The Impact of Legal Abortion on Maternal Health: Looking to the Past to Inform the Present

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Michael F. Pesko[a]

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Introduction

Motivation

- Abortion became legal in U.S in the 1960s/1970s in a state-by-state approach
- In 1973 Roe v. Wade decision legalized abortion nationally
- *Legal abortion over this period has been demonstrated to affect a variety of economic outcomes* [1]
    - Family formation, fertility, crime, and schooling
- Fewer studies consider whether legal abortion impacts maternal health?[2]
    - Best available measures: *maternal and abortion-related mortality*

[1] Zabin et al. (1989); Angrist and Evans (1996); Levine et al. (1999); Donohue III and Levitt (2001); Kalist (2004); Guldi (2008); Foote and Goetz (2008); Ananat et al. (2009); Lahey (2014a,b); Myers (2017); Fischer et al. (2018), among others.

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Question: Can Abortion Legalization explain the decline

- In this study, we question:
  1. Did legal abortion impact maternal and abortion-related mortality?
  2. Does the impact of abortion differ by race?

Overview of the Present Study

- **Context:**
  - Focus on full legalization: repeal states–five states and DC–as well as the 1973 *Roe v. Wade* decision
  - Examine declines in maternal and abortion-specific mortality, 1959-1980

- **Strategy:**
  - Primary data from NCHS Multiple Cause of Death Files and population data from U.S. Census (IPUMS)
  - *Event-study design* with both *Two-Way Fixed Effects (TWFE)* and Sun and Abraham (2020) *Interaction-Weighted (IW) Estimator*

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Legal Abortion Most important for Non-white Mortality

- **Primary Finding:** Non-white women benefit the most from legal abortion[3]
    1. *Reduced non-white maternal mortality by 30-40%*
    2. Non-white abortion-specific mortality declines by 30-60%
- Unable to disentangle changes in white abortion-related mortality from the secular decline
- Early state-level legalizations crucial–and find less of an impact of *Roe v. Wade* decision

[3] Aligns with narratives of the time (e.g., Gold, 2003), and other related studies (e.g., Joyce et al., 2013; Myers, 2017).

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Previous Literature and Contribution

1. **Abortion Important for Economic Outcomes** [4]
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2. **Abortion Restrictions Matter**
    - Kane and Staiger, 1996; Joyce et al., 1997; Joyce and Kaestner, 2001; Levine, 2003; Klick and Stratmann, 2008; Sabia and Rees, 2013; Sabia and Anderson, 2016; Myers and Ladd (2020); Lindo and Pineda-Torres, 2021; Myers, 2021
3. **Abortion Access Linked to Maternal Health/Mortality**
    - Suggestive Trends in US: Cates et al., 1978; Bauman and Anderson, 1980; Grossman and Jacobowitz, 1981; Miller et al., 1988; Coble et al., 1992; CDC, 1999
    - Impact of Decriminalization in Mexico City: Betancourt (2017); Clarke and Mühlrad (2021)

[4] Other related literature: American Civil Rights Movement literature (e.g. Chay and Greenstone, 2000; Tamura et al., 2016; Thompson, 2019; Anderson et al., 2020); historical perspectives on maternal mortality (next slide)

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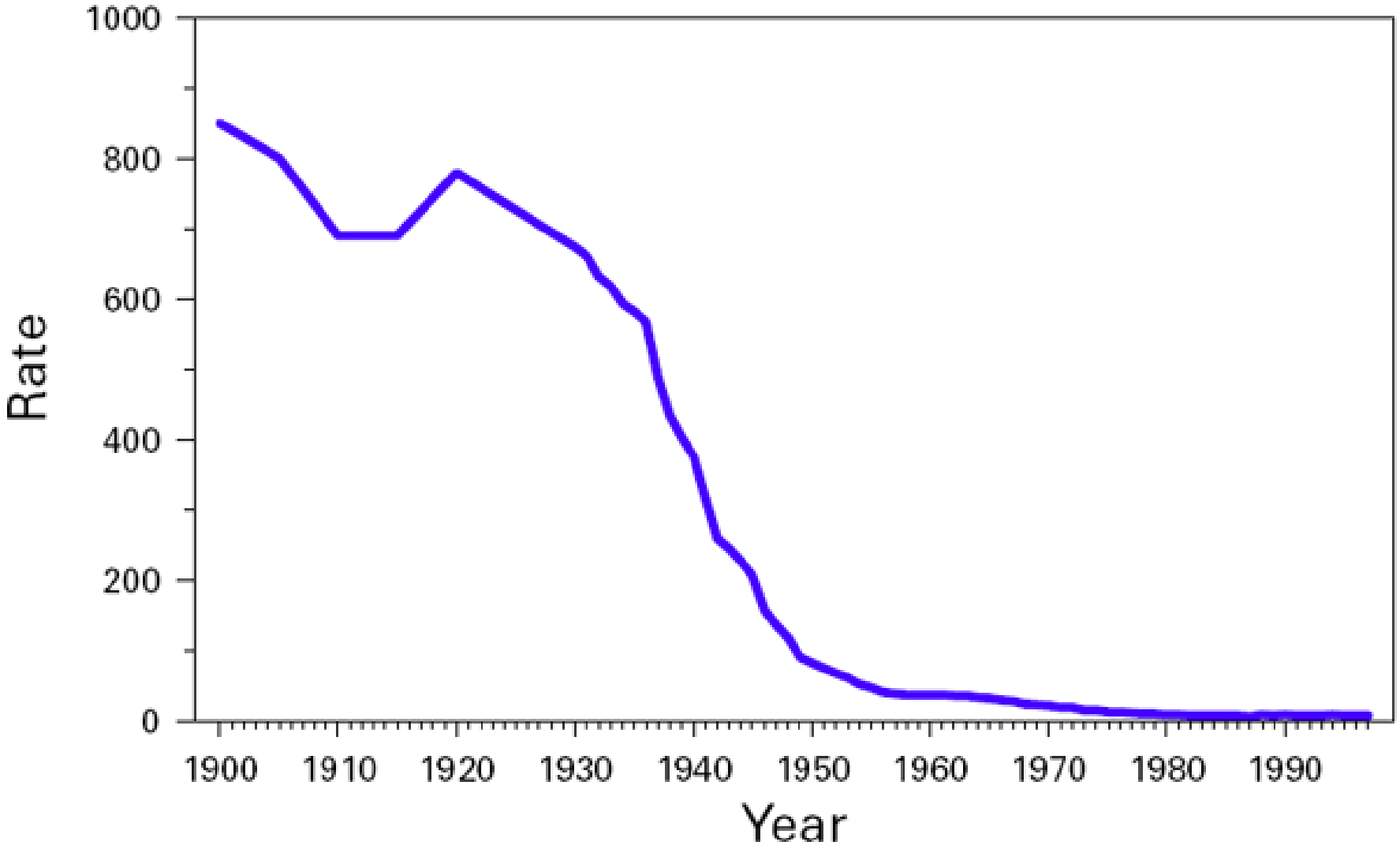
Contribution: One of the 1st studies to consider the impact of U.S. abortion legalization on maternal health

Historical Background–Maternal Mortality

FIGURE 2. Maternal mortality rate,* by year — United States, 1900–1997



*Per 100,000 live births.

SOURCE: CDC (1999)

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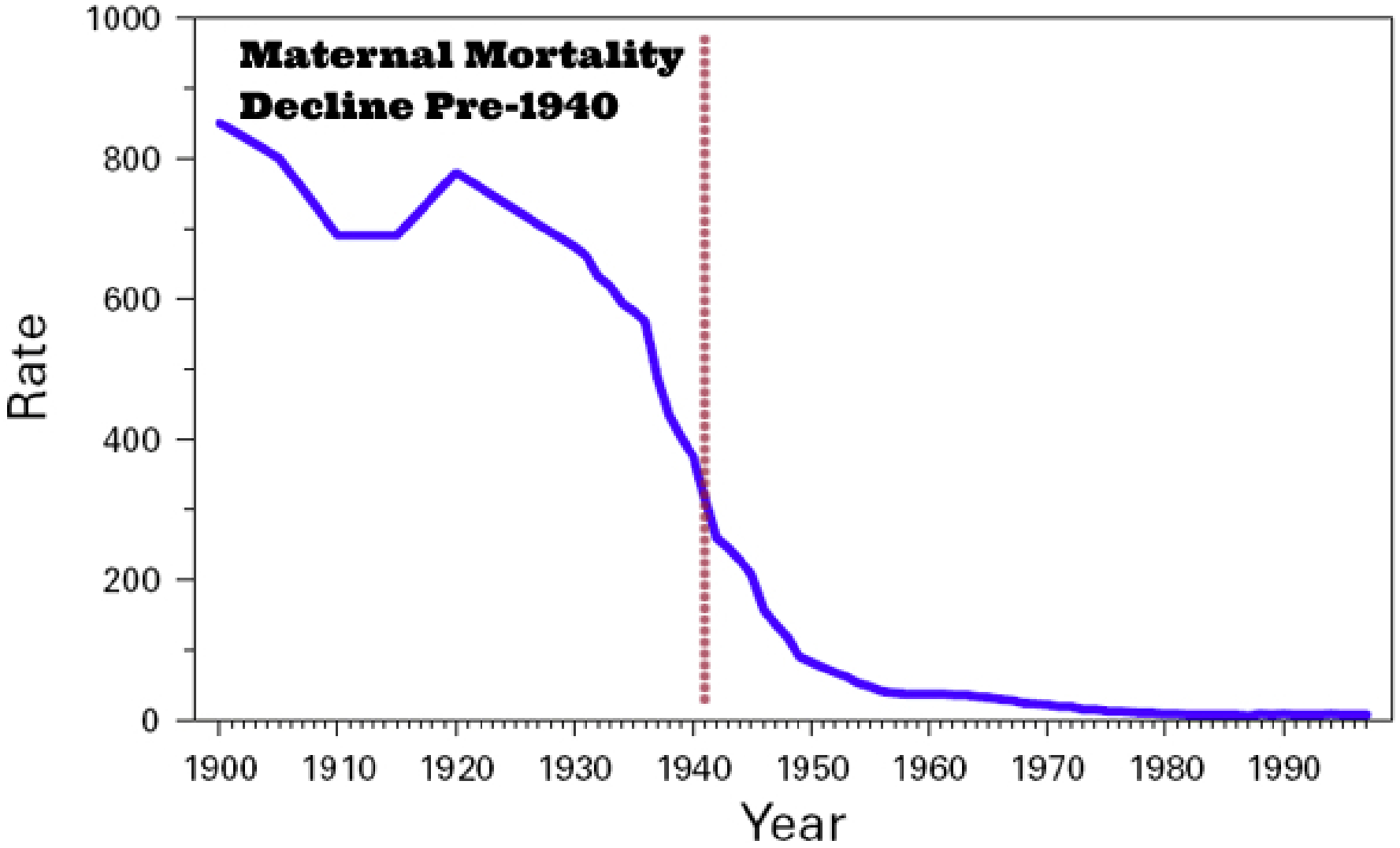

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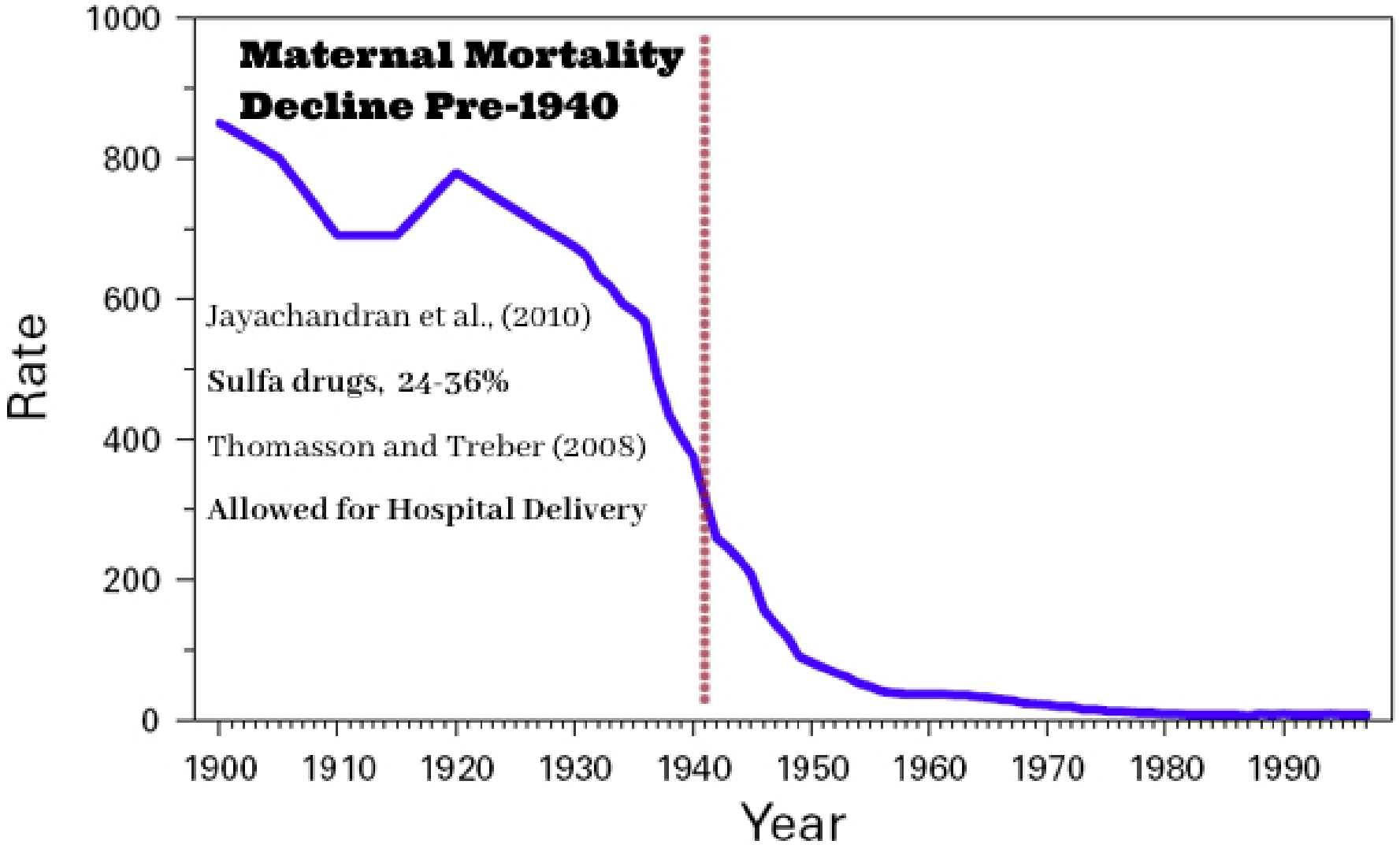

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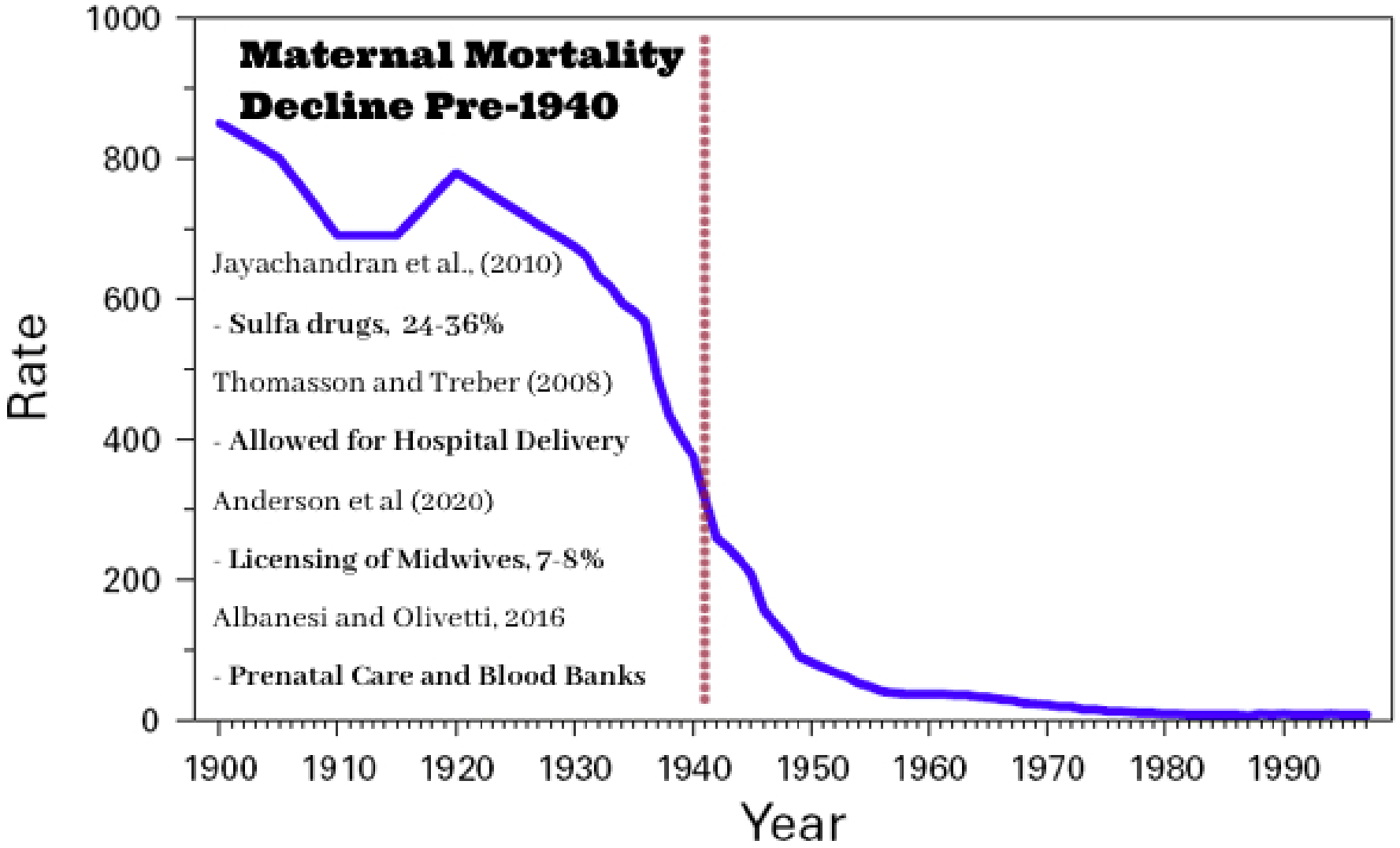

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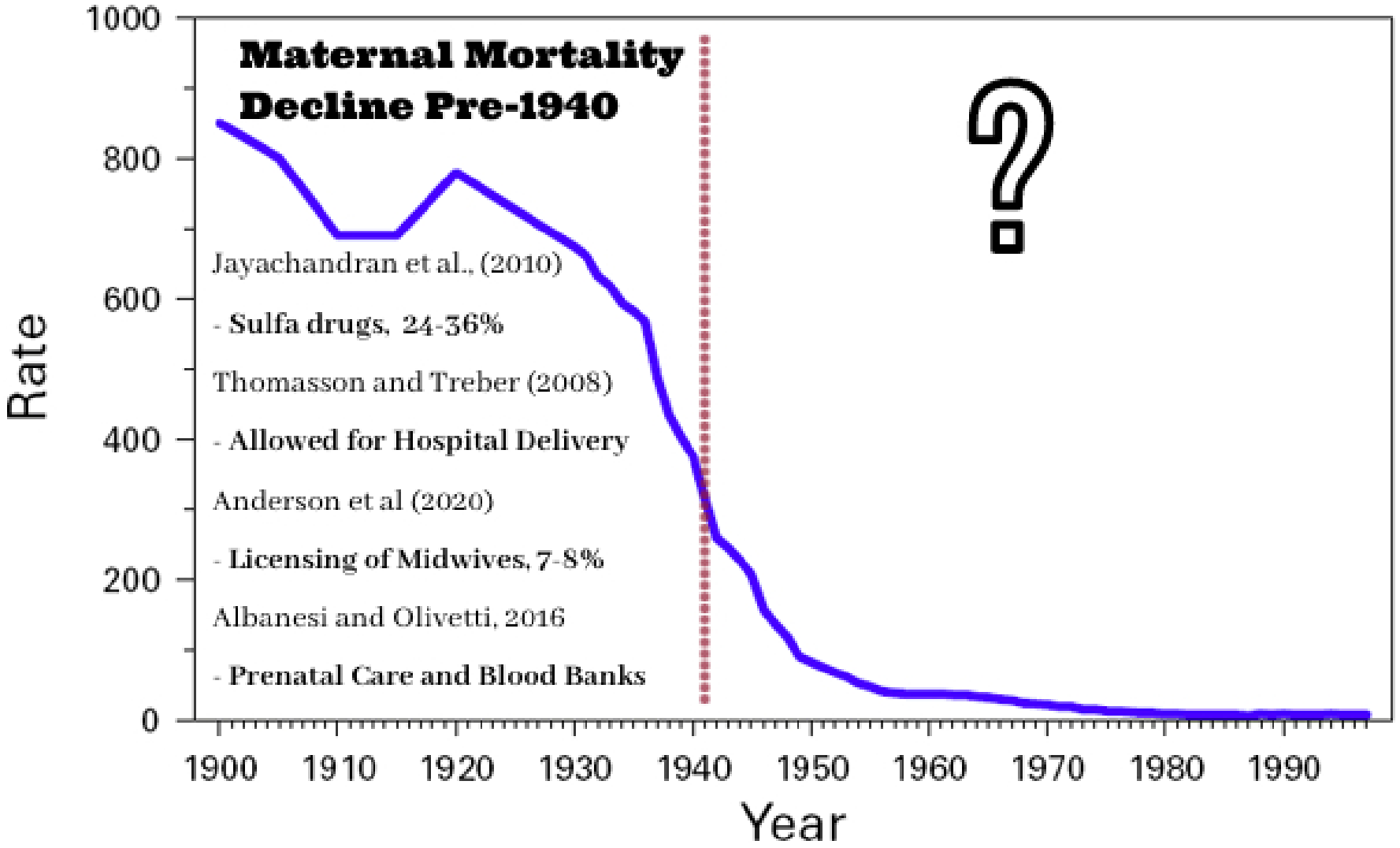

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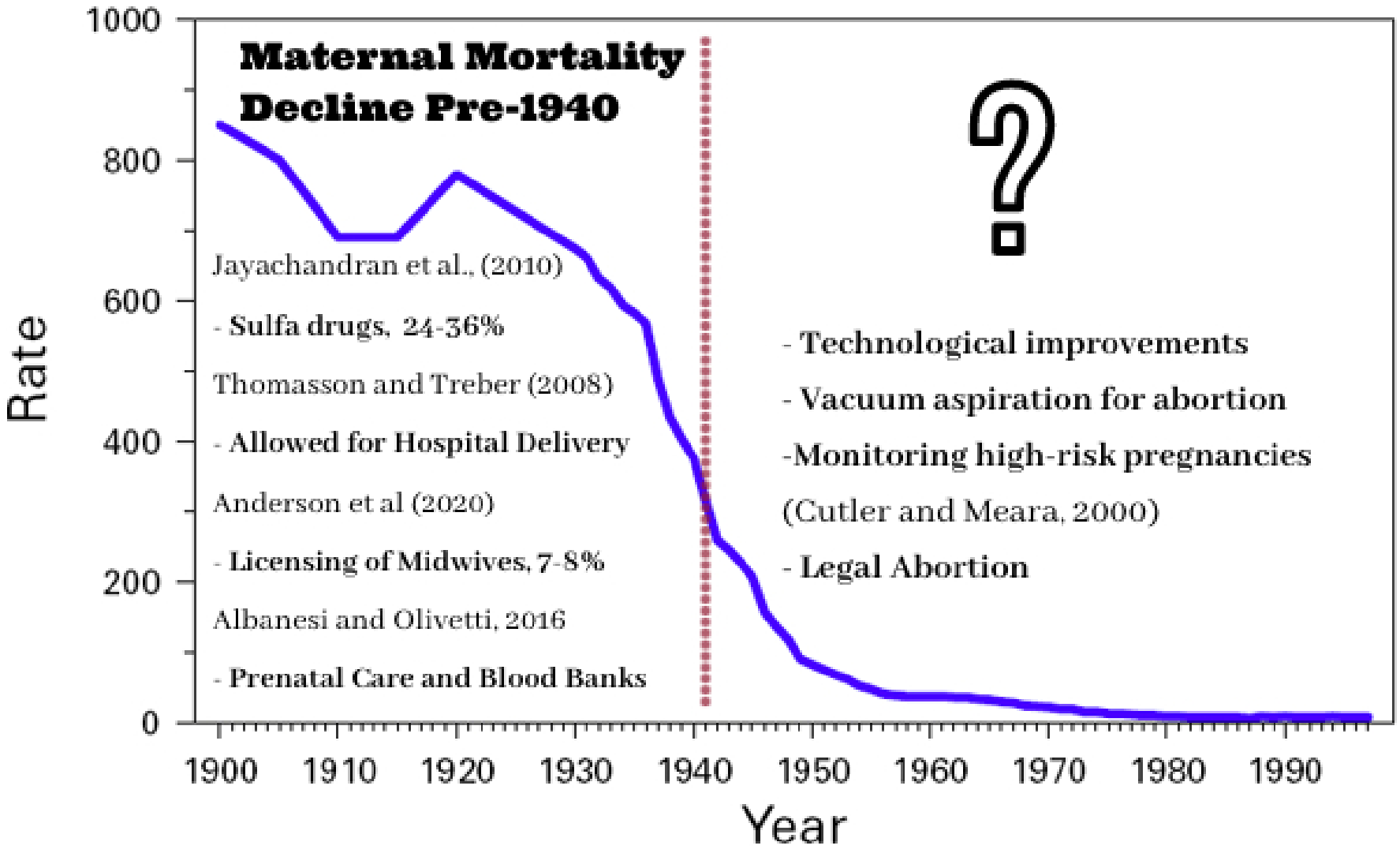

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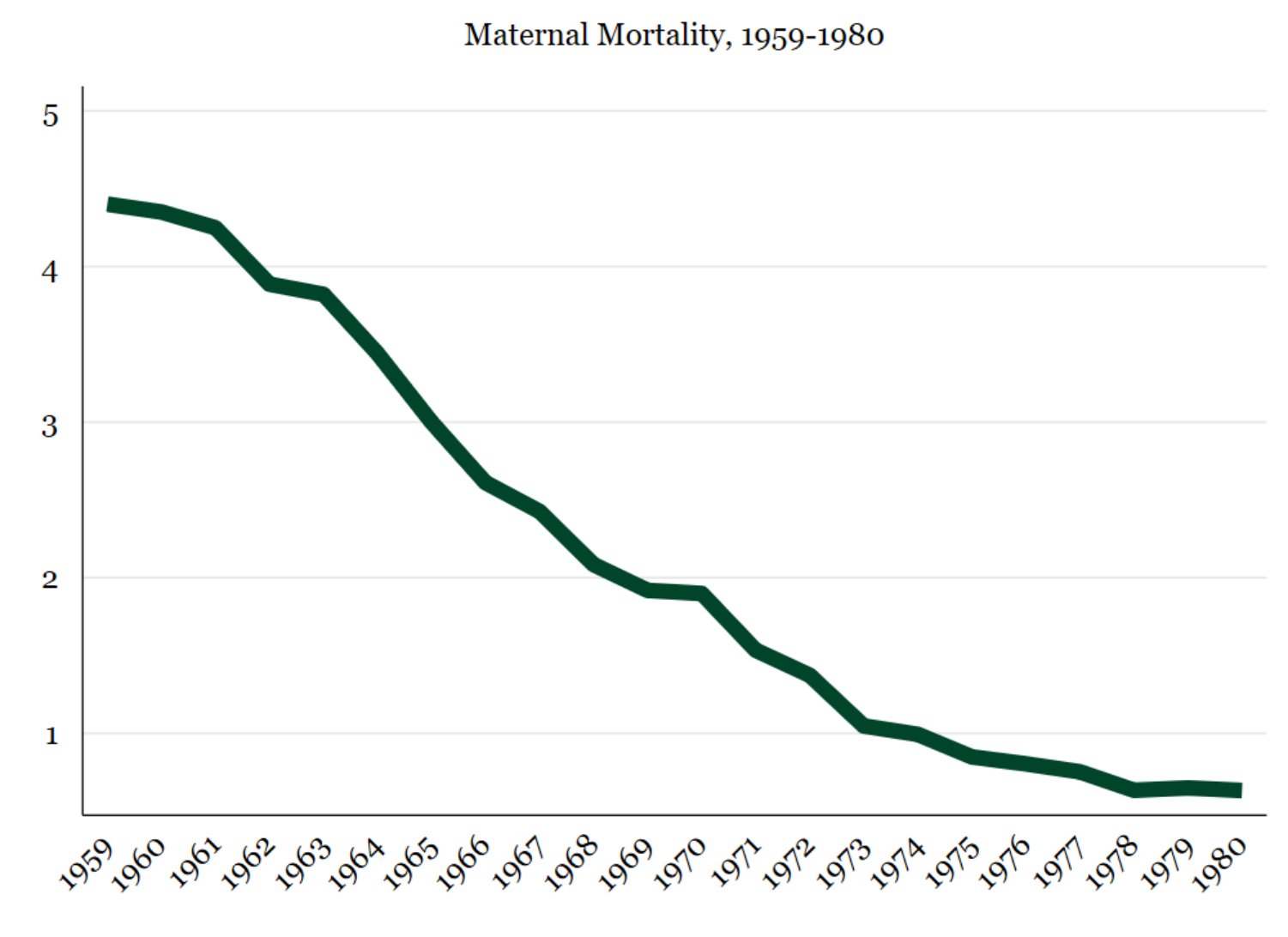
Decline in Maternal Mortality, 1959-1980



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

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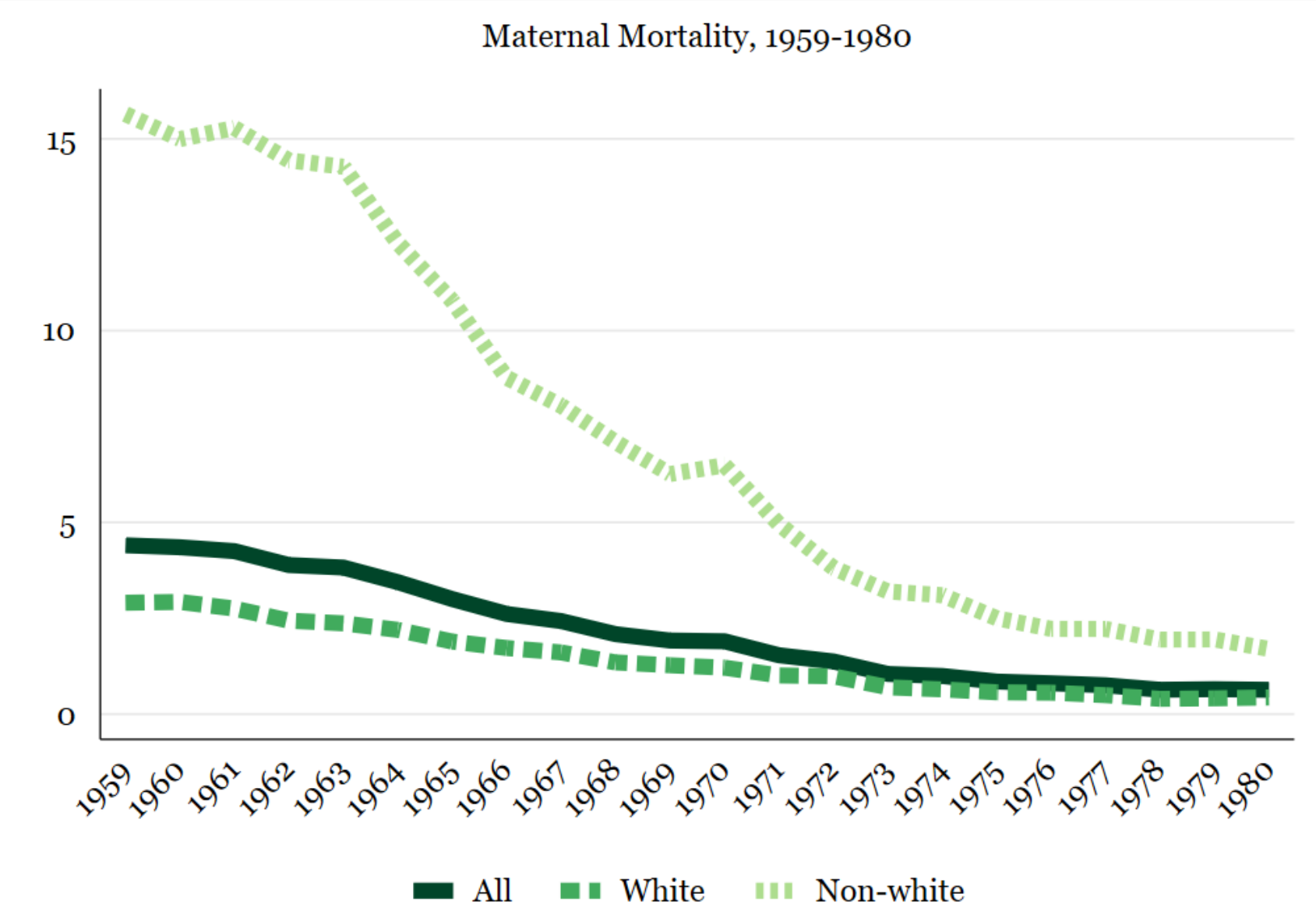

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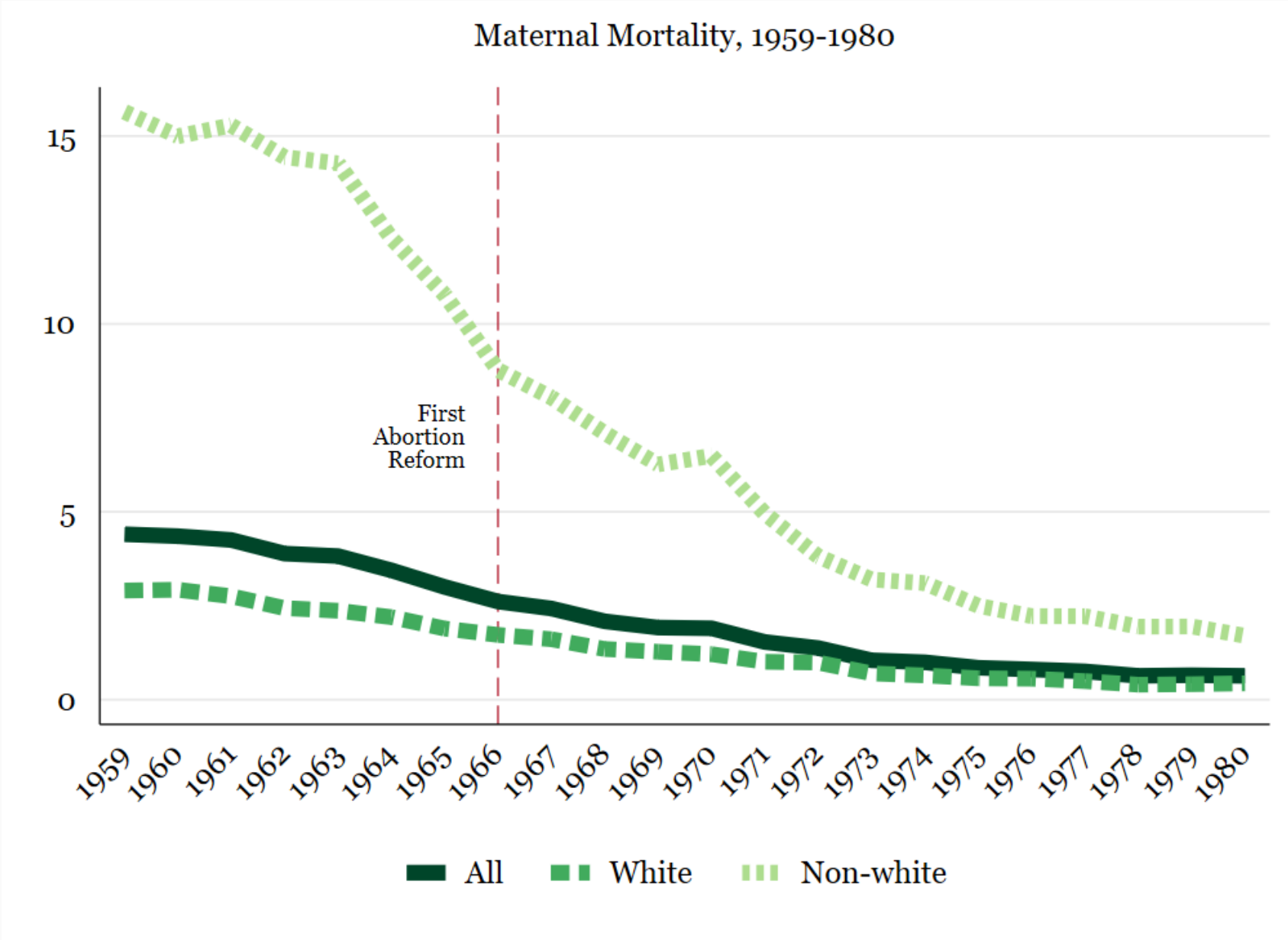

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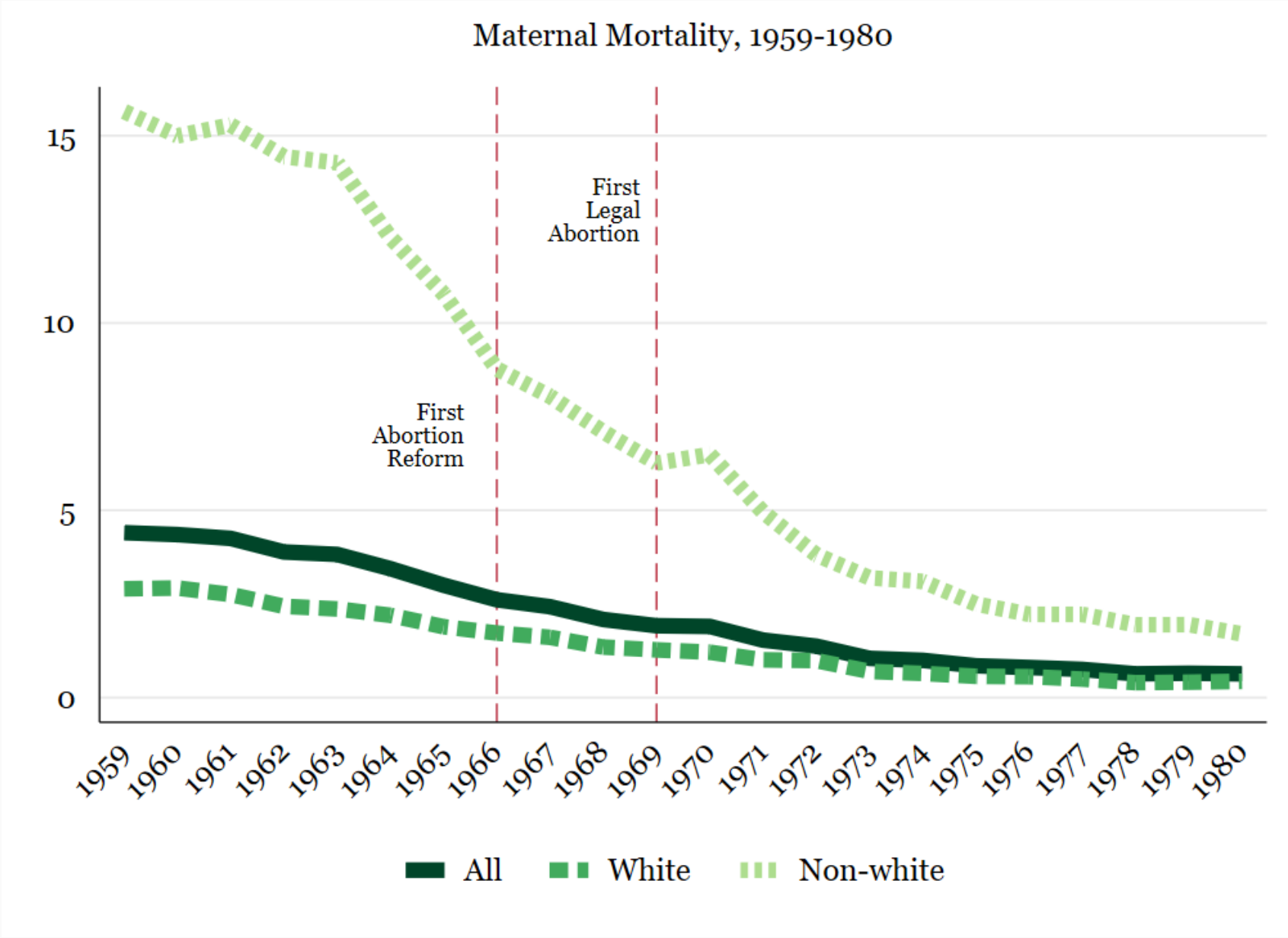

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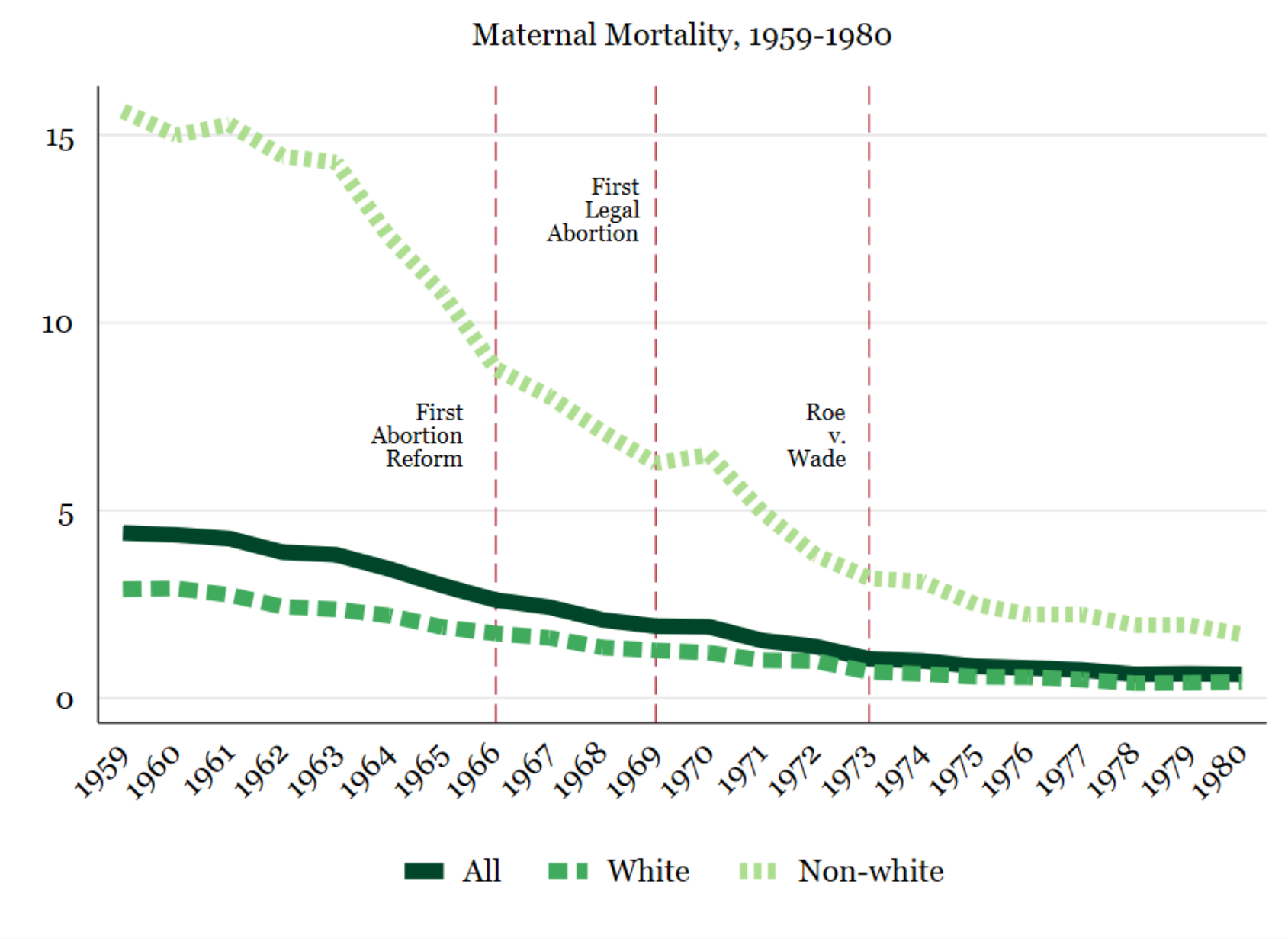
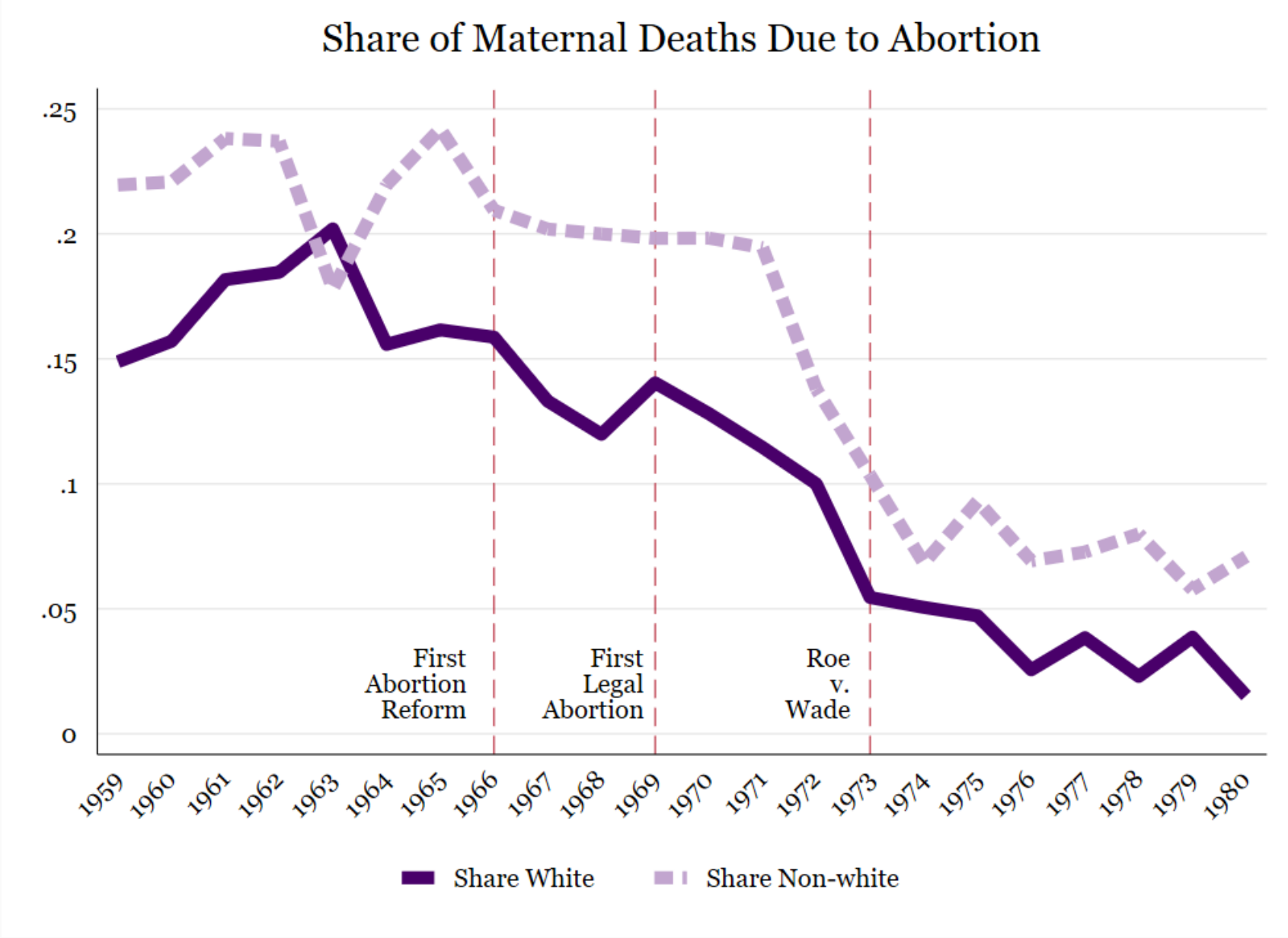


Abortion Deaths in the 1960s and 1970s



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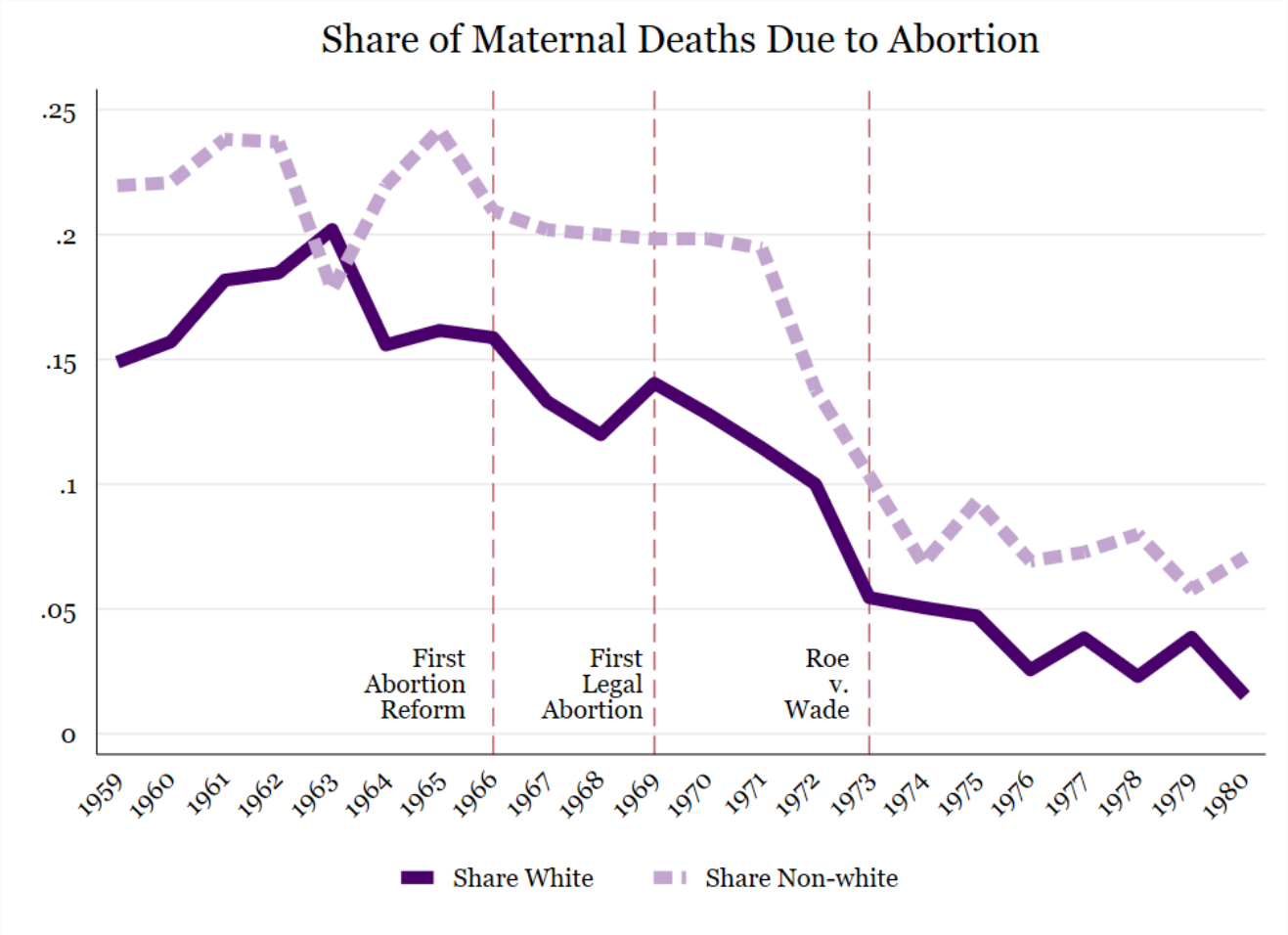
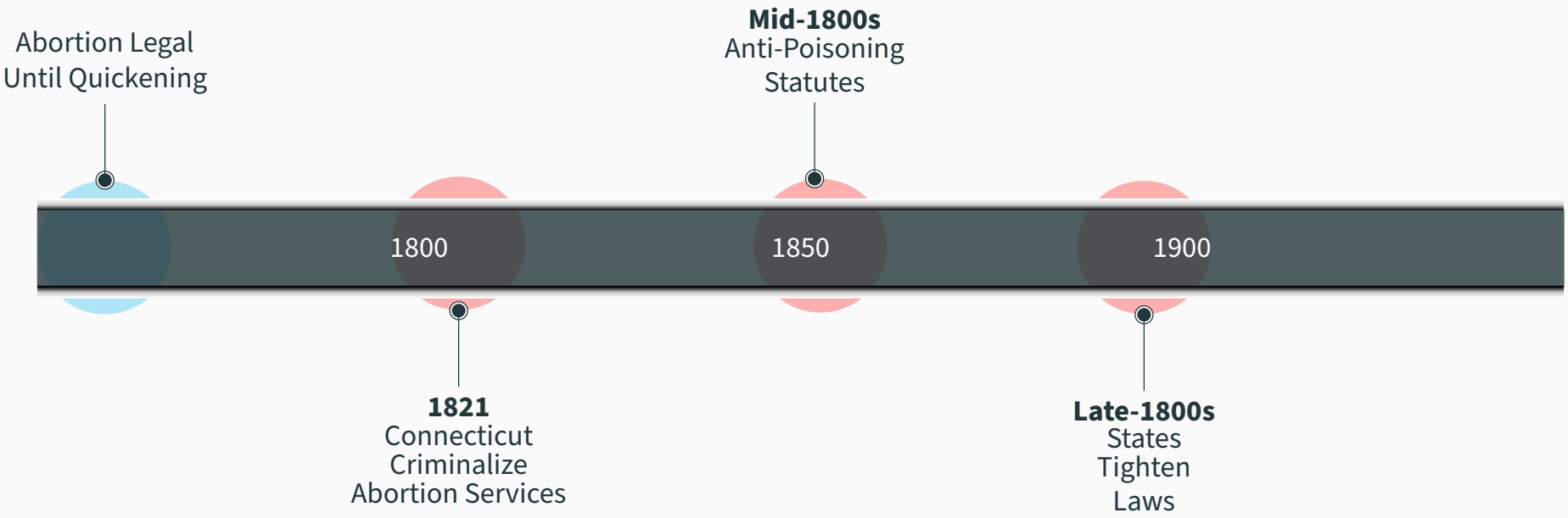


- In 1973 Supreme Court notes that abortion *"is now relatively safe"* with *"...mortality rates for women undergoing early abortions, where the procedure is legal, appear to be as low as or lower than the rates for normal childbirth"* (Roe v Wade, 1973).

Historical Background–Legal History

Abbreviated Timeline of Legal Abortion in the United States



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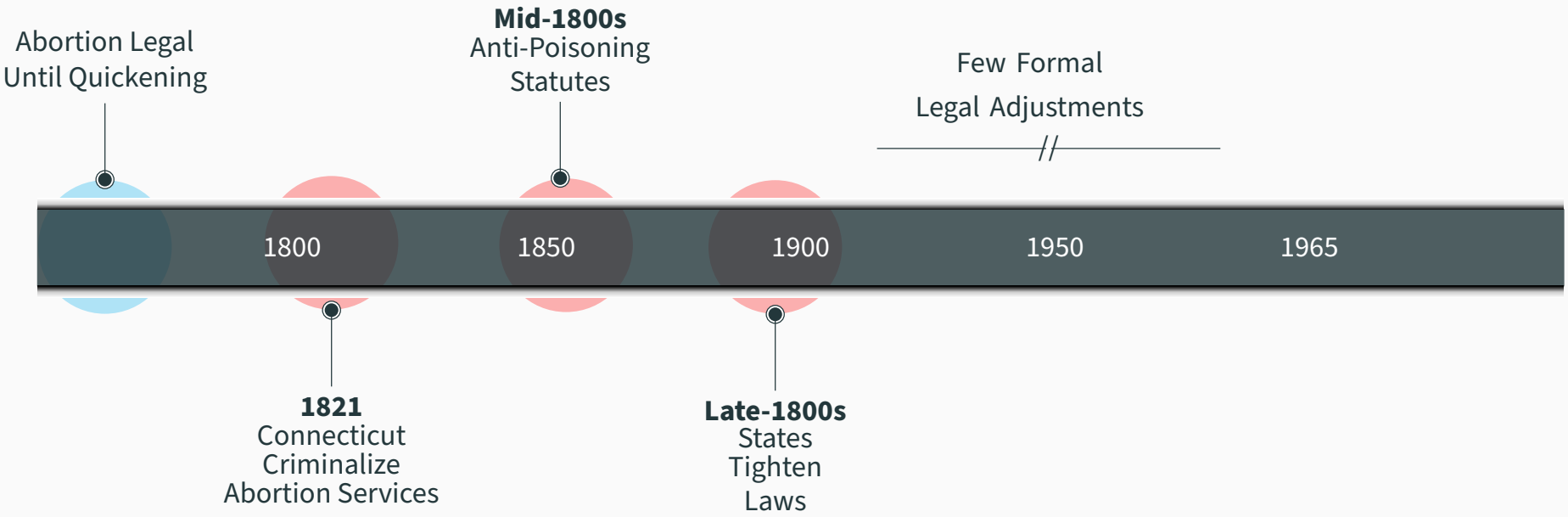

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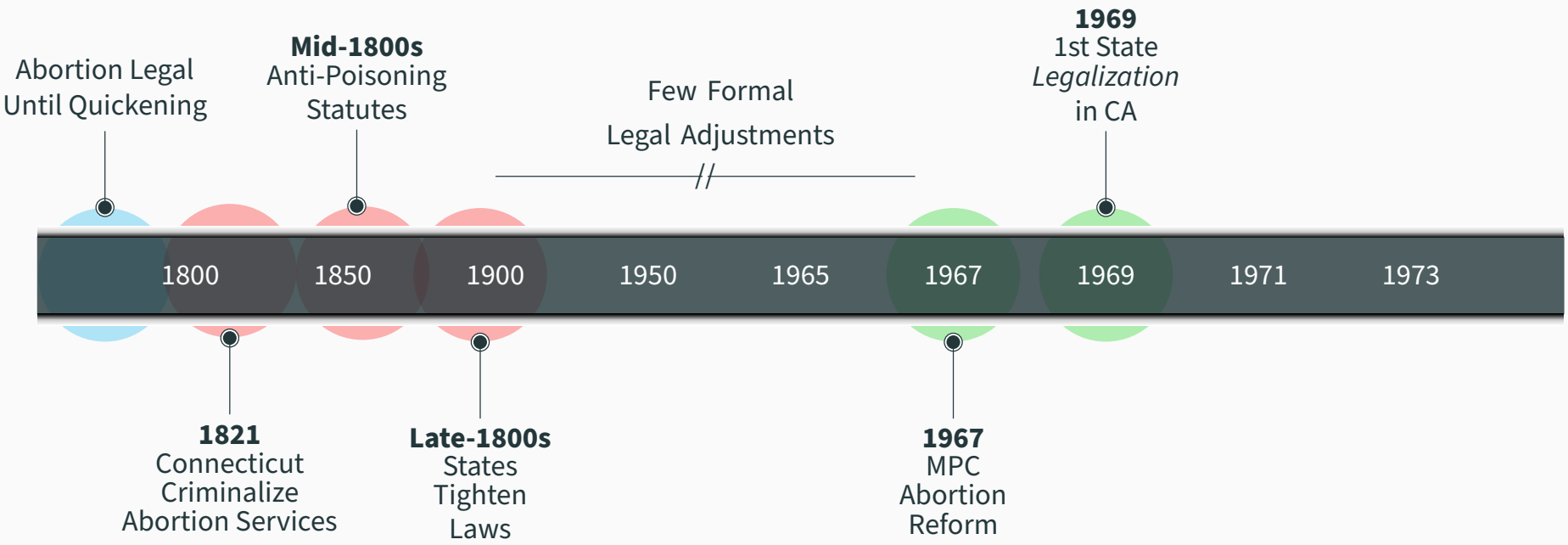

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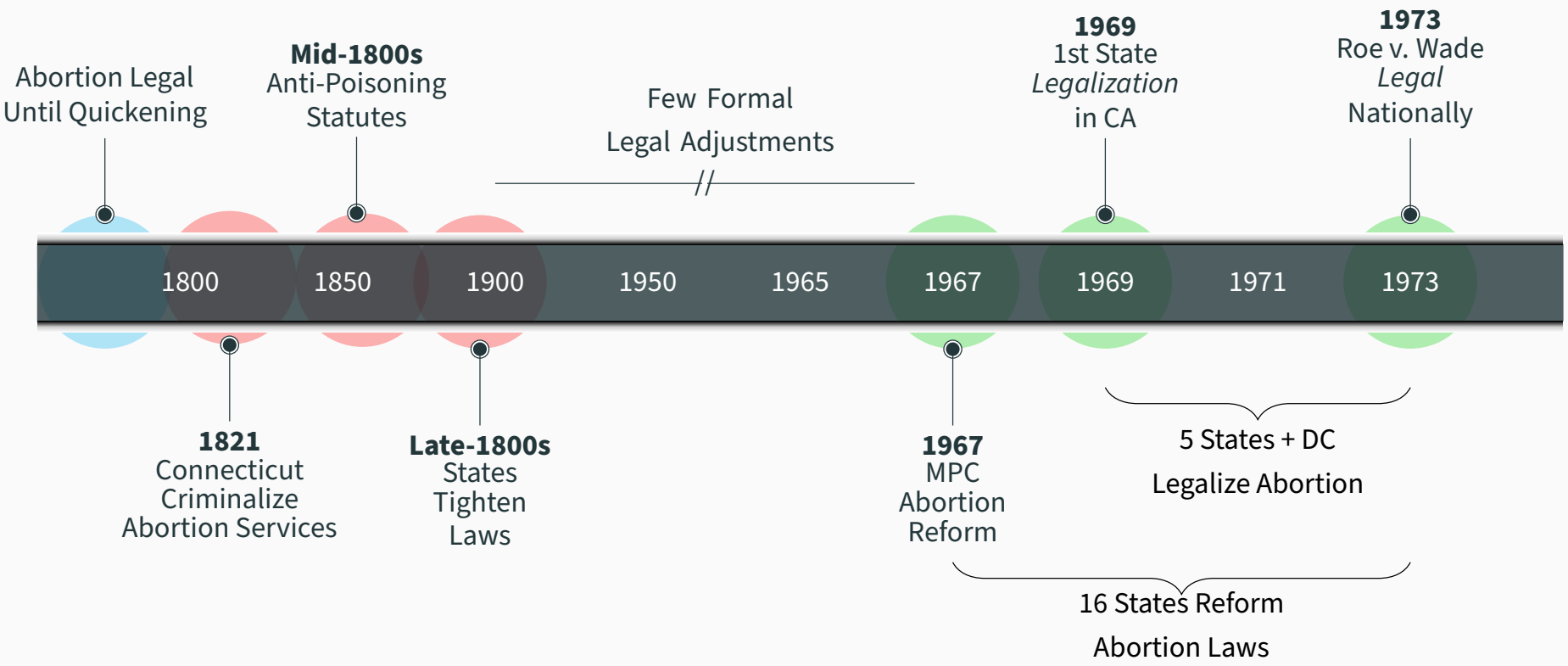


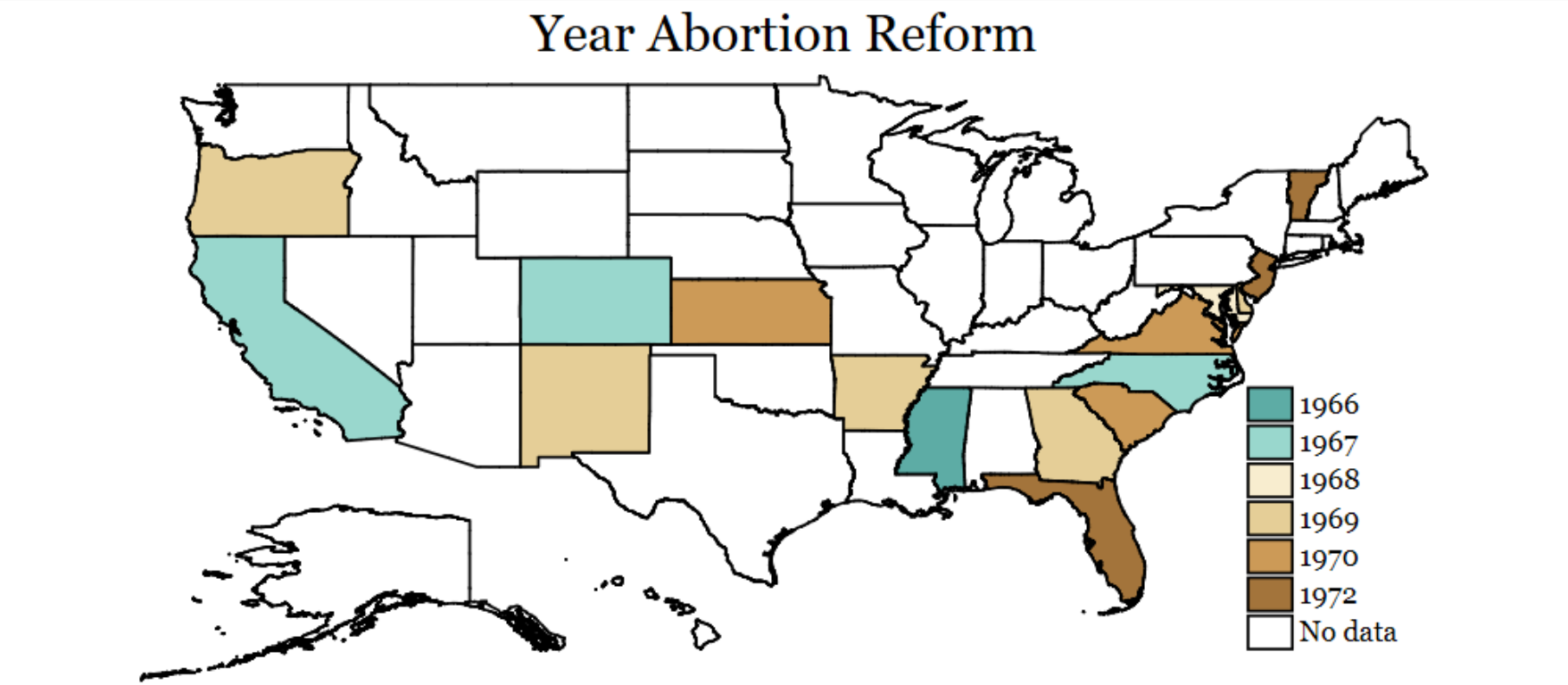
Data and Empirical Strategy

Legal Coding

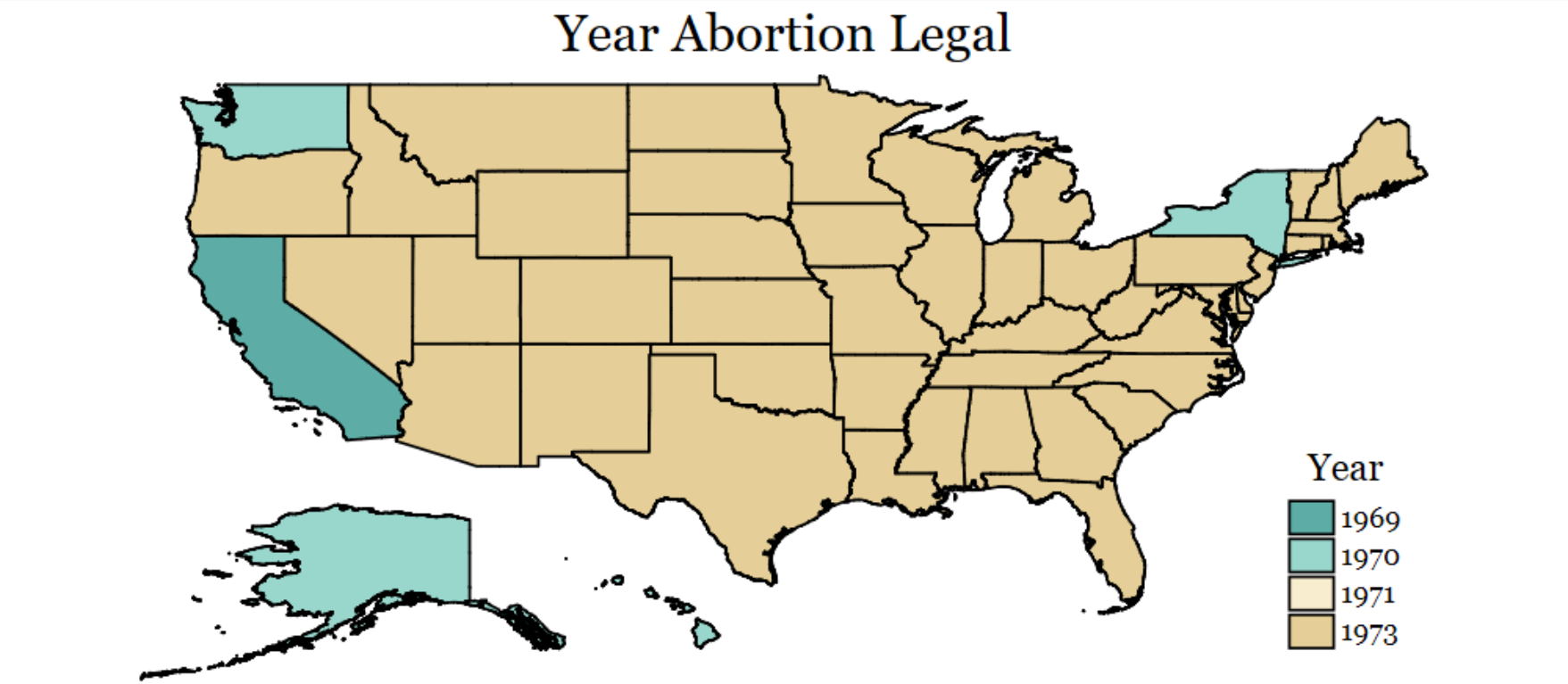
- Over 1966-1973, states liberalized abortion legislation:[4]

[4] Sources: CDC, (1969-1980), Rubin (1994), Mertz et al. (1996), Myers (2021)

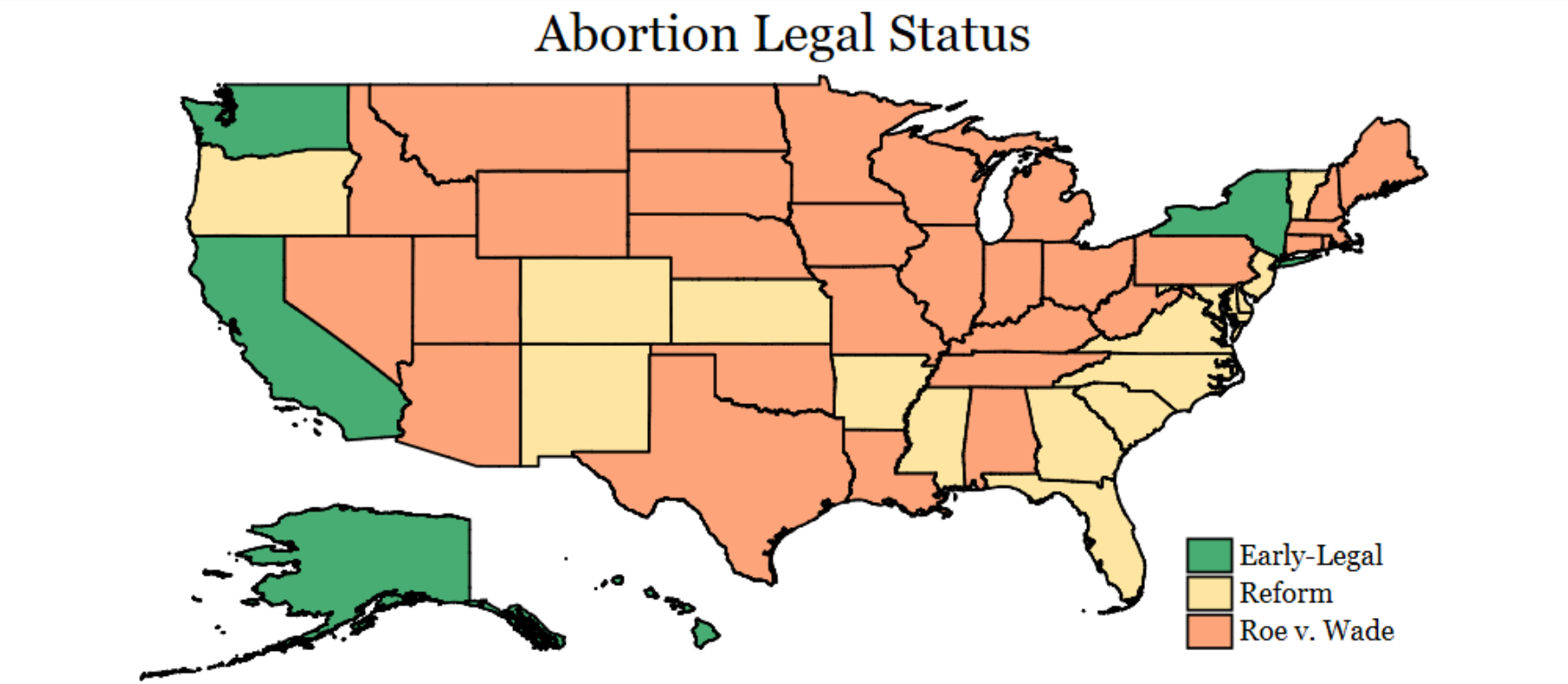
1. **Reform states**: Sixteen states permit abortion under certain circumstances, 1966-1972



2. **Repeal (early-legal) states:** removed their criminal abortion laws and passed clear legal abortion, 1969-1971
    - Five states plus DC



3. ***Roe v. Wade***: national legalization of abortion, 1973



Data

1. **Mortality Data**, 1959-1980
    - NCHS Multiple Cause of Death Files (NVSS/CDC and NBER)
2. **Population Composition**
    - U.S. Census data available from IPUMS (Ruggles et al., 2021)
3. **Births**
    - Bailey et al. (2016)
    - Natality Detailed File (NCHS, 1968-1980)
4. **Controls for Family and Fertility Policy**
    - *Unilateral divorce* — Wolfers (2006)
    - *Access to pill* and *minor's access to pill* — Myers (2021)
    - *State-level equal pay laws* — Myers (2017)

Main outcomes: Mortality over 1959-1980

- Measures of Mortality:
  1. *All-cause* maternal deaths
  2. *Narrow* abortion-specific deaths
  3. *Broad* abortion-specific deaths: using recategorized sepsis, hemorrhage, and ectopic pregnancies plus narrow abortion deaths

- Two Specifics About Maternal Mortality:
  1. Measure deaths per 100,000 reproductive-age females (15-44)
     - Instead of maternal deaths per birth
     - Fertility affected by abortion
  2. Use inverse hyperbolic sine (IHS) of mortality rate
     - *To capture proportional changes* & maintain zeros
     - In the appendix, we verify findings across other choices

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Empirical Strategy

Use an event-study specification for state s and year $t = 1959, \ldots, 1980$:

$$M_{st} = \alpha + \sum_{m=-7}^{6} \beta_m \text{ Legal Abortion}_{sm} + \mathbf{X}'_{st}\gamma + a_s + \eta_t + \epsilon_{st}$$

- M_{st} – inverse hyperbolic sine of maternal mortality rate
- $\text{Legal Abortion}_{sm}$ indicator variables (=1), capturing passage of legal abortion in state s during period $m = 0$
- $\mathbf{X}_{st}$ are state-level demographic controls – *share of reproductive-age females 15-19 who are white, those non-white, and the log of the mean family income; and relevant fertility and family policy controls*
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Specifics of Event Study

- Problem: All States Treated (No Control Group)
    1. **TWFE Estimator**
        - "bin" ($m = -7$ & $m = 6$) endpoints and omit -1 (Schmidheiny and Siegloch, 2020).
    2. **IW Estimator**—from Sun and Abraham, 2020
        - Leave endpoints "unbinned," and compare effect of early-legalization states to not-yet-treated Roe v. Wade States and omit -1
        - Deals with problems of TWFE (Callaway and Sant'Anna, 2020; Goodman-Bacon, 2021).
- Another issue: *Does mortality predict timing of legalization?*
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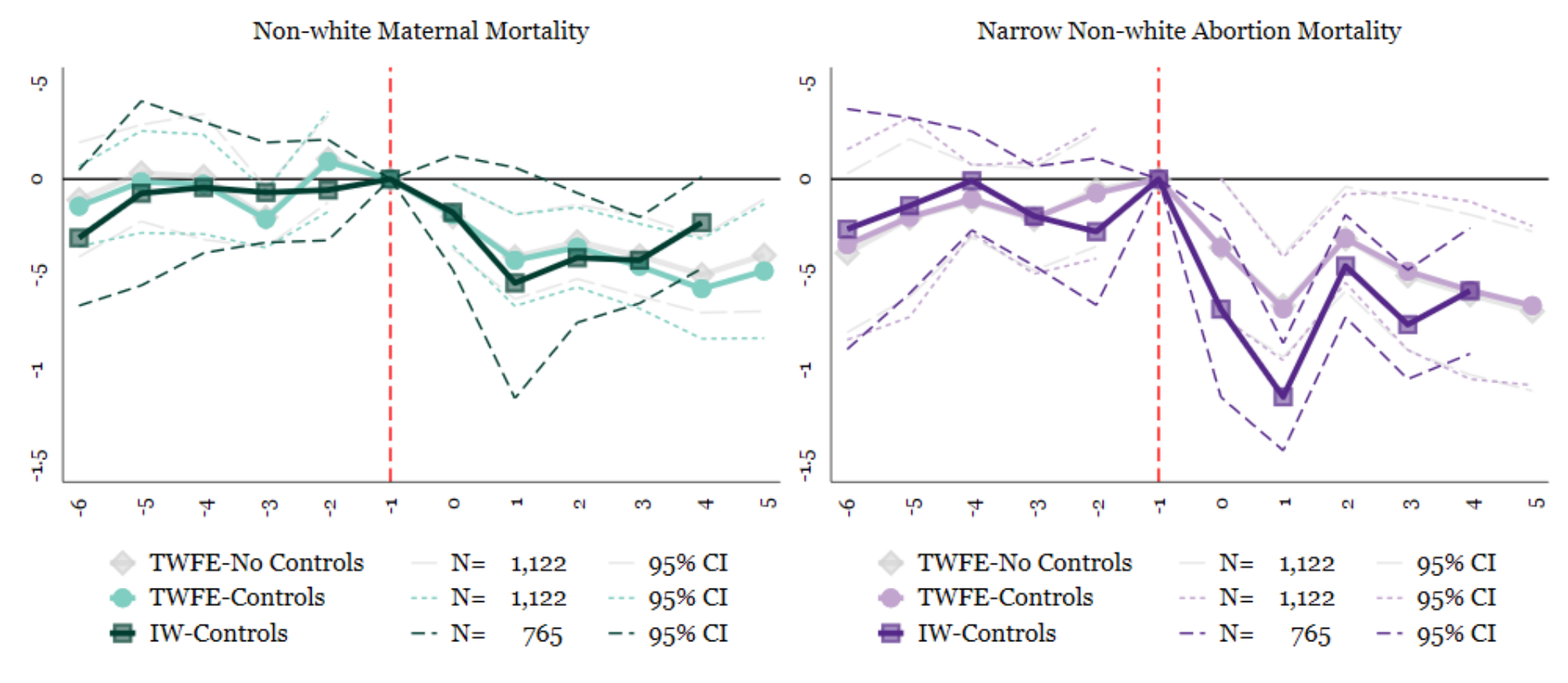
Findings

Event Study: Non-white Mortality



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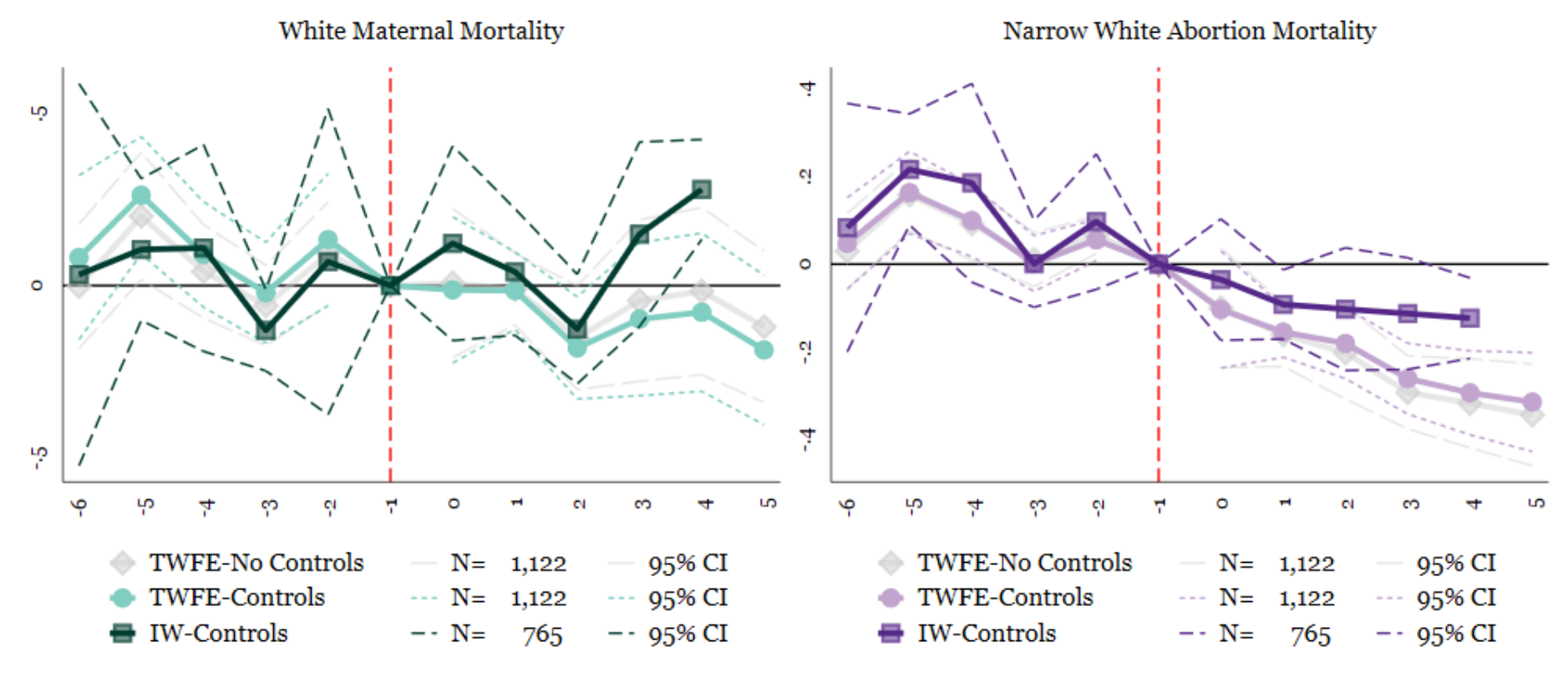
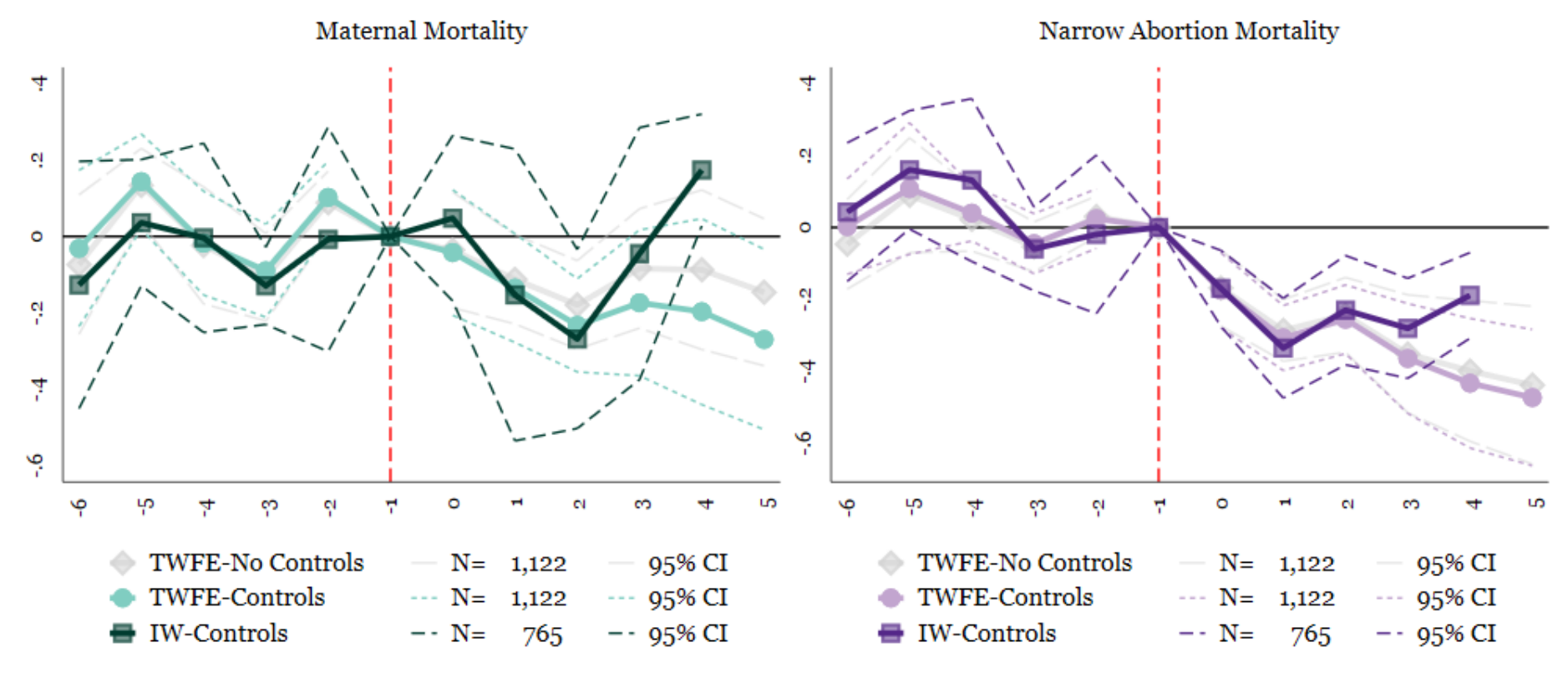
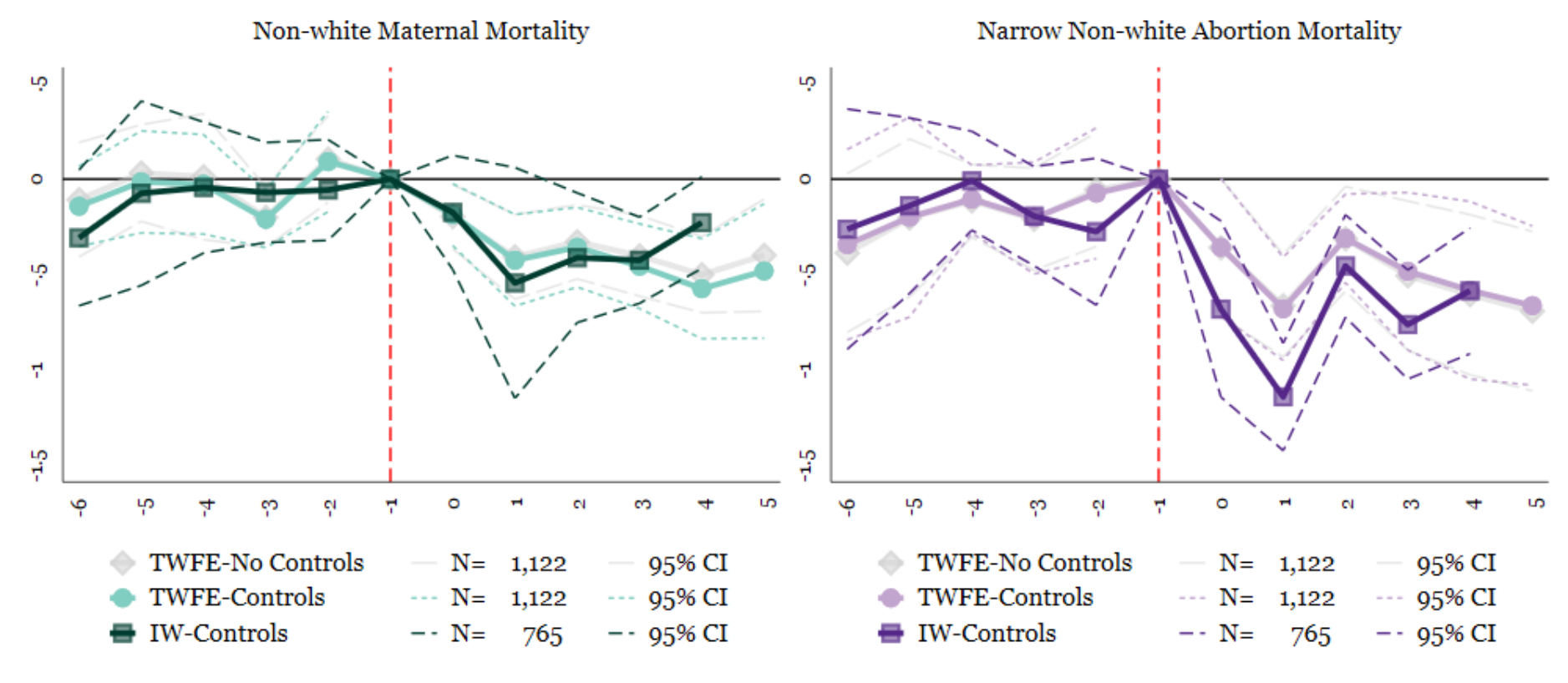


Event Study: All Mortality



Main Effect Isolated to Non-white Mortality



Essential Checks on the Main Findings

1. **Spillovers**: From early-legal or reform states Go
2. **Abortion Reforms**: Less important than legal abortion Go
3. ***De facto* Legalizations:** Potentially some effect, but not large Go
4. **Placebo and Misclassification Tests**
    - *Placebo test* using all-cause male mortality for those aged 15 to 44
    - *Test for Misclassification* using overall all-cause female mortality for women aged 15-44 Go
5. **Difference-in-differences**
    - Show ten variations of main specification Go
    - Check interactions: little interacting impact of other state-level policies

Skip

Roe v. Wade Effect versus Early Legalizations

- Main identification strategy relies on early-legal states (IW specification)
- Examine whether *Roe v. Wade* has a noticable impact
  - i *Already-treated* states as controls in TWFE specification Go
  - ii Proxy for demand for unsafe abortion using pre-reform mortality level
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- **Findings:** All suggest early legalizations have a clearer impact on mortality

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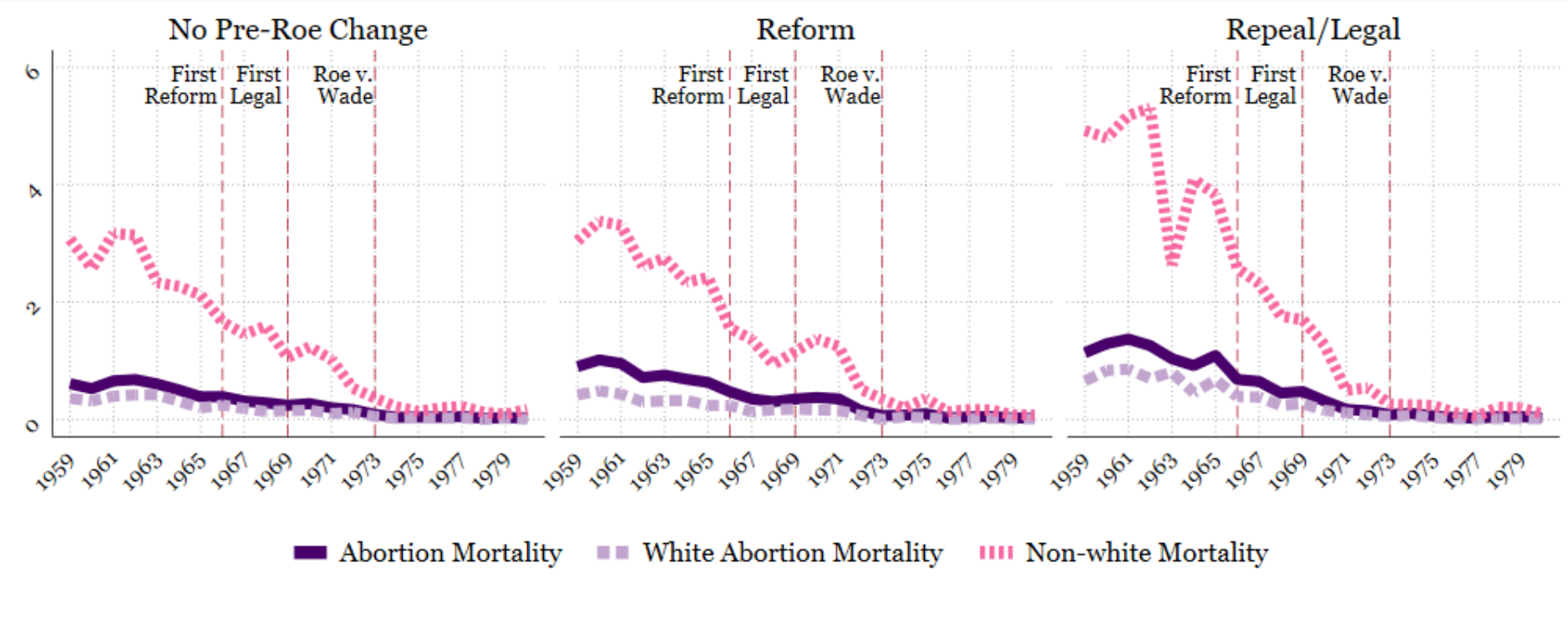
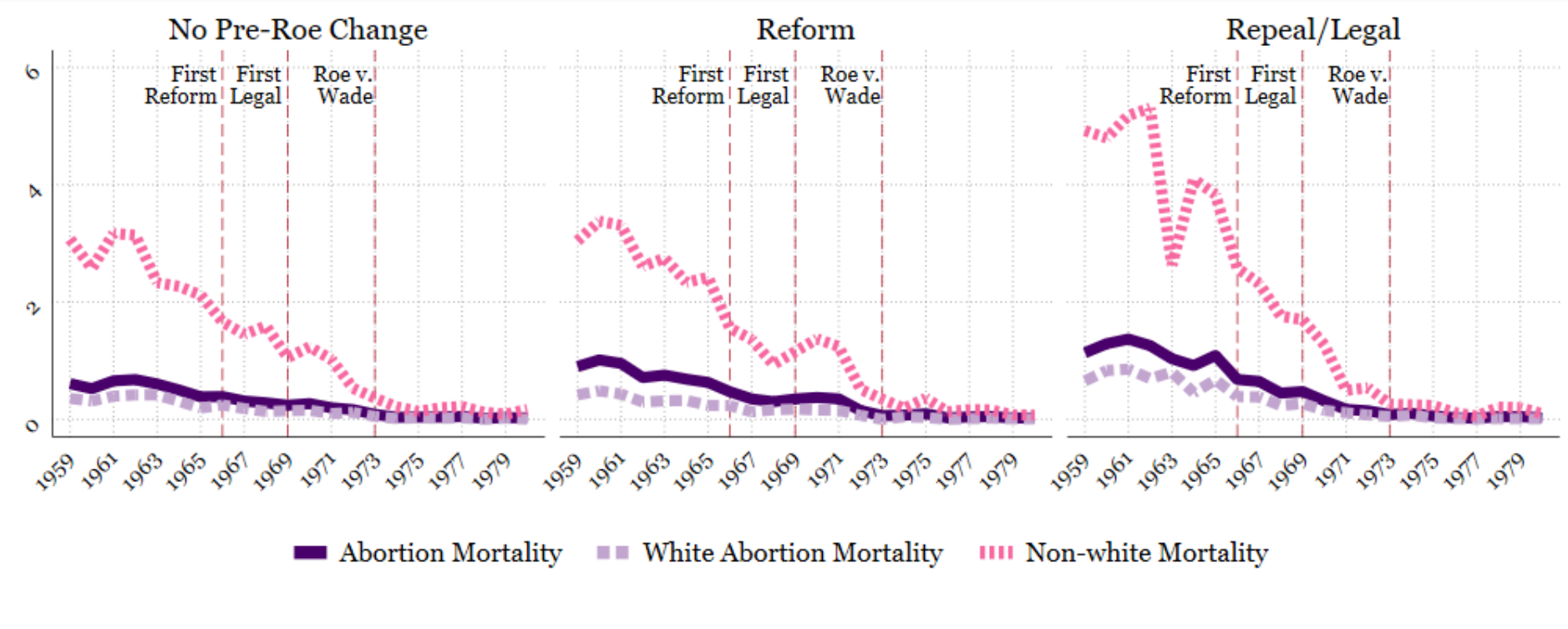
Abortion Mortality: By Legal Status



- In 1973 abortion-related mortality had already fallen by
  1. 90% since 1959
  2. 87% since 1965

Skip

Abortion Mortality: By Legal Status



- Early-legalization states (CA, NY) also had the highest population of non-white women
  - Aligns with the unweighted findings as well ▸ Go

Skip

Conclusions

Conclusions: Non-white Women Benefit the Most

- **Primary Finding:** Non-white maternal health (measured by mortality) the most impacted by legal abortion
    1. Maternal: *Legal abortion reduced non-white maternal mortality by 30-40%*
    2. Abortion-specific: Non-white abortion-related mortality declines by 30-60%
- Aligns with narratives of the time (e.g., Gold, 2003), and other related studies (e.g., Joyce et al., 2013; Myers, 2017).

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3. Delivery characteristics changed in the wake of legal abortion
    - Significant increase in the average maternal age - *showing clearest prevention of unwanted pregnancies for younger mothers*[4]

[4] aligns with the findings in Cates et al. (2003); Donohue III et al. (2009); Ananat et al. (2009)

Does this Matter for Policy?

1. Worldwide each year ∼4-13% of maternal deaths from unsafe abortion[5]
    - Abortion restrictions may produce higher than necessary abortion-related deaths
    - Especially for disadvantaged groups who cannot travel or advocate for themselves in the medical system

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    - U.S. maternal mortality higher than comparable settings
    - Non-Hispanic black women suffer three times the maternal mortality of white women[6]
    - If *Roe v. Wade* were repealed today, abortion will depend on:
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    - Our research demonstrates that non-white women were the most affected by legal restrictions on abortion[7]
    - Potential for the racial gap in maternal mortality to widen further

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Thank you!

Thank you!

Comments very much appreciated

Email: lvelasco@gsu.edu

Appendix

Appendix

Additional Background

Legal Abortion Most important for Non-white Women

1. *Legal abortion important for non-white all-cause and abortion-related maternal mortality*, maintains effect throughout robustness checks
    - Physicians *"saw women who needlessly suffered and died as a consequence of illegal abortion" (Rubin, 1994, pg. 71) with these physicians "disturbed that most of those women were poor and black"* (Rubin, 1994, pg. 71).
    - Prior to legal abortion–*"a two-tiered abortion system emerged in which service depended on the class, race, age and residence of the woman. Poor and rural women obtained illegal abortions, performed by people, physicians and others, who were willing to defy the law out of sympathy for the woman or for the fee. More privileged women steadily pressed physicians for legal abortions and many obtained them"* (Law et al., 1989, pg. 18).

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2. White women may have experienced early-legal access, potentially impacting mortality before full legalization
    - *"...class bias inherent in the psychiatric indications for therapeutic abortions* (Rubin, 1994, pg. 71).
    - Inter-state travel was limited by economic means–*"really only available to the small proportion of women who were able to pay for the procedure plus the expense of travel and lodging"* (Gold, 2003, pg. 4)

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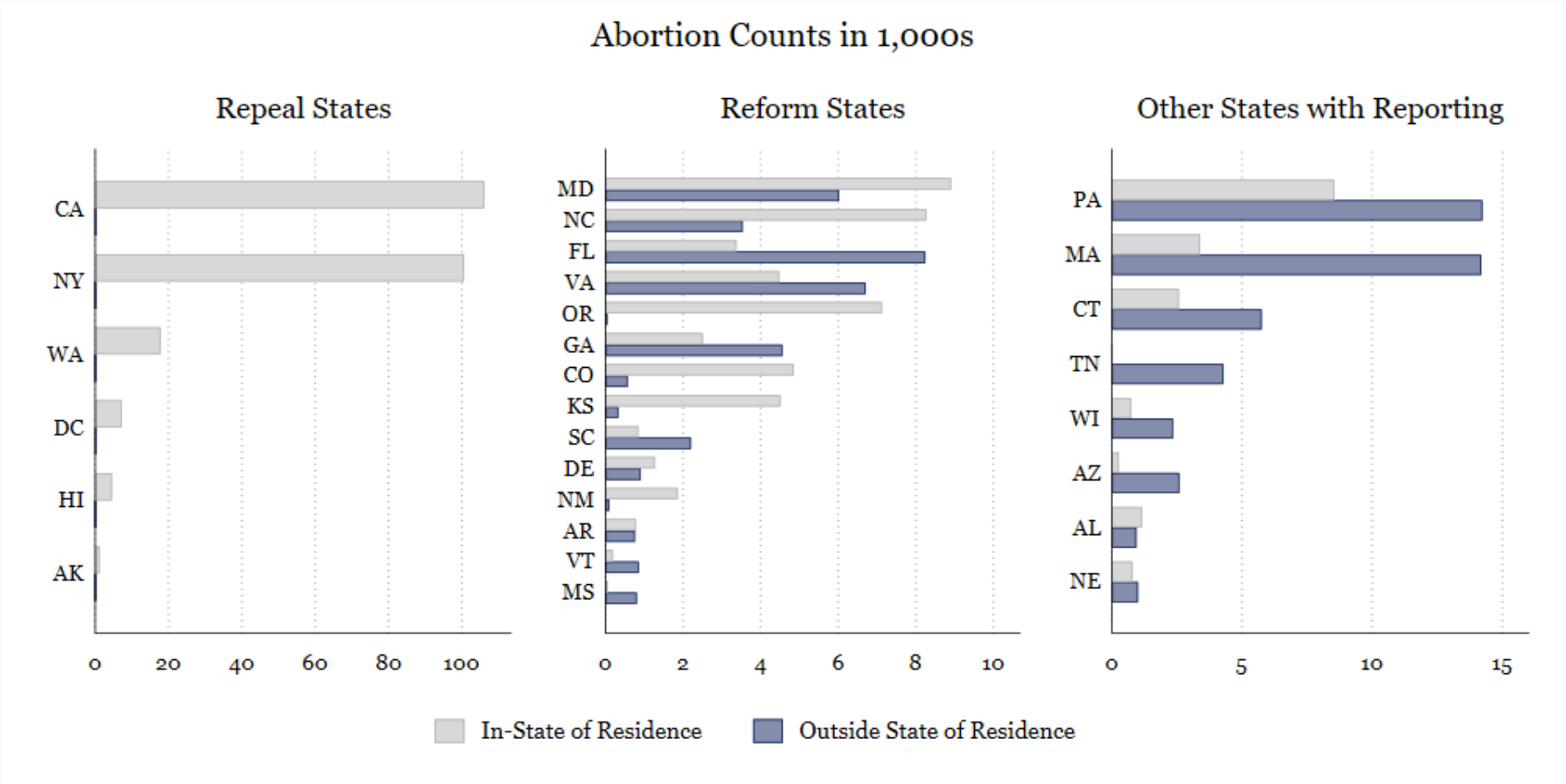
Sources of Abortion Before Legalization

1. **Abortion through Travel**
    - International–Japan, “Iron Curtain,” London, and some in Mexico
    - Domestic after early legalization
2. **Therapeutic Abortion**
    - Abortions to prevent physical and mental harm
3. **Abortion Reforms**
    - MPC provisions, and others
4. **Illegal Abortion**

Where did *recorded* abortions occur? In 1972



Appendix

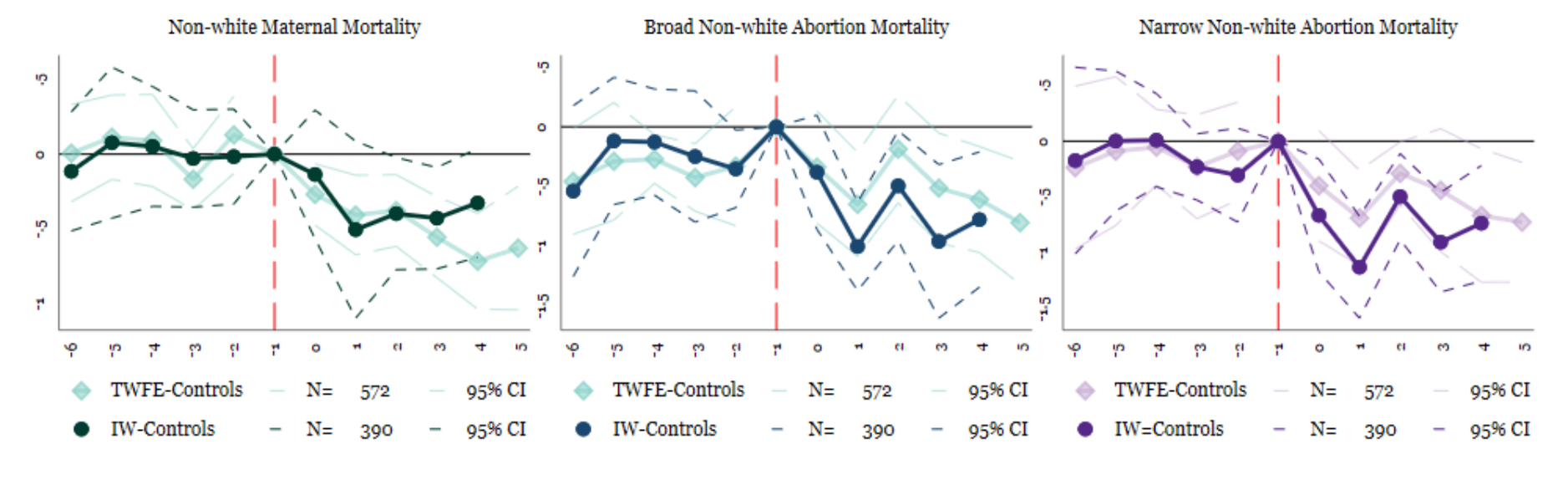
Additional Robustness

Robustness Checks: Spillover from repeal, reform states

- Check if control group is polluted through travel
- Remove states affected by these spillovers
    1. States within 500 miles of early-legalization states (CA/NY/DC, Myers (2017))
    2. States with early abortion reforms

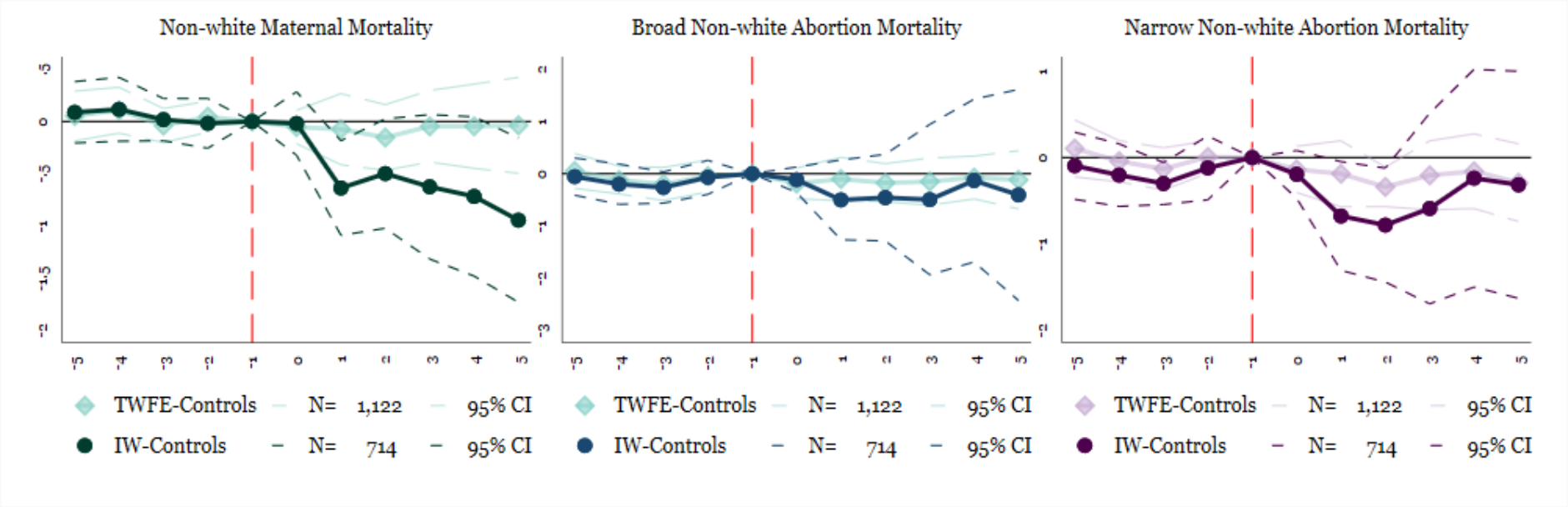
Back

Spillovers, Non-White Results



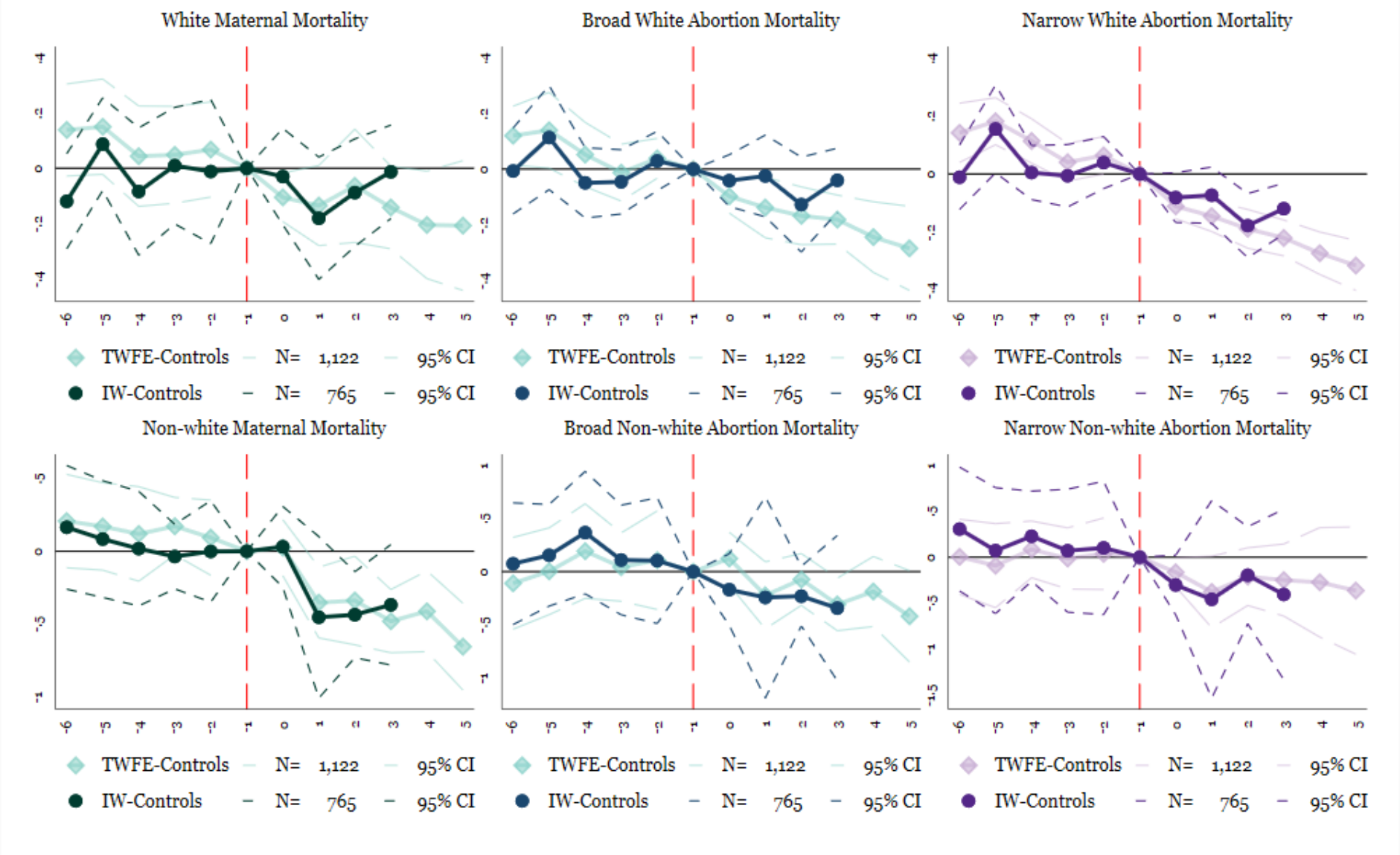
Back

Any Abortion Reform, Non-White Results



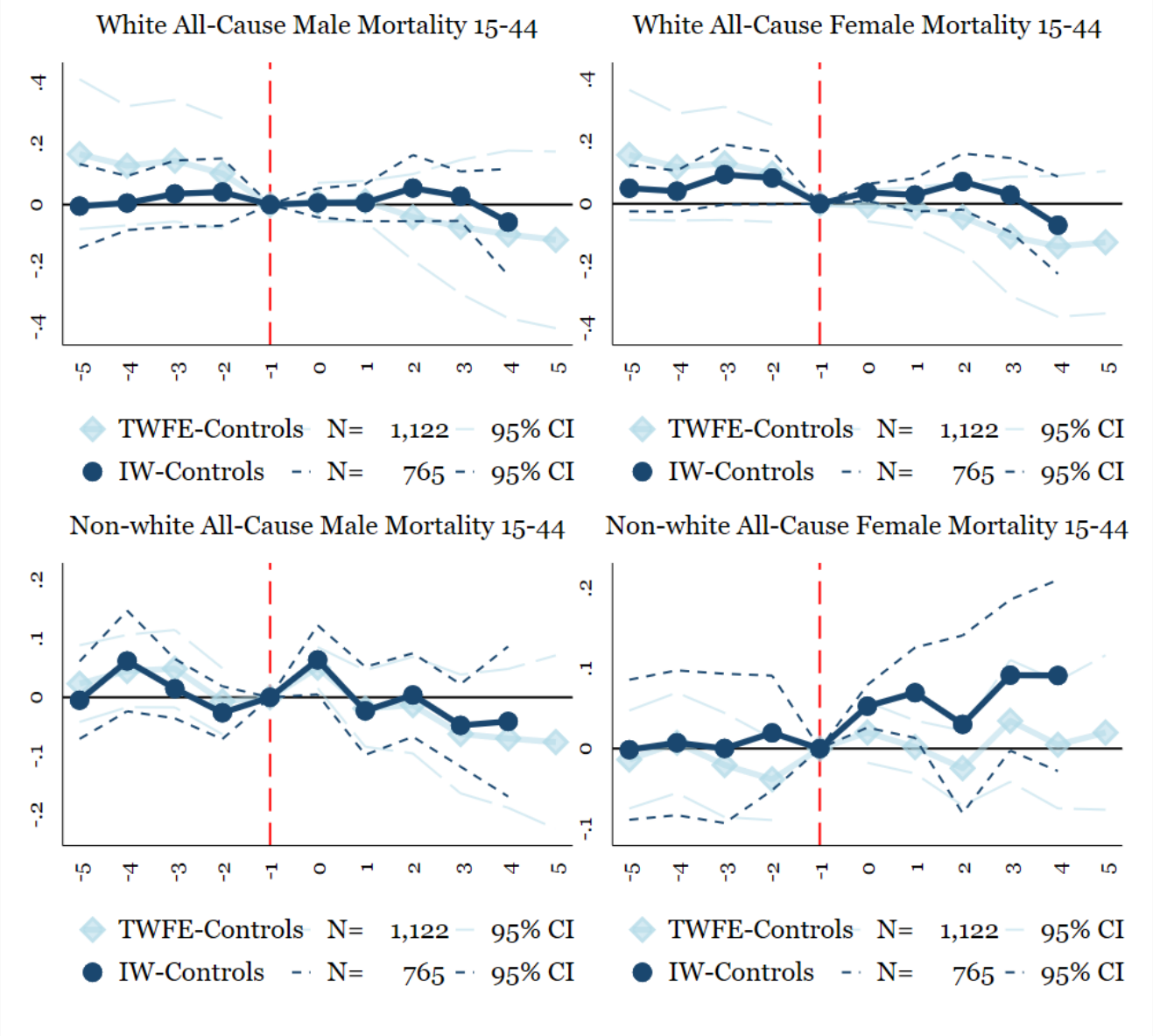
Back

De facto, White and Non-White Results



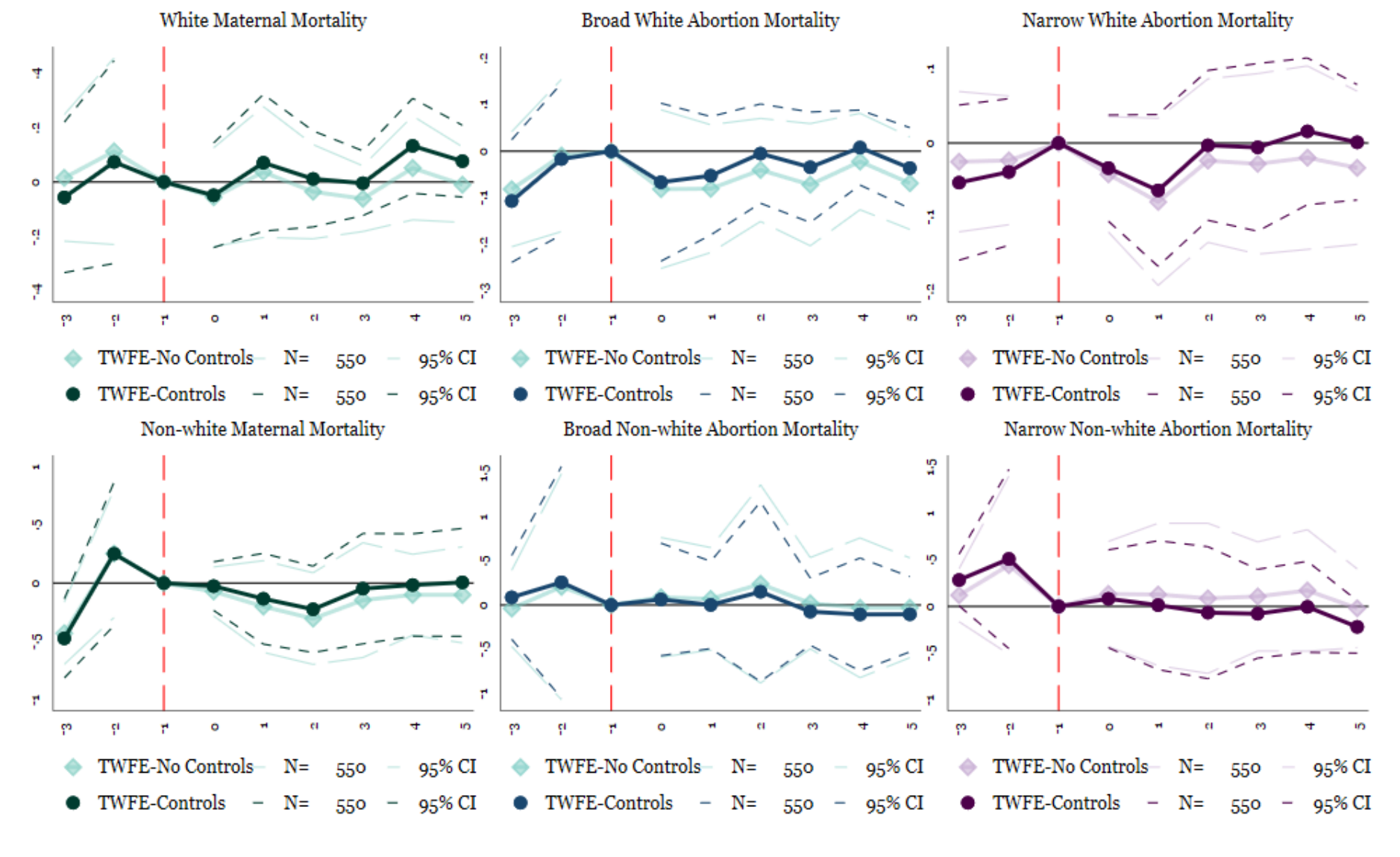
Back

Placebo Test and Misspecification Test



Back

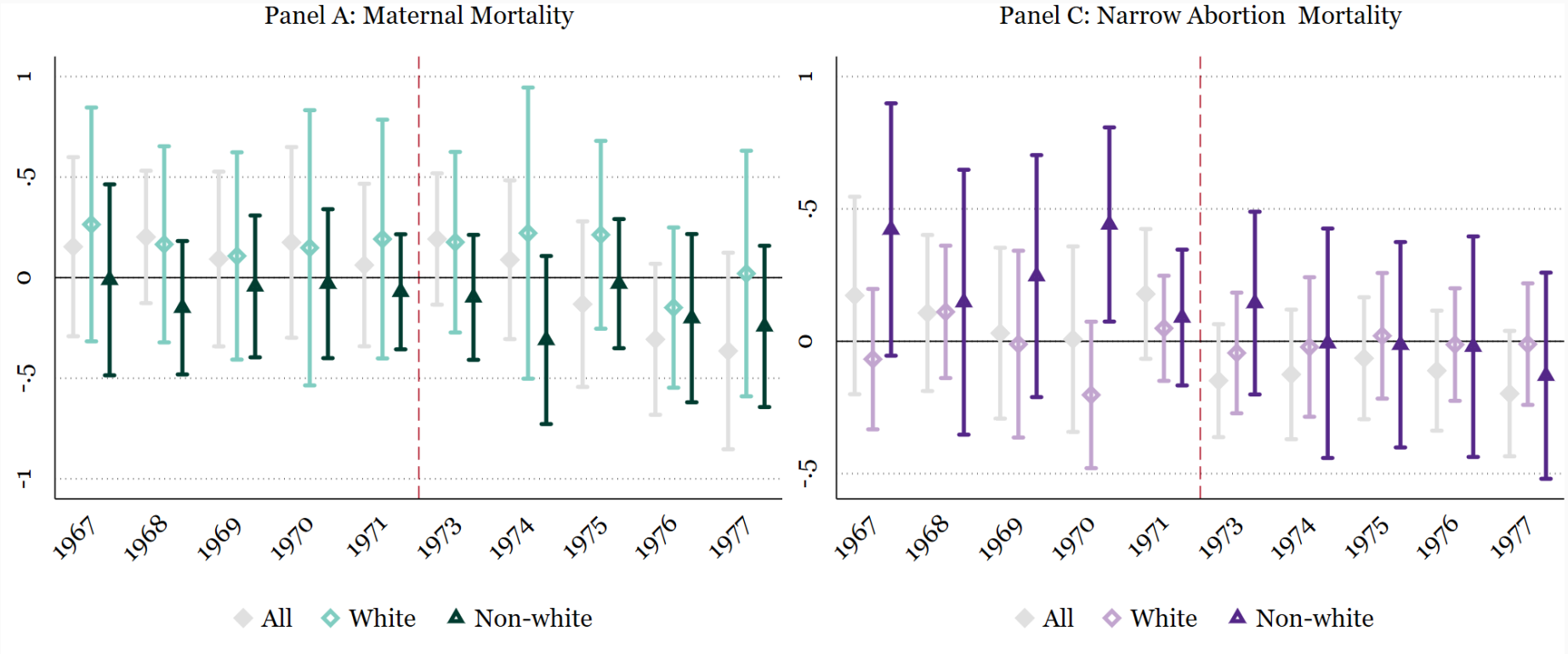
Roe v. Wade Relative to Early-Legal States (by 1970, TWFE)



Back

Effect of *Roe v. Wade* Accounting for Abortion Demand

Abortion Demand–Abortion Deaths Prior to Legalization (1965)



Back

Robustness Checks: Year-over-Year Changes in Mortality

Panel A: 1972-1973

	Maternal Mortality			Broad Abortion Mortality			Narrow Abortion Mortality		
	(1) All	(2) White	(3) Non-White	(4) All	(5) White	(6) Non-White	(7) All	(8) White	(9) Non-White
1(Roe v. Wade)	-0.5622	-0.8322	1.2008	0.3858	0.5191	-0.7413	-0.2480	0.0838	-2.3502
	(0.7312)	(0.8897)	(1.5364)	(0.6682)	(0.6191)	(2.2747)	(0.5123)	(0.4803)	(1.5785)
N	90	90	90	90	90	90	90	90	90
Controls	X	X	X	X	X	X	X	X	X

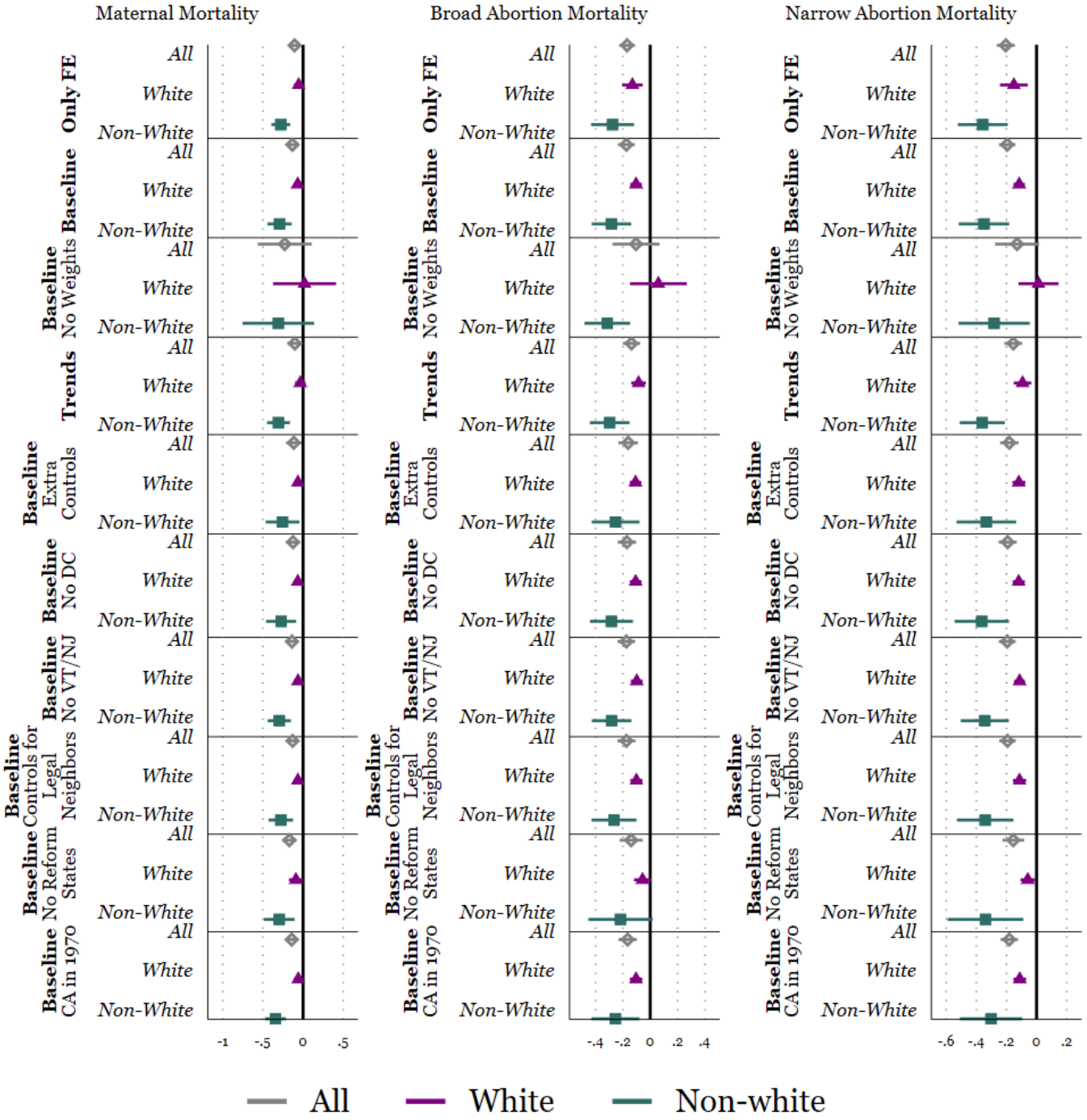
Panel B: 1973-1974

	Maternal Mortality			Broad Abortion Mortality			Narrow Abortion Mortality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1(Roe v. Wade)	-0.3809	-0.2824	-0.7232	-0.3107	0.1300	-2.8947	0.0205	0.3494	-2.5939
	(0.7345)	(1.0890)	(1.6853)	(0.4942)	(0.4393)	(2.5873)	(0.2395)	(0.2782)	(1.5527)
N	90	90	90	90	90	90	90	90	90
Controls	X	X	X	X	X	X	X	X	X

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

$$\text{Mortality}_{st} = \alpha + \beta\, \text{Roe v. Wade}_{st} + \mathbf{X}'_{st}\gamma + a_s + \epsilon_{st}$$

Back



All Checks

Roe

DD Comparison	Weight	DD Estimate
Maternal Mortality		
Earlier Treated v. Later Control	0.628	-0.236
Later Treated v. Earlier Control	0.372	-0.148
Average DD Estimate		-0.203
White Maternal Mortality		
Earlier Treated v. Later Control	0.628	0.069
Later Treated v. Earlier Control	0.372	-0.054
Average DD Estimate		0.023
Non-white Maternal Mortality		
Earlier Treated v. Later Control	0.628	-0.409
Later Treated v. Earlier Control	0.372	-0.047
Average DD Estimate		-0.274
Narrow Abortion Mortality		
Earlier Treated v. Later Control	0.628	-0.198
Later Treated v. Earlier Control	0.372	-0.035
Average DD Estimate		-0.137
Narrow White Abortion Mortality		
Earlier Treated v. Later Control	0.628	-0.005
Later Treated v. Earlier Control	0.372	0.045
Average DD Estimate		0.013
Narrow Non-white Abortion Mortality		
Earlier Treated v. Later Control	0.628	-0.364
Later Treated v. Earlier Control	0.372	-0.146
Average DD Estimate		-0.283
Notes: controls and weights excluded		