

Kentucky's abortion landscape, 2010 to 2019: an analysis of pre-*Dobbs* abortion disparities in a rural, restrictive state

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Summary

Background Since 2010, many US states have passed laws restricting abortion providers' ability to provide care. Such legislation has no demonstrated health benefits and creates inequitable barriers for patients.

Methods To examine how Kentucky's abortion policies coincided with facility closures and abortion utilisation, we conducted a review of state abortion policies from 2010 to 2019 using newspapers and websites. We calculated abortion rates (abortions per 1000 women ages 15–44) by state of residence and provision for Kentucky, the South, and the US using data from the CDC and Kentucky Department of Health. We calculated percentages leaving and from out-of-state, and analysed abortions by race, pregnancy duration, and method.

Findings Of 17 policies passed between 2010 and 2019, ten were enacted, including 20-week and telemedicine bans. One of Kentucky's two abortion facilities closed in 2017. The pooled average abortion rate in Kentucky (4.1) and for Kentuckians (5.8) was lower than national averages (11.8 and 11.1). An average of 38% of Kentuckians left their state for care, compared to 7% nationally. In 2019, the abortion rate in Kentucky was 5.8 times higher for Black patients than White patients (compared to 4.8 times nationally). The majority (62%) of abortions in Kentucky took place at 7–13 weeks' gestation.

Interpretation Abortions in Kentucky were less frequent than in the South and US. The larger Black-White abortion rate gap reflects race- and class-based structural inequities in healthcare. Without federal protections, abortion access in Kentucky will continue waning.

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Introduction

Abortion is a common¹ and safe² form of health care in the United States (US). While the 1973 Supreme Court *Roe v. Wade* ruling nationally protected abortion access before viability (i.e. the third trimester), during the last decade, many US states, particularly in the South and Midwest, passed laws intending to limit access to abortion care.³ These laws include targeted regulation of

abortion providers (i.e., TRAP laws that regulated abortion facility licensure and abortion providers' hospital admitting privileges), bans against certain abortion methods, and “trigger bans” which immediately banned abortion once the US Supreme Court overturned *Roe v. Wade*. Such legislation has been shown to create barriers for people seeking abortion—barriers that are associated with delays and inequitable access to care—and

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Research in context**Evidence before this study**

Abortion is a common and safe form of health care in the United States (US), yet since 2010, many states in the Midwestern and Southern US have passed abortion laws restricting its use. These include targeted regulation of abortion providers (TRAP laws), bans against certain abortion methods, and ultrasound and waiting period requirements. Such legislation has no demonstrated health benefits and creates inequitable barriers for patients.

Added value of this study

Given states' abilities to regulate abortion, in particular following the 2022 *Dobbs v. Jackson Women's Health US* Supreme Court decision, examining changes in policy and use at the state level is necessary in order to understand the local and regional impacts of these laws. In this study, we find that the state of Kentucky enacted ten abortion restrictions from

2010 to 2019, a period during which one abortion facility closed and rates of abortion in Kentucky, and among Kentuckians, were consistently lower than the rest of the country. Furthermore, Kentucky had a higher Black-White gap in abortion use than the US, pointing to race- and class-based structural inequities in healthcare in the state. Additionally, more than a third of Kentuckians travelled out of state in order to receive care, five times national percentages.

Implications of all the available evidence

Given the US Supreme Court's recent overturn of *Roe v. Wade*, and states' continued restrictions of abortion, people in restrictive states, including Kentucky, will face increasingly difficult burdens to accessing necessary healthcare. As states surrounding Kentucky similarly become more hostile toward abortion, patients will likely have more difficulty traveling out-of-state for care.

does not have demonstrated health benefits for people seeking abortion.^{4–6}

In the current study, we described dynamic changes in state laws, political parties in power, policy enforcement, and abortion facility closures that took place in Kentucky from 2010 to 2019. We then examined how these changes corresponded to differences in abortion utilisation in Kentucky, and among Kentuckians, compared to the South and the US as a whole. We also disaggregated abortion counts by patient race, pregnancy duration, and method.

As a Southern, Appalachian state, Kentucky is situated at the border of the Southern and Midwestern United States. Kentucky's population is 87% White (compared to 71% in the South and 72% nationally) and 8% Black (compared to 19% in the South and 13% nationally), with 17% living below the poverty level (compared to 15% in the South and 13% nationally).⁷ Approximately one third (36/120) of Kentucky's counties are rural, compared to one sixth in the south and one fifth nationally.⁸ Thus, Kentucky, a state with comparatively high poverty and rurality, as well as high rates of maternal mortality and child abuse,⁹ served as a useful case study of the ways in which abortion-restrictive state policy changes can have cascading effects on an already-burdened healthcare system.

Methods**Data sources**

We used abortion surveillance data from the Kentucky Department of Health (KDH)¹⁰ and the Centers for Disease Control and Prevention (CDC),¹¹ as well as public reports from the Guttmacher Institute.^{12,13} KDH is required by law to collect information on abortions occurring in Kentucky and to provide a publicly available

annual report.¹⁰ The 2017–2019 reports were available online; we received data from additional years from KDH by request. To calculate abortion rates (abortions per 1000 women ages 15–44) overall and by race, we used population data from the US Census.⁷

To compare trends in Kentucky to regional and national abortion trends, we used data from the CDC's Abortion Surveillance reports.¹¹ Data in these reports came from state health departments that choose to report their abortion statistics to the CDC. Due to failure to report or to follow reporting guidelines, a small number of states are missing data across the CDC reports. We excluded states that are missing data for any year within each of our analyses, leading to the following number of states excluded for the following statistics: rates by state of residence and provision (8); percent leaving and from out-of-state (8); breakdown by race (39); breakdown by gestation (31); and breakdown by method (16). Lists of specific missing states can be found in the tables and figures related to each of these analyses and in [Supplemental Table S1](#).

Some small discrepancies existed between the CDC and KDH data. When comparing the percent difference between the two sources by year across all variables analysed in this paper, the median difference was 1%, ranging from 0% to 5% (with the exception of "other race," likely due to differences in ethnicity classification; see below and [Supplemental Table S2](#)). Given the small magnitude of the discrepancy, when comparing Kentucky to the South or the US (except for analyses of differences by race), we used CDC data to retain consistency across states. For breakdown by race, the CDC reports were missing Kentucky data for 2010, 2013, and 2014; thus we used KDH data for this variable. Notably, KDH reported abortion counts by race and Hispanic ethnicity separately, while CDC reported counts by race

and ethnicity combined (except for Texas). Additionally, Census population counts of women ages 15–44 by race, which we used as the denominator for both CDC and KDH data, are also reported irrespective of Hispanic ethnicity. Thus, for Kentucky we calculated the number of abortions among White patients per 1000 White women ages 15–44, while for the US we calculated the number of abortions among non-Hispanic White patients per 1000 White women ages 15–44. Finally, because of the extent of missingness on the race and gestation variables, we did not separately compare data from Southern states for these two analyses.

To study abortion patient flow into, and out of, Kentucky, we used data from the CDC's Annual Surveillance Reports. These reports included counts of abortions by state of provision and state of patient residence from 2010 to 2019. We calculated changes in the percent of patients leaving Kentucky, as well as in the percent of abortions in Kentucky performed on out-of-state patients, over time. Similarly, we described changes in where patients from Kentucky travelled to, and where patients receiving care in Kentucky travelled from.

For rates by state of provision and residence, and percentage leaving, we conducted a sensitivity analysis using data from the Guttmacher Institute's Abortion Provider Census (APC),^{12,14} as CDC reports are not nationally representative. We rely on CDC reports as our primary source of data given that Guttmacher's data, while more nationally representative (estimates account for abortions in, and patients from, all fifty states and Washington, DC) were not available for each year of our study.

We determined the number of standalone abortion facilities in Kentucky from 2010 to 2019 during our policy review (see details below). To compare these numbers to the South and the US, we used additional Guttmacher reports¹³ that drew from the APC; these regional and national counts are only available for 2014 and 2017.

Statistical analysis

We analysed abortion statistics representing abortions that took place from 2010 to 2019 to coincide with the rapid growth of abortion regulations in Kentucky and nationwide during this time period.¹⁵ Specifically, we calculated the abortion rate for abortions taking place in Kentucky (among all patients, regardless of state of residence), as well as abortion rates among Kentuckians (regardless of state of provision). We calculated the decline in abortion rates by dividing the difference between rates in 2019 and 2010 by the 2010 rate. We also calculated Kentucky's facility density (number of standalone abortion facilities per million women ages 15–44).

To examine travel for abortion both into and out of Kentucky, we calculated the percent of patients leaving

Kentucky and the percent of patients receiving care in Kentucky who were from out-of-state. We calculated the number of patients leaving by taking the difference between the number of Kentuckians who have abortions and the number who received those abortions in Kentucky. We then divided by the total number of Kentuckians who had abortions to determine percent leaving, per Smith et al.¹⁶ Similarly, we calculated the number of patients travelling into Kentucky from another state by taking the difference between the total number of abortions in Kentucky and the number of Kentuckians who received their care in-state; percent from out of state was calculated by dividing this number by the total number of abortions in Kentucky. To examine where Kentuckians are travelling to obtain abortion care, and how distributions have changed over time, we reported counts of abortions among Kentuckians leaving the state by state of provision from 2010 to 2019. Similarly, we reported counts of abortions by state of residence for patients from outside Kentucky who receive their abortions in Kentucky from 2010 to 2019.

Finally, we disaggregated counts for abortions taking place in Kentucky by race, gestation, and method. We calculated rates by race by dividing the counts of abortions among White patients, Black patients, and those of another race by the number of women ages 15–44, respective of race. We calculated the percent of abortions taking place at less than 7 weeks' gestation, 7–13 weeks' gestation, and over 13 weeks' gestation, as well as percentages of medication versus procedural abortions.

To contextualize findings, we calculated comparable statistics for the South and US. The US Census defines the following states as Southern: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. When examining abortions by race and gestation, we excluded comparison to the South due to missingness (see details in the [Data sources](#) section).

We used Stata 16 (StataCorp, College Station, TX) for all statistical analyses.

Policy review

We compiled and reviewed state laws, case law, and political events in Kentucky, identifying abortion-related legislative activity from 2010 to 2019, to construct a legislative and regulatory timeline. This search included both news media and content published by organizations involved in legal or policy advocacy on behalf of abortion rights, such as the American Civil Liberties Union (ACLU) of Kentucky, Planned Parenthood Advocates of Indiana and Kentucky, and Kentucky Health Justice Network. We verified the media search by reviewing policy tracking resources and reports compiled by organisations such as the Guttmacher Institute and NARAL Pro Choice America. We then performed a keyword search for the word “abortion” in

the Kentucky Revised Statutes, cross-referencing the results found in the Kentucky Revised Code with the Kentucky General Assembly Archives, revising and updating the initial legislative timeline accordingly.

Role of the funding source

This study was supported by an anonymous foundation. The funder had no role in the study design; in the collection, analysis and interpretation of the data; in the writing of the manuscript; or in the decision to submit the article for publication.

Results

Policy and facility context

The Kentucky General Assembly passed 17 abortion-related bills from 2010 to 2019, ten of which went into effect during that time period (Table 1). Abortion regulation intensified in Kentucky from 2015 to 2019, when the state legislature had a Republican governor willing to sign anti-abortion legislation and activate the executive branch to limit the availability of abortion in Kentucky. From 2010 to 2019, seven regulations specifically targeted abortion providers' practices: dictating the setting and mode of abortion counselling (Senate Bill [SB] 4); limiting the gestation up to which physicians could provide abortion to 21 weeks 6 days after last menstrual period (SB 5); requiring fetal gestational estimates prior

to inducing an abortion (SB 5); mandating physician-narrated fetal ultrasounds prior to obtaining informed consent for abortion (House Bill [HB] 2); banning telemedicine abortion (SB 112); mandating that physicians tell patients that a medication abortion can be reversed despite being medically inaccurate and potentially harmful to patients (SB 50); and banning certified professional midwives from performing abortions (SB 84). Regulations created administrative burdens for abortion facilities by establishing vital statistics reporting requirements (SB 5) and requiring abortion facilities to have written transfer agreements with a hospital while simultaneously imposing penalties on physicians' offices that provide abortions without an abortion facility license (SB 217). Additional regulations restricted the activities of public entities as they pertain to abortion: SB 192 banned school districts' youth and family centres from providing abortion counselling; and SB 8 restricted the use of state funds for abortion care and deprioritized the allocation of federal funding for family planning services. Additionally, HB 420 limited powers of attorneys' ability to consent to minors' abortion care.

Three of the bills that the state legislature passed from 2010 to 2019 were enjoined in the courts and were not in effect during the study period: HB 454, which would have banned the most common second-trimester method of abortion, dilation and evacuation (D&E), at

Year	Legislative bill number	Description	Legal status ^a
2010	SB 217	Penalty for operating unlicensed clinic. Sets fines for operating an unlicensed clinic or a clinic on fraudulent grounds.	In effect
2016	SB 4	Defines "individual, private setting" for informed consent. Requires abortion counseling to be delivered in real time, either face-to-face or via telemedicine.	In effect
2016	HB 420	Refuses the attorney-in-tact or a minor the power to consent to performance or inducement of an abortion on or for the child	In effect
2017	SB 5	Physician must determine gestational age of fetus prior to performing an abortion. Abortion prohibited at 20 weeks post-fertilization or greater with exception for risk to woman's life and physical capabilities. Specifies penalties for failure to report abortion procedures to the Vital Statistics Branch within a given period of time.	In effect
2017	SB 8	State funding of abortion prohibited except to avert "physical death" of woman; prioritizes federal funds so that family planning services are funded last.	In effect
2017	HB 2	Requires physicians to perform an ultrasound (including verbal explanation) prior to the patient giving informed consent, except in the case of a medical emergency.	In effect
2018	SB 112	Forbids telemedicine abortions	In effect
2018	HB 454	Prohibits performing "an abortion that would result in the bodily dismemberment, crushing, or human vivisection of the fetus" beginning at 11 weeks gestation. Effectively bans D&E, which is the most common abortion method after the first trimester.	Enjoined
2019	HB 5	Bans physicians from performing an abortion if they believe the patient is seeking the procedure because of the gender, race, or disability of the fetus.	Enjoined
2019	SB 9	Ban on abortions when the "fetal heartbeat" can be detected ^b	Enjoined
2019	SB 50	Requires physicians to tell patients seeking a medication abortion that the procedure could be "reversed," a claim that is medically and scientifically unsupported.	In effect
2019	HB 148	Would ban abortion in KY if U.S. Supreme Court overturned 1973 court decision <i>Roe v. Wade</i> .	In effect
2019	SB 84	Specifies that licensed certified professional midwives may not perform abortions. Bolsters a physician-only law.	In effect

^aAs of end of study period, December 2019. ^bSB 9 mis-applies the term "fetal heartbeat" to embryonic and fetal "cardiac activity."

Table 1: Timeline of abortion-related legislation and in Kentucky, 2010–2019.

11-weeks' gestation; HB 5, which would have banned abortion on the grounds of fetal sex, race, or disability; and SB 9, which would have banned abortion after detection of fetal cardiac activity. Finally, in 2019, the Kentucky state legislature passed a trigger ban (HB 148) to ban abortion following the overturning of *Roe v. Wade*.

Three abortion facilities provided abortion care in the state during this time: two in Louisville and one in Lexington. The first Louisville facility opened in 1981 and provided care into the second trimester across the entire study period. The second Louisville facility offered abortions only briefly, from December 2015 to January 2016, under pre-licensure authorisation granted by the previous Governor's administration. Provision stopped when newly elected Republican Governor Matt Bevin's administration would not issue a license to the facility, arguing that it illegally provided abortion care without a valid license.¹⁷ Finally, the Lexington facility, open from 1989 to 2017, provided abortions through the first trimester. This facility was originally exempt from licensure since it operated as an independent doctor's office¹⁸; however, in 2016, the state determined that because the facility had transitioned to exclusively offering abortion care, it was required to obtain a license and transfer and transport agreements with a local hospital.^{17,19} The state subsequently denied the facility's license application, forcing the facility to close in January 2017. Thus, Kentucky's facility density went from 2.3 clinics per million women ages 15–44 in 2010 to 1.2 in 2019; for comparison, the facility density for the South was 8.5 in 2014 and 7.5 in 2017, and that for the US was 15.3 in 2014 and 15.5 in 2019.

Abortion utilization in Kentucky, 2010 to 2019

On average, 3534 abortions took place in Kentucky annually from 2010 to 2019 (Table 2). The pooled average rate for abortions in Kentucky was 4.1, almost half the Southern and US rates of 10.4 and 11.8, respectively. The abortion rate in Kentucky declined from 4.6 in 2010 to 4.3 in 2019, with a minimum of 3.7 in 2015: an overall decline of 5%. The rates for abortions taking place in the South and US declined from 12.9 to 9.6 (25%) and 13.8 to 10.9 (21%), respectively.

An average of 4966 patients from Kentucky received abortions each year, for a pooled average abortion rate among Kentuckians of 5.8 (Table 2). Rates of abortion among Kentuckians were consistently lower than rates among Southerners (10.4) or among US residents (11.6). Rates of abortions among Kentuckians decreased from 6.5 in 2010 to 5.5 in 2019, a 15% decline; rates for patients from the South decreased from 12.6 to 9.8 (22%) and from the US decreased from 13.6 to 10.8 (20%). Rates among Kentuckians are higher than rates of abortions taking place in Kentucky, while rates by state of provision and state of residence are similar for the South and the US (Fig. 1).

Travelling for abortion care into and out of Kentucky

From 2010 to 2019, an average of 38% of Kentucky abortion patients left their state of residence for care, compared to 10% in the South and 7% in the US (Table 3). Values were relatively stable over time, rising from 39% in 2010 to 42% in 2018, with a minimum of 36% in 2019. Percent leaving in both the South and the US increased over time, from 9% to 13% in the South and 6%–9% in the US. CDC data of interstate travel over time (Fig. 2) showed consistently high counts of

Year	Provision						Residence					
	Kentucky		South		US		Kentucky		South		US	
	Counts	Rate	Counts	Rate	Counts	Rate	Counts	Rate	Counts	Rate	Counts	Rate
2010	3929	4.6	234,452	12.9	652,319	13.8	5590	6.5	230,142	12.6	640,973	13.6
2011	3957	4.6	218,940	12.0	622,057	13.2	5514	6.4	215,293	11.8	606,572	12.8
2012	3810	4.4	207,739	11.3	596,476	12.6	5367	6.3	203,618	11.1	584,457	12.3
2013	3637	4.3	195,537	10.6	565,488	11.9	5004	5.9	193,549	10.5	556,471	11.7
2014	3442	4.0	185,023	9.9	551,539	11.6	4923	5.7	184,526	9.9	542,050	11.4
2015	3188	3.7	182,275	9.7	540,052	11.3	4585	5.4	181,649	9.7	528,179	11.1
2016	3312	3.9	181,054	9.6	527,210	11.0	4586	5.4	181,093	9.6	516,649	10.8
2017	3201	3.8	175,574	9.3	516,550	10.8	4715	5.5	179,076	9.4	509,754	10.6
2018	3203	3.8	180,734	9.5	519,696	10.8	4675	5.5	184,639	9.7	515,023	10.7
2019	3664	4.3	185,247	9.6	529,202	10.9	4701	5.5	188,341	9.8	523,873	10.8
AVERAGE	3534	4.1	194,658	10.4	562,059	11.8	4966	5.8	194,193	10.4	552,400	11.6
DECLINE	7%	5%	21%	25%	19%	21%	16%	15%	18%	22%	18%	20%

The following states are excluded in regional/national totals: California, District of Columbia, Florida, Maine, Maryland, New Hampshire, New Jersey, and Wyoming. Southern states include: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Percent decline is defined as $(N_{2019} - N_{2010}) / N_{2010}$ and $(rate_{2019} - rate_{2010}) / rate_{2010}$.

Table 2: Counts of abortions and abortion rates (abortions per 1000 women ages 15–44) for abortions by state of provision and state of patient residence, 2010–2019.

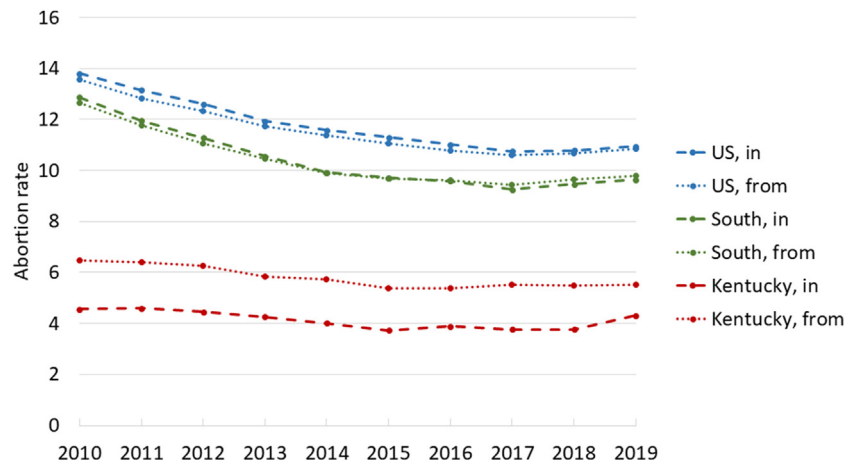


Fig. 1: Abortion rates (abortions per 1000 women ages 15–44) for abortions by state of provision and state of patient residence, 2010–2019. Notes: The following states are excluded in regional/national totals: California, District of Columbia, Florida, Maine, Maryland, New Hampshire, New Jersey, and Wyoming. Southern states include: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

Kentucky patients travelling to Ohio (annual average of 746), along with increases in the percent of patients travelling to Indiana (from 116 in 2010 to 387 in 2019) and decreases in percent of patients travelling to Tennessee (from 880 to 282). Travel to Illinois and West Virginia remained low during this period.

Of abortions that took place in Kentucky, most (87%) were for Kentuckians (Table 4). On average, 13% of patients in Kentucky travelled from out-of-state, compared to 10% in the South and 8% in the US. The percent of out-of-state patients receiving abortions in Kentucky increased from 13% in 2010 to 18% in 2019, while the percentages for the US and region remained relatively consistent. Across this time period, patients travelled from nearby Indiana and Tennessee, with both the absolute and relative number of patients from Tennessee increasing in particular beginning in 2018 (Fig. 3); specifically, 83 patients travelled from Tennessee to Kentucky in 2017, while 136 travelled in 2018 and 236 in 2019. An annual average of 321 patients travelled from Indiana during this time.

Characteristics of abortions and abortion patients: race, gestation, and method

The pooled average abortion rate for Black patients in Kentucky was 13.1, compared to 3.1 for White patients and 7.9 for patients of another race (Table 5; Supplementary Fig. S1). The abortion rate among Black patients was more than three times that for White patients at all time points, and almost six times the White patient rate in 2019. Rates for all patients decreased over time, until 2018 when rates for Black patients began increasing while rates for White patients and those of another race continued to decrease. Specifically, rates among Black patients increased from 13.5 in 2010 to

16.6 in 2019, while rates among White patients decreased from 3.5 to 2.9 and those among patients of another race decreased from 4.7 to 4.3. Comparison of Kentucky data to CDC data of the twelve states that consistently reported abortions by race showed a similar Black-White rate gap, with a pooled average for non-Hispanic Black patients of 21.4 and for non-Hispanic White patients of 5.0. However, the abortion rate among non-Hispanic Black patients within these states failed to increase as it did in Kentucky in 2018 and 2019; rather, the rate among non-Hispanic Black patients decreased from 26.8 in 2010 to 19.4 in 2019, while the rate among non-Hispanic White patients decreased from 6.7 to 4.1, and the rate among those of another race decreased from 28.2 to 19.9.

Most abortions in Kentucky (62%) took place between 7 and 13 weeks’ gestation. Beginning in 2017, there was an increase in both the absolute number of abortions at less than 7 weeks (from 857 in 2016 to 1225 in 2017; Table 6, Supplementary Fig. S2) and in the relative number of abortions at less than 7 weeks (from 26% in 2016 to 38% in 2017). In comparison, in the US, 56% of abortions were 7–13 weeks and 9% were 14 weeks or higher; trends aligned beginning in 2017. In parallel with this increase in earlier abortions in Kentucky, the percent of medication abortions rose from 20% in 2010 to 50% in 2019, a trend similar to that seen in the South (18%–45%) and the US (18%–43%).

Discussion

Since 2010, Kentucky saw the enactment and enforcement of increasingly hostile abortion legislation and administrative law, resulting in a facility closure and barriers to attaining new clinic licenses. The facility density in Kentucky, already a fraction of that in the US,

Year	Kentucky		South		US	
	No. (%) of pts. leaving KY	No. (%) of pts. staying in KY	No. (%) of pts. leaving state of residence in South	No. (%) of pts. staying in state of residence in South	Total No. (%) of pts. leaving state of residence	Total No. (%) of pts. staying in state of residence
2010	2157 (39%)	3433 (61%)	20,049 (9%)	210,093 (91%)	40,712 (6%)	600,261 (94%)
2011	1994 (36%)	3520 (64%)	17,939 (8%)	197,354 (92%)	37,338 (6%)	569,234 (94%)
2012	1988 (37%)	3379 (63%)	16,717 (8%)	186,901 (92%)	35,002 (6%)	549,455 (94%)
2013	1788 (36%)	3216 (64%)	16,523 (9%)	177,026 (91%)	33,851 (6%)	522,620 (94%)
2014	1869 (38%)	3054 (62%)	17,705 (10%)	166,821 (90%)	35,275 (7%)	506,775 (93%)
2015	1805 (39%)	2780 (61%)	18,116 (10%)	163,533 (90%)	35,074 (7%)	493,105 (93%)
2016	1738 (38%)	2848 (62%)	18,315 (10%)	162,778 (90%)	35,828 (7%)	480,821 (93%)
2017	1928 (41%)	2787 (59%)	21,564 (12%)	157,512 (88%)	39,714 (8%)	470,040 (92%)
2018	1961 (42%)	2714 (58%)	23,437 (13%)	161,202 (87%)	43,141 (8%)	471,882 (92%)
2019	1680 (36%)	3021 (64%)	24,306 (13%)	164,035 (87%)	45,416 (9%)	478,457 (91%)
TOTAL	18,908 (38%)	30,752 (62%)	194,671 (10%)	1,747,255 (90%)	381,351 (7%)	5,142,650 (93%)
CHANGE	-477 (-3%)	-412 (3%)	4257 (4%)	-46,058 (-4%)	4704 (2%)	-121,804 (-2%)

The following states are excluded in regional/national totals: California, District of Columbia, Florida, Maine, Maryland, New Hampshire, New Jersey, and Wyoming. Southern states include: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Percentages calculated out of total by state of residence. Change is defined as $N_{2019} - N_{2010}$ and $\%_{2019} - \%_{2010}$.

Table 3: Counts (and percentages) of patients leaving versus staying in their state of residence for patients from Kentucky, the South, and the US, 2010–2019.

decreased as a result. Research from Indiana, Ohio, and Texas, three other abortion-restrictive states, reflects similar patterns of restrictions during this time period.^{20–22}

Simultaneously, the rate of abortions taking place in Kentucky was consistently three times lower than other states. Kentucky has a higher rate of Evangelicalism than other Southern states,²³ which may be associated with a lower desire for abortion or increased stigma around its use, resulting in lower utilization. Nevertheless, the rate of abortion among Kentuckians was higher at all time points than the rate of abortions in Kentucky, a finding that is consistent with the relatively high percentage of Kentuckians leaving the state to have an abortion elsewhere. This suggests that need and

utilization among Kentuckians was not being met by care available within the state.

In particular, in 2019, the percentage of abortion patients from Kentucky who left their state for care was four times the 2020 national average of 9%.¹² Previous research shows that the majority (54%) of patients travelling from abortion-hostile states go to states that are also hostile to abortion,¹⁶ which we see here both in terms of who travelled into Kentucky, and where Kentuckians went.

In the wake of the *Dobbs* decision, several states to which Kentucky patients have previously travelled experienced rapid changes in their abortion laws: Ohio’s 6-week ban was in effect from late-June to mid-September 2022, Indiana’s total abortion ban was

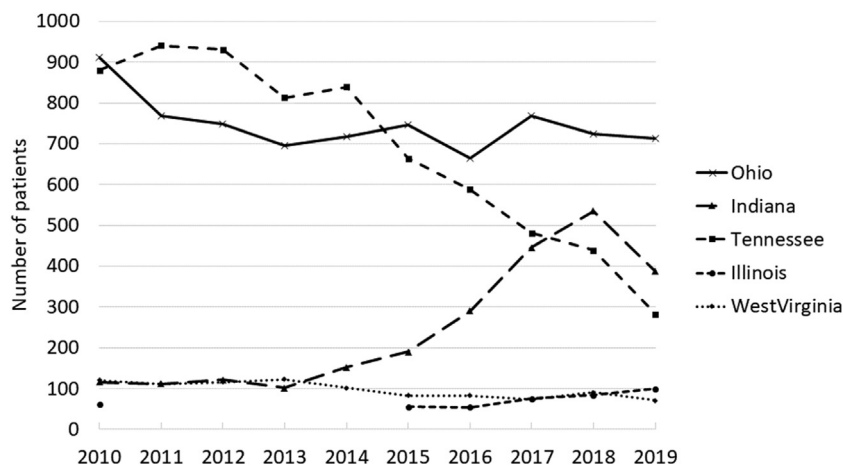


Fig. 2: Number of Kentuckians receiving care in each surrounding state, 2010–2019.

Year	Kentucky		South		US	
	No. (%) of abortions for pts. from outside KY	No. (%) of abortions for pts. from KY	No. (%) of abortions for pts. from outside state of provision	No. (%) of abortions for pts. from inside state of provision	No. (%) of abortions for pts. from outside state of provision	No. (%) of abortions for pts. from inside state of provision
2010	496 (13%)	3433 (87%)	24,359 (10%)	210,093 (90%)	52,058 (8%)	600,261 (92%)
2011	437 (11%)	3520 (89%)	21,586 (10%)	197,354 (90%)	52,823 (8%)	569,234 (92%)
2012	431 (11%)	3379 (89%)	20,838 (10%)	186,901 (90%)	47,021 (8%)	549,455 (92%)
2013	421 (12%)	3216 (88%)	18,511 (9%)	177,026 (91%)	42,868 (8%)	522,620 (92%)
2014	388 (11%)	3054 (89%)	18,202 (10%)	166,821 (90%)	44,764 (8%)	506,775 (92%)
2015	408 (13%)	2780 (87%)	18,742 (10%)	163,533 (90%)	46,947 (9%)	493,105 (91%)
2016	464 (14%)	2848 (86%)	18,276 (10%)	162,778 (90%)	46,389 (9%)	480,821 (91%)
2017	414 (13%)	2787 (87%)	18,062 (9%)	157,512 (90%)	46,510 (9%)	470,040 (91%)
2018	489 (15%)	2714 (85%)	19,532 (11%)	161,202 (89%)	47,814 (9%)	471,882 (91%)
2019	643 (18%)	3021 (82%)	21,212 (11%)	164,035 (89%)	50,745 (10%)	478,457 (90%)
TOTAL	4591 (13%)	30,752 (87%)	199,320 (10%)	1,747,255 (90%)	477,939 (9%)	5,142,650 (91%)
CHANGE	147 (5%)	-412 (-5%)	-3147 (1%)	-46,058 (-1%)	-1313 (2%)	-121,804 (-2%)

The following states are excluded in regional/national totals: California, District of Columbia, Florida, Maine, Maryland, New Hampshire, New Jersey, and Wyoming. Southern states include: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Percentages calculated out of total by state of provision. Change is defined as $N_{2019} - N_{2010}$ and $\%_{2019} - \%_{2010}$.

Table 4: Counts (and percentages) of patients from out-of-state versus in-state for abortions in Kentucky, the South, and the US, 2010-2019.

in effect for a week in September 2022, and Tennessee’s trigger law went into effect in August 2022.²⁴ Given the dynamic case law and regulatory environment in states surrounding Kentucky, Kentuckians will likely have to travel further to receive care in states where abortion remains more accessible, such as Illinois, Michigan, Pennsylvania, and Virginia.²⁴ Furthermore, the closure of additional facilities will likely result in facility congestion in neighbouring states that maintain access,²⁵ leading to further delays in care and inaccessibility of care. Notably, the Southern and Midwestern US is home to many abortion deserts,²⁶ such that even with *Roe*’s protections, access in these regions was already difficult.

Abortion access in Kentucky itself has been precarious following the *Dobbs* ruling as the state’s trigger ban and 15-week ban (initially passed in April 2022) were processed through the courts, ultimately leading to a total ban on August 1, 2022.²⁷ Frequent changes to abortion legality and availability create service delivery instability, or care churn,²⁸ for facilities and patients seeking care and generate confusion for the public that could drive future abortion seekers out of state.

When we examined the racial breakdown of those receiving abortions between 2010 and 2019 in Kentucky, we saw an increasing Black-White gap, a trend not observed in the twelve other states included in our

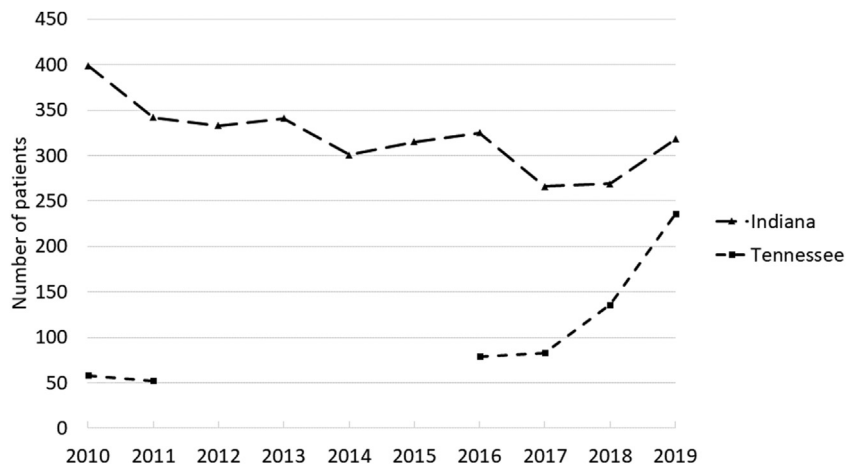


Fig. 3: Number of patients from each surrounding state receiving care in Kentucky, 2010-2019.

Year	Kentucky								US							
	White		Black		Other race		Total by known race		Non-Hisp. White		Non-Hisp. Black		Other race		Total by known race	
	Counts	Rates	Counts	Rates	Counts	Rates	Counts	Rates	Counts	Rates	Counts	Rates	Counts	Rates	Counts	Rates
2010	2661	3.5	990	13.5	357	10.2	4008	4.7	73,991	6.7	58,510	26.8	57,243	28.2	189,744	12.4
2011	2618	3.5	993	13.4	344	9.3	3955	4.6	70,039	6.2	55,584	25.4	53,621	26.9	179,244	11.6
2012	2572	3.5	1001	13.5	326	8.6	3899	4.6	65,023	5.7	51,178	23.3	49,850	25.5	166,051	10.7
2013	2495	3.4	931	12.6	326	8.4	3752	4.4	57,587	5.1	48,264	21.8	49,010	24.9	154,861	10.0
2014	2288	3.1	895	12.0	322	7.6	3505	4.1	58,456	5.1	45,126	20.3	42,870	21.6	146,452	9.3
2015	2087	2.8	896	12.1	325	7.4	3308	3.9	55,154	4.8	44,632	19.9	42,696	21.2	142,482	9.0
2016	2057	2.8	892	12.1	363	8.1	3312	3.9	50,831	4.4	44,708	19.8	43,203	21.1	138,742	8.7
2017	1968	2.7	906	12.1	327	7.1	3201	3.8	48,110	4.1	42,486	18.7	43,431	20.6	134,027	8.4
2018	1880	2.6	974	13.1	337	6.8	3191	3.7	50,415	4.3	43,107	18.8	43,997	20.4	137,519	8.5
2019	2069	2.9	1248	16.6	333	6.8	3650	4.3	47,317	4.1	44,909	19.4	44,318	19.9	136,544	8.4
AVERAGE	2270	3.1	973	13.1	336	7.9	3578	4.2	57,692	5.0	47,850	21.4	47,024	23.0	152,567	9.7
CHANGE	-22%	-19%	26%	23%	-7%	-33%	-9%	-8%	-36%	-39%	-23%	-28%	-23%	-29%	-28%	-32%

The following states are included in US totals: Arkansas, Idaho, Indiana, Kansas, Minnesota, New Jersey, South Carolina, South Dakota, Tennessee, Texas, Utah, and Virginia. Counts of abortions for Texas are irrespective of Hispanic ethnicity. Percent change is defined as $(N_{2019} - N_{2010}) / N_{2010}$ and $(rate_{2019} - rate_{2010}) / rate_{2010}$.

Table 5: Counts of abortions and abortion rates (abortions per 1000 women ages 15–44) by race, 2010–2019.

analysis. This larger racial gap is evidence of structural inequities in the reproductive healthcare system leading to lack of access to preventative care, medical mistrust, and risk of reproductive coercion.^{29,30} Unintended pregnancies among Black and minoritized patients are likewise associated with higher maternal morbidity and mortality, financial hardship, and diminished access to reliable and affordable contraception and sexual and reproductive health care.³¹ Given the intersection between racism and poverty in the US, this finding may be a reflection of Kentucky’s relatively high poverty rate as well as the extent to which lack of financial resources is a primary reason for having an abortion.^{32,33}

Limitations

While reliance upon multiple data sources for this analysis increased confidence in our findings, we were limited by the quality of data provided by the CDC. The eight areas we excluded from our national and regional analyses of abortion rates (California, Washington DC, Florida, Maine, Maryland, New Hampshire, New Jersey, and Wyoming) make up approximately one third of abortions that take place in the US.¹² Without these data points, our statistics differed from more nationally representative rates reported by the Guttmacher Institute.^{12,14} A sensitivity analysis comparing abortion rates by state of occurrence, state of provision, and percent leaving

Year	Kentucky				US			
	Less than 7 weeks	7 weeks–13 weeks, 6 days	14 weeks or more	Total by known gestation	Less than 7 weeks	7 weeks–13 weeks, 6 days	14 weeks or more	Total by known gestation
2010	875 (22%)	2597 (66%)	457 (12%)	3929 (100%)	116,512 (35%)	187,962 (57%)	27,210 (8%)	331,684 (100%)
2011	875 (22%)	2664 (67%)	418 (11%)	3957 (100%)	108,946 (35%)	179,643 (57%)	27,089 (9%)	315,678 (100%)
2012	963 (25%)	2465 (65%)	382 (10%)	3810 (100%)	104,666 (35%)	167,973 (56%)	26,694 (9%)	299,333 (100%)
2013	693 (19%)	2549 (70%)	393 (11%)	3635 (100%)	98,280 (34%)	162,303 (57%)	25,559 (9%)	286,142 (100%)
2014	733 (21%)	2324 (68%)	385 (11%)	3442 (100%)	91,490 (33%)	160,313 (57%)	27,402 (10%)	279,205 (100%)
2015	847 (27%)	1961 (62%)	380 (12%)	3188 (100%)	92,238 (34%)	153,089 (56%)	26,557 (10%)	271,884 (100%)
2016	857 (26%)	2026 (61%)	429 (13%)	3312 (100%)	92,831 (34%)	153,269 (56%)	26,280 (10%)	272,380 (100%)
2017	1225 (38%)	1603 (50%)	373 (12%)	3201 (100%)	94,522 (36%)	144,437 (55%)	24,773 (9%)	263,732 (100%)
2018	1160 (36%)	1737 (54%)	306 (10%)	3203 (100%)	100,394 (37%)	146,531 (54%)	24,026 (9%)	270,951 (100%)
2019	1302 (36%)	2043 (56%)	319 (9%)	3664 (100%)	104,045 (38%)	145,995 (54%)	22,817 (8%)	272,857 (100%)
TOTAL	9530 (27%)	21,969 (62%)	3842 (11%)	35,341 (100%)	1,003,924 (35%)	1,601,515 (56%)	258,407 (9%)	2,863,846 (100%)
CHANGE	427 (13%)	-554 (-10%)	-138 (-3%)	-265 (0%)	-12,467 (3%)	-41,967 (-3%)	-4393 (0%)	-58,827 (0%)

The following states are included in US totals: Alabama, Arizona, Colorado, Georgia, Hawaii, Kansas, Kentucky, Michigan, Minnesota, Missouri, Montana, Nevada, New Jersey, New Mexico, Ohio, Oregon, Texas, Utah, Virginia, and Washington. Change is defined as $N_{2019} - N_{2010}$ and $\%_{2019} - \%_{2010}$.

Table 6: Counts (and percentages) of abortions by gestation for abortions taking place in Kentucky and the US, 2010–2019.

showed that for Kentucky, CDC rates were 93%–101% of those from Guttmacher; for the South and US, CDC rates were 76%–84% those from Guttmacher (Supplemental Table S3). Additionally, due to the extreme missingness in the CDC data for our breakdowns by race and gestation, counts for the US were not nationally representative. Nonetheless, the CDC data remained a useful touchpoint for our findings given its annual reporting and provision of gestation, method, and patient rate details.

We were also limited in our ability to conduct more complex statistical analyses given the descriptive nature of our study and that the publicly available data is aggregated to the state-level, rather than presented at the patient-level. While we examined trends in the patient and abortion characteristics described above, without patient-level data, we could not further stratify trends by multiple patient and abortion characteristics. Similarly, we could not disentangle the impacts of any one policy change or facility closure individually, such as the observed increase in earlier abortions in Kentucky in 2017. Finally, this analysis relied on data from patients who received their care in formal healthcare settings. We could not speak to the number of abortions that took place in Kentucky, or among Kentuckians, outside of the formal medical system, such as when patients undertake safe abortions using medications obtained online.

Conclusions

Our research highlighted the extent to which Kentuckians faced barriers to abortion care pre-*Dobbs*, barriers that have only been magnified now that Kentucky has passed a total abortion ban.²⁷ When people seeking abortion are denied abortion care, they are at increased risk of staying with a violent intimate partner, lower socioeconomic conditions, and poorer health.³⁴ Delays to care are also burdensome, as receiving an abortion at a later gestation is associated with increased costs and risk. Furthermore, inequities in access to healthcare, and reproductive healthcare in particular, are not evenly distributed³⁵; those burdened by structural racism or financial insecurity, or those living in rural areas that are further from facilities, are disproportionately impacted by these barriers to care. Similarly, patients who are unable to travel out-of-state for an abortion may be at risk of criminalization for self-managing (a greater risk among Black pregnant people)³⁶ or will be forced to carry their pregnancy to term, which is associated with a 14 times greater risk of death than having an abortion.³⁷ Other research predicts an increase in pregnancy-related deaths following abortion bans,³⁸ which is particularly relevant given Kentucky's rising maternal mortality rate, large gap in White versus Black rates of maternal mortality, and the legislature's stated goals of decreasing these rates.³⁹

Given Kentucky's history of anti-abortion regulation, low abortion rates, high percent of residents leaving the state for abortions, and disparities between

Black and White patients' utilization of abortion, Kentucky serves as an example of what residents of many abortion-hostile states may experience in the current post-*Dobbs* policy landscape. These findings portend negative health consequences for Kentuckians, and others from abortion-restrictive states, who need abortion care in the future.

Contributors

- Smith led the project, accessed and verified the data, was responsible for manuscript submission, and contributed to the study design, literature search, data collection, data analysis, figure development, and writing.
- McGowan contributed to the study design, data collection, data analysis, figure development, and writing.
- Chakraborty accessed and verified the data, and contributed to the data analysis, figure development, and writing.
- Hood contributed to the data analysis, figure development, and writing.
- Field contributed to the data collection, data analysis, figure development, and writing.
- Bessett contributed to the study design and writing.
- Norwood contributed to the study design and writing.
- Norris accessed and verified the data, and contributed to the study design, data analysis, and writing.

Data sharing statement

This study uses publicly available data from the CDC (https://www.cdc.gov/reproductivehealth/data_stats/abortion.htm), the US Census (<https://data.census.gov/>), the Kentucky Department of Health (<https://chfs.ky.gov/agencies/dph/dehp/vsb/Pages/abreqadr.aspx>), and the Guttmacher Institute (<https://data.guttmacher.org/>).

Declaration of interests

- Smith: Funded under the Ohio Policy Evaluation Network, which is supported by a philanthropic foundation that makes grants anonymously.
- McGowan: Funded under the Ohio Policy Evaluation Network, which is supported by a philanthropic foundation that makes grants anonymously; Ethics Consultant for the Ethics Committee of the American College of Obstetricians and Gynecology.
- Chakraborty: Funded under the Ohio Policy Evaluation Network, which is supported by a philanthropic foundation that makes grants anonymously, the National Institute on Minority Health and Health Disparities of the National Institutes of Health (NIH) under award number R01MD015256, and the National Heart, Lung, and Blood Institute of the NIH through T32HL098048.
- Hood: Funded under NIEHS T32-ES012870.
- Field: Secretary and Governance Committee Chair of Board of Directors for National Women's Health Network; Public Member of "Committee on Clinical Practice Guidelines - Obstetrics" for American College of Obstetricians and Gynecologists.
- Bessett: Co-investigator of the Ohio Policy Evaluation Network, which is supported by a philanthropic foundation that makes grants anonymously; Co-investigator, Inequities in Abortion Access Grant, Society of Family Planning, Assessing Reproductive Equity in Kentucky after *Dobbs* 2022–2024; Led memo on Abortion Clinic Protesters in Louisville, Kentucky that was used in meetings with the Louisville Police Department, Mero Council Community Affairs, Housing, Health, and Education Committee, and Metro Council in 2021; Testified on memo findings before the Louisville Mero Council Community Affairs, Housing, Health, and Education Committee on April 22 2021.
- Norwood: None.
- Norris: Co-investigator of the Ohio Policy Evaluation Network, which is supported by a philanthropic foundation that makes grants anonymously.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lana.2023.100441>.

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