# Online Appendix*

## The Impact of Legal Abortion on Maternal Mortality

Sherajum Monira Farin,† Lauren Hoehn-Velasco,‡ and Michael F. Pesko§

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†Georgia State University, Department of Economics, Andrew Young School of Policy Studies. Email: sfarin1@gsu.edu

‡Corresponding author: Georgia State University, Department of Economics, Andrew Young School of Policy Studies. Email: lvelasco@gsu.edu

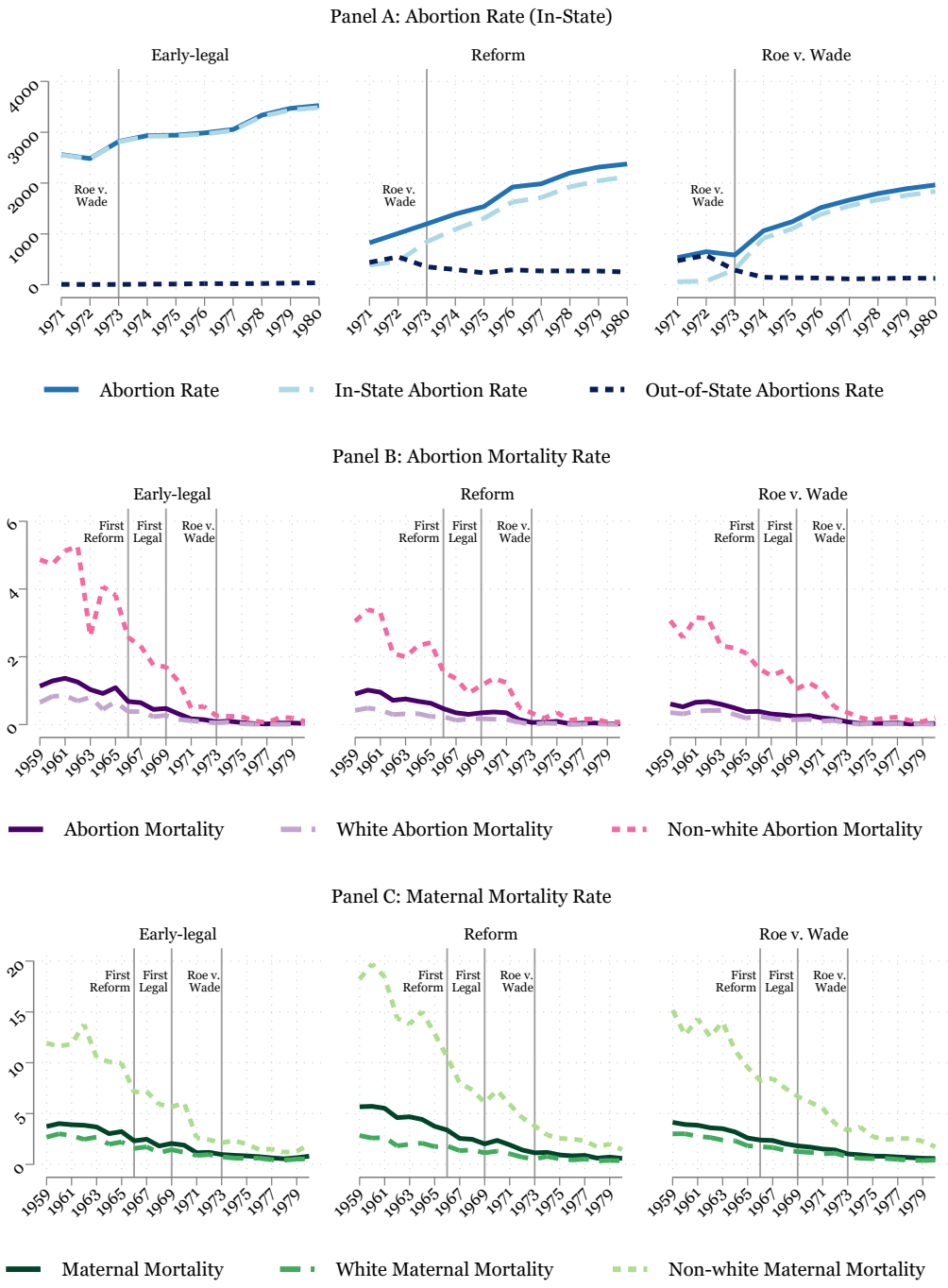
§Georgia State University, Department of Economics, Andrew Young School of Policy Studies and IZA. Email: mpesko@gsu.edu

# A Additional Descriptive Tables and Figures

Table A.1: Data Sources

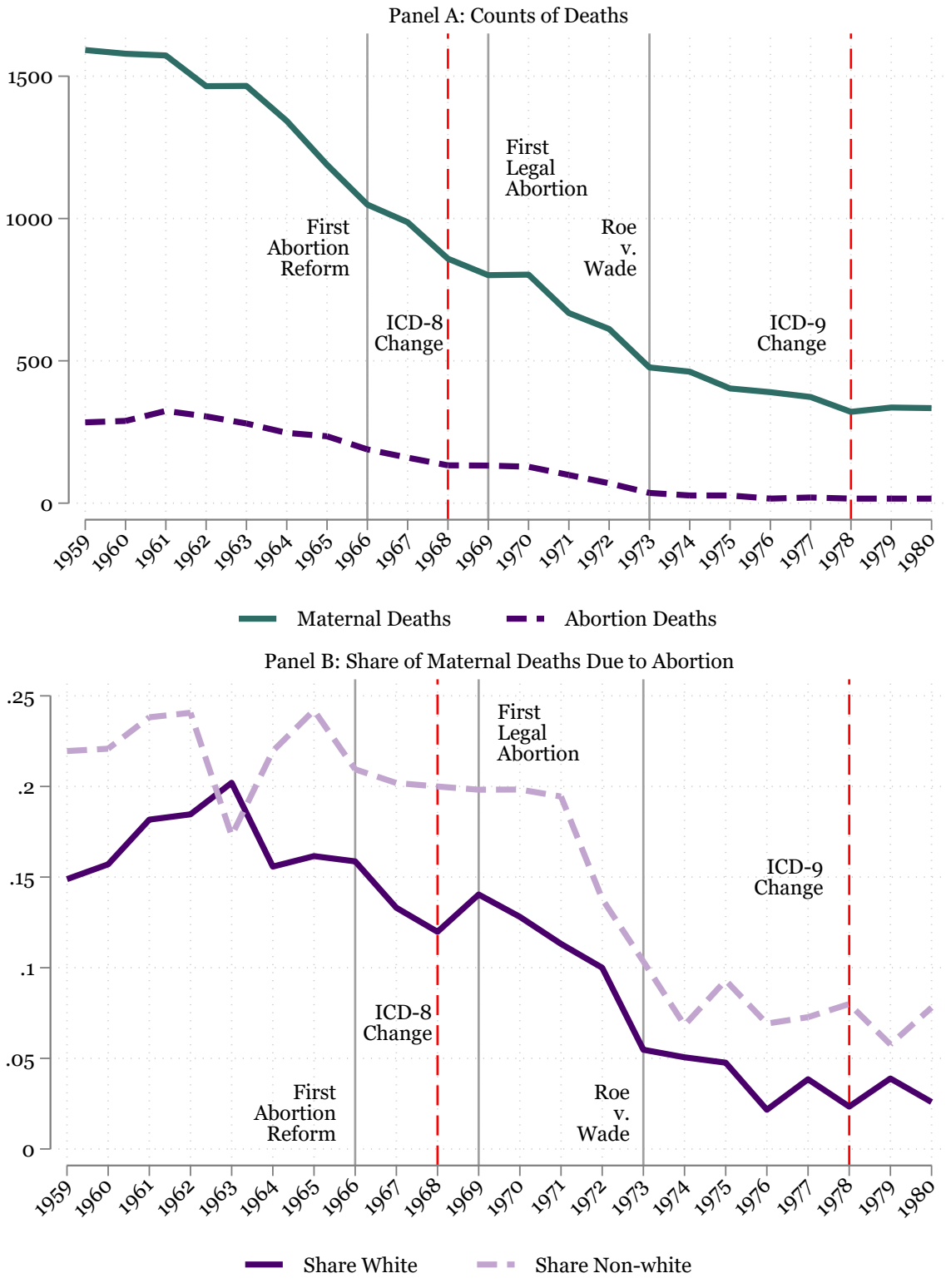
| | |
|---|---|
| **Outcomes** | |
| *Deaths* | NCHS Mortality Files and NBER, 1959-1980 (NCHS, 1959-1980a) |
| *Births I and Delivery Characteristics* | NCHS Natality Files and NBER, 1968-1980 (NCHS, 1968-1980b) |
| *Births II* | Vital Statistics of the US and NBER, 1959-1968 (NVSS, 1959-1968) |
| **Demographic Controls** | |
| *Age Shares* | IPUMS USA, 1950-1990 (Ruggles et al., 2021) |
| *Education Shares* | IPUMS USA, 1950-1990 (Ruggles et al., 2021) |
| *Population Totals* | Wolfers (2006) |
| *Annual Per Capita Income* | Bureau of Economic Analysis.<br>'SA1-3 Personal income summary' via<br>Correlates of State Policy (Jordan and Grossmann, 2020) |
| *Per Pupil Spending* | US Department of Education<br>National Center for Education Statistics<br>Statistics of State School Systems (NCES, 1959-1980) |
| **Policy Controls** | |
| *Unilateral Divorce* | Gruber (2004) via Wolfers (2006) |
| *EPL, ERA, and FEPA* | Myers (2017) |
| *Abortion Laws* | Myers (2017) and Myers (2021a) |
| *Pill and Minor's Access to Pill* | Myers (2021a) |
| *Inductions* | Received from Bitler and Schmidt (2012)<br>Combined with 1958/1959<br>Digitized from Selective Service Records |
| **Additional Data Sources** | |
| *Unemployment* | Correlates of State Policy (1975+, Jordan and Grossmann (2020))<br>Historical, Demographic, Economic, and Social Data:<br>The United States, 1790-2002 (Pre-1975, Haines (2010)) |
| *Fair Housing Laws* | Collins (2006) |
| *Medicaid* | Boudreaux et al. (2016) |
| *AFDC UP* | Winkler (1995) |
| *1971 Religion Data* | Churches and Church Membership<br>in the United States, 1971 (States, Johnson et al. (1971)) |
| *Political Alignment* | Klarner (2013, 2003) via<br>Correlates of State Policy (Jordan and Grossmann, 2020) |
| *Discrimination Laws* | Caughey and Warshaw (2016) via<br>Correlates of State Policy (Jordan and Grossmann, 2020) |
| *Share Urban* | Historical, Demographic, Economic, and Social Data:<br>The United States, 1790-2002 (ICPSR 2896, Haines (2010)) |
| *MDs* | Bureau of Health Professions Area Resource File,<br>1940-1990: [United States] (ICPSR 9075, AHRF (1994)) |
| *Share Hospital Deliveries* | Vital Statistics of the US and NBER, 1959-1968 NVSS (1959-1968) |
| *Abortion Counts* | CDC Abortion surveillance (CDC, 1969-1980) |
| **County-level Data Sources** | |
| *Reproductive-Age Female Population* | U.S. County-Level Natality and Mortality Data,<br>1915-2007 (ICPSR 36603, Bailey et al. (2016)) |
| *Missing Reproductive-Age Females* | IPUMS USA, 1950-1990 and<br>Historical, Demographic, Economic, and Social Data:<br>The United States, 1790-2002 (ICPSR 2896, Haines (2010)) |
| *1971 Religion Data* | Churches and Church Membership<br>in the United States, 1971 (Counties, Johnson et al. (1971)) |
| *Population Characteristics* | Historical, Demographic, Economic, and Social Data:<br>The United States, 1790-2002 (ICPSR 2896, Haines (2010)) |
| *Births I* | NCHS Natality Files and NBER,<br>1968-1980 NVSS (1959-1968) |
| *Births II and Share Hospital Deliveries* | Vital Statistics of the US and<br>NBER, 1959-1968 NCHS (1968-1980b) |
| *MDs* | Bureau of Health Professions Area Resource File,<br>1940-1990: [United States] (ICPSR 9075, AHRF (1994)) |

Figure A.1: Maternal Mortality Rate, Abortion Mortality Rate, and Abortion Rate, by Legal Abortion Status



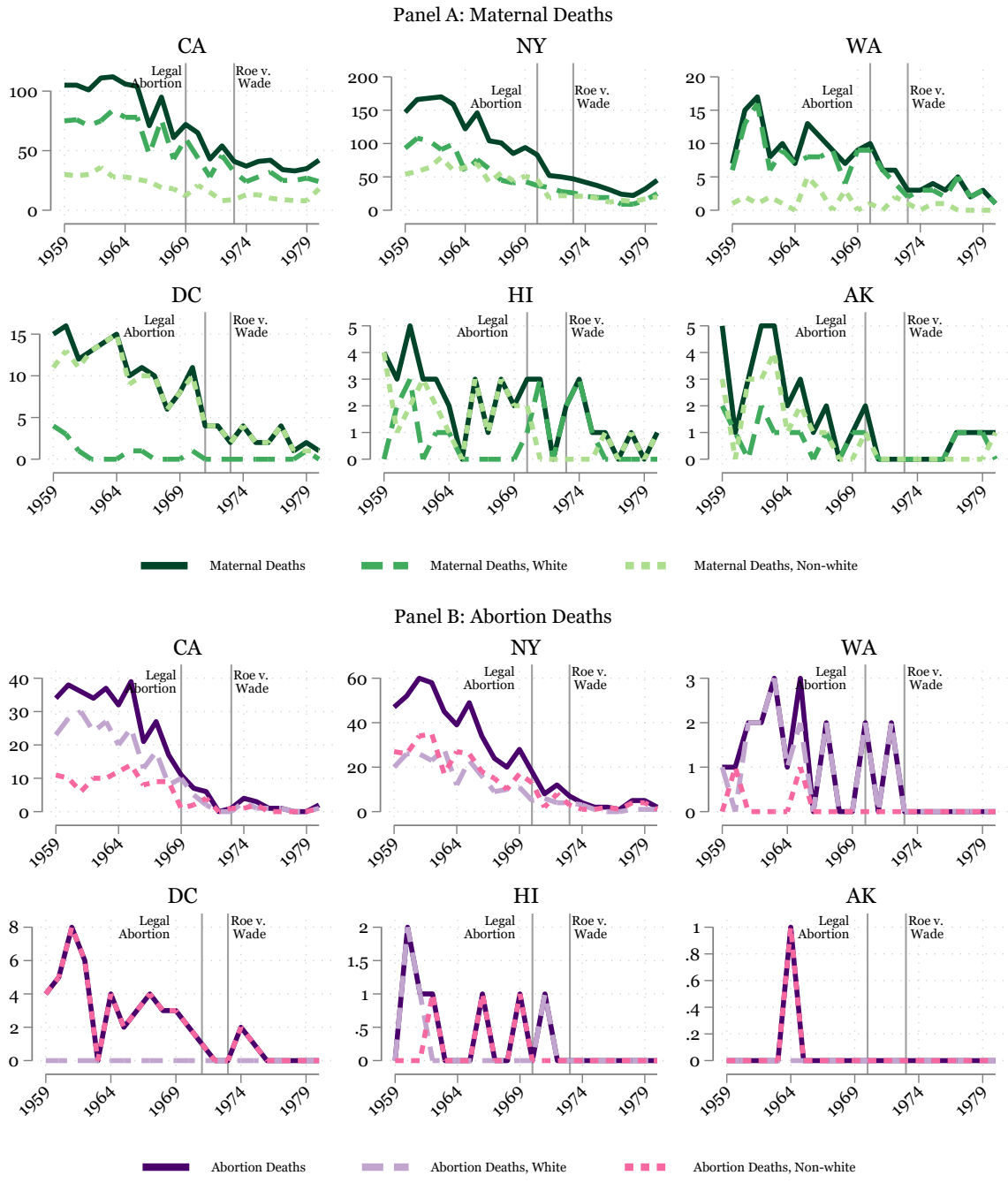

Source: CDC Abortion Surveillance Program, 1971-1980. NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.
Notes: Rates are per 100,000 reproductive-aged females in each population (all, white, and non-white).

Figure A.2: Trends in Maternal and Abortion-Related Deaths, 1959-1980



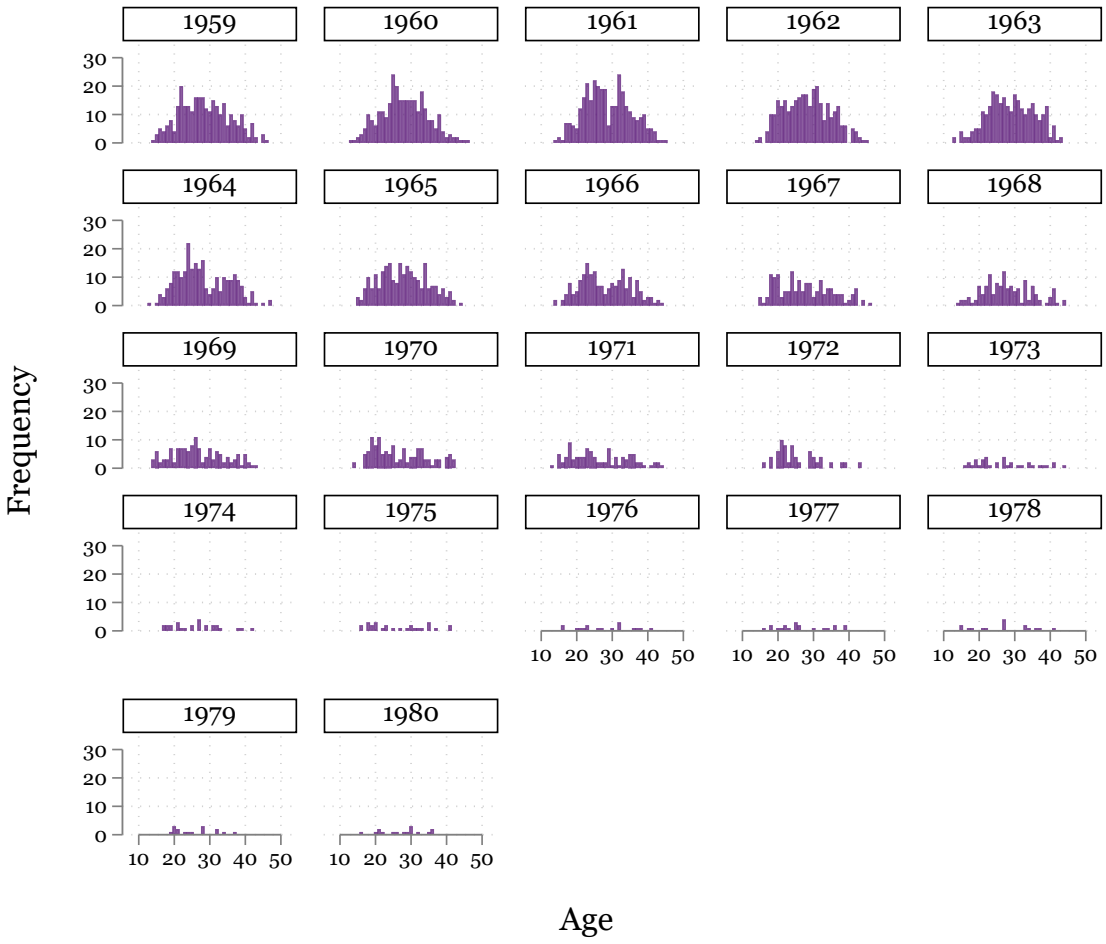

Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.
Notes: Panel A shows the number of maternal and abortion deaths each year. The vertical dashed lines show the legal changes and the ICD code changes. Panel B shows the proportion of maternal deaths due to abortion.

Figure A.3: State-level Trends in Maternal and Abortion-Related Deaths for Early Legalization States, 1959-1980



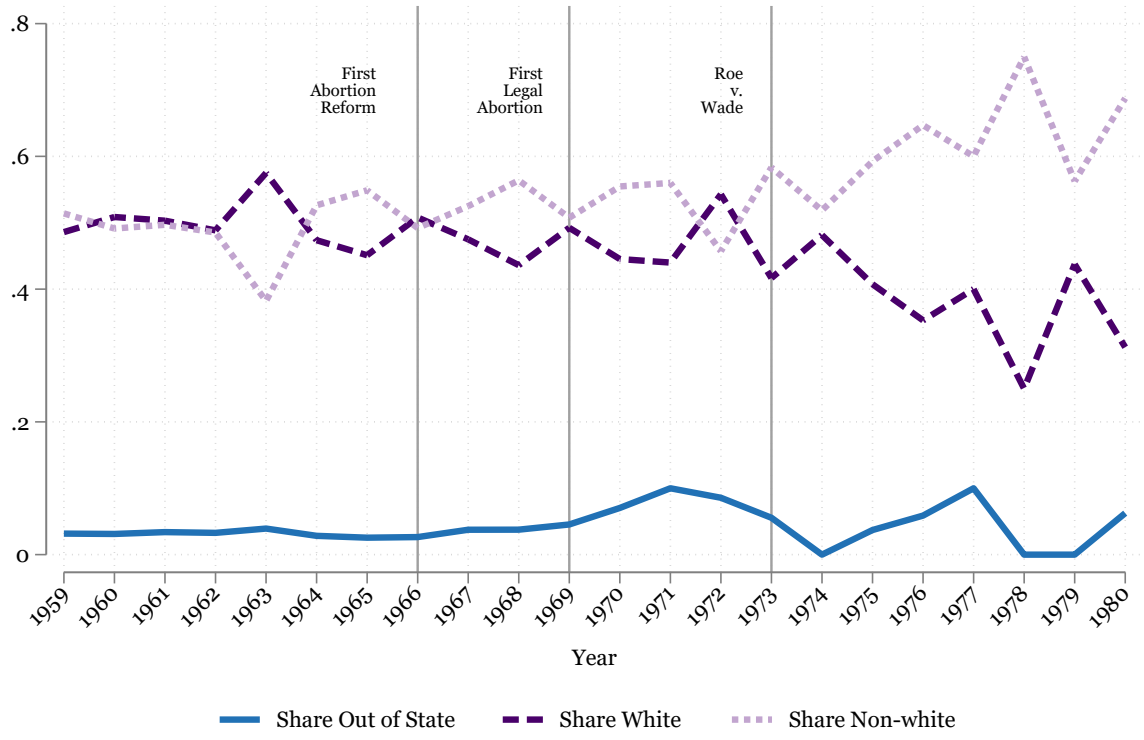

Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.
Notes: Plotted points represent the number of maternal and abortion deaths.

Figure A.4: Abortion Deaths: Counts over the Age Distribution, 1959-1980




Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.

Figure A.5: Abortion Deaths: Composition by Race and Resident Status




Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.

# B Additional Tables and Figures

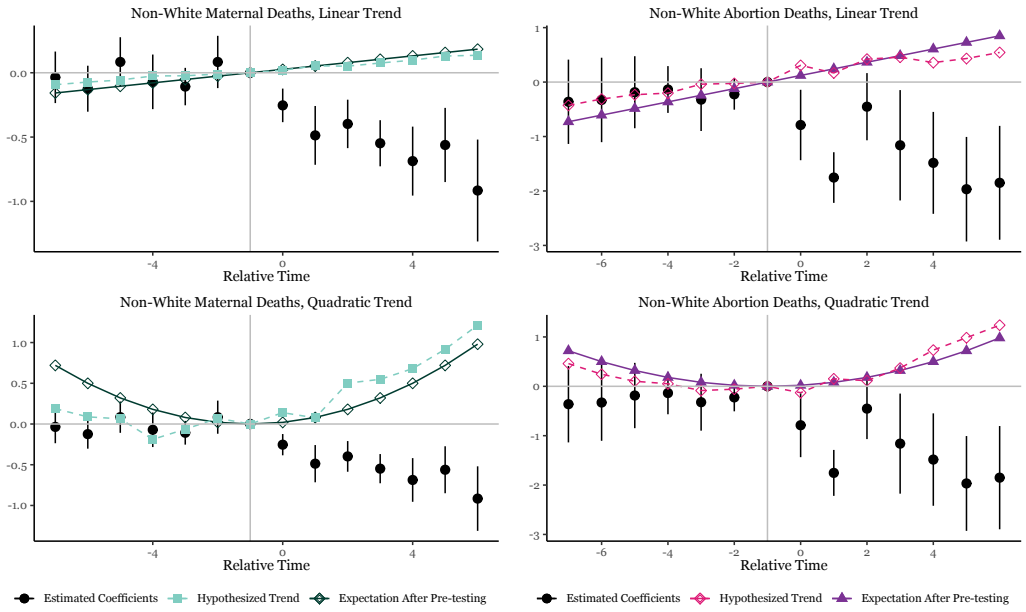
Table B.1: Percent Reduction and Deaths Averted–Estimates from Figure 3, Non-White Maternal and Non-white Abortion Deaths

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Non-white Abortion** *All-National* | | | **Non-white Abortion** *Early Legal* | | | **Non-white Maternal** *All-National* | | | **Non-white Maternal** *Early Legal* | | |
| | % Magnitude Decline | Observed Number of Deaths | Estimated Deaths Averted | % Magnitude Decline | Observed Number of Deaths | Estimated Deaths Averted | % Magnitude Decline | Observed Number of Deaths | Estimated Deaths Averted | % Magnitude Decline | Observed Number of Deaths | Estimated Deaths Averted |
| 0 | -0.55 | 32 | 39 | -0.56 | 15 | 19 | -0.22 | 236 | 67 | -0.24 | 66 | 21 |
| 1 | -0.83 | 14 | 68 | -0.86 | 4 | 25 | -0.39 | 210 | 134 | -0.48 | 43 | 40 |
| 2 | -0.36 | 24 | 14 | -0.30 | 12 | 5 | -0.33 | 179 | 88 | -0.33 | 41 | 20 |
| 3 | -0.69 | 14 | 31 | -0.74 | 3 | 9 | -0.42 | 167 | 121 | -0.40 | 30 | 20 |
| 4 | -0.77 | 14 | 47 | -0.65 | 1 | 2 | -0.50 | 169 | 169 | -0.37 | 9 | 5 |
| 5 | -0.86 | 10 | 61 | | | | -0.43 | 161 | 121 | | | |

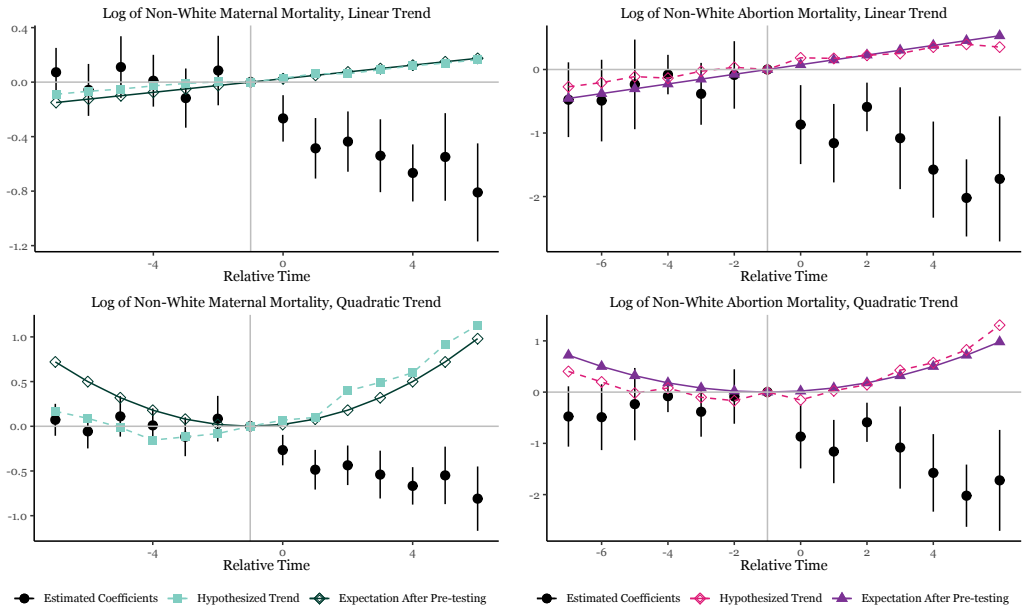
Notes: We calculate the deaths averted for each period (m) using the estimated % reduction in deaths ($\exp(\beta) - 1$) and the observed death count in period m as: Observed # of $\text{Deaths}_m/(1 + \text{Estimated \% Decline}) -$ Observed # of $\text{Deaths}_m$.

Figure B.1: Main Results: Test for Pre-trends

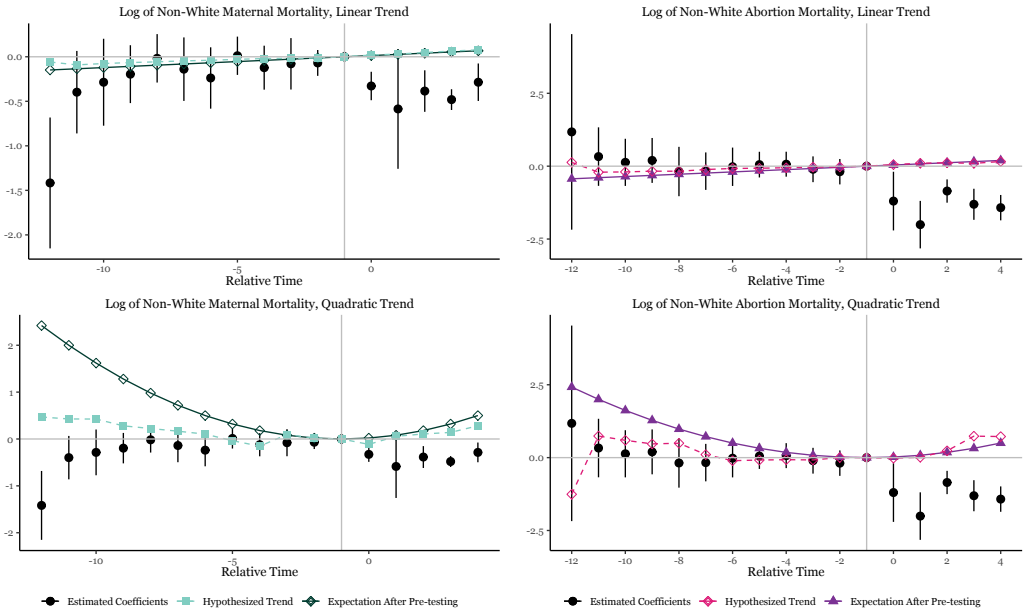
Panel A: TWFE Poisson Model, Figure 3




Panel B: TWFE OLS Specification with Log of Mortality, Panel A of Figure 5

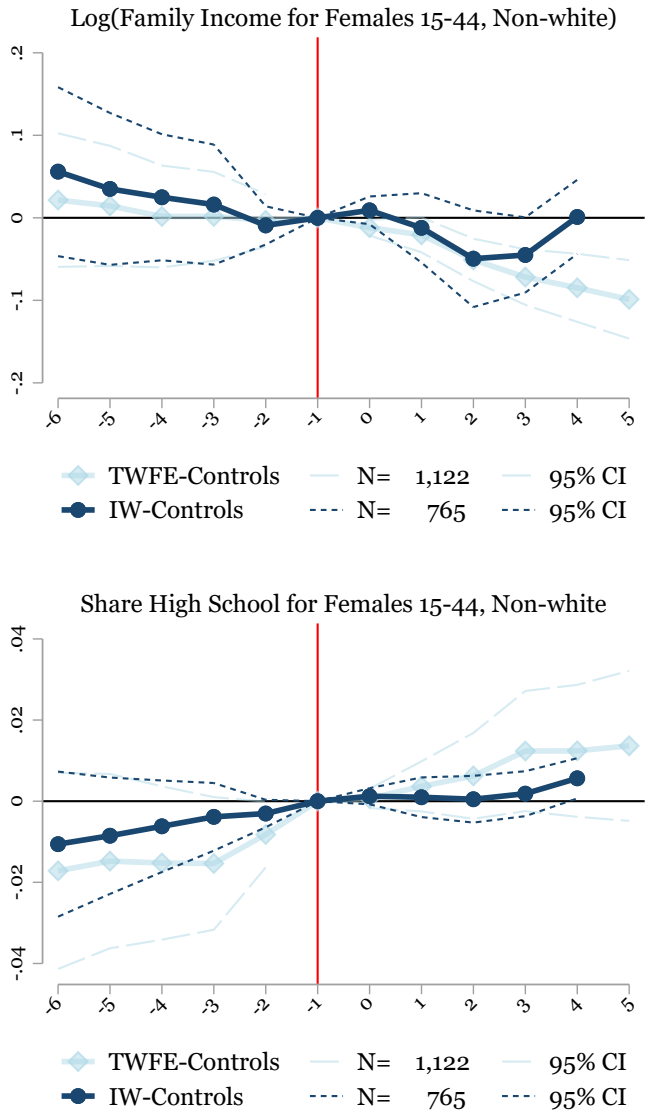



Panel C: IW Specification with Log of Mortality, Panel A of Figure 5



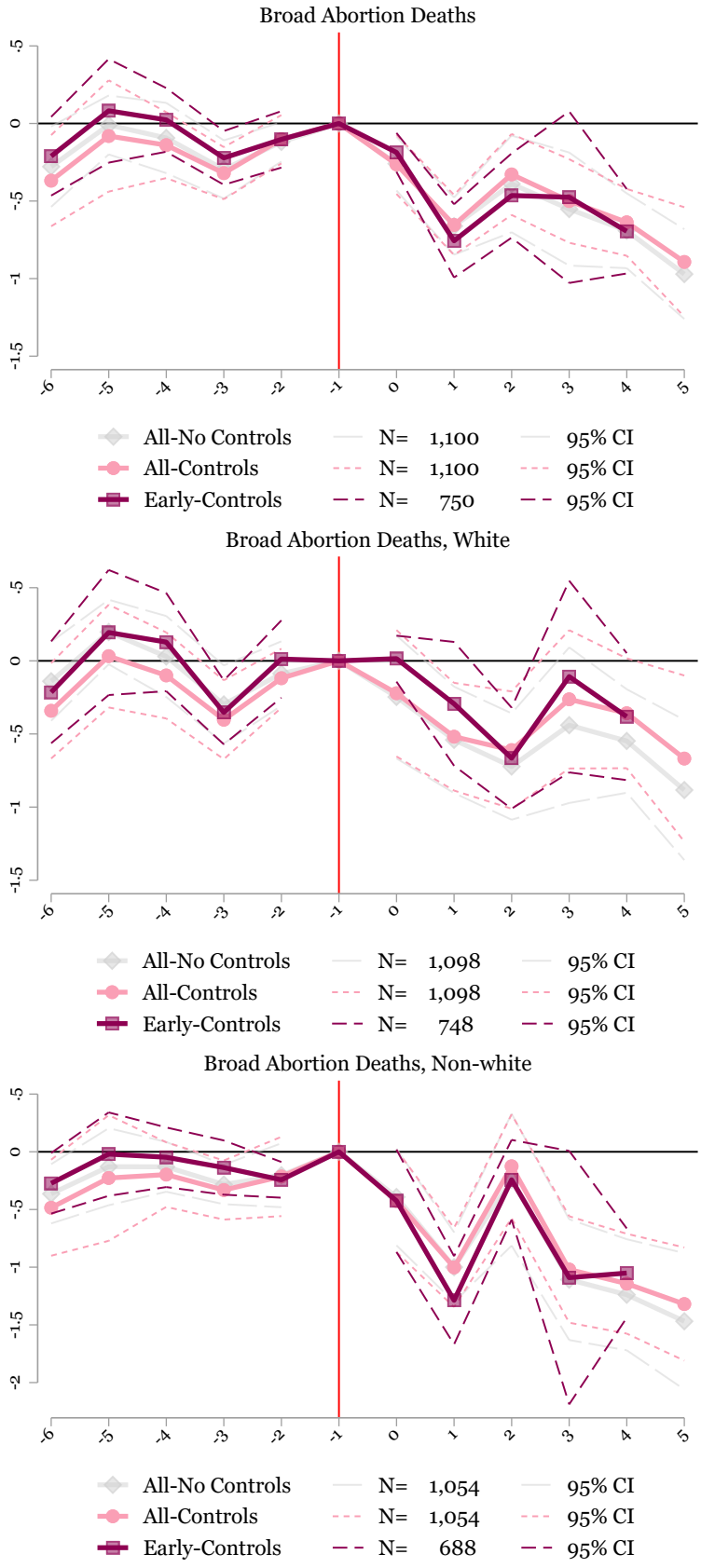

Notes: Trends and hypothesized trends calculated based on Roth (2022)'s *pretrends* R package.

Figure B.2: Event-study Results: Education and Income for Non-white Females 15-44



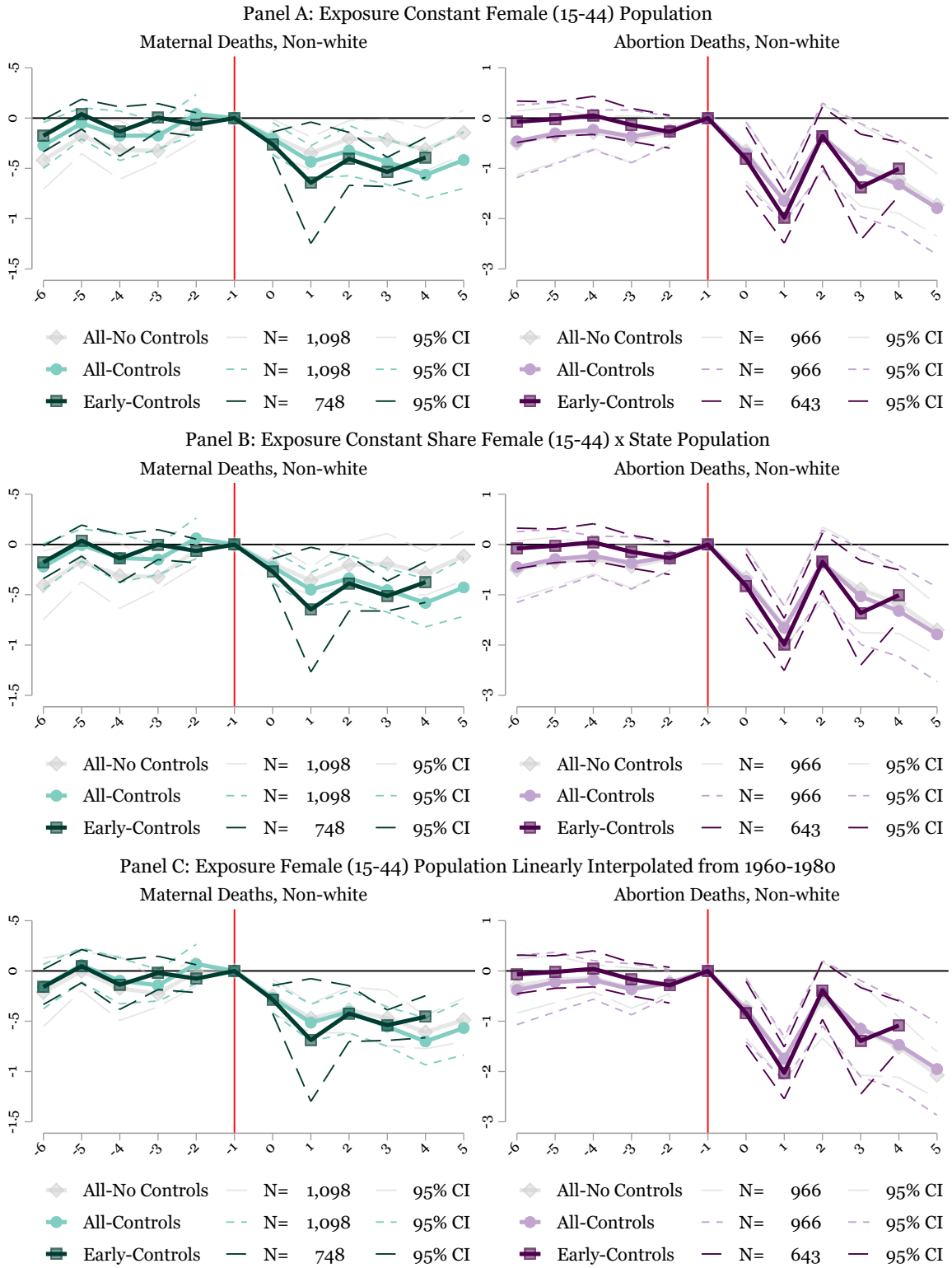

Notes: Reflects the OLS specification shown in Figure 5 Panel A, except we adjust the outcome and the controls. For the controls, we include all baseline policy controls. We omit the remainder of the controls (instead considered as outcomes), which may be correlated with the outcome in each specification. Non-white reproductive age female results weighted by non-white females 15-44. Note that the share high school captures the population share with a high school degree.

Figure B.3: Misclassification Test (III): Effect of Legal Abortion on Broad Abortion Mortality



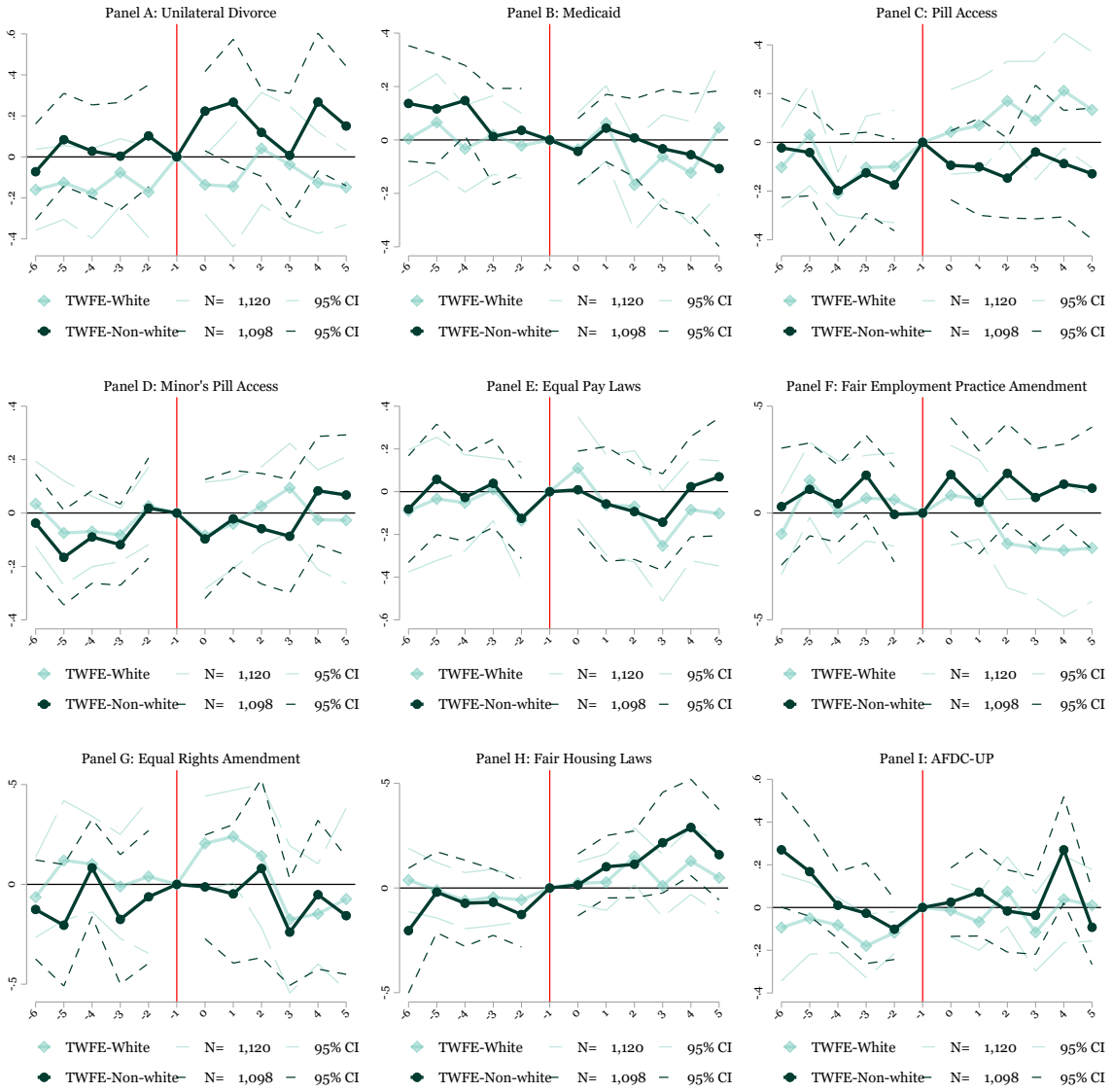

Notes: Results reflect Figure 3, but considering a broader classification of abortion-related mortality (see Table F.1).

Figure B.4: Alternative Measures of the Reproductive-age Female Population



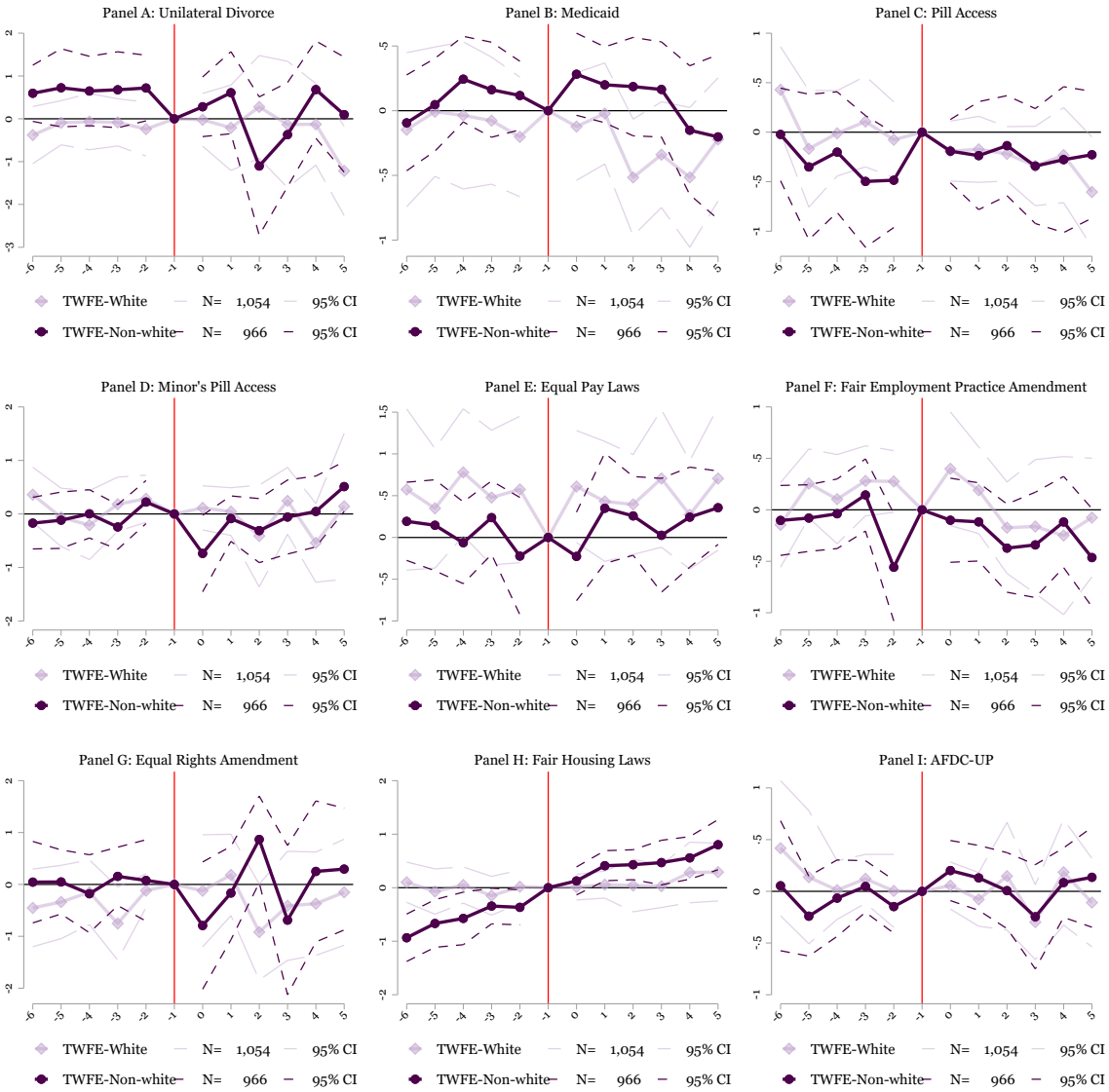

Notes: Results reflect Figure 3, but altering the population of reproductive-age females. Panel A uses a constant measure of reproductive-age females (from the first year of our sample). Panel B shows the share of reproductive-age females from the first year of the sample multiplied by the state population in each year. Panel C shows the reproductive-age female population linearly interpolated over 1960-1980 and omitting 1970 from the interpolation. We also omit census controls; and only include policy controls, as well as the log of per capita income and the log of per pupil spending.

Figure B.5: Impact of Related Policies (I): Maternal Mortality




Notes: Specifications similar to Figure 3, considering a different policy in each panel. Estimated coefficients from a Poisson model. Baseline fixed effects include year fixed effects and state fixed effects. Dashed and dotted lines reflect 95% confidence intervals. Robust standard errors clustered at the state level. We control for the main policy and demographic controls.

Figure B.6: Impact of Related Policies (II): Abortion-Related Mortality




Notes: Reflects B.5 except considering abortion-related deaths.

## Table B.2: Baseline Difference-in-differences, Additional Controls

| | Non-white Maternal Mortality Weights Non-white Females 15-44 | Non-white Maternal Deaths Exposure Non-white Females 15-44 | | | Non-white Abortion Mortality Weights Non-white Females 15-44 | Non-white Abortion Deaths Exposure Non-white Females 15-44 | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1(Legal Abortion) | -0.3059*** | -0.3059*** | -0.2205*** | -0.2414*** | -0.7477*** | -0.7477*** | -0.6153*** | -0.6233*** |
| | (0.0532) | (0.0532) | (0.0525) | (0.0499) | (0.1785) | (0.1785) | (0.2010) | (0.1992) |
| Share Reproductive Age Females, 15-19 White | -6.0516* | -6.0516* | -8.1565** | -6.5246** | -18.4233* | -18.4233* | -21.5407* | -13.0244 |
| | (3.0987) | (3.0987) | (3.1700) | (3.0580) | (11.0805) | (11.0805) | (12.2943) | (13.1249) |
| Share Reproductive Age Females, 15-19 Non-white | 3.8491 | 3.8491 | 9.4783 | 8.1203 | -11.3118 | -11.3118 | -8.1346 | -6.1185 |
| | (4.4938) | (4.4938) | (6.0785) | (6.2076) | (10.8623) | (10.8623) | (12.4245) | (11.9289) |
| Share High School Educated | 3.3951 | 3.3951 | 4.8939** | 4.7189* | 10.6503 | 10.6503 | 11.3788 | 13.3362 |
| | (2.4327) | (2.4327) | (2.4489) | (2.5728) | (8.5169) | (8.5169) | (8.7143) | (9.0204) |
| Log(Income Per Capita) | 0.3194 | 0.3194 | -0.2052 | -0.8553* | 0.1576 | 0.1576 | -0.7791 | -2.4977* |
| | (0.5153) | (0.5153) | (0.4547) | (0.4640) | (1.0296) | (1.0296) | (1.1391) | (1.3076) |
| Log(Per Pupil Education Expenditure) | -0.4672** | -0.4672** | -0.1976 | 0.0067 | -0.9131 | -0.9131 | -0.4524 | -0.1726 |
| | (0.2205) | (0.2205) | (0.2224) | (0.2061) | (0.6729) | (0.6729) | (0.6242) | (0.7218) |
| 1(Abortion Reform) | -0.1060** | -0.1060** | -0.0646 | -0.0439 | -0.0954 | -0.0954 | -0.0799 | -0.0507 |
| | (0.0440) | (0.0440) | (0.0415) | (0.0376) | (0.1271) | (0.1271) | (0.1235) | (0.1320) |
| 1(Minor's Access to Pill) | 0.0016 | 0.0016 | 0.0283 | 0.0366 | -0.1100 | -0.1100 | -0.1332 | -0.1071 |
| | (0.0662) | (0.0662) | (0.0540) | (0.0470) | (0.1544) | (0.1544) | (0.1448) | (0.1365) |
| 1(Pill Access) | 0.0063 | 0.0063 | -0.0355 | -0.0357 | 0.1452 | 0.1452 | 0.0598 | 0.0806 |
| | (0.0639) | (0.0639) | (0.0578) | (0.0546) | (0.1721) | (0.1721) | (0.1640) | (0.1618) |
| 1(Unilateral Divorce) | 0.0813 | 0.0813 | 0.1006** | 0.0875* | -0.2683 | -0.2683 | -0.2818 | -0.3342* |
| | (0.0571) | (0.0571) | (0.0513) | (0.0505) | (0.2233) | (0.2233) | (0.2161) | (0.1990) |
| 1(Equal Pay Laws) | 0.0283 | 0.0283 | 0.0826* | 0.0917** | 0.0615 | 0.0615 | 0.1016 | 0.1479 |
| | (0.0466) | (0.0466) | (0.0441) | (0.0421) | (0.1614) | (0.1614) | (0.1687) | (0.1656) |
| IHS(Inductions Per 1,000 Males 18-25) | -0.3057*** | -0.3057*** | -0.2793*** | -0.2690*** | -0.2849* | -0.2849* | -0.3503** | -0.3427** |
| | (0.0691) | (0.0691) | (0.0653) | (0.0713) | (0.1705) | (0.1705) | (0.1734) | (0.1735) |
| Unemployment | | | -0.0114 | -0.0148 | | | -0.0149 | -0.0004 |
| | | | (0.0257) | (0.0245) | | | (0.0652) | (0.0683) |
| 1(Medicaid) | | | 0.0288 | 0.0325 | | | 0.1562 | 0.1746 |
| | | | (0.0415) | (0.0428) | | | (0.1563) | (0.1643) |
| MDs per 1,000 | | | -0.6612** | -0.3769 | | | -0.6398 | 0.0807 |
| | | | (0.2652) | (0.2924) | | | (0.6870) | (0.7472) |
| 1(Fair Housing) | | | 0.0469 | 0.0313 | | | 0.2387* | 0.2097* |
| | | | (0.0569) | (0.0540) | | | (0.1251) | (0.1268) |
| 1(Equal Rights Amendment) | | | 0.1104* | 0.1527*** | | | -0.1123 | -0.0536 |
| | | | (0.0574) | (0.0504) | | | (0.1979) | (0.1948) |
| 1(AFDC-UP) | | | 0.0908 | 0.1019* | | | 0.0338 | 0.0735 |
| | | | (0.0609) | (0.0580) | | | (0.1748) | (0.1754) |
| Log(Family Income for Females 15-44, White) | | | | 1.1536 | | | | 2.9090 |
| | | | | (0.7916) | | | | (2.6881) |
| Log(Family Income for Females 15-44, Non-white) | | | | -0.3846 | | | | -0.0717 |
| | | | | (0.4294) | | | | (0.9901) |
| College Educated, Reproductive Age Females White | | | | -12.7484*** | | | | -28.8672*** |
| | | | | (3.8428) | | | | (10.0961) |
| College Educated, Reproductive Age Females Non-white | | | | -4.6037 | | | | -20.3737 |
| | | | | (5.9928) | | | | (23.0731) |
| N | 1,098 | 1,098 | 1,092 | 1,092 | 966 | 966 | 960 | 960 |
| Pseudo R-squared | 0.495 | 0.774 | 0.776 | 0.776 | 0.415 | 0.634 | 0.635 | 0.637 |
| 1965-1968 Mean Dependent | 25.005 | 25.005 | 25.005 | 25.005 | 6.215 | 6.215 | 6.215 | 6.215 |
| Post-Roe Mean Dependent | 7.526 | 7.526 | 7.526 | 7.526 | 0.618 | 0.618 | 0.618 | 0.618 |
| State FE and Year FE | X | X | X | X | X | X | X | X |
| Controls | X | X | X | X | X | X | X | X |

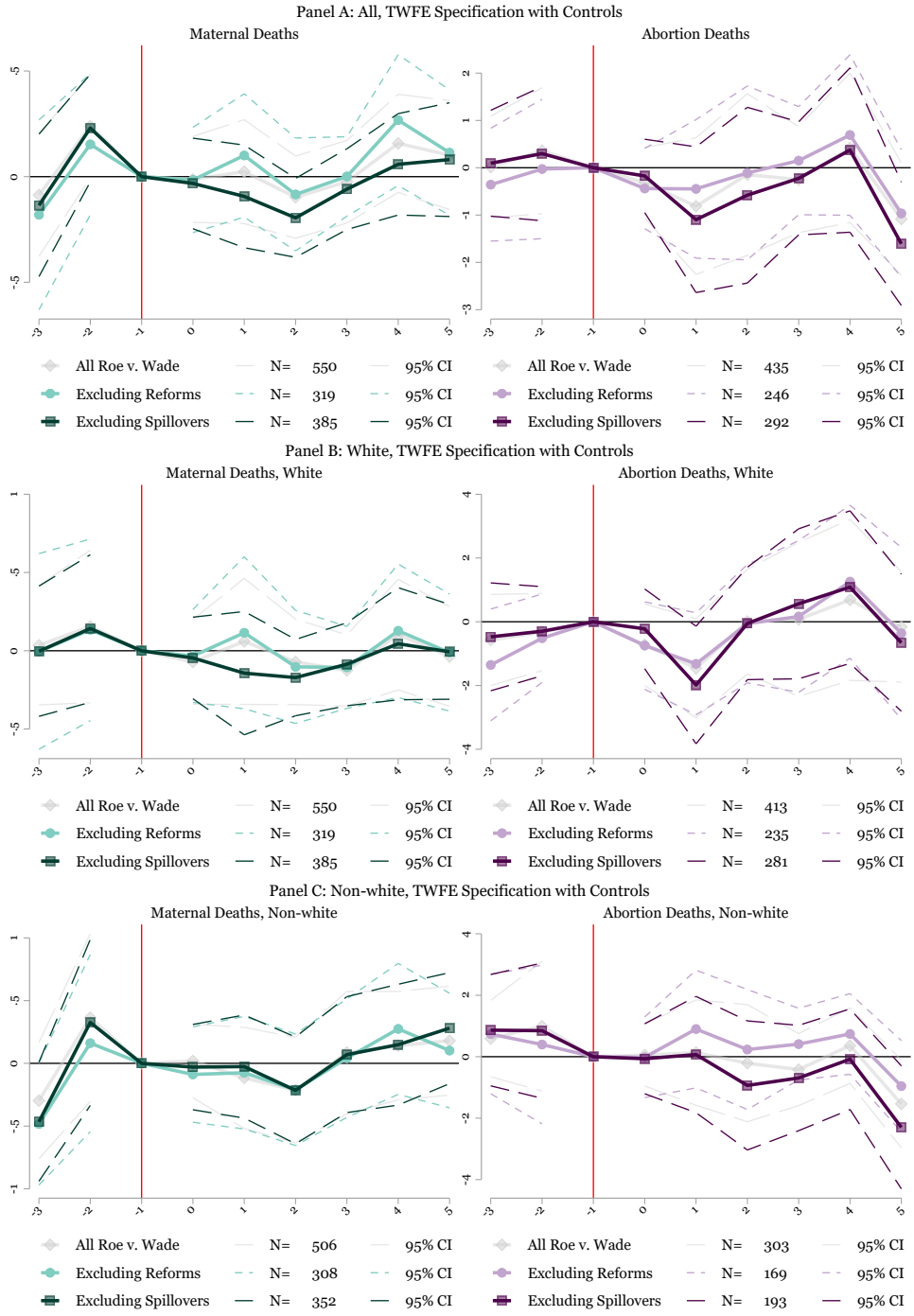
Source: See Table 1, Figure 6, and all sources listed in Table A.1.
Notes: Reflects the grouped post-period from the baseline Poisson TWFE specification shown in Figure 6 and Equation D.2, with added controls displayed above. Columns (1) and (5) show the results modeling the rate as the outcome with the population of reproductive-age females as the weight. These results in Columns (1) and (5), modeling the rate directly, are equivalent to our baseline strategy (shown in Columns (2) and (6)).

## Table B.3: Difference-in-differences, Interaction of Policies

| | Non-white Maternal Deaths Exposure Non-white Females 15-44 | | | | | | Non-white Abortion Deaths Exposure Non-white Females 15-44 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| 1(Legal Abortion)=1 | -0.3045*** | -0.2277*** | -0.2029*** | -0.3480*** | -0.3176*** | -0.2471*** | -0.7119*** | -0.8149*** | -0.4159 | -0.0704 | -0.7908*** | 0.1196 |
| | (0.0655) | (0.0509) | (0.0655) | (0.1005) | (0.0508) | (0.0937) | (0.1681) | (0.2326) | (0.3329) | (0.2727) | (0.2226) | (0.2923) |
| 1(Legal Abortion)=1 × 1(Unilateral Divorce)=1 | -0.0070 | | | | | | -0.2463 | | | | | |
| | (0.1090) | | | | | | (0.4343) | | | | | |
| 1(Legal Abortion)=1 × 1(Minor's Access to Pill)=1 | | -0.2441*** | | | | | | 0.2242 | | | | |
| | | (0.0943) | | | | | | (0.2688) | | | | |
| 1(Legal Abortion)=1 × 1(Fair Employment Practices Act)=1 | | | -0.2098*** | | | | | | -0.5284** | | | |
| | | | (0.0770) | | | | | | (0.2503) | | | |
| 1(Legal Abortion)=1 × 1(Equal Pay Laws)=1 | | | | 0.0545 | | | | | | -0.8083*** | | |
| | | | | (0.0926) | | | | | | (0.2008) | | |
| 1(Legal Abortion)=1 × 1(Equal Rights Amendment)=1 | | | | | 0.0313 | | | | | | 0.1104 | |
| | | | | | (0.0608) | | | | | | (0.4420) | |
| 1(Legal Abortion)=1 × 1(State Bans Discrimination, Public Accommodations)=1 | | | | | | -0.0732 | | | | | | -0.9948*** |
| | | | | | | (0.0965) | | | | | | (0.2455) |
| N | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,079 | 966 | 966 | 966 | 966 | 966 | 955 |
| Pseudo R-squared | 0.774 | 0.775 | 0.775 | 0.774 | 0.775 | 0.774 | 0.634 | 0.634 | 0.635 | 0.636 | 0.634 | 0.638 |
| State FE and Year FE | X | X | X | X | X | X | X | X | X | X | X | X |
| Controls | X | X | X | X | X | X | X | X | X | X | X | X |

Source: Reflects sources in Table B.2 except Fair Employment Practices Acts (FEPA) from Myers (2021a). Discrimination laws from Jordan and Grossmann (2020).
Notes: Specification the same as Columns (2) and (6) of Table B.2, except showing policy interactions with legal abortion.

## Figure B.7: Effect of Roe v. Wade Relative to Early-Treated States




Source: NVSS/CDC Multiple Cause of Death Files. The years included in the sample are 1970-1980, omitting DC.
Notes: Estimates comparing Roe v. Wade states to early-treated states from 1970 onward. DC (treated in 1971) omitted from the specification. Estimated coefficients from a Poisson model. Baseline fixed effects include year fixed effects and state fixed effects. Plotted coefficients are dummy variables on each year before and after the change to abortion policy (see Equation 1). The period just before the legal change is the excluded period (-1)–indicated by the vertical line. Event study is fully saturated with endpoints unbinned. Only the point estimates in the main event window are displayed. Dashed and dotted lines reflect 95% confidence intervals. Robust standard errors clustered at the state level. Poisson model uses the death count as the outcome, with the exposure set to the reproductive-age females 15-44 in each group (all, white, non-white). Our main set of state-level demographic controls includes the share of reproductive-age females who are 15-19 and white, the share of reproductive-age females who are 15-19 and non-white, the log of per capita income, the log of per pupil education spending, and the state-level share with a high school degree. We also include policy controls for state-level abortion reforms, access to the pill for minors, access to the pill generally, unilateral divorce legislation, state equal pay legislation, and the inverse hyperbolic sine of state-level inductions per 1,000 males 18-25.

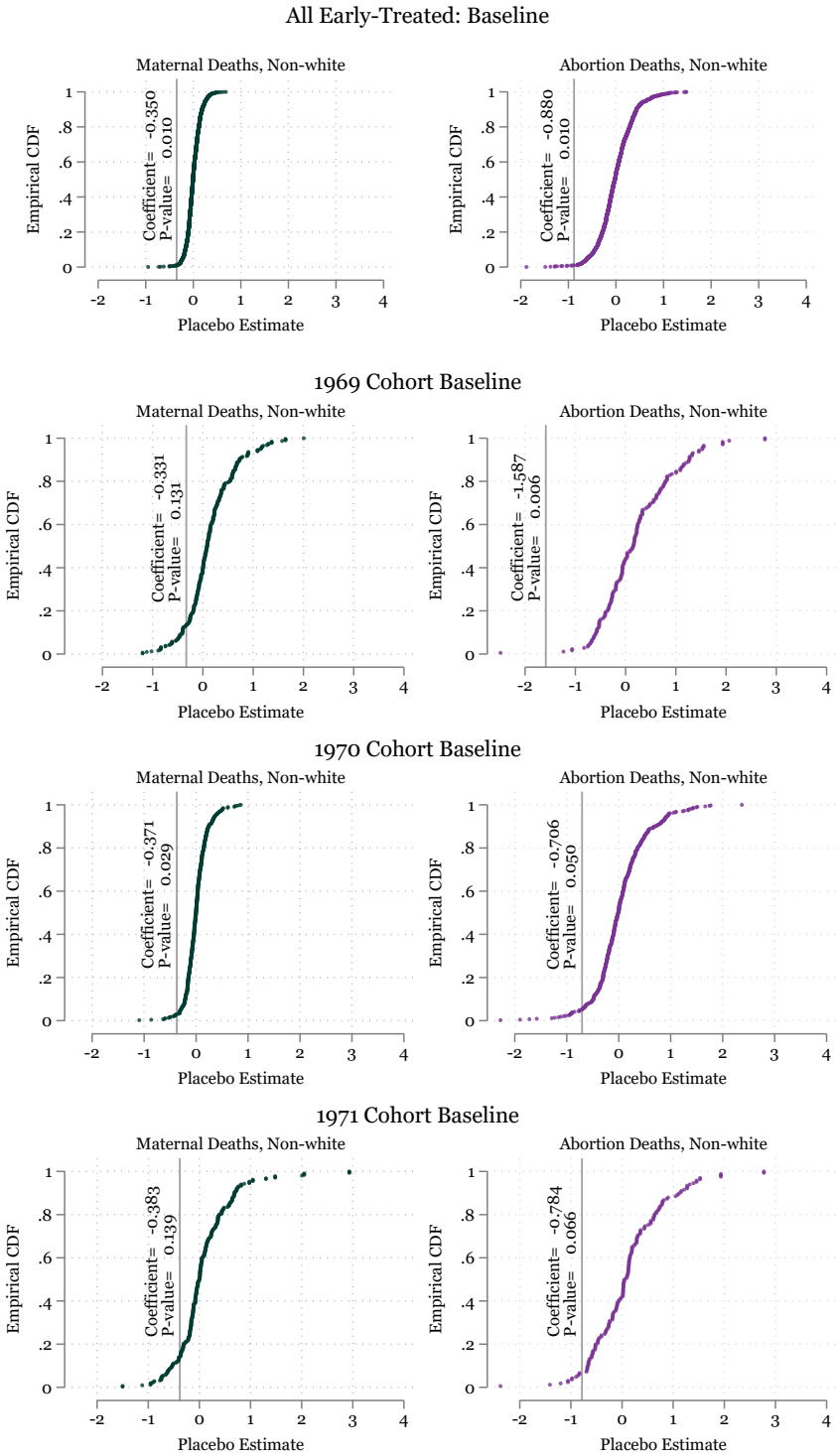
Table B.4: Summary Statistics in 1960, by Legal Status and Driving Time

| | Legal Abortion | | Roe v. Wade | | Diff. | Within 8 Hours to CA, NY, DC | | 8+ Hours to CA, NY, DC | | Diff. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. | Est. | Mean | S.D. | Mean | S.D. | Est. |
| **Mortality** | | | | | | | | | | |
| Maternal Mortality Rate | 4.08 | 2.78 | 4.31 | 2.33 | -0.23 | 3.93 | 1.81 | 4.61 | 2.67 | -0.68 |
| Maternal Mortality Rate, White | 3.40 | 0.97 | 2.99 | 1.06 | 0.41 | 2.92 | 1.07 | 3.05 | 1.06 | -0.13 |
| Maternal Mortality Rate, Non-white | 8.31 | 6.31 | 10.71 | 8.55 | -2.40 | 9.67 | 7.19 | 11.55 | 9.56 | -1.89 |
| Abortion Mortality Rate | 1.21 | 1.06 | 0.69 | 0.65 | 0.52 | 0.66 | 0.58 | 0.71 | 0.72 | -0.05 |
| Abortion Mortality Rate, White | 1.09 | 1.85 | 0.45 | 0.57 | 0.64 | 0.46 | 0.46 | 0.44 | 0.65 | 0.02 |
| Abortion Mortality Rate, Non-white | 3.42 | 2.84 | 2.40 | 3.02 | 1.02 | 2.02 | 2.21 | 2.70 | 3.55 | -0.68 |
| **State Characteristics** | | | | | | | | | | |
| Share High School Educated | 0.33 | 0.03 | 0.27 | 0.05 | 0.06** | 0.27 | 0.04 | 0.27 | 0.05 | -0.00 |
| Share College Educated | 0.06 | 0.02 | 0.04 | 0.01 | 0.02 | 0.04 | 0.01 | 0.04 | 0.01 | 0.00 |
| Unemployment | 5.95 | 3.94 | 5.03 | 1.05 | 0.92 | 5.24 | 1.13 | 4.86 | 0.97 | 0.38 |
| MDs per 1,000 | 1.50 | 0.90 | 1.02 | 0.23 | 0.48 | 1.09 | 0.25 | 0.96 | 0.20 | 0.13 |
| Share Urban | 0.71 | 0.18 | 0.61 | 0.14 | 0.10 | 0.63 | 0.17 | 0.59 | 0.12 | 0.05 |
| State Population (Millions) | 6.20 | 7.92 | 3.17 | 2.80 | 3.03 | 3.56 | 3.18 | 2.86 | 2.49 | 0.70 |
| Log(Income Per Capita) | 7.90 | 0.11 | 7.62 | 0.19 | 0.28*** | 7.68 | 0.20 | 7.57 | 0.17 | 0.10 |
| Log(Per Pupil Education Expenditure) | 6.21 | 0.19 | 5.94 | 0.21 | 0.28* | 5.96 | 0.22 | 5.92 | 0.21 | 0.04 |
| **Females, 15-44** | | | | | | | | | | |
| State Share Females 15-44 | 0.21 | 0.01 | 0.20 | 0.01 | 0.01 | 0.20 | 0.01 | 0.19 | 0.01 | 0.01** |
| State Share White Females 15-44 | 0.14 | 0.05 | 0.18 | 0.02 | -0.03 | 0.18 | 0.01 | 0.17 | 0.02 | 0.01 |
| State Share Non-white Females 15-44 | 0.06 | 0.06 | 0.02 | 0.02 | 0.04 | 0.02 | 0.02 | 0.02 | 0.02 | -0.00 |
| Share High School for Females 15-44 | 0.56 | 0.03 | 0.51 | 0.08 | 0.06** | 0.50 | 0.06 | 0.52 | 0.09 | -0.02 |
| College Educated, Reproductive Age Females 15-44 | 0.07 | 0.02 | 0.05 | 0.01 | 0.02* | 0.05 | 0.01 | 0.05 | 0.01 | 0.00 |
| Log(Family Income for Females 15-44) | 8.90 | 0.08 | 8.70 | 0.16 | 0.19*** | 8.76 | 0.17 | 8.66 | 0.14 | 0.09 |
| Log(Family Income for Females 15-44, White) | 8.95 | 0.10 | 8.75 | 0.13 | 0.20** | 8.80 | 0.15 | 8.71 | 0.10 | 0.09* |
| Log(Family Income for Females 15-44, Non-white) | 8.59 | 0.21 | 8.23 | 0.29 | 0.35** | 8.27 | 0.32 | 8.21 | 0.27 | 0.06 |
| **Policies** | | | | | | | | | | |
| Inductions Per 1,000 Males 18-25 | 6.84 | 3.48 | 9.36 | 3.09 | -2.52 | 8.98 | 3.80 | 9.66 | 2.42 | -0.68 |
| Year Medicaid | 19.67 | 0.02 | 19.68 | 0.03 | -0.01 | 19.68 | 0.04 | 19.67 | 0.01 | 0.01 |
| Year Equal Rights Amendment | 19.41 | 0.54 | 19.66 | 0.30 | -0.25 | 19.73 | 0.02 | 19.62 | 0.38 | 0.11 |
| Year Equal Pay Laws | 19.49 | 0.06 | 19.57 | 0.13 | -0.08 | 19.55 | 0.13 | 19.59 | 0.13 | -0.04 |
| Year Pill Access | 19.61 | 0.01 | 19.62 | 0.03 | -0.01 | 19.62 | 0.03 | 19.61 | 0.03 | 0.00 |
| Year Minor's Access to Pill | 19.77 | 0.08 | 19.73 | 0.06 | 0.04 | 19.73 | 0.03 | 19.73 | 0.08 | -0.01 |
| Fair Housing Year | 19.65 | 0.03 | 19.66 | 0.03 | -0.01 | 19.65 | 0.03 | 19.67 | 0.03 | -0.02 |
| Year Unilateral Divorce | 19.63 | 0.18 | 19.71 | 0.09 | -0.09 | 19.72 | 0.03 | 19.71 | 0.11 | 0.01 |
| **Religion (1971)** | | | | | | | | | | |
| Churches Per 1,000 | 0.57 | 0.28 | 1.18 | 0.55 | -0.60** | 1.02 | 0.54 | 1.30 | 0.53 | -0.28 |
| Catholic Churches Per 1,000 | 0.11 | 0.08 | 0.15 | 0.11 | -0.04 | 0.12 | 0.07 | 0.17 | 0.13 | -0.04 |
| P.C. Church Members | 0.11 | 0.03 | 0.24 | 0.11 | -0.13*** | 0.19 | 0.11 | 0.27 | 0.10 | -0.07* |
| P.C. Church Adherents | 0.37 | 0.06 | 0.53 | 0.11 | -0.16*** | 0.50 | 0.09 | 0.55 | 0.12 | -0.05 |
| P.C. Catholic Adherents | 0.20 | 0.09 | 0.20 | 0.14 | 0.00 | 0.25 | 0.17 | 0.16 | 0.11 | 0.09 |
| **Abortions** | | | | | | | | | | |
| Abortion Rate-1972 | 25.66 | 8.05 | 7.12 | 4.45 | 18.54** | 9.83 | 4.01 | 4.95 | 3.54 | 4.89*** |
| Abortion Rate-1976 | 32.94 | 21.25 | 14.37 | 6.12 | 18.58 | 16.85 | 6.33 | 12.39 | 5.27 | 4.46* |
| Abortion Rate-1980 | 38.75 | 22.73 | 19.12 | 6.50 | 19.63 | 21.23 | 7.38 | 17.42 | 5.25 | 3.81 |
| **Political** | | | | | | | | | | |
| Republican Governor | 0.33 | 0.52 | 0.31 | 0.47 | 0.02 | 0.40 | 0.50 | 0.24 | 0.44 | 0.16 |
| State Senate-Proportion Republican | 0.37 | 0.20 | 0.35 | 0.26 | 0.03 | 0.38 | 0.25 | 0.32 | 0.27 | 0.05 |
| State House-Proportion Republican | 0.36 | 0.17 | 0.30 | 0.22 | 0.06 | 0.33 | 0.22 | 0.28 | 0.22 | 0.06 |
| Democrat Governor | 0.50 | 0.55 | 0.67 | 0.48 | -0.17 | 0.60 | 0.50 | 0.72 | 0.46 | -0.12 |
| State House-Proportion Democrat | 0.63 | 0.17 | 0.70 | 0.22 | -0.07 | 0.67 | 0.22 | 0.72 | 0.22 | -0.06 |
| State Senate-Proportion Democrat | 0.63 | 0.20 | 0.65 | 0.26 | -0.02 | 0.62 | 0.25 | 0.68 | 0.27 | -0.06 |
| Proportion Legislature Same Party as Governor | 0.65 | 0.16 | 0.64 | 0.25 | 0.01 | 0.60 | 0.25 | 0.68 | 0.26 | -0.08 |
| N | 6 | | 45 | | 51 | 20 | | 25 | | 45 |

Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980. State population characteristics are from Ruggles et al. (2021) (shares and means). Population totals use to construct denominators from Wolfers (2006) (also the source of the unilateral divorce laws). Abortion access, equal rights amendments, and equal pay laws from Myers (2021a). Induction data from Bitler and Schmidt (2012). State-level economic conditions are measured by the unemployment rate from Haines (2010). Medicaid implementation from Boudreaux et al. (2016). Physicians per 1,000 persons from the Area Health Resource File, (AHRF, 1994). Fair housing laws from Collins (2006), Myers (2021a). The log of per pupil spending from National Center NCES (1959-1980). The passage of AFDC UP from Winkler (1995). Religious affiliation data from Johnson et al. (1971). Abortion counts from CDC (1969-1980), and reported per 1,000 reproductive-age females. Political alignment from Jordan and Grossmann (2020). Fair housing laws from Collins (2006). The log of per pupil spending from NCES (1959-1980).

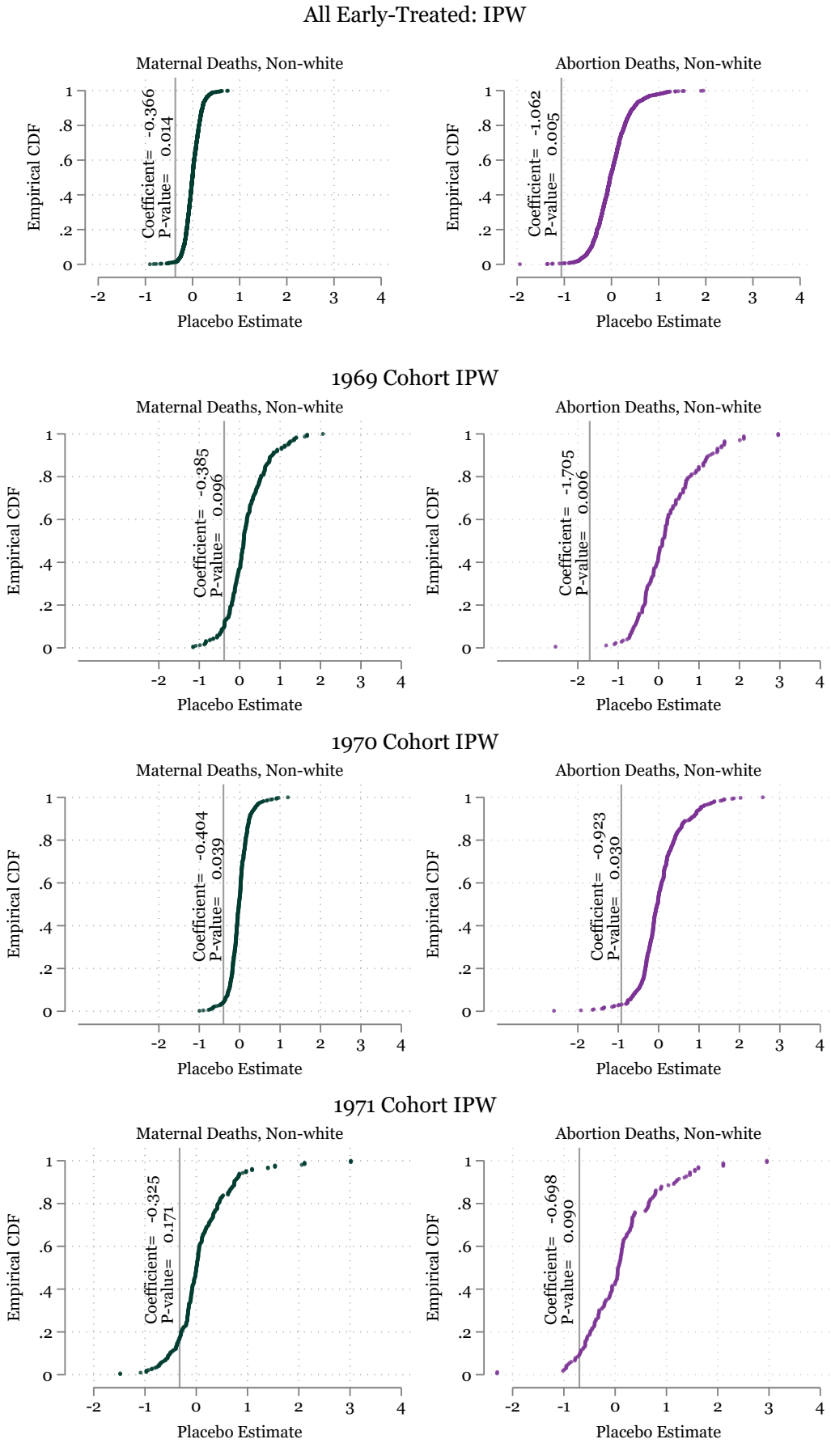
Notes: Unweighted means presented. All characteristics from the 1960 census year unless otherwise noted (religion and abortion rates). ***, **, * represent statistical significance at 1, 5, and 10 percent levels.

## Figure B.8: Permutation Tests: Baseline



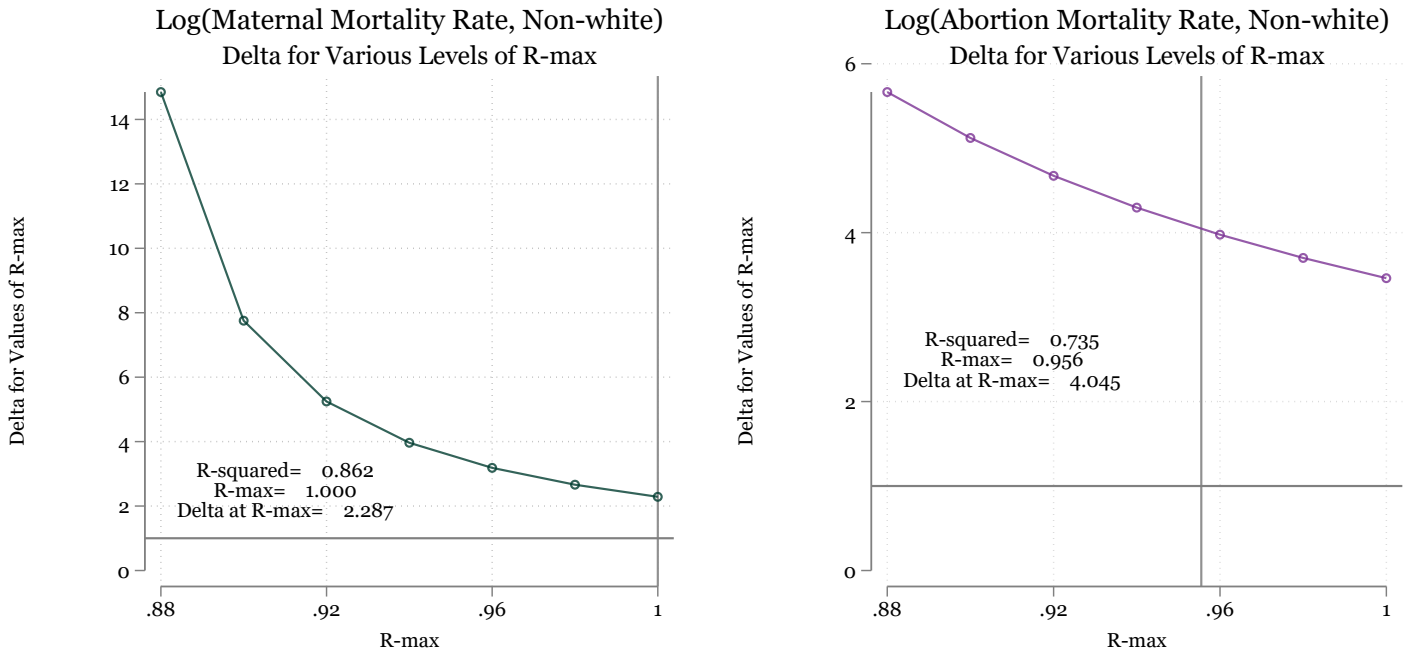

Notes: Permutation tests based on the estimates provided in Table 2. Each cumulative distribution function is constructed from a different set of permutation tests. In the top two panels, Equation D.2 is estimated over two different scenarios. First, we vary the treatment states over identical treatment years, with *Roe v. Wade* control states as placebo-treatment states (only those without abortion reforms). In this case, we assume a similar timing of legal abortion, with a staggered treatment set up of one state treated in 1969, four in 1970, and one in 1971. in this exercise, we randomly choose four of the *Roe v. Wade* states for each treatment year and run this simulation 500 times (choosing a different state combination each time). Second, we use placebo treatment years. In this case, we vary the start year of legal abortion from 1960 to 1967 (stopping the sample at 1969), but use the same staggered setup with one state treated in the first year, four in the second year, and one in the final year. Placebo treatment states are selected from the set of early-legal and *Roe v. Wade* states and randomly assigned to the treatment years. We run this simulation 100 times for eight years. Between the two sets of permutations, we have 500+800=1,300 permutations in total. For the bottom six panels, we again vary both treatment timing and treatment states for each cohort. We randomly select the same number of treated states as in each cohort (e.g., one for 1971 and 1969; four for 1970). We then keep only the treated cohort as well as *Roe v. Wade states* and randomly assign the timing of legal abortion (for each state) from 1960 until just before the actual treatment year (differs by cohort). Then we run the same analysis with only *Roe v. Wade states* from each cohort's treatment year until 1972. The number of observations in this set of permutations depends on the cohort. To calculate the nonparametric p-value, we take the number of observations with a coefficient less than the baseline estimate, divided by the sample size of all permutations.

Figure B.9: Permutation Tests: Inverse Probability Weights




Notes: See description in Figure B.8.

Figure B.10: Degree of Selection on Unobservables at Different Levels of $R_{max}$




NOTES: Results show different levels of R-max from the Stata routine *pscalc*, representing the impact of legal abortion in the early-treated cohort of states over 1959-1972 (similar to Column (2) of Table 2, but estimated with Equation D.3 and OLS). Because the Oster ratios require a linear model, we estimate the difference-in-difference results using OLS with the outcome set to the log of the mortality rate. We apply the inverse probability weights in the OLS model similar to Column (2) of Table 2. However, the IPW are multiplied by the non-white females 15-44 to recover the population-weighted results. Delta represents the degree of selection on unobservables relative to observables that would be needed to explain away the observed findings. Oster (2019) sets a reasonable value of $R_{max}$ equal to 1.3 multiplied by the observed R-squared from the restricted regression, denoted in each specification by the vertical line. The minimum robust level of $\delta$ is one, and indicated by the horizontal line (Oster, 2019).

# C Mechanisms-Additional Results

Table C.1: Pre-Roe Treatment by Inverse Travel Distance to Nearest Major Repeal State, NY/CA/DC

*Omitting Repeal States*, 1959-1973

| | White Maternal | | Non-white Maternal | | White Abortion | | Non-white Abortion | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1(Nearest Repeal Legal)=1 | -0.1558* | 0.0100 | 0.1633 | 0.0818 | 0.0724 | 0.3747 | 0.1476 | -0.6006 |
| | (0.0941) | (0.1159) | (0.1145) | (0.1830) | (0.2410) | (0.3016) | (0.2319) | (0.5615) |
| 1(Nearest Repeal Legal)=1 × 1/Travel Time | -0.1157* | | -0.0835*** | | -0.0371 | | 0.0525 | |
| | (0.0637) | | (0.0296) | | (0.1509) | | (0.0598) | |
| 1(Nearest Repeal Legal)=1 × 1(Within 4 Hours) | | -0.3335*** | | -0.0123 | | -0.3844 | | 0.7856 |
| | | (0.1216) | | (0.1739) | | (0.3081) | | (0.5330) |
| 1(Nearest Repeal Legal)=1 × 1(4-7.99 Hours) | | -0.2323** | | 0.0867 | | -0.4476 | | 1.1189** |
| | | (0.1096) | | (0.1734) | | (0.3487) | | (0.5525) |
| 1(Nearest Repeal Legal)=1 × 1(8-15.99 Hours) | | -0.2311** | | 0.0884 | | -0.4560 | | 0.5973 |
| | | (0.1059) | | (0.1733) | | (0.3263) | | (0.5743) |
| N | 27,521 | 27,521 | 14,752 | 14,752 | 7,021 | 7,021 | 5,072 | 5,072 |
| County FE and Year FE | X | X | X | X | X | X | X | X |

Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980. County-level population data and county-level characteristics are from Bailey et al. (2016) and Haines (2010).

Notes: Estimated coefficients from a county-level Poisson model (see Equation D.2). County and year fixed effects are included, but no covariates are included. The outcome is the (linear) maternal and abortion deaths, and the exposure is the county-level population of females 15-44. Robust standard errors clustered at the county level. ***, **, * represent statistical significance at 1, 5, and 10 percent levels. County-level travel time to the nearest of the major cities in NY/CA/DC, with the timing of the legal reform based on the nearest repeal state. We calculate the distance in miles and assume individuals can travel roughly 60 miles per hour to calculate the travel time.

Table C.2: Correlations of Travel Time and Abortion Rates

| | Travel Time | | | | |
|---|---|---|---|---|---|
| | (1) 1972 | (2) 1974 | (3) 1976 | (4) 1978 | (5) 1980 |
| Abortion Rate | -0.9028*** | -0.5057*** | -0.5144*** | -0.3468*** | -0.2450 |
| | (0.1258) | (0.1155) | (0.1467) | (0.1088) | (0.1534) |
| N | 45 | 45 | 45 | 45 | 45 |

Notes: Linear regression of travel time on abortion rate per 1,000 reproductive age females 15-44. Only *Roe v. Wade* states are included. Robust standard errors are shown. ***, **, * represent statistical significance at 1, 5, and 10 percent levels.

# D Other Robustness Checks

## D.1 Factors that Predict Adoption

In this section, we use a Cox proportional hazard model to test whether the log of the mortality rate in the previous year predicts the state-level implementation of legal abortion. To consider this, we take a similar specification to Equation D.3. However, we use a Cox Proportional Hazard model and consider whether the lag of mortality predicts the timing of legal abortion. We use the lag of the log of mortality to avoid capturing the effect of legal abortion on mortality. We also include our standard set of controls. Table D.1 shows the hazard rate of adoption of legal abortion by state and over time. The log of the mortality rate in the prior year fails to predict the timing of legal abortion (once controls are added to the specification). This analysis bolsters our primary empirical strategy, by validating that adoption is not conditional on mortality. States did not systematically adopt legal abortion based on the evolution of mortality. While states with higher mortality overall may have adopted abortion earlier, this time-invariant level of mortality is accounted for by the state fixed effects.

Table D.1: Cox Proportional Hazard Model

| | Adoption of Legal Abortion | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ***Panel A: Maternal Mortality*** | | | | | | |
| L.Log(Maternal Mortality Rate) | 0.0503 | 0.0043 | | | | |
| | (0.0776) | (0.1346) | | | | |
| L.Log(Maternal Mortality Rate, White) | | | 0.0889 | 0.0870 | | |
| | | | (0.0621) | (0.1092) | | |
| L.Log(Maternal Mortality Rate, Non-white) | | | | | -0.1632 | -0.1417 |
| | | | | | (0.1407) | (0.1620) |
| N | 673 | 673 | 650 | 650 | 512 | 512 |
| Pseudo R-squared | 0.000 | 0.026 | 0.000 | 0.027 | 0.002 | 0.041 |
| ***Panel B: Abortion Mortality*** | | | | | | |
| L.Log(Abortion Mortality Rate) | 0.3311* | 0.7867 | | | | |
| | (0.1778) | (0.5415) | | | | |
| L.Log(Abortion Mortality Rate, White) | | | 0.1239 | 0.4175 | | |
| | | | (0.1246) | (0.4687) | | |
| L.Log(Abortion Mortality Rate, Non-white) | | | | | 0.1887 | 0.4479 |
| | | | | | (0.2602) | (0.7922) |
| N | 471 | 471 | 397 | 397 | 329 | 329 |
| Pseudo R-squared | 0.008 | 0.098 | 0.001 | 0.072 | 0.002 | 0.139 |
| State FE and Year FE | X | X | X | X | X | X |
| Controls | | X | | X | | X |

Notes: Results from a Cox Proportional Hazard model, considering whether the log of the previous year's mortality rate predicts the timing of adoption of legal abortion. The 'failure year' is the year after legal abortion passes (goes into effect) in each state. Rates represent the log of the mortality rate and are per 100,000 reproductive-aged females in each population (all, white, and non-white). L. denotes the lag. Our main set of state-level demographic controls includes the share of reproductive-age females who are 15-19 and white, the share of reproductive-age females who are 15-19 and non-white, the log of per capita income, the log of per pupil education spending, and the state-level share with a high school degree. We also include policy controls for state-level abortion reforms, access to the pill for minors, access to the pill generally, unilateral divorce legislation, state equal pay legislation, and the inverse hyperbolic sine of state-level inductions per 1,000 males 18-25. ***, **, * represent statistical significance at 1, 5, and 10 percent levels.

## D.2 Alternative Specifications

### D.2.1 Log-linear OLS Event Study

Our log-linear OLS specification appears similar to the Poisson model. For these alternative results, formally, we estimate the following equation:

$$\ln(\text{Mortality}_{st}) = \alpha + \sum_{m=-7}^{6} \beta_m \text{ Legal Abortion}_{sm} + \mathbf{X}'_{st}\gamma + \alpha_s + \eta_t + \epsilon_{st} \tag{D.1}$$

where $\ln(\text{Mortality}_{st})$ reflects the natural log of the mortality rate in state $s$ during year $t = 1959, ..., 1980$. All OLS regressions are weighted by the denominator of the rate, which is the number of reproductive-age females for the main specification. We choose to weight the regressions so that the estimates reflect the size of the population impacted by the legal framework. All other notation reflects Equation 1.

### D.2.2 Difference-in-differences

Throughout the main results, we prefer the event study to other approaches, such as a difference-in-differences specification, for several reasons (see Section 7.6 for the difference-in-differences results). The event study allows us to visualize the pre and post-period effects of legal abortion, allowing us to determine (1) whether there are pre-existing trends (or pre-trends) leading up to the passage of legal abortion, (2) whether there is a clear break in mortality with the passage of legal abortion, and (3) whether the treatment effect varies after the passage of legal abortion (Wolfers, 2006; Goodman-Bacon, 2021). However, throughout the results, we also show the difference-in-differences results and outline this alternative specification here.

**Difference-in-differences in a Poisson Model** In additional results, due to the substantial number of zeros in abortion-related mortality, for our main difference-in-differences results, we assume a Poisson distribution (similar to Equation 1). Thus, we estimate:

$$\text{Mortality}_{st} = exp(\alpha + \beta \text{ Legal Abortion}_{st} + \mathbf{X}'_{st}\gamma + \alpha_s + \eta_t)\epsilon_{st} \tag{D.2}$$

where all notation reflects Equation 1, except $\text{Legal Abortion}_{st}$ captures the grouped post-period, or the legal abortion for all years after legal abortion goes into effect. $\text{Legal Abortion}_{st}$ includes both the early legalization of abortion in repeal states as well as the 1973 passage of Roe v. Wade. $\text{Legal Abortion}_{st}$ is a dummy variable that is equal to one in the year $t$ (on onward) that state $s$ passed legal abortion, and zero in the years before the abortion law

passed. All other features of Equation D.3 reflect Equation 1.

We also modify this equation in the mechanisms section to be at the county level, $\text{Mortality}_{ct}$. In this specification, we replace state fixed effects, $\alpha_s$, with county-level fixed effects, $\alpha_c$. In the county-level specification, standard errors are clustered at the county level instead of the state level.

**OLS Difference-in-differences** We also rely on OLS in several specifications, most notably, the results considering alternative functional forms. Formally, this difference-in-differences approach is expressed as:

$$\text{Mortality}_{st} = \alpha + \beta \text{ Legal Abortion}_{st} + \mathbf{X}'_{st}\gamma + \alpha_s + \eta_t + \epsilon_{st} \tag{D.3}$$

where the notation in Equation D.3 reflects Equation D.2. Another notable adjustment is that we weight OLS regressions by the denominator of the mortality rate. In most cases, this denominator is the number of reproductive-age females, 15-44.

# E Additional Background Information

## E.1 Declines in Maternal Mortality, 1900-1960

The leading cause of maternal mortality at the start of the twentieth century was "childbed" or puerperal fever (Anderson et al., 2020). Until 1937 (with the advent of sulfa drugs), there was no cure for puerperal fever, only preventative measures through hand-washing and the cleaning of instruments. In 1920, 40% of maternal mortality was caused by puerperal sepsis (or septicemia) (CDC, 1999; Albanesi and Olivetti, 2016). CDC (1999) reports that half of the cases of sepsis occurred directly following delivery while the other half occurred after an illegal abortion. The remaining major causes of maternal deaths included hemorrhage, toxemia, and obstructed labors (CDC, 1999; Albanesi and Olivetti, 2016). Over 1900-1930, maternal mortality showed few improvements, hovering around seven deaths per 1,000 (or 700 deaths per 100,000) (Albanesi and Olivetti, 2016).

Before the medical advancements of the 1930s and onwards, the largest contributor to improved maternal mortality occurred through public health preventive measures. Public health measures include the advent of prenatal care, which starting in the 1920s lowered deaths from toxemia (Albanesi and Olivetti, 2016). Regulatory reforms also targeted maternal mortality over this period. Hospital and state maternal mortality review boards helped to monitor maternal health conditions (CDC, 1999). Further, state-level occupational licensing of midwives led to a reduction in maternal mortality by 6-7% over 1900-1940 (Anderson et al., 2020).

Then, between 1930 and 1950, significant medical progress produced substantial reductions in maternal mortality. In 1936, the establishment of blood banks allowed mothers to survive maternal hemorrhage for the first time (Albanesi and Olivetti, 2016). The most significant contributor to the decline in maternal mortality occurred through the discovery of sulfa drugs (between 1937 to 1943) (Thomasson and Treber, 2008; Jayachandran et al., 2010; Albanesi and Olivetti, 2016). Jayachandran et al. (2010) shows that the discovery of sulfa drugs reduced maternal mortality by 24-36%. Sulfa drugs not only lowered deaths from puerperal fever, but they also improved the survival rate from live-saving medical procedures such as cesarean section (Thomasson and Treber, 2008). Finally, the medical advancement of penicillin in the early 1940s helped further reduce maternal deaths from sepsis (Albanesi and Olivetti, 2016).

## E.2 A Brief History of Abortion Laws in the United States

Abortion at the founding of the United States was legal until quickening (the first fetal movement felt by the mother) (Roe v Wade, 1973; Law et al., 1989; Rubin, 1994). This focus on abortion only until quickening was a practice based on English common law (Mohr, 1979; Gold, 2003). After quickening, abortion was considered a criminal offense (Mohr, 1979; Gold, 2003; Lahey, 2014a). The 1830s and 1840s brought the first U.S. laws regulating abortion. The new laws restricting abortion started as medical malpractice laws that targeted abortion practitioners instead of the mothers (Rubin, 1994; Reagan, 1997; Lahey, 2014a,b). Connecticut was the first state to pass an anti-abortion law, and "made it a crime to give a poisonous substance to a woman in order to cause a miscarriage" (Rubin, 1994, pg. 2). States that followed over the early 1800s passed "anti-poisoning statutes" (Law et al., 1989, pg. 66) and it became a crime to "administer such remedies" (Law et al., 1989, pg. 66).

As the 1800s progressed, state regulation became more stringent so that by the 1860s, many states were actively outlawing abortion (Mohr, 1979; Lahey, 2014a). Still, over the nineteenth century, abortion was common enough that performing "abortions became one of the first specialties in American medical history" (Law et al., 1989, pg. 63). But as the American Medical Association (AMA) grew in influence, physicians attempted to distinguish themselves from non-physician providers (Mohr, 1979; Lahey, 2014a). Thus, the AMA became the "single most important factor in altering the legal policies towards abortions in this country" (Law et al., 1989, pg. 63).

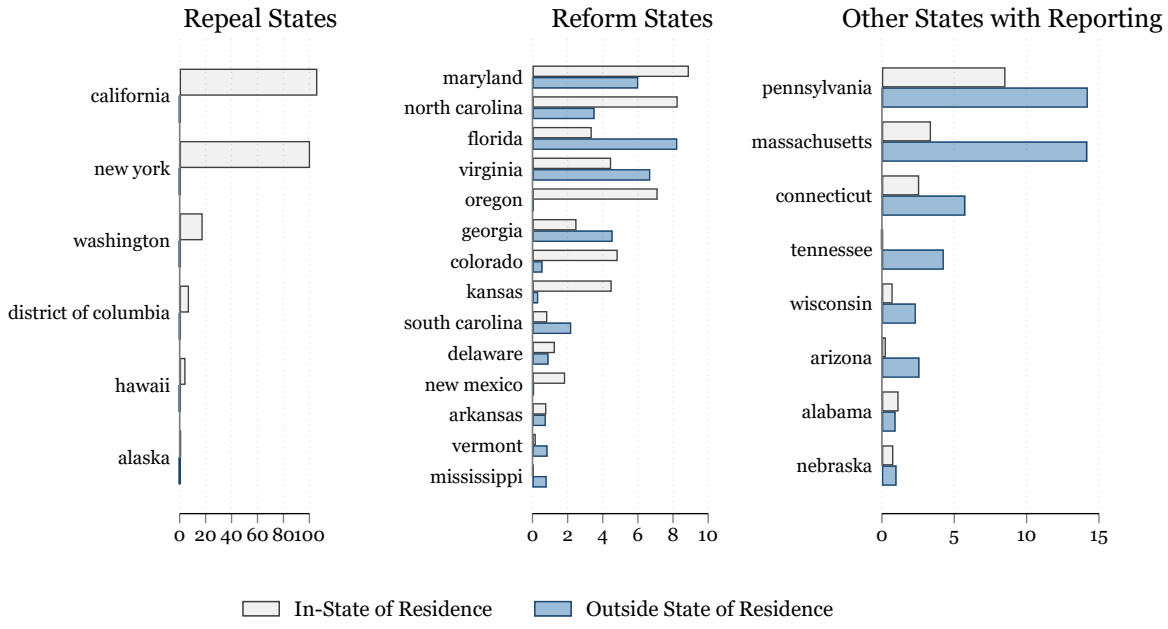
State laws outlawing abortion spanned 1840 to 1899, with women facing potential prosecution for obtaining an abortion (Mohr, 1979; Lahey, 2014a,b). As these criminal abortion laws went into effect, the years spanning 1880 to 1960 were "labeled 'the silent decades"' for abortion (Rubin, 1994, pg. 2). During this period, abortion was forced underground and ill-reported in public records. "Despite the criminalization of abortion nationwide, abortion continued" (Reagan, 1997, pg.20) and a substantial number of abortions still occurred, with some estimates suggesting as many as "one million illegal abortions a year" (Rubin, 1994, pg. 2). In fact, in 1871 NYC, the city's population of less than a million "supported two hundred full-time abortionists, not including doctors who sometimes performed abortions" (Law et al., 1989, pg. 64). The legal restrictions on abortion, "did not stop abortion, but made it furtive, humiliating, and dangerous" (Law et al., 1989, pg. 66).

## E.3 Speculative Evidence on Abortion Access in the Early 1970s

In 1969, the Centers for Disease Control and Prevention (CDC) began separately compiling, analyzing and disseminating statistics on legal abortion from each reporting area through-

out the United States in the form of periodic surveillance reports, under the Abortion Surveillance Program (Smith and Bourne, 1973; Cates et al., 1977). By 1972, the abortion surveillance program included data from 20 states (plus DC) with state-wide abortion data, as well as abortion data from single hospitals in eight non-reporting states (CDC, 1972).[1] An important relevant limitation of the data from the CDC abortion surveillance reports is that it does not span the nation, and thus, may depict incomplete and undercounted information (Koonin et al., 1993; Henshaw and Feivelson, 2000; Kortsmit et al., 2020; Myers, 2021b).[2] Still, this data provides the best historical picture of abortions occurring in the early 1970s. We digitize this CDC abortion surveillance program data to demonstrate that in the years before *Roe v. Wade*, abortion was still quite prevalent.

Figure E.1: Reported Abortion Counts by Residence State, Split by Abortions Occurring In-Residence State and Out-of-Residence State–CDC (1972)




Source: CDC (1972).
Notes: Counts reported in 1,000s. States sorted by total reported abortions, note the scaling differences between state groups. Reporting states with legal abortion include: Alaska, California, the District of Columbia, Hawaii, New York, and Washington. Reporting States with abortion reforms include Arkansas, Colorado, Delaware, Georgia, Florida, Kansas, Maryland, North Carolina, Oregon, South Carolina, Virginia, Vermont, and Mississippi. Other reporting states include Massachusetts. Single hospitals reporting include Alabama, Arizona, Connecticut, Nebraska, New Mexico, Pennsylvania, Tennessee, and Wisconsin.

In 1972 there were 586,760 known cases of legal abortion (versus 1,864,064 births) in 27

[1]Reporting states with legal abortion include: Alaska, California, the District of Columbia, Hawaii, New York, and Washington. Reporting States with abortion reforms include Arkansas, Colorado, Delaware, Georgia, Florida, Kansas, Maryland, North Carolina, Oregon, South Carolina, Virginia, Vermont, and Mississippi. Other reporting states include Massachusetts. Single hospitals reporting include Alabama, Arizona, Connecticut, Nebraska, New Mexico, Pennsylvania, Tennessee, and Wisconsin.

[2]The CDC abortion surveillance program, by design, relies on the voluntary cooperation of the state and local health departments to report the data on legal induced abortions (Smith and Bourne, 1973). This leaves scope for a wide range of variation in the reporting mechanism - some states may choose not to survey or report abortions, while some states may not require all abortion providers to report data, leading to underreporting (Saul, 1998).

states and DC, and the legal abortion to live birth ratio was 0.18 (CDC, 1972).As shown in Panel A of Figure A.1 abortions per reproductive-age female were highest in repeal (fully legal) states (both before and after *Roe v. Wade*). While abortion rates were more similar between reform states and states that never adopted any legal changes, reform states had slightly higher abortion rates. States without repeals or reforms also had the highest share of abortion occurring outside of the women's state of residence (as demonstrated by the dashed line in the darkest shade of blue in Figure A.1). In 1972, just before *Roe v. Wade*, 43% of all abortions occurred outside the individual's state of residence (CDC, 1972).

The prominence of out-of-state abortions is also demonstrated clearly in the 1972 abortion counts by residence state, shown in Figure E.1. Figure E.1 presents the total number of *known* abortions by state of residence, split into abortion in the state of residence and abortions outside the residence state. The lighter gray bars show abortions performed in the state of residence (for each state), and the darker blue bars show abortions performed outside the state of residence. The prominence of the darker blue bars in non-repeal states demonstrates that women commonly traveled outside their state of residence to obtain an abortion. The presence of lighter gray bars in non-repeal states also reveals that abortion access did exist in non-repeal states in the year just before *Roe v. Wade*.

# F Data Appendix

## F.1 Abortion and Maternal Causes of Death by ICD Code

We include deaths that occurred due to maternal causes (which includes abortion) and abortion-specific causes over the period of our analysis. The major ICD codes included in each of our mortality measures are shown in Table F.1.

Over the period of analysis, two major revisions to the ICD codes occurred. During the seventh revision, in place for 1958–67, maternal causes of death included ICD-7 codes 640–689 (Hoyert, 2007). In the eighth revision, applicable for 1968–78, maternal causes of death included ICD-8 codes 630–678. In the ninth revision, occurring in 1979–1998, maternal causes of death come from ICD-9 codes 630–677.[3]

For abortion-specific causes of death, during the 7th revision, abortion includes ICD-7 codes 650–652. During the 8th revision, abortion-related deaths include ICD-8 codes 640–645. Finally, in the ninth revision, abortion-related deaths include 634–639 (Hoyert, 2007; WHO, 2019). Abortion classifications change slightly between revisions to reflect the changing nature of abortion. To account for these adjustments, we take the larger header of "abortion deaths" as encompassing these changes in finer causes of abortion-related deaths.

Due to the changes in the specific causes of death, it is difficult to follow classifications of legal versus illegal abortion over time. For instance, in the ICD-9 version of the causes of death, abortion is separated into "spontaneous abortion," "legally induced abortion," and "Illegally induced abortion." However, in the ICD-7 codes, abortion is classified only as "Abortion without mention of sepsis or toxaemia," "Abortion with sepsis," "abortion with toxaemia, without mention of sepsis." These changes in the classifications of abortion deaths are a limitation of this data, making it difficult to track individual causes of abortion deaths.

Another important feature of the multiple cause of death data is the difference between death by residence and death by occurrence. For our main results, we show the results by residence instead of occurrence. If women traveled from their residence to obtain an abortion, we would want to capture the decline in these deaths based on the residence state due to their residence states' illegal status. Despite the concern over differences between deaths in the state of residence versus occurrence, the results are similar between the use of both. We suspect this is due to the fact that only a small share of deaths occur outside the resident state (Figure A.5).

[3] In addition to the underlying causes of death, the data includes grouped causes of death, which can also be used to ascertain maternal mortality (separately from the ICD codes).

In addition to the maternal and abortion-related deaths, we also show the effect of abortion on infant and neonatal mortality. We use the age at the time of death reported on the death certificates to compute the infant and neonatal rates. Infant mortality is measured as any death occurring to infants under one year of age. Neonatal mortality is defined as the death of an infant in the first month of life.

Table F.1: ICD-10 Codes in Each Cause of Mortality

| 7th Revision | 8th Revision | 9th Revision |
|---|---|---|
| 1959-1967 | 1968-1978 | 1979-1998 |
| **Panel A: ICD Definition of Maternal Deaths (All-cause)** | | |
| Complications of pregnancy (640-649) | Complications of pregnancy (630-634) | Ectopic and molar pregnancy (630-633) |
| Abortion (650-652) | Urinary infections and toxaemias of pregnancy and the puerperium (650-652) | Other pregnancy with abortive outcome (634-639) |
| Delivery without mention of complication (660) | Abortion (640-645) | Complications mainly related to pregnancy (640-648) |
| Delivery with specified complication (670-678) | Delivery (650-662) | Normal delivery and other indications for care in pregnancy, labour and delivery (650-659) |
| Complications of the puerperium (680-689) | Complications of the puerperium (670-678) | Complications occurring mainly in the course of labour and delivery (660-669) |
| | | Complications of the puerperium (670-677) |
| **Panel B: *Broad* Definition of Abortion-specific Deaths** | | |
| Other infections of genito-urinary tract during pregnancy (641) | Infections of genital tract during pregnancy (630) | Hydatidiform mole (630) |
| Other haemorrhage of pregnancy (644) | Ectopic pregnancy (631) | Other abnormal product of conception (631) |
| Ectopic pregnancy (645) | Haemorrhage of pregnancy (632) | Missed abortion (632) |
| Anaemia of pregnancy (646) | Anaemia of pregnancy (633) | Ectopic pregnancy (633) |
| Abortion (650-652) | Abortion (640-645) | Abortion (634-639) |
| Puerperal urinary infection without other sepsis (680) | Sepsis of childbirth and the puerperium (670) | Hemorrhage in early pregnancy (640) |
| Sepsis of childbirth and the puerperium (681) | | Antepartum hemorrhage, abruptio placentae and placenta praevia (641) |
| | | Infective and parasitic conditions in the mother classifiable elsewhere but complicating pregnancy, childbirth and the puerperium (647) |
| | | Major puerperal infection (670) |
| **Panel C: ICD Definition of Abortion-specific Deaths** | | |
| Abortion without mention of sepsis or toxaemia (650) | Abortion induced for medical indications (640) | Spontaneous abortion (634) |
| Abortion with sepsis (651) | Abortion induced for other legal indications (641) | Legally induced abortion (635) |
| Abortion with toxaemia, without mention of sepsis (652) | Abortion induced for other reasons (642) | Illegally induced abortion (636) |
| | Spontaneous abortion (643) | Unspecified abortion (637) |
| | Abortion not specified as induced or spontaneous (644) | Failed attempted abortion (638) |
| | Other abortion (645) | Complications following abortion and ectopic and molar pregnancies (639) |

### F.2 Does the change to the ICD code impact mortality?

Over the period of analysis, two major revisions of the ICD codes occurred, ICD-7 to ICD-8 over 1968–78 and ICD-8 to ICD-9 over 1979–1998. This change in classification poses some concern in our baseline specification, where the switch from ICD-7 to ICD-8 occurred just before legal abortion took hold in the United States. In the literature, this change from ICD–7 to ICD–8 has been thought to have little impact on maternal mortality statistics (Hoyert, 2007). Hoyert (2007) also demonstrated that changes in ICD definition did not lead to major jumps in the maternal mortality rates, except for the change from ICD-9 to ICD-10, which is not included in our period of analysis. In the difference-in-differences results in Figure 6, we also show that omitting years before ICD-8 codes, and focusing on 1968-1978, has little impact on the point estimate of our results. Still, we further analyze whether the change to ICD-8 led to any noticeable change in mortality.

To consider whether ICD changes produced a change in mortality, we estimate the year-over-year changes in mortality in Table F.2. Table F.2 shows two different specifications considering whether the mortality rate changes from ICD-7 to ICD-8. First, in Panel A, we follow Equation D.2 and show the year-over-year change in mortality from 1967 to 1968, omitting year fixed effects but including state fixed effects. In the year-over-year specification from 1967-1968, the ICD-8 change suggests little evidence of a jump in mortality.

Second, in Panel B, we consider whether there is a break from the state-level trend from 1963-1972. The difference from Panel A is that multiple years are considered, and a state-level linear trend is added to the specification. Here again, the ICD-8 code produces little change in the number of deaths collected. Together, these findings suggest that the change to ICD-8 codes is not producing a statistically significant change in maternal or abortion-related mortality.

Table F.2: ICD Changes

| | Maternal Deaths | | | Abortion Deaths | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| | All | White | Non-white | All | White | Non-white |
| ***Panel A: Year-Over-Year Change 1967-1968*** | | | | | | |
| 1(Adoption of ICD-8) | -0.4876 | -1.1103 | -0.6342 | 1.7619 | 2.7877 | 0.1600 |
| | (0.5954) | (0.9650) | (1.0062) | (1.3710) | (2.5313) | (2.0856) |
| N | 102 | 98 | 84 | 72 | 60 | 54 |
| Pseudo R-squared | 0.820 | 0.737 | 0.743 | 0.610 | 0.513 | 0.462 |
| State FE | X | X | X | X | X | X |
| Controls | X | X | X | X | X | X |
| ***Panel B: Trend over 1963-1972*** | | | | | | |
| 1(Adoption of ICD-8) | -0.0289 | -0.0556 | -0.0000 | 0.0091 | 0.0180 | -0.0050 |
| | (0.0544) | (0.0831) | (0.0715) | (0.0975) | (0.1619) | (0.1482) |
| N | 510 | 509 | 489 | 480 | 459 | 419 |
| Pseudo R-squared | 0.813 | 0.738 | 0.772 | 0.663 | 0.563 | 0.590 |
| State FE | X | X | X | X | X | X |
| Controls | X | X | X | X | X | X |

Source: NCHS/NVSS/CDC Multiple Cause of Death Files, 1959-1980.

Notes: Poisson model with maternal and abortion deaths as the outcome and the exposure set to the female population 15-44 (all, white, non-white). The binary variable of interest captures the change in the ICD classification in 1968. Panel A shows year-over-year changes between 1967 and 1968 with only state fixed effects included. Panel B shows the results over 1963-1972, controlling for state-level linear trends and state fixed effects. Our main set of state-level demographic controls includes the share of reproductive-age females who are 15-19 and white, the share of reproductive-age females who are 15-19 and non-white, the log of per capita income, the log of per pupil education spending, and the state-level share with a high school degree. We also include policy controls for state-level abortion reforms, access to the pill for minors, access to the pill generally, unilateral divorce legislation, state equal pay legislation, and the inverse hyperbolic sine of state-level inductions per 1,000 males 18-25. Robust standard errors clustered at the state level. ***, **, * represent statistical significance at 1, 5, and 10 percent levels.

### F.3 Issues and Limitations with the Mortality Data

Two notable data issues exist in the raw mortality data. First, NJ has a substantial number of missing race values for 1962 and 1963. We replace the mortality by race as missing for NJ in 1963 and 1962 to account for the substantial number of observations with missing race. This missing race issue is present in the underlying raw data and noted in the codebook. Another issue is that in 1972 only, the mortality data represent a 50% sample. We thus, replace 1972 with double the underlying deaths to smooth the rates over time.

### F.4 Natality Data

We also add data on the number of births from the *Natality Detailed File* and U.S. Vital Statistics (NCHS, 1968-1980b; NVSS, 1959-1968). Pre-1968, the data is available at the state level from NVSS (1959-1968), but for 1968 and onward, we aggregate post-1968 data to the state level from individual birth certificates (NCHS, 1968-1980b). Two notable limitations of the Natality Detail File exist for our sample time frame. First, the microdata is only available from 1968 onward, limiting our ability to consider an extensive pre-period. Still, since all legalizations occurred from 1970 onward, the data allow us at least one pre-period for each state. Thus, due to the limited pre-legalization years in the sample, we consider the impact of early legalizations relative to *Roe v. Wade* using the IW specification (rather than TWFE). Second, the data are based on a 50% sample for specific years, with states gradually expanding from 1973 onward. This 50% sample does not affect our results because we use the average delivery characteristics by state for each year. Though, when we calculate the birth counts, we use double the births for the specific year noted as 50% samples in the NCHS codebooks NCHS (1968-1980b).

### F.5 County-level Data

In the mechanism section, Section 8, we perform a county-level analysis. For this analysis, we adjust the main data sources. First, we use county-level estimates of births and deaths from NCHS (1959-1980a), NCHS (1968-1980b), NVSS (1959-1968) (instead of the state level). Then, we use Bailey et al. (2016) to obtain the NCHS county codes and the county-level population of reproductive-age females. Though, a notable data limitation of Bailey et al. (2016) is that certain counties are missing population information.[4] To replace the missing population counts, we estimate the county population of reproductive-age females using state-level population shares from the Ruggles et al. (2021) combined with the county-level populations from Haines (2010). This population replacement only affects around 2,000 out of 68,000 observa-

[4] Alaska is missing for the entire sample, and we are unable to remove this information.

tions. Replacing the missing population information is important, as DC is notably missing the reproductive age-females for a portion of the analysis period. For the heterogeneity analysis, we use the 1960 population characteristics from Haines (2010); AHRF (1994), the 1960 information on hospital deliveries available in NVSS (1959-1968), and the 1971 information from Johnson et al. (1971).

## F.6 Specifics of Abortion Legislation

Table F.3: Abortion Legalizations–States that Repealed their Anti-abortion Statutes

| | Year | State | ACTION |
|---|---|---|---|
| 1 | 1969 | California | Legalized abortion |
| 2 | 1970 | New York | Legalized abortion |
| 3 | 1970 | Alaska | Legalized abortion |
| 4 | 1970 | Hawaii | Legalized abortion |
| 5 | 1970 | Washington | Legalized abortion |
| 6 | 1971 | District of Columbia | Legalized abortion |
| | January 22, 1973 | All states | Supreme Court decisions in Roe v. Wade |

Sources: CDC (1969-1980), Rubin (1994), Merz et al. (1996), Myers (2021a)

Table F.4: Abortion Reforms pre-Roe v. Wade

| | Year | State | Action |
|---|---|---|---|
| 1 | 1966 | Mississippi | Legalized abortion in cases of rape. |
| 2 | 1967 | Colorado | MPC reform |
| 3 | 1967 | North Carolina | MPC reform |
| 4 | 1967 | California | MPC reform |
| 5 | 1968 | Maryland | MPC reform |
| 6 | 1969 | Arkansas | MPC reform |
| 7 | 1969 | Delaware | MPC reform |
| 8 | 1969 | New Mexico | MPC reform |
| 9 | 1969 | Georgia | MPC reform |
| 10 | 1969 | Oregon | MPC reform |
| 11 | 1970 | South Carolina | MPC reform |
| 12 | 1970 | Kansas | MPC reform |
| 13 | 1970 | Virginia | MPC reform |
| 14 | 1972 | Florida | MPC reform |
| 15 | 1972 | Vermont | Court case on abortion |
| 16 | 1972 | New Jersey | Court case on abortion |

Sources: CDC (1969-1980), Rubin (1994), Merz et al. (1996), Myers (2021a)
Notes: MPC decriminalized abortion in cases of: danger to the mother's physical or mental health, a fetus with a physical or mental defect, and a case of rape or incest.

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