Discussion Paper Series

IZA DP No. 19081

November 2026

The Effects of Coerced Sterilization: Evidence from Native American Women

Arcangelo Dimico
Queen's University Belfast,
GLO, IZA@LISER, CEPH, NIDE and HHDI

Gaia Narciso
TIME and CEPH, Trinity College Dublin

The IZA Discussion Paper Series (ISSN: 2365-9793) ("Series") is the primary platform for disseminating research produced within the framework of the IZA@LISER Network, an unincorporated international network of labour economists coordinated by the Luxembourg Institute of Socio-Economic Research (LISER). The Series is operated by LISER, a Luxembourg public establishment (établissement public) registered with the Luxembourg Business Registers under number J57, with its registered office at 11, Porte des Sciences, 4366 Esch-sur-Alzette, Grand Duchy of Luxembourg.

Any opinions expressed in this Series are solely those of the author(s). LISER accepts no responsibility or liability for the content of the contributions published herein. LISER adheres to the European Code of Conduct for Research Integrity. Contributions published in this Series present preliminary work intended to foster academic debate. They may be revised, are not definitive, and should be cited accordingly. Copyright remains with the author(s) unless otherwise indicated.

IZA DP No. 19081 November 2026

The Effects of Coerced Sterilization: Evidence from Native American Women*

Abstract

Forced sterilization represents one of several coercive population control measures enacted during the 20th century. This paper examines the short- and long-run effects of coerced sterilization, drawing evidence from the experience of Native American women in the 1970s. Beyond reduced fertility, our findings indicate that, in the long run, Native American women exposed to forced sterilization experienced worse health outcomes, lower labor market participation, lower income, and decreased investment in their children's education. We also examine the intergenerational transmission of fertility choices and find suggestive evidence of a reversal: children of mothers exposed to forced sterilization have higher fertility.

JEL classification

I15, J13, J15, N32, O12

Keywords

sterilization, fertility, human capital, intergenerational transmission

Corresponding author

Arcangelo Dimico
a.dimico@qub.ac.uk

* We gratefully acknowledge funding from the North South Research programme (Strand II) of the Higher Education Authority of Ireland. We thank Jack Egan for excellent research assistance. We would also like to thank Elisabetta De Cao and conference and seminar participants at Trinity College Dublin, the UCD-TCD-QUB Economic History workshop, CEPH Economic History workshop, Fondazione DeBenedetti workshop, 2nd HHDI-NIDE Workshop on Cultural Transmission and Persistence, and NBER Summer Institute (Development of the American Economy) 2026.

1 Introduction

Forced sterilization represents one of the most coercive forms of population control implemented during the twentieth century. Across the world, coercive contraception and other restrictions on reproductive autonomy have been used to regulate the fertility of groups deemed poor, marginalized, racially undesirable, or socially burdensome. These policies were often justified by demographic, developmental, and public health arguments, but they were also deeply shaped by eugenic ideas about improving population quality (Birke, 2025). In the United States, the eugenics movement gained prominence in the early twentieth century and promoted the belief that certain human traits should be *"bred out"* through the control of reproduction (Kluchin, 2020). Although no comprehensive statistics exist, forced sterilization and coercive contraception have likely affected millions of individuals worldwide, including African American, Native American and Hispanic women in the United States (Kluchin, 2020), men in India (Singh and Vincent, 2024), Indigenous women in Peru (Vasquez Del Aguila, 2022) and Canada (Stote, 2012), and Aboriginal women in Australia (Rademaker, 2024). Despite the scale of these interventions, their full social and economic consequences remain poorly understood.

This paper sheds light on the short- and long-run impact of coercive population control policies, drawing evidence from the experience of Native American women. It is estimated that between 25 and 40 percent of Native American women were coercively sterilized in the 1970s, through tubal ligation or hysterectomy, often without consent or full understanding of the procedure or its physical and psychological effects (Ralstin-Lewis, 2005; Kluchin, 2020). Our analysis evaluates how exposure to such measures affected women's fertility, health, labor market outcomes, and investment in children. We also explore the intergenerational transmission of fertility choices among children of potentially exposed mothers.

Identifying American Indian households affected by coerced sterilization is a significant challenge, as individual-level data on Native American women forcibly sterilized are not available. We address this issue by capturing the likelihood of exposure to coerced sterilization through proxies for the loss of reproductive autonomy during this period. According to numerous studies (Kluchin, 2020; Lawrence, 2000), tubal ligations or hysterectomies were often performed on women at the time of giving birth. Therefore, we define the treatment group as the cohort of Native American women whose youngest child was born during the late 1960s and through the 1970s. We mitigate

the influence of potential confounding factors, such as menopause or broader fertility trends, by comparing women of the same cohort.

We test the validity of our treatment definition in three ways. First, we provide evidence that the timing of the last birth is a reasonable proxy for exposure to forced sterilization by showing that the age at last birth declines markedly during the period under consideration for Native American women in peak fertility. Given the expansion of contraceptive access and family planning initiatives from 1965 onward, we would expect maternal age at last birth to increase over this time period. Instead, we find that Native American women who entered childbearing age in the 1970s had their last child almost 0.6 years earlier, on average, than women in the comparison group, even after controlling for mother's cohort. Notably, this pattern is specific to the 1970s: the age at last birth for Native American women entering childbearing age either before or after the period of interest tends to be relatively higher than that of the reference group. As a second step in the validation of our treatment definition, we use a sharp age-based cutoff introduced by a 1973 moratorium on sterilization for women below 21 to show that the timing of the last birth changes in line with the restrictions imposed by the moratorium. Native American women who turned 20 after the 1973 moratorium were more likely to have their last child at age 21. Conversely, women who turned 20 just before the moratorium were more likely to have their last child at age 20. This evidence is relevant for two reasons. It supports the use of the timing of the last birth as a proxy for exposure to forced sterilization for Native American women. At the same time, it suggests that the sterilization of young Native American girls was indeed practiced before the moratorium. This phenomenon bears comparison to other documented instances of coercive reproductive control. Notably, similar practices have been identified among Inuit populations in Greenland, where large numbers of girls and women were subjected to non-consensual contraception or sterilization as part of state-led population control initiatives (Lekvall, 2025). Finally, to further test the validity of the treatment definition, we rely on the medical evidence on the gynecological side effects of permanent sterilization. Using data from the National Health Interview Survey, we show that Native American women potentially exposed to sterilization have an almost 3 percentage point higher probability of reporting gynecological disorders in the long run, which, relative to the sample mean (3.3 percent), corresponds to a substantial increase in the share of women reporting such issues.

Having established the validity of the treatment definition, we turn to the short-run effect of exposure to forced sterilization. We use retrospective house-

hold data from the 1990 5% U.S. Census State Sample, combined with the National Health Interview Survey data, and exploit variation across treated and untreated cohorts as well as variation across races. We find that Native American women potentially exposed to forced sterilization have a lower number of children. The probability of having more than one child for treated women decreases by approximately 6.1 percentage points, corresponding to an 8 percent reduction relative to the sample mean. The probability of having more than two children decreases by nearly 11 percent, and the estimated probability of having more than three children drops by roughly 6%.

We disentangle the effect of family planning from forced sterilization by exploiting the timing of the provision of family planning at IHS facilities in 1965, and conducting an event study. We show that family planning had no impact on fertility, in line with anecdotal and medical evidence of low adoption of contraception among Native American women (Lawrence, 2000; Temkin-Greener et al., 1981). The effect of exposure to forced sterilization begins to manifest in households whose last child was born in 1969, with fertility levelling among successive cohorts until 1979, when hysterectomies were banned as a contraception measure.

We then examine whether the effect on parity varies by tribe: we find that the impact of potential exposure to forced sterilization is considerably larger among tribes with traditionally shorter birth spacing, and thus among women who were likely to have more children. This latter result is in line with the evidence of a selective use of forced sterilization to conform American Indian families to traditional white family norms and to keep their population growth under control (Kluchin, 2020). We match tribes with ethnographic data from Murdock (1967) on post-partum sex taboos and show that the effect on parity is larger in tribes with a post-partum abstinence period below one month, which confirms heterogeneity by birth spacing. We also conduct a sentiment analysis on newspaper articles from the early 1960s to capture Malthusian fears related to population growth and attitudes toward Native Americans. We find that the effect on parity is larger in states where population growth is a significant concern and attitudes toward Native Americans are more negative. Drawing on the 1930 Census, which records information on Native Americans, we document substantial heterogeneity across tribes, driven by differences in baseline fertility and socioeconomic conditions. Tribes with higher fertility rates in 1930 experienced larger reductions in parity by 1990. This decline is more pronounced among women from tribes where the average age at marriage in 1930 was lower and where literacy rates were relatively low. Overall, this

evidence consistently points to a potential targeting of forced sterilization.

Next, we investigate the long-run effects of exposure to forced sterilization on health and socioeconomic outcomes. Using data from the National Health Interview Survey, we show that Native American women exposed to coerced sterilization experience worse health outcomes in the long run. They are 4.3 percentage points more likely to report health issues, and more likely to report having been bedridden due to a disability. Using the 5% 1990 Census, we find that treated women are more likely to live in single-headed households (a proxy for divorce or separation), have a higher probability of a disability, and, consequently, less likely to participate in the labor force, which in turn lowers their personal and household income.

As a second step, we evaluate the effect of exposure to forced sterilization on children's human capital. Controlling for birth cohort and current school enrollment, we find that for children of mothers potentially exposed to sterilization, the probability of completing a high school diploma (grade 12) or at least one year of college decreases by 2.3 and 4.3 percentage points, respectively. As a placebo test, we examine whether treatment exposure affects the probability of completing free compulsory education (i.e., middle school) and find no effect. These findings are robust when controlling for the household head's education level, labor force participation, and socioeconomic status.

Finally, we explore the intergenerational transmission of fertility to children born in households exposed to the treatment using data from the IPUMS 2000 US census (5% sample) and the Panel Study of Income Dynamics - Social, Health, and Economic Longitudinal File. We find suggestive evidence that children born into households exposed to forced sterilization have higher fertility later in life. This pattern is consistent with two channels: more negative attitudes toward contraception and a shift in fertility preferences in response to the declining Native American population. Data limitations prevent us from formally testing either channel, so we treat these results as exploratory.

To the best of our knowledge, this is the first study to provide a quantitative estimate of the short- and long-term economic effects of forced sterilization. We contribute to three main strands of literature.

First, this paper is closely related to the literature on the long-term effects of medical malpractice and medical abuse. Gaston and Alleyne-Green (2013) conduct a systematic review to examine the legacy of abuse from medical experimentation on slaves and African Americans, finding significant effects of

these past experiences on attitudes toward HIV-related health care. Alsan and Wanamaker (2018) evaluate the lasting impact of the Tuskegee Study of Untreated Syphilis on the behavior and health of older Black men, documenting enduring effects on medical mistrust and mortality. Chang (2018) studies the impact of the controversy surrounding the measles-mumps-rubella (MMR) vaccine on vaccination rates among subsequent cohorts and observe spillover effects on the uptake of other vaccines. Similarly, Qian et al. (2020) provide evidence of confirmatory bias in health decisions following the MMR-autism vaccine controversy. Lowes and Montero (2021) find lower vaccination rates and diminished trust in medicine in areas heavily exposed to the French medical campaign to treat and prevent sleeping sickness in Africa. Martinez-Bravo and Stegmann (2022) examine the effects of the anti-vaccination campaign led by the Taliban after news emerged that the CIA had used a vaccination program as cover to capture Osama Bin Laden. Finally, Archibong and Annan (2023) investigate the impact of the 1996 Pfizer human trials in Kano, Northern Nigeria, where an experimental antibiotic for meningitis led to the deaths of 11 children.

Second, this study relates to the literature on racial discrimination in the US. A large part of this literature has focused on the effect of slavery (Fogel and Engerman, 1995; Nunn, 2008; Naidu, 2010; Engerman and Sokoloff, 2012; Bertocchi and Dimico, 2014; Boustan and Margo, 2014; Acharya et al., 2016; Levine et al., 2020; Ager et al., 2021; Wright, 2022; Bleakley and Rhode, 2024), the impact of the Jim Crow laws (Margo, 1982, 1984, 1987, 1990; Collins, 2003; Bertocchi and Dimico, 2017; Carruthers and Wanamaker, 2017; Ruef and Grigoryeva, 2018; Althoff and Reichardt, 2024) and consequences of racial violence (Collins and Margo, 2004, 2007; Cook, 2014; Cook et al., 2018; Albright et al., 2021; Williams, 2022). A small part of this literature has focused instead on discrimination against American Indians. Feir (2016) evaluates the impact of residential schools on cultural and economic assimilation and finds that children who attended residential schools show a higher level of assimilation. Maruthiah (2024) looks at cohort variation in the exposure to boarding schools and finds that children in reservations are more likely to speak English, have a Western name and be perceived as white. Gregg (2018) shows that children in reservations that sent a larger share of students to off-reservation boarding schools have better educational and economic outcomes, lower fertility, and a higher probability of speaking English. Kopriva (2024) finds that the Indian Relocation Policies in the late 1950s and 1960s promoted the redistribution of Indigenous Peoples to the urban centers selected for relocation. Frye and Parker (2021) look at close elections following the formation of Indigenous

self-government units as part of the Indian Reorganization Act (IRA) and argue that adopting an IRA constitution has implied more federal oversight and lower income. Anderson and Lueck (1992) argue that the low agricultural productivity across Indian reservations is the result of constraints imposed by the federal government over Indian land. Dippel (2014) studies the impact of American Indian reservations and finds that forced coexistence led to a reduction in income per capita on reservations today by about 30%. Leonard et al. (2020) evaluate the impact of land titling following the General Allotment Act of 1887 and find a non-linear effect on income across reservations. Feir and Cattaneo (2021) look at discrimination in the mortgage market, while Feir et al. (2024) evaluate the impact on health of the Slaughter of the Bison toward the end of the 19th century on health. Watson (2006) evaluates the impact of federal sanitation interventions in reservations using a staggered DiD and find a substantial effect on child mortality. Anderson and Parker (2008), Brown et al. (2019), Cookson (2010) examine the effect of the 1953 Public Law 280. Feir (2025) and Carlos et al. (2022) provide a broad review of the historical and economic literature related to Native Americans.

Finally, this paper contributes to the broader literature on fertility and family planning. Seminal studies (Goldin and Katz, 2002; Bailey, 2006; Bailey and Lindo, 2018; Bauernschuster et al., 2023) document the transformative effects of access to contraception, including reductions in fertility, increased birth spacing, declines in stillbirths and infant mortality, and increases in age at first birth and marriage. These changes are also associated with greater investments in education and higher labor force participation. While this literature clearly demonstrates the positive impacts of expanding access to family planning, our paper offers the first examination of the consequences of restricting women's autonomy in these decisions. We show that when Native American women's reproductive choices were removed, the long-run effects were deeply adverse, with negative impacts across health, socioeconomic outcomes, and labor force participation.[1]

The paper is structured as follows. Section 2 provides a discussion of the his-

[1]The paper also contributes to the literature investigating the impact of parental job loss, maternal mental health, negative family environment on children's outcomes (Heckman, 2007; Oreopoulos et al., 2008; Frank and Meara, 2009; Aizer et al., 2016; Dahlen, 2016; Persson and Rossin-Slater, 2018; Mörk et al., 2020; Carneiro et al., 2021; Willage and Willén, 2022; Eshaghnia et al., 2022; Carneiro et al., 2024; Huttunen and Riukula, 2024; Salvanes et al., 2024). In line with the literature, we find evidence of a significant relationship between negative family environment and child outcomes.

torical background regarding coerced sterilization of American Indian women. Section 3 presents the data sources, while Section 4 provides evidence on the validity of the treatment definition. Section 5 presents the estimation strategy. The effects of forced sterilization exposure on fertility in Section 6, followed by a set of heterogeneity exercises in Section 7. Section 8 explores the effect of sterilization exposure on health and labor market outcomes. Section 9 investigates the potential intergenerational transmission channel and Section 10 concludes.

2 Background

The 1960s marked a period of significant change for many American women, particularly regarding reproductive rights. President Lyndon B. Johnson's War on Poverty provided unprecedented access to family planning programs, under the expectation that increased reproductive autonomy would foster greater economic mobility and equality. For many women, the ability to control their fertility represented an opportunity for self-sufficiency, enabling them to take advantage of the educational and economic prospects created by the program. While many American women benefited from these policies, reports of reproductive rights abuses involving American Indian women at Indian Health Service (IHS) hospitals began to surface in the 1970s. Several women from various tribes came forward with accounts of forced sterilizations. The growing number of such reports, along with allegations of questionable sterilization practices at the Claremore IHS hospital in Oklahoma, prompted Dr. Constance Redbird Pinkerton-Uri, a physician with the IHS, to conduct her own inquiry. By examining records from 26 of the 35 Indian Health Service hospitals across the country with obstetric wards, she estimated that approximately 25 percent of American Indian women had been sterilized (Shepherd, 2021). Dr. Uri's findings led to an investigation by the General Accounting Office (GAO) in four of the twelve IHS program areas: Aberdeen, Albuquerque, Oklahoma City, and Phoenix (Lawrence, 2000). The resulting report, released in 1976, revealed that the IHS performed 3,406 sterilizations between 1973 and 1976 and highlighted potential issues in terms of: (1) *sterilization of persons under 21 years of age* - despite the Department of Health, Education, and Welfare moratorium on underage sterilizations, introduced in 1973; (2) *non-standard consent forms*; (3) *lack of widespread physician understanding of the regulations*; and (4) *lack of definitive requirements for informed consent for sterilizations performed by contract doctors* (General Accounting Office, 1976).

Over the period considered by the Government Accountability Office (1973-1976), the reported rates of female sterilization procedures ranged from approximately 3 percent of women at the IHS Albuquerque center to nearly 7 percent at the IHS Oklahoma center, with an average across the four centers of around 6 percent (General Accounting Office, 1976). However, the report covers only a limited three-year period and a small number of IHS centres. In light of the prolonged prevalence of sterilization practices from the late 1960s through the 1970s, subsequent studies suggest that the prevalence may have been much higher. For example, Carpio (2004), Ralstin-Lewis (2005) and Kluchin (2020) report estimates indicating that between 25 and 40 percent of Native American women may have been subjected to sterilization procedures during this era. Several civil lawsuits and class actions followed, with the first one received by the Court for the Western District of Pennsylvania on March 25, 1974, filed by the lawyer of Norma Jean Serena. A bilateral salpingectomy was performed on her without her knowledge or consent after the delivery of her third child on August 16, 1970. The procedure was deemed necessary for her health, based on the belief that she had enough children and that further pregnancies could result in children with disabilities (USDC WDPA, 1974). Like Serena, thousands of American Indian women were sterilized in the 1970s, often without consent or full understanding of the procedure or its physical and psychological effects. This loss of reproductive autonomy not only disrupted traditional family structures but also led to significant economic, psychological, and emotional consequences. Many marriages ended in divorce, friendships dissolved, and an increasing number of women faced marital conflicts, alcoholism, and physical and mental health challenges (Lawrence, 2000).

The resurgence of eugenic movements in the 1960s, following their post-World War II decline, coupled with Malthusian concerns over overpopulation, resource scarcity, and the perceived social and economic burdens of a growing population, provides a plausible explanation for coercive sterilization practices over this period, targeting women of color, Native Americans, and Hispanics. Although no comprehensive official statistics exist, the loss of reproductive autonomy is likely to have affected thousands of women in the U.S. between 1950 and 1980 (Kluchin, 2020).

Malthusian concerns were also reflected in federal policy. In 1969, President Nixon described population growth as *'one of the most serious challenges to human destiny in the last third of this century'* (Nixon, 1969) and viewed birth control methods of *all types* as a potential solution to this issue. Consis-

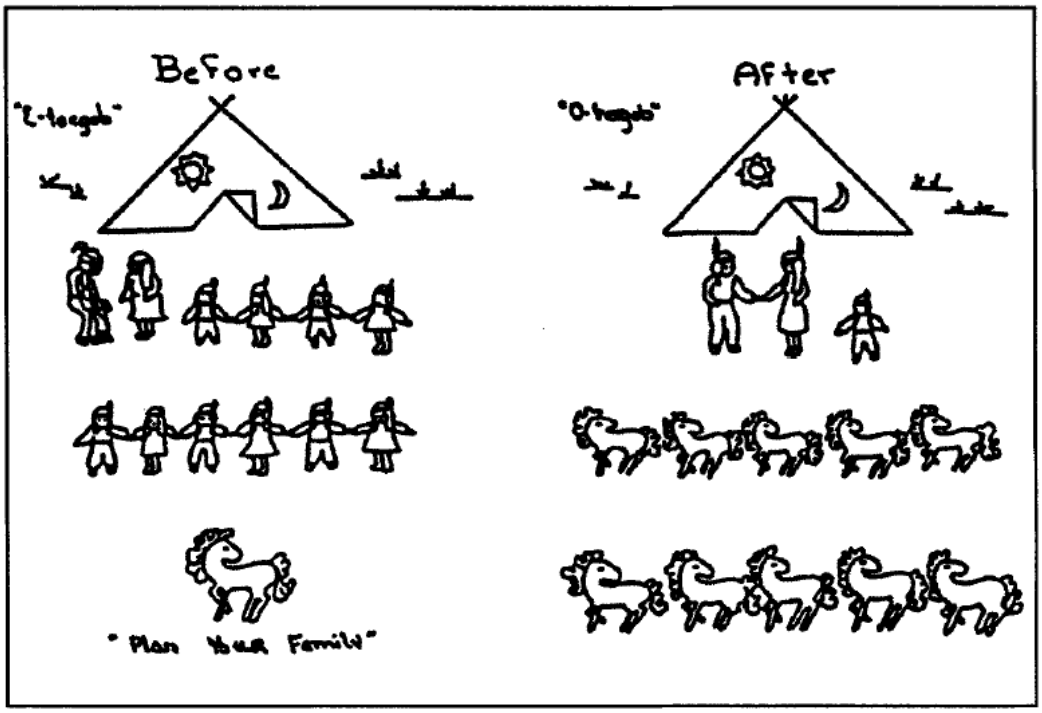
tent with this perspective, the Department of Health, Education, and Welfare expanded family planning programs aimed at poor and disadvantaged populations under the Economic Opportunity Act of 1964. Similarly, in 1965, the Indian Health Service (IHS), established in 1955 within the Department of Health, Education, and Welfare, began providing family planning services to American Indians.

Native Americans were considered a primary target for family planning programs due to their high fertility rates and the poor economic conditions of women on reservations (Ralstin-Lewis, 2005). Lawrence (2000) reports that the average number of children per woman among American Indians was above three, compared to an average of two children among white women.[2] Despite the availability of free family planning services, contraceptive use among American Indian women remained strikingly low (Temkin-Greener et al., 1981). To incentivize their use, the 1970 Family Planning Services and Population Research Act subsidized (up to 90 percent) the cost of sterilization to Medicaid and Indian Health Service patients, hence indirectly providing financial incentives for physicians to perform sterilizations (Shepherd, 2021). At the same time, the Department of Health, Education and Welfare launched information campaigns in the early 1970s promoting the benefits of sterilization (Figure 1). While directives required that sterilizations should only be performed on individuals at risk, and with valid informed consent, physicians at Indian Health Service facilities frequently disregarded these requirements, with doctors pressuring women into sterilizations (Kluchin, 2020).

Figure 2 provides the timeline for the introduction of family planning services and sterilizations. According to several reports (Lawrence, 2000), coerced sterilizations began in the late 1960s and intensified throughout the 1970s, until 1979, when IHS formally prohibited hysterectomies as a method of sterilization or population control (North et al., 2000). This implies that coerced sterilization began prior to the 1970 Family Planning Act and a few years after the IHS started providing family planning services, thereby allowing us to evaluate the impact of these potentially confounding policies when examining dynamic treatment effects (see Section 6).

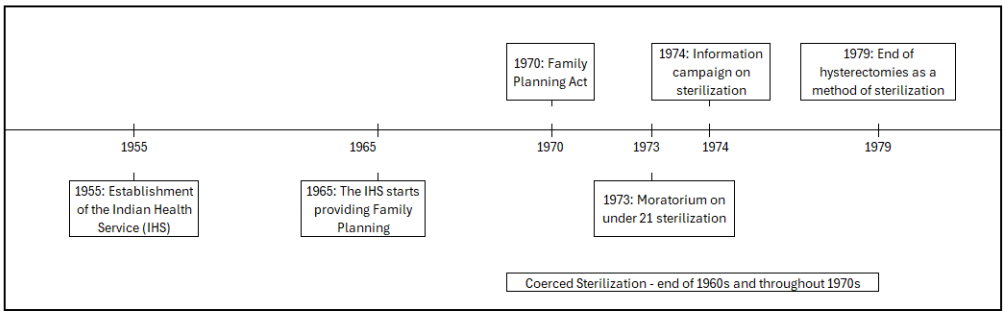
[2]The average number of children per woman among some tribes, e.g., Navajo and Apache, was even higher, around 4.

Figure 1: Family Planning and American Indians



Note: A 1974 Department of Health, Education and Welfare pamphlet (Akwesasne Notes, 1974).

Figure 2: Timeline



3 Data

We use four main data sources. First, we collect retrospective fertility information from the IPUMS 1990 5% U.S. State Sample, which reports the total number of children ever born to each female respondent.[3] Our sample includes parents (the household head and their spouse/partner) and household head's parents, within the age of 15 and 90.[4]

Our second data source is the National Health Interview Survey (NHIS), an annual survey that collects information on health, healthcare access, and health behaviors.[5] We use the sample over the period 1980-1995, which includes more than $7,000$ American Indians. Data on American Indians as a racial category is only available from 1979 onward, hence preventing the use of earlier survey waves. In line with recent censuses, the NHIS includes information only on children still residing in the household. By limiting the sample to years up to 1995, we assume that the eldest children in a treated house-

[3]Data for the IPUMS 5% U.S. Census State Sample are provided by Ruggles et al. (2024). The 1980 Census reports the total number of children ever born. However, this sample is too close to the treatment period, leading to a censored fertility distribution because children born after the treatment period (i.e., after 1980) are not reported. Conversely, more recent censuses (since 2000) report only the number of children currently in the household, leading to an undercount of children who have already left.

[4]We exclude individuals who are not yet of reproductive age (i.e., below 15) and those above 90 (i.e., born before 1900) as they are unlikely to have had children during the treatment period (1970s) and, therefore, unlikely to provide cohort variation. In one of the robustness checks, we restrict the sample to women born between 1940 and 1970. The results hold across the two samples.

[5]Data for the National Health Interview Survey are provided by Blewett et al. (2024).

hold were in their mid-twenties by 1995 and hence still likely to be household members.

To evaluate the intergenerational transmission of fertility choices, we use the IPUMS 2000 5% sample of the U.S. Census and the 2023 Panel Study of Income Dynamics - Social, Health, and Economic Longitudinal File (PSID-SHELF).[6][7] Both datasets have potential issues: the IPUMS 2000 5% sample allows us to analyze the children of treated households who are still residing within the household. However, this may lead to sample selection: for instance, children in extended families are more likely to remain in the household longer, potentially causing an upward bias since they are also more likely to have more children. The PSID-SHELF dataset, on the other hand, includes only a small number of American Indians (372 in our sample), and the number of treated individuals is even smaller, raising concerns about sample representativeness. Appendix A provides details about the construction of these datasets, while Tables A1-A5 report summary statistics for the relevant variables.

4 Treatment Definition

Identifying American Indian households impacted by forced sterilization is a major challenge, since individual-level data on Native American women forcibly sterilized are not available. As discussed in Section 2 (Figure 2), Indian Health Service (IHS) hospitals began operating in 1955 and started providing family planning services to Native Americans in 1965. It was only towards the end of the 1960s, until 1979, that forced sterilization was practiced at a larger scale in IHS facilities (Lawrence, 2000; Ralstin-Lewis, 2005). According to extensive evidence (Kluchin, 2020), American Indian women underwent tubal ligations or hysterectomies at the time of childbirth or alongside other abdominal surgeries, often without their informed consent. On the basis of this evidence, we measure the likelihood of exposure to coerced sterilization using proxies for the loss of fertility during this period and define the treatment group as the cohort of Native American women whose youngest child was born between 1965 and 1979.[8] We mitigate potential confounding factors, such as

[6]Data for the PSID-SHELF are provided by Pfeffer et al. (2023).

[7]Children of households potentially exposed to forced sterilization are of reproductive age (i.e. between 20 and 35 years old) in 2000.

[8]The definition of the variable in the census is "Age of youngest own child in household". The fact that the variable refers to the youngest child in the household does not seem to be

menopause or broader fertility trends, by comparing women born in the same year. Figure B1 in Appendix B shows the distribution of mothers' age at last birth in our sample, divided by race.[9] Native American and African American women have a lower age at last birth than white women. The average age at last birth is around 28 for the entire sample, which compares reasonably well with the average in the population. Carlson and Guzzo (2021), for example, report that the median age at last birth among women aged 45–49 in 2021 is close to 31, which, considering changes in the distribution of age at motherhood over recent decades, appears broadly consistent with the average in our sample.

We validate the treatment definition in three steps. First, we exploit information on women's age at last birth to test whether using the year of birth of the last child is a reasonable proxy for identifying treatment exposure. Medical evidence shows that peak fertility occurs from the late teens through the late 20s, with a gradual decline beginning around the age of 30. Coerced sterilization, therefore, should lead to a marked reduction in the age at last birth for Native American women whose peak fertility occurred during the 1970s. In other words, we expect the last child to be born when fertility is at its highest. Figure 3 plots the differential trend between Native American and White women by birth cohort. The horizontal axis reports the year in which a woman turns 15; zero denotes a woman who turns 15 in 1965, +1 a woman who turns 15 in 1966, +2 a woman who turns 15 in 1967 and so on.[10] The vertical axis shows the difference in age at last birth between Native American and White women who turn 15 in a given year. Although the figure captures a simple correlational difference and should not be interpreted causally, it reveals a marked decline in the age at last birth among Native American women who

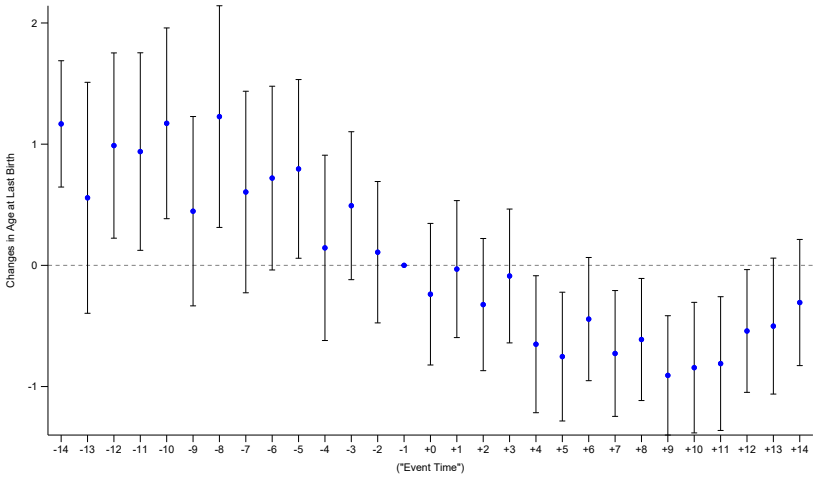
an issue in terms of selection. First, the youngest child is the one most likely to still reside in the household, which is consistent with the definition of the treatment. Second, almost 90 percent of mothers born after 1940 who have a child report the age of the youngest child. This percentage is almost 95 percent for mothers born after 1950, 94 percent for those born after 1960, and 85 percent for those born after 1970. Hence the pattern seems consistent across cohorts. In addition, there is no significant difference across races (88 percent for Native Americans after 1940, 93 percent after 1950 and 93 percent after 1960).

[9] We trim the top and bottom 1 percent of the distribution of the age at last birth.

[10] The estimated model is the following: $Y_{mrt} = \delta_t + \sigma_r + \sum_\tau \beta_\tau NA_r * \mathbf{1}(Birth_Year + 15 - T_{1965} = \tau) + \rho X_{mrt} + \epsilon_{mrt}$. Where $Y_{m,r,t}$ is the age at last birth of a mother m of race r and birth cohort t, δ_t are birth cohort FE, σ_r are race fixed effects, and $\mathbf{1}(Birth_Year + 15 - T_{1965} = \tau)$ is a dummy for how many years before/after 1965 the mother turns 15, which is interacted with a dummy for Native American women (NA_r). The coefficient β_τ therefore captures the difference for women who turn 15 τ years away from 1965.

were in their peak fertility during the 1970s, compared to White mothers and across cohorts. For women unlikely to be affected by sterilization (i.e., those toward the end of peak fertility in the 1970s), the differential trend is positive and significant, consistent with the idea that before the sterilization era Native American women had more children and a likely later age at last birth. The difference in the age at last birth begins to decrease for women likely to have been exposed to sterilization, and declines significantly for those in their peak fertility during the 1970s. The reduction becomes statistically significant for women who turned 15 in 1969 (i.e., event period +4) and decreases further for those who turned 15 in subsequent periods. When coerced sterilization ceased to be practiced, the difference in age at last birth begins to increase again (i.e., starting with women who turned 15 in 1979). This reduction in the age at last birth for Native American women during this specific period suggests a higher probability of having a last birth during the years when mass sterilization at IHS facilities was practiced, and supports the use of the youngest child's birth cohort as a proxy for treatment definition.

Figure 3: Mother's age at last birth



Note: The dependent variable is age at last birth. The horizontal axis reports years when a mother turns 15 with 0 denoting Native American women who turn 15 in 1965, +1 women who turn 15 in 1966, -1 women who turn 15 in 1964 and so on. The vertical axis reports changes in the differential age at last birth. We exploit variation over cohorts and between Native American and White women. Controls include: *i*) Region FE; *ii*) Mother cohort FE; *iii*) Marital status; *iv*) Race; *v*) Relation to the head; *vi*) Urban/rural location; *vii*) citizenship status; *viii*) birthplace; *ix*) PUMA FE. Clustered standard errors at the PUMA level. 95% Confidence intervals reported.

Second, we test whether the youngest child's birth is a valid proxy for treatment exposure by exploiting the 1973 moratorium on sterilizations for women under the age of 21, using the IPUMS 1990 5% U.S. State Sample. The moratorium, introduced in 1973 (Figure 2), creates a sharp age-based cutoff, allowing us to compare women who turned 20 in cohorts around 1973 and to test whether the regulation shifted mothers' age at last birth[11]. Specifically, we examine whether the age at last birth for women aged 20 (i.e., those unlikely to be sterilized after the moratorium) increases above the age threshold specified in the regulation[12]. Column 1 in Table 1 shows that women who turned 20 before the moratorium (i.e., age 20 in 1972) were more likely to have their last child at age 20 (i.e., when sterilization before age 21 was still possible). Column 2, by contrast, provides evidence that women who turned 20 after the moratorium (i.e., age 20 in 1975) were more likely to have their last child at age 21 (i.e., when sterilization was permitted under the moratorium). These results suggest that, among women of similar age, the moratorium effectively decreased (albeit did not eradicate) the sterilization of women under the age of 21. This exercise, based on a sharp age-based cut-off, appears to validate the use of the youngest child cohort for the treatment definition.

Finally, we rely on the medical literature (Clarke-Pearson and Geller, 2013), which focuses on the genital disorders associated with permanent sterilization. For a small number of women in the sample (16%), the 1980-1995 National Health Interview Survey (NHIS) provides information on whether the woman experienced gynecological issues in the last year, such as inflammatory disorders, infertility, and chronic gynecological conditions, which can be caused by sterilization (Clarke-Pearson and Geller, 2013). To further validate the treatment definition, we estimate the treatment effect on whether the woman had any gynecological disorder in the last year.[13] Controlling for the number of children in the household to exclude the effect of parity (another likely cause), Table 2 shows that Native American women potentially exposed to sterilization

[11] We confine the sample to women who turn 20 between 1971 and 1975.

[12] We estimate the following model: $Y_{i,r,t} = \beta + \delta_r + \gamma_t + \sum_\tau \beta_\tau NA \cdot \mathbf{1} * \cdot (\tau = t - 1973) + \epsilon i, r, t$. The dependent variable $Y_{i,r,t}$ is a dummy indicating whether a mother i, race r, and birth year t has a child at either 20 or 21. Race and birth-cohort fixed effects are captured by δ_r and γ_t. The dynamic effect ($\sum_{\tau=1}^{2} \beta_\tau$) captures the effect on the probability of having a child at 20 (or 21) τ periods away from the moratorium ($\tau = t - 1973$). The year of the moratorium (1973) is the reference year. We decide to exclude ($\tau = 0$) because the moratorium was introduced in August 1973, leaving the majority of women untreated in 1973.

[13] The econometric specification is in line with equation 1.

Table 1: The Effect of the Moratorium

	(1)	(2)
	Age at Last Birth = 20	Age at Last Birth = 21
NA*Aged 20 in 1975	0.011	0.018*
	(0.009)	(0.010)
NA*Aged 20 in 1974	0.003	-0.004
	(0.009)	(0.011)
NA*Aged 20 in 1973	0	0
	(.)	(.)
NA*Aged 20 in 1972	0.017*	0.0002
	(0.010)	(0.011)
NA*Aged 20 in 1971	-0.009	0.005
	(0.008)	(0.011)
Adj.R-squared	0.006	0.006
Observation	305,773	305,773
Clusters	1,723	1,723
Sample Mean	0.021	0.028
Mother Cohort FE	Yes	Yes
Race FE	Yes	Yes
Other FE	Yes	Yes

Notes: The dependent variable is a dummy equal to one if the last child was born at the age of 20 (Model 1) or at the age of 21 (Model 2). The treatment variable is a dummy indicating whether a woman turned 20 in a given year, interacted with a dummy for American Indian women. White and Native American women are kept in the sample. Controls include: *i*) PUMA FE; *ii*) Individual cohort FE; *iii*) Race; *iv*) Relation to the head; *v*) Rural/urban location; *vi*) citizenship status; *vii*) birthplace). Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1..

Table 2: Long-run gynecological issues

	(1)	(2)	(3)
	Gynecological issues		
ATT	0.029*	0.037**	0.040*
	(0.017)	(0.018)	(0.021)
Adj.R-squared	0.004	0.003	0.002
Observation	48,022	43,890	37,884
Clusters	921	919	915
Treated	175	165	127
Sample Mean	0.033	0.036	0.039
Mother Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes
Sample	Full sample	Mothers born after 1930	Mothers born after 1940

Notes: The dependent variable is a dummy indicating whether the woman had any gynecological issues over the previous 12 months, based on the 1980-1995 National Health Interview Survey. Controls include: *i*) Region FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Survey year FE; *v*) Race; *vi*) Relation to the head; *vii*) Number of children; *viii*) Marital status. Clustered standard errors at the primary sampling unit. *** p<0.01, ** p<0.05, * p<0.1.

are more likely to report gynecological issues by almost 3 percentage points than white women. Given that the share of women reporting such issues in the sample is 3.3 percent, exposure to treatment almost doubles the probability of experiencing gynecological issues. Although exploratory given the small sample size, this evidence seems to support the validity of the treatment as a proxy for (coerced) sterilization of Native American women.[14]

[14]The sample includes only 175 treated women out of 388 American Indian women.

5 Econometric specification

We examine the effect of exposure to coercive sterilization on short-run and long-run outcomes and estimate a classical difference-in-differences model as follows:

$$Y_{mrtc} = \beta \mathbb{I}_c * NA_r + \sigma_r + \gamma_c + \delta_t + \rho X_{mrtc} + \epsilon_{mrtc} \quad (1)$$

where Y_{mrtc} is the outcome variable for mother m, of race r, from birth cohort t, with youngest child's birth cohort c (i.e. parity, health outcomes, labour market outcomes). The variable $\mathbb{I}_c$ is an indicator taking the value of 1 if the youngest child was born between 1965 and 1979 and 0 otherwise, while NA_r is an indicator taking the value of 1 for Native American women and 0 otherwise. Aging and changes in fertility preferences are other potential reasons why women might stop having children during the period under consideration, and hence could be correlated with exposure to forced sterilization. To attenuate the bias, the model also includes mother's cohort fixed effects (δ_t). Differences across races are captured by race fixed effects (σ_r). The inclusion of the youngest child's cohort fixed effects(γ_c) forces the estimator to exploit variation among women who gave birth to their last child in the same year. Hence, the estimator considers women born in the same year and, among these women, compares those whose last child is born in the same year. Finally, the specification includes a set of control variables, X_{mrtc}, namely Public Use Microdata Areas (PUMAs) boundaries fixed effects, birth place fixed effects, urban/rural residency, citizenship, and relation to the head (i.e., whether the individual is the spouse, mother, partner, etc.). Standard errors are clustered at the primary sampling units, depending on the dataset used. We also estimate equation 1 using Gardner (2022)'s estimator, which is robust to heterogeneous treatment effects. Like Borusyak et al. (2021), Gardner (2022)'s estimator uses an imputation approach to select the control group. Our results are similar under this estimator, indicating that they are not driven by treatment effect heterogeneity.

6 Parity and Coerced Sterilization

Having validated our treatment definition, we evaluate the effect of coerced sterilization on parity by using the 1990 US Census retrospective information on the total number of children ever born. Figure B2 in Appendix B shows the overall trend in the average number of children ever born for Whites, African Americans, and American Indians, based on the birth year of the last child,

to illustrate the variance exploited by the treatment. The average number of children declines across groups for cohorts born after the 1960s, which, as documented in the literature, is likely due to family planning methods introduced during that decade, following the approval of Enovid (i.e., the birth control pill) by the FDA. However, the reduction in the average number of children ever born for American Indians is significantly larger, declining from nearly five children per woman to fewer than three. The reduction among African Americans is also larger compared to Whites, but is not as pronounced as that of American Indians. While African Americans were also targeted by sterilization programs in the 1960s, the reduction in fertility for this group is unlikely to be primarily due to such programs, as the relative number of African American women forcibly sterilized appears to have been relatively small during this period (State Library of North Carolina, 1968) [15]

We estimate equation 1, whereby the dependent variable is the number of children ever born to a mother. Since the estimator compares women whose last child is born in the same year (controlling for the birth-year of the mother), the estimated effect on the number of children in 1990 is likely to reflect the impact on completed fertility.

Column 1 in Table 3 presents the estimated effect of exposure to forced sterilization on the total number of children ever born. The estimated coefficient is negative and statistically significant at the 5% level, indicating a reduction of approximately 2.3 percent in the total number of children among Native American women compared with the overall sample average. In Column 2, the dependent variable is a dummy indicating whether a woman reports having more than one child. For Native American women exposed to forced sterilization, the probability of having more than one child decreases by 6 percentage points, or approximately 8 percent relative to the overall mean. In Columns 3 and 4 of Table 3, we estimate the changes in the probabilities of having more than two children and more than three children, respectively. Native

[15] Kluchin (2020) argues that the civil and reproductive rights movements of the 1950s and 1960s provided *'neo-eugenic'* advocates with new opportunities, leading to a renewed wave of sterilizations among African Americans. For example, Sinderbrand (2005) notes that African Americans accounted for 60 percent of those sterilized in North Carolina during the 1950s. However, by the late 1960s, the total number of sterilizations in the state had declined significantly, with only 290 procedures performed between 1966 and 1968 (State Library of North Carolina, 1968). This equates to roughly 90 annual sterilizations among African Americans in a population of about 1.2 million, a rate unlikely to significantly impact the estimated effects.

American women's probability of having more than two children decreases by approximately 10.7 percent (Column 3), while the probability of having more than three children decreases by 6 percent (Column 4), both relative to the overall mean. These results suggest that exposure to sterilization was significantly stronger after the second child, seemingly to force Indian American households to conform to the family size norms prevalent among whites.[16]

Table C2 in Appendix C reports results using the estimator proposed by Gardner (2022), which, similar to Borusyak et al. (2021), uses an imputation approach to construct a suitable control group and to show that estimated effects are robust to heterogeneous treatment effects. Point estimates in Table C2 are similar to those in 3, confirming the absence of issues related to negative ATT weighting.

Next, we isolate and disentangle the effect of the family planning services from forced sterilization by conducting an event study. Figure 2 shows the timeline of the setup of the Indian Health Service (IHS) in 1955, as well as the IHS provision of family planning and the subsequent sterilization period during the 1970s. Given that Native American women are less likely to use contraception (Lawrence, 2000; Temkin-Greener et al., 1981) and given the timing of forced sterilization, we would expect to observe a decline in parity for Native American women in the 1970s, but not in the 1960s. Figure 4 presents the dynamic treatment effect on parity, using 1964 as the reference year[17]. Prior to the treatment, there is no significant difference in the number of children ever born for Native American women with respect to the overall sample. The treatment effect becomes statistically significant for American Indian women whose youngest child was born in 1969, i.e. four years after the IHS started providing family planning, and it remains constant in subsequent event periods. The lack of significant effects for earlier cohorts suggests that

[16]Table C1 in Appendix C reports estimates restricting the sample to women born between 1940 (i.e., 25 years old by 1965) and 1970 (i.e., entering childbearing age after the end of the sterilization period). As discussed earlier, almost 90% of women report the age of last birth for this cohort, with no significant difference by race. Estimated effects are in line with our main findings.

[17]The baseline equation for the dynamic treatment can be written as follows: $Y_{m,r,t,c} = \beta + \delta_r + \gamma_t + \lambda_c + \sum_\tau \beta_\tau NA \cdot \mathbf{1} * \cdot(\tau = t - 1965) + \rho X_{mrtc} + \epsilon_{mrtc}$, where Y_{mrtc} is the outcome variable for mother m, of race r, from birth cohort t, with youngest child's birth cohort c. $NA \cdot \mathbf{1} * \cdot(\tau = t - 1965)$ are individual dummies for whether the last child is born τ periods away from 1965, interacted with a dummy for Native American women. The reference period is $\tau = -1$. The last event time captures all periods after the last one.

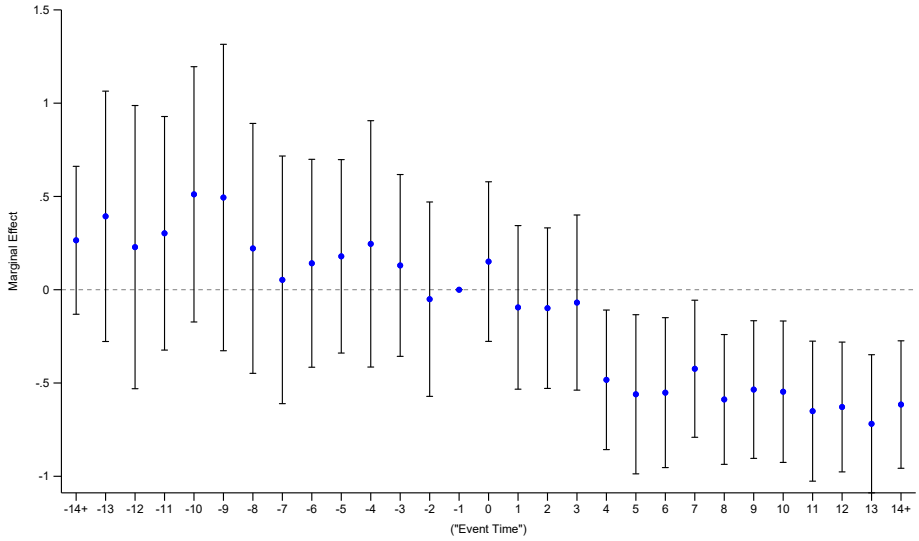
Table 3: The effect of sterilization on parity

	(1)	(2)	(3)	(4)
	Nr Children	Nr Children>1	Nr Children>2	Nr Children>3
ATT	-0.062**	-0.061***	-0.045***	-0.012*
	(0.031)	(0.006)	(0.007)	(0.007)
Adj.R-squared	0.294	0.120	0.188	0.218
Observation	2,035,797	2,035,797	2,035,797	2,035,797
Treated	7,047	7,047	7,047	7,047
Sample Mean	2.653	0.785	0.420	0.204
Clusters	1,726	1,726	1,726	1,726
Mother Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other FE	Yes	Yes	Yes	Yes

Notes: The dependent variable is the number of children ever born (Model 1) and dummies for more than one child (Model 2), more than 2 children (Model 3), and more than 3 children (Model 4). Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural location. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

any potential impact of family planning is minimal. This aligns with existing literature indicating a limited use of contraceptive methods among American Indians due to cultural and gender norms. Doran (1972), for instance, interviewed Navajo women who had delivered at the Gallup Indian Medical Center (GIMC) and found that traditional beliefs, such as the idea that a woman is of no worth to a man unless she can bear him children, were key barriers to contraception adoption. The timing of the observed treatment effect also coincides with the *Jessin v. County of Shasta* ruling in 1969, which recognized sterilization as an acceptable family-planning method, hence providing doctors the legal foundation to perform sterilizations. Quite interestingly, the effect precedes the 1970 Family Planning Services and Population Research Act, which subsidized sterilizations at Medicaid and Indian Health Service, and the information campaign about sterilization, which started around 1973. Point estimates seem to suggest that these two initiatives had little additional effect on fertility. Figure B3 in Appendix B presents the event study restrict-

Figure 4: Forced sterilization - event study



Note: The dependent variable is the number of children ever born. The vertical axis reports changes in the number of children ever born. The horizontal axis reports event periods, where 0 is 1965. The reference period is $\tau = -1$ and +/-14+ denote all remaining periods after 14. Controls include: i) PUMA FE; ii) Individual cohort FE; iii) Youngest child cohort FE; iv) Race; v) Citizenship; vi) Birthplace; vii) Relation to the head; viii) Urban/rural location. Clustered standard errors at the PUMA level. 95% confidence intervals.

ing the sample to Native American and White women only. The pattern is in line with Figure 4.

In Table C3 in Appendix C, we test the robustness of the effect using data from the NHIS for the period 1980–1995. Unlike the 1990 US Census, the NHIS provides information only on the number of children currently residing in the household, which likely influences both the mean and variance of the fertility distribution. This bias in the distribution of fertility is also likely to be group-specific. For instance, children in extended families are more likely to remain in the household for longer periods, which could lead to an upward bias.[18] The results in Table C3 largely confirm the negative effect of sterilization on fertility. As expected, the estimated effect is larger than the one obtained using data on the total number of children ever born. In Model 1, the total number of children in the household decreases by nearly

[18]For example, if white children are more likely to leave the household earlier, the observed change in fertility due to sterilization would be compared to a smaller change in fertility in the untreated group. This difference would result in an upward bias.

8 percent relative to the mean, compared to a 2.3 percent reduction in the total number of children ever born. Similarly, the probability of having more than two children decreases by approximately 25 percent, compared to an 10.7 percent reduction reported in Table 3.

7 Heterogeneity

This section explores the heterogeneous effects of exposure to coerced sterilization on parity across several dimensions. First, we explore the treatment effect across the 28 tribe categories in our sample. Second, we investigate whether coerced sterilization was targeted at specific tribes with a preference for larger families. We do so by looking at predetermined birth spacing across tribes, Murdock (1967)'s postpartum sex taboos indicator, and historical fertility by tribe. Third, we explore the role of the eugenic ideology and Malthusian fears in the 1960s, based on a newspaper sentiment analysis.

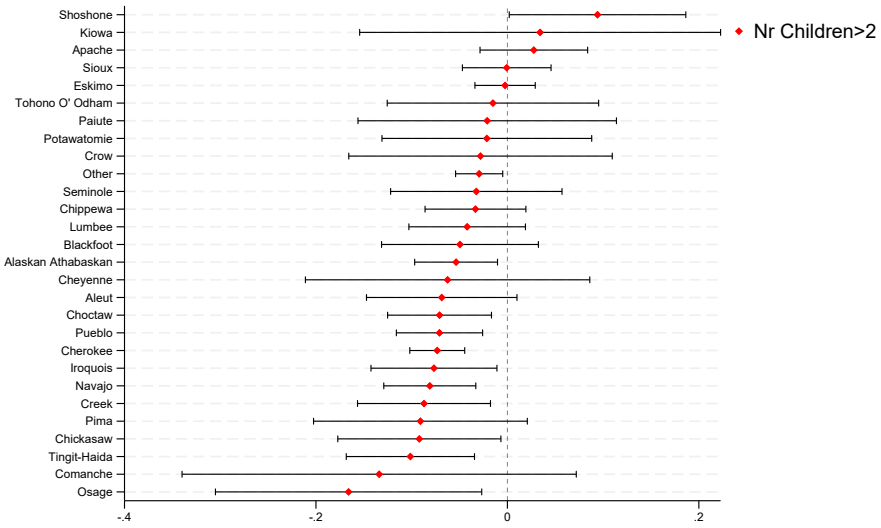
7.1 Heterogeneity by tribe

Figure 5 presents the estimated effect of sterilization exposure on the probability of having more than two children, separately by tribal affiliation.[19] While small sample sizes for some tribes result in large standard errors, several important patterns emerge. The Osage tribe is the most affected, with the probability of having more than two children decreasing by nearly 17 percentage points. For the Comanche and Chickasaw tribes, the reduction ranges from approximately 10 to 15 percentage points. Other tribes, including the Tlingit-Haida, Pueblo, Iroquois, Choctaw, Cherokee, Navajo, and Creek, also experience significant declines. In contrast, the Shoshone tribe is the only group where the probability of having more than two children increases. This increase likely reflects broader health care provision by the Indian Health Service (IHS): according to Kunitz (1976), the Shoshone tribe experienced the highest infant mortality in the 1960s. Thus, access to the IHS might have reduced infant mortality in this specific group, eventually leading to an increase in the probability of having more than two children, as shown in Figure 5.[20]

[19] We focus on the probability of having more than two children as this is the measure for which we observe the largest impact relative to the mean (Table 3).

[20] Figure B4 in Appendix B shows changes in the probability of having more than one, two, and three children across tribes.

Figure 5: Average Treatment Effect on the Treated (ATT) by Tribe



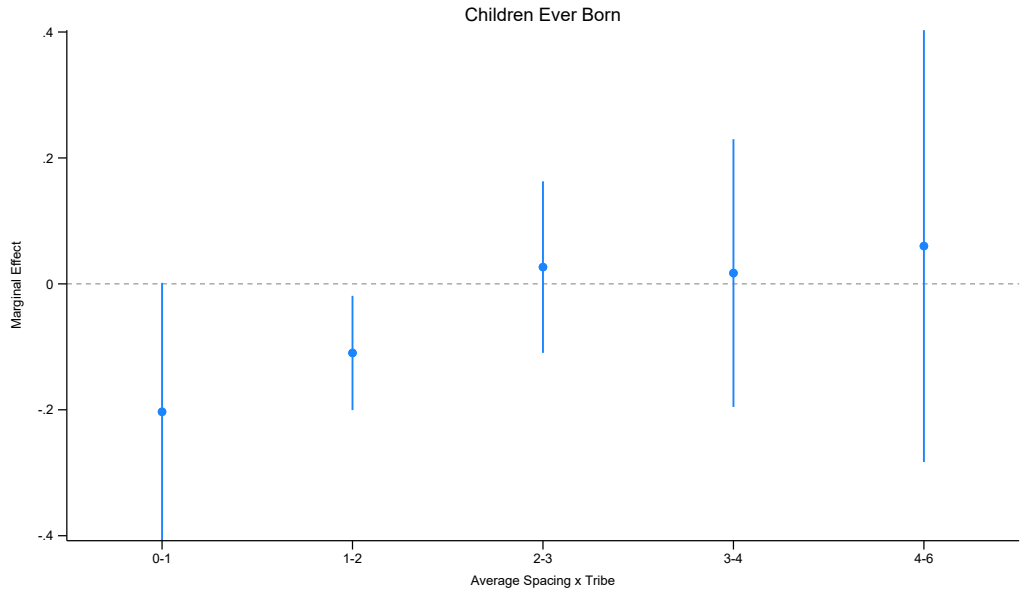
Note: The dependent variable is a dummy for whether the number of children ever born is above two. The horizontal axis reports changes in the probability of having more than two children. Controls include: *i*) PUMA FE; *ii*) Individual cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*)Relation to the head; *viii*) Urban/rural location. Clustered standard errors at the PUMA level. 95% confidence intervals.

7.2 Heterogeneity by family size preferences

Birth spacing. To gain a better understanding of treatment heterogeneity by tribe, we construct a proxy for traditional fertility preferences at the tribal level, measured as the average birth spacing across tribes for women who were at least 35 years old by 1965, that is, women close to the end of their childbearing years.[21] We expect tribes with a larger expected number of children, i.e. a shorter spacing between births, to be more targeted by coercive sterilization. Figure 6 reports heterogeneous treatment effects by average birth spacing at the tribal level. Tribes with a birth interval shorter than one year tend to have about 0.2 fewer children than the untreated sample, and this effect is significant at the 10 percent level despite large standard errors due to the small number of observations. The change in the number of children for tribes with average spacing between one and two years is approximately

[21] Average birth spacing is measured using the IPUMS 1990 5% U.S. State Sample, described in Section 3. Ideally, such a measure of traditional fertility preferences would be based on women who have completed their fertility. However, there are very few American Native women born before 1920 in the IPUMS 1990 5% U.S. State Sample.

Figure 6: Heterogeneous Effect by Tribe Birth Spacing



Note: The dependent variable is the number of children ever born. The horizontal axis reports the birth-interval by tribe. The vertical axis reports changes in the number of children ever born. Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural residency. Clustered standard errors at the PUMA level. 95% confidence intervals.

−0.12 and is statistically significant at the 5 percent level. The treatment effect is not statistically significant for tribes with longer birth intervals. This heterogeneity in the treatment effect is consistent with potential targeting of specific Native American tribes with a preference for larger families, in line with Malthusian fears of overpopulation and eugenic beliefs.

Post-Partum Abstinence. We use Murdock (1967)'s ethnographic information on post-partum sex taboos to provide an alternative measure of spacing between births. Although the two measures have different purposes, the relation between the duration of post-partum sex abstinence and birth spacing is mechanical (i.e., the longer the abstinence, the longer the spacing).[22] Figure B5 in the Appendix confirms the results on birth spacing: Native American women in tribes whose postpartum abstinence is less than a month experience a larger parity reduction (at the 5% significance level), while the estimated

[22]Data on post-partum sex taboo in Murdock (1967) are available only for a selected number of tribes (17 out of the 28 tribes).

differential effect for Native American women in tribes that abstain longer is not statistically significant.

7.3 Eugenic beliefs & Malthusian fears

Attitudes towards Native Americans. One of the explanations for coerced sterilization is grounded in the revival of an eugenic ideology in the 1960s. To capture such a channel, we conduct a newspaper sentiment analysis on Native Americans at the beginning of the 1960s. The analysis is based on newspapers reported in the Chronicling America (chroniclingamerica.loc.gov) between 1960 and 1963. The query searched for positive/negative words associated with Native American, American Indian, Indian reservation, Indian affairs, Indian bureau, Bureau of Indian Affairs, Indian tribe, Indian tribes, tribal council, tribal land, reservation Indians, and specific tribes (i.e., Navajo, Cherokee, Sioux, Apache, etc.). First, we generate a sentiment score on Native Americans at the state level.[23] We find that a one standard deviation in the negative sentiment about Native Americans within the state doubles the estimated effect of potential exposure to coerced sterilization on the number of children (Column 1 in Table 4).[24] Next, we generate a sentiment score, aggregated at the tribe level. Column 2 of Table 4 reports the corresponding estimates. Native American women belonging to tribes with a greater negative sentiment score experience a larger reduction in the number of children: a one standard deviation change is associated with a further decrease in the number of children of 0.06.

Malthusian Fears. Malthusian fears on overpopulation and its consequences on the welfare state are equally an alternative explanation provided for sterilization practices. To capture such a channel, we also conduct a newspaper sentiment analysis about population growth at the beginning of the 1960s[25] and generate a measure of negative sentiment about population growth at a state level. Column 3 of Table 4 reports the heterogeneous effect of the treatment depending on concerns about population growth. A one standard

[23] A search at a lower geographical level is not possible as *i* the 1990 Census does not report small counties in which individuals could be identified; *ii* the newspaper search does not return results when conducting the analysis at a county level.

[24] Because of the symmetry in the index, a one standard deviation in the positive sentiment about Native Americans almost cancels the estimated effect on the number of children.

[25] We look at words related to population growth, population increase, urban growth, rapid population, population boom, migration growth, city growth, suburban growth, and variation of these.

Table 4: Sentiment analysis

	(1)	(2)	(3)
	Nr Children	Nr Children	Nr Children
Treatment	-0.080**	-0.075**	-0.053
	(0.034)	(0.034)	(0.033)
Treatment*	-0.088**		
Neg Sentiment on NA - State	(0.038)		
Treatment*		-0.062**	
Neg. Sentiment by NA Tribe		(0.028)	
Treatment*			-0.038***
Negative Pop growth - State			(0.014)
Adj.R-squared	0.291	0.293	0.293
Observation	1,905,149	2,032,245	1,967,875
Treated	5,901	5,812	6,770
Mother Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes

Notes: The dependent variable is the number of children ever born. Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural location. Sentiment score variables as described in the text (Section 7.3). Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

deviation in the negative sentiment associated with population growth leads to a reduction in the number of children by an additional 0.038. This means that the estimated effect increases by almost 72%, confirming that women in states where population growth was a major concern were more likely to be targeted.

7.4 Historical characteristics

Number of Children in 1930. Given that our analysis relies on retrospective data, it is not possible to assess whether the treatment effects vary according to socio-economic characteristics or pre-treatment conditions. However, the 1930 Census provides information on Native Americans and individuals' tribal affiliations. We collapse the 1930 census data at the state, race, and tribe levels, and then match information from the 1930 census with data from the 1990 census to test differential effects depending on pre-treatment conditions. Column 1 in Table C4 in the Appendix shows the differential effect depending on the number of reported children in 1930 to test whether women in tribes who used to have a larger number of children are likely to experience a larger reduction in the number of children in 1990 (i.e., whether they are more likely to be targeted). Treated women in tribes with a larger number of children in 1930 have a much larger reduction in the number of children in 1990. The differential effect decreases by almost 0.19 for each additional child. For example, the estimated effect for tribes averaging one child in 1930 is about -0.023, and the reduction becomes larger for each additional child.

By Age of Marriage in 1930. Column 2 in Table C4 in the Appendix reports the differential effect by women's age at marriage, which we use as a proxy for age at first birth. The estimated differential effect is positive, indicating that women in tribes that used to marry at a later age experienced a much smaller reduction in the number of children in 1990. The estimated effect approaches zero for women who, in 1930, married at age 20 years.

By Literacy in 1930. Column 3 of Table C4 in the Appendix reports the differential effect by literacy in 1930 (i.e., whether they could read/write in English), which we use as a proxy for the assimilation of Native Americans. The estimated reduction in the number of children in 1990 decreases as the share of individuals who can read/write within the tribe increases, and becomes zero when that share is close to 60%.

8 The Impact on Health and Economic Outcomes

8.1 Health and Labor Market Outcomes

Lawrence (2000) argues that the inability to conceive and bear children had profound emotional and psychological consequences, affecting not only the women themselves but also their families, friends, and the broader Indian community. To evaluate the consequences of coerced sterilization, we use health information from the NHIS and socioeconomic data from the 1990 US Census.

Table 5 reports the estimated effects of sterilization on health outcomes using the same empirical methodology applied to fertility (equation 1). Column 1 examines the probability that individuals self-report poor health. Native American women exposed to forced sterilization are nearly 1.7 percentage points more likely to self-report a health level classified as poor. When compared to the mean, this effect corresponds to an increase of almost 65 percent. In Column 2, the dependent variable is a dummy denoting whether the woman reports any health issue. The change in the probability of reporting health issues for women likely to be exposed to sterilization increases by almost 4.3 percentage points. In Column 3, the probability of having more than one week of bed disability in the past year rises by nearly 2.6 percentage points, or almost 19 percent, when compared to the mean. All these estimated effects are statistically significant at the 5 percent level except the effect on bed disability, which is significant at a 10 percent level.

Next, we explore the effect of exposure to coerced sterilization on socioeconomic conditions. As discussed in Section 2, the loss of reproductive autonomy disrupted traditional family structures. Column 1 of Table 6 presents the effect of exposure to forced sterilization on the probability of single-headed households, which we interpret as a measure of family disruption. The probability of a single-headed household increases by 4 percent for Native American women exposed to forced sterilization, compared to the mean. Columns 2 to 5 explore the economic impact of the health outcomes presented in Table 5. Native American women exposed to forced sterilization report a higher probability of work disability[26] increases by approximately 3.5 percentage points,

[26]Work disability is a binary variable equal to one if the woman reports any work-related

Table 5: The effect of sterilization on health status

	(1)	(2)	(3)
	Poor Health	Health Conditions	Bed Disability
ATT	0.017**	0.043**	0.026*
	(0.0081)	(0.021)	(0.015)
Adj.R-squared	0.035	0.031	0.010
Observation	291,498	257,274	290,679
Treated	1,035	899	1,030
Sample Mean	0.027	0.437	0.134
Clusters	939	939	939
Mother Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes

Notes: The dependent variable is a dummy for whether self-reported health is poor (Column 1), whether the reported number of health conditions is greater than zero (Column 2), and a dummy for at least one week of bed disability in the last 12 months (Column 3). Controls include: *i*) Region FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Survey year FE; *v*) Marital status; *vi*) Race; *vii*) Relation to the head. Clustered standard errors at a primary sampling unit. *** p<0.01, ** p<0.05, * p<0.1.

or nearly 40 percent relative to the mean. Deteriorated health outcomes are the likely reason for the observed lower labor force participation (Column 3), which decreases for treated Native American women by 2.7 percentage points (equivalent to a 4.2 percent reduction relative to the mean). This reduced labor force participation leads to a decrease in total household income (Column 4) of almost $1,592, 3.7 percent. This effect is similar when household income is replaced with a measure of individual income (Column 5).

These findings underscore the profound and far-reaching consequences of such trauma for Native American women. Family structures were undermined and health outcomes deteriorated markedly, contributing in turn to declines in labor force participation and income in the long run.

disability.

Table 6: The effect of sterilization on socio-economic outcomes

	(1)	(2)	(3)	(4)	(5)
	Single-Headed Household	Disability	LFP	HH Income	Individual Income
ATT	0.009**	0.035***	-0.027***	-1,592.6***	-392.2**
	(0.004)	(0.005)	(0.007)	(405.4)	(179.0)
Adj.R-squared	0.723	0.140	0.161	0.283	0.108
Observation	2,035,797	2,035,797	2,035,763	2,034,404	2,031,725
Treated	7,047	7,047	7,047	7,043	7,033
Sample Mean	0.226	0.087	0.638	43146.47	11,578.85
Clusters	1,726	1,726	1,726	1,726	1,726
Mother Cohort FE	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes

Notes: Dependent variables are: an indicator for single-headed household (Column 1), a dummy for reported work disability (Column 2), labor force participation (Column 3), household income (Column 4) and individual income (Column 5). Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural location. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

8.2 Investment in Children

According to the quantity-quality (Q-Q) trade-off (Becker, 1981), parents are likely to devote more resources to investing in their children when fertility declines. However, the Q-Q framework considers ceteris paribus conditions in which socioeconomic factors remain constant. Consequently, the positive effect on child investment becomes less certain when family dynamics, health, and economic conditions are adversely affected.

We use data from the 1990 U.S. census to examine the effects of exposure to forced sterilization on investment in children. Census data report information on children living in the household, which could introduce sample selection issues, as these children are likely to have fewer opt-out options. However, given the prevalent family structure among Native American households, we would expect white children to be much more likely to leave the household of origin than American Indian children. If white children leaving the household are those with a better opt-out option, the mean and variance of the education

distribution in the control group may be relatively lower, potentially biasing the estimates toward zero (i.e. an upward bias).

Children of women exposed to forced sterilization were likely to be between the ages of 10 and 21 in 1990.[27] Some of these children are likely to have completed their education by 1990, while others may still be enrolled in educational programs. For this reason, the estimated model includes a control for whether the child is still in education. Table 7 reports the estimated impact of Native American mothers' exposure to forced sterilization on the probability of the child completing at least 8^{th} grade (Column 1), at least 12^{th} grade (Column 2) and any college (Column 3), on the basis of equation 1. In order to account for intergenerational preferences on education, we include additional control variables, namely the employment status and the education level of the household head. Compulsory education in most states is between the ages of 6 and 16[28]. For this reason, the probability of the child completing at least the 8th grade is not statistically significantly affected.[29] However, the probability of completing either the 12th grade or any college significantly decreases by nearly 2.3 and 4.3 percentage points, respectively. These changes in probability amount to a reduction in the likelihood of completing the 12th grade by almost 2.3 percent relative to the mean, and a reduction in the likelihood of completing any college by close to 10 percent for children of Native American women exposed to forced sterilization.

To evaluate the robustness of these results, we repeat the same exercise using survey data from the NHIS over the period 1980-1995, which allows us to exploit the annual variation. Looking again at children whose mothers had been exposed to the treatment, we find a similar negative effect on the probability of completing further education. The probability of completing the 8^{th} grade in Table C5 in Appendix C is not significantly affected, nor is the probability of completing the 12^{th} grade. However, there is a significant reduction in the probability of completing any college, amounting to almost 3 percentage points, or nearly 28 percent relative to the mean. This effect is larger than the reduction in the probability of completing any college estimated

[27] Figure 4 shows that households most likely to be affected by sterilization are those with the youngest child born after 1969.

[28] Compulsory school attendance laws in the U.S. vary by state, with some states requiring attendance to start at age 5, while others impose a minimum drop-out age of 17.

[29] We look at the probability of completing the 8th grade (rather than the 9th grade) for consistency with estimates using data from the NHIS reported in Table C5 in Appendix C, where grades 9, 10, and 11 are grouped together.

Table 7: The effect of sterilization on Education

	(1)	(2)	(3)
	Grade 8	Grade 12	College
ATT	0.0004	-0.023*	-0.043***
	(0.002)	(0.013)	(0.0163)
Adj.R-squared	0.036	0.125	0.213
Observation	1,311,955	753,291	376,942
Treated	8,957	4,747	1,639
Sample Mean	0.990	0.985	0.439
Clusters	1,726	1,726	1,726
Individual Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other Control	Yes	Yes	Yes

Notes: The dependent variable is a dummy for whether the individual completed at least grade 8 (Column 1), grade 12 (Column 2), or any college (Column 3). The sample in Column 1 is restricted to children over 14; in Column 2 it is restricted to children over 18; in Column 3 it is restricted to children over 23. Controls include: *i*) PUMAs FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Birthplace; *vi*) Household head marital status; *vii*) Household head citizenship; *viii*) Household head gender; *ix*) Household head urban/rural location; *x*) Household head Duncan Socioeconomic Index; *xi*) Household head highest education Level; *xii*) Household head labor force participation; *xiv*) Child currently in education indicator. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

using data from the US Census in Table 7.

9 Intergenerational Transmission

The economic evidence on medical negligence shows a long-standing culture of medical distrust (Alsan and Wanamaker, 2018) that can potentially spread to future generations. If children of parents likely exposed to the treatment tend to avoid family planning methods because of their parents' experiences, then one should expect them to have more children compared to a control group that tends to use contraception.

To provide exploratory evidence on the intergenerational transmission of fertility preferences, we begin with the 2023 Panel Study of Income Dynamics - Social, Health, and Economic Longitudinal File (PSID-SHELF). The PSID-SHELF is a longitudinal study that follows the descendants of households originally sampled in 1968. It reports information about children, which can then be linked back to the family of origin. After linking children to parents, the sample includes 74 treated individuals out of 342 American Indians in the dataset. The relatively small number of treated individuals is likely to compromise representativeness. For this reason, we supplement the estimation results from the PSID-SHELF sample with estimates using the IPUMS 2000 5 percent sample of the US Census. The 2000 U.S. Census sample is particularly useful, as children of Native American women exposed to forced sterilization should be between 20 and 35 years old by 2000 and therefore all of reproductive age. However, the 5 percent US Census limits the analysis to children still living with their parents, which, of course, would again cause sample selection problems. Because of issues with both datasets, the analysis should be interpreted as exploratory without proper causal interpretation. Nevertheless, it helps identify suggestive correlations with fertility changes among the second generation.

Panel A of Table 8 reports estimates using the PSID-SHELF dataset. The number of children of Native American women exposed to coerced sterilization further drops to 58, once controls are included. We find that fertility for treated Native American offspring is higher by about 0.5, which, compared to the average number of children in the sample, corresponds to an average increase of nearly 50 percent. The probability of having more than one child (Column 2) is higher by almost 15.7 percentage points (nearly 50 percent compared to the mean), and the probability of having more than two children (Column 3) increases by almost 10 percentage points (significant at a 10 percent level). The effect on the probability of having more than three children (Column 4), on the other hand, is not significantly affected by the treatment. However, this loss of significance for the latter reflects the relatively low number of women in the sample (and hence in the treatment group) with more than three children.

Panel B reports estimates using the 5 percent US Census sample and focusing on individuals of age 20 or above. The average number of children in this sample is much smaller (i.e., close to 0.2), reflecting the selection issue in this sample. This sample selection generates an upward bias. However, the estimates confirm the positive impact of parents' trauma on their children's fertility. The estimated number of children in Column 1 is higher by almost

44 percent. The probability of having more than one child (Column 2), and more than three children (Column 4) increases by nearly 3,and 0.6 percentage points, respectively.

Table 8: Intergenerational Transmission

	Panel A			
	(1)	(2)	(3)	(4)
	Nr of Children	Children >1	Children >2	Children >3
ATT	0.517**	0.157**	0.102*	0.0388
	(0.196)	(0.0741)	(0.0581)	(0.0446)
Adj.R-squared	0.255	0.242	0.125	0.067
Observations	20,643	20,643	20,643	20,643
Treated	58	58	58	58
Sample Mean	1.045	0.321	0.153	0.062
Clusters	52	52	52	52
Parent Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other FE	Yes	Yes	Yes	Yes
	Panel B			
	(1)	(2)	(3)	(4)
	Nr of Children	Children >1	Children >2	Children >3
ATT	0.083***	0.029***	0.009	0.007*
	(0.026)	(0.009)	(0.006)	(0.004)
Adj.R-squared	0.149	0.085	0.038	0.017
Observations	370,516	370,516	370,516	370,516
Treated	1,867	1,867	1,867	1,867
Sample Mean	0.188	0.044	0.013	0.004
Clusters	2,071	2,071	2,071	2,071
Parent Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other FE	Yes	Yes	Yes	Yes

Notes: The dependent variable is the number of children in the household (Model 1) and dummies for more than one child (Model 2), more than 2 children (Model 3), and more than 3 children (Model 4).

Panel A reports the impact of sterilization on fertility using data from the PSID-SHELF. The dependent variable is the total number of children. Controls include: *i*) Individual cohort FE for the parent and his/her child; *ii*) Youngest child birth cohort FE; *iii*) State FE for the parent and his/her child; *iv*) Parent's race; *v*) Parent's education; *vi*) Parent's number of children; *vii*) Parent's employment status; *viii*) Parent's salary income and wage; *ix*) Children's gender; *x*) Children's marital status; *xi*) Children's education level; *xii*) Children's relation to the head; *xiii*) Children's employment status; *xiv*) Children's salary income and wage. Clustered standard errors at the state level. *** p<0.01, ** p<0.05, * p<0.1.

Panel B reports estimates using data from the 2000 US Census. The dependent variable is the total number of children. Controls include: *i*) Individual cohort FE for the parent and his/her child; *ii*) Youngest child birth cohort FE; *iii*) PUMA FE; *iv*) Child race; *v*) Child gender; *vi*) Child Duncan socioeconomic index; *vii*) Child education; *viii*) Gender of the household head; *ix*) Marital status of the head; *x*) Number of children of the head; *xi*) Duncan socioeconomic index of the head; *xii*) Education level of the head; *xiii*) An indicator for extended family. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

10 Conclusions

The IHS has provided an important healthcare service for American Indians since it was founded in 1955. However, physicians working at IHS facilities often operated under the assumption that Native people were morally, mentally, and socially defective (Lawrence, 2000). This presumption, combined with a government narrative that birth rates should be reduced due to Malthusian fears, led to the mass sterilization of American Indians. Women who went into hospitals for tonsillectomies or appendectomies often came out with tubal ligations or salpingectomies.

Using different data sources, we show that this mass sterilization reduced on fertility, which then led to deep social and economic ramifications. Future generations may also have been affected by the creation of a culture of medical mistrust and lower reliance on family planning methods.

These social and economic consequences persist today, with American Indians having some of the highest rates of suicide and alcoholism in the nation (Leavitt et al., 2018). To what extent this trauma explains such poor health outcomes is something that still needs to be better understood.

References

Acharya, Avidit, Matthew Blackwell, and Maya Sen, "The political legacy of American slavery," *The Journal of Politics*, 2016, *78* (3), 621–641.

Ager, Philipp, Leah Boustan, and Katherine Eriksson, "The intergenerational effects of a large wealth shock: White Southerners after the Civil War," *American Economic Review*, 2021, *111* (11), 3767–3794.

Aguila, Ernesto Vasquez Del, "Precarious Lives: Forced sterilisation and the struggle for reproductive justice in Peru," *Global Public Health*, Jan 2022, *1* (17), 100–114.

Aizer, Anna, Laura Stroud, and Stephen Buka, "Maternal stress and child outcomes: Evidence from siblings," *Journal of Human Resources*, 2016, *51* (3), 523–555.

Akwesasne Notes, "Akwesasne Notes," *American Indian Digital History Project*, 1974, *6* (5).

Albright, Alex, Jeremy A Cook, James J Feigenbaum, Laura Kincaide, Jason Long, and Nathan Nunn, "After the burning: The economic effects of the 1921 Tulsa race massacre," *National Bureau of Economic Research*, 2021, *W.P. w28985.*

Alsan, Marcella and Marianne Wanamaker, "Tuskegee and the health of black men," *The Quarterly Journal of Economics*, 2018, *133* (1), 407–455.

Althoff, Lukas and Hugo Reichardt, "Jim Crow and Black economic progress after slavery," *The Quarterly Journal of Economics*, 2024, *139* (4), 2279–2330.

Anderson, Terry L and Dean Lueck, "Land tenure and agricultural productivity on Indian reservations," *The Journal of Law and Economics*, 1992, *35* (2), 427–454.

_ **and Dominic P Parker**, "Sovereignty, credible commitments, and economic prosperity on American Indian reservations," *The Journal of Law and Economics*, 2008, *51* (4), 641–666.

Archibong, Belinda and Francis Annan, "We are not guinea pigs: The effects of disclosure of medical misconduct on vaccine compliance," *National Bureau of Economic Research*, 2023, *W.P. w31655.*

Bailey, Martha and Jason Lindo, "Access and Use of Contraception and Its Effects on Women's Outcomes in the United States," in L. M. Argys S.L. Averett and S. D. Hoffman, eds., *Oxford Handbook of Women and the Economy*, Oxford University Press, 2018, p. 219–258.

Bailey, Martha J., "More power to the pill: The impact of contraceptive freedom on women's life cycle labor supply," *The Quarterly Journal of Economics*, 2006, *121* (1), 289–320.

Bauernschuster, Stefan, Michael Grimm, and Cathy Hajo, "The Impact of Margaret Sanger's Birth Control Clinics on Early 20th Century U.S. Fertility and Mortality," CESifo Working Paper Series 10421, CESifo 2023.

Becker, Gary S., *A Treatise on the Family*, Cambridge, MA: Harvard University Press, 1981.

Bertocchi, Graziella and Arcangelo Dimico, "Slavery, education, and inequality," *European Economic Review*, 2014, *70*, 197–209.

_ **and** _ , "De jure and de facto determinants of power: Evidence from Mississippi," *Constitutional Political Economy*, 2017, *28*, 321–345.

Birke, Roman, *Population Control as a Human Right: International Law and the Global Quest to Curb Overpopulation*, Cambridge University Press, 2025.

Bleakley, Hoyt and Paul Rhode, "The economic effects of American slavery: Tests at the border," *National Bureau of Economic Research*, 2024, *W.P. w32640.*

Blewett, Lynn A., Julia A. Rivera Drew, Miriam L. King, Kari C.W. Williams, Daniel Backman, Annie Chen, and Stephanie Richards, "IPUMS Health Surveys: National Health Interview Survey, Version 7.4 [dataset]," 2024, *Minneapolis, MN: IPUMS.*

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess, "Revisiting event study designs: Robust and efficient estimation," *arXiv preprint arXiv:2108.12419*, 2021.

Boustan, Leah and Robert A Margo, "Racial differences in health in long-run perspective: A brief introduction," *National Bureau of Economic Research*, 2014, *W.P. w20765.*

Brown, James R, J Anthony Cookson, and Rawley Z Heimer, "Growing up without finance," *Journal of Financial Economics*, 2019, *134* (3), 591–616.

Carlos, Ann M, Donna L Feir, and Angela Redish, "Indigenous nations and the development of the US economy: Land, resources, and dispossession," *The Journal of Economic History*, 2022, *82* (2), 516–555.

Carlson, L. and K. B. Guzzo, "Median age at last birth," Family Profiles, FP-21-05, Bowling Green, OH: National Center for Family and Marriage Research 2021.

Carneiro, Pedro, Italo Lopez Garcia, Kjell G Salvanes, and Emma Tominey, "Intergenerational mobility and the timing of parental income," *Journal of Political Economy*, 2021, *129* (3), 757–788.

_ , Kjell Salvanes, Barton Willage, Alexander WillÃ et al., "Childhood Shocks Across Ages and Human Capital Formation," 2024.

Carpio, Myla Vicenti, "The Lost Generation: American Indian Women and Sterilization Abuse," *Social Justice*, 2004, *31* (4 (98)), 40–53.

Carruthers, Celeste K and Marianne H Wanamaker, "Separate and unequal in the labor market: Human capital and the Jim Crow wage gap," *Journal of Labor Economics*, 2017, *35* (3), 655–696.

Chang, Lenisa V, "Information, education, and health behaviors: Evidence from the MMR vaccine autism controversy," *Health Economics*, 2018, *27* (7), 1043–1062.

Clarke-Pearson, DL. and EJ. Geller, "Complications of hysterectomy.," *Obstetrical and Gynecology*, 03 2013, *3*, 654–673.

Collins, William J, "The political economy of state-level fair employment laws, 1940–1964," *Explorations in Economic History*, 2003, *40* (1), 24–51.

_ and Robert A Margo, "The labor market effects of the 1960s riots," *National Bureau of Economic Research*, 2004, *W.P. w10243.*

_ and _ , "The economic aftermath of the 1960s riots in American cities: Evidence from property values," *The Journal of Economic History*, 2007, *67* (4), 849–883.

Cook, Lisa D, "Violence and economic activity: Evidence from African American patents, 1870–1940," *Journal of Economic Growth*, 2014, *19*, 221–257.

_ , Trevon D Logan, and John M Parman, "Racial segregation and Southern lynching," *Social Science History*, 2018, *42* (4), 635–675.

Cookson, J Anthony, "Institutions and casinos on American Indian reservations: An empirical analysis of the location of Indian casinos," *The Journal of Law and Economics*, 2010, *53* (4), 651–687.

Dahlen, Heather M, "The impact of maternal depression on child academic and socioemotional outcomes," *Economics of Education Review*, 2016, *52*, 77–90.

Dippel, Christian, "Forced coexistence and economic development: Evidence from Native American reservations," *Econometrica*, 2014, *82* (6), 2131–2165.

Doran, Christopher M., "Attitudes of 30 American Indian women toward birth control," *Health Services Reports*, 1972, *87* (7), 658–663.

Engerman, Stanley L and Kenneth L Sokoloff, *Economic development in the Americas since 1500: Endowments and institutions*, Cambridge University Press, 2012.

Eshaghnia, Sadegh, James J Heckman, Rasmus Landersø, and Rafeh Qureshi, "Intergenerational transmission of family influence," *National Bureau of Economic Research*, 2022, *W.P. w30412.*

Feir, Donn. L., "Economic History and Indigenous Peoples in North America," *Annual Review of Economics*, 2025, *17* (Volume 17, 2025), 479–509.

Feir, Donn L, Rob Gillezeau, and Maggie E C Jones, "The slaughter of the bison and reversal of fortunes on the Great Plains," *The Review of Economic Studies*, 05 2024, *91* (3), 1634–1670.

Feir, Donna and Laura Cattaneo, "The price of mortgage financing for Native Americans," *Journal of Race, Economics, and Policy*, 2021, *4*, 302–319.

Feir, Donna L, "The long-term effects of forcible assimilation policy: The case of Indian boarding schools," *Canadian Journal of Economics/Revue canadienne d'économique*, 2016, *49* (2), 433–480.

Fogel, Robert William and Stanley L Engerman, *Time on the cross: The economics of American Negro slavery*, Vol. 1, WW Norton & Company, 1995.

Frank, Richard G and Ellen Meara, "The effect of maternal depression and substance abuse on child human capital development," *National Bureau of Economic Research*, 2009, *W.P. w15314*.

Frye, Dustin and Dominic P Parker, "Indigenous self-governance and development on American Indian reservations," in "AEA Papers and Proceedings," Vol. 111 2021, pp. 233–237.

Gardner, John, "Two-stage differences in differences," *arXiv preprint arXiv:2207.05943*, 2022.

Gaston, Gina B and Binta Alleyne-Green, "The impact of African Americans' beliefs about HIV medical care on treatment adherence: A systematic review and recommendations for interventions," *AIDS and Behavior*, 2013, *17*, 31–40.

General Accounting Office, "Investigation of allegations concerning Indian Health Service," Technical Report, HRD-77-3 1976.

Goldin, Claudia and Lawrence F. Katz, "The power of the pill: Oral contraceptives and women's career and marriage decisions," *Journal of Political Economy*, 2002, *110* (4), 730–770.

Gregg, Matthew T, "The long-term effects of American Indian boarding schools," *Journal of Development Economics*, 2018, *130*, 17–32.

Heckman, James J, "The economics, technology, and neuroscience of human capability formation," *Proceedings of the National Academy of Sciences*, 2007, *104* (33), 13250–13255.

Huttunen, Kristiina and Krista Riukula, "Parental job loss and children's career choices," *Labour Economics*, 2024, p. 102578.

Kluchin, Rebecca M, *Fit to be tied: Sterilization and reproductive rights in America, 1950-1980*, Rutgers University Press, 2020.

Kopriva, Mary, "Impacts of the Relocation Program on Native American Migration and Fertility," *The Journal of Economic History*, 2024, *84* (1), 74–110.

Kunitz, Stephen J., "Fertility, Mortality, and Social Organization," *Human Biology*, 1976, *48* (2), 361–377.

Lawrence, Jane, "The Indian Health Service and the sterilization of Native American women," *American Indian Quarterly*, 2000, *24* (3), 400–419.

Leavitt, R.A., A. Ertl, K. Sheats, E. Petrosky, A. Ivey-Stephenson, and K.A. Fowler, "Suicides among American Indian/Alaska natives — National violent death reporting system, 18 states, 2003–2014.," *Morbidity and Mortality Weekly Report*, 2018.

Lekvall, Ebba, "The Danish 'Coil Campaign' in Greenland: Indigenous Genocide Through Forced Birth Control?," *Nordic Journal of International Law*, 2025, *94* (3), 270 – 312.

Leonard, Bryan, Dominic P Parker, and Terry L Anderson, "Land quality, land rights, and indigenous poverty," *Journal of Development Economics*, 2020, *143*, 102435.

Levine, Ross, Chen Lin, and Wensi Xie, "The African slave trade and modern household finance," *The Economic Journal*, 2020, *130* (630), 1817–1841.

Lowes, Sara and Eduardo Montero, "The legacy of colonial medicine in Central Africa," *American Economic Review*, 2021, *111* (4), 1284–1314.

Margo, Robert A, "Teacher salaries in black and white: The South in 1910," *Explorations in Economic History*, 1984, *21* (3), 306–326.

_ , "Accounting for racial differences in school attendance in the American South, 1900: The role of separate-but-equal," *The Review of Economics and Statistics*, 1987, pp. 661–666.

_ , *Race and schooling in the South, 1880-1950: An economic history*, University of Chicago Press, 1990.

Margo, Robert Andrew, *Disfranchisement, school finance, and the economics of segregated schools in the United States South, 1890-1910*, Harvard University, 1982.

Martinez-Bravo, Monica and Andreas Stegmann, "In vaccines we trust? The effects of the CIA's vaccine ruse on immunization in Pakistan," *Journal of the European Economic Association*, 2022, *20* (1), 150–186.

Maruthiah, Christian, "Coercive assimilation policy and ethnic identification across generations," Technical Report, Technical report, Trinity College Dublin 2024.

Mörk, Eva, Anna Sjögren, and Helena Svaleryd, "Consequences of parental job loss on the family environment and on human capital formation-Evidence from workplace closures," *Labour Economics*, 2020, *67*, 101911.

Murdock, George Peter, *Ethnographic Atlas*, Pittsburgh: University of Pittsburgh Press, 1967.

Naidu, Suresh, "Recruitment restrictions and labor markets: Evidence from the postbellum US South," *Journal of Labor Economics*, 2010, *28* (2), 413–445.

Nixon, Richard, "Special Message to the Congress on Problems of Population Growth," 1969.

North, Kari, Jean MacCluer, Linda Cowan, and Barbara Howard, "Gravidity and Parity in Postmenopausal American Indian Women: The Strong Heart Study," *Human Biology*, 2000, *72* (3), 397–414.

Nunn, Nathan, "The long-term effects of Africa's slave trades," *The Quarterly Journal of Economics*, 2008, *123* (1), 139–176.

Oreopoulos, Philip, Marianne Page, and Ann Huff Stevens, "The intergenerational effects of worker displacement," *Journal of Labor Economics*, 2008, *26* (3), 455–483.

Persson, Petra and Maya Rossin-Slater, "Family ruptures, stress, and the mental health of the next generation," *American Economic Review*, 2018, *108* (4-5), 1214–1252.

Pfeffer, Fabian T., Davis Daumler, and Esther Friedman, "PSID-SHELF, 1968-2019: The PSID Social, Health and Economic Longitudinal, Beta release," 2023, *Ann Arbor MI: Inter-university Consortium for Political and Social Research.*

Qian, Mengcen, Shin-Yi Chou, and Ernest K Lai, "Confirmatory bias in health decisions: Evidence from the MMR-autism controversy," *Journal of Health Economics*, 2020, *70*, 102284.

Rademaker, Laura, "Being Counted: Family Planning and Aboriginal Population, 1967–75," *Australian Historical Studies*, 2024, *55* (3), 506–524.

Ralstin-Lewis, D Marie, "The continuing struggle against genocide: Indigenous women's reproductive rights," *Wicazo Sa Review*, 2005, pp. 71–95.

Ruef, Martin and Angelina Grigoryeva, "Jim Crow, ethnic enclaves, and status attainment: Occupational mobility among US Blacks, 1880–1940," *American Journal of Sociology*, 2018, *124* (3), 814–859.

Ruggles, Steven, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler, "IPUMS USA: Version 15.0 [dataset]," 2024, *Minneapolis, MN: IPUMS.*

Salvanes, Kjell G, Barton Willage, and Alexander Willén, "The effect of labor market shocks across the life cycle," *Journal of Labor Economics*, 2024, *42* (1), 121–160.

Shepherd, Sophia, "The enemy is the knife: Native Americans, medical genocide, and the prohibition of nonconsensual sterilizations," *Michigan Journal of Race and Law*, 2021, *27* (1), 89–106.

Sinderbrand, R., "Choice and coercion: Birth control, sterilization, and abortion in public health and welfare," *Newsweek*, 2005, *145*, 13–33.

Singh, Aditi and Sarah Vincent, "Male Sterilization and Persistence of Violence: Evidence from Emergency in India," AMSE Working Papers 2403, Aix-Marseille School of Economics, France Feb 2024.

State Library of North Carolina, "Biennial report of the Eugenics Board of North Carolina," 1968. UNC Libraries.

Stote, Karen, "The Coercive Sterilization of Aboriginal Women in Canada," *American Indian Culture and Research Journal*, 01 2012, *36*, 117–150.

Temkin-Greener, Helena, Stephen J Kunitz, David Broudy, and Marlene Haffner, "Surgical fertility regulation among women on the Navajo Indian reservation, 1972-1978," *American Journal of Public Health*, 1981, *71* (4), 403–407.

USDC WDPA, "Norma Jean Serena, et al. v. Natalie J. Leezer, et al.; United States District Court, Western District of Pennsylvania; Civil Case No. 74-313; NAID: 248318997," https://text-message.blogs.archives.gov/2022/08/25/an-indigenous-womans-legal-fight-after-forced-sterilization/#jp-carousel-19702 1974.

Watson, Tara, "Public health investments and the infant mortality gap: Evidence from federal sanitation interventions on US Indian reservations," *Journal of Public Economics*, 2006, *90* (8-9), 1537–1560.

Willage, Barton and Alexander Willén, "Postpartum job loss: Transitory effect on mothers, long-run damage to children," *European Economic Review*, 2022, *150*, 104287.

Williams, Jhacova, "Historical lynchings and the contemporary voting behavior of Blacks," *American Economic Journal: Applied Economics*, 2022, *14* (3), 224–253.

Wright, Gavin, "Slavery and the rise of the nineteenth-century American economy," *Journal of Economic Perspectives*, 2022, *36* (2), 123–148.

Appendix A - Data Description

IPUMS 1990 5% US Census State Sample

The 1990 5% State sample is a 1-in-20 national random sample of the population. The file is hierarchical in structure, meaning that a housing unit record is followed in sequence by records for the individuals in that housing unit. The variable *relate* identifies household members and their relation to the head of the household.

We include the household head, their spouse/partner, and parents (*relate=1, 2, 5, 11*) in the analysis of fertility and economic outcomes. Data on children ever born are reported only for women, i.e., the information on children ever born is reported by the head if she is female or the spouse if the head is male. Parents and partners will also report information on children ever born if they are women and have had children. We exclude household members aged below 15 because they are unlikely to have children, and those aged above 90. In one of the robustness checks we replicate the analysis focusing only on women born in 1940-1970.

For the analysis of investment in children, we retain only observations on the household head's children (*relate=3*), excluding children-in-law. We then merge children's characteristics with information about the household head (*relate=1*) using the household identifier (*serial*) to control for parental characteristics. Children for whom information on school attendance is unavailable (i.e., those under 3) are excluded from the sample.

IPUMS NHIS 1980-1995

The National Health Interview Survey collects information on the health, health care access, and health behaviors of the U.S. population. Each record represents an individual, and similar to the U.S. Census, individual records are organized into households. To evaluate health consequences, we restrict the observations to those related to the household head and their spouse (*relate=10, 21, 22*). Furthermore, similar to the analysis conducted using the 1990 U.S. Census sample, we drop individuals under 15 and above 90.

To evaluate investment in children, we follow the same steps as for the U.S. Census 5% sample, which are: *i)* we keep individual characteristics related to the child of the householder (*relate=41*); *ii)* we merge children's characteristics

with information related to the head of the household (*relate=10*) using the household identifier (*serial*) to control for parental characteristics.

PSID-SHELF

The Panel Study of Income Dynamics–Social, Health, and Economic Longitudinal File (PSID-SHELF) provides a harmonized longitudinal dataset for the Panel Study of Income Dynamics (PSID). The dataset covers the period from 1968 to 2019. We use the long version of the file, which provides information for each person over time.

To link children's information to parents, we first reshape the dataset using child identifiers to capture fertility information for each child over time. Since characteristics may change over time and we only need to exploit cross-sectional variation, we compute the mode or maximum value for each variable to obtain the most frequent or maximal value. For example, for variables such as employment status and marital status, we report the mode to reflect the prevalent employment and marital status over the period. For variables like the number of children, education levels, and family size, we take the maximum value to capture the total number of children or the highest educational level, for instance. We then collapse the dataset (at the median value) by child ID to avoid inflating standard errors. This information is subsequently merged with data on the child's parent to obtain a measure of the most recent child born to that parent. Therefore, we have a single observation per child, along with information about that child's parent.

IPUMS 2000 5% US Census Sample

We use the 2000 5% US sample to complement the analysis on the intergenerational transmission of fertility. To obtain a measure of the fertility of children born to given parents, we follow the same procedure used to evaluate investment in children, which is: *i)* we keep observations related to children of the household head (*relate=3*), excluding children in law; *ii)* we then merge children characteristics with information about the household head (*relate=1*) using the household identifier (*serial*). Children below 15 are dropped as below reproductive age. We also drop individuals of age above 90.

Table A1: Summary statistics - 1990 US Census

	Obs.	Mean	SD	Min	Max
Child Ever Born	2,035,797	2.653	1.641	1	12
Nr Children > 1	2,035,797	0.785	0.410	0	1
Nr Children > 2	2,035,797	0.420	0.493	0	1
Nr Children > 3	2,035,797	0.204	0.403	0	1
Single-headed HH	2,035,797	0.226	0.4189	0	1
Disability	2,035,797	0.086	0.281	0	1
Labor Force Participation	2,035,763	0.638	0.481	0	1
Race	2,035,797	1.505	1.396	1	7
Relation to the Head	2,035,797	1.989	1.396	1	11
Urban/Rural	2,035,797	1.662	0.473	1	2
Citizenship	2,035,797	0.269	0.799	0	3
Household income	2,034,404	43,146.47	35,335.36	0	815,483
Personal income	2,031,725	11,578.85	13,650.37	0	384,554

Table A2: Summary statistics 1990 US Census (5% Sample)

	Obs.	Mean	SD	Min	Max
Grade 8	3,219,137	0.5816	0.4933	0	1
Grade 12	3,219,137	0.226	0.418	0	1
College	3,219,137	0.112	0.316	0	1
Child - Race	3,219,137	1.566	1.478	1	7
Child - Gender	3,219,137	1.474	0.499	1	2
Head - Gender	3,219,137	1.259	0.438 1	2	
Head - Marital Status	3,219,137	1.7018	1.4257	1	6
Head - Highest Education Level	3,219,137	6.622	2.520	0	11
Head - Duncan Socioeconomic Index	3,219,137	37.459	26.080	0	96
Head - Labor Force Participation	3,219,137	1.855	0.3520	0	2
Head - Urban/Rural	3,219,137	1.6518	0.4764	1	2
Head - Citizenship	3,219,137	0.2784	0.8083	0	3
Child - School Attendance	3,219,137	1.711	0.453	1	2

Table A3: Summary Statistics NHIS

	Obs.	mean	SD	Min	Max
Gynecological Issues	48,075	0.0333	0.1795	0	1
Number of Children	292,430	1.921	1.038	1	9
Nr Children > 1	292,430	0.587	0.492	0	1
Nr Children > 2	292,430	0.225	0.418	0	1
Nr Children > 3	292,430	0.072	0.259	0	1
Poor Health Indicator	291,498	0.027	0.162	0	1
Health conditions	257,277	0.794	1.227	0	16
Bed Disability	290,680	0.134	0.341	0	1
Race	292,430	1.534	1.976	1	15
Relation to Household Head	292,430	17.656	5.074	10	22

Table A4: Summary Statistics PSID-SHELF

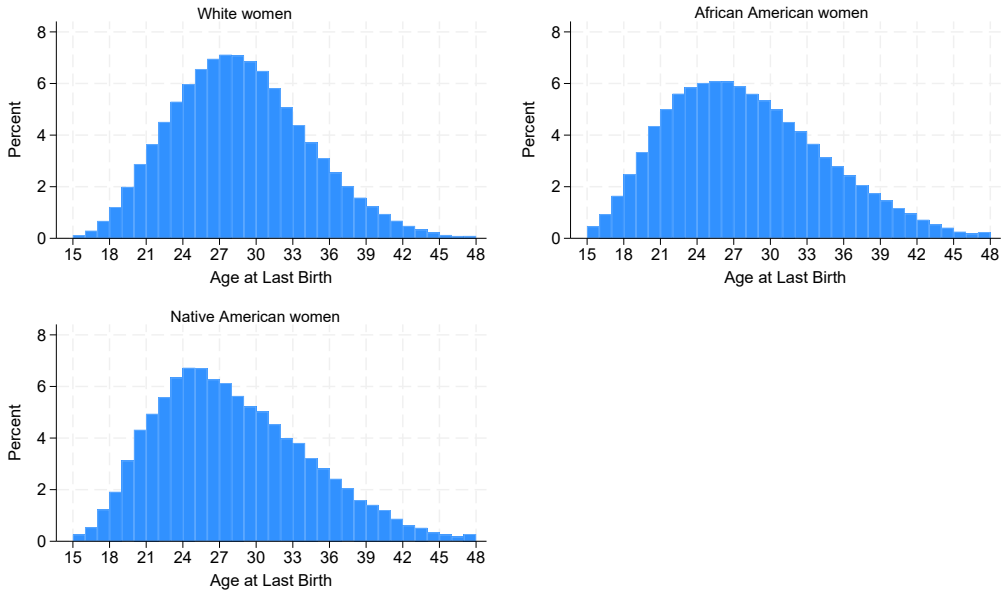
	Obs.	Mean	SD	Min	Max
Nr. of Children	40,488	0.572	1.159	0	16
Children >1	40,488	0.175	0.380	0	1
Children >2	40,488	0.083	0.276	0	1
Children >3	40,488	0.0347	0.180	0	1
Parent - Earning (real $ 2022)	40,352	41,866.54	40,640.4	0	1,185,335
Child - Earning (real $ 2022)	39,913	46,353.64	50,170.7	0	1,567,172
Parent - Race	37,489	3.206	3.742	1	14
Child - Gender	40,488	1.492	0.500	1	2
Child - Married	39,094	0.694	0.461	0	1
Parent - Highest Education Level	40,239	1.650	1.162	0	4
Child - Highest Education Level	22,888	1.501	1.110	0	4
Child - Relation to Ref. Pers	39,411	291.344	67.756	100	490
Parent - Nr of Children	40,488	3.671	2.242	1	20
Parent - Employment Status	40,387	0.673	0.453	0	1
Child - Employment Status	22,779	0.565	0.476	0	1

Table A5: Summary statistics 2000 Census (5% Sample)

	Obs.	Mean	SD	Min	Max
Nr of Children	1,479,495	0.1264	0.4902	0	9
Children > 1	1,479,495	0.0295	0.1692	0	1
Children > 2	1,479,495	0.0095	0.0971	0	1
Children > 3	1,479,495	0.0029	0.0542	0	1
Race	1,479,495	1.949	1.993	1	9
Gender	1,479,495	1.456	0.498	1	2
Head - gender	1,475,177	1.325	0.468	1	2
Head - marital status	1,475,177	2.100	1.653	1	6
Head - nr of children	1,475,177	2.123	1.215	1	9
Duncan Socioeconomic Index	1,479,495	22.586	23.259	0	96
Head - Duncan Soc. Index	1,475,177	34.718	26.430	0	96
Education level	1,479,495	5.283	2.076	0	11
Head - education level	1,475,177	6.474	2.588	0	11
Dummy for extended family	1,479,495	0.081	0.272	0	1

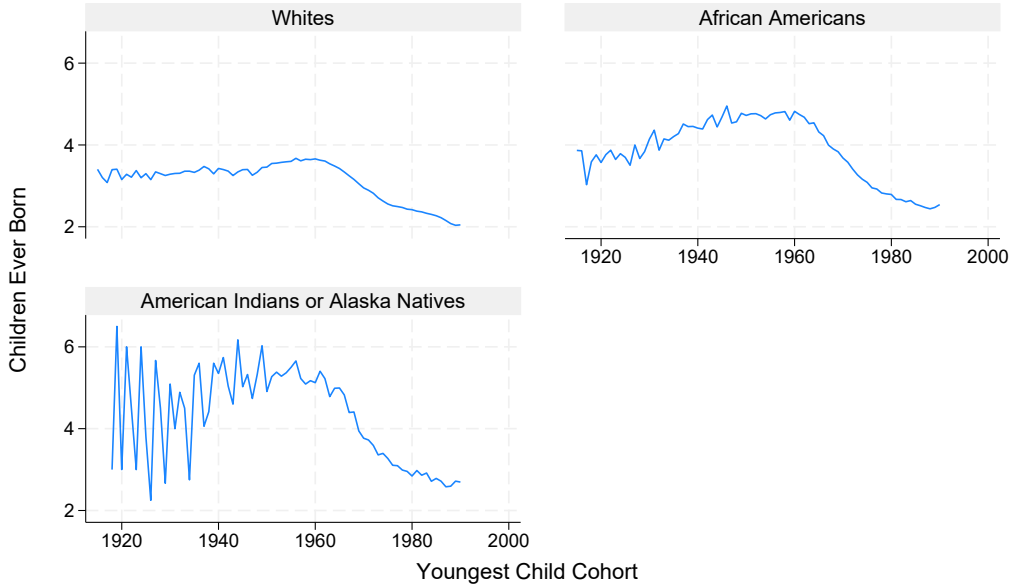
Appendix B - Figures

Figure B1: Distribution of mother's age at last birth



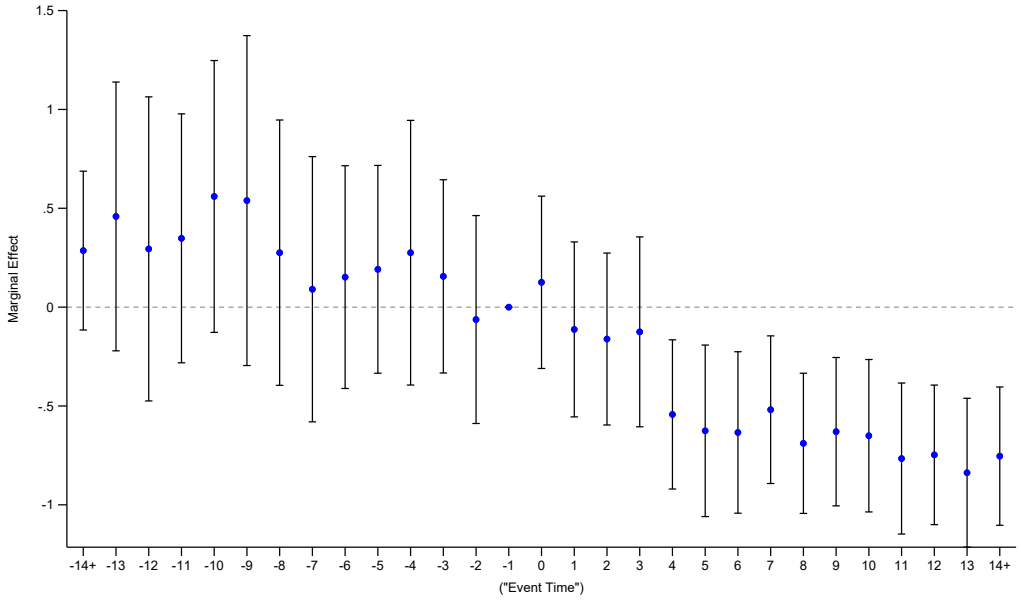
Note: The graph shows the distribution of mothers' age at last birth using the 1990 US Census (5% sample) by race.

Figure B2: Average number of children by race



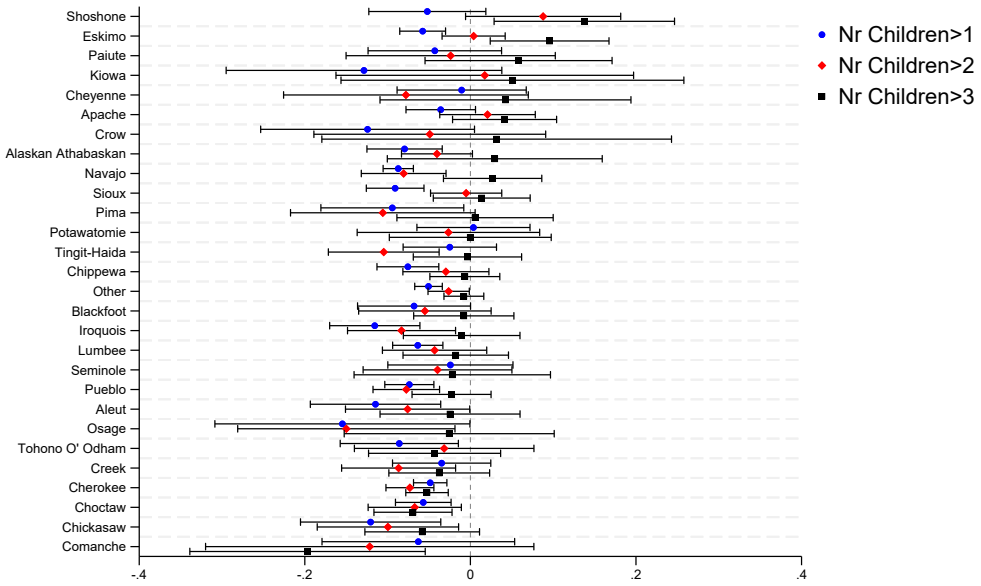
Note: The graph shows the average number of children ever born by race and over the birth year of the last child. The plot reports the number of children for Whites, African Americans, and American Indians. Other races are excluded. The larger variability for earlier cohorts among American Indians is due to the relative small number of observations for those years.

Figure B3: Event study - restricted sample



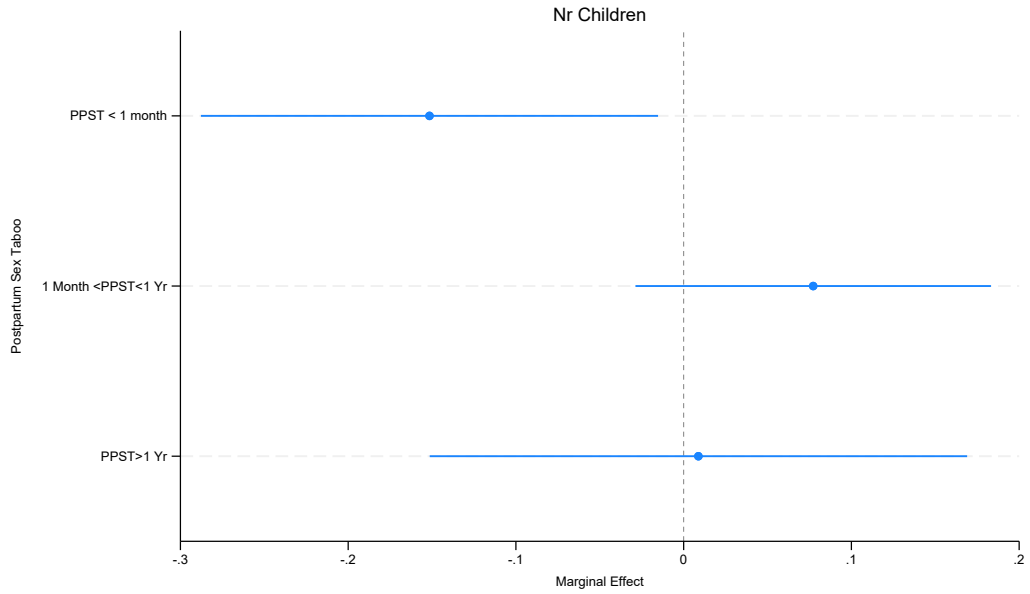
Note: The dependent variable is the number of children ever born. The vertical axis reports changes in the number of children ever born. The horizontal axis reports event periods, where 0 is 1965. Controls include: i) PUMA FE; ii) Individual cohort FE; iii) Youngest child cohort FE; iv) Race; v) Citizenship; vi) Birthplace; vii) Relation to the head; viii) Urban/rural location. Clustered standard errors at the PUMA level. The sample is restricted to Native American and White women. 95% confidence intervals.

Figure B4: Average Treatment Effect by Tribe



Note: The dependent variable is the number of children ever born. The horizontal axis reports changes in the probability of having more than one, two, or 3 children. Controls include: i) PUMA FE; ii) Individual cohort FE; iii) Youngest child cohort FE; iv) Race; v) Citizenship; vi) Birth place; vii) Relation to the head; viii) Urban/rural location. Clustered standard errors at the PUMA level. 95% confidence intervals.

Figure B5: Heterogeneous Effect by Tribe Birth Spacing - Murdock (1967) indicator



Note: The dependent variable is the number of children ever born. The vertical axis reports the birth interval by tribe, using the Murdock (1967) indicator of post-partum intercourse taboo (less than a month, between 1 and 12 months, more than a year). The horizontal axis reports changes in the number of children ever born. Controls include: i) PUMA FE; ii) Mother cohort FE; iii) Youngest child cohort FE; iv) Race; v) Citizenship; vi) Birth place; vii) Relation to the head; viii) Urban/rural residency. Clustered standard errors at the PUMA level. 95% confidence intervals.

Appendix C - Tables

Table C1: The effect of sterilization on parity – Women born in 1940–1970

	(1)	(2)	(3)	(4)
	Nr Children	Nr Children>1	Nr Children>2	Nr Children>3
ATT	-0.109***	-0.068***	-0.048***	-0.009
	(0.028)	(0.006)	(0.008)	(0.008)
Adj.R-squared	0.201	0.105	0.132	0.126
Observations	1,641,663	1,641,663	1,641,663	1,641,663
Treated	5,686	5,686	5,686	5,686
Sample Mean	2.352	0.761	0.355	0.138
Clusters	1,726	1,726	1,726	1,726
Mother Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes

Notes: The dependent variable is the number of children ever born (Model 1) and dummies for more than one child in the household (Model 2), more than 2 children in the household (Model 3), and more than 3 children in the household (Model 4). Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural residency. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

Table C2: The effect of sterilization on parity - Gardner (2022) estimator

	(1)	(2)	(3)	(4)
	Nr Children	Nr Children > 1	Nr Children > 2	Nr Children > 3
ATT	−0.065**	−0.061***	−0.048***	−0.012*
	(0.030)	(0.006)	(0.007)	(0.007)
Adj. R-squared	0.297	0.122	0.189	0.219
Observations	2,035,797	2,035,797	2,035,797	2,035,797
Treated	7,047	7,047	7,047	7,047
Sample Mean	2.653	0.785	0.420	0.204
Clusters	1,726	1,726	1,726	1,726
Mother Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other FE	Yes	Yes	Yes	Yes

Notes: The dependent variable is the number of children ever born (Model 1) and dummies for more than one child in the household (Model 2), more than 2 children in the household (Model 3), and more than 3 children in the household (Model 4). Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural location. Clustered standard errors at the PUMA level. Estimation method following Gardner (2022). *** p<0.01, ** p<0.05, * p<0.1.

Table C3: The Effect of Sterilization on Fertility - NHIS data

	(1)	(2)	(3)	(4)
	Nr Children	Nr Children>1	Nr Children>2	Nr Children>3
ATT	-0.150***	-0.032*	-0.057***	-0.027**
	(0.047)	(0.017)	(0.020)	(0.013)
Adj.R-squared	0.180	0.173	0.108	0.064
Observation	292,430	292,430	292,430	292,430
Treated	1,037	1,037	1,037	1,037
Sample Mean	1.9212	0.5867	0.2251	0.0722
Clusters	939	939	939	939
Mother Cohort FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes

Notes: The dependent variable is the number of children in the household (Model 1) and dummies for more than one child in the household (Model 2), more than 2 children in the household (Model 3), and more than 3 children in the household (Model 4). Controls include: *i*) Region FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Survey year FE;*v*) Race; *vi*) Relation to the head. Clustered standard errors at the primary sampling unit. *** p<0.01, ** p<0.05, * p<0.1.

Table C4: The effect of sterilization on parity – Heterogeneity with preconditions

	(1)	(2)	(3)
	Nr Children	Nr Children	Nr Children
ATT	0.165**	-0.907**	-0.253
	(0.082)	(0.451)	(0.189)
ATT*Nr of Children 1930	-0.188**		
	(0.0827)		
ATT*Age at Marriage 1930		0.0450**	
		(0.0216)	
ATT*Literacy 1930			0.424**
			(0.215)
Adj.R-squared	0.287	0.287	0.288
Observations	1,939,028	1,909,951	1,938,214
Treated	2,955	2,460	2,955
Sample Mean	2.628	2.626	2.627
Clusters	1,726	1,713	1,726
Mother Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other FE	Yes	Yes	Yes

Notes: The dependent variable is the number of children ever born. Controls include: *i*) PUMA FE; *ii*) Mother cohort FE; *iii*) Youngest child cohort FE; *iv*) Race; *v*) Citizenship; *vi*) Birth place; *vii*) Relation to the head; *viii*) Urban/rural location. Clustered standard errors at the PUMA level. *** p<0.01, ** p<0.05, * p<0.1.

Table C5: The effect of sterilization on Education - NHIS data

	(1)	(2)	(3)
	Grade 8	Grade 12	College
ATT	0.0137	0.00635	−0.0291**
	(0.00954)	(0.0112)	(0.0127)
Adj. R-squared	0.689	0.550	0.255
Observations	389,312	389,312	389,312
Treated	1,599	1,599	1,599
Sample Mean	0.493	0.245	0.106
Clusters	298	298	298
Cohort FE	Yes	Yes	Yes
Race FE	Yes	Yes	Yes
Child Cohort FE	Yes	Yes	Yes
Other FE	Yes	Yes	Yes

Notes: The dependent variable is a dummy for whether the highest completed level of education is grade 8 (Model 1), grade 12 (Model 2), or any college (Model 3). Controls include: *i*) Region FE; *ii*) Individual cohort FE; *iii*) Youngest child cohort FE; *iv*) Survey year FE; *v*) Marital status of the head; *vi*) Gender; *vii*) Gender of the head; *viii*) Race; *ix*) Employment status of the head; *x*) Education level of the head. Standard errors clustered at the primary sampling unit level. *** p<0.01, ** p<0.05, * p<0.1.