CENTER ON THE ECONOMICS OF REPRODUCTIVE HEALTH

THE ECONOMIC EFFECTS OF CONTRACEPTIVE ACCESS: A Review of the Evidence

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About this Report

This review highlights the relationship between contraceptive access in the United States and a number of economic outcomes, including educational attainment, labor market indicators, poverty, and economic effects for later generations. The body of literature reviewed uses research designs that allow for the identification of causal impacts of contraceptive access, rather than associations. Unlike associations, causal relationships isolate the impact of contraceptive access itself and eliminate factors that might be associated with both economic outcomes and use of contraception. The implications of these findings for programs, policy, and research are discussed, in addition to limitations and challenges of this body of literature.

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The Economic Effects of Contraceptive Access: A Review of the Evidence

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Highlights

Research reviewed in this report explored the ways that access to contraception affected women's economic outcomes in the following ways:

Educational Attainment

- Young women's access to the pill improved higher education rates. Women gained access to the pill both through laws that legalized access to contraception for younger, unmarried women, and laws that lowered the minimum age for marriage—since married young women were legally able to access the pill before unmarried women.
- Women both enrolled in and graduated from college in great numbers due to contraceptive access.

Labor Force Participation

- Access to the pill allowed women to delay childbirth and increase their human capital investment in education and their careers.
- Pill access contributed to a substantial increase in the proportion of women in the workforce and the number of hours worked by women.

Career Outcomes

- In the 1970s, women began making up higher proportions of individuals with careers in professional fields, such as medicine and law. Among college-educated women, some of this increase can be attributed to access to the contraceptive pill.
- In particular, women from more selective colleges may have experienced greater labor market benefits from the pill.

Earnings

- Access to the pill translated into lower wages for women in their 20s, as women were able to pursue more education before entering the labor force.
- Women's wages then grew more rapidly than women without access to the pill, resulting in substantially higher earnings by their 30s and 40s.

• Earnings effects were concentrated in women with middle- and higher scores on IQ tests. These test scores may be indicative of privilege more generally, as there is some evidence of cultural bias in IQ testing.

Poverty

- Having access to contraception by age 20 reduced the probability that a woman lived in poverty.
- Contraceptive access likely impacted women's expectations for their future (or their sense of empowerment more broadly defined), which may have contributed to a reduction in poverty.

Effects on the Next Generation

- As legalization of contraception allowed more highly educated women to delay childbearing, the resulting cohort of births was more likely to live in poverty *in the short term* (as fewer births were born to non-poor women).
- Legal changes to contraceptive access resulted in fertility delays rather than reductions for more highly educated women. As births were retimed, longer-run effects show more children were born into households with more highly educated mothers, and children were less likely to live in poverty.
- In contrast, access to federally funded family planning programs resulted in fewer children in both the short and long run.
- Economic effects of family planning programs on the next generation extended to their adulthood, with a substantial reduction in the number living in poverty as adults.

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Introduction

The first birth control pill was approved for use as long-term contraception in the United States in 1960. "The pill," as it came to be known, radically changed women's ability to control their reproductive lives by providing a convenient and reliable method of family planning. It quickly became popular, with 80 percent of the public supporting access to contraception by the mid-1960s. Actual pill usage also increased during this time. By 1965, 16 percent of married women of reproductive age were currently using oral contraception and over a quarter had used it at some point. By the late 1980s, the proportion of all women who had ever used the pill had increased to four in five women (Dawson 1990).

The intervening two decades saw substantial change in women's opportunities in the United States. In the 1960s, the Equal Pay Act of 1963 and the Civil Rights Act of 1964 expanded women's legal rights at work. National legislation in the 1970s was championed by an energized women's movement and included Title IX of the Education Amendments of 1972, which opened the door to more equal college and graduate school admissions, and the Pregnancy Discrimination Act of 1978, which increased the legal rights of employed women who experienced pregnancy or childbirth. In the midst of all these changes in women's status, it is a challenge to identify the specific effects of contraception. This review includes only studies that have successfully dealt with this challenge, credibly isolating the effects of contraceptive access from all the other changes occurring during this era.¹

Many studies of this nature have documented the effects of contraceptive access on fertility. Both laws that expanded legal access to the pill and programs that made family planning services affordable have contributed to a reduction in births in the United States (M. J. Bailey 2010; Guldi 2008; Kearney and Levine 2009). One study examining Comstock laws, which ban the sale of contraceptives, found the marital fertility rate in

¹ Most of the studies included here are published in peer-reviewed journals. Exceptions where we include high-quality working papers are noted.

the United States would have been lower had the bans not been introduced: the fertility rate for married women would have been eight percent lower than it was in states that did pass the bans and four percent lower in the country overall (M. J. Bailey 2010). These fertility effects vary by demographic group, including by income and race. After contraception became legally accessible, the rollout of federally funded family planning programs contributed to both reductions and delays in childbearing, specifically among low-income women (M. J. Bailey 2012). Expanding legal access to contraceptives to include minors also decreased birth rates (Guldi 2008). Examining the impact of minors' access by race indicates that it decreased birth rates of minors primarily for White women.

The effect of contraception on fertility is one specific mechanism by which contraceptive access can improve women's economic outcomes. An early birth can disrupt secondary schooling or college attainment, reducing a woman's future earning potential; each additional birth can have further financial effects especially in low-income households; and unexpected late births can impact a woman's career trajectory during her prime earning years. Of course, the extent to which contraception access affects fertility also depends on access to abortion—lack of access to one will increase the fertility impact of access to the other. This suggests that impacts of contraceptive access today may be muted relative to the impacts measured in the 1960's, when abortion was illegal and available services were often unsafe. This hypothesis is supported by new evidence that access to abortion had larger fertility impacts than access to contraception for teenagers in the 1970s (Myers 2017a).

But contraceptive access can affect economic outcomes even in the absence of fertility impacts. Prior to ever using contraception, the knowledge that she will have the future ability to control whether and when to have a child can shape a young woman's aspirations and life plans. Such "expectation effects" can impact her investment in education and her career choice. For a woman who has completed her desired childbearing, the knowledge that she will not take another maternity leave, for example, can impact her engagement in the labor market, career choices, and advancement.

A subset of this literature goes beyond the economic effects for the women who gained access and examines contraception's effects on the subsequent generation. Similarly, these effects operate through both actual lowered fertility and changes to women's expectations. By reducing fertility rates there is a decrease in families falling below the poverty level because of a reduced number of children in a given household. Having fewer children also frees up time and financial resources to improve the status of existing children. The increased education and earnings that may arise through changes in fertility or expectations also increase financial resources. Finally, children of subsequent

generations may benefit from smaller cohort sizes as a result of decreased fertility rates. The evidence linking cohort size and economic outcomes has conflicting findings, but some have argued that those from smaller cohorts have faster wage growth over their life course (Berger 1984). This report will describe the importance of, and challenges with, identifying causal effects of laws and programs related to contraceptive access and the resulting policy changes. It will present the strongest evidence available on the impacts of contraceptive access and then discuss implications for today.

Identifying Causal Effects

In order to assess the true economic impact of family planning policies, researchers must disentangle the causal effects from other socioeconomic factors that may be driving both contraceptive access or use and economic outcomes later in life. The sociodemographic characteristics of women are strong predictors of fertility-related behaviors and fertility outcomes, including sexual behavior, contraception access and use, pregnancy, motherhood, and birth timing. These same sociodemographic characteristics are also strong predictors of economic outcomes, such as education and earnings. For example, women from low-income families are more likely to experience unintended pregnancy, especially as teens. Women with low incomes, regardless of whether they become pregnant as teens or not, are also less likely to get a college degree and more likely to live in poverty as an adult. As such, the association of teen pregnancy with adult poverty will be much higher than the actual causal impact of teen pregnancy on poverty.

A first step toward addressing this challenge is to include controls for the relevant sociodemographic characteristics in any attempted estimation of impact. But which are the relevant variables? Poverty? Race? Parents' education? What about number of siblings? Household curfew? In truth, one could never control for all possible factors that could affect both fertility and later economic outcomes. In an improved approach, researchers have compared sets of siblings or cousins, estimating within-family differences to control for all family background characteristics (both observed and unobserved). These studies find much lower associations of unintended pregnancy and economic outcomes than those that simply control for observable factors (Geronimus and Korenman 1992; Hoffman, Foster, and Furstenberg 1993; Geronimus, Korenman, and Hillemeier 1994; Turley 2003).

Yet, family characteristics are not the only drivers of these outcomes. Individual characteristics, such as personality, talents, aspirations, and non-cognitive "soft" skills can also play a role. In a representative sample of high school seniors from 1992, almost all young women who planned to delay motherhood until their late 20s or later also

expected to obtain a college degree or a graduate/professional degree. Women who planned to have children while they were younger were less likely to aspire to a bachelor's degree (Stange 2011).

These issues may seem nuanced, but their impact can be significant according to Stange (2011), who quantified the bias introduced by unobserved factors in estimations of the effects of pregnancy and childbearing. Stange shows that women with a first birth right out of high school earn 88 fewer college credits (of 120 typically required for a BA degree and 64 typically required for an associate degree) than women who delay motherhood by seven or more years. When controlling for a rich set of sociodemographic controls, as well as controls for life expectations and sexual behavior, the difference is reduced to 30 credits, but remains significant. Longitudinal analysis, however, shows that the women with early births were less likely to enroll in college and were accumulating significantly fewer college credits than other women prior to their first birth. Estimates indicate that 10 to 24 percent of the estimated 30 lost credits occur before a woman could have known about her pregnancy. This indicates that despite the rich set of controls, unobserved factors were driving both the lower educational attainment and the early birth. Stange concludes that many of the factors are changing over time, so no controls for predetermined characteristics or even individual fixed effects would resolve this issue.

To adequately address this challenge, some researchers have sought factors—such as an unintended pregnancy resulting in miscarriage—that affect women's fertility outcomes that are otherwise unrelated to factors that may drive the economic outcomes of interest. Other researchers have argued, however, that the occurrence of miscarriage actually may be related to individual characteristics, including health, which may be directly related to economic background (Hotz, McElroy, and Sanders 2005; Fletcher and Wolfe 2008).

The best solution to the challenge of isolating the effects of contraception from other factors is the use of policies that create differential access to contraception. The contraceptive pill became available at different times to different groups of women, with laws varying by state and date of implementation. The variation in timing by state offers an opportunity to compare birth cohorts of women across and within states, examining differences in outcomes for those who had access to a reliable form of contraception and those who did not. These methods, using large population-level datasets, eliminate differences in outcomes that are caused by unobservable or unmeasurable underlying factors, which cannot be controlled in statistical models. Remaining effects are then attributable to the policies being studied, enabling a causal relationship between contraceptive access and economic outcomes to be established. The different types of

policy and funding changes used in this body of research occurred in the 1960s and 1970s in the United States. Each is discussed in detail below.

Contraception Policy and Funding Changes in the 1960s-1970s

Comstock Laws and Access for Married Women

Although most of this research examines effects on young, unmarried women, **the early 1960s** saw variations by state in whether married women could access the pill. "Comstock laws" refers to anti-obscenity statutes that were passed by states in the late 19th century after the 1873 passage of the federal Comstock Act, which prohibited sale of "obscenities," including contraception, by mail and across state lines. Although the federal act itself had been invalidated in 1938, well before the pill was approved, many states continued to enforce similar laws that "restricted the advertisement, sale, and/or use of contraceptives within those states" (Myers 2017b). The state laws, however, used varied language—and in 1960, only 24 states actually explicitly prohibited the sale of contraceptives. In other states, "obscene" articles were banned without specifying contraception. Thirty states prohibited advertisement of contraception, but physicians and pharmacists were legally able to fill patients' prescriptions.

These bans were struck down in the 1965 Supreme Court *Griswold v. Connecticut* decision, though several states repealed bans between 1960 and 1965. Bailey (2010) argues that the state bans translated into fertility rates falling more slowly than they would have otherwise. She makes the case that this variation is exogenous, or independent of women's measurable sociodemographic characteristics, because of the unique pattern of pill usage by state that is not reflected in other contraceptive usage rates.

Even in states where contraceptives were legally available, they were typically unavailable to unmarried minors, though married minors did have access. Thus, differences in state policies regarding at what age minors could marry without parental consent offer an additional source of exogenous variation in contraceptive access, specific to minors. This source is analyzed by Edlund and Machado (2015) and included in this report.

Early Legal Access

In the early 1960s, the age of majority—when an individual is granted the rights of an adult—was 21 years in most states. When the pill was introduced in 1960, most unmarried women under age 21 did not have access. Over the course of **the 1960s and early 1970s**, states passed laws that lowered the age of majority or granted more rights to minors, therefore making the pill accessible for single women ages 18-20. These policies

are referred to in the relevant literature as early legal access (ELA) laws. Young, unmarried women quickly took advantage of this expanded access: by 1965, 41 percent of "contracepting" women under 30 (including those using sterilization, the rhythm method, and withdrawal, as well as barrier methods, such as the condom or diaphragm) were using the pill, representing over a quarter of all unmarried women of that age group (Goldin and Katz 2002).

Rather than being motivated by expanded access to contraception, the primary reason for these laws was a movement for young people's rights sparked by the war in Vietnam. In response to protests over the fact that those ages 18-20 could be drafted but could not legally vote, the 26th amendment to the U.S. Constitution was passed in 1971 to lower the voting age to 18 for federal elections. Following the passage of this amendment, states began lowering the age of majority to 18. Even before these changes, certain states allowed "mature minors" to receive medical care, including contraception, once it became available. Because changes in contraceptive access were not the intended consequence of these state-level policies, they provide a source of plausibly exogenous variation—meaning their exact timing does not correspond with other social or cultural trends that were driving changes to either women's acceptance or use of contraception, or women's economic outcomes. The distinct timing of these laws allows researchers to directly examine the effects of legal access to contraception without conflating the results with the effects of evolving societal norms or other policy changes. The coding of these legal environments is not entirely straightforward, however, and it is important to note that not all studies discussed here use the same classification for ELA states.

Public Funding

Besides legality, affordability is a key determinant of access to contraception. Federally funded family planning programs began in **1964** and were strengthened by the passage of Title X of the Public Health Service Act in **1970**. The aim of these programs was to provide education, counseling, and low-cost contraception at a time when the birth control pill was unaffordable to many. Continuing until **1973**, programs were rolled out at different times by county, allowing for county-level variation to be used in these analyses. Research examining economic impacts of county-specific federally funded family planning programs builds upon Bailey's 2012 article, which established a decline in fertility as a result of such programs (M. J. Bailey 2012). In that article she also gave evidence of how the programs' implementation was distinct from the general availability of contraception. The timing of the programs' rollout was not associated with a number of other indicators of fertility, sexual behavior, or contraception use. The use of the county-specific programs as a source of plausibly exogenous variation in contraceptive access is bolstered by the fact that the timing of the programs was not associated with the funding of other anti-poverty programs.

Potential Limitations of this Evidence

One challenge to this body of research is ensuring that the estimated effects of these policies are not confounded by other societal and political changes that occurred around the same time. The rise in support for and increased focus on women's rights and feminism during the 1960s and 1970s empowered more women to invest in their human capital by pursuing higher education and joining the labor force. Changing social norms and federal legislation, such as the 1963 Equal Pay Act and 1964 Civil Rights Act, may have also increased wages and encouraged human capital investments.

In addition, Title IX of the Education Amendments passed in 1972 banned sex discrimination in education programs and activities that receive federal funding and had important implications for women's educational opportunities. But Goldin and Katz (2002) argue that, because the regulation's guidelines were not completed until 1975, Title IX occurred too late to be the primary cause for women's gains in educational attainment during this time. Throughout this body of literature, researchers argue that the exact timing of states' implementation of ELA laws and family planning programs allows for their effects to be identified. Many suggest that the pill had its power in improving economic outcomes because of other existing social movements. Thus, access to contraception worked to complement gains made by feminism and antidiscrimination legislation.

The methods used in the analyses included in this review allow for the isolation of the causal effects of contraceptive access. Two key econometric techniques are employed to ensure that the estimates represent causal impacts. First, controlling for time trends (and/or year-fixed effects) captures other social changes of the time that would affect these outcomes and ensures that only changes occurring with the exact timing and location of changes in contraceptive access are considered. Researchers typically allow such trends to vary by state, controlling for state-specific time trends. Second, researchers account for the fact that states that chose to grant contraceptive access earlier (a major source of variation in these studies) are different from other states in many ways that may also affect women's outcomes. Therefore, researchers compare women with increased access only to other women from the same state, before and after the policy change; this technique amounts to holding differences between states constant and is known as 'state fixed effects.' Given these techniques, any other factor that may affect these outcomes of interest would need to align with changes in contraceptive access (in both timing and location) in order to be driving the results presented here. None of the key confounding factors (e.g., worker protections from discrimination, Title IX, etc.) have a perfect alignment; nonetheless, indicators of these potential confounders are often also included as controls out of an abundance of caution.

Due to variances in the laws governing contraception access at the state level, out-ofstate travel could cause misclassification of exposure to access. Women may have crossed state lines to obtain contraception while it was still inaccessible in their state of residence. This misclassification should, however, bias results toward zero, resulting in underestimated effects of contraceptive access.

Finally, given that contraception is not the only method of preventing births, access to abortion could also potentially confound the estimated effects of access to contraception. Abortion became legally available in the late 1960s and early 1970s, with timing varying by state until nationwide legalization in 1973. Although timing of state laws governing contraceptive and abortion access do not align exactly, there is an ongoing debate among researchers over what fertility and economic effects are attributable to each. In particular, Myers (2017a) calls into question some of the findings discussed in this review. (See the section "Contraception or Abortion?" for more on this topic.)

Discrepancies in Legal Coding

Within this body of literature, there is disagreement over the most accurate coding of states' policies over time. Although some changes in these various iterations of legal coding were due to errors made by researchers, most discrepancies stem from difficulties in interpreting the policies. The first legal coding was completed by Goldin and Katz in 2002 and was updated by various researchers for subsequent articles building off their framework (Goldin and Katz 2002). As Myers points out in her 2017 article, in which she proposes an updated coding scheme, coding used by these various researchers differs for around half of all states by a margin of several years (Myers 2017b).

Joyce (2013) argues that the ambiguity surrounding the laws and their implementation makes it impossible to know whether young women, parents, and physicians knew the state of legality at the time. Bailey, in response, points out that this lack of clarity would not have been relevant to young women at the time—they would have known whether or not they were able to actually obtain the pill (M. J. Bailey, Guldi, and Hershbein 2013).

Still, ambiguity in legal coding does cast some doubt on the accuracy of the estimates reviewed in this article. The replicated analyses completed by Myers and discussed below highlight some effect sizes debated as a result of coding differences.

What Does the Historic Evidence Tell Us?

The literature reviewed here uses historic changes in contraception policy and family planning funding to identify the causal effects of contraceptive access and generally finds improved economic outcomes. This section provides an overview and synthesis of key findings and themes. Many of these findings differ by racial group. Given the limitations of large-scale population data from the relevant decades, however, analyses are limited primarily to Black and White women. Because many findings in the aggregate mask trends among different groups of women, there are likely unmeasured differences in the effects of contraceptive access.

Because the results of these studies reflect a historical context very different from the United States today, the following section will discuss what implications these findings have for the present day. (More detail on the articles discussed here—such as the policy change studied, samples used, and analyses conducted—can be found in the Appendix.)

Career choice

This body of work began with an examination of the makeup of women in professional, education-heavy careers. **Goldin and Katz** (2002) found that the increase in pill usage arising from *early legal access* (ELA) accounts for nearly one-third of the total increase of the share of women in professional careers between 1970 and 1990 (representing 1.7 percentage points out of an overall increase of five percentage points). This sample itself is quite limited, however: the authors looked only at college-educated women, who appear to have benefitted from contraceptive access. When examining self-reported career plans, **Steingrimsdottir** (2016) found that, similarly, more-advantaged women had expectations of improved outcomes due to early legal access to contraception. In this case, women who attended more selective colleges benefited while women at less selective colleges reported a decrease in their expectations. In terms of actual career outcomes, improved outcomes were found for men only. But, again, findings are limited by a restricted sample; since only college students are included, a major potential benefit of contraceptive access—college enrollment—is not captured.

Education

Edlund and Machado (2015) use changes in *marriage laws* to examine the educational effects of minors gaining contraceptive access without parental consent. Because marriage was one way in which minors could confidentially access contraception, laws that reduced the minimum age for marriage resulted in increased access to contraception for minors. These laws increased the probability of a woman ever attending college by four percentage points, or 10 percent.

Several other studies examine the impacts of *early legal access* on educational outcomes. A working paper by **Hock** (2007) finds that women's college enrollment between 1968 and 1979 increased by nearly 12 percent for women who had ELA, with their dropout rate decreasing by 35 percent. He finds that these women were also 3 percent more likely to obtain a bachelor's degree by age 31. He also estimates that as of the year 2000, more than 250,000 women over age 30 were able to obtain bachelor's degrees as a result of contraception.

In their article focusing on wages, **Bailey, Hershbein, and Miller** (2012) also find evidence of increased human capital investment as a result of ELA. College enrollment was 20 percent higher for women aged 20-24 in 1968-1974 who had ELA. These women were also 15 percent more likely to report occupational training in their late twenties. The increases to educational attainment were greatest for women with higher measured ability and women from less-advantaged backgrounds. Conversely, in their article focused on effects on the next generation, **Ananat and Hungerman** (2012) also found that women who gained access to the pill had higher levels of education—but that effects were stronger among women with higher incomes.

Labor Market Outcomes

Bailey (2006) finds that ELA resulted in delayed motherhood, which translated to improvements in labor market outcomes. Her analysis attributes 14-15 percent of the increases in labor force participation rates and hours worked among women aged 16 to 30 that occurred from 1970 to 1990 to ELA. Bailey, Hershbein, and Miller (2012) also find that ELA improved wages in the long term. For women exposed to ELA, wages were lower during their early twenties, perhaps because of the increase in human capital investment in education and job training. But wages and salaries after age 30 then increased more rapidly than those of women who were not exposed to ELA. By their early forties, these women earned five percent more per hour and 11 percent more per year, translating roughly to increases of 63 cents per hour and \$2,200 per year. The authors find that two-thirds of this increase is driven by the pill's effect on labor force participation, with one-third due to changes in educational attainment and occupational choice. These benefits, however, did not extend to all women. This study uses IQ test results as a measure of ability to examine differential effects among various groups of women. Potential flaws in such measures are discussed in the section, "Impacts by Sub-Group." Wages increased the most among women with middle-to-high scores on IQ tests, with the individuals with the most improved outcomes being women with some college in the middle of the test score distribution.

Poverty

An article by **Browne and LaLumia** (2014) examines ELA's direct effects on women's poverty. Having access to contraception by age 20 reduces the probability that a woman is in poverty by one percentage point to 12.2 percent. Even when controlling for many of the mechanisms through which contraception might impact poverty—such as fertility and educational attainment, for instance—there remains a reduction of 0.5 percentage points in the probability that a woman is living in poverty. These potential alternate mechanisms include occupational choice, quality of schooling, differences in hours worked in the labor market, on-the-job human capital investments, and husbands' human capital and earnings potential. In addition, it seems likely that contraceptive access impacts women's expectations for themselves and sense of empowerment more broadly, which may contribute to a reduction in poverty.

Impacts on Next Generation

Three studies examine the impact of *subsidized contraceptive access* through countylevel changes in federally funded family planning programs. These studies show that children born in a county and year where these programs were in operation were economically better off, both as children and in later life. Bailey, Malkova, and Norling (2014) examine poverty outcomes for children under 18 (born between 1963 and 1979), as measured in the 1980 Census. Cohorts who were born after the introduction of family planning programs in their county were 4.2 percent less likely to live in poverty during childhood and 2.4 less likely during adulthood, relative to cohorts born in the same county just before program introduction. Bailey, Malkova, and McLaren (2018) improve on this analysis using long-form Census data from 1970 and 1980 to estimate poverty at the child level, rather than the cohort level. The findings are consistent, but suggest larger effects: those born after program introduction were 7.4 percent less likely to live in poverty and 4.3 percent less likely to live in near-poverty. They were also 12 percent less likely to live in a household receiving public assistance. In her working paper, Bailey (2013) also finds that children born to mothers with access to these programs were more likely to complete at least 12, 13, and 16 years of schooling, and had two percent higher family incomes as adults.

These studies show that access to subsidized contraception reduced childhood poverty in the short run and adult poverty a generation later. In contrast, **Ananat and Hungerman** (2012) find that (unsubsidized) *early legal access* to the pill increased childhood poverty in the short run. This is due to changes in the composition of births, as the more-advantaged women used contraception to reduce early births. Access to contraception appears to have delayed, rather than reduced, fertility for these women, allowing them to invest more in their education and postpone childbearing, rather than avoid it altogether. This resulted in better longer-term outcomes for the next generation: when examining children of women aged 30-49, those whose mothers had legal access before age 21 were more likely to have college-educated mothers.

Finally, **Bailey** (2013) also examines the timing of *Comstock law repeals*, in addition to the analysis of subsidies discussed above, and finds that a child born in a state that allowed the sale of contraception in the year of her birth (between 1953 and 1965) had a family income 1.5 percent higher as an adult. This effect is driven primarily by increases in the wages of sons who were born after Comstock repeal, which is likely related to the increased levels of higher education experienced by children of the next generation.

Impacts by Sub-Group

These studies offer convincing evidence of the economic benefits of contraceptive access. They also highlight that the benefits may be different across demographic groups. For groups that are able to access abortion, contraception may have smaller impacts on fertility and smaller potential impacts on other outcomes. Impacts on economic outcomes may also be smaller for women who are generally disadvantaged in terms of life opportunities; they are less likely to be able to benefit from avoiding a pregnancy.

Both of the studies that rely on changes in *federal family planning funding* (Bailey et al 2014 and Bailey et al 2018) find that these programs reduced childhood poverty, and that these effects were up to twice as large among non-White households. (The data from these studies are restricted to disaggregation by White and non-White, given the limited race categories available during the time period examined in the analyses.) This is consistent with the significant overrepresentation of non-White populations among patients of federally funded clinics and indicates the importance of this funding for reducing poverty.

Eight of the twelve studies reviewed here rely on *Early Legal Access (ELA)* changes to identify impacts of contraceptive access. By virtue of those laws, the majority of findings discussed here are specific to contraceptive access of women under 21.

Considering contraceptive access for young women, there is no evidence that impacts on economic outcomes differ significantly by race. Only one study tests for such a difference, however, which means that there is a lack of evidence overall regarding potential differences by race. Browne and LaLumia (2014) find that estimated impacts were smaller for Black women, but cannot statistically reject that the effects were the same for Black and White women. They do find that the mechanisms by which contraception affects poverty may differ by race: they find that changes in fertility, household structure, and education fully accounted for the impacts of ELA on poverty for Black women but not for White women. This indicates that, among White women, there are other ways by which contraceptive access affects future poverty. For instance, changing expectations about fertility and economic opportunity can result in increased investment in human capital (Myers 2017a).

The primary difference in impact of ELA is based on what some in the literature refer to as individual ability—a categorization that likely signifies a more advantaged subset of the population as much as it encompasses natural ability. There has long been discussion of potential cultural bias in intelligence testing, calling into question whether these tests measure innate ability or cultural background by favoring White and middle-class individuals (Ford 2004). Similarly, college selectivity, also used in this body of research as a measure of ability, is associated with factors of race and class in addition to student performance. Bailey, Hershbein, and Miller (2012) find that the impacts of access on education and wages were concentrated among women in the upper two-thirds of the distribution of scores on standardized IQ tests. This is supported by the strong effects estimated by Goldin and Katz (2002), when focusing on a sample of college-educated women, and the finding of Steingrimsdottir (2016) that among women enrolled in college, ELA improved career expectations only among those enrolled at more selective colleges. Due to contraceptive access, these more advantaged women were able to plan for and delay childbearing and invest in their education and careers, resulting in higher labor force participation, better jobs, and higher wages. These different impacts seem to reflect a more advantaged group of women benefitting from access to contraception.

Studies focusing on fertility outcomes have also shown that impacts for older, married women include reduced fertility and increased birth spacing (M. J. Bailey 2010; M. Bailey 2013). Only one study examines economic impacts of older women's access, but it does find that repealing Comstock laws improved the education and adult income of the next generation (Bailey 2013). More recently, one scholar has proposed that contraceptive access is actually *more* beneficial for older, married women, because the primary impacts of access for younger, unmarried women arise from *access to abortion*, not access to contraception (Myers 2017a). This debate is detailed in the following section.

Contraception or Abortion?

Access to abortion was legalized or restrictions were relaxed in several states in the late 1960s and early 1970s before nationwide legalization following the Supreme Court *Roe v*. *Wade* decision in 1973. Because of this state variation in abortion reform and minors'

access, quasi-experimental analyses similar to those reviewed here can be conducted to assess the economic impact of abortion access.² The period from 1960 to 1979 saw rapid change in access to both contraception and abortion; while the changes to contraception access were earlier in general, changes in access overlap in many states. Although the studies reviewed in this report do include abortion policies in their control variables, Myers (2017) claims that their classifications of policies include errors or misinterpretation of laws that group certain states into the wrong legal categories. As a result of differences in legal interpretations, there is still debate over whether the effects of young women's access to the pill were overstated by this literature due to confounding of these effects with the effects of abortion access.

Myers uses her updated legal coding to replicate estimations from several of the studies discussed in this review (Golden and Katz 2002, Bailey 2006 and 2009, and Bailey et al. 2013). These replications do not consider the economic outcomes discussed here, but focus on fertility and marriage outcomes. She finds that, when using corrected legal coding (or when using alternative data), ELA does not have a significant impact on early marriage or early birth. In contrast, she shows that legalization of abortion and minors' access to confidential abortion (without the involvement or notification of a parent) is a strong predictor of these outcomes for young, unmarried women. Given the strong body of evidence presented here that ELA has positive impacts on education, career choice, labor market outcomes, poverty, and the welfare of the next generation, one must conclude from Myers' findings that changes in early marriage and early birth were not the only mechanisms that led to these economic benefits.

Implications for Today

The research reviewed here takes advantage of policy and funding program changes that occurred in the 1960s and 1970s, but what relevance do the findings have for today? The dramatic nature of the expanded availability that resulted from these past legal and funding changes allowed for studies examining economic effects; any changes to contraceptive access today, though, will be less extreme. There is now much greater access to both contraception and abortion—particularly for women with higher incomes and with access to health insurance. Thus, the greatest effects of changes in contraceptive access today will be measurable primarily among low-income and uninsured women. This suggests a different study population from the research reviewed here and underlines the importance of examining economic effects. The

² An accompanying report by IWPR details the causal economic effects of abortion access in greater detail (Bernstein and Jones 2019).

women who will be most affected by changes in contraceptive access today are those whose economic security is already threatened.

Contemporary access to contraception may change in several ways. Actual accessibility of contraception, beyond legal access, has important implications, including women's ability to physically access family planning services and laws governing the dispensing of contraception, even though contraception itself is legal to obtain and use. Perhaps the most central factor governing women's ability to access contraception, though, is affordability. Changes to private insurance mandates, cuts to publicly funded family planning programs that ensure access to contraception at little or no cost, and expanded availability of more expensive long-acting methods, are three ways in which we may see access to a range of contraceptive methods may allow for long-term economic benefits, while reduced access may hinder women's economic security.

Accessibility

A potential route to expanding access to contraception would be to make oral contraceptives available over the counter, so that women would not need a prescription to obtain the pill. This is the reality for women in 100 countries, and there is demonstrated demand among women in the United States (Grindlay and Grossman 2018). If over-the-counter oral contraceptives were made available without out-of-pocket costs, there would be an estimated 7-25 percent decrease in unintended pregnancies (Diana G. Foster et al. 2015). Although oral contraceptives are not likely to be available over the counter in the near future, there are more immediate methods of expanding access by changing how they are dispensed. Nine states and the District of Columbia allow pharmacists to prescribe contraception, and 16 states plus DC require insurers to cover a 12-month supply of contraception after an initial 3-month supply (Kaiser Family Foundation 2019). Compared with the more commonly covered one- or three-month supply, receiving a 12-month supply was associated with a 30 percent reduction in the odds of having an unintended pregnancy (Foster et al. 2011).

Particularly given the increased threat of clinic closures caused by changes to the Title X program, discussed below, making contraception more accessible to women is key. The legal right to contraception is not sufficient—for women to see economic benefits of contraception, it needs to be accessible. Requiring fewer visits to physicians and pharmacies can make contraception easier to obtain and makes it easier for women to continually use contraceptives and reduce their risk of unintended pregnancy.

Contraceptive Coverage Mandates

Today, most policy changes regarding contraception surround insurance coverage of various methods. Although many states mandated that employer-based health plans cover contraception prior to the passage of the Patient Protection and Affordable Care Act (ACA), the ACA included a mandate that private plans cover contraception without a copay. In the years since the mandate's 2012 implementation, it has been challenged by religious and other groups that object to providing contraceptive coverage for their employees. Various changes to these regulations have allowed exemptions to the mandate under certain circumstances, with additional proposed changes undergoing legal challenges.

An emerging body of research examines the fertility effects of these mandates from the mid-1990s to the late-2000's and finds mixed results, with some indication that contraception use increased and birth rates declined (Gius 2013; Dills and Grecu 2017; Mulligan 2015). The lack of consistency and significance in these findings may be due in part to the proportion of employers already covering contraceptive methods before mandates were in place. Future research should further explore these effects, including longer-term economic impacts. This is particularly important given that cost can be a barrier to contraceptive uptake, especially for more effective methods, which have higher upfront costs. Any out-of-pocket expenses will hit the most vulnerable and low-income women hardest. A range of studies looking at cost sharing for preventive care has demonstrated that even seemingly small out-of-pocket costs can reduce use of services and medication (Artiga et al. 2017). Since the majority of Americans are insured through their employer, these mandates are important to ensuring contraceptive access, even though their downstream effects may be hard to measure.

Subsidized Contraception

In addition to private insurance coverage for contraception, present-day changes to family planning funding have implications given the research reviewed here. As noted in this report, the rollout of Title X programs expanded access to contraception for low-income women and reduced the number of children and adults subsequently living in poverty. Despite the bipartisan history of this program, government-subsidized family planning programs have become increasingly controversial in recent years. Politically motivated funding cuts, both by states and in federal regulations, threaten the Title X network. These efforts often target health care providers, mainly Planned Parenthood, that offer abortion care along with other family planning services—despite the fact that Title X funding is not used for abortion provision.

A recent study examines the effects of severe funding cuts to Texas's family planning program, which includes funding from Title X and other state grants (Packham 2017). Two changes passed by the state legislature in 2011 reduced the family planning budget by 67 percent and diverted funds away from health centers that provided only family planning services, such as Planned Parenthood. This legislation resulted in the closure of over 80 clinics, with 56 percent of all clinics losing funding for family planning by 2013. Packham found that this led to an increase in the teen birth rate of approximately 3.4 percent, amounting to nearly 2,200 additional teen births over four years. Another analysis examined these changes in combination with restrictions on abortion access which resulted in the closure of over half of the state's abortion clinics. The authors found that having no publicly funded family planning clinic within 25 miles was associated with a 1.2 percent increase in births (Fischer, Royer, and White 2018). As states and the Trump Administration propose changes to family planning funding that would reduce contraceptive access, there may be potential downstream economic effects. These policies inherently target the lower-income women eligible for these programs, making economic implications particularly relevant.

Medicaid is also crucial in allowing low-income women to access family planning services. Medicaid has become an important funding mechanism for family planning in the United States, even surpassing Title X; in 1999 Medicaid accounted for 14 percent of all public funds allocated for contraceptive services and supplies, but by 2010, this number had risen to 75 percent (Sonfield and Gold 2012). This shift is due in large part to the expansion of state Medicaid family planning programs through waivers and amendments to state Medicaid plans, which have been implemented by over half of all states. Most of these changes to state Medicaid requirements increase the income threshold for eligibility, while a few extend benefits to women losing post-partum Medicaid coverage (Ranji, Bair, and Salganicoff 2015).

One study examines these changes and finds that they led to an almost nine percent reduction in births to women ages 20-44 who became eligible for coverage (Kearney and Levine 2009). California's family planning program, Family PACT, began as a waiver program and was incorporated into the Medicaid program in 2011. Based on contraceptive services provided in 2007 alone, Family PACT averted an estimated 286,000 unintended pregnancies (Foster et al. 2011). Future research should examine the potential economic effects associated with states' expansion of Medicaid family planning, in addition to these fertility effects. States that have not expanded Medicaid or established family planning programs should consider the potential to meet contraceptive demand through these avenues.

Long-Acting Methods

Although the body of research examining access to contraceptives focuses primarily on the pill, more reliable and longer lasting contraceptive methods are also available and widely used in the United States. Long-acting reversible contraceptive (LARC) methods have lower failure rates than oral contraceptives and, depending on the method, can last for up to 12 years. These methods include hormonal and non-hormonal intrauterine devices (IUDs), subdermal implants, and injections. Because they are more effective, they are often promoted as a solution to teen pregnancy or as a cost-saving measure.

LARC methods are typically more expensive than oral contraceptives, which can be a barrier to access—particularly for adolescents (Eisenberg, McNicholas, and Peipert 2013). Several programs have provided free or low-cost LARC methods to remove this obstacle. The Colorado Family Planning Initiative (CFPI) helped women gain access to LARCs and other methods through Title X clinics, where a disproportionate share of clients are teenagers. One analysis estimated that this program causally reduced the teen birth rate by 6.4 percent over five years (Lindo and Packham 2017). These effects were concentrated among teens living closest to clinics: for those living within seven miles to a clinic, CFPI reduced childbearing to 15-17 year olds by 20 percent and to 18-19 year olds by 18 percent over seven years (Kelly, Lindo, and Packham 2019). This study also found longer-run effects for women in their 20s, with reduced births 6 to 7 years after implementation, with no clear evidence in the short-run. In St. Louis, the Contraceptive CHOICE Project provided no-cost contraceptive methods, including LARCs, and found high rates of LARC uptake once cost and access barriers were removed (Birgisson et al. 2015). Delaware CAN (Contraceptive Access Now) is an ongoing public-private partnership aimed at reducing rates of unplanned pregnancy by increasing access to contraception, particularly LARC. Early findings from this program show an increase in LARC usage and a decrease in unintended pregnancies (Welti and Manlove 2018).

As of 2014, however, only 14 percent of sexually active women of reproductive age were using a LARC method (an increase from six percent in 2008). Even as use of LARC methods have increased, contraceptive use overall has remained relatively stable—most change in method use occurred among women already using various methods categorized as moderately or highly effective (Kavanaugh and Jerman 2018). A recent microsimulation demonstrated that the non-marital pregnancy rate would substantially decrease only if women begin switching from no contraceptive use to LARC methods (Thomas and Karpilow 2016).

Future research should address long-term impacts of programs like those mentioned here. Although fertility effects of these family planning programs and higher LARC uptake may not be as dramatic as they have been promised to be, it would be beneficial

to examine the economic effects for women. An important piece of this research and any future programs will be ensuring that they use a patient-centered framework—meaning they respect and support individuals' autonomy, preferences, and needs. In particular, research should focus on how LARC access may allow for greater human capital investment for the women who desire it, while understanding that women's preferences go beyond which method is most effective at preventing pregnancy (Lessard et al. 2012).

Patient-centered care is particularly important in contraceptive care because of the legacy of reproductive coercion in the United States. Because unintended pregnancies are higher among women of color and low-income women, they are often targeted for LARC promotion. These efforts cannot be separated from historic practices, such as compulsory sterilization and aggressive marketing of the contraceptive implant Norplant to low-income women (Gold 2014; Roberts 1997). These biases persist today: providers are more likely to recommend intrauterine contraceptive devices to low-income women of color than low-income White women, and women of color are more likely to report discrimination when obtaining family planning services and pressure to use contraceptives (Dehlendorf et al. 2010; Thorburn and Bogart 2005; Becker and Tsui 2008). Method effectiveness is not the only factor that patients look for in contraceptive decision-making. Access to LARC must go hand-in-hand with access to all methods, using a patient-centered approach that allows women freedom of choice (Gomez, Fuentes, and Allina 2014).

Given the success that some programs have had in reducing unintended pregnancies, policymakers are also looking towards these models for potential economic benefits. Increased legal and financial access to reliable contraception will undoubtedly have significant implications for women. Allowing women to use the contraceptive method of their choice and more effectively plan pregnancies could improve their educational and career outcomes and increase their economic security. It is essential to remember, however, that LARC methods cannot cure poverty at a societal level. Eliminating poverty requires a broad set of policies that support the education and economic security of existing families and individuals, not just the prevention of unplanned pregnancies. Such policies as paid family and medical leave, universal child care, affordable higher education, and living wages will help lift up both women who choose to have children and those who do not. In addition to allowing women to control their reproductive lives, the underlying causes of poverty must also be addressed. Most importantly, individual women's preferences must be centered and prioritized, regardless of societal-level economic effects. With these principles in mind, policies and programs that expand access to contraception can effectively support women, both in their family planning needs and their economic security.

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Appendix. Review Details

Methods

To complete this review, we focused only on studies that used methods that can convincingly estimate causal impacts of contraceptive access on economic outcomes (as described earlier in this report). To do this we conducted searches using PubMed, EconLit, JSTOR, and Google Scholar.3 Citations of articles were used to identify additional studies for inclusion. We did not place limits on time of publication. We limited the studies to peer-reviewed literature other than a small number of working papers that we evaluated for their quality of methods.

³ Search terms were: ("contraception," OR "the pill," OR "family planning," OR "birth control") AND ("education," OR "income," OR "wages," OR "job," OR "employ*," OR "career," OR "poor," OR "poverty," OR "labor force" OR "labor market" OR "socioeconomic") AND "united states"

Included Studies

Women's outcomes

Author(s), year: Bailey, 2006

Title: More Power to the Pill: The Impact of Contraceptive Freedom on Women's Life Cycle Labor Supply

Data source(s): March Social and Economic Supplement and June Fertility supplement to CPS, 1964 to 2001

Sample: Women aged 18 to 20 in any year 1953 to 1980 who are also between the ages of 18 to 44 at the time of observation (March supplement); 36-44 (June supplement); Observations with allocated values on the dependent variable omitted.

Exposure: ELA

Age at exposure: 18-20

Outcomes: Timing of first birth and women's labor force participation

Age at outcome measurement: 18-44

Analysis: Probit specification with state linear time trends included in some specifications and state and cohort fixed effects.

Key findings: The labor force participation rates of women ages 26 to 30 increased by four percentage points, or seven percent, as a result of ELA, with an increase of two percentage points for women 31 to 35. There is no effect for women who had given birth by age 22, providing support for the mechanism of delayed childbearing increasing labor force participation for women ages 26 to 35. The lack of effect for women aged 21-25 is consistent with the theory put forth by Goldin and Katz that younger women increased their human capital investment by spending more time in school (and therefore are not reflected in the workforce during that time). When assessing the intensity of the labor supply a similar pattern emerges, with the greatest increase in hours worked for the same age group. Women 26 to 30 worked 1.7 to 2.7 more weeks per year (68 to 107 hours).

These are likely conservative estimates, as the effects of access to the pill for women ages 21 and over cannot be assessed using this framework. Additionally, the pill might have had spillover effects across states within a birth cohort or across cohorts within a state. These differences would have been eliminated by the year and state fixed-effects used in the model. Still, her analysis attributes to ELA 14-15 percent of the increases in labor-force participation rates and hours worked among women aged 16 to 30 that occurred from 1970 to 1990.

Potential confounding by abortion access? Abortion controls are included, but does not account for the policies granting young people access to the pill that also granted access to abortion

Author(s), year: Bailey, Hershbein, and Miller, 2012

Title: The Opt-In Revolution: Contraception and the Gender Gap in Wages Data source(s): The National Longitudinal Surveys of Young Women (NLS-YW) Sample: Women aged 20 in any year 1963 to 1974, interviewed beginning in 1968 Exposure: ELA Age at exposure: Under 21 (state of residence at age 21 used) Outcomes: Women's lifecycle wages; educational attainment

Age at outcome measurement: 20-49

Analysis: Linear regression models with fixed effects for state of residence and year-of-birth cohorts; additional specifications test the validity of using ELA to identify the pill's impact.

Key findings: For women exposed to ELA, results consistently show a pattern of lower wages for women during their early twenties, but with wage and salaries increasing more rapidly than those of women who were not exposed to ELA. By their early forties, women exposed to ELA earned five percent more hourly and 11 percent more per year, translating roughly to increases of 63 cents per hour and \$2,200 per year. Two-thirds of this increase is driven by the pill's effect on labor force participation, with one-third due to changes in educational attainment and occupational choice.

Women with middle to high scores on IQ tests responded to contraceptive access by increasing their educational attainment and work experience the most. These women received more years of education in their twenties, which translated to higher wages in their thirties and forties. These benefits do not appear to extend to women who scored lower on tests.

Potential confounding by abortion access? Uses a set of abortion controls including legal availability and log distance to the nearest large city providing out-of-state abortion.

Author(s), year: Browne and LaLumia, 2014 Title: The Effects of Contraception on Female Poverty Data source(s): IPUMS from the decennial Census, 1960-1990 Sample: Women ages 16-44 in 1960 to 1990 (aged 20 in years 1916 to 1996)

Exposure: ELA

Age at exposure: 20 (specifications with both using state of birth and state of residence at Census enumeration)

Outcomes: Likelihood of living in poverty for women

Age at outcome measurement: 16-44

Analysis: Ordinary least squares (OLS) with state and year fixed effects; one equation uses only controls exogenous to the individual and unrelated to ELA, while the second includes potential mechanisms and variables that could also be affected by ELA, including educational attainment, fertility, employment, marital status, and living with one's parent. This second equation intends to capture the remaining effect that occurs outside of these mechanisms, potentially through less measurable mechanisms.

Key findings: Having access to contraception by age 20 reduces the probability that a woman is in poverty by 1 percentage point, from a base of 13.2 percent. The likely mechanisms controlled in the second model account for only half of this effect. The authors suggest some other mechanisms through which ELA might affect poverty; these include occupational choice, quality of schooling beyond highest grade completed, differences in hours worked in the labor market, on-the-job human capital investments, and husbands' human capital and earnings potential. In addition, it seems likely that women's expectations as well as empowerment more broadly defined may contribute to a reduction in poverty.

Potential confounding by abortion access? Abortion legality is included in controls.

Author(s), year: Edlund and Machado, 2015

Title: How the other half lived: Marriage and emancipation in the age of the pill

Data source(s): The Marriage and Fertility Supplement of the June Current Population Survey (CPS), 1977-1995

Sample: Women who were aged 20 in any year 1955 to 1979, and who were 36 to 44 years old at the time they were surveyed

Exposure: Changes in the minimum age of marriage (as marriage allowed access to contraception; 1960's & 1970's)

Age at exposure: 20

Outcomes: Age of marriage, fertility, educational attainment, and labor market outcomes (all managerial positions as opposed to the "High Professionals" category used by Goldin and Katz)

Age at outcome measurement: 36-44

Analysis: Their main econometric approach uses a linear probability model, with specifications controlling for age fixed effects, state-specific cohort trends, and ELA controls.

Key findings: *Education:* No effects are found for high school education, which is unsurprising given that it is generally both tuition-free and completed by age 20. Early marriage access increases the probability of having some college by four percentage points, or 10 percent. For the four-year college outcome, the effect is only statistically significant for those without early legal access to contraception, but for these women has effects in the 10 to 15 percent range.

Occupational outcomes: Early marriage access increased the probability of having a managerial or professional career by three to four percentage points, or 10-14 percent. This effect is stronger than the effect of ELA for these occupations. For the high professionals and doctors/lawyers category (following the Goldin and Katz article), there are also positive significant effects. The authors conclude that, between early marriage and ELA, the policy that was enacted in a state first had the most substantial effect.

Potential confounding by abortion access? Abortion legality is included in controls.

Author(s), year: Goldin and Katz, 2002

Title: *The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions* Data source(s): Decennial Census data from 1970, 1980, and 1990 Sample: Unmarried, U.S. college women; ages 30-49 at the time of the 1970-1990 Censuses Exposure: Early legal access

Age at exposure: Under 21

Outcomes: Descriptive analyses: career investment, marriage, sex and fertility. Econometric analyses: marital status and professional career outcomes (these included law, medicine, dentistry, and business administration).

Age at outcome measurement: 20-49

Analysis: Descriptive analyses on professional school enrollment; difference-in-differences model to assess impact of variation in ELA laws between states; state and year of birth fixed effects are included, as are dummy variables to account for state contraception and abortion policies in each woman's state of birth at age 18.

Key findings: Findings suggest strong positive and statistically significant effects of contraception access on women moving into professional careers. The increase in pill usage accounts for an increase of 1.7 percentage points in the share of women in all professional careers over 1970 to 1990, out of an overall increase of five percentage points. For doctors (including dentists and veterinarians) and lawyers, expanded access to the pill accounts for over 30 percent of the increased professionalism. Though these results suggest promising effects of the pill, it is important to note that this sample is fairly limited. Because it looks at only college-educated women, who already are a more advantaged subset of the population, these results may not be generalizable to all women.

Potential confounding by abortion access? Includes controls for abortion legality and abortion rates, but does not account for the policies granting young people access to the pill that also granted access to abortion.

Author(s), year: Hock, 2008

Title: The Pill and the College Attainment of American Women and Men

Data source(s): The October schooling supplement of the Current Population Survey (CPS), 1968-1979; Census Public Use Microsample data, 1990 and 2000. "Excluded from the sample are women with allocated schooling variables (Bollinger and Hirsch 2006), women who reported that their major activity last week was 'retired' or 'unable to work', and women who reported that they were not enrolled despite listing their major activity as 'in school'."

Sample: Women ages 21-22 between 1968 and 1979 (college enrollment outcomes); women born between April 1940 and April 1959, observed once at ages 31 to 49 and once at 41-59 (college completion outcomes)

Exposure: ELA

Age at exposure: 18

Outcomes: Women's college enrollment and completion, and men's educational opportunities. **Age at outcome measurement:** 21-22 (college enrollment); 31-49 and again at 41-59 (college completion)

Analysis: College enrollment: a difference-in-difference model is used to assess the impact of variation in state ELA policies, with year fixed effects and a set of state fixed effects for each age, as well as state trends, racial indicators, and other indicators for contraception and abortion access. College completion: the model is the same as above, but using a continuous measure of educational attainment at some uniform age; state of birth is substituted for state of residence in this model.

Key findings: The pill increased college enrollment for women by over two percentage points, with a decrease of five percentage points in the women's dropout rate. Women exposed to ELA were 0.78 percentage points more likely to obtain a bachelor's degree by age 31. As of 2000, more than 250,000 women over 30 were able to obtain bachelor's degrees as a result of contraception. These results underestimate the effect of the pill, as it only captures the impact on women who could not access contraception before the implementation of ELA policies.

Potential confounding by abortion access? Indicators for abortion legality and minor consent for abortion are included.

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Author(s), year: Steingrimsdottir, 2016

Title: Reproductive rights and the career plans of U.S. college freshmen

Data source(s): Career plan data came from the 1968-1976 Cooperative Institutional Research Program's (CIRP) Freshman Surveys; career outcomes are taken from the 1980, 1990, and 2000 Censuses

Sample: Survey data: first-year college students; career outcomes: men and women who have completed at least one year of college

Exposure: Early legal access to the pill and abortion (1960's & 1970's)

Age at exposure: 18

Outcomes: College freshmen's career plans (survey results) and cohort career outcomes (Census data)

Age at outcome measurement: 18-38

Analysis: The econometric model includes state and cohort fixed effects, indicator variables measuring access to abortion and the pill, controls for race, high school grades, and college selectivity, as well as dummy variables for several other background characteristics. A second equation examines heterogeneity in effects.

Key findings: In terms of career plans, findings are mixed. Overall, no significant effect of ELA to the pill was found for women. In contrast, lower income and prestige scores of expected occupations were associated with access to abortion. When examining different groups, "higher-ability" women (as measured by college selectivity) were actually found to have expectations that benefitted from access to the pill, which is in line with the author's theoretical framework which posited that these women would see improved outcomes given that higher-educated and more advantaged women are more likely to use the pill. Conversely, abortion access actually led to worse career expectations for lower-ability women. There is some evidence that this negative effect of access to abortion might be partially explained by an increased share of women in the sample who did not have college-educated fathers.

When examining actual career outcomes, the author suggests that it might have been only men whose careers and incomes benefitted from access to the pill and abortion. It is important to note, though, that the nature of this sample (individuals who have some college education) excludes one of the potential improvements in educational attainment caused by pill access: increased college enrollment.

Potential confounding by abortion access? Indicators of abortion access are included as controls.

Children's outcomes

Author(s), year: Ananat and Hungerman, 2012

Title: *The Power of the Pill for the Next Generation: Oral Contraception's Effects on Fertility, Abortion, and Maternal and Child Characteristics*

Data source(s): IPUMS from the 1980 Census;

Sample: Births to women aged 14 to 20 in years 1964 to 1978, observed as children in 1980 census

Exposure: ELA

Age at exposure: mothers aged 14-20

Outcomes: Fertility of young women; characteristics of cohorts of children born after pill availability: welfare receipt, living in a single-parent household, living in poverty, and low birthweight

Age at outcome measurement: 1-15 (next generation)

Analysis: A difference-in-difference model is used to measure changes across states over time, with state-specific time trends, interactions between mother's age and region-specific averages, and other state-specific controls. A triple-difference model adds a third source of variation: within-state policy changes that affected pill access for some young women and not others.

Key findings: The proportion of children receiving public assistance or living in poverty was higher for those children born to women who had access to the pill. The child not born due to ELA would have been eight percent less likely to live in a household receiving public assistance. This short-term change in the composition of births occurs as more-advantaged women delay childbearing—resulting in comparatively worse outcomes for those children that are immediately born to women with ELA. This delay was not a reduction of lifetime fertility and appears to have allowed women to invest more heavily in their own human capital. ELA led to a 2.3 percent increase in the share of women who are college graduates. The average child also became 4.5 percent more likely to have a college-educated mother.

Potential confounding by abortion access? Abortion access control variables included in some analyses.

Author(s), year: Bailey, 2013

Title: Fifty Years of Family Planning: New Evidence on the Long-Run Effects of Increasing Access to Contraception

Data source(s): IPUMS from the 2000 Census and the 2005-2011 ACS

Sample: Individuals born between 1946 and 1980; for family planning funding analyses, data are additionally restricted to Public Use Microdata Areas (PUMAs) that ever received a family planning grant from 1964 to 1973

Exposure: Exposure of individual's mother to available contraception (based on Comstock-era bans and repeals) and county-level differences in access to federal family planning funding

Age at exposure: Exposure of mother at time of individual's birth (i.e. any reproductive age)

Outcomes: Long-term effects on children; adulthood college completion, labor force participation, wages, and family income

Age at outcome measurement: individuals aged 20-59 born during variations in contraceptive exposure

Analysis: Comstock laws: a flexible linear specification that includes state and year fixed effects, a set of time-varying covariates, and a set of region x year fixed effects. Family planning funding: a difference-in-difference model that includes county fixed effects and a set of either year or state x year fixed effects.

Key findings: Children born from 1958 to 1965 in states that allowed the sale of contraception had family incomes 1.5 percent higher as adults. When Comstock laws were repealed, she finds an expected convergence of incomes, with differences disappearing once all states allow contraceptive sales for later cohorts. These effects were driven primarily by increases in men's wages, which is likely related to the greater labor force participation among affected men. For higher education, effects are also concentrated among men. The relative share of men with 16 or more years of education increases approximately 1 or 2 percent for affected cohorts. Effects are not found when examining other education levels for men, or any education levels for women.

Children born to mothers exposed to federally-subsidized family planning programs have family incomes in adulthood 2 percent higher than those born to mothers in the same locations 5 to 9 years before programs began. These individuals were more likely to complete at least 12, 13, and 16 years of schooling. These effects were driven by increases in 16+ years schooling. Effect sizes increase for cohort born even later after the programs were implemented.

Potential confounding by abortion access? Covariates include legal availability of abortion and number of abortion providers per county.

Author(s), year: Bailey, Malkova, and McLaren, 2018

Title: *Does Access to Family Planning Increase Children's Opportunities? Evidence from the War on Poverty and the Early Years of Title X*

Data source(s): Restricted-use long-form 1970 and 1980 Census samples

Sample: Children under 18; cohorts born from 6 years before to 6 years after rollout of family planning funding

Exposure: Exposure of mother to county-specific rollout of federally-funded family planning programs

Age at exposure: Exposure of mother at time of individual's birth (i.e. any reproductive age)

Outcomes: Children's economic outcomes: household income, likelihood of living in poverty, receipt of public assistance, and living in a single-headed household

Age at outcome measurement: 0-18

Analysis: Event-study framework with county fixed effects, birth-year fixed effects, state-bybirth fixed effects, and a set of other covariates typically used in studies examining the War on Poverty.

Key findings: Cohorts born after the introduction of family planning programs had higher household incomes and were less likely to live below the poverty line in childhood. Compared to cohorts born 6 years before programs began, cohorts born 5 years after were 7.4 percent less likely to live in poverty, 6.4 percent less likely to live below 1.5 times the poverty line, and 4.3 percent less likely to live below twice the poverty line. Children born 5 years after were 12 percent less likely to live in a household receiving public assistance. These changes were driven in part by older mothers reducing unintended pregnancies.

Results were stronger for non-White households, consistent the overrepresentation of non-White women among subsidized family planning patients. The absolute reduction of poverty for the average non-White child born 5 years after rollout was twice that of the reduction for the average White child. When taking into account lower poverty rates by reduction in siblings, reductions in poverty rates attributable to family planning were even higher. These results suggest that family planning programs raised household incomes by allowing parents to invest in their human capital and careers, as well as find stable partnerships.

Potential confounding by abortion access? Abortion legalization is included in the fixed effects, with the number of abortion providers included in some specifications.

Author(s), year: Bailey, Malkova, and Norling, 2014

Title: Do Family Planning Programs Decrease Poverty? Evidence from Public Census Data

Data source(s): Vital Statistics, the 1980 Census, and a pooled sample of the 2000 Census and 2005-2011 American Community Survey (ACS)

Sample: County groups in which all counties received family planning funding before 1974; age restrictions described below

Exposure: County-specific rollout of federal family planning funding

Age at exposure: born 1 to 6 years after the family planning program began

Outcomes: Childhood and adult poverty of individuals born after the introduction of family planning programs

Age at outcome measurement: individuals under age 18, or birth cohorts born from 1963 to 1979 (childhood outcomes); individuals ages 20 to 59 when observed, or born from 1946 to 1980 (adult outcomes)

Analysis: Difference-in-differences model comparing the cohort born 1-6 years after the program began to those born 0 to 2 years before the program, across counties with and without programs; county fixed effects or county x observation year fixed effects (when using Census and ACS, respectively), and birth year fixed effects or state-by-birth cohort fixed effects are included.

Key findings: Funding reduced child poverty rates by 4.2 percent, a 4.1 percent reduction for White children a reduction of 8.3 percent for non-White children. The reduction of children living below the poverty line was larger than the reduction of children living below twice the poverty line, indicating the strongest effects for the poorest.

In adulthood, children from exposed cohorts are 2.4% less likely to live in poverty and 2.4% less likely to live below twice the poverty line. The authors estimate that almost 80,000 fewer children lived below the poverty line in 1980 than would have if family planning programs had not existed. They also estimate that over 46,000 adults escaped poverty as a result.

Potential confounding by abortion access? Abortion legalization is included in the fixed effects, with the number of abortion providers included in some specifications.

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