Gestation During Abortion Legalization and Adult Disability and Mortality[*]

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Abstract

This paper examines long-term health impacts of abortion legalization on cohorts born during the time in the early 1970s in the United States. While prior research highlights the short-term benefits of legal abortion on maternal and infant health, such as reduced mortality and improved infant health outcomes, this study investigates whether these benefits extend into later life. Leveraging variation in the timing of abortion legalization across states and the complete set of death records, we find that birth cohorts gestating under legal abortion reforms experience significant reductions in cumulative mortality and disability in adulthood. Our analysis of the mechanisms suggests that improved maternal and infant health, along with compositional changes in the characteristics of mothers giving birth, may explain these lasting health improvements.

Keywords: Abortion, Roe v. Wade, Dobbs v. Jackson, Women's Health Organization, Disability, Mortality

JEL Codes: H75, I18, J13, J14, J18

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1. Introduction

Legal abortion, an important component of reproductive healthcare, has been a subject of intense debate following the Supreme Court's decision in Dobbs v. Jackson Women's Health Organization. This ruling overturned Roe v. Wade, significantly impacting women's reproductive rights and access to abortion services. Research consistently demonstrates that legal abortion access has profound benefits for maternal and infant health, including reduced maternal mortality, decreased infant mortality, and improved infant health (Farin et al., 2024; Gruber et al., 1999; Joyce, 1987). Building on that work, this paper asks a different question: how legal abortion changes the composition of births and thereby alters long-run population health of affected birth cohorts. We situate the analysis in the prenatal demography literature (e.g., Nobles & Hamoudi, 2019; Bruckner & Catalano, 2018), which emphasizes that selection into birth can materially change cohort-level outcomes.

Our central hypothesis is that when abortion is legally accessible, pregnancies at greatest risk of adverse outcomes are less likely to result in live births. As a result, cohorts gestating under legal abortion regimes comprise a different, on-average healthier, set of infants than pre-legalization cohorts. The long-term health advantages we document therefore arise from changes in cohort composition rather than from individual-level "exposure" effects in utero.

To test this hypothesis, we exploit variation in the timing of abortion legalization across states and the complete set of death records from the National Center for Health Statistics and implement difference-in-differences models to examine changes in cumulative mortality rate and disability prevalence among birth cohorts gestating during periods of change in legal abortion access. We find that cohorts gestating under legal abortion access experienced significant reductions in mortality and disability over their life course. These improvements are consistent with abortion policy changes contributing to a shift in the composition of women who give birth in a given time period towards those who have healthier infants. Event study analyses rule out concerns that these effects reflect pre-policy differences across states. Further, we show that the effects are robust to alternative specifications and new methods introduced by Sun & Abraham (2021), which address biases often encountered in staggered adoption of laws and regulations.

To shed light on the mechanisms, we first replicate the analyses in Gruber et al. (1999) and Joyce (1987) and confirm that legal abortion led to a decrease in infant mortality and improved infant health. Next, we explore how abortion legalization affected changes in the composition of mothers giving birth. We find that (1) abortion legalization is associated with a reduction of approximately 1.9% in fertility rates among White mothers and 6.7% among Black mothers. Because Black mothers face higher risks of adverse birth outcomes, these compositional shifts may help explain the improvements in later-life health outcomes for the exposed cohorts; and (2) abortion legalization is linked to a reduction in teenage motherhood and an increase in the share of married mothers—compositional changes that plausibly contribute to healthier birth cohorts.

Evidence from the Turnaway Study provides useful corroboration and context for these findings. This longitudinal U.S. study follows women who either obtained or were denied a wanted abortion and documents substantial socioeconomic consequences of being denied one. Miller et al. (2023), using linked credit report data, show that women denied abortions experience sharp and persistent increases in financial distress—including higher debt, loan delinquencies, bankruptcies, and evictions—relative to those who received abortions. These economic strains plausibly reduce the resources available to children. Foster et al. (2019) further demonstrate spillovers to children's outcomes: existing children of women denied abortions exhibit slightly lower developmental scores and live in poorer family environments compared to children of women who obtained abortions. Taken together, this evidence helps contextualize our results by highlighting how abortion access can affect not only the characteristics of birth cohorts but also broader family and socioeconomic conditions that shape long-term population health.

Our study contributes to the growing body of research on the impacts of abortion legalization and improvements in reproductive healthcare access in the late 1960s and early 1970s. A large literature has documented broad effects on various maternal socioeconomic outcomes, including increases in educational attainment and female labor force participation, changes in family structure and fertility rates, reduced maternal mortality, lowered infant mortality, improved infant health outcomes, with long-lasting benefits for these children's later-life outcomes (Ananat et al., 2009; Angrist et al., 2012; Donohue & Levitt, 2001, 2008; Farin et al., 2024; Foote & Goetz, 2008; Gruber et al., 1999, 1999; Joyce, 1987; Kalist, 2004; Melanie, 2008; Myers, 2024; Noghanibehambari, Slusky, et al., 2025; Noghanibehambari, Vu, et al., 2025). For instance, Donohue and Levitt (2001) suggest that children born post-legalization of abortion reveal lower arrest rates during early adulthood. Their findings imply that roughly 50% of crime reductions in the 1990s may be attributable to abortion legalization movement in the 1970s. However, later studies have extensively criticized these findings.[5]

[5] Several economists have raised serious questions about Donohue and Levitt's (2001) abortion-crime hypothesis in leading journals. Joyce (2004) re-examined the data and argued that the supposed crime drop was mainly driven by unobserved confounders, such as the 1980s crack cocaine epidemic. Joyce (2009) found similarly negligible results, showing no reduction in crime for cohorts born after legalization once age-specific homicide and arrest rates were properly analyzed. Foote & Goetz (2008) discovered a coding error in Donohue and Levitt's regressions and demonstrated that correcting this mistake – and measuring crime rates per capita – drastically weakened the statistical

Similar effects of abortion access on next generations' outcomes have also been documented in other contexts. For instance, Pop-Eleches (2006) documents that Ceaușescu's abortion ban of 1966 in Romania changed the composition of children and that children born post-ban exhibited worse educational attainment and labor market outcomes as adults. Lahey and Wanamaker (2022) exploit the staggered adoption of abortion ban policies across U.S. states during the 19th century to examine the effects on fertility and mortality. They observe increases in birth rate post-ban and reductions in longevity of these children during the first 10 years of life. We contribute to this strand of research by examining the effects of abortion legalization during the 1970s in the U.S. on later-life mortality and disability outcomes.

Building on these established findings, we extend the analysis by following these cohorts further in time to evaluate their health outcomes. Given that these cohorts are already known to have lower crime rates and higher education levels, it is perhaps unsurprising that they would also experience better health outcomes. Our contribution is to measure the magnitude of these effects, expanding the focus beyond mortality to include disability, which provides a broader view of life-course health and a potential early signal of future mortality risks. We also note that these cohorts and their different composition might have implications for the deaths of despair processes in the literature (Case & Deaton, 2020).

Our study also contributes to the prenatal demography literature, which emphasizes that those who survive to birth are a selective subset of all conceptions; selection processes in

link between abortion and crime. Lott Jr and Whitley (2007) challenged the original findings on several aspects. First, they note that states with only limited pre-Roe abortion access did not exhibit the higher abortion rates assumed by Donohue and Levitt, and observing that if the hypothesis were correct, crime should have fallen first among the youngest cohorts born after legalization – yet in reality the 1990s crime decline began with older offenders. Second, they further showed that using actual homicide incidence (by year of crime) instead of arrest data reverses the sign of the abortion effect, undermining Donohue and Levitt's conclusions. However, Donohue and Levitt (2008) corrected the coding error, refined their empirical approach, and continued to find that legalized abortion reduced crime.

utero can therefore alter birth-cohort composition in ways that influence population health (Bruckner & Catalano, 2018). Consistent with this view, Nobles and Hamoudi (2019) show that failing to account for selective survival to birth can yield misleading inferences about in-utero exposures. In the context of abortion policy, Gruber et al. (1999) argue that the "marginal child"—the child not born because abortion was available—would, if born, have faced substantially worse socioeconomic and health circumstances, implying that cohort selection is a key driver of improved outcomes following U.S. legalization in the early 1970s. Evidence from Uruguay points in the same direction: Antón et al. (2018) document immediate declines in births from unplanned pregnancies after legalization, along with positive selection of births—higher prenatal care utilization, a higher share of married mothers, and higher Apgar scores among post-reform cohorts. More broadly, Van Ewijk and Lindeboom (2022) examine cohorts in utero during World War II in Western Europe and show how selective fertility and fetal loss can mask underlying harms: cohorts born during severe stress can appear relatively robust because frailer fetuses are less likely to survive to birth. In this spirit, our study shows how abortion legalization reshaped the composition of U.S. birth cohorts and traces the long-term health consequences of that shift.

In a working paper, Lutchen (2011) examines the effect of abortion legalization on the mortality rates of children born to women directly impacted by abortion legalization. In a concurrent working paper, Farin (2024) documents a positive impact of legal abortion on the likelihood of survival among the exposed cohorts.[6] Our paper differs from these studies in two

[6] Lutchen (2011) uses the NCHS cause specific mortality data from the years 1988–2006 focusing on cohorts of 1968–1975 in age range of 20–30. He documents a reduction of roughly 3% in mortality for those were exposed to abortion legalization prior to conception. Compared to this paper, our work extends the years of analysis and age range of mortality as well as considers a set of mechanisms and morbidity outcomes. Farin (2024) uses the NCHS data for the years 1959–2018 focusing on ages 0–50 and document roughly 3.2% increases in survival rates of exposed cohorts. Compared to this paper, we focus attention on a 'balanced' set of ages of mortality, which we believe is more

ways. First, we measure later-life health beyond mortality, including disability prevalence. This extension is important as it provides a more comprehensive understanding of the long-term effects of in-utero exposure to abortion legalization, capturing health outcomes that significantly influence quality of life and economic well-being and also providing a potential preview to future mortality effects as these cohorts age. Second, we incorporate various supplementary datasets to explore potential mechanisms through which legal abortion might influence later-life health outcomes. These include factors such as fertility, infant mortality, birth outcomes, and compositional changes in births.

The rest of the paper is organized as follows. Section 2 provides a background on abortion policy in the US. Section 3 details the econometric method. Section 4 discusses data sources and sample selections. Section 5 reviews the results. Section 6 provides several mechanism channels. Section 7 concludes the paper.

2. Background

In the 1960s, abortion was largely prohibited across the United States, with only a few states permitting it when the mother's life was at serious risk (Droegemueller et al., 1969). By the mid-1960s, however, several states began to reconsider these restrictive policies. The first changes came from "reform" states, which amended their criminal abortion statutes to allow the procedure under certain conditions. Colorado led the way in 1967, becoming the first state to reform its abortion laws and permitting the procedure in cases of rape, incest, serious birth defects, or when the mother's health was at substantial risk, whether physical or mental (Lamm

appropriate and interpretable, and explore mechanisms and morbidity outcomes. Our results are in line with these studies.

& Davison, 1970). Over the next few years, other states followed suit, and by 1972, 13 states had introduced similar reforms (Farin et al., 2024; Myers, 2024).[7]

While these reform states permitted abortions in specific cases, they did not fully legalize the procedure. By the late 1960s, a second group of states—known as "repeal" states—went further. Beginning with California in 1969, these states removed criminal prohibitions on abortion, allowing the procedure without the stringent restrictions of earlier laws (Myers, 2024). In 1970, Alaska, Hawaii, New York, and Washington followed California's example, fully legalizing abortion, with Washington, D.C., allowing it after a 1971 court decision. Appendix Figure A-1 illustrates the geographic distribution of these repeal states.[8] This evolving legal landscape culminated in the pivotal 1973 Roe v. Wade ruling, in which the Supreme Court overturned state-level abortion restrictions and established a nationwide constitutional right to abortion access

3. Econometric Method

The empirical strategy leverages a difference-in-differences framework to compare health outcomes across birth cohorts born in different years relative to state-specific legalization year, i.e., comparing early-adopting states with late-adopting states. We operationalize these comparisons using the following specification and implementing the method developed by Sun & Abraham (2021):

[7] The "reform" states that enacted limited abortion law reforms during the late 1960s and early 1970s include: 1967: California, Colorado, North Carolina; 1968: Maryland; 1969: Arkansas, Delaware, Georgia, New Mexico, Oregon; 1970: Kansas, South Carolina, Virginia; 1972: Florida

[8] To examine the correlates of states' repeal decision, we show the correlation between an indicator of early abortion status and several state' characteristics in Appendix Table A-2. In specifications that also include region fixed effects (columns 2 and 4), we observe four significant correlations: gender wage gap (raw and adjusted for age, race, and education), income, share of AFDC women, and infant mortality rate. Repeal states had higher per capita income, higher share of AFDC, lower infant mortality rate, and higher gender wage gap.

$$y_{srb} = \alpha + \sum_{j \neq -1} \lambda_j I(T_s^* - b = j) + \beta Z_{srb} + \zeta_{rb} + \xi_s + \varepsilon_{srb} \tag{1}$$

Where y_{srb} is the average outcome for birth cohorts born in state s, in census region r, and belonging to birth cohort b. The indicator function $I(.)$ captures the cohort's distance from the state-specific abortion legalization year. The coefficients on each relative year (i.e., λ_j for $j < 0$ and $j > 0$) represent the estimated difference in the outcome for birth cohorts gestating that many years before or after abortion legalization, relative to the omitted reference group (cohorts gestating immediately before legalization).

The matrix Z includes birth state by birth year covariates, such as real per capita income, hospital beds per capita, hospital per capita, share of Whites, share of Blacks, share of females, total reported disease rate, Black fertility rates, White fertility rates, Black mortality rates in different age groups (0, 1-4, 5-9, 10-14), White mortality rates in different age groups (0, 1-4, 5-9, 10-14), share of women and children recipients of Aid to Families with Dependent Children (AFDC), and state-cohort measures of exposure to Medicaid, the Fair Employment Practices Act (FEPA), and the Equal Pay Law (EPL).

The parameter ζ represents birth region-by-birth year fixed effects, which capture the convergence of cross-cohort health outcomes across different census regions (Goodman-Bacon, 2021). The parameter ξ includes birth state fixed effects to absorb all unobservable time-invariant state-specific factors that affect long-term outcomes with spillovers for health and longevity outcomes. Finally, ε is a disturbance term. Standard errors are clustered on birth state and birth year to account for both serial and spatial correlations in error terms. For the analyses regarding disability outcomes, we apply the same specification at the individual level, adding gender, race, and ethnicity dummies.

To summarize the event study results, we group all positive event time coefficients into a binary variable indicating being born post-legalization (Exp), using the following equation:

$$y_{srb} = \alpha + \lambda Exp_{srb} + \beta Z_{srb} + \zeta_{rb} + \xi_s + \varepsilon_{srb} \quad (2)$$

All parameters and covariates are as in Equation (1).

4. Data

This study utilizes two primary data sources. First, we employ restricted-access death records from the National Center for Health Statistics (NCHS, 2020). The NCHS data reports the universe of deaths in the US with their underlying causes. It contains limited demographic information, such as race and gender, and report the deceased's state of birth and age at death. The latter two variables allow us to infer the individual's birth year, which is crucial to our analysis. We restrict the sample to the years 1990-2020 and birth cohorts of 1960-1980. This window allows us to observe multiple cohorts pre- and post-legalization. The earlier cohorts are aged 30 at the start of the sample window and the later cohorts are aged 40 at the end of the window. Therefore, to have a balanced sample of cohorts, we focus on deaths between ages 30-40. However, in Appendix Figure A-3 and Appendix Figure A-4, we show that the results follow a similar pattern when we include all ages in the analysis. To calculate the numerator for cumulative mortality rates, we collapse the death data at the birth state, birth year, gender, and race level.

For the denominator, we use the 5% sample of the 1990 Census, extracted from the IPUMS project (Ruggles et al., 2024). Using the IPUMS-provided person weights, we calculate the total number of individuals alive in 1990 for each specific birth state (s) and birth year (b). These figures allow us to calculate the cumulative mortality rate using the following formula:[9]

$$CMR = \frac{Deaths_{sb}^{1990-2020}}{Pop_{sb}^{1990}} \times 100{,}000$$

The cumulative mortality rate for cohorts born pre-legalization and post-legalization is approximately 2,151.2 and 1,899 deaths per 100,000, respectively (

[9] Although we focus on log CMR as the primary outcome, in column 1 of Appendix Table A-11, we show the robustness to using a linear measure of CMR. In addition, in the main results we focus on death window of 1990 – 2020. In Appendix Table A-11, we show that the results are quite robust when we expand the window the years 1980 – 2020.

Appendix Table A-1). Appendix Figure A-2 depicts the geographic distribution of cumulative mortality rates across US states (based on cohorts' birth state) in relation to low birth weight, an adverse measure of infants' health. This bivariate map suggests a concentration of these adverse in-utero and later-life outcomes in several southern and Midwestern states, although with scattered clustering in other regions.

The disability outcomes are taken from the Census 2000 and American Community Survey data 2001-2022 (hereafter Census-ACS). We start the sample in the year 2000, as the primary disability measures (e.g., cognitive disability) are reported in the Census and ACS data beginning that year. Similar to the NCHS data, we restrict the sample to cohorts born between 1960-1980.

Other data sources to construct the covariate matrix are as follows. State-level income per capita is taken from (Schaller et al., 2020).[10] Fertility rate and infant mortality rate are taken from (Bailey et al., 2016).[11] Total reported disease cases are extracted from the Tycho project (Tycho, 2021).[12] Measures of hospitals per capita and hospital beds per capita are taken from

[10] The income data is based on state personal income data from the U.S. Bureau of Economic Analysis. This measure represents real annual personal income per resident of each state (in 2012 dollars).

[11] The data provides county-level birth data from historical vital statistics on births and deaths. We compute the general fertility rate, defined as the number of live births per 1,000 women of childbearing age (15–44) in a given state-year, using the birth counts and population data from that source. The infant mortality data is also from the US vital statistics data, as compiled by (Bailey et al., 2016). This is defined as the number of infant deaths (under 1 year of age) per 1,000 live births in each state-year. We aggregate the county-level infant death counts and birth counts to the state level to construct this rate.

[12] Project Tycho compiled weekly reports of notifiable diseases in the U.S. (e.g., polio, measles, tuberculosis, etc.) from 1887 onward. Using their data, we aggregate the total number of reported cases of infectious diseases for each state-year in our sample. This total case count is then normalized by state population (per 100,000 people) to reflect the overall disease exposure in early life for each cohort.

(Goodman-Bacon, 2018).[13] Measures of state-cohort exposure to FEPA, Medicaid, and EPL are extracted from (Farin et al., 2024).[14]

Summary statistics are reported in

[13] Hospitals per capita is the number of hospitals in the state per population (we express it per 100,000 residents), and hospital beds per capita is the number of hospital beds per 1,000 residents. Goodman-Bacon's data draw on historical surveys and publications of hospital resources (for example, the American Medical Association's Hospital Service in the United States reports and American Hospital Association statistics).

[14] These variables indicate the exposure of each birth cohort to certain state policies in effect during their early life: FEPA refers to state Fair Employment Practices Acts (state-level anti-employment-discrimination laws, many enacted in the 1940s–1960s), and EPL refers to state Equal Pay Laws (laws enforcing equal pay for equal work, largely enacted in the 1960s). Medicaid exposure indicates the introduction of the Medicaid public health insurance program (mid-1960s) in the birth state. For each policy, the measure is constructed as a binary indicator for whether the policy was in force by the time the cohort was born (i.e. the cohort was "exposed" to that policy from birth). For example, if a state implemented a Fair Employment Practices Act in 1965, then cohorts born in that state in 1960 and 1970 have an exposure value of -5 and 5 for FEPA, respectively.

Appendix Table A-1. We observe fairly similar demographic characteristics in the subsample of birth cohorts born pre-legalization and post-legalization (unexposed and exposed, respectively). On average, the incidence of cognitive disability in the pre-legalization subsample is 3.7%, compared to 4.4% in the post-legalization subsample.

5. Results

The main results of Equation (1) for cumulative mortality rate are reported in the top panel of Figure 1. The pre-trend coefficients (λ_j for j < 0) represent the estimated differences in cumulative mortality for cohorts gestating j years before abortion legalization, relative to the reference group—cohorts gestating immediately before legalization. The post-legalization coefficients (λ_j for j > 0) represent the estimated differences in cumulative mortality for cohorts gestating j years after legalization, relative to the same reference group.

The pre-trend coefficients are close to zero and statistically insignificant, alleviating concerns regarding pre-existing trends in log cumulative mortality rates across several pre-legalization cohorts. Following legalization, the coefficients decrease in magnitude and become statistically significant. We should note that these coefficients reflect changes at the population level and represent intent-to-treat effects. Further, the diffusion of abortion services depended on the availability of healthcare infrastructure and cultural factors that evolved secularly over time (Hansen, 1980; Wetstein, 1995). Therefore, it is not surprising that the coefficients increase in magnitude across post-event cohorts and do not stabilize in our restricted cohort window.

The event study results for disability outcomes are reported in the four panels of Figure 2. These results also tell a consistent story: the pre-legalization event-time coefficients are, on average, fairly small and mostly insignificant, alleviating concerns about pre-existing trends in disability outcomes. Post-legalization, we observe a clear and gradual decline in the coefficients, particularly for cognitive disability and vision-hearing disability, indicating improvements in these outcomes over time.

The regression results of Equation (2) are reported in Table 1. Full exposure to legalized abortion regimes is associated with a 3.8% reduction in later-life mortality rates (column 1).[15] Comparing the results of panel B and panel C suggests slightly larger effects among nonwhites, 4.9% versus 4.3%. This is consistent with evidence that Black mothers are more likely to utilize abortion services and are often at higher risk of adverse outcomes (Dehlendorf et al., 2013; Oberman, 2018). Additionally, we observe larger effects among females than males, 5.2% versus 3% (Appendix Table A-3). Further analysis reveals that these mortality reductions are primarily driven by declines in deaths from infectious diseases and chronic diseases (columns 3-4 of Appendix Table A-3).

One intriguing avenue for exploration is whether the effects on mortality rates vary by survival age cutoff. In Appendix Figure A-5, we replicate the main event study results across nine subsamples, conditioning on survival age of 1-40 years. We should note that the sample used for this analysis is based on death records across all ages (born 1960-1980 and died 1990-2020) and the sample is no longer limited to death ages 30-40 (as in the final sample). We

[15] We should note that although Lutchen (2011) and Farin (2024) implement different sample selection, age restriction, and cohort selection (see footnote 6), their estimates are quite comparable to ours. Lutchen (2011) reports a 0.3 percentage points, equivalent to roughly 3% from the mean, reduction in mortality rate of 20-30-year-olds. Farin (2024) document a 3.2% increase in the survival rate of 0–50-year-olds.

observe a similar pattern in magnitude of post-trend coefficients, suggesting relatively linear effects on mortality rates across different survival ages.

We also observe reductions in all four measures of disability, although the coefficients are statistically significant only for cognitive disability and self-care disability (columns 2-5 of Table 1). Full exposure to abortion legalization is associated with 32 basis points reduction in the incidence of having any disability, off a mean of 0.07 (column 2). Additionally, full exposure to legalized abortion is associated with reductions of 8.7%, 5.9%, 15.2%, and 4.7% in cognitive disability, ambulatory disability, self-care disability, and vision–hearing disability, respectively, relative to the mean of the outcomes. These findings underscore the broader, long-term benefits of access to legalized abortion on population health. Additionally, we observe discernible heterogeneity by race (panels B and C of Table 1). We find quite comparable coefficients for cognitive disability among Whites and nonwhites. We observe larger reductions in ambulatory disability among Whites but self-care disability among nonwhites. The effect on vision-hearing disability is considerably larger among nonwhites, suggesting roughly 11% reduction, although statistically insignificant.

Goodman-Bacon (2021) investigates the impact of Medicaid's introduction in the 1960s on later-life mortality rates using data from NCHS death records. His findings indicate that early-life Medicaid eligibility reduces cumulative mortality rates by 10-14 percent. Medicaid's rollout marked a significant social policy that extended insurance coverage to millions previously uninsured people. The observed effects of abortion legalization policies—accounting for approximately 27.38 percent of the later-life mortality impact of Medicaid—highlight the significant economic and public health implications of these laws. While the observed effects of Medicaid on later-life mortality are significant, it is important to consider potential confounding factors. The overlap between Medicaid's introduction and abortion legalization may introduce selection effects, altering the composition of birth cohorts. For instance, if abortion legalization led to fewer births among those with lower healthcare access, the remaining cohort might be healthier on average, potentially amplifying the measured impact of Medicaid.

Additionally, we can employ simplified life table models and conduct back-of-the-envelope calculations to translate our estimate of mortality rate into changes in life expectancy. We find that a 3.8% reduction in mortality corresponds to an increase of 14.4 months in longevity.[16] Chetty et al. (2016) analyze the link between income and longevity using death records and tax return data from 1999 to 2014, finding that each additional income percentile (roughly equivalent to $8K in 2020 dollars) is linked to an approximate 1.7-month increase in longevity. Based on this relationship, the observed effects on mortality and longevity are equivalent to a shift of 8.5 income percentiles. Another way to understand the magnitude of mortality effects is to use the Value of Statistical Life (VSL) estimates. Studies suggest a VSL of roughly $10 million in the United States (Kniesner & Viscusi, 2019; Viscusi, 2018). Using the average US life expectancy, we can calculate a monetary value of each additional year of life at about $128,205. In our final sample, the number of deceased people who were fully exposed to abortion legalization added up to 404,506. This translates to a total gain in life

[16] We calculate the elasticity of life expectancy with respect to mortality rate using life tables of (Social Security, 2024). Between the years 1980 and 1990, age-specific death rate for under-65 group decreased from 331.9 to 289.4 per 100,000. During the same period, life expectancy at age 30 increased from 50.09 years to 50.90 years.
Using these numbers, we can calculate an elasticity of approximately -0.1263. This implies that a 1% decrease in the mortality rate is associated with a 12.63% increase in life expectancy.
Change in longevity can be calculated using the following formula:
$\Delta L = L_0 \times E_{L/MR} \times \Delta MR$ =30×(-0.1263)×(-3.8)=14.39 months
Where: L_0 is the initial life expectancy (30 years, as per the sample), $E_{L/MR}$ is the elasticity, ΔMR is the percentage change in the mortality rate (column 1 of panel A of Table 1).

expectancy of about 485,407 years, which is equivalent to approximately $62.2 billion in economic value.

5.1. Heterogeneity

While Roe v. Wade established a nationwide constitutional right to abortion in 1973, the practical accessibility of abortion services varied substantially across states in the subsequent years. Factors such as the number of providers, distance to clinics, and state-level regulatory environments contributed to the cross-state variation in feasibility of abortion. To assess whether our main results were concentrated in states with greater post-legalization accessibility, we interact our exposure measure with proxies for abortion access. Specifically, we use state-level abortion rates among women aged 15–19 and among all reproductive-age women, as well as teenage pregnancy rates, to capture the intensity of abortion use and the potential heterogenous effects.

State-level abortion rate data are available only from 1988 onward, so we measure state-level abortion rates for 1988–1990 to use as a proxy for abortion access. The data for abortion rate is extracted from the Guttmacher Institute (Maddow-Zimet & Kost, 2021). The abortion rates for late 1980s likely reflect persistent differences in access across states, as states with high abortion rates in the late 1980s tended to have more supportive regulatory environments and greater provider availability in earlier decades.

The results are presented in Table 2. We interact exposure measure with abortion in ages 15-19 (minors) and abortion in all ages in panels A and B, respectively. We find that the long-term mortality and disability differences between exposed and unexposed birth cohorts are more pronounced in states with higher abortion utilization (Panels A and B). For example, in high-abortion states, the mortality reduction associated with exposure is approximately 4.4–

4.5%, compared to smaller and often statistically insignificant effects in low-abortion states. These differences are also evident for disability outcomes, particularly cognitive and ambulatory disabilities. Panel C shows a similar pattern when interacting with pregnancy rates: states with higher pregnancy rates (where the potential for selection effects is arguably greater) experience larger post-legalization reductions in cohort mortality and disability rates.

5.2. Robustness Checks

In Appendix A, we show the robustness of the results to alternative specifications and sample selections. We observe fairly comparable coefficient sizes when we drop early reform states (Appendix Table A-4). We also demonstrate that the results are quite robust when we drop spillover states, i.e., states adjacent to early repeal states that may have benefited from earlier access to abortion services (Appendix Table A-5). In Appendix Table A-6, we show robustness to a parsimonious model that includes only birth state and region-cohort fixed effects.

Additionally, we add birth state infant mortality rates to account for early disease environment exposures and their potential implications for long-term outcomes. We also include a linear measure of average measles rates and polio rates in several years before the introduction of vaccines (1963 and 1955, respectively) interacted with birth year fixed effects. Several studies suggest the long-term effects of these vaccination programs. The results, reported in Appendix Table A-7, are smaller than the main results but remain statistically significant and economically meaningful.

In Appendix Table A-8, we test the robustness to birth state clustering. Standard errors remain robust for all coefficients that are statistically significant in the main results. In Appendix Table A-9, we show that the results are almost identical to the main results when using the ordinary least squares method, suggesting negligible influence of negative weighting resulting from OLS. Finally, since nonwhite mothers have a higher utilization rate of abortion services, we allow fixed effects of states to vary flexibly by race. The results, reported in Appendix Table A-10, are comparable to those in the main results of the paper.

Our baseline mortality measure is conditional on survival to 1990, and our disability measures are conditional on survival to 2000. If survival to these baseline years differed systematically between pre- and post-legalization cohorts, our estimates could be biased. To assess this, we employ state-specific age-specific cohort life expectancy data extracted from (Barbieri & Winant, 2025). A caveat of using the life expectancy data is that it reports average life expectancy at specific ages for cohorts born in a given state, rather than materialized longevity at the individual level. In addition, these measures do not account for cross-state migration.

To examine the effects of abortion legalization on life expectancy, we apply similar sample selection criteria and the same empirical strategy as in our main analyses. The event study results for life expectancy at various ages are presented in **Error! Reference source not found.** through **Error! Reference source not found.**, and the corresponding difference-in-differences estimates are reported in Appendix Table A-12. The event studies indicate that the effects emerge for life expectancy in early adulthood, middle adulthood, and older ages. The difference-in-differences coefficients in Appendix Table A-12 confirm these patterns, showing that gains in life expectancy are concentrated primarily between ages 30 and 60, while differences at birth and in early childhood are small and statistically insignificant. These findings suggest that our main results are not driven by differential early-life survival to the baseline observation years but instead reflect persistent differences in later-life mortality risks across cohorts.

Additionally, in Appendix Figure A-5, we examine the effects on mortality rates conditional on survival up to different ages and find that mortality effects are quite robust and exhibit similar patterns as the main event study results across different survival age groups.

6. Mechanisms

Improvements in later-life health outcomes for birth cohorts gestating during periods of legal abortion access may arise primarily through compositional changes, driven by selection effects. This effect reduces the likelihood of births among “marginal children”—those who are more likely to experience adverse circumstances (Gruber et al., 1999). These changes in the characteristics of mothers who choose to give birth, such as age, education, and marital status, play a central role in shaping later-life health outcomes.

To explore this pathway, we first replicate the analyses in Gruber et al. (1999) and Joyce (1987) to confirm that legal abortion led to reduction in infant mortality and improved infant health outcomes. Specifically, using a state-by-year panel dataset that covers the years 1960-1980, we investigate the associations between abortion policy changes and fertility, infant mortality, and birth outcomes. We apply similar sample selection criteria and empirical methods as in Equation (2). The results are reported in Table 3.

In columns 1-4, we observe significant improvements in measures of infant health outcomes. Specifically, the share of low birth weight infants (i.e., birth weight less than 2500 g) decreases by 3.4% among White mothers and 2.5% among Black mothers. (columns 1-2). Additionally, the share of infants with very low birth weight (i.e., birth weight less than 1500 g) declines about 3.9% in among White infants and 11.3% Black infants (columns 3-4). The fact that we observe larger effects for infants at the lower tail of birth weight distribution suggests that the benefits of legalized reproductive healthcare are concentrated among mothers who would have experienced adverse pregnancy outcomes. The greater effects observed among Black mothers highlight that these services may help reduce racial disparities in birth outcomes.

In columns 5-6, we examine the effects on infant mortality rates. While both coefficients indicate reductions in infant mortality rates for White and Black infants, they are statistically insignificant, limiting further interpretation.

Next, we analyze how abortion legalization affected the composition of mothers giving birth. We find that exposure to abortion legalization is associated with a reduction of roughly 1.9% in White fertility and 6.7% in Black fertility rates (columns 7-8). Since Black mothers are more likely to experience adverse birth outcomes with their potential legacy for later life outcomes, these compositional changes may contribute to improved later-life health outcomes in the exposed cohorts (Blumenshine et al., 2010; Vu et al., 2024).

Additionally, we observe a significant drop of about 1.8% in the share of teenage mothers (i.e., mothers under 20 years old) (column 9). Teenage pregnancy is well-documented as a risk factor for adverse birth outcomes and poorer long-term outcomes for both mothers and children, including higher mortality risks during childhood, adverse psychological behavior during adolescence, a higher likelihood of engaging in criminal behavior, and lower cognitive and educational outcomes later in life (Chen et al., 2007; Schulkind & Sandler, 2019; Shaw et al., 2006; Weng et al., 2014; Woodward et al., 2001).

We also find significant increases in the share of married mothers, indicating a reduction in unmarried motherhood. Since unmarried mothers typically have fewer financial resources to support their infants, particularly in the early years of life, this shift has important implications for child development and later-life health (Aquilino, 1996; Mariani et al., 2017; Williams et al., 2013). Taken together, these findings suggest that compositional changes play a key role in explaining the improvements in later-life health outcomes for birth cohorts gestating during periods of legal abortion access.

7. Conclusion

This study examines how compositional changes in birth cohorts induced by legal abortion reforms in the U.S. shapes population health over the long run, focusing on mortality and disability outcomes in adulthood. Our findings provide robust evidence that legal abortion access not only improves immediate maternal and infant health but also lead to significant improvements in the long-term health of affected birth cohorts, including reductions in cumulative mortality and disability. These results suggest that the population-level benefits of abortion extend beyond short-term improvements in infant outcomes and carry lasting implications for adult health.

Our analyses of mechanism suggest that cohort compositional changes may be the primary pathway through which legal abortion impacts long-term health. Specifically, reforms reduced births to teenage mothers, increased the likelihood that children were born into married households, and shifted fertility patterns across racial groups. These changes altered the early-life environments and resources available to children, which in turn affected health trajectories over life course. This evidence should be understood as documenting how policy-driven shifts in family and social contexts affected later-life outcomes, not as an argument that population health can or should be improved by altering birth composition.

We note that maternal and infant health outcomes, as well as abortion rates, are not evenly distributed across the population. Black women, unmarried women, and teens face higher risks of adverse maternal and infant health outcomes and higher abortion rates, reflecting systemic disadvantages such as unequal access to health care, fewer social supports, and structural barriers. These inequities are central to understanding the context in which abortion reforms operated and the mechanisms through which they affected population health.

Finally, when interpreting our findings, it is important to recognize that the effects of abortion legalization are context-dependent and may differ substantially from the effects of abortion bans. As Bongaarts (1978)'s proximate determinants of fertility framework emphasizes, fertility outcomes are shaped by a combination of factors—marriage, contraception, postpartum in fecundability, induced abortion, and sterility—which vary across institutional and cultural settings. The U.S. experience in the 1970s occurred in a context of increasing contraceptive availability and changing social norms, which differs markedly from settings where abortion was the primary means of fertility control and access to modern contraception was limited (e.g., Ceaușescu's 1966 abortion ban in Romania). In such contexts, the demographic and health effects of abortion policy changes may operate through different channels and with different magnitudes. Our estimates therefore reflect the magnitude of effects in the U.S. historical context and should be interpreted with caution when drawing parallels to other settings.

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Tables

Table 1 - The Effects of In-Utero Exposure to Abortion Legalization and Later-Life Mortality and Disability

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Full Sample						
Exposure	-.03824**	-.00319**	-.00341***	-.00191**	-.00197***	-.00099
	(.0157)	(.00147)	(.00104)	(.00089)	(.0006)	(.00071)
Observations	4231	7292735	7292735	7292735	7292735	7292735
R-Squared	.80119	.00419	.00192	.0039	.00115	.00144
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021
Panel B. Nonwhites						
Exposure	-.04871*	-.0008	-.00311	-.00098	-.00325**	-.00273
	(.02689)	(.00358)	(.00262)	(.00244)	(.00161)	(.00208)
Observations	2089	1299823	1299823	1299823	1299823	1299823
R-Squared	.93416	.00607	.00235	.00704	.00165	.00194
Mean DV	7.845	0.093	0.050	0.046	0.019	0.025
Panel C. Whites						
Exposure	-.04278***	-.00299*	-.00347***	-.00169*	-.00151**	-.00047
	(.01595)	(.0016)	(.00122)	(.0009)	(.00067)	(.00072)
Observations	2142	5992912	5992912	5992912	5992912	5992912
R-Squared	.95653	.00205	.00125	.00163	.00056	.00132
Mean DV	7.425	0.065	0.036	0.029	0.012	0.020

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Table 2 - Heterogeneity by State Level Abortion Access and Teenage Pregnancy

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A.						
Exposure × High Abortion	-.0444***	-.00446***	-.00398***	-.00293***	-.00209***	-.00112
Ages 15-19	(.01604)	(.00147)	(.00104)	(.00088)	(.00061)	(.00073)
Exposure	-.03334*	-.00048	-.00219*	.00029	-.00171***	-.00072
	(.01928)	(.00156)	(.00112)	(.00095)	(.00063)	(.00078)
Observations	2142	7292735	7292735	7292735	7292735	7292735
R-Squared	.95655	.0042	.00193	.00391	.00115	.00144
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021
Panel B.						
Exposure × High Abortion	-.04487***	-.00421***	-.00371***	-.0029***	-.00215***	-.00102
All Ages	(.01608)	(.00146)	(.00104)	(.00088)	(.00061)	(.00072)
Exposure	-.02993	-.001	-.00276**	.00022	-.00159**	-.00095
	(.01882)	(.00156)	(.00112)	(.00095)	(.00063)	(.00079)
Observations	2142	7292735	7292735	7292735	7292735	7292735
R-Squared	.95656	.0042	.00193	.00391	.00115	.00144
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021
Panel C.						
Exposure × High	-.04092**	-.00408***	-.0037***	-.00282***	-.00209***	-.00099
Pregnancy Ages 15-19	(.01588)	(.00148)	(.00105)	(.00089)	(.00061)	(.00073)
Exposure	-.05301***	-.0019	-.00298***	-.00057	-.0018***	-.001
	(.01861)	(.00152)	(.00108)	(.00092)	(.00062)	(.00076)
Observations	2142	7292735	7292735	7292735	7292735	7292735
R-Squared	.95655	.00419	.00193	.00391	.00115	.00144
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Table 3 - Exploring Mechanism Channels: Fertility, Infant Mortality, and Sociodemographic Characteristics of Births 1960-1980

	Log Outcomes:				
	Share Low Birth Weight Whites	Share Low Birth Weight Blacks	Share Very Low Birth Weight Whites	Share Very Low Birth Weight Blacks	Infant Mortality Rate Whites
	(1)	(2)	(3)	(4)	(5)
Exposure	-.03417***	-.02511	-.03974**	-.11276**	-.00926
	(.00967)	(.02352)	(.02)	(.0523)	(.01357)
Observations	1071	1065	1071	1044	1071
R-squared	.93321	.88426	.62395	.77554	.97249
Mean DV	4.180	4.824	2.257	3.072	2.814
	Infant Mortality Rate Blacks	Fertility Rate Whites	Fertility Rate Blacks	Share Teenage Mothers	Share Married Mothers
	(6)	(7)	(8)	(9)	(10)
Exposure	-.00966	-.01873	-.06673***	-.01882**	.01466**
	(.03984)	(.0125)	(.01315)	(.00938)	(.00729)
Observations	1054	1071	1071	650	650
R-squared	.92124	.97723	.97009	.99153	.89825
Mean DV	3.330	4.346	4.679	-1.769	-0.138

Notes. Standard errors, clustered on state, are in parentheses. Regressions are weighted using state population. All regressions include state fixed effects and region by year fixed effects. Regressions also contain state controls, including per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, and dummies for exposure to Medicaid and FEPA. The data covers the years 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Figures

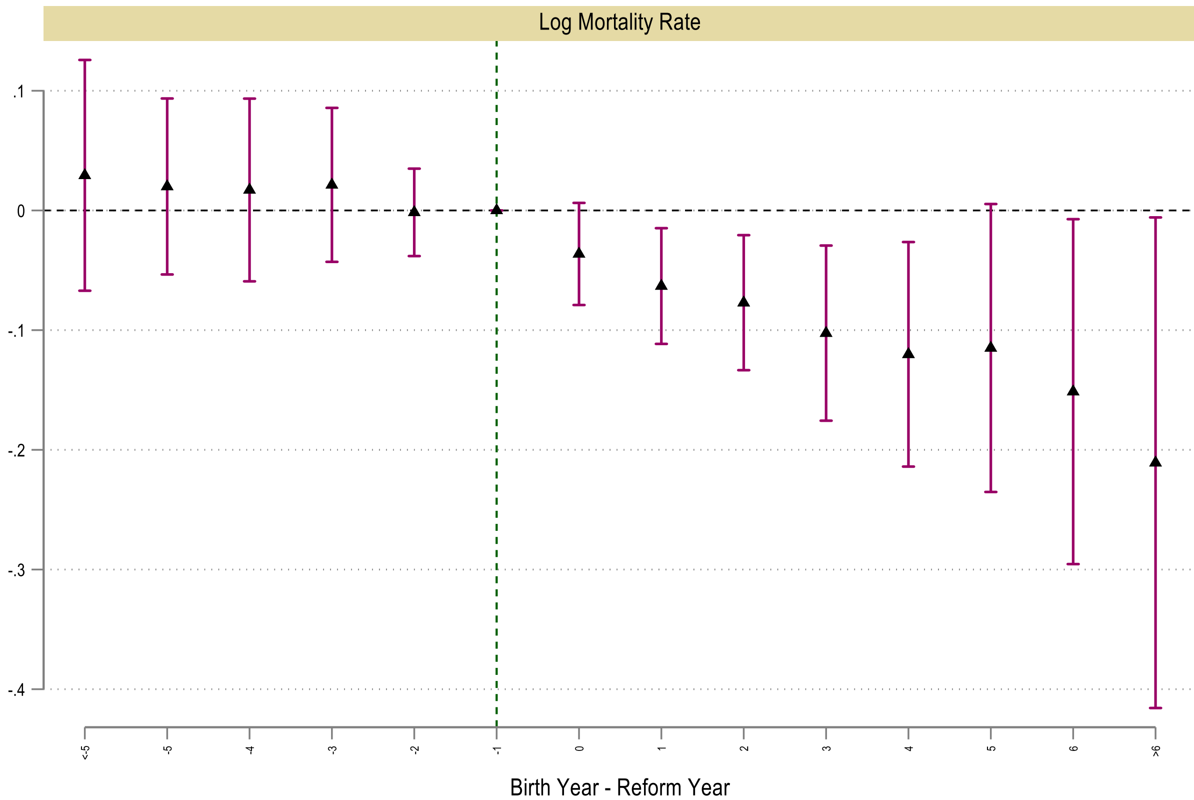


Figure 1 - Event Study Analysis to Show the Evolution of Mortality in Different Years Relative to the State-Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on birth state. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are the share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions are weighted using death counts in each cell. The data cover the death years 1990-2020 for cohorts of 1960 – 1980.

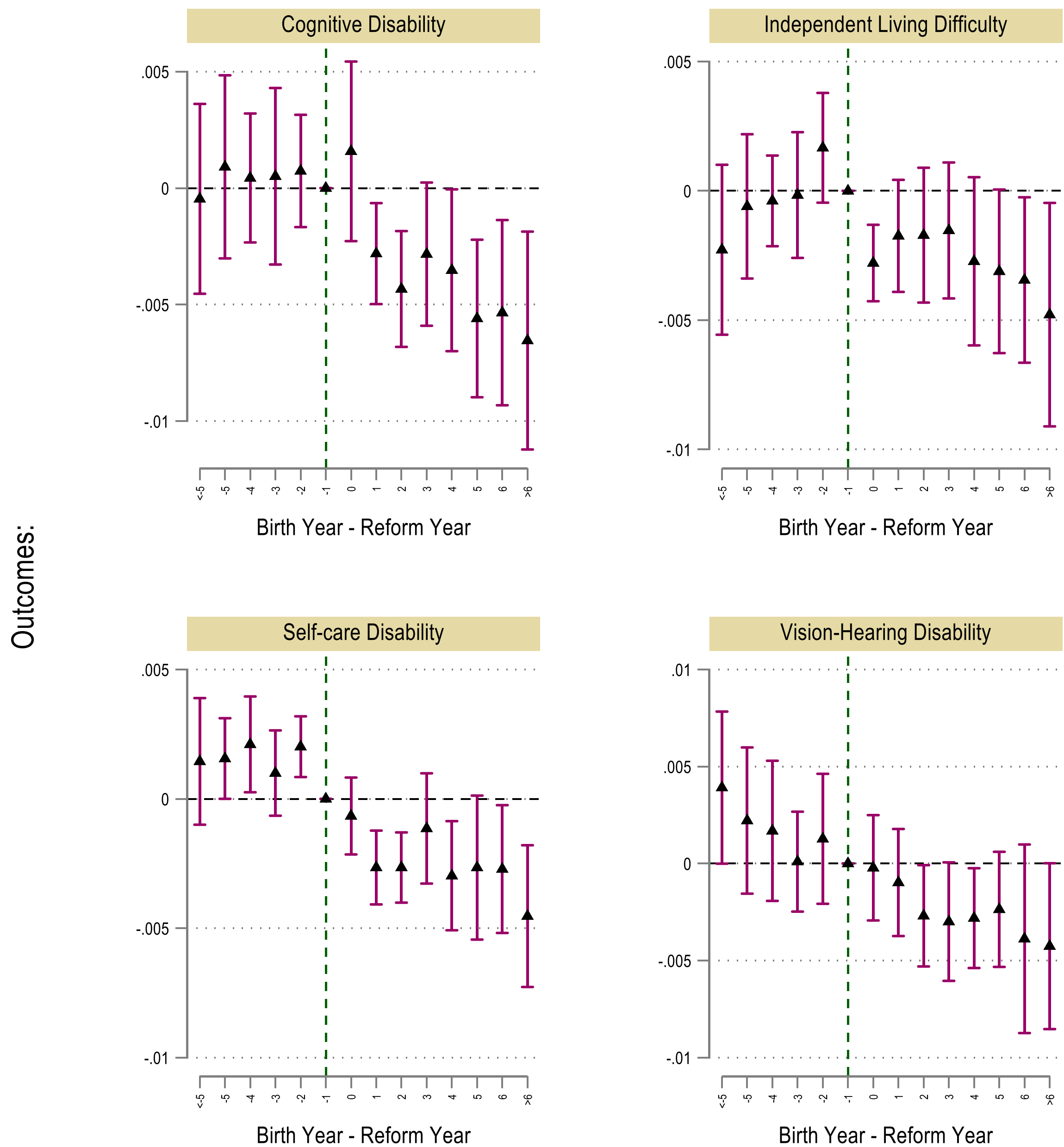
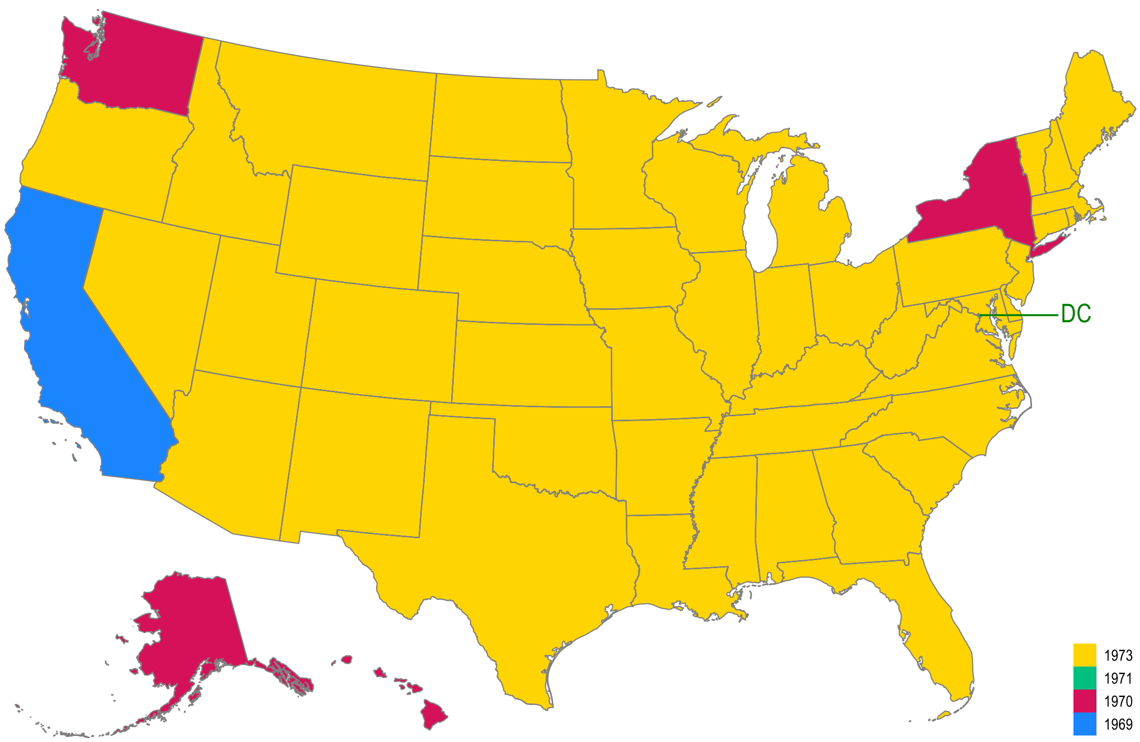


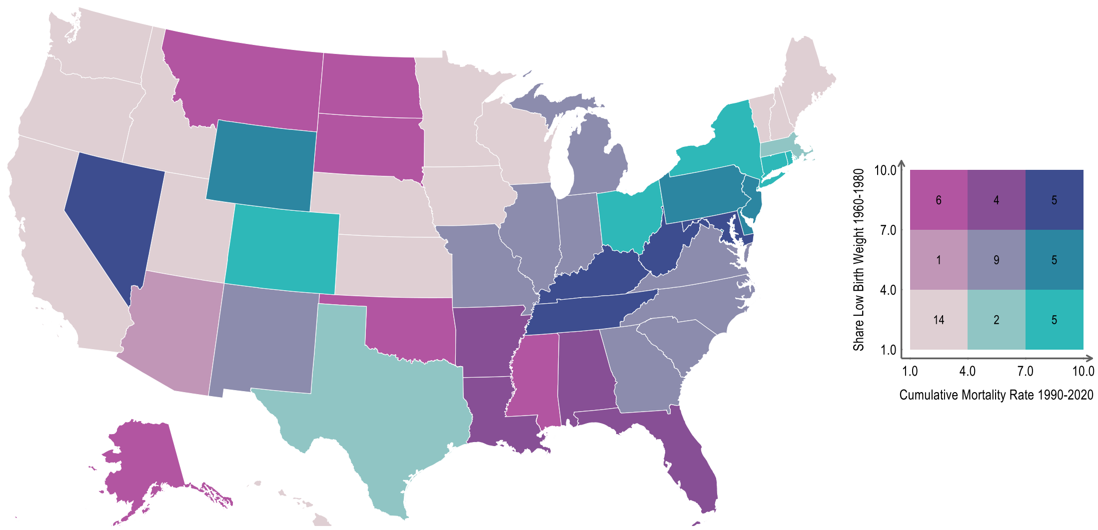
Figure 2 - Event Study Analysis to Show the Evolution of Disability Outcomes in Different Years Relative to the State Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on birth state. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. Individual controls are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions are weighted using IPUMS person weights. The covers the years 2000-2022 for cohorts of 1960 – 1980.

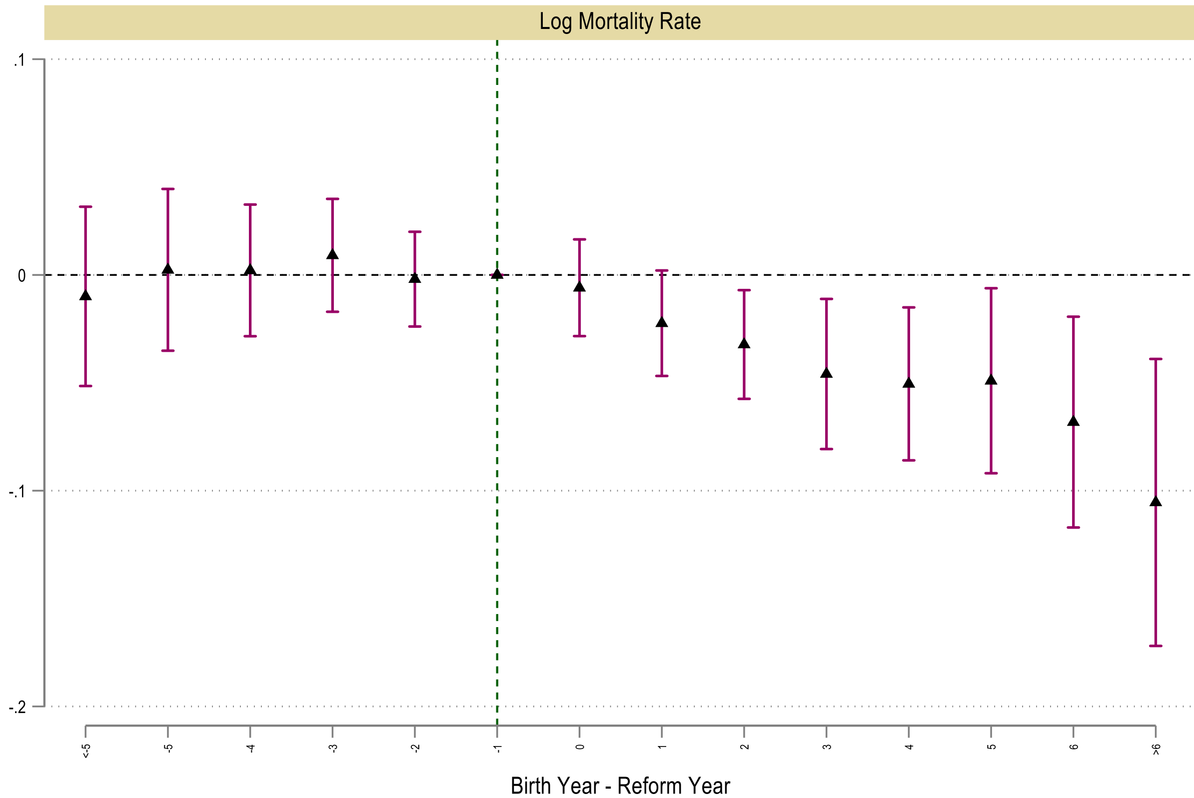
Appendix A



Appendix Figure A-1 - Abortion Legalization across States

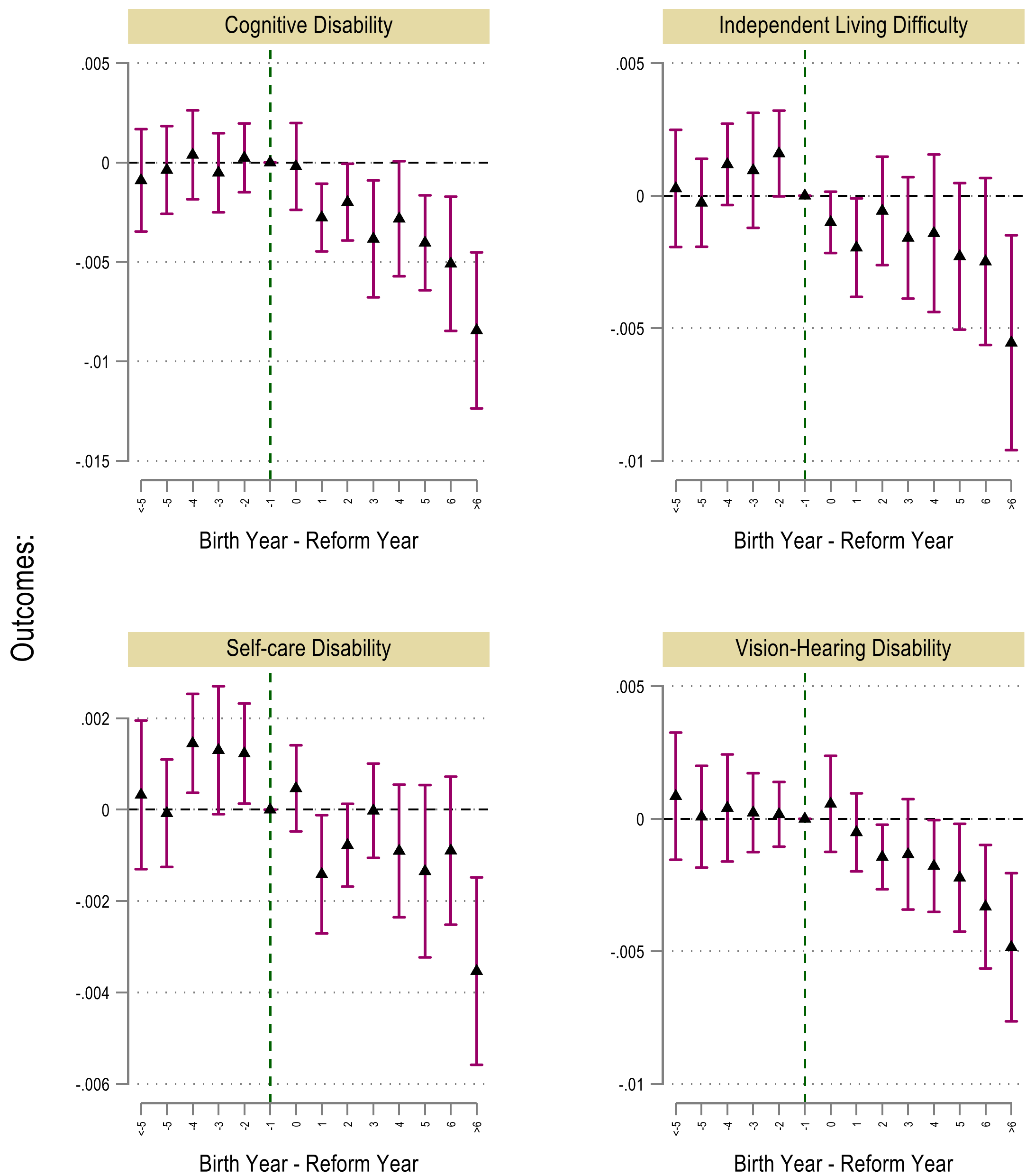


Appendix Figure A-2 - Share of Birth State Low Birth Weight and Later-Life Cumulative Mortality Rate by State



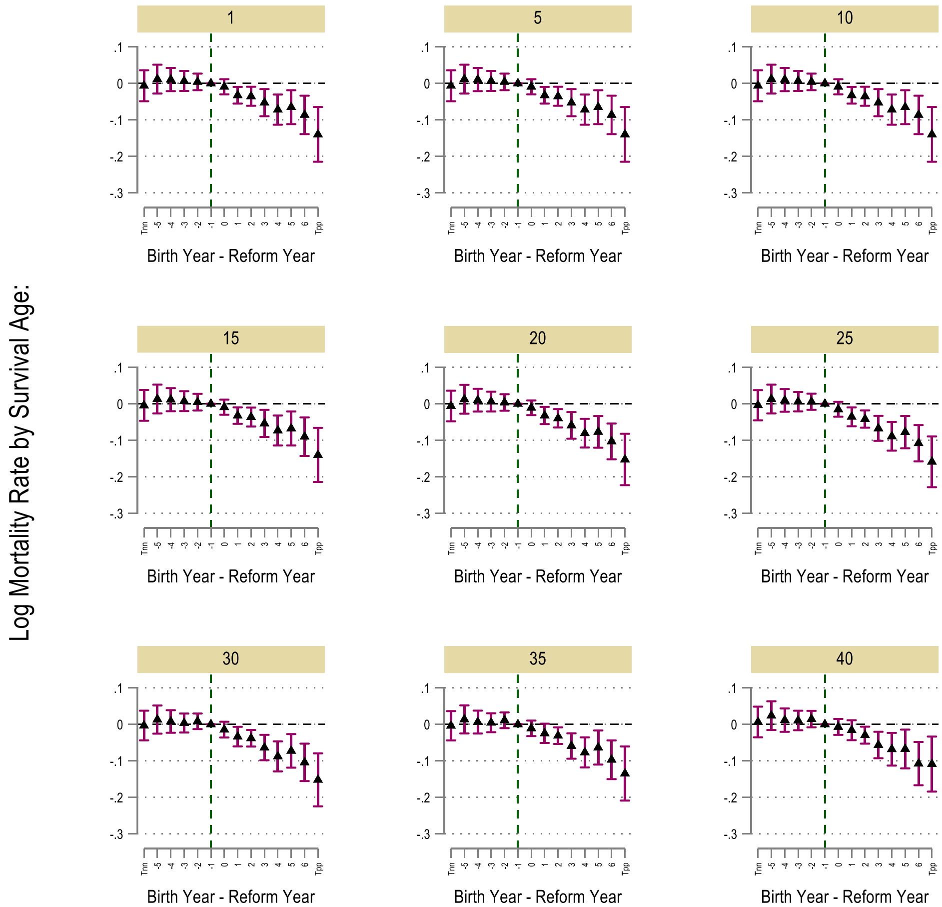
Appendix Figure A-3 - Event Study Analysis to Show the Evolution of Mortality in Different Years Relative to the State-Specific Abortion Legalization Year, No Age Restriction

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on birth state. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are the share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions are weighted using death counts in each cell. The data cover the death years 1990-2020 for cohorts of 1960 – 1980.



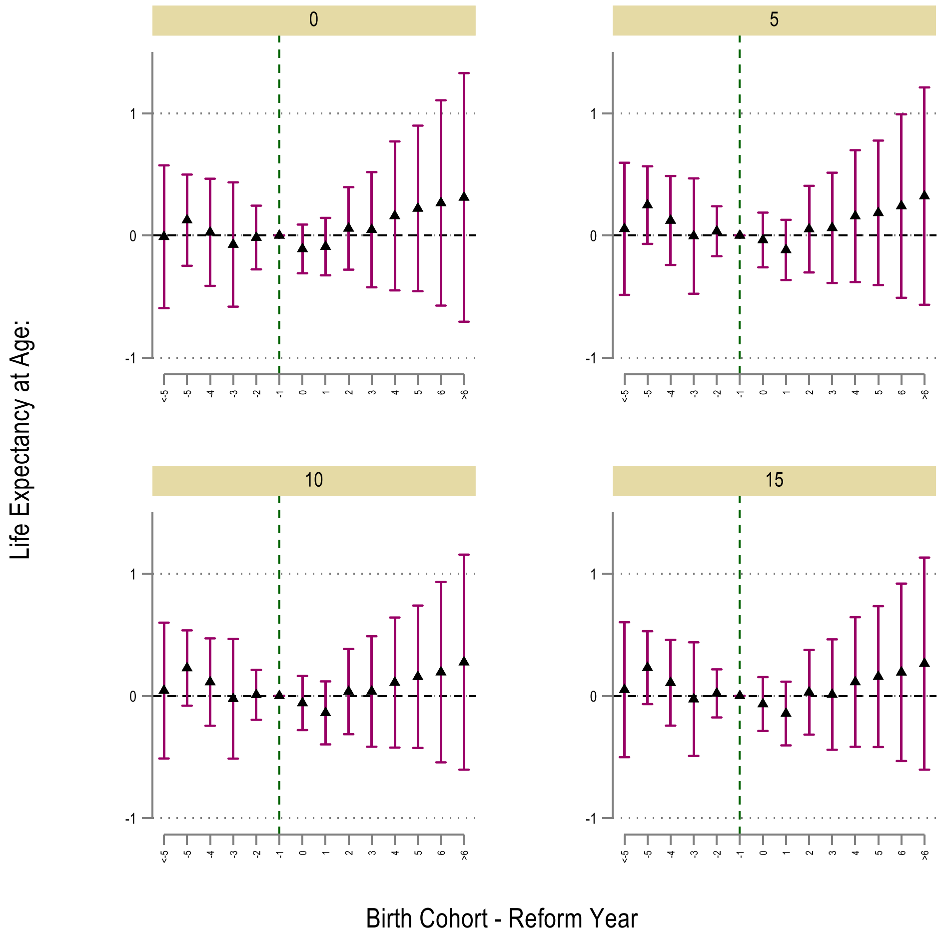
Appendix Figure A-4 - Event Study Analysis to Show the Evolution of Disability Outcomes in Different Years Relative to the State Specific Abortion Legalization Year, No Age Restriction

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on birth state. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. Individual controls are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions are weighted using IPUMS person weights. The covers the years 2000-2022 for cohorts of 1960 – 1980.



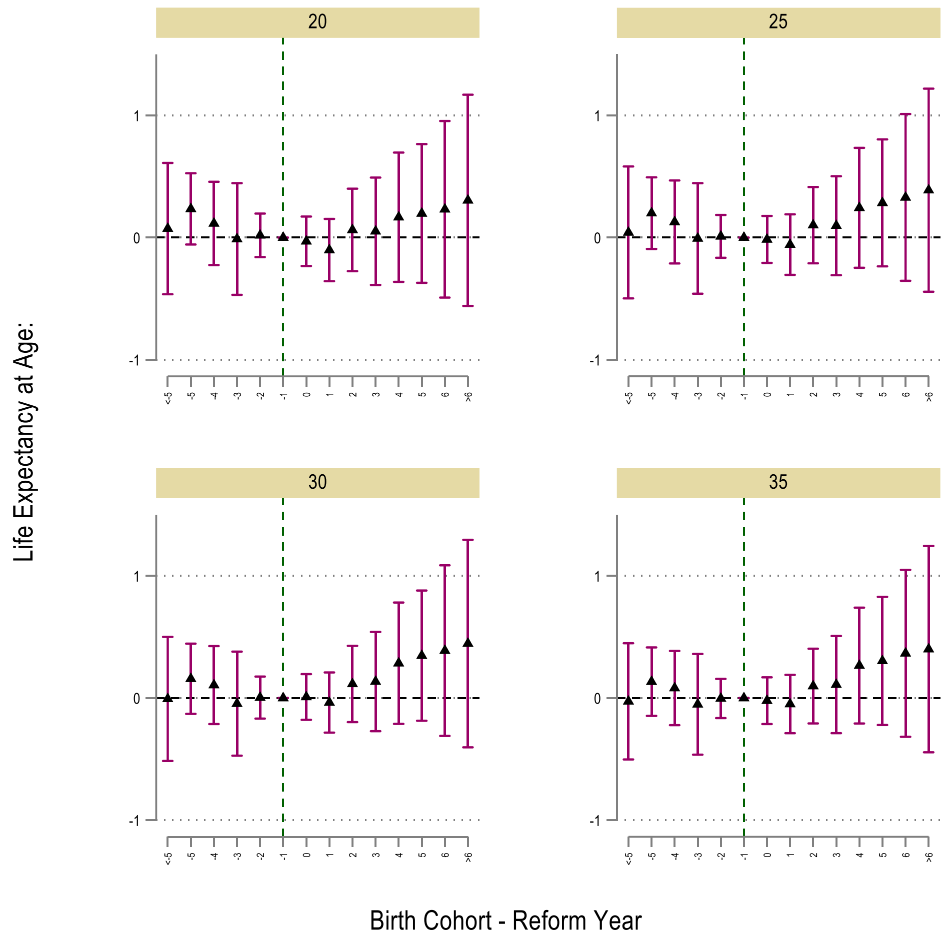
Appendix Figure A-5 - Event Study Analysis to Show the Evolution of Mortality Rate in Different Years Relative to the State-Specific Abortion Legalization Year based on Different Survival Ages

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on maternal birth state. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960 – 1980.



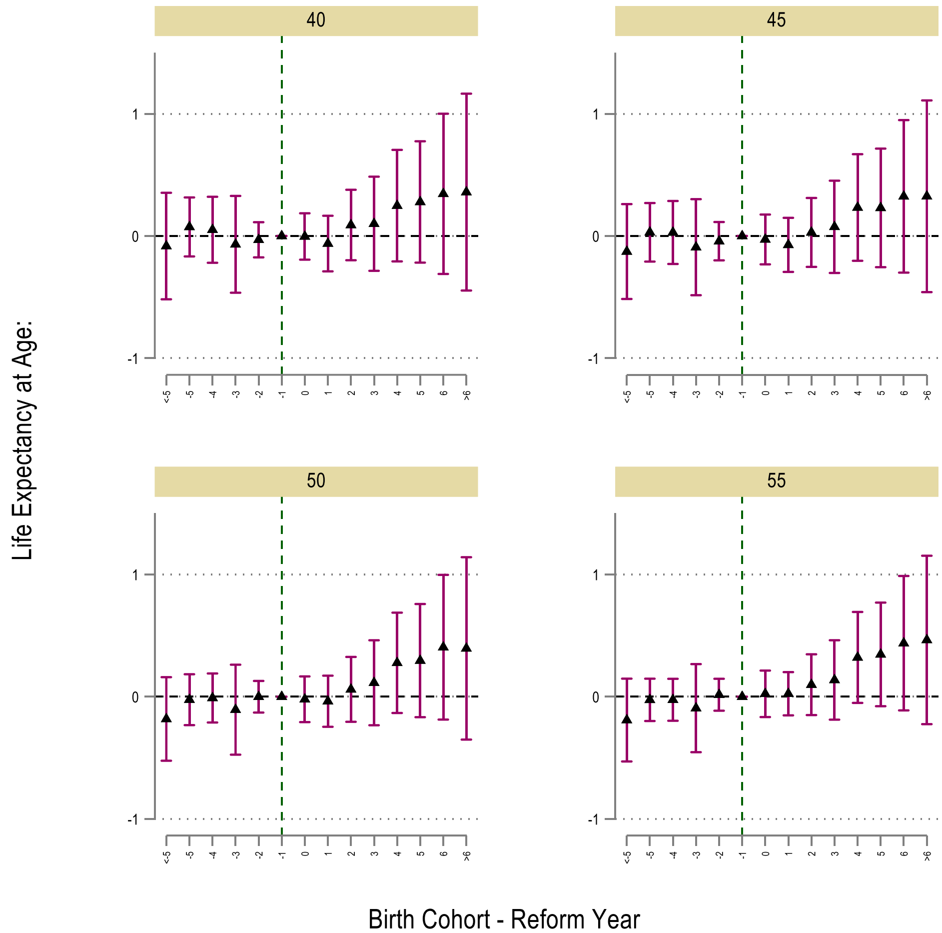
Appendix Figure A-6 - Event Study Analysis to Show the Evolution of Life Expectancy at Various Ages in Different Years Relative to the State-Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on maternal birth state. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960 – 1980.



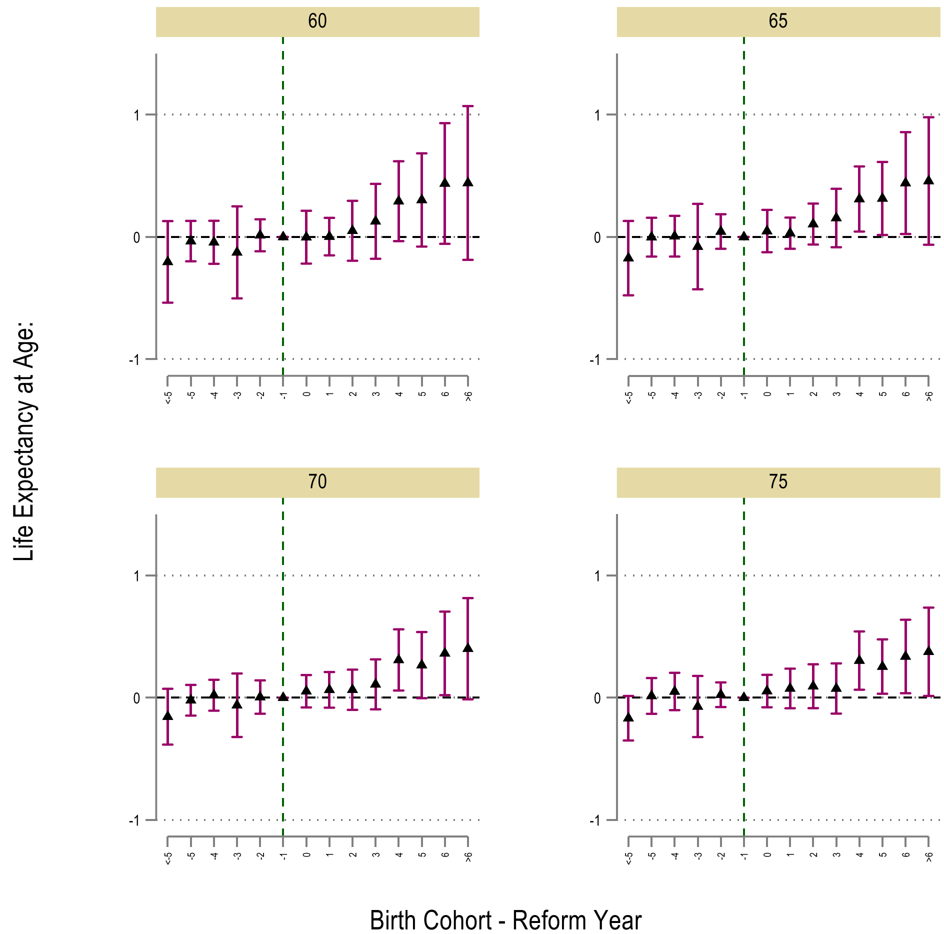
Appendix Figure A-7 - Event Study Analysis to Show the Evolution of Life Expectancy at Various Ages in Different Years Relative to the State-Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on maternal birth state. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960 – 1980.



Appendix Figure A-8 - Event Study Analysis to Show the Evolution of Life Expectancy at Various Ages in Different Years Relative to the State-Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on maternal birth state. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960 – 1980.



Appendix Figure A-9 - Event Study Analysis to Show the Evolution of Life Expectancy at Various Ages in Different Years Relative to the State-Specific Abortion Legalization Year

Notes. Point estimates and 95% confidence intervals are illustrated. Standard errors are clustered on maternal birth state. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960 – 1980.

Appendix Table A-1 - Summary Statistics

	Born Post-Legalization		Born Pre-Legalization	
	Mean	**SD**	**Mean**	**SD**
NCHS Sample:				
White	.76	.17	.76	.17
Female	.35	.03	.35	.03
Birth Year	1976.76	2.24	1966.36	3.99
Cumulative Mortality Rate 1990-2020 (%)	19.02	4.27	20.75	5.96
Log cumulative Mortality Rate	7.47	.22	7.52	.26
Number of Deaths in each cell	384.34	388.29	418.21	430.29
Per-Capita Income (in 1967 1,000 dollars)	7.34	1.86	3.14	1
Hospital Beds per Capita (per 1,000)	5.3	1.22	5.15	1.04
Hospitals per Capita (per 1,000)	.04	.02	.04	.02
Reported disease rate (per 1,000)	228.43	284.4	295.82	311.77
General Fertility Rate: Whites	65.47	12.76	92.81	18.27
General Fertility Rate: Blacks	98.55	22.93	139.22	37.8
Share of Women (20-64) on AFDC, Whites	3.13	1.58	1.58	1.08
Share of Women (20-64) on AFDC, Blacks	19.5	7.82	12.8	7.32
Birth state Mortality Rate, Ages 0, Whites	1292.45	235.32	2052.88	387.35
Birth state Mortality Rate, Ages 0, Blacks	2286.22	707.59	3862.49	1227.77
Birth state Mortality Rate, Ages 1-4, Whites	63.53	14.31	89.08	19.63
Birth state Mortality Rate, Ages 1-4, Blacks	106.7	58.44	171.75	102.34
Birth state Mortality Rate, Ages 5-9, Whites	32.92	8.86	43.56	8.72
Birth state Mortality Rate, Ages 5-9, Blacks	47.87	37.27	60.91	39.71
Birth state Mortality Rate, Ages 10-14, Whites	34.66	8.88	41.72	8.87
Birth state Mortality Rate, Ages 10-14, Blacks	42.67	27.65	56.53	43.03
Exposure to Medicaid	9.32	3.4	-1.1	4.75
Exposure to FEPA	5.47	6.65	.52	4.1
Exposure to EPL	15.06	14.33	7.24	11.9
Observations	1,487		2,746	
Census-ACS sample:				
White	.804	.397	.83	.376
Female	.503	.5	.511	.5
Birth Year	1976.599	2.502	1966.281	3.714
Census year	2011.685	4	2002.154	3.389
Cognitive Disability	.044	.205	.037	.188
Independent living Disability	.03	.172	.041	.197
Self-Care Disability	.013	.113	.014	.117
Vision Hearing Disability	.022	.148	.019	.138
Observations	2,356,134		4,937,295	

Notes. The NCHS panel reports statistics from the CDC death records data. These statistics are weighted using the average number of deaths in each cell. The NCHS sample is collapsed at the birth state, birth year, race, and gender level. Number of pre-collapse observations is 4,805,721. The sample covers years 1990-2020 for cohorts born between 1960-1980. FEPA stands for Fair Employment Practices Act. EPL stands for Equal Pay Law.

Appendix Table A-2 - Correlation Between Early Abortion and State Characteristics

	Outcome: Early abortion			
	(1)	(2)	(3)	(4)
Gender Wage Gap 1962-1968 ($1,000 in 2020 dollars)	.04236 (.03058)	.07287** (.02909)		
Residual Wage Gap 1962-1968 ($1,000 in 2020 dollars)			.04082 (.04065)	.08454** (.03826)
Log Per-Capita Income	1.78593*** (.52163)	1.77775*** (.56864)	1.65806*** (.4994)	1.71292*** (.57661)
Hospital Beds per Capita (1,000)	-.05252 (.05735)	-.00416 (.05663)	-.05537 (.05688)	-.00932 (.05683)
Hospitals per Capita (1,000)	5.79422* (2.99168)	1.94711 (3.00031)	5.4804* (2.99553)	1.46809 (2.97229)
Early Medicaid Adopter	-.198 (.12299)	-.11394 (.14736)	-.21332 (.12925)	-.14985 (.15159)
Early Contraceptive Pill Legalization	.12706 (.09518)	.10686 (.11103)	.13998 (.09815)	.12807 (.11502)
FEPA Adopter	-.06823 (.10303)	-.13102 (.09337)	-.06959 (.10467)	-.127 (.09621)
EPL Adopter	-.07292 (.07213)	-.01165 (.06603)	-.08087 (.07225)	-.01337 (.06933)
Log Disease Rate	-.02775 (.05092)	-.03848 (.0509)	-.02532 (.05214)	-.0333 (.05166)
Log Births per 1,000 Women 15-44, Whites	-1.01325 (.828)	-.69279 (.79659)	-1.13821 (.81086)	-.8046 (.80342)
Log Births per 1,000 Women 15-44, Blacks	-.00057 (.30559)	-.03812 (.36409)	.03188 (.31306)	.04416 (.35222)
Log Share of Women (20-64) on AFDC, Whites	.27743** (.11535)	.21735* (.12579)	.28504** (.11862)	.2487** (.11999)
Log Share of Women (20-64) on AFDC, Blacks	-.16981** (.07804)	-.12027 (.09027)	-.16823** (.07919)	-.12622 (.08164)
Log Infant Mortality Rate, Whites	-.4787 (.37841)	-.46428 (.34384)	-.61844** (.30452)	-.6612** (.30479)
Log Infant Mortality Rate, Blacks	.01558*** (.00501)	.00567 (.00683)	.01348*** (.00479)	.0023 (.00676)
Observations	51	51	51	51
R-squared	.60744	.66978	.59787	.65852
Mean DV	0.118	0.118	0.118	0.118
Region FE	No	Yes	No	Yes

Standard errors are in parentheses. The data is for the year 1968. Gender wage gap is extracted from the Annual Social and Economic Supplements of Current Population Survey data extracted from (Flood et al., 2018). Other data sources are explained in the text.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-3 - Heterogeneity in the Effects of In-Utero Exposure to Abortion Legalization and Later- Life Mortality

	Outcome: Log Cumulative Mortality Rate 1990-2020					
	Females	Males	Infectious Diseases (TB, Syphilis, Influenza, Pneumonia, other Infectious Diseases)	Chronic/Non-communicable Diseases (Neoplasm Diseases, Diabetes, Cardiovascular Diseases, Peptic Ulcer, Nephritis)	All other Diseases	External and Self-Inflicted Causes
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure	-.05188**	-.03013*	-.06944**	-.03227*	-.03094	-.0156
	(.02192)	(.01821)	(.03463)	(.0178)	(.02203)	(.02013)
Observations	2114	2117	4042	4149	4111	4197
R-Squared	.67309	.67113	.85044	.73023	.60416	.85831
Mean DV	7.143	7.746	5.800	6.241	5.662	6.769

Notes. Standard errors, clustered on birth state, are in parentheses. Regressions are weighted using death counts in each cell. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls are share of deaths to females and Whites. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age group, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers the years 1990-2020 for cohorts of 1960-1980.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-4 - Robustness Checks: Dropping Early Reform States

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure	-.07733***	-.00514***	-.00431***	-.00273***	-.00236***	-.00129*
	(.02207)	(.00145)	(.00102)	(.0009)	(.00057)	(.00075)
Observations	3335	6582018	6582018	6582018	6582018	6582018
R-Squared	.79572	.00604	.00318	.0058	.0017	.00235
Mean DV	7.544	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-5 - Robustness Checks: Dropping Spillover States

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure	-.03597**	-.00358**	-.00392***	-.00162*	-.0019***	-.00105
	(.01595)	(.0015)	(.00106)	(.00093)	(.00062)	(.00073)
Observations	3727	6129583	6129583	6129583	6129583	6129583
R-Squared	.80843	.00579	.00334	.00521	.00173	.00233
Mean DV	7.505	0.069	0.038	0.031	0.013	0.020

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-6 - Robustness Checks: Only Birth State and Region-Cohort Fixed Effects

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	(6)
Exposure	-.05528***	-.00382***	-.00254***	-.00216***	-.00158**	-.00097
	(.01241)	(.00143)	(.00093)	(.00083)	(.00065)	(.00064)
Observations	4231	7292735	7292735	7292735	7292735	7292735
R-Squared	.22504	.00221	.00105	.00228	.00051	.00081
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix Table A-7 - Robustness Checks: Adding birth state infant mortality rate, and Continuous Measures of Measles (1950-1963) and Polio (1950-1955) Interacted with Birth Year Fixed Effects

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	
Exposure	-.04568***	-.00259*	-.00279**	-.00216**	-.00204***	-.00054
	(.01576)	(.00156)	(.00114)	(.0009)	(.00061)	(.00075)
Observations	4063	7239000	7239000	7239000	7239000	7239000
R-Squared	.80453	.00604	.00326	.00573	.00173	.00233
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-8 - Robustness Checks: Birth State Clustering

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	
Exposure	-.03824**	-.00319**	-.00342***	-.00189**	-.00194***	-.00098
	(.01468)	(.00146)	(.00103)	(.00089)	(.0006)	(.00072)
Observations	4231	7292735	7292735	7292735	7292735	7292735
R-Squared	.80119	.006	.00322	.0057	.00171	.00233
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-9 - Robustness Checks: Employing Ordinary Least Squares Method

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	
Exposure	-.03824**	-.00319**	-.00342***	-.00189**	-.00194***	-.00098
	(.01515)	(.00146)	(.00103)	(.00089)	(.0006)	(.00072)
Observations	1220697	7292735	7292735	7292735	7292735	7292735
R-Squared	.80119	.006	.00322	.0057	.00171	.00233
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-10 - Robustness Checks: Adding Birth State by Race Fixed Effects

	Outcomes:					
	Log Cumulative Mortality Rate 1990-2020	Any Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Vision-Hearing Disability
	(1)	(2)	(3)	(4)	(5)	
Exposure	-.04044***	-.00332**	-.00347***	-.00198**	-.00196***	-.00099
	(.01565)	(.00145)	(.00102)	(.00089)	(.0006)	(.00071)
Observations	4231	7292735	7292735	7292735	7292735	7292735
R-Squared	.91657	.00626	.00343	.00585	.0018	.00243
Mean DV	7.536	0.071	0.039	0.032	0.013	0.021

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.

*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-11 - Robustness Checks: Linear Mortality Rate 1980-2020 and Alternative Death Year Selection

	Outcomes:		
	Cumulative Mortality Rate 1990-2020	Log Cumulative Mortality Rate 1980-2020	Cumulative Mortality Rate 1980-2020
	(1)	(2)	(3)
Exposure	-70.00924**	-.03227**	-55.87666*
	(33.43259)	(.01522)	(33.82836)
Observations	4121	4233	4098
R-Squared	.73246	.93706	.85672
Mean DV	1999.779	7.572	2021.802

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include birth state fixed effects, birth year by birth region fixed effects, and controls. NCHS controls (for column 1) are the share of deaths to females and Whites. Individual controls (for columns 2-5) are dummies for gender and race. Birth state controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. Regressions using the NCHS data (column 1) are weighted using death counts in each cell. Regressions using census-ACS data (columns 2-5) are weighted using IPUMS person weights. The NCHS data (column 1) covers the years 1990-2020 for cohorts of 1960-1980. The census-ACS data (columns 2-5) covers the years 2000-2022 for cohorts of 1960-1980.
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A-12 - The Effects of Abortion Legalization on Life Expectancy

	Outcome: Life Expectancy at age:			
	0	5	10	15
	(1)	(2)	(3)	(4)
Exposure	.03754	.01218	.00902	.00347
	(.03572)	(.03353)	(.03378)	(.0343)
Observations	2142	2142	2142	2142
R-Squared	.9907	.9894	.98936	.98936
Mean DV	71.531	68.159	63.289	58.403
	20	25	30	35
	(5)	(6)	(7)	(8)
Exposure	.01736	.05268*	.06578**	.06649**
	(.03323)	(.03118)	(.02911)	(.02861)
Observations	2142	2142	2142	2142
R-Squared	.98952	.98974	.99021	.99061
Mean DV	53.675	49.008	44.313	39.638
	40	45	50	55
	(9)	(10)	(11)	(12)
Exposure	.07259***	.06221**	.06432***	.06799***
	(.02657)	(.02433)	(.02302)	(.02138)
Observations	2142	2142	2142	2142
R-Squared	.9909	.99105	.99095	.99016
Mean DV	35.048	30.602	26.355	22.353
	60	65	70	75
	(13)	(14)	(15)	(16)
Exposure	.04507**	.02186	.0196	.0105
	(.02067)	(.02118)	(.02014)	(.02026)
Observations	2142	2142	2142	2142
R-Squared	.98816	.98451	.97798	.9691
Mean DV	18.617	15.197	12.111	9.396

Notes. Standard errors, clustered on birth state, are in parentheses. All regressions include state fixed effects, year by region fixed effects, and controls. State controls include per capita income, per capita hospitals, per capita hospital beds, reported disease rates, share of women receiving AFDC, race-specific ages-specific child mortality rate at different age groups, race-specific general fertility rate, and dummies for exposure to Medicaid, EPL, and FEPA. The data covers cohorts of 1960-1980. Regressions are weighted using average state population.
*** p<0.01, ** p<0.05, * p<0.1