. [2013], Sommers and Kronick [2012], Cantor et al. [2012b]). Antwi et al. [2013] found that the health insurance coverage for women increased by 1.96% after the implementation of ACA mandate. In particular, the employer dependent coverage increased by a total of 9.64%. The provision has been examined for other effects including labor market outcomes (Depew [2015]), financial security(**?**), access to medical care (Antwi et al. [2014]), and preventive and behavior outcomes (Barbaresco et al. [2015]). The effect of pregnancy coverage provided by the provision is likely to be substituting the existing Medicaid coverage, as Medicaid is already covering more than one-third of births and leaving very few uninsured pregnancy even before the young adult provision (reference).

Unlike Medicaid expansion which mainly covered women after pregnancy, ACA provision allows insurance coverage for young adults before they are pregnant. A key difference between these two types of coverage is in the access to family planning services. Evidence of insurance coverage of family planning services on fertility decisions showed that the access to family planning service helps reduce levels of unprotected sex and increase the use of more effective contraceptive methods (Sonfield and Gold [2011]). Mellor [1998] also found large negative effect of family planning programs on the probability of giving birth.

In addition, ACA also requires contraceptives to be covered in private insurance plans without cost sharing and this requirement has gone into effect for most plans since January 1, 2013. Young adults who gained access to family planning services could potentially timing their pregnancy better and reduce unintended one.

Family planning services are covered standalone for low income women regardless of whether they meet the other criteria of Medicaid in 22 states in 2011. Kearney and Levine [2009] showed that expanded eligibility for family planning services in Medicaid reduced overall births to non-teens by 2% and the reduction was suggested due to increased contraceptive use. However, even with standalone family planning services, Medicaid's offer before pregnancy is much less comprehensive.

In addition, Peipert et al. [2012] found that no cost access to contraception reduced abortion rates and teenage birth rates through the reduction of unintended pregnancy and young adults are at particularly high risk of unintended pregnancy. [5]The ACA provision may have a substantial impact on family planning decisions compared to Medicaid expansion.

Examination of access to the pill and fertility suggests an important distinction between the long term effect and short term effect (Ananat and Hungerman [2012], Goldin and Katz

[5]A side evidence of unintended pregnancy is the high abortion rate among young adult women. Women in their 20s also accounted for the majority of abortions and had the highest abortion rate. "In 2011, women aged 20-24 and 25-29 years accounted for 32.9% and 24.9% of all abortions, respectively, and had abortion rates of 24.9 and 19.4 abortions per 1,000 women aged 20-24 and 25-29 years, respectively. In contrast, women aged 30-34, 35-39, and 40 years accounted for 15.8%, 8.9%, and 3.6% of all abortions, respectively, and had abortion rates of 12.7, 7.5, and 2.8 abortions per 1,000 women aged 30-34 years, 35-39 years, and 40 years, respectively." (Pazol et al. [2014]). ecent public health efforts have improved unintended pregnancy prevention: in 2013, the teen birth rate was 26.5 births per 1000 women of the age range, a 57% decline compared to 1991 (CDC).

[2002] and Bailey [2006]). Reduction in short term fertility was suggested to be a delay of birth instead of complete avoidance, leaving the life-time fertility unchanged. In this paper, we analysis data from the immediate three year after the provision so the effect is more likely to be short term.

The impact on fertility in addition has implication on prenatal care and birth outcomes. Ananat and Hungerman [2012] found that in the short run birth weight became lower because delay or avoidance accrued to women with above-average characteristics. However, if the improved coverage does reduce unintended pregnancy, better planning and preparation for birth prenatal care may also result in more intensive prenatal care and improved birth outcomes. Joyce and Grossman [1990] found pregnancy intendedness was associated with earlier initiation and more prenatal visits. Earlier initiation of prenatal care is especially important for improving birth outcomes. Public Health Service [1989] recommended that when the first visit takes place at 6 to 8 weeks of gestation, the activities of prenatal care will be substantially more effective than when the first visit is delayed to the second or third trimester.

Changing insurance coverage during pregnancy may also affect birth outcomes. One important motivation for Medicaid expansion was to encourage prenatal care utilization because timely and adequate prenatal care has been shown to improve birth outcomes. Currie and Gruber [1996a] suggested that increased Medicaid eligibility for pregnant women and children was also associated with a sizable and significant reduction in child mortality. Rosenberg et al. [2007] found pre-pregnancy Medicaid coverage is associated with early initiation of prenatal care. However, Dave et al. [2008] found no evidence for Medicaid expansion to improve prenatal care or birth outcomes.

Private insurance generally provide more generous coverage and payment schedule for physicians than Medicaid (reference). This, the potential substitution between two insurance types may help in addition improve prenatal care and birth outcomes. Along with the eligibility expansion, Medicaid also enhanced coverage for prenatal care. Baldwin et al.

[1998] showed that the enhanced coverage increased the completeness of prenatal care visits and resulted in higher average birth weight. Medicaid has long been criticized to have low payments and thus a significant portion of physicians does not participate in Medicaid. Currie et al. [1995] analyzed the impact of Medicaid fee policy on infant mortality and found that increase in Medicaid's payment to physicians was associated with significant reduction in infant mortality rate, possibly through improved prenatal care. On the other hand, ACA provision offers coverage before pregnancy occurs. Earlier coverage itself can result in more prenatal visits.

In another study, Currie and Gruber [2001] studied the crowd-out part of Medicaid expansion: they found that among women with more education there was a countervailing effect on procedure use because most of them had private insurance before the expansion. However, the birth outcomes are insensitive to this reduction in prenatal care. The literature on the benefit of prenatal care also point out that additional visits might not be very critical for birth outcomes.

# 3 Methods

## 3.1 The Conceptual Model

Following Becker's classic fertility decision model but with an emphasis on the importance of family planning services, we model the number of children as a function of spending on family planning services. Households indirectly determine the number of children through the spending on family planning services. The maximization problem is given below.

$$\max_x U[n(x), y]$$

$$s.t. I = n * \pi_n + x * \pi_x + y * \pi_y$$

where $n$ is the number of children, $x$ spending on family planning services. and $y$ represents all other consumption; $\pi$'s are their corresponding prices.

First order condition below suggests that families increase their spending on family planning services until the marginal benefit of the number of children equals the marginal cost of giving up other consumptions.

$$(U_n * \pi_y - U_y * \pi_n) * n'(x) = U_y * \pi_x$$

The expansion of health insurance affects both the price of children $\pi_n$ and the price of family planning services $\pi_x$ in the oppsite direction. If the total effect is to increase $\pi_n * n' + \pi_x$, i.e. the birth price reduction dominates, the optimal number of births will increase. If family planning services price reduction is dominating and $\pi_n * n' + \pi_x$ is reduced, then the number of birth actually decreases. Thus, the effect on the number of children is ambiguous.

Consider the substitution between private coverage and Medicaid, it is likely that the contraceptive price reduction is more prevalent. So we hypothesize that the young adult mandate would result in a reduction in fertility rate.

The effect on prenatal care and birth outcome is uncertain. The improved coverage would encourage the use of prenatal care in the form of earlier initiation and more prenatal visits. Also, the reduction of unwanted pregnancy would also increase prenatal care. However, if the average mother's characteristics were worsened, either due to their different elasticity of the family planning service or the heterogeneous insurance change due to the provision, the birth outcomes can be worse.

For subgroups, the expected expects depend on the interaction between the relative magnitude of private insurance coverage gain from the provision and the likelihood to make use of the coverage. We hypothesize the expect to be stronger among white mothers because they were more likely to gain insurance from the provision. The comparison between married and unmarried mothers remains unclear because the unmarried mothers experienced larger insurance gain but the married mothers were more likely to plan for the birth.

### 3.2 The empirical approach

We use a difference-in-difference framework to identify the effect of ACA young adult provision on fertility, prenatal care and birth outcomes. The specification is shown below:

$$Y_{gt} = \beta_0 + \beta_1 * Treat_g + \beta_2 * Post_t + \beta_3 * (Treat_g * Post_t) + \gamma' X_{gt} + \epsilon_g t$$

We control for time trends by including calender month dummies and year dummies. A linear time trend is also added to soak changes common for two groups but varying linear in time. Year fixed effects help to control for unobserved measures that are common to all mothers within a given year and month fixed effects remove the unmeasured factors that contribute to seasonal fluctuations in births. Year dummies are also helpful in accounting for the sample composition change caused by gradual adoption of the 2003 certificate.

Data is collapsed to cell level of race-marital status-education-age. Following DeLeire et al. [2011], cell level fixed effects are included to control for unobserved factors that are invariant within a cell that also might be correlated with Medicaid eligibility and fertility. Standard errors are clustered at the age-month level. We focus on the results of cell-level analyses to keep the consistency across fertility and other outcomes.

To account for the concern that the differential trends by age groups, possibly from labor market shifts especially during 2007-2009 may contaminate any age-time difference-in-difference analysis, we include an interaction between the unemployment rate and the treatment status in addition to controlling for unemployment rates. Unemployment rates are lagged for 9 months for the fertility model.

For fertility, logged birth counts at the cell level are used as the independent variable and logged female population is included as a regressor. The reason to use logged birth counts but not fertility rates is due to the availability of population data: the most disaggregate population is at race-age-month level which does not match the regression cell. The same specification is used in Medicaid and fertility literature (e.g. DeLeire et al. [2011]). Fertility regression is weighted by female population at the race-age level and prenatal outcomes are weighted by birth counts in each cell. We also control for baby's gender in prenatal care and birth outcome models.

$Treat_g$ is a dummy variable for the treatment group. The treatment group is defined as mothers between 23 and 25 years of age and the control group consisted of mothers between 27 and 29 years of age. We leave out 26 year-olds for the unambiguity of their treatment status. Although the law affects age 19-26 year olds, we focus on mothers 23-25 because they are potentially more similar to the older control group, both in underlying labor market trends and in fertility decision mechanism.

Figure 3 shows unemployment trends for age 19-22, 23-25 and 27-29 groups. The trends are more similar between 23-25 and 27-20 than between the younger group and 27-29 group. Slusky [2003] also suggested that narrowing bandwidth for the treatment and control group can help improve model performance in placebo tests. Our own tests also suggested that the older control group performed better in pre-trend tests and placebo implementation tests.

School enrollment can be very relevant with fertility decision mechanism. Most people do not finish college before age 22. Figure 4 shows the school enrollment rate by age. It suggests that the school enrollment declines more rapidly before age 23 and the change becomes more smooth afterwards. For mothers who are still in school, pregnancy is more likely to be an accident and thus the patterns different from old mothers.

Another concern for using the older moms as the control group is to eliminate variation from prior state young adult provision. Most prior state young adult provision laws capped provision at 22 years old. Starting from age 23 avoids this type of variation. In addition, the younger 19-22 group and full time students are also less affected by the young adult provision: they gained less coverage.

$Post_t$ is a dummy variable for policy implementation. The young adult provision was announced in March 2010 and went into effect in September 2010. However, the majority of private insurance plans (reference) renew in the beginning of a year so the full effect should be expected from Jan 2011. Timeline of the young adult provision is shown in Figure 5.

Fertility decisions for births before Nov 2010 should not be affected because those decisions were made before the announcement of the provision. Babies conceived after the full effect date Jan 2011 would start to be born from Oct 2011. For a clear picture, we dropped the transitional period. For fertility analysis, the post period started from Oct 2011, dropping Nov 2010 to Sep 2011. The impact on prenatal care and birth outcomes may start as early as March 2010 due to the private insurance during the pregnancy. For prenatal care and birth outcomes, the post period started from Oct 2011 dropping Mar 2010 to Sep 2011.

## 3.3 Data

The main dataset used in this study is the Natality files collected through the National Vital Statistics System by the Centers for Disease Control and Prevention. They contain information filled in the birth certificates for all states. It provides information on prenatal care and measures of birth outcomes. It also has demographic information of the parents. To measure fertility rates, population data are obtained from National Population Estimates by U.S. Census Bureau, Population Division [6]. One important control variable-unemployment rate-is obtained from Labor Force Statistics from the Current Population Survey. The unemployment data is monthly by race for age group 18-19, 20-24 and 25-29.

The sample period examined in this study is from 2009 to 2013. Birth certificate underwent systematic update during the sample period: states began adopting the 2003 revision of the U.S. Standard Certificate of Live Birth from 2003, but full implementation in all states has been phased in over several years. The number of states and territories adopted new certificate rose from 28 in 2009 to 39 (including D.C.) in 2012.

[6] The Census Bureau's Population Estimates Program (PEP) produces estimates of the population and these estimates are used in federal funding allocations, as survey controls, as denominators for vital rates and per capita time series, and as indicators of recent demographic changes.

Among our outcome variables, only birth weight and birth counts are comparable across two versions of birth certificates. Maternal smoking and prenatal care, though included in both versions, are not comparable because of changes in how questions are specified and the source where information is obtained. According to the documentation of the 2009 natality file, after adopting the new certificate the average number of prenatal visits in a certain county was more than 10% lower than the number collected in the previous year. Other outcome variables are only available for 2003 certificates. To avoid such inconsistency, we only keep the information from the updated 2003 certificate[7].

Summary statistics of covariates for the treatment group and control group are shown in Table 2. It suggests that our treatment group and control group are very different in observed covariates and we need to account for those differences in our empirical framework. The table also reports the statistics for 19-22 age group. The comparison suggests that the 23-25 year-old appears to be more similar to the control group of older moms 27-29.

Table 3 shows the summary statistics of outcome variables. We examine four sets of outcomes: fertility; infant health including birth weight and gestational age; mother's behaviors and health including maternal smoking, weight gain, gestational diabetes and hypertension; medical utilization such as prenatal visits, which month after pregnancy prenatal care started, use of infertility treatment, and cesarean delivery. The control group has higher fertility, uses more prenatal care and other medical assistance, and has better birth outcomes as in higher birth weight of the babies.

[7]Saadi et al. [2013] accessed the data quality of 2003 certificate by comparing to hospital record data. They found that prenatal care (visits and timing), diabetes and hypertension are among the lowest agreement and huge variation of data quality across hospital and states. 2012 natility documentation also noted unusually high missing among certain states for key outcomes: unusually high missing: Georgia (13%) and Nevada (17.2%) for prenatal visits, Georgia (21.9%) for smoking, Georgia (15.1%) for weight gain, Massachusetts (11.8%) and New Mexico (25.4%) for payment, Georgia (13.3%) for prenatal care start date.

# 4 Results

## 4.1 Fertility

We first examine the effect of young adult provision on fertility decisions. Figure 6 shows the fertility trend from 2009 to 2013. The red lines are drawn at Nov 2010 and Oct 2011, when the births after the provision was announced and or went into full effect were expected to show up in the data. From the graph, the treatment group and the control group seemed to have very similar trends up until 2010. Both the treatment and control groups showed upward trend throughout the sample period, but the gap between two groups appeared to become larger after the provision. In other words, fertility of the treatment group was not increasing as fast as that of the control group, which implied a relative drop in fertility for the treated mothers.

Table 4 reports the regression results for fertility changes in the full sample and by marital status and race subgroups . Panel 1 results are from the specification described in the method section with the older treatment groups age 23-25. The main result suggests that the provision resulted in a 4.95% decrease of fertility. This is consistent with our hypothesis that the enhanced family planning coverage provided by insurance coverage reduced fertility, possibly through more use of family planning services.

The effect was concentrated on married mothers, who were more likely to plan for births than unmarried mothers. Among race subgroups, white mothers experienced the largest effect, a 5.40% decrease. Fertility among Hispanic mothers showed very little change. This might be because that the effect of the provision on insurance was relatively small among Hispanics. Table 5 reports results among subgroups by education. The sign of most coefficients are also negative. The fertility among mothers with less than high school education experienced the largest drop of 10.2% and the coefficient is significant at 1% level.

In addition to the main specification, Panel 2 of two tables report results with the broader treatment group of age 19-25. The signs are agreeable between two specifications but the magnitude of estimates using the broader treatment group is generally larger than those using the narrow treatment. The comparison across subgroups is very similar too, with the effect concentrating on married and white mothers.

The potential channel for the provision to reduce fertility is through encouraging the use of family planning services. We provide evidence for this channel using MEPS data. Table **??** shows the percentage of women in treatment and control age groups who used prescription contraceptive drugs in 2009-2010 and 2011-2012. The percentage for the treatment group increased more after the provision compared to the control group.

## 4.2 Mother's Composition

To examine the selection of women of different characteristics into delay or avoidance of childbearing, we apply the DD framework to the composition of mothers. The natality dataset has other's demographics including marital status, race, education; pre-pregnancy health such as pre-pregnancy diabetes, hypertension and BMI, and welfare program participation-The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

Because we are examining the proportion of mothers for each characteristics, we can no longer use cell level data for this analysis. Instead, we use aggregate data at age-month level and the model includes linear age, year-month FE, unemployment and its interaction with treatment status in additional to the DD variables. The estimation is weighted by female population and standard errors are clustered at age level.

Table 7 to 9 reports changes in mother's characteristics for the marginal child. The mother became less likely to be married, less likely to be white and more likely to be black. The education level also shifted to be more likely high school graduates than college and higher degree holders. The mother was also more likely to be smokers before pregnancy and received WIC. All these indicated that the marginal child was more likely to be born into a more disadvantaged family. In another word, women of more advantaged background disproportionally delayed or avoided childbirth provided the ACA young adult provision.

There are two possible explanations for the heterogeneity in response. On one hand, this may results from different treatment intensity for subpopulation. For example, Table 1 suggested that the insurance coverage gain was larger among white women than black women. White women thus gained more access to family planning services and thus avoided or delayed child birth. It could also because of the difference in elasticity. For example, married women might be more elastic to the price change in family planning services. Despite their relative smaller gain in insurance coverage, their fertility showed a larger drop.

The change in mother's characteristics of the marginal child also has implications on birth outcomes. Intuitively, infant health of more disadvantaged women would be worse than advantaged mothers. Table 10 shows that birth weight is higher for married mothers than unmarried mothers, higher for white mothers than black mother.

We then examined the fertility decisions using aggregate data. In addition to using log count and controlling for female population in the main specification, we can now compute the fertility rate as the number of new born per 1,000 women in the group. Table 11 reports the estimation for log count, fertility rate and log fertility rate. The upper panel shows the estimation is similar to the main specification, with fertility rate dropping 5.07%.

To measure the magnitude of changes of mother's characteristics for the marginal child, we construct Wald estimates similar to estimate in an instrumental variable approach, by dividing the coefficients of mother's characteristics by the coefficient of fertility change. To use a consistent model, we choose the estimate using aggregate data and log fertility rate. The estimation is reported in the bottom row of Table 7 to 9. For example, the marginal child is 9.23% more likely to have a mother receiving WIC benefits.

However, the lower panel of Table 11 reports results controlling for the proportion of married mother, race and education distribution. The estimates are reduced to almost zero after controlling for demographic compositions.

## 4.3 Prenatal Care and Birth Outcomes

Figure 12 shows the difference between the treatment and control groups in the number of prenatal visit, which month prenatal care started, whether or not infertility treatment was used for this pregnancy and whether or not it was a cesarean delivery. Ideally, we would like to see constant difference before the provision and changes after the provision. The difference was fairly constant before the provision except for infertility treatment use. The post difference for prenatal visits and cesarean delivery was not obviously different. For month prenatal care started, there seemed to be a drop after the provision. The treatment group may have started to go to the doctor's earlier. The changing difference raises concerns for the identification strategy for infertility treatment.

Figure 13 shows mother's behaviors including maternal smoking and weight gain, and mother's health including gestational diabetes and hypertension. The graphs do not suggest strong changes but nonetheless support common trends between the treatment and control group.

From Figure 14, we observe difference between the treatment and control groups over time for birth weight and gestation age. Except for the birth weight graph, other graphs show relatively constant difference between the treatment and control group, supporting the common pre-trend assumption. The birth weight graph may be somewhat worrying due to the downward trend before the provision.

The regression results for medical utilization are shown in Table 12. The number of prenatal visits increased by a small margin: 0.0267 visit is less than 1% of the average number of visits for the treatment group before the provision. Mothers do start to go to the doctors earlier in the pregnancy: 1.35 percentage more mothers started prenatal care in the first trimester, which was about 2% of the prior average. The increase was accompanied by a reduction of care starting in later trimesters, rather than an increase of the extensive margin where more mothers got prenatal care. Percentage of whether or not had any prenatal care hardly changed. Having private insurance before pregnancy rather than signing up for

Medicaid after becoming pregnant seemed to encourage earlier initiation of prenatal care. In theory, the earlier initiation of prenatal care can contribute to better birth outcome. The provision did not seem to have an impact on cesarean delivery. The drop in infertility treatment was rather unintuitive; I expect more mothers would have access to infertility treatment due to the private insurance coverage.

Table 13 reports results for mother's behaviors and health. Maternal smoking, gestational diabetes and hypertension was reduced by the provision. Overall, the provision improved maternal health. I also include two smoking cessation measures: quit smoking before pregnancy among those mothers who were smoking within 3 months of the pregnancy, and quit smoking during pregnancy among mothers who were smoking during the first trimester but not the third trimester. Surprisingly, there was fewer mothers who quited smoking before pregnancy, which was not exactly consistent with the improved birth planning hypothesis.

Infant health, however, did not seem to respond to the provision. Birth weight instead showed a very small drop around 0.1%. There seems to be a small reduction in pre-term births. Overall, the improved prenatal care and possibly better planned birth did do much to improve infant health.

The previous literature on the effect of the pill and birth decisions found that the short term effect of pill led to mothers of "above-average" babies to retime their birth. So the short term birth quality was actually worsened. If the access to family planning services similarly reduced "above-average" babies in the immediate 3 years following, the birth results can be worse even with improved prenatal care.

Using the information in Table 14 and Table 4, we measure the characteristics of those avoided, or marginal, children, if changes in the composition of births immediately after provision resulted from the differential avoidance of some types of births (Ananat and Hungerman [2012]). We divide the change in average characteristics by the change in fertility rate to create a Wald estimate of the marginal child's characteristics. Here birth weight decreased by 3.176 grams and the fertility decreased by 409.95%, so the Wald estimate suggests that the marginal child is 64.141 (3.175/0.0495) grams heavier.

## Heterogeneity of Prenatal Care and Birth Outcomes

We examined heterogeneity across marital status, race and education by estimating the model among subgroups. Table 15 shows the heterogeneity of medical utilization by marital status. Both groups show improved prenatal care in the form of earlier prenatal care initiation, and the number of prenatal visits also increased for married mothers. This poses an interesting contrast because the effect of the provision was substantial for unmarried population and the insurance composition change during pregnancy was concentrated on unmarried mothers too. The married women appear to make more use of services provided by insurance. The fertility reduction was also more prominent among married mothers.

Table 16 suggests that effects mother's health were similar between married and unmarried mothers. Maternal smoking was reduced in both groups by about 0.2 percentage. However, the relative magnitude was much larger for married mothers because of their lower smoking prevalence: maternal smoking went down about 2.6 percent for married mothers compared to 1.3 percent for unmarried mothers. Married mothers also experienced larger reduction in maternal weight gain. However, the improved prenatal care did not spill out to improve birth outcomes for married mother as Table 17 shows. A small increase in gestational age and reduction in preterm births were observed for unmarried mother.

Table 18 reports regression results by race and ethnicity groups. Three groups all experienced improved prenatal care and reduction in infertility treatment. Black mothers experienced the largest improvement both in the number of prenatal visits and proportion started prenatal care in the first trimester. Table 19 suggests that more black mothers also quited smoking and they gained more weight during pregnancy. The birth outcomes again showed little evidence for improvement for all race groups (Table 20).

Examination shown in Table 21 to Table 23 revealed similar effects across education levels: improved care, mother's behaviors and health but little change in infant health. The effects were generally stronger for college educated mothers: they had more prenatal visits and higher percentage increase in first trimester prenatal care initiation; maternal smoking went down more than 10% for them.

## 4.4 Robustness Check

### Pre-trend Test

We first check the pre-policy time trend to examine the common trend assumption for the DID framework. To capture the pre-trend difference between the treatment and control group, we regress outcome variables on the treatment status, a linear time trend and the interaction between the treatment status and the linear time trend, as well as other control variables, using data prior to November 2010 for fertility and Mar 2010 for prenatal care and birth outcomes. The coefficient of the interaction term is expected to catch pre-trend difference.

Table 24 to Table 27 report the estimation. Pre-trend for fertility of black mothers is significantly different between the treatment and the control group. Pre-trend for prenatal care initiation is marginally different between the treatment and control group. Other outcome variables show similar pre-trends.

To compare the two potential treatment definition, pre-trend tests using 19-25 year-old as the treatment group are reported in the lower panel of Table 24 to Table 27. The pre-trend differences between the treatment and control group are more prominent using age 19-25 treatment group, especially for prenatal care initiation.

Next we perform placebo tests for prenatal care and birth outcomes using pseudo implementation dates. In these tests, we set the implementation dates to months prior to Mar 2010 before the law was announced. There are 12 pseudo dates from Feb 2009 to Jan 2010 that can be estimated by our data. The placebo tests raise mild concern for the model specification. Table 28 reports the coefficients and some show significant change with the pseudo policy dates. Outcomes of particular concerns are prenatal care initiation in the first trimester and the third trimester, and infertility treatment. Other outcomes are less of a concern: the significance is usually more marginal and less consistent.

### Alternate models

To address the performance of our model in placebo tests, we attempt another way to model the time trend by including month-year fixed effects. The results for fertility are reported in Table 29. The sign and magnitude of coefficients are very close to the original model.

Next we try to use aggregate data at age-month level to examine the effect of the provision on prenatal care and birth outcomes. The reason that more aggregate data might be more suitable for this analysis is that the variation of the provision was at the age-month level. So the aggregate data help eliminate influence of unobservables in the less-aggregate level. In addition, we use standard error clustered at the age level to be the most conservative. Here the critical values use a t distribution with degree of the number of clusters minus one to correct for over-rejection. We also use the more flexible time trend specification by including year-month dummies.

The results are reported in Table 30 to Table 32. They are consistent with the main model with smaller magnitude. Prenatal care started earlier. Pregnancy complications had lower prevalence. Birth weight and gestation were both reduced.

## 4.5 The IV Approach

To isolate the effect of women's selection into delay or avoidance of child birth and the change in prenatal care on birth outcomes, we focus on the transition period of the provision between March 2010 to October 2010. Births during that period had been conceived before the announcement of the ACA and thus the composition of mothers are fixed. As insurance companies responded to the provision even before the implementation dates, the expansion of private insurance has began.

Figure 10 shows the insurance change during the transition period. The trends for selfpay and other payment types basically stay the same for the treatment and control groups. Private insurance and Medicaid seem to change differently for two groups. Due to the changing composition of our sample due to the gradual adoption of 2003 certificate, the level of average payment percentage changed between 2009 and 2010. So it's hard to tell from the graph the changes in private insurance and Medicaid besides that they moved differently for the treatment and control group.

In the IV model, I only include births paid by private insurance and Medicaid based on the previous findings that there was a one-on-one crowd-out between two payment types. The first stage of the model is given as the following:

$$\begin{aligned} Private_{gt} = \beta_0 + \beta_1 * YoungerMom_g + \beta_2 * MonthsAfterMar_t + \\ \beta_3 * (YoungerMom_g * MonthsAfterMar_t) + \gamma' X_{gt} + \epsilon_{gt} \end{aligned}$$

To account for the intensity of the treatment caused by the gradual implementation and months of pregnancy after the enactment, the private and policy variable take into account the number of months after Mar 2010. The private is 0 if the birth was paid by Medicaid; it is the number of months after Mar 2010 if the birth was paid by private insurance. The excluded instrument is $YoungerMom_g * MonthsAfterMar_t$. Enact is the number of month after Mar 2010.

The second stage is given below.

$$\begin{aligned} y_{gt} = \theta_0 + \theta_1 * YoungerMom_g + \theta_2 * MonthsAfterMar_t + \\ \theta_3 * Private + \alpha' X_{gt} + \zeta_{gt} \end{aligned}$$

Outcomes examined here include prenatal care and birth outcomes. The coefficient of interest is $\theta_3$. One thing to note here is that the interpretation of the coefficient would be the effect for one more month on private insurance.

Table 33 reports the first stage results. The first stage instrument actually reduced the coverage of private insurance. And the F-test statistic is below the conventional cutoff 10. So the instrument is somehow lack statistic power. Table 34 reports the coefficients of a selected outcomes. The IV results are generally lacking statistic power and produce results similar to the OLS base model. The only exception is that although OLS suggests having private insurance is reversely correlated with birth weight, IV provide suggestive evidence that private insurance improves birth outcomes.

# 5 Concluding remarks

This paper examined how the ACA young adult provision, which allowed young adults to stay on their parents plan until their 26 birthday, changed fertility decisions, prenatal care utilization and birth outcomes among the affected population.

The evidence suggests that the short-term effect of the provision reduced fertility by about 5% and improved prenatal care and mother's health, but had little impact on birth outcomes. This finding suggests that the improved access to family planning services provided by insurance coverage seems to reduce fertility in the short term. This negative relationship is consistent with the literature indicating a substantial drop in fertility when the pill first became available.

However, is the reduction merely a change in timing of pregnancy or a reduction in completed fertility? The previous literature suggests that long term effect of the pill was not lower fertility in either extensive or intensive margin: the percentage of women selected into motherhood and the average family size remained unaffected in the long run. The effect of insurance provision is likely to follow the same route: a retiming of birth.

The one difference between the legalization of the pill and the young adult provision may be the income effect from the provision. Insurance coverage in effect increased real income of the affected group and can change fertility decisions. However, the magnitude is likely to be small.

Delayed pregnancy, however, could have substantial effects on education and lifetime income: avoiding unintended early pregnancy may result in higher education level and higher permanent income. This argument is supported by the contraceptive literature (e.g. Ananat and Hungerman [2012]). Theoretically, the higher income encourages higher spending in children, assuming children being a normal good. The constant long run fertility may suggest that the quality of children might benefit instead.

Another surprising finding of Ananat and Hungerman [2012] is that in the short run it appears that those mothers of "above-average" babies reacted to delay their births: babies were more likely to be born in poor households and with lower birth weight. Following this finding, the short run birth outcomes can actually be worsened.

In our results, despite the supposable benefits of early prenatal visits, we failed to find improvement in birth outcomes. One possibility is that birth outcomes such as gestation and birth weight are not sensitive to improvement in prenatal care. Another possibility would be that the disproportional reduction of "above-average" babies resulted in worse birth outcomes. Combined with improved prenatal care, the total effect was ambiguous.

One challenge of this study is the changing states composition in the sample due to gradual implementation of 2003 birth certificate. The inclusion of year fixed effects can partly take care of the time invariant differences in states, nut it may still introduce variations irrelevant to the provision.

Another challenge, as pointed out in Slusky [2003], is that the potentially different trends of the treatment and control group caused by shifting labor market poses a threat to the identification strategy used in the young adult provision literature. The narrow treatment group and the unemployment interaction term may help sooth the difference. But as the placebo tests indicate, the identification may still be a concern. Our conservative model using aggregate date, flexible time trend and age-level clustering suggests similar results to the main specification. This adds to confidence of our main findings.

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Figure 1: Births Distribution by Age

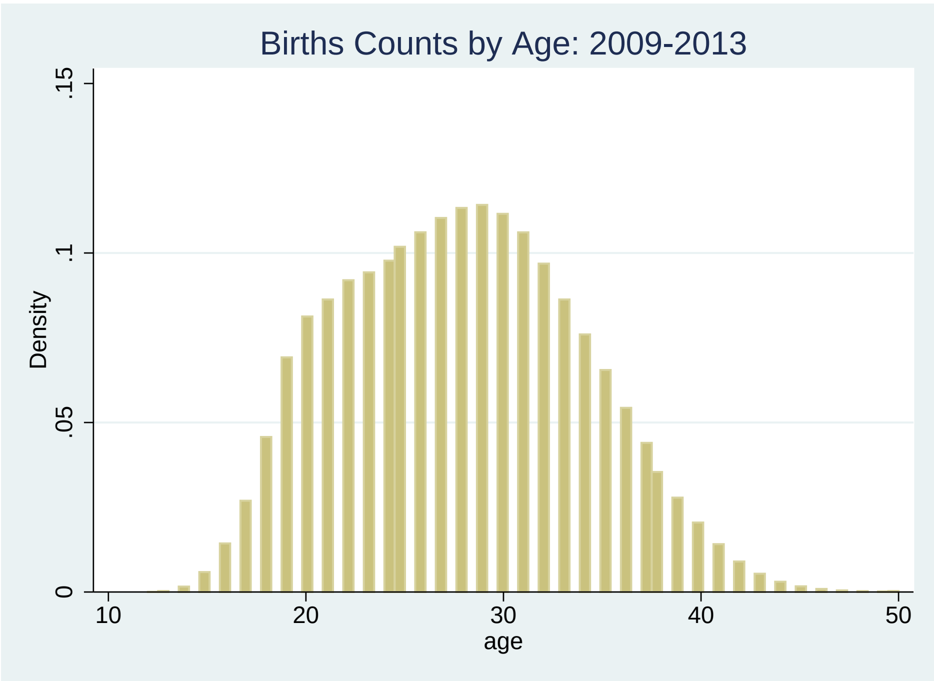


Figure 2: Insurance Coverage by Age, CPS

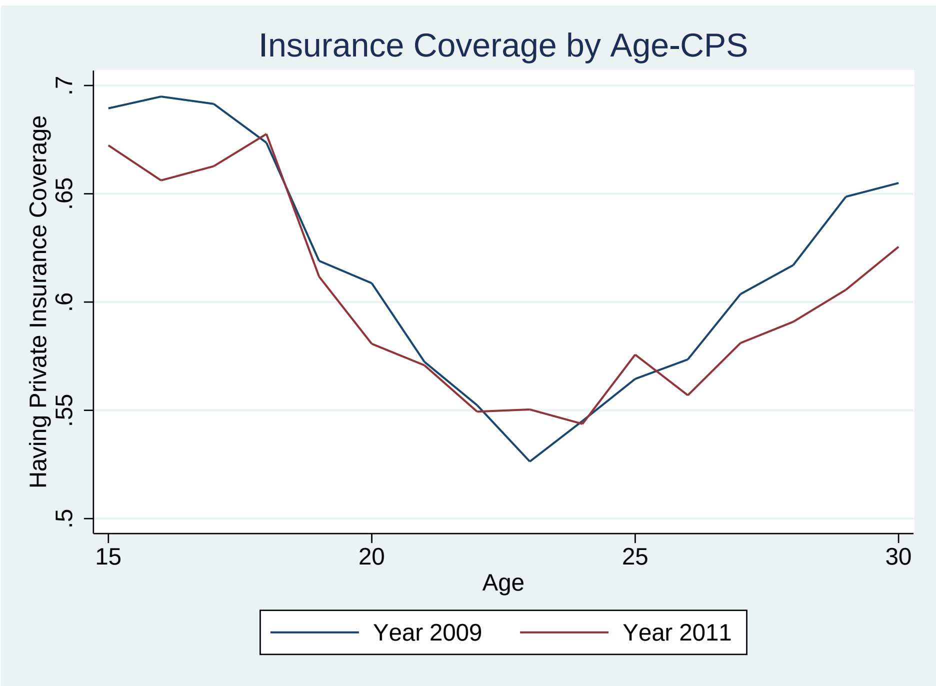
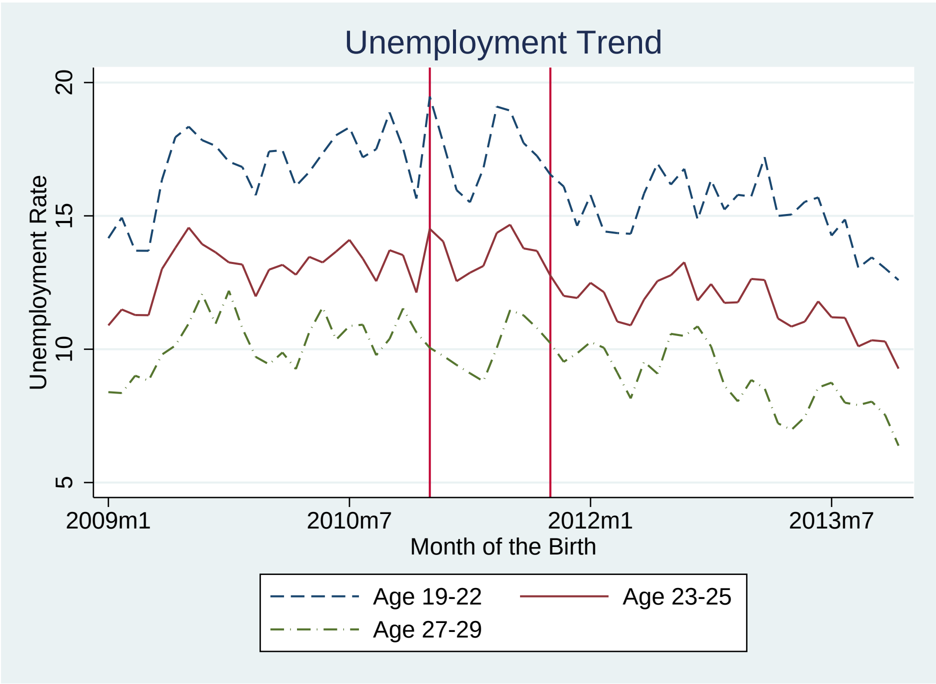
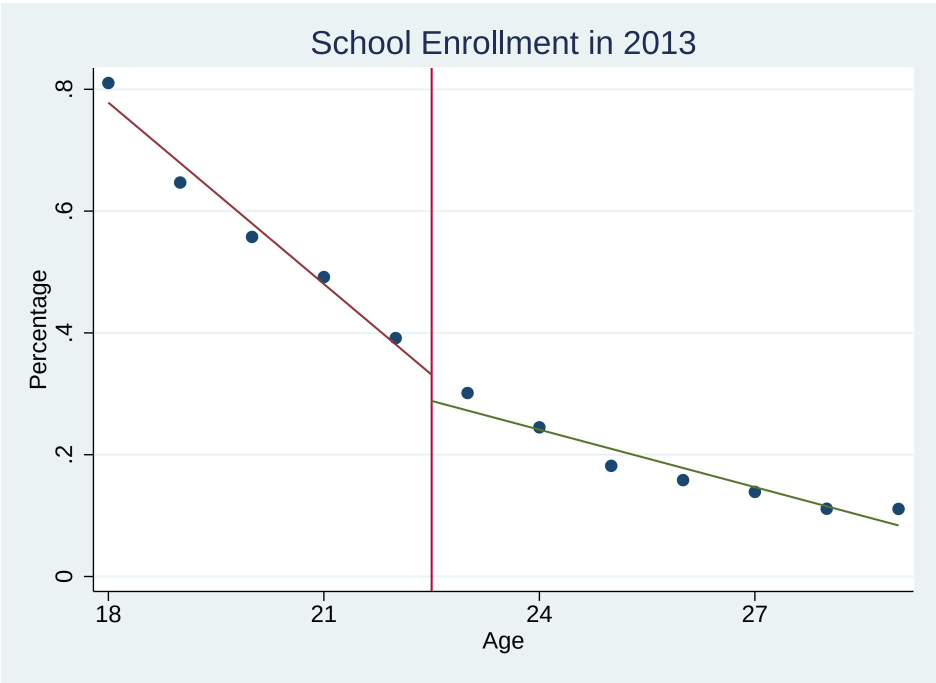


Figure 3: Unemployment by Age Groups




Note: The unemployment data from Bureau of Labor Statistics are for age groups 18-19, 20-24 and 25-29. The data shown is imputed.

Figure 4: School Enrollment by Age




Note: Data is obtained from CPS. The vertical line is at age 22.5.

Figure 5: Young Adult Provision Timeline

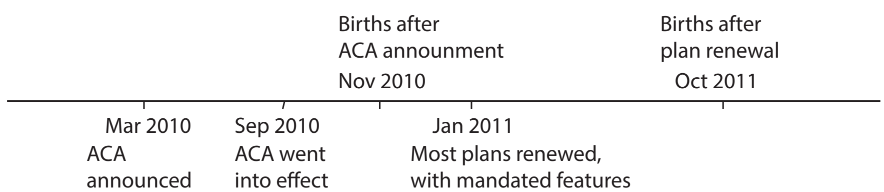
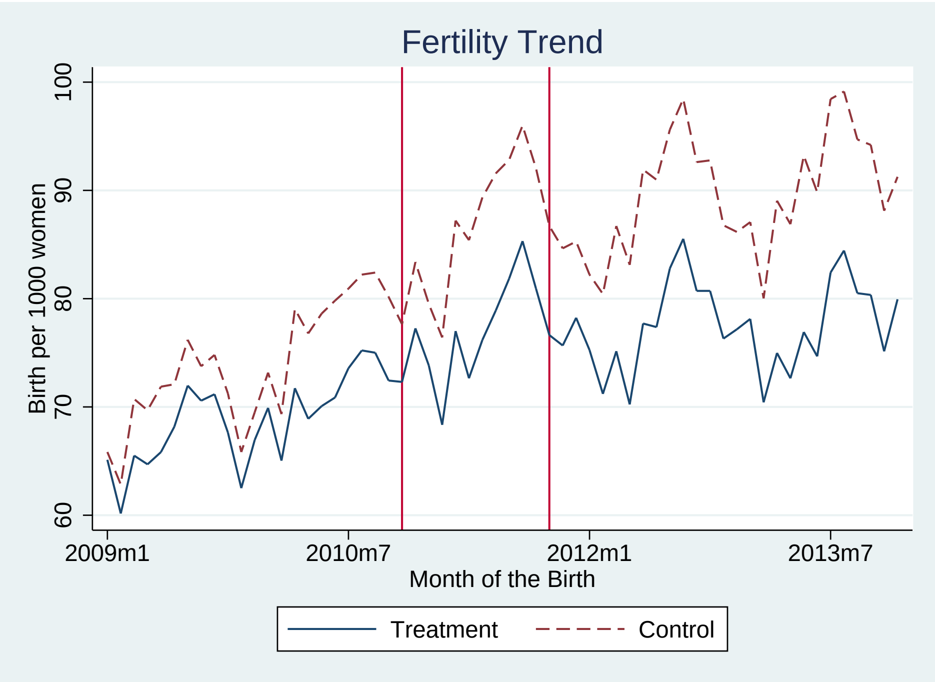
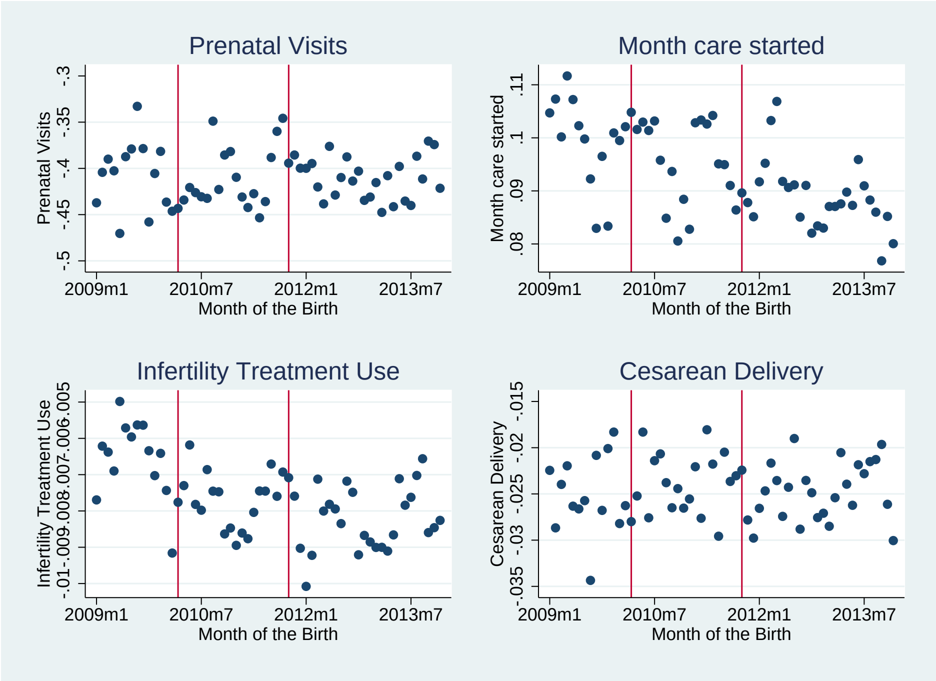


Figure 6: Fertility Trend



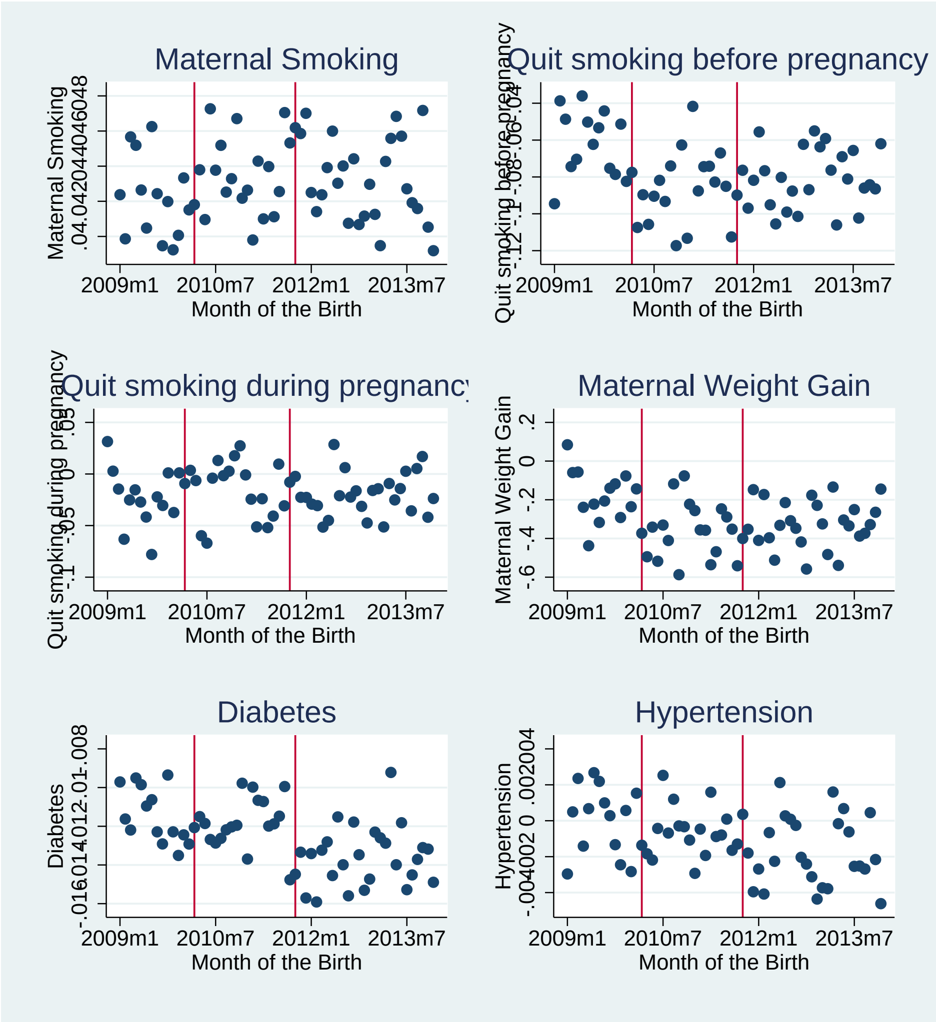

Note: Monthly births are projected to the annual rate by multiplying by 12; timelines drawn at Nov 2010 and Oct 2011.

Figure 7: Medical Utilization



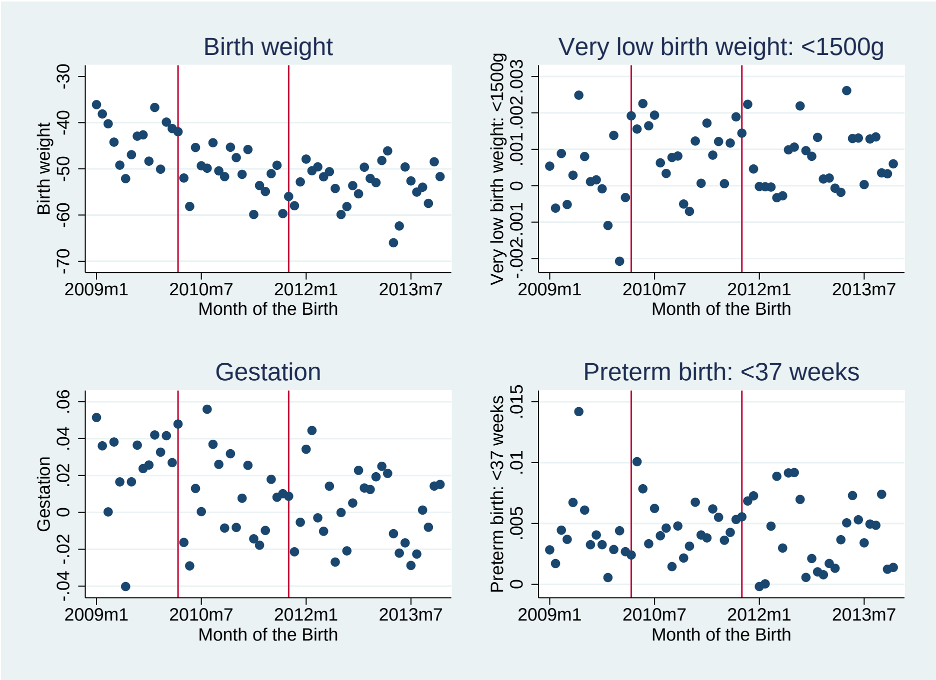

Note: The difference between treatment group and the control group is plotted in the graphs.

Figure 8: Mother's health



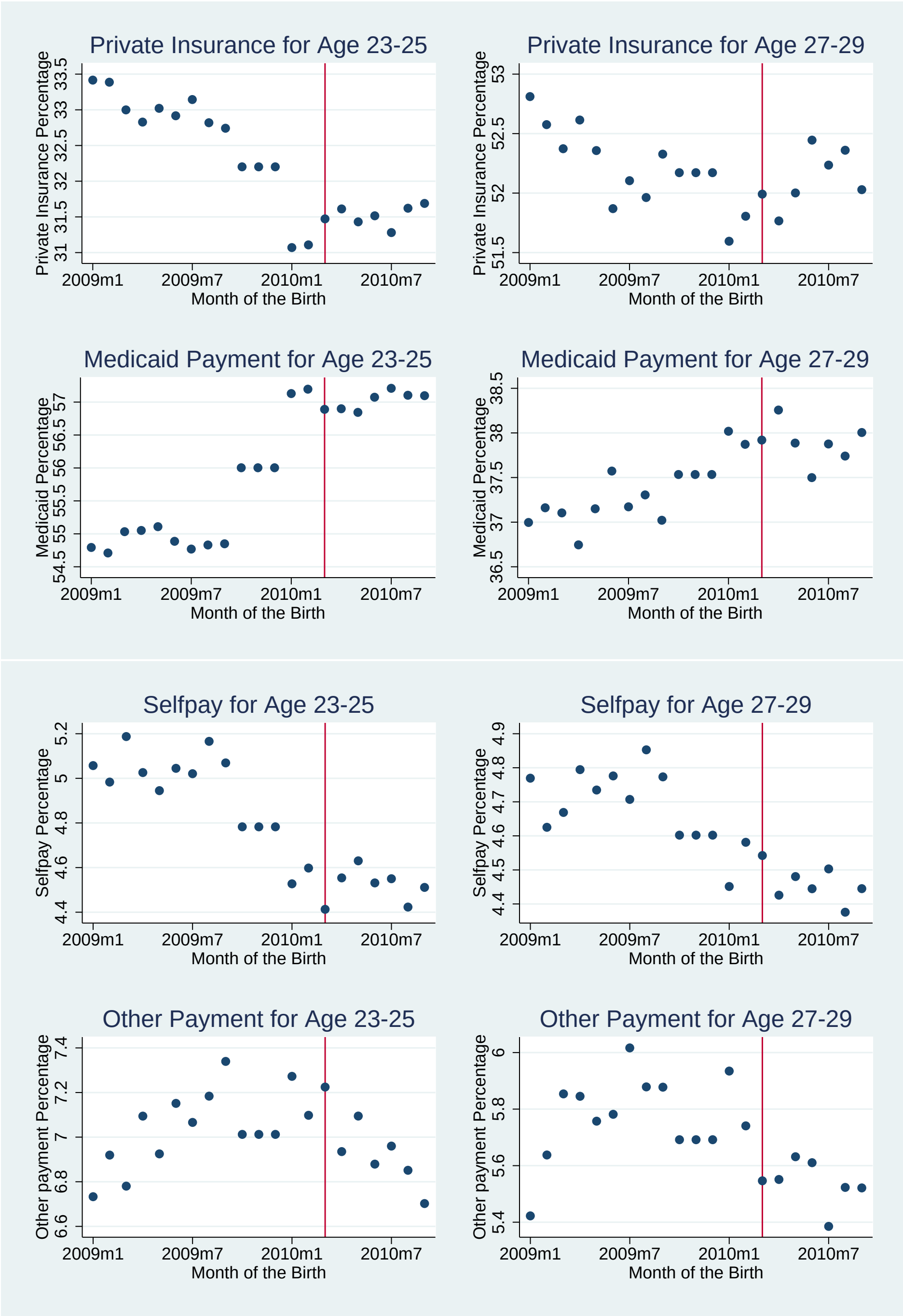

Note: The difference between treatment group and the control group is plotted in the graphs.

Figure 9: Birth Outcomes: Infant Health




Note:

Figure 10: Seasonally Adjusted Insurance Change during the transition period




Note: The graph is similar to the one in our research letter forthcoming in NEJM, only with narrower treatment group definition.

Table 1: Summary Statistics: Covariates

| | | ACA Implementation Effect |
|---|---|---|
| Age group | 23-25 group | 0.0414 |
| | 19-22 group | 0.019 |
| Race | White | 0.0339 |
| | Nonwhite | 0.0286 |
| Marital Status | Married | 0.0097 |
| | Nonmarried | 0.0309 |
| Student Status | Full-time students | 0.0016 |
| | Non full-time students | 0.0481 |

Note: Estimates from Antwi et al. [2013]

Table 2: Summary Statistics: Covariates

| | Age 27-29 | Age 23-25 | Age 19-22 |
|---|---|---|---|
| Race | | | |
| White | 58.09 | 51.94 | 45.69 |
| Black | 11.9 | 16.52 | 21.17 |
| Hispanic | 22.69 | 26.89 | 29.93 |
| | | | |
| Education | | | |
| <High School | 13.07 | 18.39 | 25 |
| High School | 21.34 | 33 | 44 |
| Some College | 31.72 | 36.64 | 29.78 |
| College | 23.96 | 10.67 | 1 |
| Graduate Degree | 9.9 | 1.3 | 0.06 |
| | | | |
| Married | 0.700 | 0.490 | 0.269 |
| | | | |
| Unemployment | 9.523 | 12.390 | 16.112 |

Note: T test indicates significant difference. P-value<0.001

Table 3: Summary Statistics: Outcome Variables

| | Age 27-29 | | Age 23-25 | |
|---|---|---|---|---|
| Outcome Variables | Mean | Std. Dev. | Mean | Std. Dev |
| Births | | | | |
| Fertility | 91.183 | 8.897 | 78.947 | 5.843 |
| | | | | |
| Infant Health | | | | |
| Birth weight | 3300.716 | 102.670 | 3255.640 | 105.488 |
| Gestation | 38.701 | 0.308 | 38.707 | 0.318 |
| | | | | |
| Mother Health | | | | |
| Maternal Smoking | 0.083 | 0.116 | 0.127 | 0.135 |
| Maternal Weight Gain | 30.636 | 2.551 | 30.371 | 2.377 |
| Pregnancy Diabetes | 0.047 | 0.019 | 0.033 | 0.014 |
| Pregnancy Hypertension | 0.044 | 0.017 | 0.044 | 0.018 |
| | | | | |
| Medical Utilization | | | | |
| Prenatal Visits | 11.390 | 0.752 | 10.971 | 0.782 |
| Month Prenatal Care Started | 1.293 | 0.152 | 1.388 | 0.144 |
| Infertility Treatment | 0.011 | 0.011 | 0.004 | 0.006 |
| Cesarean delivery | 0.320 | 0.047 | 0.296 | 0.047 |

Note: Fertility reports as the number of births per 1,000 women

Table 4: Regression Results: Fertility

| | Full Sample | Marriage Unmarried | Status Married | White | Race Black | Hispanic |
|---|---|---|---|---|---|---|
| Main | | | | | | |
| | -0.0495*** | -0.0225 | -0.0744*** | -0.0540*** | 0.0278 | -0.0245 |
| | (0.0170) | (0.0181) | (0.0205) | (0.0190) | (0.0210) | (0.0198) |
| Sample Size | 14,222 | 7,065 | 7,157 | 4,842 | 4,628 | 4,752 |
| $R^2$ | 0.907 | 0.951 | 0.884 | 0.876 | 0.891 | 0.922 |
| Characterizing complier | 1.000 | 0.455 | 1.503 | 1.091 | -0.562 | 0.495 |
| 19-25 as Treatment Group | | | | | | |
| | -0.0892*** | -0.0577** | -0.117*** | -0.0839*** | -0.0671** | -0.00677 |
| | (0.0229) | (0.0234) | (0.0269) | (0.0288) | (0.0265) | (0.0210) |
| N | 21,586 | 10,830 | 10,756 | 7,397 | 6,970 | 7,219 |
| $R^2$ | 0.823 | 0.877 | 0.813 | 0.727 | 0.809 | 0.852 |
| Z score for comparison | 1.392 | 1.190 | 1.260 | 0.867 | 2.807 | -0.614 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented. The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the number of cells.
2. The outcome is log(birth counts) in each cell and control for log(women population) of the corresponding age-month-race, year and month fixed effects, mother's age, cell level fixed effect of race, marital status and education, a linear time trend, the lagged unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by women's population. Standard error clustered at age-month level.
3. Row "Characterizing complier" reports Last row reports the ratio of the coefficient for the subgroup to the overall coefficient. This can be interpreted as the relative likelihood that compliers have the characteristic indicated at left.

Table 5: Regression Results: Fertility (cont)

| | <High Scholl | Education High School | Status Some College | College | Graduate School |
|---|---|---|---|---|---|
| Main | | | | | |
| | -0.102*** | -0.00517 | 0.0183 | -0.00902 | 0.00415 |
| | (0.0182) | (0.0101) | (0.0130) | (0.0279) | (0.0516) |
| Sample Size | 3,672 | 1,836 | 3,672 | 1,836 | 3,206 |
| $R^2$ | 0.961 | 0.938 | 0.929 | 0.853 | 0.831 |
| Characterizing complier | 2.061 | 0.104 | -0.370 | 0.182 | 0.084 |
| 19-25 as Treatment Group | | | | | |
| | -0.125*** | -0.0447*** | -0.100** | -0.0113 | 0.0421 |
| | (0.0207) | (0.0163) | (0.0443) | (0.0957) | (0.0517) |
| N | 6,092 | 3,060 | 6,080 | 2,791 | 3,563 |
| $R^2$ | 0.910 | 0.860 | 0.811 | 0.831 | 0.816 |
| Z score for comparison | 0.834 | 2.061 | 2.562 | 0.0229 | -0.520 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the number of cells.
2. The outcome is log(birth counts) in each cell and control for log(women population) of the corresponding age-month-race, year and month fixed effects, mother's age, cell level fixed effect of race, marital status and education, a linear time trend, the lagged unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by women's population. Standard error clustered at age-month level.
3. Row "Characterizing complier" reports Last row reports the ratio of the coefficient for the subgroup to the overall coefficient. This can be interpreted as the relative likelihood that compliers have the characteristic indicated at left.

Table 6: Percentage among Women Use Contraceptive

| | 2009-2010 | 2011-2012 |
|---|---|---|
| Treatment: Age 23-25 | 0.187 | 0.247 |
| Control: Age 27-29 | 0.156 | 0.209 |

Table 7: Mother of the Marginal Child

| | Married | White | Black | Hispanic |
|---|---|---|---|---|
| Coefficients | -0.0166*** | -0.0111*** | 0.0121*** | -0.000959 |
| | (0.00229) | (0.00118) | (0.00233) | (0.00172) |
| Pre mean | 0.497 | 0.542 | 0.161 | 0.297084 |
| N | 306 | 306 | 306 | 306 |
| adj. R-sq | 0.991 | 0.986 | 0.970 | 0.969 |
| Wald Estimate | 0.327 | 0.219 | 0.239 | 0.0189 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29.
2. The model controls for year-month fixed effects, linear age, unemployment and its interaction with treatment status. The estimation is weighted by female population and standard errors are clustered at age level.

Table 8: Mother of the Marginal Child

| | Less than High School | High School | Some College | College | Graduate Degree |
|---|---|---|---|---|---|
| Coefficients | -0.00325 | 0.0104*** | 0.00611* | -0.00605*** | -0.00718*** |
| | (0.00209) | (0.00133) | (0.00295) | (0.000639) | (0.00161) |
| Pre mean | 0.1982982 | 0.331 | 0.358 | 0.101 | 0.0116 |
| N | 306 | 306 | 306 | 306 | 306 |
| adj. R-sq | 0.980 | 0.992 | 0.888 | 0.991 | 0.968 |
| Wald Estimate | -0.064 | 0.205 | 0.121 | 0.119 | 0.142 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29.
2. The model controls for year-month fixed effects, linear age, unemployment and its interaction with treatment status. The estimation is weighted by female population and standard errors are clustered at age level.

Table 9: Mother of the Marginal Child

| | WIC Receipt | Smoking before Pregnancy | Pre-pregnancy BMI | Pre-pregnancy Diabetes | Pre-pregnancy Hytension |
|---|---|---|---|---|---|
| Coefficients | 0.00468** | 0.00258** | 0.00597 | 0.0000311 | -0.000460* |
| | (0.00159) | (0.000648) | (0.0179) | (0.000144) | (0.000224) |
| Pre mean | 0.584 | 0.165 | 29.65739 | 0.005119 | 0.009186 |
| N | 306 | 306 | 306 | 306 | 306 |
| adj. R-sq | 0.995 | 0.986 | 0.738 | 0.656 | 0.816 |
| Wald Estimate | 0.0923 | 0.0509 | 0.118 | 0.000613 | -0.00907 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29.
2. The model controls for year-month fixed effects, linear age, unemployment and its interaction with treatment status. The estimation is weighted by female population and standard errors are clustered at age level.

Table 10: Birth Outcomes by Marital Status and Race

| | Birth Weight | Very Low Birth Weight | Gestation | Pre-term |
|---|---|---|---|---|
| Marital | | | | |
| Unmarried | 3211.286 | 0.0154 | 38.561 | 0.129 |
| Married | 3305.729 | 0.0102 | 38.769 | 0.0999 |
| Race | | | | |
| White | 3302.812 | 0.0103 | 38.791 | 0.103 |
| Black | 3072.907 | 0.0275 | 38.167 | 0.163 |
| Hispanic | 3274.189 | 0.00987 | 38.694 | 0.110 |

Table 11: Fertility results Using Aggregate Data

| | Log Count | Fertility Rate | Log Rate |
|---|---|---|---|
| Without Covariates | | | |
| | -0.0263** | -4.797*** | -0.0507** |
| | (0.00824) | (1.122) | (0.0130) |
| N | 306 | 306 | 306 |
| adj. R-sq | 0.977 | 0.954 | 0.960 |
| With Covariates | | | |
| | -0.00564 | -0.897 | -0.00835 |
| | (0.00415) | (0.573) | (0.00706) |
| N | 306 | 306 | 306 |
| adj. R-sq | 0.988 | 0.976 | 0.982 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29.
2. The model controls for year-month fixed effects, linear age, unemployment and its interaction with treatment status. The estimation is weighted by female population and standard errors are clustered at age level.

Table 12: Medical Utilization

| | Prenatal Visits | Prenatal 1st Trimester | Care 2nd Trimester | Start 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| Full Sample | | | | | | |
| | 0.0267** | 0.0135*** | -0.00994*** | -0.00238*** | -0.000525** | -0.00158 |
| | (0.0112) | (0.00150) | (0.00133) | (0.000491) | (0.000257) | (0.00129) |
| Pre Mean | 10.840 | 0.688 | 0.238 | 0.0539 | 0.00351 | 0.301 |
| N | 3,412,440 | 3,412,434 | 3,412,434 | 3,412,434 | 3,412,449 | 3,412,450 |
| $R^2$ | 0.894 | 0.928 | 0.883 | 0.715 | 0.742 | 0.622 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 13: Mother-Behaviors and Health

| | Maternal Weight Gain | Maternal Smoking | Quit Before Pregnancy | Smoking During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| Full Sample | | | | | | |
| | -0.0590 | -0.00509*** | -0.000525** | -0.00158 | -0.00268*** | -0.00251*** |
| | (0.0383) | (0.000794) | (0.000257) | (0.00129) | (0.000439) | (0.000583) |
| Pre Mean | 30.736 | 0.134 | 0.329 | 0.268 | 0.0291 | 0.0411 |
| N | 3,412,431 | 3,412,403 | 3,412,449 | 3,412,450 | 3,412,449 | 3,412,449 |
| $R^2$ | 0.847 | 0.979 | 0.742 | 0.622 | 0.457 | 0.428 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 14: Infant Health

| | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| Full Sample | | | | |
| | -3.176** | -0.000126 | -0.00445 | -0.00259*** |
| | (1.582) | (0.000294) | (0.00734) | (0.000959) |
| Pre Mean | 3259.136 | 0.0127 | 38.666 | 0.114 |
| N | 3,412,450 | 3,412,450 | 3,412,450 | 3,412,450 |
| $R^2$ | 0.880 | 0.422 | 0.720 | 0.635 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 15: Medical Utilization by Marital Status

| | Prenatal Visits | Prenatal 1st Trimester | Care 2nd Trimester | Start 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| Marital Status | | | | | | |
| Unmarried | 0.00787 | 0.00899*** | -0.00763*** | -0.00115 | -0.000242 | -0.00725*** |
| | (0.0186) | (0.00217) | (0.00184) | (0.000945) | (0.000164) | (0.00200) |
| Pre Mean | 10.501 | 0.630 | 0.277 | 0.0657 | 0.000677 | 0.317 |
| N | 1,402,200 | 1,402,194 | 1,402,194 | 1,402,194 | 1,402,207 | 1,402,207 |
| $R^2$ | 0.825 | 0.810 | 0.656 | 0.474 | 0.102 | 0.457 |
| | | | | | | |
| Married | | | | | | |
| | 0.0285** | 0.00985*** | -0.00756*** | -0.00142** | -0.000882** | -0.000619 |
| | (0.0129) | (0.00180) | (0.00157) | (0.000637) | (0.000379) | (0.00159) |
| Pre Mean | 11.17 | 0.7454229 | 0.1993713 | 0.0423701 | 0.006 | 0.285 |
| N | 2,010,240 | 2,010,240 | 2,010,240 | 2,010,240 | 2,010,242 | 2,010,243 |
| $R^2$ | 0.883 | 0.923 | 0.882 | 0.735 | 0.692 | 0.661 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 16: Mother's Behaviors and Health by Marital Status

| | Maternal Weight Gain | Maternal Smoking | Quit Before Pregnancy | Smoking During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| Marital Status | | | | | | |
| Unmarried | 0.0485 | -0.00251** | -0.00972 | 0.00400 | -0.00315*** | -0.00255*** |
| | (0.0620) | (0.00122) | (0.00700) | (0.00744) | (0.000772) | (0.000817) |
| Pre Mean | 30.691 | 0.186 | 0.267 | 0.253 | 0.0281 | 0.0391 |
| N | 1,402,191 | 1,402,170 | 1,387,326 | 1,371,377 | 1,402,207 | 1,402,207 |
| $R^2$ | 0.823 | 0.978 | 0.465 | 0.300 | 0.421 | 0.407 |
| | | | | | | |
| Married | | | | | | |
| | -0.107** | -0.00217** | -0.0115 | 0.00725 | -0.00251*** | -0.00270*** |
| | (0.0487) | (0.000837) | (0.00831) | (0.0117) | (0.000623) | (0.000734) |
| Pre Mean | 30.779 | 0.0846 | 0.390 | 0.282 | 0.0300 | 0.0431 |
| N | 2,010,240 | 2,010,233 | 1,946,477 | 1,882,672 | 2,010,242 | 2,010,242 |
| $R^2$ | 0.865 | 0.970 | 0.575 | 0.240 | 0.490 | 0.454 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.

2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 17: Infant Health by Marital Status

| Marital Status | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| Unmarried | -3.492 | -0.0000428 | 0.0183* | -0.00448*** |
| | (2.178) | (0.000522) | (0.0110) | (0.00147) |
| Pre Mean | 3211.286 | 0.0154 | 38.561 | 0.129 |
| N | 1,402,208 | 1,402,208 | 1,402,208 | 1,402,208 |
| $R^2$ | 0.858 | 0.439 | 0.710 | 0.589 |
| | | | | |
| Married | | | | |
| | -1.405 | 0.00000517 | -0.0108 | -0.000932 |
| | (2.077) | (0.000368) | (0.00871) | (0.00111) |
| Pre Mean | 3305.729 | 0.0102 | 38.769 | 0.0999 |
| N | 2,010,242 | 2,010,242 | 2,010,242 | 2,010,242 |
| $R^2$ | 0.778 | 0.243 | 0.596 | 0.426 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 18: Medical Utilization by Race

| | Prenatal Visits | Prenatal 1st Trimester | Care Start 2nd Trimester | 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| Race | | | | | | |
| White | 0.0123 | 0.0113*** | -0.0104*** | -0.000664 | -0.00104** | -0.00119 |
| | (0.0134) | (0.00188) | (0.00170) | (0.000682) | (0.000426) | (0.00175) |
| Pre Mean | 11.226 | 0.732 | 0.213 | 0.0429 | 0.00565 | 0.291 |
| Sample Size | 2,007,727 | 2,007,729 | 2,007,729 | 2,007,729 | 2,007,731 | 2,007,731 |
| $R^2$ | 0.913 | 0.949 | 0.923 | 0.813 | 0.759 | 0.709 |
| Black | | | | | | |
| | 0.0658** | 0.0171*** | -0.0123*** | -0.00495*** | -0.000359 | -0.00484 |
| | (0.0290) | (0.00329) | (0.00289) | (0.00156) | (0.000277) | (0.00323) |
| Pre Mean | 10.182 | 0.612 | 0.283 | 0.071 | 0.000842 | 0.344 |
| Sample Size | 517,181 | 517,175 | 517,175 | 517,175 | 517,184 | 517,185 |
| $R^2$ | 0.746 | 0.731 | 0.604 | 0.246 | 0.174 | 0.232 |
| Hispanic | | | | | | |
| | 0.0479** | 0.00945*** | -0.00500** | -0.00187 | -0.000734** | -0.00454* |
| | (0.0225) | (0.00255) | (0.00214) | (0.00118) | (0.000319) | (0.00259) |
| Pre Mean | 10.494 | 0.650 | 0.258 | 0.0646 | 0.00112 | 0.298 |
| Sample Size | 887,532 | 887,530 | 887,530 | 887,530 | 887,534 | 887,534 |
| $R^2$ | 0.764 | 0.864 | 0.787 | 0.514 | 0.263 | 0.428 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 19: Mother's Behaviors and Health by Race

| | Maternal Weight Gain | Pregnancy Smoking | Quit Before Pregnancy | Smoking During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| Race | | | | | | |
| White | | | | | | |
| | -0.187*** | -0.00741*** | 0.00422 | 0.0106 | -0.00302*** | -0.00169** |
| | (0.0521) | (0.00119) | (0.00648) | (0.0104) | (0.000611) | (0.000826) |
| Pre Mean | 32.341 | 0.206 | 0.298 | 0.236 | 0.0305 | 0.0475 |
| Sample Size | 2,007,729 | 2,007,727 | 1,998,797 | 1,978,468 | 2,007,731 | 2,007,731 |
| $R^2$ | 0.772 | 0.982 | 0.848 | 0.459 | 0.568 | 0.330 |
| Black | | | | | | |
| | 0.211** | -0.00175 | -0.0156 | 0.0380*** | -0.00115 | -0.00110 |
| | (0.105) | (0.00210) | (0.0109) | (0.0140) | (0.00125) | (0.00141) |
| Pre Mean | 29.713 | 0.109 | 0.269 | 0.258 | 0.0264 | 0.0472 |
| Sample Size | 517,174 | 517,147 | 489,071 | 472,762 | 517,184 | 517,184 |
| $R^2$ | 0.450 | 0.873 | 0.319 | 0.179 | 0.268 | 0.102 |
| Hispanic | | | | | | |
| | -0.153** | 0.000938 | -0.0335** | -0.0297 | -0.00300*** | -0.00172** |
| | (0.0728) | (0.000774) | (0.0165) | (0.0203) | (0.00101) | (0.000827) |
| Pre Mean | 28.46358 | 0.0242 | 0.414 | 0.331 | 0.0280 | 0.0270 |
| Sample Size | 887,528 | 887,529 | 845,935 | 802,819 | 887,534 | 887,534 |
| $R^2$ | 0.786 | 0.709 | 0.268 | 0.092 | 0.460 | 0.175 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 20: Infant Health by Race

| | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| Race | | | | |
| White | | | | |
| | -2.789 | 0.0000917 | -0.0119 | -0.000441 |
| | (2.122) | (0.000374) | (0.00951) | (0.00120) |
| Pre Mean | 3302.812 | 0.0103 | 38.791 | 0.103 |
| Sample Size | 2,007,731 | 2,007,731 | 2,007,731 | 2,007,731 |
| $R^2$ | 0.823 | 0.124 | 0.585 | 0.533 |
| Black | | | | |
| | -7.275* | 0.00105 | -0.00928 | -0.00165 |
| | (4.261) | (0.00112) | (0.0191) | (0.00252) |
| Pre Mean | 3072.907 | 0.0275 | 38.167 | 0.163 |
| Sample Size | 517,185 | 517,185 | 517185 | 517,185 |
| $R^2$ | 0.528 | 0.085 | 0.328 | 0.354 |
| Hispanic | | | | |
| | -2.666 | 0.000401 | 0.0158 | -0.00465** |
| | (3.170) | (0.000562) | (0.0138) | (0.00206) |
| Pre Mean | 3274.189 | 0.00987 | 38.694 | 0.110 |
| Sample Size | 887,534 | 887,534 | 887,534 | 887,534 |
| $R^2$ | 0.302 | 0.052 | 0.198 | 0.223 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 21: Medical Utilization by Education

| | Prenatal Visits | Prenatal 1st Trimester | Care Start 2nd Trimester | 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| <High School | | | | | | |
| | -0.0310 | 0.00281 | -0.00120 | 0.000459 | 0.0000215 | -0.000953 |
| | (0.0267) | (0.00307) | (0.00280) | (0.00161) | (0.000232) | (0.00300) |
| Pre Mean | 9.857 | 0.564 | 0.310 | 0.0859 | 0.000752 | 0.292 |
| Sample Size | 530,809 | 530,809 | 530,809 | 530,809 | 530,809 | 530,809 |
| $R^2$ | 0.755 | 0.740 | 0.578 | 0.491 | 0.107 | 0.577 |
| High School | | | | | | |
| | 0.0129 | 0.0107*** | -0.00913*** | -0.00228** | 0.000382 | -0.00869*** |
| | (0.0186) | (0.00225) | (0.00217) | (0.000999) | (0.000327) | (0.00238) |
| Pre Mean | 10.793 | 0.674 | 0.251 | 0.0548 | 0.00226 | 0.3124454 |
| Sample Size | 929,997 | 929,997 | 929,997 | 929,997 | 929,997 | 929,997 |
| $R^2$ | 0.878 | 0.897 | 0.829 | 0.653 | 0.660 | 0.624 |
| Some college | | | | | | |
| | 0.0343* | 0.0121*** | -0.0101*** | -0.000977 | -0.000554 | -0.00449** |
| | (0.0180) | (0.00196) | (0.00173) | (0.000857) | (0.000383) | (0.00181) |
| Pre Mean | 11.253 | 0.737 | 0.210 | 0.0406 | 0.00484 | 0.307 |
| Sample Size | 1,184,169 | 1,184,169 | 1,184,169 | 1,184,169 | 1,184,169 | 1,184,169 |
| $R^2$ | 0.787 | 0.877 | 0.820 | 0.610 | 0.718 | 0.639 |
| College | | | | | | |
| | 0.0737*** | 0.00951*** | -0.00757*** | -0.000982 | -0.000969 | -0.00196 |
| | (0.0268) | (0.00293) | (0.00238) | (0.00129) | (0.000766) | (0.00308) |
| Pre Mean | 11.513 | 0.807 | 0.152 | 0.0329 | 0.00801 | 0.265 |
| Sample Size | 584,993 | 584,993 | 584,993 | 584,993 | 584,993 | 584,993 |
| $R^2$ | 0.649 | 0.826 | 0.742 | 0.625 | 0.770 | 0.753 |
| Graduate degree | | | | | | |
| | -0.0404 | -0.00905 | 0.000304 | 0.00683** | -0.00257 | 0.00613 |
| | (0.0718) | (0.00647) | (0.00580) | (0.00285) | (0.00257) | (0.00810) |
| Pre Mean | 11.641 | 0.841 | 0.124 | 0.0281 | 0.0112 | 0.266 |
| Sample Size | 182,472 | 182,466 | 182,466 | 182,466 | 182,481 | 182,482 |
| $R^2$ | 0.198 | 0.374 | 0.230 | 0.213 | 0.325 | 0.276 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 22: Mother's Behaviors and Health by Education

| | Maternal Weight Gain | Maternal Smoking | Quit Before Pregnancy | Smoking During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| <High School | | | | | | |
| | -0.0608 | -0.00916*** | -0.0263 | 0.0225 | -0.00531*** | -0.00275*** |
| | (0.0911) | (0.00204) | (0.0172) | (0.0175) | (0.00115) | (0.000947) |
| Pre Mean | 28.067 | 0.175 | 0.231 | 0.186 | 0.029089 | 0.027037 |
| Sample Size | 530809 | 530809 | 508256 | 496814 | 530809 | 530809 |
| $R^2$ | 0.727 | 0.979 | 0.217 | 0.133 | 0.442 | 0.336 |
| Hight School | | | | | | |
| | -0.0217 | -0.00470*** | 0.00435 | 0.0126 | -0.00214** | -0.00231** |
| | (0.0773) | (0.00170) | (0.00838) | (0.00994) | (0.000946) | (0.00103) |
| Pre Mean | 30.355 | 0.174 | 0.263 | 0.234 | 0.0296 | 0.0388 |
| Sample Size | 929997 | 929997 | 929997 | 929997 | 929997 | 929997 |
| $R^2$ | 0.815 | 0.985 | 0.591 | 0.335 | 0.619 | 0.496 |
| Some college | | | | | | |
| | -0.109 | 0.000163 | -0.0110* | -0.0120 | -0.00356*** | -0.00364*** |
| | (0.0697) | (0.00132) | (0.00663) | (0.00919) | (0.000827) | (0.000958) |
| Pre Mean | 31.901 | 0.109 | 0.379 | 0.317 | 0.0305 | 0.0482 |
| Sample Size | 1184169 | 1184169 | 1177586 | 1164964 | 1184169 | 1184169 |
| $R^2$ | 0.729 | 0.959 | 0.398 | 0.159 | 0.486 | 0.391 |
| College | | | | | | |
| | 0.00837 | -0.00248** | 0.0187 | 0.0323 | -0.00362*** | -0.00303** |
| | (0.0960) | (0.000969) | (0.0217) | (0.0359) | (0.000957) | (0.00148) |
| Pre Mean | 33.227 | 0.020 | 0.574 | 0.376 | 0.0238 | 0.0520 |
| Sample Size | 584993 | 584993 | 564125 | 532560 | 584993 | 584993 |
| $R^2$ | 0.628 | 0.810 | 0.111 | 0.042 | 0.311 | 0.288 |
| Graduate degree | | | | | | |
| | 0.0875 | -0.000477 | -0.0603 | -0.125 | 0.00442 | -0.00319 |
| | (0.278) | (0.00233) | (0.0893) | (0.155) | (0.00295) | (0.00367) |
| Pre Mean | 33.253 | 0.015 | 0.624 | 0.493 | 0.0192 | 0.0525 |
| Sample Size | 182463 | 182435 | 153839 | 129714 | 182481 | 182481 |
| $R^2$ | 0.156 | 0.236 | 0.096 | 0.163 | 0.055 | 0.053 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 23: Infant Health by Education

| | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| <High School | | | | |
| | -1.342 | -0.00114 | 0.0149 | -0.00424* |
| | (3.439) | (0.000799) | (0.0168) | (0.00235) |
| Pre Mean | 3222.655 | 0.0129 | 38.591 | 0.129 |
| Sample Size | 530,809 | 530,809 | 530,809 | 530,809 |
| $R^2$ | 0.842 | 0.381 | 0.625 | 0.552 |
| Hight School | | | | |
| | -4.394 | 0.000364 | -0.00344 | -0.00286* |
| | (2.810) | (0.000545) | (0.0130) | (0.00165) |
| Pre Mean | 3244.109 | 0.0132 | 38.630 | 0.119 |
| Sample Size | 929,997 | 929,997 | 929,997 | 929,997 |
| $R^2$ | 0.927 | 0.606 | 0.823 | 0.766 |
| Some college | | | | |
| | -1.415 | 0.000302 | 0.00876 | -0.00438*** |
| | (2.640) | (0.000504) | (0.0118) | (0.00148) |
| Pre Mean | 3276.025 | 0.0126 | 38.683 | 0.109 |
| Sample Size | 1,184,169 | 1,184,169 | 1,184,169 | 1,184,169 |
| $R^2$ | 0.892 | 0.492 | 0.738 | 0.604 |
| College | | | | |
| | 1.283 | -0.00123* | -0.000467 | 0.00106 |
| | (3.608) | (0.000721) | (0.0158) | (0.00187) |
| Pre Mean | 3321.395 | 0.0115 | 38.863 | 0.090 |
| Sample Size | 584,993 | 584,993 | 584,993 | 584,993 |
| $R^2$ | 0.821 | 0.299 | 0.622 | 0.430 |
| Graduate degree | | | | 0.042 |
| | 6.525 | -0.00257 | 0.00393 | 0.00367 |
| | (10.64) | (0.00187) | (0.0372) | (0.00473) |
| Pre Mean | 3308.551 | 0.0118 | 38.875 | 0.088 |
| Sample Size | 182,482 | 182,482 | 182,482 | 182,482 |
| $R^2$ | 0.398 | 0.084 | 0.227 | 0.100 |

Note: 1. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
2. The model controls for year and month fixed effects, mother's age, infant gender, cell-level fixed effects of race, marital status and education level, a linear time trend, the unemployment rate and its interaction with the treatment dummy. Cell level data race-education-marital-year-month-age is used in the regressions. Regressions are weighted by birth counts in each cell. Standard error clustered at age-month level.

Table 24: Pretrend Test: Fertility

| | Full Sample | Marriage Status Unmarried | Race Married | White | Black | Education Status Hispanic | <High Scholl | High School | Some College | College | Graduate School |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-25 Treatment | -0.00411 | -0.000721 | -0.00720 | -0.0126* | 0.0176*** | -0.0107* | 0.00569 | 0.00444* | 0.00340 | -0.0128 | -0.00400 |
| | (0.00442) | (0.00450) | (0.00560) | (0.00517) | (0.00486) | (0.00529) | (0.00397) | (0.00193) | (0.00312) | (0.00847) | (0.0127) |
| N | 3614 | 1788 | 1826 | 1236 | 1170 | 1208 | 936 | 468 | 936 | 468 | 806 |
| $R^2$ | 0.911 | 0.955 | 0.890 | 0.882 | 0.894 | 0.924 | 0.974 | 0.945 | 0.930 | 0.848 | 0.831 |
| 19-25 Treatment | -0.00456 | -0.00128 | -0.00680 | -0.00571 | 0.0134** | -0.00000946 | 0.00712 | 0.00462 | 0.00240 | -0.00799 | -0.00471 |
| | (0.00472) | (0.00441) | (0.00601) | (0.00767) | (0.00504) | (0.00431) | (0.00467) | (0.00261) | (0.00750) | (0.0194) | (0.0131) |
| N | 5477 | 2740 | 2737 | 1889 | 1762 | 1826 | 1554 | 780 | 1549 | 708 | 886 |
| $R^2$ | 0.830 | 0.883 | 0.821 | 0.724 | 0.814 | 0.858 | 0.923 | 0.867 | 0.815 | 0.841 | 0.808 |

Note: 1. Coefficients for an interaction term between the treatment status and the linear time trend.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. Outcome variables are regressed on the treatment status, a linear time trend and the interaction between the treatment status and the linear time trend, as well as other control variables, using data prior to November 2010 for fertility and Mar 2010 for prenatal care and birth outcomes.

Table 25: Pretrend Test: Medical Utilization

| | Prenatal Visits | Prenatal Care Start 1st Trimester | 2nd Trimester | 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| 23-25 as Treatment | | | | | | |
| | 0.000755 | 0.000678* | -0.000421 | -0.000208* | -0.000167** | -0.00000192 |
| | (0.00191) | (0.000261) | (0.000236) | (0.0000811) | (0.0000512) | (0.000235) |
| N | 1003859 | 1003856 | 1003856 | 1003856 | 1003863 | 1003864 |
| $R^2$ | 0.882 | 0.932 | 0.885 | 0.722 | 0.681 | 0.554 |
| 19-25 as Treatment | | | | | | |
| | -0.000357 | 0.000969*** | -0.000454 | -0.000406*** | -0.000195*** | -0.000241 |
| | (0.00194) | (0.000284) | (0.000252) | (0.0000854) | (0.0000515) | (0.000195) |
| N | 1579719 | 1579722 | 1579722 | 1579722 | 1579749 | 1579751 |
| $R^2$ | 0.883 | 0.924 | 0.874 | 0.713 | 0.688 | 0.599 |

Note: 1. Coefficients for an interaction term between the treatment status and the linear time trend.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. Outcome variables are regressed on the treatment status, a linear time trend and the interaction between the treatment status and the linear time trend, as well as other control variables, using data prior to November 2010 for fertility and Mar 2010 for prenatal care and birth outcomes.

Table 26: Pretrend Test: Mother Behaviors and Health

| | Maternal Weight Gain | Maternal Smoking | Quit Smoking Before Pregnancy | During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| 23-25 as Treatment | | | | | | |
| | -0.0109 | -0.0000418 | -0.00179 | -0.00117 | -0.000125 | 0.0000304 |
| | (0.00575) | (0.000134) | (0.00112) | (0.00139) | (0.0000776) | (0.000122) |
| N | 1003859 | 1003828 | 976497 | 954473 | 1003863 | 1003863 |
| $R^2$ | 0.850 | 0.977 | 0.591 | 0.257 | 0.369 | 0.419 |
| 19-25 as Treatment | | | | | | |
| | -0.0102 | -0.000112 | -0.00192 | -0.00136 | -0.000143* | 0.0000700 |
| | (0.0103) | (0.000253) | (0.00101) | (0.00127) | (0.0000636) | (0.000112) |
| N | 1579726 | 1579636 | 1544210 | 1516799 | 1579749 | 1579749 |
| $R^2$ | 0.837 | 0.966 | 0.577 | 0.294 | 0.499 | 0.420 |

Note: 1. Coefficients for an interaction term between the treatment status and the linear time trend.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. Outcome variables are regressed on the treatment status, a linear time trend and the interaction between the treatment status and the linear time trend, as well as other control variables, using data prior to November 2010 for fertility and Mar 2010 for prenatal care and birth outcomes.

Table 27: Pretrend Test: Infant Health

| | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| 23-25 Treatment | | | | |
| | 0.0649 | -0.0000625 | 0.00115 | -0.000125 |
| | (0.295) | (0.0000568) | (0.00144) | (0.000203) |
| N | 1003864 | 1003864 | 1003864 | 1003864 |
| $R^2$ | 0.853 | 0.405 | 0.665 | 0.586 |
| 19-25 Treatment | | | | |
| | 0.175 | 0.00000113 | 0.000637 | -0.000164 |
| | (0.334) | (0.0000592) | (0.00135) | (0.000197) |
| N | 1579751 | 1579751 | 1579751 | 1579751 |
| $R^2$ | 0.863 | 0.397 | 0.658 | 0.571 |

Note: 1. Coefficients for an interaction term between the treatment status and the linear time trend.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. Outcome variables are regressed on the treatment status, a linear time trend and the interaction between the treatment status and the linear time trend, as well as other control variables, using data prior to November 2010 for fertility and Mar 2010 for prenatal care and birth outcomes.

Table 28: Pseudo Implementation Dates

| | Prenatal Visits | Prenatal 1st Trimester | Care 2nd Trimester | Start 3rd Trimester | Infertility Treatment | Maternal Smoking | Diabetes | Hypertension | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Feb-09 | 0.0615** | 0.00506 | -0.00167 | -0.00294** | 0.000469 | 0.000888 | -0.00118 | 0.00466*** | -5.752 | -0.00000799 | -0.0234 | 0.00174 |
| | (0.0264) | (0.00438) | (0.00383) | (0.00130) | (0.000608) | (0.00226) | (0.000964) | (0.00174) | (4.734) | (0.000478) | (0.0150) | (0.00291) |
| Mar-09 | 0.0449* | 0.00580* | -0.00202 | -0.00254** | -0.000236 | 0.00152 | -0.000198 | 0.00302** | -4.664 | 0.000610 | -0.0187 | 0.00283 |
| | (0.0239) | (0.00321) | (0.00257) | (0.00107) | (0.000472) | (0.00167) | (0.000903) | (0.00130) | (2.940) | (0.000462) | (0.0145) | (0.00256) |
| Apr-09 | 0.0276 | 0.00480* | -0.00241 | -0.00181** | -0.000605 | 0.000389 | 0.000502 | 0.00140 | -4.161 | 0.000209 | -0.000362 | 0.00199 |
| | (0.0199) | (0.00253) | (0.00218) | (0.000848) | (0.000450) | (0.00145) | (0.000707) | (0.00137) | (2.565) | (0.000417) | (0.0140) | (0.00202) |
| May-09 | 0.0226 | 0.00676*** | -0.00365 | -0.00260*** | -0.000694* | 0.000252 | -0.00000217 | 0.00205 | -3.451 | 0.000600 | -0.00686 | 0.00219 |
| | (0.0178) | (0.00245) | (0.00220) | (0.000723) | (0.000409) | (0.00131) | (0.000633) | (0.00127) | (2.370) | (0.000448) | (0.0127) | (0.00170) |
| Jun-09 | 0.0347** | 0.00585** | -0.00268 | -0.00211*** | -0.00122*** | 0.000338 | -0.000431 | 0.00151 | -1.874 | 0.000470 | -0.00442 | 0.00133 |
| | (0.0167) | (0.00240) | (0.00213) | (0.000734) | (0.000395) | (0.00120) | (0.000615) | (0.00110) | (2.399) | (0.000427) | (0.0117) | (0.00157) |
| Jul-09 | 0.0231 | 0.00605*** | -0.00334 | -0.00158** | -0.00128*** | 0.000970 | -0.000610 | 0.000488 | 0.647 | -0.000374 | 0.0156 | -0.00174 |
| | (0.0172) | (0.00224) | (0.00202) | (0.000790) | (0.000385) | (0.00114) | (0.000609) | (0.00102) | (2.301) | (0.000456) | (0.0113) | (0.00151) |
| Aug-09 | 0.00738 | 0.00529** | -0.00235 | -0.00198** | -0.00117*** | -0.000410 | -0.00101 | -0.000502 | 1.542 | -0.000705 | 0.0165 | -0.00213 |
| | (0.0167) | (0.00223) | (0.00199) | (0.000755) | (0.000392) | (0.00113) | (0.000615) | (0.000933) | (2.317) | (0.000462) | (0.0112) | (0.00152) |
| Sep-09 | -0.0156 | 0.00587*** | -0.00395** | -0.00167** | -0.00116*** | -0.000826 | -0.000996 | -0.00108 | 1.631 | -0.000795* | 0.0134 | -0.00214 |
| | (0.0156) | (0.00222) | (0.00194) | (0.000692) | (0.000397) | (0.00110) | (0.000628) | (0.000873) | (2.329) | (0.000454) | (0.0112) | (0.00153) |
| Oct-09 | -0.0275* | 0.00325 | -0.00274 | -0.000940 | -0.00138*** | -0.000653 | -0.000702 | -0.00141 | 1.477 | -0.000934* | 0.0149 | -0.00231 |
| | (0.0154) | (0.00227) | (0.00200) | (0.000687) | (0.000406) | (0.00110) | (0.000708) | (0.000864) | (2.607) | (0.000503) | (0.0121) | (0.00165) |
| Nov-09 | -0.0152 | 0.00352 | -0.00355 | -0.0000197 | -0.00143*** | -0.00128 | -0.00181** | -0.00146 | 3.578 | -0.00105* | 0.0179 | -0.00278 |
| | (0.0157) | (0.00240) | (0.00215) | (0.000691) | (0.000425) | (0.00103) | (0.000709) | (0.000939) | (2.839) | (0.000543) | (0.0131) | (0.00184) |
| Dec-09 | -0.0156 | 0.000908 | -0.00184 | 0.000186 | -0.00134** | -0.00139 | -0.00204*** | -0.000849 | 2.024 | -0.000828 | 0.0157 | -0.00208 |
| | (0.0152) | (0.00252) | (0.00243) | (0.000735) | (0.000517) | (0.00117) | (0.000746) | (0.00102) | (3.243) | (0.000677) | (0.0152) | (0.00210) |
| Jan-10 | -0.0233 | 0.00288 | -0.00274 | -0.000640 | -0.00195*** | -0.00135 | -0.00159* | -0.00108 | 6.906** | -0.00175** | 0.0192 | -0.00220 |
| | (0.0170) | (0.00243) | (0.00263) | (0.000863) | (0.000637) | (0.00151) | (0.000843) | (0.00119) | (2.790) | (0.000733) | (0.0194) | (0.00220) |

Note: 1. Each coefficient is a regression outcome with the corresponding pseudo implementation date.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. The model controls for year and month fixed effects, mother's age, infant sex, cell fixed effect of race and education, a linear time trend, the unemployment rate and its interaction with treatment status. Cell level data race-education-year-month-age is used in the regressions, weighted by the birth counts of each cell. Standard errors are clustered at age-month level.

Table 29: Fertility Results with Alternative Time Trend

| | | Marriage Status | Race | Education Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Full Sample | Unmarried | Married | White | Black | Hispanic | <High School | High School | Some College | College | Graduate School |
| Main | | | | | | | | | | | |
| | -0.0513*** | -0.0243 | -0.0764*** | -0.0533*** | 0.0263 | -0.0283 | -0.104*** | -0.00548 | 0.0171 | -0.0101 | 0.00338 |
| | (0.0161) | (0.0171) | (0.0198) | (0.0185) | (0.0204) | (0.0193) | (0.0172) | (0.00883) | (0.0122) | (0.0274) | (0.0496) |
| Sample Size | 14222 | 7065 | 7157 | 4842 | 4628 | 4752 | 3672 | 1836 | 3672 | 1836 | 3206 |
| $R^2$ | 0.907 | 0.951 | 0.884 | 0.876 | 0.891 | 0.921 | 0.961 | 0.938 | 0.929 | 0.851 | 0.831 |

Note: 1. Coefficients for an interaction term between the treatment status and the policy implementation dummy variable.

2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.

3. The model controls for year-month fixed effects, cell fixed effects for mother's age, race and education, the unemployment rate and its interaction with treatment status. Cell level data race-education-year-month-age is used in the regressions, weighted by the birth counts of each cell. Standard error clustered at age-month level.

Table 30: Results with Aggregate Data: Prenatal Care

| | Prenatal Visits | Prenatal Care Start 1st Trimester | 2nd Trimester | 3rd Trimester | Infertility Treatment | Cesarean |
|---|---|---|---|---|---|---|
| Full Sample | | | | | | |
| | 0.00452 | 0.00593** | -0.00524** | -0.000239 | -0.000505*** | -0.000680 |
| | (0.00545) | (0.00192) | (0.00137) | (0.000600) | (0.000117) | (0.000551) |
| N | 4408593 | 4408593 | 4408593 | 4408593 | 4408593 | 4408593 |
| $R^2$ | 0.983 | 0.986 | 0.982 | 0.946 | 0.961 | 0.941 |

Note: 1. Coefficients for an interaction term between the treatment status and the policy implementation dummy variable.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. The model controls for year-month fixed effects, the unemployment rate and its interaction with treatment status. Aggregate data at month-age is used in the regressions, weighted by the birth counts of each cell. Standard error clustered at age level.

Table 31: Results with Aggregate Data: Mother

| | Maternal Weight Gain | Maternal Smoking | Quit Smoking Before Pregnancy | During Pregnancy | Diabetes | Hypertension |
|---|---|---|---|---|---|---|
| Full Sample | | | | | | |
| | 0.00251 | 0.000495 | 0.00832** | 0.00345 | -0.00175*** | -0.000862* |
| | (0.0337) | (0.000649) | (0.00230) | (0.00214) | (0.000345) | (0.000350) |
| N | 4408593 | 4408593 | 4408593 | 4408593 | 4408593 | 4408593 |
| $R^2$ | 0.900 | 0.989 | 0.715 | 0.288 | 0.959 | 0.722 |

Note: 1. Coefficients for an interaction term between the treatment status and the policy implementation dummy variable.

2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.

3. The model controls for year-month fixed effects, the unemployment rate and its interaction with treatment status. Aggregate data at month-age is used in the regressions, weighted by the birth counts of each cell. Standard error clustered at age level.

Table 32: Results with Aggregate Data: Infant

| | Birth Weight | Very Low Birth Weight: <1500g | Gestation | Preterm: Gestation<37 weeks |
|---|---|---|---|---|
| Full Sample | | | | |
| | -4.581** | 0.0000859 | -0.0140** | 0.0000102 |
| | (1.491) | (0.000322) | (0.00432) | (0.000386) |
| N | 4408593 | 4408593 | 4408593 | 4408593 |
| $R^2$ | 0.965 | 0.351 | 0.785 | 0.768 |

Note: 1. Coefficients for an interaction term between the treatment status and the policy implementation dummy variable.
2. Samples include state-years where the 2003 certificate have been implemented (for detailed sample composition, see Table 35). The treatment group include mother age 23-25 and the control group age 27-29. The sample size reported is the total birth counts.
3. The model controls for year-month fixed effects, the unemployment rate and its interaction with treatment status. Aggregate data at month-age is used in the regressions, weighted by the birth counts of each cell. Standard error clustered at age level.

Table 33: IV Approach: First Stage

| | Private Insurance | |
|---|---|---|
| Instrument | | |
| YoungerMom*MonthsAfterMar | -0.00111*** | (0.000387) |
| F-test (p-value) | 8.25 | -0.0048 |
| Instrument can be excluded | | |
| Some Covariates | | |
| Age | 0.0175*** | (0.000782) |
| Unemployment | -0.00161*** | (0.000400) |
| Unemployment*YoungerMom | 0.00181*** | (0.000296) |
| MonthsAfterMarch | 0.00102** | (0.000516) |
| $R^2$ | 0.986 | |

Table 34: Results: IV Approach

| | Prenatal Visits | No care | Smoking | Quit Smoking before Pregnancy | Birth Weight | Preterm |
|---|---|---|---|---|---|---|
| IV | | | | | | |
| private | 0.320 | -0.0323** | 0.0482 | 0.148** | 25.30 | -0.0237 |
| | (0.289) | (0.0159) | (0.0307) | (0.0678) | (47.37) | (0.0327) |
| OLS | | | | | | |
| private | 0.166*** | -0.00267 | -0.00430 | 0.126*** | -20.56* | 0.00484 |
| | (0.0627) | (0.00178) | (0.00625) | (0.0180) | (11.17) | (0.00604) |

Table 35: Implementation of the 2003 U.S. Standard Certificate of Live Birth: Each state and territory, New York City, and the District of Columbia

| Year | 2013 | 2012 | 2011 | 2010 | 2009 |
|---|---|---|---|---|---|
| Total | 41 states and the District of Columbia | 38 states and the District of Columbia | 36 states and the District of Columbia | 33 states and the District of Columbia | 28 states |
| Alabama | | | | | |
| Alaska | 1 | | | | |
| Arizona | | | | | |
| Arkansas | | | | | |
| California | 1 | 1 | 1 | 1 | 1 |
| Colorado | 1 | 1 | 1 | 1 | 1 |
| Connecticut | | | | | |
| Delaware | 1 | 1 | 1 | 1 | 1 |
| D.C. | 1 | 1 | 1 | 1 | 1* |
| Florida | 1 | 1 | 1 | 1 | 1 |
| Georgia | 1 | 1 | 1 | 1 | 1 |
| Hawaii | | | | | |
| Idaho | 1 | 1 | 1 | 1 | 1 |
| Illinois | 1 | 1 | 1 | 1 | |
| Indiana | 1 | 1 | 1 | 1 | 1 |
| Iowa | 1 | 1 | 1 | 1 | 1 |
| Kansas | 1 | 1 | 1 | 1 | 1 |
| Kentucky | 1 | 1 | 1 | 1 | 1 |
| Louisiana | 1 | 1 | 1 | 1* | |
| Maine | 1* | | | | |
| Maryland | 1 | 1 | 1 | 1 | |
| Massachusetts | 1 | 1 | 1* | | |
| Michigan | 1 | 1 | 1 | 1 | 1 |
| Minnesota | 1 | 1 | | | |
| Mississippi | 1 | | | | |
| Missouri | 1 | 1 | 1 | 1 | |
| Montana | 1 | 1 | 1 | 1 | 1 |
| Nebraska | 1 | 1 | 1 | 1 | 1 |
| Nevada | 1 | 1 | 1 | 1 | 1* |
| New Hampshire | 1 | 1 | 1 | 1 | 1 |
| New Jersey | | | | | |
| New Mexico | 1 | 1 | 1 | 1 | 1 |
| New York (excluding NYC) | 1 | 1 | 1 | 1 | 1 |
| New York City | 1 | 1 | 1 | 1 | 1 |
| North Carolina | 1 | 1 | 1 | 1* | |
| North Dakota | 1 | 1 | 1 | 1 | 1 |
| Ohio | 1 | 1 | 1 | 1 | 1 |
| Oklahoma | 1 | 1 | 1 | 1 | 1* |
| Oregon | 1 | 1 | 1 | 1 | 1 |
| Pennsylvania | 1 | 1 | 1 | 1 | 1 |
| Rhode Island | | | | | |
| South Carolina | 1 | 1 | 1 | 1 | 1 |
| South Dakota | 1 | 1 | 1 | 1 | 1 |
| Tennessee | 1 | 1 | 1 | 1 | 1 |
| Texas | 1 | 1 | 1 | 1 | 1 |
| Utah | 1 | 1 | 1 | 1 | 1 |
| Vermont | 1 | 1 | 1 | 1 | 1 |
| Virginia | 1 | 1* | | | |
| Washington | 1 | 1 | 1 | 1 | 1 |
| West Virginia | | | | | |
| Wisconsin | 1 | 1 | 1 | | |
| Wyoming | 1 | 1 | 1 | 1 | 1 |

Note: * states revised certificate after Jan 1st. Total excludes reporting areas that revised after January 1 because information from the new birth certificate is reported to the natality data set from the following year.