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The Road Not Taken: How Driving Distance and Appointment Availability Shape the Effects of Abortion Bans

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ABSTRACT

We use difference-in-differences research designs to estimate the effects of abortion bans on births at the county level, leveraging data on changes in driving distance and appointment availability at the nearest facility where abortion remains legal. We find that bans alone increase births, but their total impact depends on geographic barriers to access. Even in counties where distance and appointment availability remain unchanged, a total ban leads to a 1.0% increase in births, suggesting a chilling effect—potentially due to legal uncertainty, misinformation, or logistical hurdles—that is independent of measurable barriers. However, the effects grow substantially with travel burdens. In counties where the nearest abortion facility was 50 miles away pre-Dobbs, a total ban increases births by 2.8% when distance rises to 300 miles. Limited appointment availability in destination cities further amplifies these effects, resulting in an additional 0.4 percentage point increase in births. The largest increases occur among Black and Hispanic women, those without a college degree, and unmarried women. We do not observe evidence that the effects have diminished with time despite expanded logistical, financial, and telehealth abortion support, underscoring the persistent role that geographic barriers play in abortion access.

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A data appendix is available at http://www.nber.org/data-appendix/w33548

1 Introduction

The Supreme Court's decision in *Dobbs v. Jackson Women's Health Organization* (2022), which overturned *Roe v. Wade* (1973) and withdrew federal protections for abortion rights, fundamentally reshaped abortion access in the United States. By the end of 2022, 13 states were enforcing near-total abortion bans, increasing driving distance to the nearest abortion facility for millions of women of reproductive age. Past research has shown that driving distance is a significant barrier to abortion access (Quast et al., 2017; Fischer et al., 2018; Lindo et al., 2019; Venator and Fletcher, 2021; Myers, 2024c), and Myers (2024c) predicted that the resulting increases in distance would prevent 21% of residents of ban states from obtaining abortions. However, these projections rely on pre-*Dobbs* behaviors, and the decision itself may have altered abortion-seeking patterns.

Abortion bans not only shuttered facilities across a wide swath of the country, but also catalyzed offsetting measures and expansions of access in the rest of the country. Abortion funds, which provide financial and logistical support, saw an 88% surge in donations, enabling them to distribute $37 million to over 102,000 people—approximately 10% of all abortions (NNAF, 2024; Maddow-Zimet and Gibson, 2024). Direct-to-patient telehealth abortion services also rapidly expanded as the number of virtual clinics and telehealth abortions nearly doubled (Society of Family Planning, 2024; Koenig et al., 2024).

These developments likely mitigated the impact of bans while also expanding access in non-ban states where abortion remained protected. Indeed, the Guttmacher Institute (2024) estimates that national abortions *increased* by 11% between 2020 and 2023, challenging the assumption that abortion bans effectively prevent people from obtaining abortions.

In prior work, we adopted a synthetic difference-in-differences research design using preliminary state-level births for the first half of 2023 and estimated that the average ban increased births by 2.3 to 2.7% relative to a counterfactual in which the ban was not enforced (Dench et al., 2024). However, this preliminary evidence, based on state-level data, offered little insight into which populations were most affected by the bans. In this paper, we use newly-released individual birth records for all of 2023 to disaggregate these effects

across counties and demographic groups, allowing us to isolate the role of travel distance and appointment constraints in shaping post-Dobbs birth outcomes. We additionally use newly released provisional state-level birth data for 2024 to examine whether the effects of bans persist over time or attenuate as logistical support changed in the post-Dobbs policy landscape.

We construct a panel of county birth rates by demographic group, paired with county-level data on driving distances to abortion facilities and novel measures of appointment availability. We implement a variety of difference-in-differences and event study specifications. These include specifications with state-by-year fixed effects that rely solely on comparisons across counties within each ban state rather than between ban and non-ban states.

Across all specifications, the results confirm that abortion bans prevent some people from obtaining abortions, resulting in an increase in births. Even in the face of expanding telehealth access and travel support, distance remained a substantial barrier. In counties where the nearest abortion facility was 50 miles away before *Dobbs*, a total abortion ban is estimated to increase births by 1.0% if distance remained constant but by 2.8% if distance rose to 300 miles. Limited appointment availability in destination cities further increased births by 0.4 percentage points.

The burdens of abortion bans and distance are not distributed evenly. The estimated effects of the average ban—which increased distance from 50 to 300 miles—are larger for Black women (3.2%) and Hispanic women (3.8%) than for White women (2.0%). These findings are consistent with previous studies documenting that the impacts of restrictive abortion policies on fertility are stronger for non-White women (e.g., Levine et al., 1999; Myers, 2017; Fischer et al., 2018; Lindo et al., 2019; Myers and Ladd, 2020; Myers, 2021). We also find evidence of heterogeneous effects across other demographic groups. The average ban increased births to women who did not attend college by 3.1% versus 1.3% for college graduates. Similarly, we find the average ban increased births by 3.5% among unmarried women compared to 1.8% among married women. These findings reinforce evidence that socioeconomic status interacts with legal restrictions to shape reproductive outcomes.

2 Abortion before and after *Dobbs*

In 2020, the last full year before *Dobbs* with available estimates, 930,160 people obtained abortions from providers in the formal U.S. healthcare system—approximately one in five pregnancies (Jones et al., 2022).[1] At this rate, approximately 25% of U.S. women would have an abortion in their reproductive lifetimes (Jones, 2024). While available abortion surveillance data include limited demographic information, in a survey of abortion patients conducted between June 2021 and July 2022, 98% were legal adults aged 18 or older, 55% had previously given birth, 69% were non-white, and 70% were low income (Jones et al., 2023). In a 2017 survey, 55% of abortion patients reported at least one disruptive life event in the previous 12 months such as falling behind on the rent, separating from a spouse or partner, having a partner arrested or incarcerated, or moving multiple times (Jones and Jerman, 2017). Miller et al. (2023) matched abortion patients to their Experian credit reports and observed that 84% had subprime credit scores.

For low-income, credit-constrained parents experiencing disruptive life events, the logistical and financial costs of obtaining an abortion may pose substantial obstacles. This expectation is borne out in the economics literature that exploits various natural experiments to identify the effects of abortion restrictions on abortion and birth rates.[2] Both demand-side policies like parental involvement laws and mandatory waiting periods, and supply-side policies that target abortion facilities and force closures, reduce abortion rates and increase birth rates (Althaus and Henshaw, 1994; Joyce et al., 1997; Joyce and Kaestner, 2000; Levine, 2003; Joyce et al., 2006, 2020; Myers and Ladd, 2020; Quast et al., 2017; Fischer et al., 2018; Lindo et al., 2019; Lindo and Pineda-Torres, 2021; Myers, 2021; Venator and Fletcher, 2021; Altındağ and Joyce, 2022; Jones and Pineda-Torres, 2024; Myers,

[1] There are three sources of abortion surveillance data in the United States: The Centers for Disease Control (CDC, 2024), the Society of Family Planning's #WeCount initiative (2024), and the Guttmacher Institute. The CDC data are incomplete due to the lack of a federal mandate for abortion data and are missing information from several states entirely. The #WeCount initiative began collecting data in April 2022 and hence provides limited information on abortions prior to *Dobbs* in June 2022. It also only tracks abortions by state of occurrence and not by state of residence. We therefore use the Guttmacher Institute surveillance data, which are based on state surveillance augmented with Guttmacher's periodic surveys of abortion providers. We note that the Guttmacher surveillance data do not include direct-to-patient telehealth abortions provided in states where they are restricted, resulting in an undercount of abortions.

[2] For reviews of the economics literature on the effects of abortion policies from 1960 through 2020, see Clarke (2024) and Myers (2024a).

2024c).

Driving distance significantly mediates these policy effects. For instance, the fertility effects of Roe were smaller in states near New York. New York had legalized abortion three years earlier and become a destination for thousands of women traveling from nearby states (Joyce et al., 2013). In the decades that followed, parental involvement laws had smaller fertility effects in counties that were near abortion facilities in neighboring states that did not require parental involvement (Myers and Ladd, 2020) and two-trip mandatory waiting period requirements had smaller effects in counties with nearby abortion providers reducing the travel burdens of two required trips (Myers, 2021).

Studies on driving distance consistently show it is a significant barrier to people seeking abortions (Quast et al., 2017; Fischer et al., 2018; Lindo et al., 2019; Venator and Fletcher, 2021; Myers, 2024c). These studies rely on different natural experiments but reach fundamentally similar conclusions that point to large but diminishing effects of driving distances. For instance, Myers (2024c) estimates that in an increase in distance from a baseline of 0 miles to a new level of 100 miles reduces surveilled abortion rates by 19%, while the next 100 miles increase reduces surveilled abortions by an additional 12.8%.

These drops in surveilled abortions may have been partially offset by individuals accessing abortions outside the formal healthcare system. However, the evidence suggests that these were not viable alternatives for most people unable to navigate increased driving distances. Myers (2024c) estimates corresponding increases in births of 2.2% and 1.6%, suggesting about three-quarters of women who were prevented from obtaining an abortion within the formal healthcare system between 2009 and 2020 gave birth as a result. These findings may not apply to more recent years, however, due to a telehealth revolution in abortion provision.

2.1 The telehealth revolution

In 2020, procedural abortion, which most commonly involves an aspiration procedure, accounted for 47% of all abortions (Jones et al., 2022). The remaining 53% of abortions were medication abortions, which involve oral ingestion of two drugs: mifepristone, a drug that

blocks the action of progesterone and halts the progression of pregnancy, and misoprostol, which induces uterine contractions and expulsion of the pregnancy.

In 2000, the U.S. Food and Drug Administration (FDA) approved mifepristone as an abortifacient, making medication abortion available in the United States. The FDA mandated a Risk Evaluation and Mitigation Strategy (REMS) program for mifepristone, requiring in-person distribution from providers that underwent a complicated certification process and stocked mifepristone at their facilities. These requirements precluded distribution of medication abortion by retail pharmacies or mail (ACOG, 2023) and largely limited it to brick-and-mortar abortion clinics with high enough patient volumes to justify the fixed costs of certification and stocking (Thompson et al., 2021; ACOG, 2023).

Then in July 2020, during the early stages of the COVID-19 pandemic, a court ordered the FDA to temporarily relax the in-person distribution rules for the abortion medication mifepristone, for the first time allowing medication abortion to be prescribed via telehealth and delivered directly to patients by mail, constituting a "telehealth abortion." In December 2021, the FDA updated its guidance and effectively made the provision permanent.

Telehealth services depend on the patient's location, and clinicians are typically licensed in the same state (Cohen et al., 2024). After the FDA allowed telehealth services, U.S. clinicians licensed in states where telehealth was permitted began prescribing them to patients located in those same states. In 26 states and the District of Columbia where telehealth services were permitted by state law, already-established brick-and-mortar facilities began offering telehealth services while other providers established new virtual-only clinics (KFF, 2024). The *Dobbs* decision unintentionally accelerated the expansion of telehealth access in these states as the number of virtual clinics rose from 11 to 20 in 2022 (Koenig et al., 2024) and telehealth abortions nearly doubled, increasing from 13,590 in the second quarter of 2022 to 22,430 in the second quarter of 2023 (Society of Family Planning, 2024).[3]

Telehealth expansion was slower in the remaining 24 states, where physician presence requirements and other laws effectively prohibited it. Fourteen of these states enacted

[3]The total number of telehealth abortions reported here includes those mailed to recipients in the 27 jurisdictions where telehealth abortion is unrestricted, whether provided by virtual clinics or brick-and-mortar facilities.

near-total abortion bans in 2022. Aid Access, a major telehealth provider, bypassed the formal healthcare system to provide telehealth abortions in these states by partnering with European physicians and mailing abortion medications from a pharmacy in India. Yet, the pills could take 2 to 4 weeks to arrive from India and clear customs (McCann, 2023; Cohen et al., 2024), a long delay for time-sensitive healthcare.

In the summer of 2023, this situation again changed as U.S. providers began to operate under "shield laws" enacted in six states—California, Colorado, Massachusetts, New York, Vermont, and Washington—and designed to protect licensed clinicians from civil, criminal, and professional consequences for providing telehealth abortion services to patients located in states where telehealth abortion is banned (Cohen et al., 2023, 2024).[4] For instance, under Massachusetts' shield law, a clinician licensed and located in Massachusetts could provide a telehealth abortion to a patient located in Texas, sending abortion medications directly to that patient by mail, which Massachusetts would define as legal under its law and attempt to shield that clinician from any legal action taken by Texas.[5]

In June 2023, Aid Access shifted its model, replacing international shipping with U.S.-based clinicians in shield-law states who prescribed and mailed medications directly to patients (Cohen et al., 2024). Other shield law providers, including Abuzz and the Massachusetts Medication Abortion Project (MAP), also entered the scene in the summer and fall of 2023 (Foster et al., 2024; Belluck, 2024). As they did so, telehealth abortion access likely increased in states where abortion is banned or restricted as patients were increasingly able to obtain abortion pills from providers within the formal U.S. healthcare system, mailing pills from inside the country that could arrive in days.

2.2 The end of distance?

Beginning in the summer of 2023, shield-law provision of medication abortion allowed residents of ban states to obtain telehealth abortions from a provider within the formal U.S.

[4]The number of shield laws continues to expand, and their provisions vary. For detailed information, consult UCLA Law's State Law Guide (2024).

[5]Shield laws have recently begun to be challenged by ban states. Louisiana filed criminal charges against a New York shield law provider in January 2025 and requested extradition, which New York has thus far refused. Texas issued a civil fine of $100,000 against the same provider in December 2024 (Stengle, 2025).

healthcare system within a few days. Not only did this provide an alternative to traveling to a brick-and-mortar facility in another state, but it did so at a substantially lower price. In 2023, the median cost of a medication abortion at a brick-and-mortar facility was $600 compared to $150 via telehealth clinics (Upadhyay et al., 2024).

These reductions in logistical and financial barriers may allow residents of ban states to obtain abortions via telehealth despite the challenge of distance. To the extent that this is the case, the rise of shield-law provision would meet previously unmet demand for abortion services. However, shield laws may not only expand access but also shift how people obtain abortions. If shield-law telehealth services primarily substitute for travel-based abortions, overall abortion rates would remain unchanged, and the fertility effects of bans would persist. In this scenario, those most affected by distance constraints may still lack viable alternatives, reinforcing the empirical patterns we document in this paper.

3 The association between state policy environments and abortions and births

By the end of 2022, 13 states—Alabama, Arkansas, Idaho, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, South Dakota, Tennessee, Texas, West Virginia, and Wisconsin—were enforcing near-total bans on abortions with very limited exceptions.[6,7] In addition, 13 states that were not enforcing total abortion bans had restrictive abortion policies and were categorized as 'hostile' by organizations such as the Guttmacher Institute (2025) and Center for Reproductive Rights (2025). States regarded as hostile include those enforcing gestational age bans, the most restrictive of which was Georgia's 6-week gestational ban.[8]

[6]State abortion policies and classifications are documented and described more extensively in Appendix Table A.1. All of the 13 total bans have exceptions to protect the life of the pregnant person: 5 have exceptions to protect the health of the pregnant person; 3 have exceptions for cases of rape or incest; and 2 have exceptions in cases of fatal fetal anomalies. Critics argue that exceptions to preserve the life or health of the mother are unworkable in practice due to a lack of specificity regarding clinical conditions (KFF, 2023).

[7]We focus this description on bans enforced in the second half of 2022, from the Dobbs decision in June through the end of the year, because these afford the primary identifying variation for births observed in 2023.

[8]Pregnancy is dated from the first day of the last menstrual period. For a woman with a 28-day cycle, the earliest she might discover a pregnancy is 28 days gestation, or about 4 weeks. Hence a 6-week gestational age ban affords about 2 weeks to discover a pregnancy, make a decision, gather resources, and obtain an

States classified as hostile may have pending litigation determining future enforcement of a ban or be likely to enact a ban in the future. Indeed, three of the states classified as hostile in 2022—Florida, Iowa, and South Carolina—now enforce 6-week gestational age bans (Guttmacher Institute, 2025).

Figure 1 depicts state abortion policies in the contiguous United States as of December 2022 and the corresponding changes in resident abortions and births.[9] Between 2020 and 2023,[10] resident abortions increased 20% in states that protected abortion rights and by 12% in states hostile to abortion but where it remained legal in many circumstances. In contrast, abortions provided to residents of states that banned abortion declined by 32%. Hence the 11% increase in abortions observed nationally masks substantial heterogeneity across states. Even as abortions rose in states where it remained legal and telehealth services expanded, they fell dramatically for residents of ban states.

However, this 32% decline in abortions to residents of ban states may be overstated. We rely on abortion surveillance data from the Guttmacher Institute (Maddow-Zimet et al., 2024), which for decades has published the most complete counts of U.S. abortions by augmenting abortion surveillance data with periodic surveys of abortion providers. These data account for interstate travel, so an abortion obtained by a Texas resident in Kansas is included in Texas's resident abortion count. They also capture abortions obtained under telehealth in circumstances where telehealth is legally available in the recipient state. However, these data exclude telehealth abortions provided in states where telehealth is restricted, potentially leading to an overstatement of the abortion decline in ban states.

Births data do not suffer any such measurement challenges. Using natality files from the National Center for Health Statistics (NCHS, 2024), which we describe in detail in the following section, we obtain highly accurate counts of state resident births. Despite concerns about abortion undercounting, birth data confirm that ban states saw real fertility effects.

abortion.

[9] Throughout this paper, we focus on the contiguous United States because our primary research question concerns driving distances. The lack of complete road networks connecting cities and towns in Alaska and Hawaii makes driving distances impossible to calculate for many counties. Furthermore, abortion remains legal in both Alaska and Hawaii, and both states are considered protective of abortion rights by the Guttmacher Institute and Center for Reproductive Rights.

[10] We rely on estimates of state resident abortions published by the Guttmacher Institute (Maddow-Zimet et al., 2024). These estimates are available for 2020 and 2023, but not for 2021 or 2022.

Births declined by 4.0% in protective states but increased by 0.6% in ban states, yielding a statistically significant 4.6 percentage point ($p < 0.01$) relative increase in births in states enforcing total bans.

Although these state-level difference-in-differences estimates provide valuable insights, interpretation of the results is complicated by the lack of a control group of states that were not affected by the *Dobbs* decision. Because *Dobbs* accelerated telehealth expansion, it may have simultaneously increased abortions in protective states and decreased them in ban states, complicating inference. This divergence suggests bans widened disparities in access but reveals little about how distance and appointment availability shape birth outcomes within ban states.

In this policy context, we use county-level measures of abortion access and births to provide the first empirical evidence on the effects of abortion bans at the county level. We adopt several complementary approaches, including estimating models that rely on variation in access within ban states rather than a comparison of outcomes between states. All of our analyses allow the effects of abortion bans to vary with distance, appointment availability, and demographics. In doing so, we identify the populations most affected by the barriers imposed by abortion bans in post-*Dobbs* America.

4 Data

We focus on 2021–2022, the period when *Dobbs* and the subsequent enforcement of near-total bans represented the dominant shock to abortion access, minimizing confounding effects from longer-term policy shifts. Table 1 presents summary statistics by ban status and period.

4.1 Abortion Access

Near-total bans immediately forced all abortion facilities in ban states to cease operations. Even in states where bans were not fully enforced, legal uncertainty disrupted facility operations—for example, nearly all Arizona clinics temporarily suspended services due to confu-

sion over whether the state's pre-*Roe* ban would be enforced (Healy and Robertson, 2022). The Myers Abortion Facility Database (Myers, 2024d) tracks publicly identifiable brick-and-mortar abortion facilities in the U.S. since 2009, capturing facility closures, relocations, and service suspensions.[11] The database also provides county-by-month driving distances measured between the population centroid of each origin county and the geographic coordinates of the nearest destination abortion facility in operation on the first day of each month.

As described in Table 1, between March and December 2022, the 31.2 million women of childbearing age living in ban states experienced an increase in the average distance to the nearest abortion facility from 46 miles to 310 miles. In comparison, the 97.7 million women of childbearing age residing in the rest of the country faced lower distances even before *Dobbs*—an average of 18 miles—and this increased only slightly, to 18.4 miles in December 2022.[12]

Beyond increasing travel distances, *Dobbs* indirectly reduced access by overwhelming clinics in destination states, as surging out-of-state demand strained facility capacities. We rely on novel data from the Abortion Appointment Availability Survey (Myers, 2024b) to measure appointment availability in the nearest destination facility. This survey uses a mystery-shopper approach to contact all facilities in the Myers Abortion Facility Database. Surveyors request information about the next available appointments for medication and procedural abortions. In this analysis, we rely on the soonest available appointment of either type to measure availability. The first survey was conducted in March 2022, and the surveys continue on an irregular basis.[13] For each origin county in the contiguous United States, we measure appointment availability in the nearest Core-Based Statistical Area (CBSA) with an operating abortion facility.[14] The appointment constraint variable measures the share of

[11] "Publicly identifiable" implies that a person seeking an abortion could identify that this facility provides them through an internet search or telephone directory. It does not include any healthcare providers that may offer abortion services but do not advertise or acknowledge this publicly. The database also does not track virtual-only providers that lack a physical presence.

[12] Summary statistics in Table 1 are population-weighted, meaning they reflect the average distance faced by a typical woman aged 15–44 in each policy environment (ban vs. non-ban states).

[13] To date, surveys were conducted in March, June, July, August, September, and December 2022; April and September 2023; January, April, July, and October 2024; and January 2025. We use linear interpolation for missing months.

[14] A small number of abortion facilities are in counties that are not part of a CBSA. In this case, we treat the facility's county as the destination.

facilities in a woman's nearest destination city that could not offer an appointment within two weeks at the time of survey.[15]

To illustrate how appointment constraints are measured, take the case of Wichita, Kansas, where two abortion facilities were in operation in December 2022. When contacted in the first week of December, both facilities told the caller that their schedules were full and no appointments were available. As a result, for all counties for which Wichita was the nearest abortion destination in December of 2022, *appointment constraint* is equal to 1, indicating that all of the facilities in their nearest destination were appointment constrained.

As another example, in December 2022, Tallahassee, Florida had two abortion facilities. One offered an appointment in 8 days; the other had a 34-day wait. Thus, appointment constraint is 0.5 for all counties where Tallahassee was the nearest destination—indicating that half of the facilities lacked timely availability.

As illustrated in Table 1, in March 2022—before *Dobbs*—the average woman aged 15-44 faced appointment constraints at 27.9% of facilities in her nearest destination city. Texas SB-8, a de facto 6-week gestational age ban, had taken effect in September 2021 and was likely already creating capacity constraints in neighboring states. By December 2022, appointment constraints increased further, with the average woman facing them at 36.0% of facilities in her nearest destination. Notably, residents of both ban and non-ban states experienced increases.

4.2 Births

We rely on individual birth records from the NCHS with restricted-use county identifiers to measure the number of births at a county-by-month level in aggregate and disaggregated by various demographic characteristics reported on the birth certificates (NCHS, 2024). We construct birth rates by dividing county-level births by population estimates for women of reproductive age, stratified by sex, race, and single year of age, as reported by the Surveillance, Epidemiology, and End Results Program (SEER, 2022).

[15] Although the database includes the exact number of days until the next available appointment, constrained facilities often inform callers that no appointment can be scheduled at all. Given this outcome, we choose to measure whether a timely appointment is available rather than use an alternative measure, such as the mean number of days until the next available appointment.

County-level abortion rates are incomplete pre-Dobbs and entirely unavailable post-*Dobbs* (see, e.g., Myers, 2024c). As a result, our analysis focuses solely on birth outcomes.

4.3 Controls

Table 1 summarizes the additional controls used in the analyses that follow. These controls include county-by-year demographic measures for the racial, ethnic, and age composition of women of childbearing age (SEER, 2022) and economic conditions associated with fertility using annual county-level estimates of unemployment published by the Bureau of Labor Statistics (2025) and annual county-level estimates of poverty rates published by the Census Bureau's (2022) Small Area Income and Poverty Estimates (SAIPE) program (2024). These demographic and economic conditions have evolved similarly over time across ban and non-ban states.

5 Descriptive Evidence

5.1 The effect of increased distance

Figure 2 illustrates total state abortion bans enforced as of the end of 2022, facility closures, and resulting county-level changes in distances between March and December of that year. The magnitude of distance increases varied substantially both across and within ban states, driven by pre-*Dobbs* facility locations and proximity to out-of-state abortion facilities. For instance, every parish in Louisiana, a state with a total abortion ban and surrounded by other ban states, experienced an increase in distance exceeding 200 miles. In contrast, most Missouri counties saw little to no increase in driving distance following its ban. This is because prior to *Dobbs*, Missouri had only a single abortion facility, and it was located in St. Louis near the Illinois border. When this facility stopped providing abortions, the nearest destinations were about 10 miles farther away in Illinois. Meanwhile, Missouri residents in the Kansas City area had been traveling to facilities in Kansas before *Dobbs*, and the ban did not change this situation.

If distance remains a salient dimension of abortion access, then the variation in the

distance shocks illustrated in Figure 2 would suggest that bans may have very different effects across counties. This hypothesis is supported by the descriptive evidence on changes in births that accompanies the map. The bar chart illustrates the change in births in counties in ban states relative to non-ban states. Between 2021 and 2023, counties in ban states in which distance increased by less than 10 miles due to *Dobbs* experienced a 1.0 percentage point increase in births ($p = 0.03$) relative to counties in non-ban states. These results suggest that abortion bans deter some individuals seeking abortions, even when distance remains unchanged. However, distance plays a critical role: counties with larger distance shocks saw progressively larger increases in births. Relative to counties in non-ban states, births increased by 1.6 percentage points ($p = 0.01$) in counties where distance increased by 10–100 miles, 3.3 percentage points ($p < 0.01$) in counties where distance increased by 100–200 miles, and by 4.9 percentage points ($p < 0.01$) in counties where distance increased by more than 200 miles.

5.2 The effect of constrained appointment availability

Figure 3 extends the previous exercise by adding a second dimension of access: appointment availability. This bivariate choropleth highlights counties where abortion access was most restricted, capturing both travel burdens and facility congestion. The map shows which counties faced the largest increases in distance and which had the most constrained appointment availability at the nearest destination by December 2022. Shading is used to highlight counties for which more than one-third of facilities in the nearest destination did not have appointments available within two weeks in December of 2022.

Counties experiencing the greatest barriers to abortion access—marked in dark green—faced both large travel burdens and constrained appointment availability. These include eastern and northern Texas, Oklahoma, and western Louisiana and Arkansas, where residents had to travel over 100 miles to reach highly congested clinics in Kansas. Southern Louisiana, Alabama, and Mississippi were similarly affected, as their nearest destinations—facilities in northern Florida—were also highly constrained. In contrast, other regions of ban states were less impacted. Counties in eastern Missouri experienced

little to no increases in travel distances, and in nearby southern Illinois facilities were expanding and appointments were unconstrained.

As shown in Figure 3, the variation in births within ban states is associated with appointment constraints in addition to increased distance. In counties where abortion was banned but distance remained unchanged, births trended similarly to the non-ban states (-0.1 percentage point change, $p = 0.94$) if appointments were unconstrained. However, when appointments were constrained, births increased by 1.9 percentage points ($p < 0.01$) relative to non-ban states—suggesting that appointment constraints, independent of driving distance, significantly limited abortion access.

In counties where abortion was banned and distance increased by more than 100 miles, births increased by 3.7 percentage points ($p < 0.01$) if appointments were constrained and by 4.9 percentage points ($p < 0.01$) if appointments were not constrained, relative to non-ban states.[16]

Overall, birth trends suggest that the effects of bans are depend not just on driving distance, but also on the availability of appointments at destination facilities.

6 Empirical method

To estimate the effect of abortion bans as mediated by travel distances and appointment availability, we aggregate the data to a county-by-half-year panel and implement difference-in-differences and event study research designs that exploit the spatial and temporal variation in abortion access illustrated in Figure 3. Given that birth counts are discrete, non-negative, and sometimes zero, we use Poisson models with an exposure term for the relevant population of women. Our model takes the following form:

$$E\Big[births_{c,s,t+1}, |\text{ban}_{s,t}, \text{dist}_{c,s,t}, \text{appt}_{c,s,t}, \boldsymbol{\beta X_{cst}}, \boldsymbol{\upsilon_c}, \boldsymbol{\upsilon_t}\Big] = \\ \exp\left(\beta_b \text{ban}_{s,t} + \beta_d \text{dist}_{c,s,t} + \beta_{dd} \text{dist}^2_{c,s,t} + \beta_a \text{appt}_{c,s,t} + \boldsymbol{\gamma X_{c,s,t}} + \upsilon_c + \upsilon_{s,H2_t}\right) \quad (1)$$

[16] The 1.2 percentage point difference is statistically significant ($p = 0.03$).

where $births_{c,s,t+1}$ is the total number of births in county c in state s in half-year $t+1$. To account for gestation, births are modeled as a function of explanatory variables observed one half-year prior in period t.

Abortion access is captured by three variables: $\text{ban}_{s,t}$ measuring exposure to a total abortion ban in state s at time t; $\text{distance}_{c,s,t}$ measuring distance to the nearest abortion facility in county c, state s, at time t; and, $\text{appointments}_{c,s,t}$ measuring the fraction of facilities in the nearest destination city that had no appointments available at time t. Distance is modeled quadratically to capture diminishing marginal effects, as documented in prior literature (Fischer et al., 2018; Lindo et al., 2019; Venator and Fletcher, 2021; Myers, 2024c).

The vector $\boldsymbol{X}_{c,s,t}$ includes an intercept, time-varying controls for exposure to a state-level 6-week gestational age ban,[17] and county-level unemployment and poverty rates. Controls also include the percentage of women aged 15-44 categorized by race and five-year age groupings, interacted with time fixed effects to allow national shocks in birth outcomes to vary across detailed demographic groups.

All models include υ_c, county fixed effects that control for unobserved county characteristics with time-invariant effects on birth rates, and υ_t, period fixed effects, which control for national shocks affecting birth rates similarly across all counties. In addition, all models include $\upsilon_{s,H2_t}$, county fixed effects interacted with an indicator for the second half of the year to allow for differential seasonal patterns in births by county. All standard errors are cluster-robust using counties as clusters to control for arbitrary forms of serial correlation in errors within counties (Bertrand et al., 2004).

In Appendix B, we demonstrate that the results are robust to a variety of alternative specifications and sample selection criteria, including omitting various sets of controls (Table B.1-Table B.7). We also demonstrate that the results are robust to omitting Texas from the analysis (Table B.5), assuaging concerns that its enforcement of a 6-week gestational age ban prior to Dobbs may drive the overall results. Finally, we demonstrate that the results

[17] Gestational age bans are documented in section 8 In our study period, 6-week bans were enforced in Georgia beginning in July 2022 and by Texas, which enforced SB-8 from September 2021 until it was replaced with a total ban in August 2022. Idaho, Ohio, South Carolina, and Tennessee also briefly enforced 6-week gestational age bans in 2022. Given the limited variation in the enforcement of 6-week bans, we focus this analysis on the effects of total bans.

are robust to substituting Ordinary Least Squares (OLS) models with the log birthrate as the outcome for our preferred Poisson specification, and that this is true regardless of one estiamtes population-weighted models (Table B.6) or unweighted models (Table B.7).

As with all difference-in-differences approaches, the identification of the average treatment effect (ATT) relies on the common trends assumption. In this context, this requires assuming that absent changes in abortion access, births would have trended similarly across counties if not for treatment. This assumption would be threatened if, for instance, changes in abortion access were driven by underlying changes in demand for abortions that are not explained by the controls.

Several points should mitigate this concern. First, our analysis spans a short period of time, with births observed from January 2021 through December 2023 explained by changes in abortion access from July 2020 through June 2023. These changes in abortion access were sudden and nearly entirely driven by the release of the Supreme Court's decision in Dobbs, a plausible shock allowing long-standing trigger bans to take immediate effect and suddenly close facilities. We also estimate specifications that include state-by-time fixed effects and therefore rely on variation in access that occurs within rather than between states to identify the effects of distance and appointment availability. This eliminates the possibility of contaminating statewide shocks to births, and the resulting estimated effects of distance and appointment availability are quite similar to the results of the primary specifications.

Finally, we assess whether the effects of bans change over time, particularly as telehealth access expands. To do so, we implement synthetic difference-in-differences (SDiD) event studies, which allow us to evaluate pre-trends and dynamic treatment effects. We implement SDiD event study specifications using weighting procedures as outlined in Arkhangelsky et al. (2021) and estimation procedures outlined in Clarke et al. (2024). Because we wish to evaluate the presence of dynamic treatment effects but county-level births are not yet available for 2024, we implement this approach for logged state-level birth rates as an outcome, utilizing preliminary 2024 births released on the CDC Wonder platform (Centers for Disease Control and Prevention (CDC), 2025). This involves a replication and extension

of our prior work in Dench et al. (2024), with the key differences that we can now add data for 2024 births to explore the possibility that the effects of bans declined as shield laws took effect.[18]

7 Results

7.1 The effect of distance

Table 2 presents the results of the primary specification.[19] As reported in Column 1, the average total abortion ban is estimated to increase births by 2.3% (Column 1, $p < 0.01$).

In Column 2, we incorporate travel distance to distinguish the direct effect of state-level bans from the barriers created by increased travel requirements. Even when travel distances remain unchanged, the average total abortion ban increases births by 1.0% ($p < 0.01$)—evidence of a chilling effect that extends beyond physical barriers. The effects of the bans, however, increase markedly with the distance residents must travel to avoid them. Figure 4 uses the Column 2 estimates to illustrate the effect of a total abortion ban on births in a county that was 50 miles from the nearest abortion facility prior to the ban. A ban that increases distance by 100 miles is estimated to cause a 1.8% ($p < 0.01$) increase in births. The marginal impact of distance diminishes at higher distances, meaning that while the first 100 miles substantially increase births, additional distance increases beyond this threshold have a progressively smaller effect. A ban that increases distance by 200 miles results in a 2.5% increase in births ($p < 0.01$). The average resident of a ban state experienced a 250 mile increase in distance, from about 50 miles at baseline to 300 miles after Dobbs. This is estimated to result in a 2.8% ($p < 0.01$) increase in births.

[18] There are two additional difference in these analyses. First, in our earlier work, we categorized Wisconsin as a ban state because all of the state's abortion facilities ceased services in June 2022 in response to the threatened enforcement of an extant ban pre-dating *Roe*. Following a judicial ruling that enjoined enforcement, Wisconsin facilities began to re-open in September 2023. In our new analysis, we exclude Wisconsin. Appendix Figure B.1 demonstrates that the results are substantively the same if we instead include it as as ban state. Second, in our earlier work we used level birth rates as an outcome whereas here we use log rates for easy of comparability to the Poisson estimates in the county-level models. Appendix Figure B.2 and Figure B.3 demonstrate that the results are substantively the same if we use level birth rates as an outcome.

[19] This table presents coefficients estimated with a Poisson model. Throughout the discussion of the results as well as in all figures depicting marginal effects, we calculate the exact percent effects as $100 \times (exp(\beta \Delta X) - 1)$ and use the delta method to construct standard errors and p-values.

In Column 3 of Table 2, we introduce state-by-period fixed effects to account for statewide shocks that may simultaneously affect births and abortion access. This specification exploits within-state variation in distance shocks, allowing for a cleaner causal interpretation of the estimated distance gradient. Because these fixed effects are perfectly collinear with the enforcement of a total ban, we drop that term from the model and rely on intrastate variation in distance shocks to estimate the effects of distance. The results are quite similar to those in Column 2, supporting a causal interpretation of the estimated distance gradient.

Notably, the estimated impact of distance on births is smaller in the post-Dobbs era compared to prior periods (Fischer et al., 2018; Lindo et al., 2019; Venator and Fletcher, 2021; Myers, 2024c). For instance, an increase in distance from a baseline of 0 miles to a new level of 100 miles is estimated to result in a 0.8% ($p < 0.01$) increase in births (Column 3) compared to a 2.2% increase estimated by Myers (2024c) based on distance variation between 2009 and 2019. This suggests that wider availability of medication abortion, particularly through telehealth, may have reduced the impact of travel distance on birth outcomes. Nonetheless, the results also indicate that distance remains highly salient in ban states and that bans combined with increased distances have prevented residents from obtaining abortions.

7.2 Heterogeneous effects by population subgroups

Figure 5 presents the estimated effect of a total abortion ban accompanied by an increase in distance from 50 to 300 miles—the average change in distance for residents of ban states—estimated for birth outcomes for different demographic groups. We first replicate the previously reported 2.8% ($p < 0.01$) increase in births for all women. We then estimate the same model separately for key demographic groups to assess how abortion bans disproportionately impact different populations. These estimates, presented in Figure 5, include effects by race, age, educational attainment, marital status, and prior births.[20]

[20]For births by race and age groupings, we are able to use the corresponding population of women as the exposure. For instance, the exposure for total births to women aged 15 to 19 is the population of women aged 15 to 19. However, the SEER population data do not provide bridged estimates of county populations by education, marital status, or parity. This information also is not available by year for women aged 15-44 in all counties of the United States using other sources. We therefore rely on the total population of women

The results show that the average total ban has much greater effects on births to Black (3.2%, $p < 0.01$) and Hispanic (3.8%, $p < 0.01$) women than White women (2.0%, $p < 0.01$). Bans also have much larger effects on births to women with a high school education or less (3.1%, $p < 0.01$) or some college education (3.6%, $p < 0.01$) than on births to women with a college degree (1.3%, $p < 0.01$). Bans also have a much greater effect on births to unmarried women (3.5%, $p < 0.01$) than to married women (1.8%, $p = 0.03$).

These disparities likely reflect both higher baseline unintended pregnancy rates and greater barriers to abortion access among affected groups. Women of color, unmarried women, and those with lower educational attainment experience higher unintended pregnancy rates (Finer and Zolna, 2016). At the same time, these groups may face greater challenges in overcoming travel barriers—including financial constraints, job inflexibility, and heightened risks of intimate partner violence—which make it more difficult to access out-of-state abortion services.

We do not observe evidence of different effects by age group or birth parity. Teens aged 15–19 experience a larger estimated effect (3.4%, $p < 0.01$) than women aged 20–24 (3.8%, $p < 0.01$) or 25–29 (3.1%, $p < 0.01$). However, these estimated effects are not statistically significantly difference between groups. This is somewhat surprising given that young women have higher rates of unintended pregnancy than older women (Finer and Zolna, 2016) and past research has tended to find larger effects of abortion restrictions on women aged 15–24 than on older women (see, e.g. Myers, 2024c). Greater visibility of abortion funds and expanded telehealth services may have narrowed access gaps between teens and older women, reducing the impact of bans on younger age groups who historically faced greater travel-related barriers.

7.3 The effect of constrained appointment availability

Table 2 Column 4 adds appointment constraints to the model. This variable measures the fraction of facilities in the nearest destination city that do not have appointments avail-

aged 15-44 as the exposure in models of births by education, marital status, and parity. Note that Appendix Table B.2 includes models without exposure variables, showing results that are with those using population exposures. This is expected given the inclusion of county fixed effects and the short observation window during which populations are not likely to change substantially.

able within 2 weeks. Thus, when no facilities in the nearest destination have available appointments, births are predicted to increase by 0.4% ($p = 0.05$), indicating a modest but statistically significant effect of appointment constraints. However, as illustrated in Column 5, this result is somewhat sensitive to the inclusion of state-by-time fixed effects. The estimated effect is reduced by half and lacks statistical significance (0.2% increase in births, $p = 0.34$).

Figure 7 uses the results in Column 4 of Table 2 to illustrate the estimated effect of a total abortion ban for residents of a county who, prior to the ban, were 50 miles from the nearest abortion destination and where that destination did not have appointment constraints. The effects are allowed to vary with both the increase in distance and a change in appointment availability resulting from the ban. For residents of a county where abortion was previously accessible within 50 miles, a ban increasing travel distance to 300 miles is estimated to raise births by 2.8% ($p < 0.01$) if destination facilities remain unconstrained and 3.2% ($p < 0.01$) if no appointments are available within two weeks.

As illustrated by the confidence intervals in Figure 7, the estimated effects of appointment constraints are somewhat imprecise. This may be due to measurement error. Unlike distance measures, which precisely track facility operations by date, appointment availability relies on periodic survey snapshots beginning in March 2022. We use linear interpolation to fill in missing months. This measurement error may attenuate the estimates. Overall, while appointment constraints likely present obstacles to abortion access, their estimated effects are less robust and more sensitive to model specification than those of travel distance.

7.4 Spatial heterogeneity in the effects of abortion bans

These results suggest that the impact of abortion bans on births is largely mediated by the distance residents must travel to reach abortion services in non-ban states, with additional but modest amplification if appointments are constrained in the destination. To quantify this relationship, we use county-level changes in distance from Figure 2 and estimates from Column 4 of Table 2 to predict the relative change in births in each county affected by a ban. These predictions are illustrated in Figure 6, which shows that the increase in births

varies substantially across and within ban states. For example, in Missouri, where residents had already been traveling to Kansas and Illinois for abortions, every county is predicted to see less than a 1.5% increase in births—reflecting the minimal impact of the ban on travel distance. Similarly, in west Texas, where residents had been traveling to New Mexico for abortions even prior to the state's ban, births are predicted to increase little. In contrast, in cities like Austin, Houston, and San Antonio—where local abortion facilities closed and residents were forced to travel hundreds of miles—births are predicted to increase by more than 3%.

7.5 Dynamic treatment effects

Figure 8 present the results of event study estimates of log birth rate outcomes obtained with the doubly robust difference-in-difference procedure suggested by Arkhangelsky et al. (2021). This estimator is designed for linear models and requires treatments that are binary and absorbing—i.e., once a unit is treated, it remains treated indefinitely. Therefore, applying this estimator requires reducing the complexity of our preferred model to a binary "ban" or "protected" characterization of treatment.

Figure 8 depicts the estimated coefficients. The estimated effects are that abortion bans increased births by 1.9% in 2023 and by 1.8% in 2024, suggesting little to no reduction in the effects of bans on births in the second full year following Dobbs. Since most of the effect observed in Table 2 is shown to come from the effect of distance in 2023, this evidence of a sustained effect on births suggests that distance remains relevant into 2024.

We note that the confidence intervals are quite a bit larger in 2024 than in 2023. One possible explanation is greater heterogeneity in treatment effects in 2024, potentially driven by differential shield law implementation and variations in medication abortion shipments across states. Additionally, while the 2023 data are finalized birth counts, the 2024 data remain provisional and subject to revision, introducing potential measurement error that likely reduces the precision of the 2024 estimate. As the CDC updates the natality data, we will update the analysis.

8 Conclusion

Although abortions have risen by 11% since *Dobbs* overturned *Roe v. Wade*, this increase does not imply that all individuals can circumvent the bans. Our findings highlight growing inequality in abortion access post-Dobbs. Rising abortion rates in states where the procedure remains legal mask the sharp decline in access for residents of ban states.

By combining individual-level birth records that identify county of residence with detailed information on abortion facility operations and appointment availability, we provide the first evidence of the effects of abortion bans within ban states. These effects vary with distance to facilities in non-ban states and appointment availability at those destinations.

Total abortion bans following *Dobbs* measurably increased births, particularly in counties where driving distances to abortion facilities surged. Even as telehealth abortion services expanded and logistical support for travel improved, distance remains a stubborn barrier for many seeking abortion care. The burden is not evenly distributed. Black and Hispanic women, unmarried women, and those without a college degree exhibit the greatest increases in births observed among these groups. Constraints on appointment availability at brick-and-mortar facilities may further amplify the effects of bans, though these estimates are less precise due to data limitations.

While shield laws and telehealth options have eased access for some, they primarily benefit those who would have traveled for abortion services anyway, leaving others unable to overcome the barriers of distance. These findings underscore that despite rapid policy changes, abortion bans continue to impose substantial and deeply inequitable burdens, disproportionately affecting vulnerable populations.

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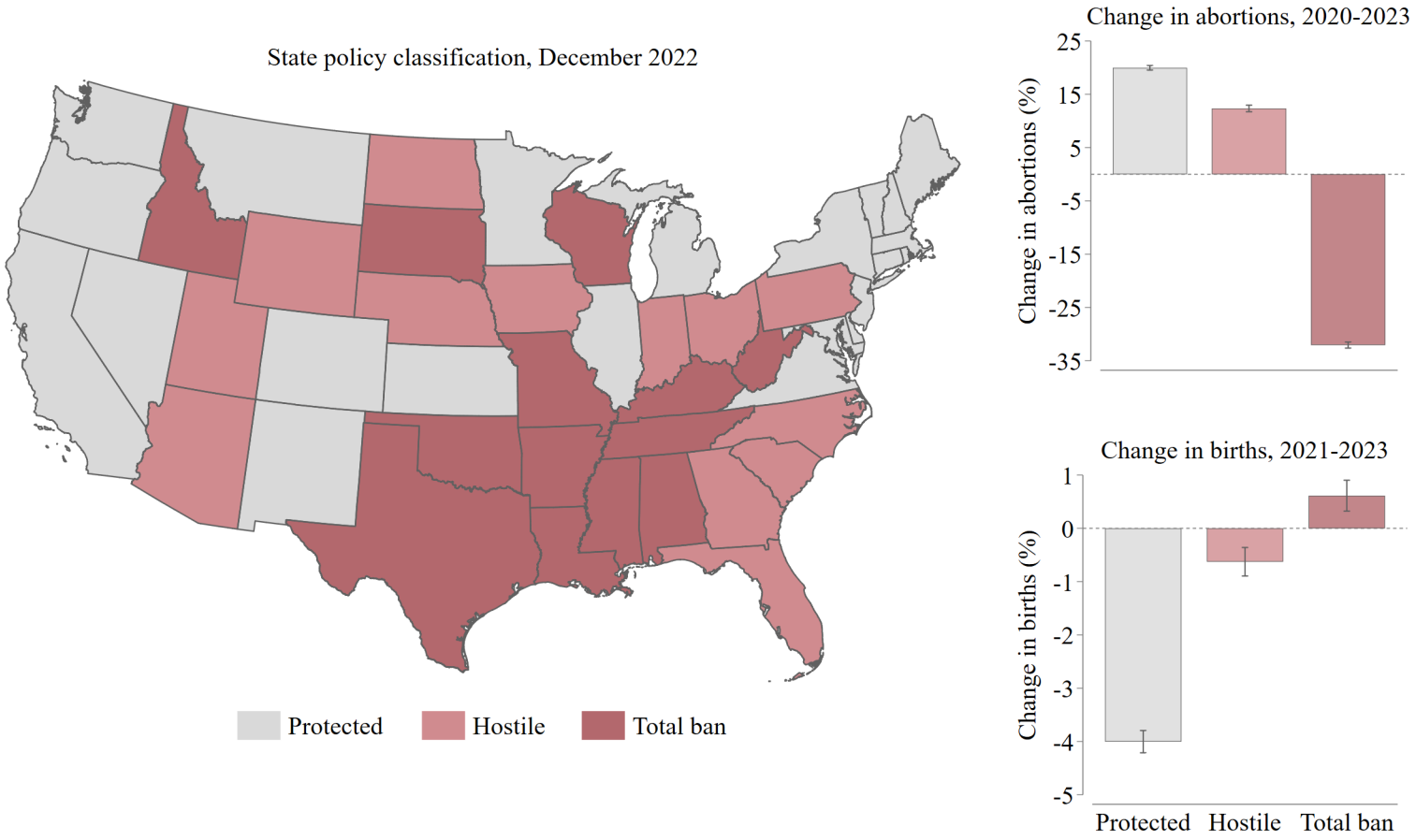
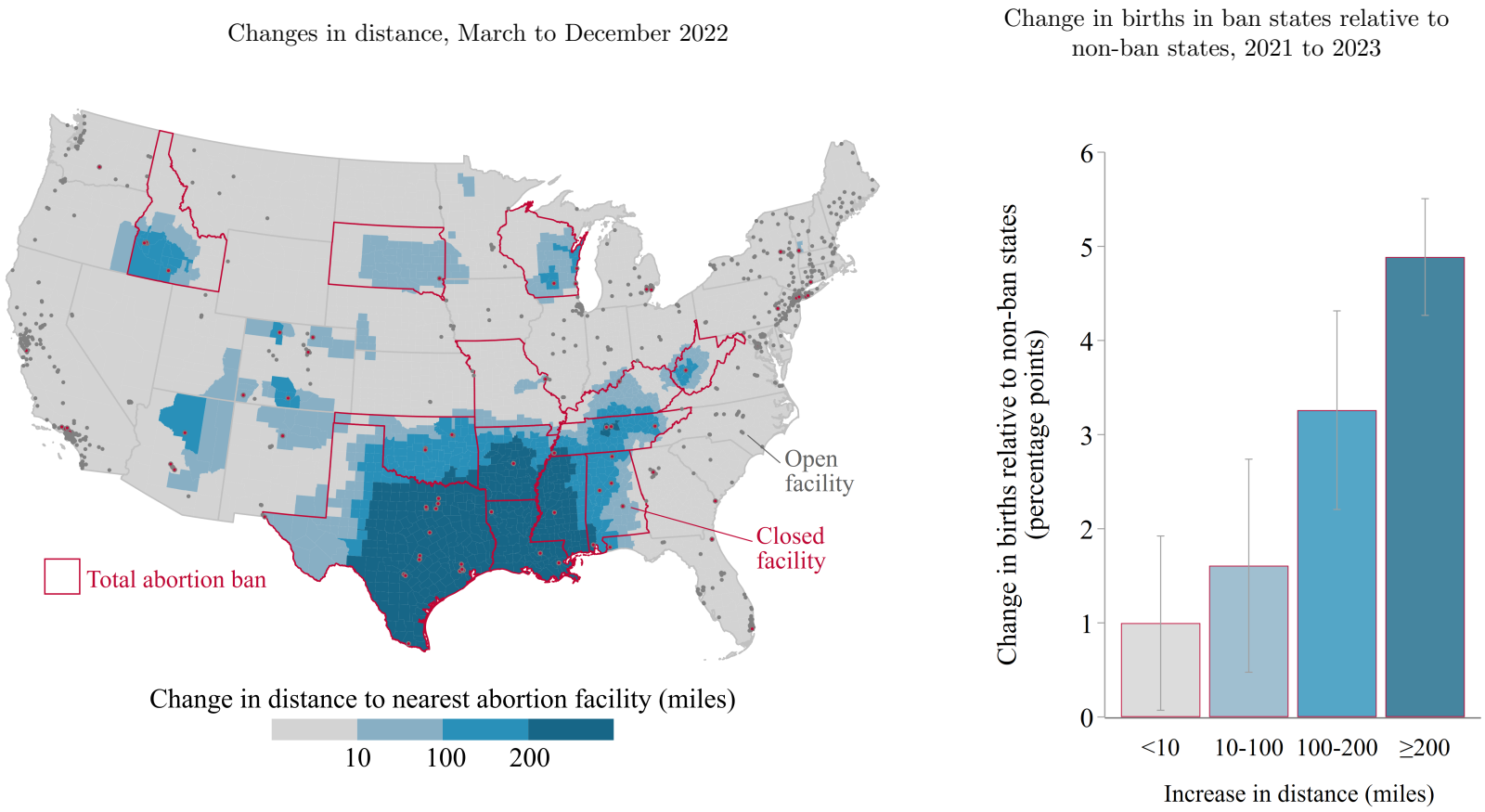
Figure 1: Total abortion bans correlate with a decline in resident abortions and an increase in births



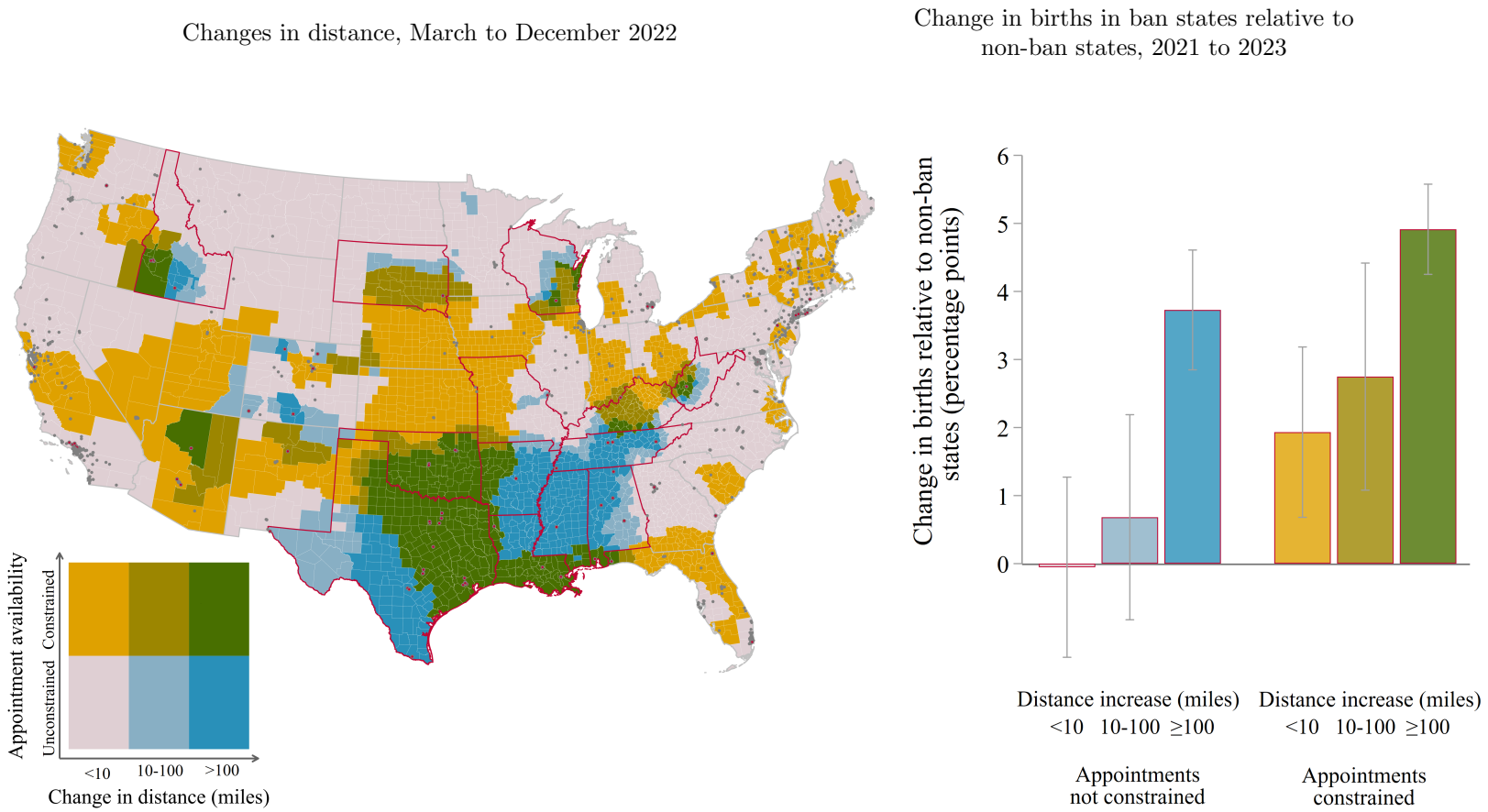
Notes: State policy classifications are described and documented in Appendix A. Resident abortions are estimated by the Guttmacher Institute in 2020 and 2023 (Maddow-Zimet et al., 2024); estimates for 2021 and 2022 are not available. Resident abortion counts capture abortions by state of residence, accounting for interstate travel but not for shield-law provision. Resident births are calculated by the authors using all-county natality files (National Center for Health Statistics, 2024). Bars represent 95% confidence intervals based on Poisson models of abortion and birth counts.

Figure 2: Distance as a mediator of the effects of abortion bans



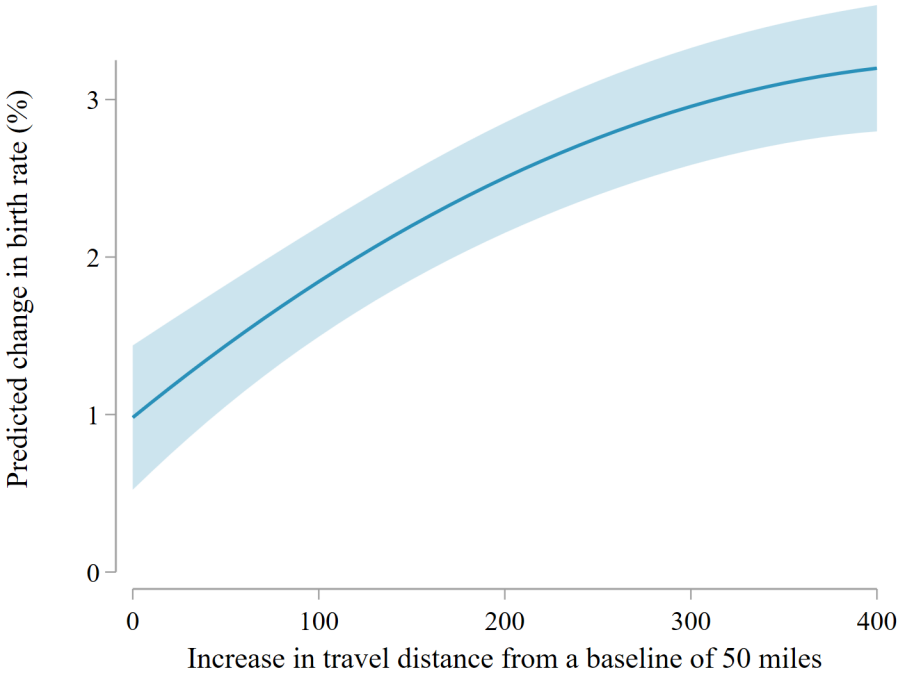
Notes: Red state borders indicate states enforcing total abortion bans in December 2022. Counties are shaded by changes in driving distance from the county population centroid to the nearest abortion facility, measured between March 1, 2022 and December 31, 2022. The bar chart illustrates the percent change in births between 2021 and 2023 in ban states relative to non-ban states, by the increase in driving distance. Bars represent 90% confidence intervals.

Figure 3: Increased distance and constrained appointment availability as mediators of abortion bans



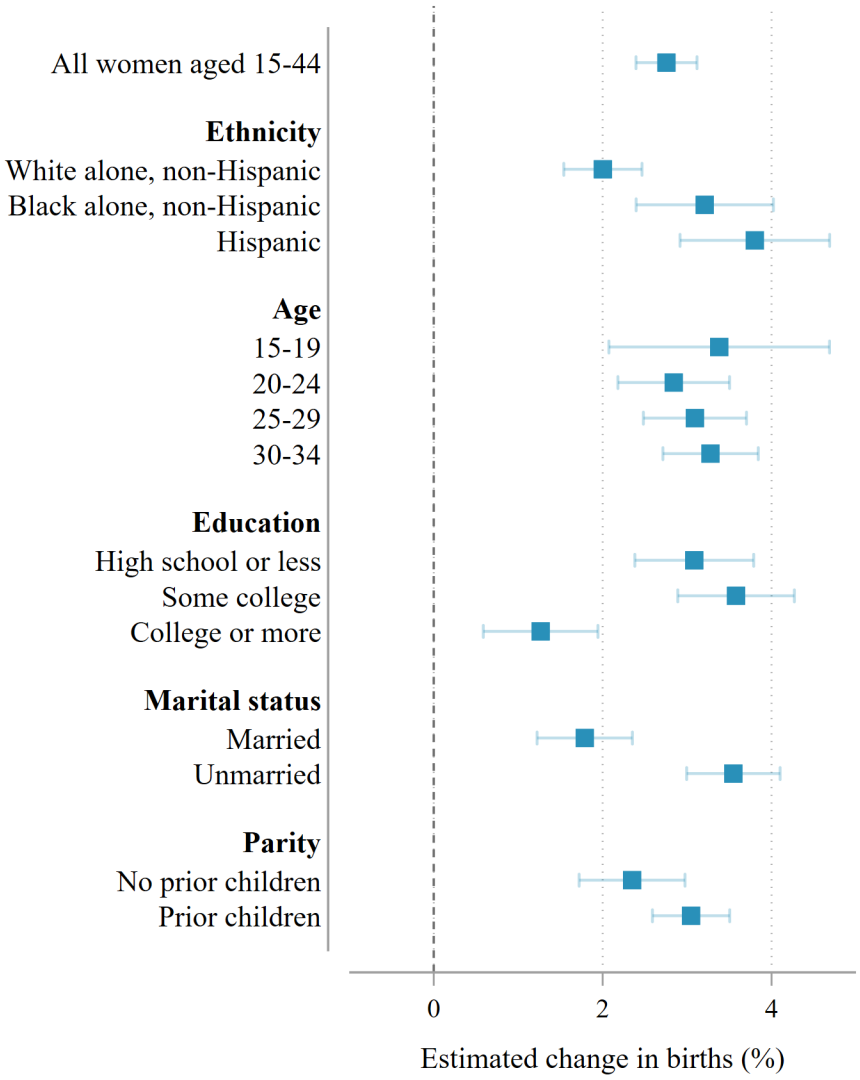
Notes: Counties are shaded by (1) change in driving distance to the nearest abortion facility, measured between March 1, 2022 and December 31, 2022 and (2) constrained appointment availability in the nearest destination city in December 2022. "Constrained" indicates that more than one-third of facilities in the nearest destination city did not have an appointment available within 2 weeks. Red state borders indicate states that enforced total abortion bans during this period. The bar chart illustrates the percent change in births between 2021 and 2023 in ban states relative to non-ban states, by the increase in driving distance and appointment constraints. Bars represent 90% confidence intervals.

Figure 4: Predicted effect of a total abortion ban in a county 50-miles from the nearest abortion facility prior to the ban



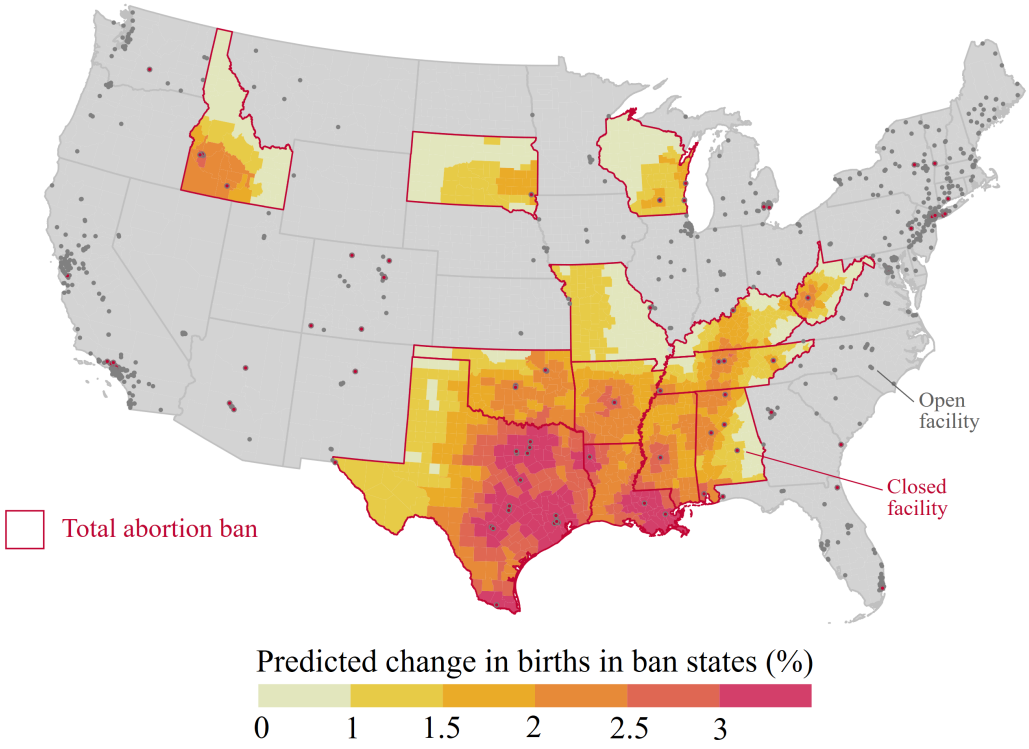
Notes: Estimated effects of a total abortion ban accompanied by an increase in driving distance from a baseline of 50 miles. These estimates correspond to Model 2 in Table 2. Shaded areas represent 90% confidence intervals.

Figure 5: Predicted effects of the average abortion ban, by demographic group



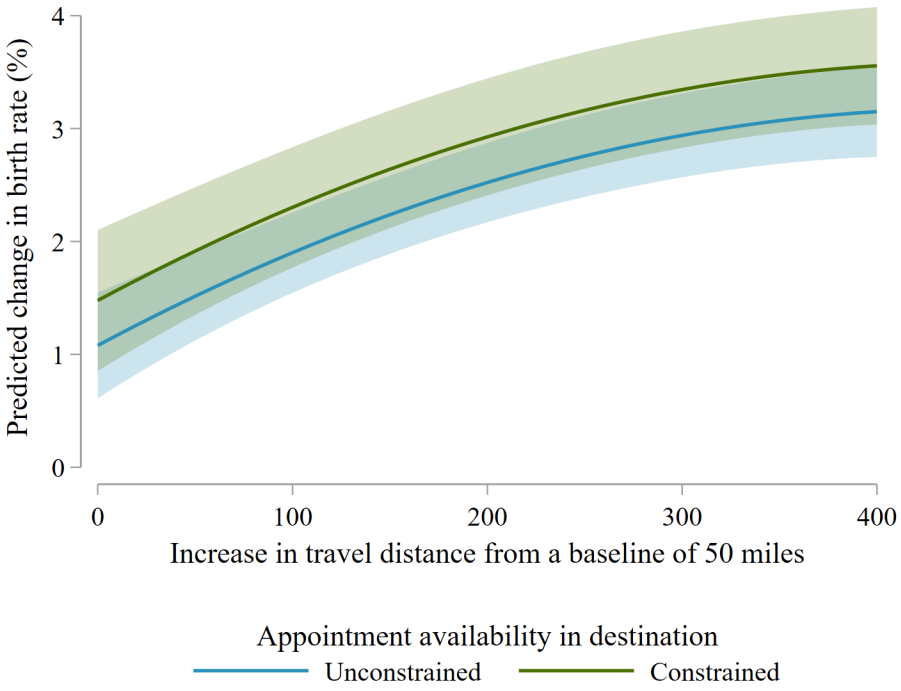
Notes: Estimated effects of a total abortion ban that increases driving distance from a baseline of 50 miles to a post-ban level of 300 miles. All estimates are based on two-way fixed effects Poisson models of birth counts by county of residence as a quadratic function of driving distance. These specifications correspond to that in Model 2 of Table 2 for all births, but are estimated separately for the indicated ethnic or age group. Capped bars represent 90% confidence intervals.

Figure 6: Spatial heterogeneity in the effects of bans: Predicted increases in births by county



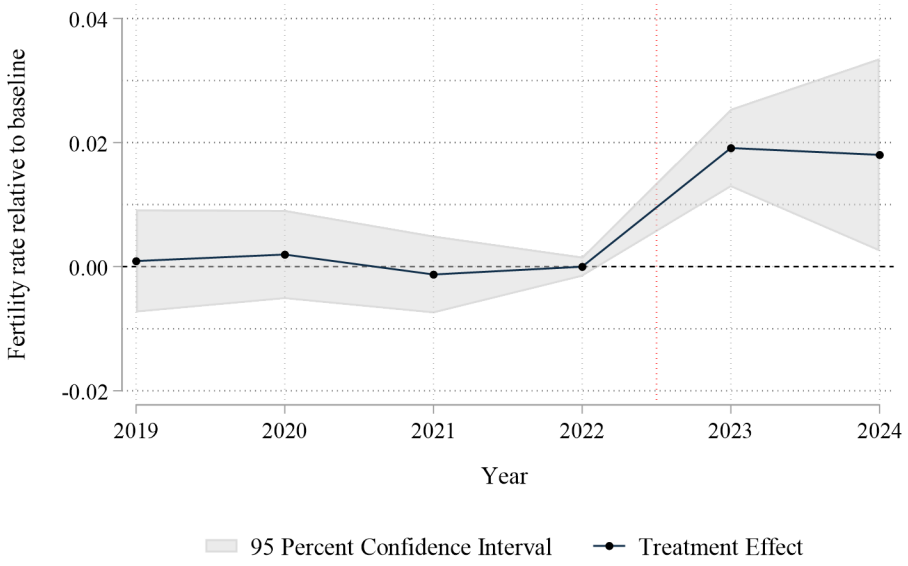
Notes: Estimated effects of a total abortion ban and the associated county-level change in distances observed between March and December 2022, using results in Model 4 of Table 2. Each county in a state enforcing a total abortion ban is shaded to illustrate the predicted increase in births resulting from the ban.

Figure 7: Predicted effect of a ban that increases driving distance from 50 to 300 miles, by appointment constraints in destination city



Notes: Estimated effects of a total abortion ban accompanied by an increase in driving distance from a baseline of 50 miles, by appointment constraints in the destination city. These estimates correspond to Model 4 in Table 2. "Constrained" appointment availability is defined as no appointments available in the nearest destination city within the next 2 weeks. "Unconstrained" is defined by all facilities in the nearest destination having appointments available within the next 2 weeks. Shaded areas represent 90% confidence intervals.

Figure 8: Synthetic Difference-in-differences event study estimated effects of a ban on fertility



Notes: Estimated treatment effects produced with the implementing the event study estimator proposed by Clarke et al. (2024). This is an extension of results from Dench et al. (2024) including final estimates for the full year 2023 and provisional estimates for 2024 from CDC wonder (2025). We use log birth rates as our outcome for ready comparability to the results of the Poisson models used elsewhere in the paper. Treatment and control are defined by state ban classifications in Table A.1, where treated states are those enforcing total bans and control states are those classified as "protected." The only change is Wisconsin is removed from the ban classification since their state supreme court ruling lead to a removal of the ban in September 2023. November and December 2024 birth counts are especially preliminary since data is released on a rolling basis and counts appear to stabilize approximately three months after first release.

Table 1: Summary statistics by abortion ban status, before and after *Dobbs*

	All states		Non-ban states		Ban states	
	Before	After	Before	After	Before	After
Birth rate (Births per 1,000 persons in group)						
Total	56.2	54.5	55.0	53.1	60.0	59.1
	(8.4)	(8.9)	(8.1)	(8.5)	(8.2)	(8.7)
Abortion access						
Distance (miles)	24.6	88.4	17.9	18.3	46.1	310.1
	(39.4)	(161.8)	(29.2)	(30.7)	(56.5)	(203.1)
Appointment constraints (%)	27.9	36.0	24.2	29.8	39.8	55.5
	(32.6)	(35.0)	(27.3)	(29.6)	(43.6)	(42.7)
Economic conditions						
Unemployment rate (%)	3.8	3.3	3.9	3.3	3.5	3.2
	(1.2)	(1.1)	(1.3)	(1.1)	(0.9)	(1.0)
Poverty rate (%)	12.8	12.7	12.2	12.2	14.6	14.5
	(4.5)	(4.5)	(4.1)	(4.1)	(5.2)	(5.1)
Demographics (% of total population of women aged 15-44)						
White & non-Hispanic	55.0	54.8	54.7	54.5	56.1	55.9
	(22.5)	(22.4)	(21.8)	(21.7)	(24.5)	(24.4)
Black & non-Hispanic	14.9	14.9	14.4	14.4	16.7	16.6
	(13.6)	(13.5)	(13.0)	(13.0)	(15.3)	(15.1)
Hispanic	21.8	21.9	21.8	21.9	21.7	22.0
	(18.5)	(18.4)	(17.2)	(17.1)	(22.2)	(22.1)
Age 15–19	16.1	16.1	16.0	15.9	16.6	16.5
	(2.2)	(2.2)	(2.2)	(2.2)	(2.3)	(2.3)
Age 20–24	16.9	17.0	16.8	16.9	17.3	17.4
	(3.5)	(3.5)	(3.4)	(3.5)	(3.6)	(3.7)
Age 25–29	16.6	16.4	16.7	16.5	16.4	16.3
	(1.7)	(1.8)	(1.8)	(1.8)	(1.6)	(1.6)
Age 30–34	17.5	17.5	17.6	17.7	17.1	17.2
	(1.9)	(1.8)	(1.9)	(1.9)	(1.7)	(1.7)
Age 35–39	16.7	16.7	16.8	16.8	16.5	16.5
	(1.5)	(1.6)	(1.5)	(1.6)	(1.6)	(1.7)
Age 40–44	16.1	16.3	16.1	16.3	16.1	16.2
	(1.7)	(1.8)	(1.7)	(1.7)	(1.8)	(1.8)
Number of states	49		36		13	
Number of counties	3,142		1,956		1,186	
Total population of women aged 15-44	130.3 million		99.1 million		31.2 million	

Notes: Population-weighted summary statistics calculated for United States counties. Ban states are those enforcing near-total abortion bans in December 2022: Alabama, Arkansas, Idaho, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, South Dakota, Tennessee, Texas, West Virginia, and Wisconsin. Non-ban states represent the remaining states in the contiguous United States. Birth outcomes, economic conditions, and demographics are observed in 2021 ("Before") and 2023 ("After"). Abortion access is measured in March 2022 ("Before") and December 2022 ("After") because the appointment series begins in March 2022. See text and replication package for additional information. Sources: National Center for Health Statistics (2024); Myers (2024d,b); Surveillance, Epidemiology, and End Results Program (SEER) (2022); Bureau of Labor Statistics, Local Area Unemployment Program (BLS) (2025); U.S. Census Bureau (2024).

Table 2: Two-way fixed effects Poisson estimates of the effect of bans and driving distance on birth rates

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0223***	0.0098***		0.0107***	
	(0.002)	(0.003)		(0.003)	
Distance		0.0106***	0.0088***	0.0101***	0.0084***
		(0.002)	(0.003)	(0.002)	(0.003)
Distance^2		-0.0010***	-0.0012***	-0.0010***	-0.0012***
		(0.000)	(0.000)	(0.000)	(0.000)
Appointment constraint				0.0039**	0.0022
				(0.002)	(0.002)
Controls	yes	yes	yes	yes	yes
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,645	18,645	18,639	18,543	18,537

Notes: Table presents coefficients from Poisson models of county-level birth rates, with the population of women aged 15-44 as an exposure. Data are county-by-half-year panel of 3,108 counties in the contiguous United States measured in 6 biannual periods from 2021 through 2023. Births are entered as a half-year lead to account for gestation. All models include county and year fixed effects and the following controls: the county-level unemployment rate; the county-level poverty rate; the fraction of the female population age 15 to 44 that falls into detailed age and ethnicity groups interacted with half-year fixed effects. Seasonality is adjusted by including county-by-half year interactions. See Appendix B for robustness checks. $^*p < 0.10$ $^{**}p < 0.05$ $^{***}p < 0.01$.

Appendix A: State abortion bans

Our starting point for classifying state abortion bans is state policy reviews published and periodically updated by the Center for Reproductive Rights (2025), Guttmacher Institute (2025), KFF (2023), and the New York Times (2022). We also consult the language of specific statutes and judicial decisions, as well as news articles that confirm the dates of enforcement. Our classifications capture the evolution of state policies through January 2025, though the analyses in this paper do not exploit variation occurring after 2023.

We use the term "total ban" to describe a ban on abortions at all gestational ages with very limited exceptions. All enforced total bans have exceptions to protect the life of the pregnant person. In addition, 5 have exceptions to protect the health of the pregnant person, 3 have exceptions for cases of rape or incest, and 2 have exceptions in cases of fatal fetal anomalies (KFF, 2023). Critics argue that exceptions to preserve mother's life or health are not feasible in practice due to the lack of specificity of clinical conditions (KFF, 2023).

Since June 2022, 15 states have enforced a total ban for a period of at least one month: Alabama, Arkansas, Idaho, Indiana, Kentucky, Louisiana, Mississippi, Missouri, North Dakota, Oklahoma, South Dakota, Tennessee, Texas, West Virginia, and Wisconsin.[21] In 12 of these states bans automatically took effect shortly after the Dobbs decision under "trigger laws" passed prior to Dobbs designed to ban abortion in the event that Roe was ever overturned. In Wisconsin, a de facto ban took effect when all of the state's abortion facilities ceased offering services because they they viewed the state as likely to enforce a 19th century abortion statute as a ban. In two states, Indiana and West Virginia, total bans took effect due to legislative actions following the Dobbs decision.

We use the term "gestational age ban" to describe a ban on abortions beyond a specified gestational age limit occurring prior to fetus viability, which is roughly 22 to 24 weeks gestation. To date, gestational age bans have been established at thresholds of 6, 12, 15 and 18-weeks gestation. The 6-week gestational age bans are by far the most restrictive of the pre-viability bans. Because pregnancy is dated from the first day of the last menstrual period (LMP), in a 28-day cycle fertilization would occur at approximately 14 days gestation and implantation of the resulting embryo in the uterus would then occur at approximately 20 to 26 days post fertilization. The earliest a person might expect a positive pregnancy test following fertilization and implantation is approximately 28 days LMP. Hence, at the soonest possible moment a person might realize that they are pregnant, they are already at 4 weeks gestational age, giving them at most 2 weeks to make a decision regarding the abortion, gather resources, and obtain the abortion before the 6-week ban prohibits it. Many pregnant people will have even less time and some will not know they are pregnant until

[21] This count does not include Arizona, where all abortion providers briefly closed twice in the months following Dobbs as a judicial battle over a pre-Roe abortion ban played out. It also does not include Utah, where a total ban was in effect for 3 days until it was enjoined by court order.

after 6 weeks. In 2020, 45.3% of abortions occurred at 6 weeks or earlier and an additional 25.6% occurred at 7–9 weeks gestation (Kortsmit, 2022). Less than 7% of abortions occurred after 13 weeks (Kortsmit, 2022).

Texas became the first state to enforce a gestational age ban when Senate Bill 8 (the "Texas Heartbeat Act") took effect on September 1, 2021, nearly 10 months before the Dobbs decision.[22] Following Dobbs, 6 additional states–Florida, Georgia, Idaho, Iowa, Ohio, South Carolina, Tennessee–enforced 6-week gestational age bans. Idaho and Tennessee's 6-week bans were quickly supplanted by total bans, while Ohio's was enjoined after two months. At present, Florida, Georgia, Iowa, and South Caroline are enforcing 6-week bans. In addition, Nebraska and North Carolina are enforcing 12-week bans, Kansas enforced a 15-week ban until December 2024, and Utah is enforcing an 18-week ban.

In addition, 5 states that were not enforcing pre-viability abortion bans are nonetheless considered "hostile" to abortion rights by organizations such as the Guttmacher Institute (2025) and Center for Reproductive Rights (2025). States classified as hostile may have pending litigation determining future enforcement of a ban or be considered likely to enact a ban in the future. In fact, three of the states these organizations were previously classified as hostile in 2022, Florida, Iowa, and South Carolina, now enforce 6-week gestational age bans (Center for Reproductive Rights, 2025).

In the remainder of this appendix, we provide state-by-state information on pre-viability abortion bans and other factors contributing to a characterization as "hostile" or "protected." Table A.1 presents dates of enforcement of pre-viability bans and a summary classification of the state policy environments.

State-by-state review

Alabama

Alabama Code §26-23H-4, a trigger law that took effect on 6/24/2022, prohibits abortions at all stages of pregnancy. The ban includes exceptions to prevent the death of the pregnant person, to prevent serious risk to the pregnant person's physical health, and where there is a lethal fetal anomaly. This state is characterized as enforcing a total ban.

Alaska

The Alaska Supreme Court ruled in 1997 that the privacy provision of Alaska's constitution protects the right to an abortion (*Valley Hospital Association, Inc. v. Mat-Su Coalition for Choice* 948: 963-73). This state is characterized as protected.

[22] This law banned abortions after detection of fetal cardiac activity, which typically occurs at about 6 weeks gestation. While critics charged that enforcement of a pre-viability abortion ban was clearly not constitutional under Roe and Casey and multiple lawsuits challenging the law were filed, the Supreme Court refused to issue an emergency injunction and the law was enforced until the Dobbs decision, at which point Texas replaced it with a total ban.

Arizona
Following the Dobbs decision, there was confusion and uncertainty about whether an total abortion ban dating to Arizona's founding criminal code in 1864 (A.R.S. §§13-3603) was enforceable. Per the facility documentation in the Myers Abortion database, all Arizona abortion facilities ceased providing services on or around 6/24/2022 under threat of enforcement. Most resumed services on or around 7/11/2022 when a judicial ruling blocked enforcement of the law. A lengthy litigation process ensued, and during it facilities again ceased services between 9/24/2022 and 10/7/2022. On 4/9/2024 the state supreme court upheld the ban (*Planned Parenthood v. Mayes* 254 Arizona 401). At that point, the total ban appeared poised to take effect in May. However, the state legislature acted quickly, passing a bill to repeal the ban that was signed by the governor on 5/1/2024. At that point the state attorney general announced the ban would not be enforced. Abortion rights proponents then introduced a ballot initiative and on 11/5/2024 state voters passed an amendment to the state constitution to protect abortion rights.

Separately, the Arizona legislature enacted statute §36-2322, a 15-week gestational age ban, after the Dobbs decision. This law took effect on 9/25/2022. After the voter referendum in November 2024, the Center for Reproductive Rights filed a lawsuit challenging the 15-week ban. On 12/5/2024 the Arizona Attorney General agreed not to enforce the ban while litigation proceeded, stating that it was no longer constitutional under the new amendment.

Arkansas
Arkansas Code §5-61-301 to –304, a trigger law that took effect on 6/24/2022, prohibits abortions at all stages of pregnancy. This total ban includes an exception to prevent the death of the pregnant person.

California
California statute allows abortion up to fetal viability (HSC §123468). Further, Prop 1 in November 2022 passed by popular vote and clarified the state constitution's right to privacy to include a right to an abortion and contraceptives. This state is characterized as protected.

Colorado
Colorado has not enacted any restrictions on the gestational age limits at which abortion can be performed. Further Colorado §§25-6-403, effective April 2022, guarantees a right to abortion in Colorado. This state is characterized as protected.

Connecticut
Connecticut § 19a-602(a) leaves the decision to have an abortion to a pregnant woman. This state is characterized as protected.

Delaware
Tit. 24, § 1790 (b) expressly allows abortion up to fetal viability.This state is characterized as protected.

District of Columbia
D.C. CODE §2-1401.06 recognizes a right to an abortion. The District of Columbia is characterized as protected.

Florida
Florida statute §390.0111 established a 15-week gestational age ban effective 7/1/2022. The

law remained in effect during an extended legal battle. On 4/13/2023, Florida's governor signed the "Heartbeat Protection Act" into law, amending Florida's statutes to establish a ban on abortions after fetal cardiac activity is detected, typically at about 6 weeks gestation. This law was not enforced during a period of judicial review, but the 15-week ban remained in effect. On 4/1/2024 the state Supreme Court ruled that the state constitution did not protect a right to abortion and that the bans could take effect (*Planned Parenthood of Southwest and Central Florida v. State of Florida* No. 384 So.3d 67) and the 6-week ban began effective and superseded the 15-week ban on 5/1/2024. Florida is characterized as enforcing a gestational age ban.

Georgia
The Georgia legislature enacted House Bill 481 in 2019, establishing a ban on abortions after fetal cardiac activity is detected. Enforcement of the ban was blocked until after the Dobbs decision, when it took effect on 7/20/2022. During an extensive battle carried in Georgia courts, enforcement was briefly enjoined between 11/15/2022 and 11/21/2022 and again between 9/30/2024 and 10/7/2024. Florida is characterized as enforcing a gestational age ban.

Hawaii
Hawaii §453-16(b) allows abortion until viability. This state is characterized as protected.

Idaho
In 2020 Idaho enacted §18-622(1)(a), a trigger ban prohibiting abortions at all stages of pregnancy. The law offered no exceptions, but did note that if prosecuted, a physician could rely on a defense that the abortion was necessary to save the life of the pregnant person, and bear the associated burden of proof. In 2021 Idaho enacted a second abortion ban on abortions after 6 weeks gestation that included exceptions to save the life of or to prevent irreversible permanent bodily damage to the pregnant person. Both bans were scheduled to take effect after Dobbs, but the trigger ban was temporarily enjoined by a federal court because it conflict with federal Emergency Medical Treatment and Labor Act (EMTALA) mandates. Meanwhile, the 6-week ban took effect on 8/19/2022 after a federal court upheld Georgia's similar 6-week ban. The state of Idaho appealed the injunction against the total ban, and it was then allowed to take effect on 8/25/2022. the total ban was allowed to take effect. In July 2023, Idaho amended the total ban to allow exceptions to save the life of the pregnant person or in cases of rape or incest reported to legal authorities. This state is classified as enforcing a total abortion ban.

Illinois
Illinois §775-55/1-25(a) allows abortion until viability. This state is characterized as protected.

Indiana
Indiana Senate Enrolled Act 1, enacted after Dobbs in a special session of the state legislature on 8/5/2022, makes it illegal to perform an abortion. The ban includes exceptions to preserve the life or health of the pregnant person, in cases of rape or incest, and in cases of severe fetal anomalies. This law was challenged and enforcement enjoined until the state supreme court issued a ruling on 8/1/2023 that it could take effect. The ban took effect on 8/21/2023. This state is classified as enforcing a total abortion ban.

Iowa
The Iowa legislature enacted House Bill 481 in 2019, establishing a ban on abortions after fetal cardiac activity is detected. The law was challenged and enjoined until 7/29/2024, when it took effect. This state is classified as enforcing a 6-week gestational age ban.

Kansas
Hodes & Nauser, MDsS, P.A. v. Schmidt, 440 P.3d 461, 502 clarified that the state constitution guarantees a right to an abortion. A ballot measure H.C.R. 5003 failed that would have changed this in August 2022. This state is characterized as protected.

Kentucky
The Kentucky legislature enacted a trigger ban in 2019. The ban, codified as §311.772, took effect on 6/24/2022. The ban includes exceptions to preserve the life or health of the pregnant person. This state is classified as enforcing a total abortion ban.

Louisiana
The Louisiana legislature enacted a trigger ban in 2006, making it among the first states to do so. The ban, codified as §§40.87.7-8 and 40:1061, took effect on 6/24/2022. The ban includes exceptions to preserve the life or health of the pregnant person. This state is classified as enforcing a total abortion ban.

Maine
Maine §22-1598 ensures the right to an abortion up to viability. This state is characterized as protected.

Maryland
Maryland §20-209 ensures the right to an abortion up to viability. This state is characterized as protected.

Massachusetts
The decision in *Moe v. Secretary of Administration and Finance* ruled that abortion is protected under the due process clause of the state constitution. In addition, Gen. Laws ch. 112, § 12L. ensures a right to an abortion. This state is characterized as protected.

Michigan
Michigan statute §333.17015 allows abortion with informed consent up to the point of viability. Article I §28 of the Michigan state constitution protects the right to an abortion. This state is characterized as protected.

Minnesota
The Minnesota Supreme Court ruled in 1995 that the state constitution protects a right to abortion (*Doe v. Gomez* 542 N.W.2d 17). In January 2023, the governor signed the Protect Reproductive Options Act into law, affirming Minnesotans' fundamental right to make independent decisions about their own reproductive health, including the right to obtain an abortion. This state is characterized as protected.

Mississippi
The Mississippi legislature enacted a trigger ban in 2007, making it among the first states to

do so. The ban, codified as §41-41-45, took effect on 7/7/2022. The ban includes exceptions to preserve the life of the pregnant person or in cases of rape or incest reported to law enforcement. This state is classified as enforcing a total abortion ban.

Missouri
The Missouri legislature enacted a trigger ban in 2019, codified as §188.017. This ban took effect on 6/24/2022. The ban includes exceptions to preserve the life of the pregnant person. In November 2024, Missouri voters approve an amendment to the state constitution to protect abortion rights. On 12/23/2024, the state Supreme Court held that the abortion ban was unconstitutional following this amendment and enjoined the bans (Comprehensive Health of Planned Parenthood Great Plains et al. v. Missouri, No. 2416-CV31931). As of February 2025, no facilities have resumed abortion services in the state.

Montana
Montana's Supreme Court held in 1999 that the state's constitutional protections for privacy extend to the right to access to abortion (*Armstrong v. State* 296 Mont. 361). Montana statute (§50-20-603) prohibits abortions beyond 20 weeks gestation, but this law was enjoined and ultimately struck down in 2024 (*Planned Parenthood of Montana v. State of Montana* No. DV-21-999). In 2023, the state legislature enacted Senate Bill 154 to redefine the constitutional right to privacy to exclude the right to abortion. But in 2024, Montana voters amended the state constitution to expressly provide a right to abortion. This state is characterized as protected.

Nebraska
The Nebraska governor signed a 12-week abortion ban (L.B. 574, 108th Leg.) into effect on 5/22/2023 and it became effective immediately. In November 2024, Nebraska voters rejected a ballot initiative to protect abortion and enshrine the 12-week abortion ban in the state constitution (Article 1, §31). This state is characterized as enforcing a 12-week gestational age ban.

Nevada
Nevada voters ratified a law (§442.250) in 1990 that expressly protects the right to abortion before 24 weeks. In November 2024, Nevada voters approved an amendment to the state constitution to protect abortion rights, but this will require a second vote to be implemented. This state is characterized as protected.

New Hampshire
New Hampshire's legislature enacted a ban on abortions after 24 weeks codified as §329-34 and effective 1/1/2022. No law expressly allows or prohibits pre-viability abortion. The Center for Reproductive Rights characterizes this state as "not protected," a status that is intermediate between "protected" and "hostile" and shared by only two other states (New Mexico and Virginia). Similarly, the Guttmacher Institute characterizes New Hampshire as having "some restrictions." We characterize New Hampshire as protected for our limited purpose of describing changes in abortions and births across three groupings of states. We encourage other researchers to critically evaluate whether this characterization is appropriate for their analytical purposes.

New Jersey
New Jersey's Supreme Court determined in 1982 that the state constitutional right to privacy

extends to abortion (*Right to Choose v. Byrne* 91NJ287).In 2022, the state legislature also enacted Senate Bill 49 establishing a right to abortion. This state is characterized as protected.

New Mexico
New Mexico's legislature repealed the state's pre-Roe abortion ban (§30-5-1(c), repealed by S.B. 10, 55th Legislature). No law expressly allows or prohibits pre-viability abortion and the state's supreme court determined whether the state's constitution protects abortion. The Center for Reproductive Rights characterizes this state as "not protected," a status that is intermediate between "protected" and "hostile" and shared by only two other states (New Hampshire and Virginia). However, given the state's recent history of repealing abortion restrictions, the Guttmacher Institute characterizes New Mexico as protective of abortion rights. We adhere to Guttmacher's characterization.

New York
The New York legislature enacted statutory protections for abortion in 2019 (§2599). In 2024, New York voters passed a state ballot initiative to enshrine abortion rights in the state constitution. This state is characterized as protected.

North Carolina
North Carolina's legislature enacted a suite of abortion restrictions effective 7/1/2023. These included a 12-week gestational age ban (§90-21.81). This state is characterized as enforcing a 12-week gestational age ban.

North Dakota
In 2007 North Dakota's legislature enacted HB 1466, a trigger ban that was one of the first in the country. When the state attempted to enforce the ban following the Dobbs decision, it was initially struck down because it did not provide exceptions to preserve the life or health of the mother. The state legislature then amended the ban to add these exceptions, and it was allowed to take effect on 4/23/2023. The law was again challenged, and on 9/12/2024 the state Supreme Court determined that the state constitution protects a right to abortion, invalidating the law (*Access Independent Health Services v. Wrigley* No. 08-2022-CV-1608). However, the state has repealed the ruling and as of February 2024 no facilities in North Dakota are publicly advertising abortion services. This state is classified as hostile.

Ohio
In April 2019, Ohio's legislature enacted a ban on abortions performed after the detection of fetal cardiac activity (Ohio Rev. Code Ann. § 2919.195), which typically takes place at about 6 weeks gestation. A court issued a preliminary injunction against enforcement, which a district court then dissolved on 6/24/2022 following the Dobbs decision. A 6-week gestational age ban therefore took effect on 6/24/2022. Enforcement was temporarily enjoined effective 9/14/2022 and the ban was subsequently struck down on 10/24/2024 (*Preterm-Cleveland v. Yost* No. A2203203 Ct. C.P. Ohio). Furthermore, on 11/7/2023, voters in Ohio approved Issue 1, a constitutional amendment to protect reproductive decision making. As a result of this series of events, the Center for Reproductive Rights characterization of Ohio evolved from hostile to protective. The Guttmacher Institute characterizes the state as having "some abortion restrictions." We characterize Ohio as "hostile" for our limited purpose of describing changes in abortions and births between 2021 and 2023 across

three groupings of states. We encourage other researchers to critically evaluate whether this characterization is appropriate for their analytical purposes.

Oklahoma
Oklahoma's legislature enacted a trigger ban in 2021 designed to make it's pre-Roe ban (§861) take effect immediately following a reversal of Roe. This ban, which only includes an exception to preserve the life of the pregnant person, took effect on 6/24/2022. However, even prior to this ban taking effect, Oklahoma had begun enforcing pre-viability bans. On 5/3/2022, Senate Bill 1503, modeled on Texas SB8, created private citizen enforcement of a 6-week ban making abortions after six weeks prohibitively costly. On 5/26/2022, this was replaced with a total abortion ban. This state is classified as enforcing a total abortion ban.

Oregon
Oregon repealed its pre-Roe abortion ban in 1983. In 2023 it enacted statutory provisions to codify abortion as a right (§435.305). This state is characterized as protected.

Pennsylvania
Pennsylvania does not include express constitutional or statutory protections for abortion. The current Pennsylvania governor is supportive of abortion, but the state also has many restrictions in place and the state legislature has attempted to enact more in recent years. The Center for Reproductive rights characterizes Pennsylvania as "hostile" and Guttmacher as "restrictive." This state is classified as hostile.

Rhode Island
Rhode Island enacted statutory protections for abortion (§23-4.13-2) in 2019. This state is characterized as protected.

South Carolina
South Carolina enacted a trigger ban in 2021 (§§ 44-41-610 et seq.) designed to ban abortions after the detection of fetal cardiac activity. This ban was in effect from 6/24/20022 to 8/17/2022, when the state supreme court issued a temporary injunction pending review. Ultimately, on 1/5/2023 the state supreme court issued an opinion striking down the law on the grounds that it violated a right to privacy protected by the state constitution (Planned Parenthood S. Atl. v. South Carolina, No. 28127). In response to this ruling, the state legislature revised the law in 2023. Enforcement was immediately enjoined pending resolution of this challenge, but the law was ultimately upheld and took effect on 8/23/2023 (*Planned Parenthood South Atlantic v. South Carolina*, No. 2023-000896). We classify the state as enforcing a 6-week ban from 6/24/2022–8/17/2022 and 8/23/2023–present.

South Dakota
South Dakota enacted a trigger ban (§22-17-5.1) in 2021 that made performing an abortion a felony except in cases to save the life of the mother. The last took effect on 6/24/2022.

Tennessee
Tennessee's constitution was amended in 2014 to preclude protection of abortion rights. Tennessee enacted a trigger ban in 2019 (§39-15-213) that took effect on 8/25/2022. The following year, the Tennessee legislature also enacted House Bill 2263, which included a 6-week gestational age ban. Enforcement of this 6-week ban was enjoined, but a court allowed

it to take effect on 6/28/2022 following Dobbs. It was superseded by the total abortion back on 8/25/2022. This total ban includes exceptions to preserve the life or health of the pregnant person.

Texas
Texas Senate Bill 8, which took effect on September 1, 2021, marked the first enforcement of a pre-viability abortion ban in the months leading up to Dobbs. The law allowed private citizens to sue anyone suspected of assisting an abortion that occurred after the detection of fetal cardiac activity, which occurs at about six weeks of pregnancy. Texas also enacted a trigger ban, codified as §§170A.001-7, which took effect on 8/25/2022. But all of the state's abortion providers ceased services immediately on 6/22/2022 after Dobbs out of concern they would be prosecuted under an extant pre-Roe ban. A judge briefly enjoined enforcement of this pre-Roe ban on 6/28/2022 before the state Supreme Court again allowed it on 7/2/2022. Texas is classified as enforcing a 6-week ban from 9/1/2021 through 6/21/2022, a total ban from 6/22/2022-6/28/2022, a 6-week ban from 6/29/2022-7/1/2022, and a total ban from 7/1/2022 forward.

Utah
Utah's legislature enacted a trigger ban in 2020, codified as §76-7a-201. This total ban briefly took effect between 6/24/2022 and 6/27/2022 before a temporary restraining order was issued followed by a preliminary injunction (*Planned Parenthood Association of Utah v. Utah*, No. 220903886, July 11, 2022). This injunction was affirmed by the state Supreme Court on 8/1/2024 pending further review by lower courts. Utah is enforcing a ban on abortions at 18 weeks (§§76-7-302) that took effect on 6/26/2022.

Vermont
The Vermont legislature enacted comprehensive abortion rights legislation in 2019 (§9493). These protections were further strengthened in November 2022 when voters approved Proposal 5, which enshrines reproductive freedom in the Vermont constitution. This state is characterized as protected.

Virginia
Virginia's legislature repealed multiple abortion restrictions in 2020, including a mandatory waiting period and supply-side regulations. No law expressly allows or prohibits pre-viability abortion. The Center for Reproductive Rights characterizes this state as "not protected," a status that is intermediate between "protected" and "hostile" and shared by only two other states (New Hampshire and New Mexico). Similarly, the Guttmacher Institute characterizes Virginia as having "some restrictions." We characterize Virginia as protected for our limited purpose of describing changes in abortions and births across three groupings of states. We encourage other researchers to critically evaluate whether this characterization is appropriate for their analytical purposes.

Washington
Washington law includes long-standing statutory protections of abortion rights (§9.02.110). This state is characterized as protected.

West Virginia
In the months and weeks leading up to Dobbs, West Virginia's attorney general issued a

series of contradictory statements about potential enforcement of the state's 19th century enforcement ban, and the state's sole abortion facility closed on 6/24/2022, citing concerns over enforcement action. The attorney general issued a memorandum on 6/29/2022 confirming that he regarded the state's 1849 abortion ban as in effect. Providers at the abortion facility filed for relief, and a state court granted a preliminary injunction on 7/20/2022 (*Women's Health Center of West Virginia v. Miller* No. 22-C-556, Jul. 20, 2022). The legislature then called a special session to enact a new total ban, which was signed by the governor and took effect on 9/16/2022, codified as §16-2R-3. The ban includes exceptions to preserve the life or health of the pregnant person, for cases of rape or incest, and for fatal fetal anomalies.

Wisconsin
Wisconsin's 1849 abortion ban was never repealed, and Wisconsin's abortion facilities began to close a month prior to the Dobbs decision, citing risk of enforcement of an 1849 pre-Roe criminal abortion ban. After a lower court ruled it was not enforceable, the facilities began to reopen on 9/18/2023. The ruling has been appealed to the state Supreme Court, which heard oral arguments in November 2024. As of February 2025, the Court has not issued a final ruling. We classify Wisconsin as enforcing a total ban between 6/22/2022 and 9/18/2023.

Wyoming
Wyoming enacted a trigger ban in 2022 (H.B. 92, 66th Leg. amending Wyo. Stat. Ann. §35-6-102). Just hours after the ban took effect on 7/27/2022, a judge issued an injunction blocking enforcement (*Johnson v. State*, No. 18732). On 3/21/2023, the legislature enacted another total abortion ban, codified as §35-6-102, but it was enjoined and struck down prior to taking effect.

Table A.1: Summary of pre-viability abortion bans

State	Classification	Enforcement Dates
Alaska	Protected	
Alabama	Total ban	6/24/2022–present
Arizona	Hostile	15-week ban 9/25/2022–12/5/2024. Facilities also closed 6/24/2022–7/11/2022 & 9/24/2022–10/7/2022 due to perceived enforcement risks.
Arkansas	Total ban	6/24/2022–present
California	Protected	
Colorado	Protected	
Connecticut	Protected	
D.C.	Protected	
Delaware	Protected	
Florida	6-week ban	15-week ban 7/1/2022–4/30/2024; 6-week ban 5/1/2024–present
Georgia	6-week ban	7/20/2022–11/15/2022; 11/21/2022–9/30/2024; 10/7/2024–present
Hawaii	Protected	
Idaho	Total ban	6-week ban 8/19/2022–8/24/2022; Total ban 8/25/2022–present
Illinois	Protected	
Indiana	Total ban	8/21/2023–present
Iowa	6-week ban	7/29/2024–present
Kansas	Protected	
Kentucky	Total ban	6/24/2022–present
Louisiana	Total ban	6/24/2022–present
Maine	Protected	
Maryland	Protected	
Massachusetts	Protected	
Michigan	Protected	
Minnesota	Protected	
Mississippi	Protected	7/7/2022–present
Missouri	Hostile	Total ban 6/24/2022–12/23/2024
Montana	Protected	
Nebraska	12-week ban	5/22/2023–present
Nevada	Protected	
New Hampshire	Protected	
New Jersey	Protected	
New Mexico	Protected	
New York	Protected	
North Carolina	12-week ban	7/1/2023–present
North Dakota	Hostile	Total ban 4/23/2023–9/12/2024
Ohio	Protected	6-week ban enforced 6/24/2022–10/24/2022. We characterize the state as "hostile" until 11/7/2023, when voters approved a constitutional amendment to protect abortion rights.
Oklahoma	Total ban	6-week ban 5/3/2022–5/25/2022; Total ban 5/26/2022–present.
Oregon	Protected	
Pennsylvania	Protected	
Rhode Island	Protected	
South Carolina	6-week ban	6/24/2022–8/17/2022; 8/23/2023–present
South Dakota	Total ban	6/24/2022–present
Tennessee	Total ban	6-week ban 6/28/2022-8/24/2022; total ban 8/25/2022–present
Texas	Total ban	6-week ban 9/1/2021–6/21/2022; total ban 6/22/2022–6/28/2022; 6-week ban 6/29/2022–7/1/2022; total ban 7/2/2022–present
Utah	18-week ban	Total ban 6/24/2022–6/27/2022; 18-week ban 6/26/2022–present
Vermont	Protected	
Virginia	Protected	
Washington	Protected	
West Virginia	Total ban	6/22/2024–7/20/2022; 9/13/2022–present
Wisconsin	Hostile	Total ban 6/22/2022–9/18/2023
Wyoming	Hostile	

Notes: Table provides dates of contemporary enforcement of pre-viability abortion bans. The classification column characterizes policies at the time of writing in February 2025. Where this classification differs from that represented in Figure 1, it is because policies differed in December 2022.

Appendix B: Alternative specifications and additional results

In the main body of the paper, we allude to various alternative specifications of our primary models. These include the following estimates:

- Table B.1 reports results of specifications omitting economic control variables from the models.
- Table B.2 reports results of specifications omitting economic and demographic controls from models
- Table B.3 reports results of specifications omitting the county-by-half-year interactions adjusting for seasonality.
- Table B.4 reports results of the primary specification in omitting economic and demographic control variables and the county-by-half-year interactions from the models.
- Table B.5 reports results of the primary specification estimated for a sample that excludes Texas.
- Table B.6 reports results of alternative specifications to the Poisson. The outcome is the natural logarithm of the birthrate and the model is estimated with WOLS where the weights are the population of women aged 15–44.
- Table B.7 reports results of alternative specifications to the Poisson. The outcome is the natural logarithm of the birthrate and the model is estimated with OLS.

Each of these tables can be directly compared to the primary estimates in Table 2 to demonstrate that the results are robust to these alternative specifications and sample selection criteria. For instance, based on the results in Column 1 of Table 2, we report in the paper that the average ban increases births by 2.3%. Using the alternative specifications and samples here, the smallest estimated effect is 1.3% if we exclude Texas from the analysis (Table B.5). This smaller effect is in keeping with the fact that Texas exhibits some of the largest distance increases in the country and distance is a mediator of bans. The results of the remaining alternative specifications are also in keeping with the primary results, ranging from a 1.6% increase in births (Table B.2 and Table B.4) to a 2.3% increase in births (Table B.3 and Table B.6)

Next, consider the estimated effect of the average ban based on Column 2 of Table 2. As we describe in the paper, the average person affected by a ban experience an increase in distance from 50 miles before the ban to 300 miles after the ban. The results in Table 2 suggest that this resulted in a 2.8% increase in births. Using the alternative specifications

and samples here, the smallest estimated effect is 1.6% if we exclude all controls and adjustments for seasonality (Table B.4) and the largest is 2.9% using the weighted ordinary least squares model (Table B.6).

The results for models that add state-by-year fixed effects (Column 3), controls for appointment availability (Column 4), and state-by-year fixed effects and controls for appointment availability (Column 5) are similarly robust across specifications.

In addition, we estimate thre alternative Synthetic Difference-in-Differences specifications for comparison to the results in Figure 8:

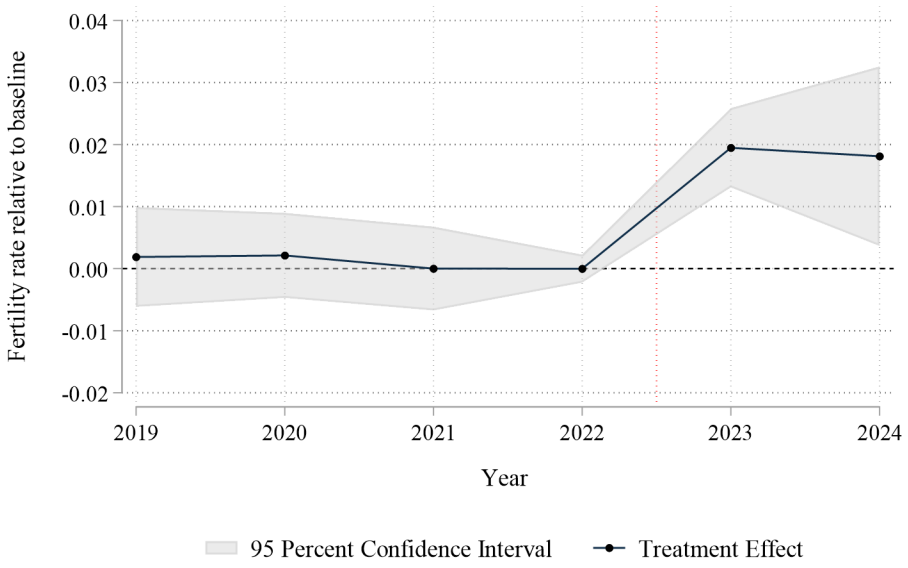
- Figure B.1 reports results of a specification that includes Wisconsin as a ban state rather than excluding it from the analysis. All Wisconsin abortion facilities closed in response to the Dobbs decision and the threatened enforcement of a 19th century abortion ban, but the resumed services in September 2023 after a judicial ruling enjoined enforcement. In our primary analysis, we exclude Wisconsin. In this alternative approach, we classify it as as ban state and include it.

- Figure B.2 reports results of a specification that uses the level birth rate (births per 1,000 women aged 15-44) rather than the log birth rate.

- Figure B.3 reports results of a specification that uses the level birth rate and includes Wisconsin as a ban states

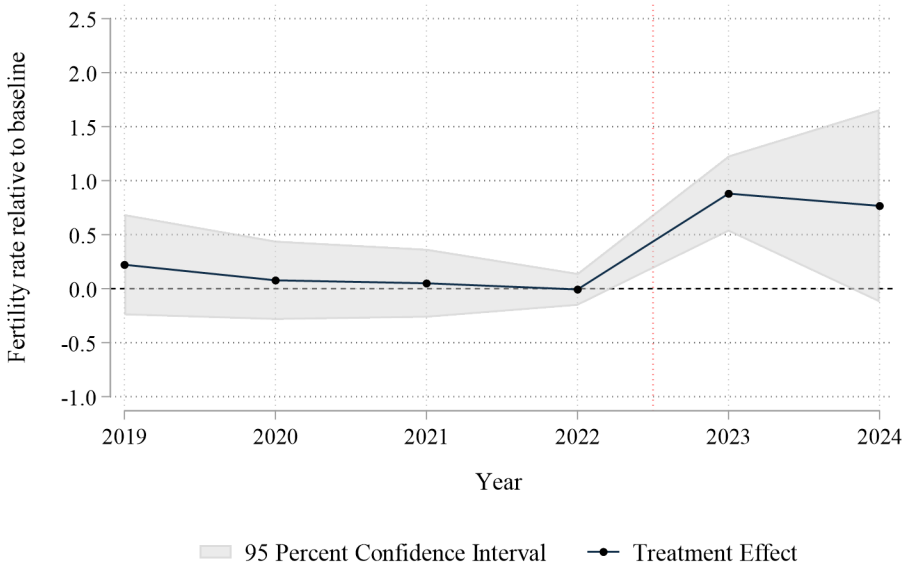
These results are substantively the same as those reported in Figure 8 and all support the view that abortion bans resulted in a sustained increase in births relative to states that protected abortion access.

Figure B.1: Alternative Figure 8 results estimated with Wisconsin included in the ban states



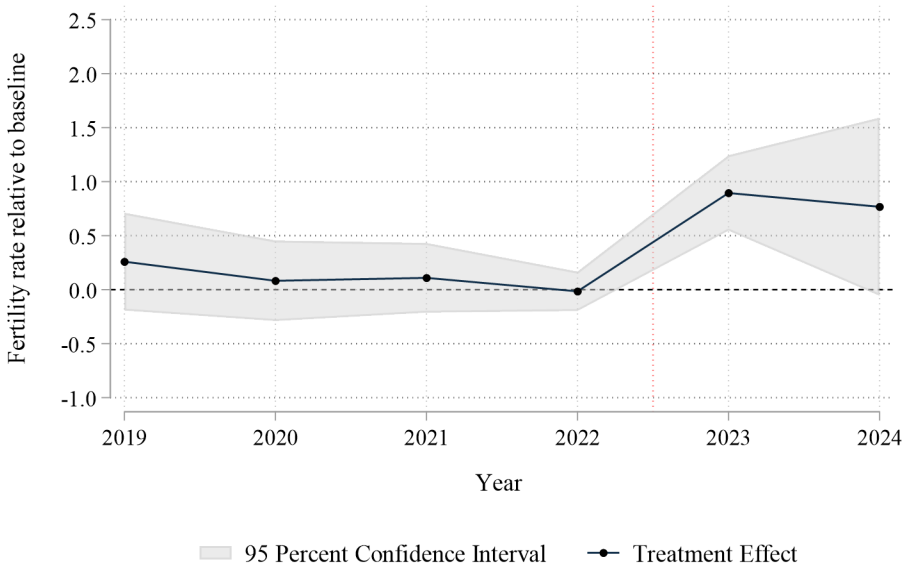
Notes: Compare to Figure 8. The ban states include Wisconsin, where abortion facilities resumed services in September 2023.

Figure B.2: Alternative Figure 8 results estimated with level birth rates as the outcome rather than log rates



Compare to Figure 8. The outcome is defined births per 1,000 women aged 15-44 rather than the log of this value.

Figure B.3: Alternative Figure 8 results estimated with Wisconsin included in the ban states



Compare to Figure 8. The outcome is defined births per 1,000 women aged 15-44 rather than the log of this value. The ban states also include Wisconsin, where abortion facilities resumed services in September 2023.

Table B.1: Alternative Table 2 results: Omitting economic controls

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0208***	0.0088***		0.0097***	
	(0.002)	(0.003)		(0.003)	
Distance		0.0097***	0.0073***	0.0093***	0.0069***
		(0.002)	(0.003)	(0.002)	(0.003)
Distance^2		-0.0009***	-0.0009***	-0.0009***	-0.0009***
		(0.000)	(0.000)	(0.000)	(0.000)
Appointment constraint				0.0036*	0.0028
				(0.002)	(0.002)
Economic controls	no	no	no	no	no
Demographic controls	yes	yes	yes	yes	yes
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,645	18,645	18,639	18,543	18,537

Notes: Compare to Table 2. Table reports results of specifications that omit controls for economic conditions.

Table B.2: Alternative Table 2 results: Omitting economic and demographic controls

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0163***	0.0066**		0.0064**	
	(0.002)	(0.003)		(0.003)	
Distance		0.0075***	0.0053**	0.0076***	0.0049*
		(0.003)	(0.003)	(0.003)	(0.003)
Distance^2		-0.0008**	-0.0005	-0.0008**	-0.0005
		(0.000)	(0.000)	(0.000)	(0.000)
Appointment constraint				-0.0009	0.0026
				(0.002)	(0.002)
Economic controls	no	no	no	no	no
Demographic controls	no	no	no	no	no
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,645	18,645	18,639	18,543	18,537

Notes: Compare to Table 2. Table reports results of specifications that omit all controls, including for economic conditions and demographic characteristics interacted with a time trend as well as a control for 6-week bans.

Table B.3: Alternative Table 2 results: Omitting county-by-half-year interactions that adjust for seasonality

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0232***	0.0110***		0.0125***	
	(0.002)	(0.003)		(0.003)	
Distance		0.0090***	0.0082***	0.0083***	0.0077***
		(0.002)	(0.003)	(0.002)	(0.003)
Distance^2		-0.0007*	-0.0011***	-0.0007*	-0.0010***
		(0.000)	(0.000)	(0.000)	(0.000)
Appointment constraint				0.0056***	0.0025
				(0.002)	(0.002)
Economic controls	yes	yes	yes	yes	yes
Demographic controls	yes	yes	yes	yes	yes
Seasonal adj.	no	no	no	no	no
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State$*$Time fixed effects	no	no	yes	no	yes
N	18,648	18,648	18,642	18,560	18,554

Notes: Compare to Table 2. Table reports results of models that removed the county-by-half-year indicators that adjusting for state-specific half-year seasonality in births.

Table B.4: Alternative Table 2 results: Omitting controls and county-by-half-year interactions that adjust for seasonality

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0161***	0.0075**		0.0078**	
	(0.003)	(0.003)		(0.003)	
Distance		0.0041	0.0045	0.0040	0.0039
		(0.004)	(0.003)	(0.004)	(0.003)
Distance^2		-0.0002	-0.0004	-0.0002	-0.0003
		(0.001)	(0.001)	(0.001)	(0.001)
Appointment constraint				0.0008	0.0032
				(0.003)	(0.003)
Economic controls	no	no	no	no	no
Demographic controls	no	no	no	no	no
Seasonal adj.	no	no	no	no	no
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,648	18,648	18,642	18,560	18,554

Notes: Compare to Table 2. Table reports results of models that omit all demographic and economic controls and also remove the county-by-half-year indicators that adjusting for state-specific half-year seasonality in births.

Table B.5: Alternative Table 2 results: Omitting Texas

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0130***	0.0034		0.0039	
	(0.002)	(0.003)		(0.003)	
Distance		0.0171***	0.0135***	0.0176***	0.0134***
		(0.003)	(0.004)	(0.003)	(0.004)
Distance^2		-0.0029***	-0.0012	-0.0030***	-0.0011
		(0.001)	(0.001)	(0.001)	(0.001)
Appointment constraint				0.0025	0.0033
Economic controls	yes	yes	yes	yes	yes
Demographic controls	yes	yes	yes	yes	yes
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	17,124	17,124	17,118	17,022	17,016

Notes: Compare to Table 2. Table reports results with Texas omitted from the sample.

Table B.6: Alternative Table 2 results: Population weighted OLS with $ln(birthrate)$ as outcome

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0233***	0.0101***		0.0111***	
	(0.002)	(0.003)		(0.004)	
Distance		0.0113***	0.0096***	0.0109***	0.0093***
		(0.003)	(0.003)	(0.003)	(0.003)
Distance^2		-0.0011***	-0.0013***	-0.0011***	-0.0012***
		(0.000)	(0.000)	(0.000)	(0.000)
Appointment constraint				0.0047*	0.0025
				(0.002)	(0.003)
N	18,624	18,624	18,618	18,522	18,516
Economic controls	yes	yes	yes	yes	yes
Demographic controls	yes	yes	yes	yes	yes
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,624	18,624	18,618	18,522	18,516

Notes: Compare to Table 2. Table reports results of an alternative specification estimated with weighted ordinary least squares. The outcome is the log of the birthrate.

Table B.7: Alternative Table 2 results: Unweighted OLS with $ln(birthrate)$ as outcome

	(1)	(2)	(3)	(4)	(5)
Total ban	0.0018	-0.0106		-0.0106	
	(0.006)	(0.008)		(0.008)	
Distance		0.0173**	0.0214**	0.0173**	0.0207**
		(0.007)	(0.009)	(0.007)	(0.009)
Distance^2		-0.0017	-0.0023*	-0.0018	-0.0022*
		(0.001)	(0.001)	(0.001)	(0.001)
Appointment constraint				-0.0004	-0.0019
				(0.005)	(0.006)
Economic controls	yes	yes	yes	yes	yes
Demographic controls	yes	yes	yes	yes	yes
Seasonal adj.	yes	yes	yes	yes	yes
County f.e.	yes	yes	yes	yes	yes
Time f.e.	yes	yes	yes	yes	yes
State∗Time fixed effects	no	no	yes	no	yes
N	18,624	18,624	18,618	18,522	18,516

Notes: Compare to Table 2. Table reports results of an alternative specification estimated with ordinary least squares. The outcome is the log of the birthrate.