State Abortion Policies and Maternal Death in the United States, 2015–2018

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See also Liu et al., p. 1578, and Galea and Vaughan, p. 1584.

Objectives. To examine associations between state-level variation in abortion-restricting policies in 2015 and total maternal mortality (TMM), maternal mortality (MM), and late maternal mortality (LMM) from 2015 to 2018 in the United States.

Methods. We derived an abortion policy composite index for each state based on 8 state-level abortion-restricting policies. We fit ecological state-level generalized linear Poisson regression models with robust standard errors to estimate 4-year TMM, MM, and LMM rate ratios and 95% confidence intervals (CIs) associated with a 1-unit increase in the abortion index, adjusting for state-level covariates.

Results. States with the higher score of abortion policy composite index had a 7% increase in TMM (adjusted rate ratio [ARR] = 1.07; 95% CI = 1.02, 1.12) compared with states with lower abortion policy composite index, after we adjusted for state-level covariates. Among individual abortion policies, states with a licensed physician requirement had a 51% higher TMM (ARR = 1.51; 95% CI = 1.15, 1.99) and a 35% higher MM (ARR = 1.35; 95% CI = 1.09, 1.67), and states with restrictions on Medicaid coverage of abortion care had a 29% higher TMM (ARR = 1.29; 95% CI = 1.03, 1.61).

Conclusions. Restricting access to abortion care at the state level may increase the risk for TMM. (*Am J Public Health*. 2021;111(9):1696–1704. https://doi.org/10.2105/AJPH.2021.306396)

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Maternal mortality in the United States has remained unacceptably high over the past few decades compared with other high-income countries.[1,2] In 2020, the National Center for Health Statistics (NCHS) reported a national maternal mortality ratio (MMR, defined as deaths of women while pregnant or within 42 days of being pregnant, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes) at 17.4 per 100 000 live births for 2018.[3] In addition, wide racial disparities in maternal death persist, with non-Hispanic Black women being more than 2 to 3 times more likely to die from a pregnancy-related complication than non-Hispanic White women.[3,4] Furthermore, research shows that more than 60% of maternal deaths are preventable.[4]

Emerging evidence suggests that broader societal and policy factors may contribute to adverse maternal health outcomes and inequities.[5–7] Along with elevated maternal mortality rates, the past decade has witnessed an increasing passage of laws restricting access to abortion care.[8] Although the United Nations and the World Health Organization recognize abortion as a key component of reproductive health services and an important aspect of maternal and child health,[9,10] and despite *Roe v. Wade* (1973) guaranteeing the right to abortion in the United States, many states continue to undermine access to safe abortion care by imposing numerous policies and regulations. In 2015, nearly 400 abortion-restricting provisions were considered in 46 states, with 17 states enacting a total of 57 new abortion restrictions.[11] Such restrictions range from gestational age limits, ultrasound requirements, mandatory counseling, and waiting periods to insurance coverage limitations and targeted regulations on abortion providers.[8] As a result, access to abortion care varies greatly across the United States, with 6 states having only 1 abortion clinic in operation.[12]

While the link between restricted access to abortion care and maternal

mortality is well established in low- and medium-income countries,[13,14] the evidence base on the impact of abortion restrictions on maternal death in the United States is limited. Using 2007–2015 National Vital Statistics System data files from 38 states and the District of Columbia, a recent study found that the enactment of gestational age limits for abortion was associated with a 38% increase in maternal mortality, and a 20% reduction in Planned Parenthood clinics was associated with an 8% increase in maternal mortality.[5] In addition, growing evidence has linked abortion restrictions to other maternal and child health outcomes, including infant mortality,[15,16] child homicide deaths,[17] negative mental health outcomes among women who were denied abortion,[18,19] and adverse birth outcomes.[20,21]

The reproductive justice framework, developed by Black women and other women of color to address the histories and ongoing experiences of reproductive injustice in their communities, clarifies how policies that limit bodily autonomy may be associated with adverse reproductive health outcomes.[22] While abortion restrictions do not eliminate the occurrence of abortion, in a restrictive environment, abortion-seeking people with limited institutional power and access to resources will be the least able to obtain a safe and healthy procedure, and most likely to suffer an adverse reproductive consequence.[23,24]

Abortion-restricting laws may contribute to risk of maternal death via direct and indirect pathways. First, while legal induced abortion–related mortality is rare,[25] abortion restrictions can lead to an enhanced number of unsafe, illegal, or self-inflicted abortions, which have been shown to contribute to maternal mortality.[13] In addition, maternal death results from health-related complications developed or exacerbated during pregnancy, and, thus, women with chronic health conditions who are not able to access abortion care are forced to carry unwanted pregnancy to term even if their health and lives are in danger.[19] Findings of the longitudinal Turnaway Study, which evaluated the health and socioeconomic consequences of receiving or being denied an abortion in the United States, found that, while women whose health was imminently at risk were excluded from the study, 1 in 8 of the study's participants reported a health concern as a reason for seeking abortion.[19] Furthermore, while there is no evidence supporting negative lasting impacts from obtaining an abortion,[18] women forced to remain pregnant are more likely to remain in unhealthy relationships, suffer mental and physical health consequences, live in poverty, and have lower life satisfaction.[19]

The objective of this study was to examine the association between state-level variations in abortion policies and maternal death using the most recently available national maternal mortality data (2015–2018). We aimed to estimate the risk of maternal death associated with living in states with a higher number of abortion restrictions as compared with states with fewer restrictions. We hypothesized that, because of direct and indirect causes, a more restrictive abortion policy context within the state will be associated with greater risk of death during pregnancy and postpartum. In addition, given the vast racial disparities in maternal death, we examined heterogeneity in the hypothesized association by race/ethnicity.

METHODS

This study was a retrospective ecological analysis of the 2015–2018 maternal mortality file available through the NCHS. These data apply the new coding method for identifying maternal deaths while mitigating misclassification that resulted from the adoption of a standardized pregnancy-status checkbox on revised death certificates.

Outcome

Our primary analysis included women aged 10 to 44 years, given the substantial risk of misclassification of maternal deaths at more advanced maternal ages.[3,26] The primary outcome of interest was total maternal mortality (TMM), defined as a death while pregnant or within 1 year following the end of a pregnancy, from any cause related to or aggravated by the pregnancy or its management. We further divided these deaths by timing to identify maternal mortality (MM; those occurring during pregnancy or within 42 days of being pregnant) and late maternal mortality (LMM; those occurring between 43 days and 1 year following the end of a pregnancy) as additional outcomes of interest. Maternal deaths were identified based on underlying cause of death from the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision* (*ICD-10;* 2nd ed. Geneva, Switzerland: World Health Organization; 2004). TMM included deaths with *ICD-10* codes O00–O99 and A34, excluding O97 codes, which apply to deaths occurring more than 1 year from the end of pregnancy. MM included deaths with *ICD-10* codes A34, O00–O95, and O98–O99. LMM included deaths with *ICD-10* code O96.[3,5] We computed the 4-year (2015–2018)

TMM, MM, and LMM ratios (deaths per 100 000 live births to women aged 10–44 years) for the total population in each state and the District of Columbia. Because of a nonstandard pregnancy checkbox question,[3] we excluded California from estimations of MM and LMM ratios. Data on live births by maternal age, residential state, and year were from the NCHS restricted-use natality file, available after application to and approval by NCHS. We merged counts of maternal death by state with counts of live births by state Federal Information Processing System codes to estimate TMM, MM, and LMM ratios.

Measures

We used an abortion policy composite index to quantify the extent of abortion-restricting policies in each state on January 1, 2015, the first year of data on mortality in this study. The index included 8 state-level policies limiting access to abortion care:

1. state-mandated counseling before abortion (i.e., abortion provider is required to read their patients information leaflets that are written in a way to dissuade patients from completing the abortion);
2. mandatory waiting periods (usually 24 hours) between counseling and abortion services;
3. mandatory ultrasound before abortion procedure (i.e., abortion provider is required to display or describe preabortion ultrasound images);
4. mandatory parental involvement laws for minors seeking abortion (i.e., a requirement that a parent be notified or give consent for an unmarried adolescent minor to obtain an abortion);
5. gestational age restrictions (i.e., limits on abortion after a specified point—e.g., 20 or more weeks of gestation—in pregnancy);
6. licensed physician requirement in providing abortion care (i.e., nonphysician health care providers, such as physician assistants, advanced practice registered nurses, or nurse midwives, are prohibited from providing abortion care);
7. denial of coverage for abortion in private insurance plans; and
8. restrictions on public funding for abortion (i.e., prohibitions against use of state Medicaid funds to pay for abortions).

We retrieved data on the 8 abortion regulations from January 2015 policy status reports compiled by the Guttmacher Institute.[27]

We computed the composite index based on a similar reproductive rights composite index developed by the Institute for Women's Policy Research[28] and previously used in reproductive health studies.[20,21] First, we coded each indicator as either 0 (policy not in effect) or 1 (policy in effect). Given that parental involvement requirement affects a small proportion of the abortion-seeking population, we assigned this policy a weight of 0.5, and the remaining indicators were given a weight of 1. To measure the cumulative impact of multiple abortion restrictions within a state over a single policy, we summed weighted indicators to compute a total composite index for each state. The internal consistency of the 8 policies was high (Cronbach $\alpha = 0.85$). In addition, to compare states with lower versus higher number of abortion-restricting policies, we categorized the composite index (low, moderate, high) with the highest tertile representing states with the highest number of abortion restrictions.

Covariates

Adjusted models included estimates of state-level poverty, unemployment, percentage of the population with college degree, percentage of the population that is non-Hispanic White, percentage of the population living in urban counties, percentage of the population that is foreign-born, and Medicaid expenditure per capita. We retrieved these measures from the US Census Bureau's American Community Survey and the Regional Economic Information System of the US Bureau of Economic Analysis. In addition, we included Medicaid expansion status in 2015 (retrieved from the Kaiser Family Foundation)[29] and 4-year (2015–2018) averages of the percentage of births covered by Medicaid and the percentage of births to women aged 35 years and older, aggregated from the NCHS natality files.

Statistical Analysis

We conducted descriptive analysis to characterize the variation of state-level TMM, MM, and LMM and contextual indicators across all states, and then separately by tertiles of abortion policy composite index. We then fit models examining the association between the abortion policy index (coded as a continuous variable) and TMM, MM, and LMM separately. We used a modified Poisson regression with cluster-robust standard errors to account for serial correlation of error terms within states to estimate the adjusted rate ratios (ARRs) and 95% confidence intervals (CIs) for all outcomes. To explore whether 1 abortion-restricting policy in particular may have been driving

associations between the composite index and the outcomes, we examined the associations between each outcome and each component of the abortion policy index separately. We weighted all models by the total number of live births by state (2015–2018). To test for heterogeneity by race/ethnicity, we fit the fully adjusted model with data aggregated by race/ethnicity and state and included an interaction term between the composite index and dummy variables for non-Hispanic Black and Hispanic populations.

Finally, we ran sensitivity analysis to confirm the robustness of our findings with an even more conservative age-restricted sample (i.e., decedents aged 10–39 years) to further reduce the possibility of misclassification.[3] We performed all statistical analyses with SAS version 9.4 (SAS Institute, Cary, NC).

RESULTS

From 2015 to 2018, there were 3785 total maternal deaths among women aged 10 to 44 years, including 2524 maternal deaths and 962 late maternal deaths. The 4-year TMM ratio across 50 states and the District of Columbia was 24.62 deaths per 100 000 live births, whereas MM and LMM ratios across 49 states (California excluded) and the District of Columbia were 17.78 and 7.02 deaths per 100 000 live births, respectively (Table 1). Crude TMM, MM, and LMM rates were significantly higher ($P < .05$) in states with the largest number of abortion restrictions (i.e., the highest tertile of the composite index).

In 2015, the abortion policy composite index ranged from 0 in California, Connecticut, Oregon, Vermont, and Washington to a high of 7.5 in Indiana, Kansas, Nebraska, and Oklahoma (mean = 3.75; SD = 2.5; Table A, available as a supplement to the online version of this article at http://www.ajph.org). Fifteen states had 2 or fewer abortion restrictions and were grouped in the lowest tertile of the composite index, while 17 and 19 states were clustered in the moderate (from 2.5 to 4.5 restrictions) and the highest (5.5 to 7.5 restrictions) tertiles, respectively. State groupings by tertile level of the abortion policy composite index are listed in Table 2 and shown visually in

TABLE 1— Total Maternal Mortality (TMM), Maternal Mortality (MM), and Late Maternal Mortality (LMM; 2015–2018) and State-Level Covariates (2015) by Tertile of State Abortion Policy Composite Index: United States

	All States (n = 51), Mean ±SD or No. (%)	Low (n = 15), Mean ±SD or No. (%)	Moderate (n = 17), Mean ±SD or No. (%)	High (n = 19), Mean ±SD or No. (%)
TMM per 100 000 live births	24.62 ±8.89	20.79 ±5.25	22.04 ±7.60	29.98 ±9.90
MM per 100 000 live births	17.78 ±7.13	14.83 ±3.89	15.81 ±6.10	21.73 ±8.21
LMM per 100 000 live births	7.02 ±2.86	6.32 ±2.34	6.23 ±2.73	8.25 ±3.03
Abortion policy composite index, 2015	3.75 ±2.46	0.73 ±0.65	3.41 ±0.91	6.42 ±0.71
Poverty (% of state population with income below federal poverty level[a])	14.85 ±3.17	13.81 ±3.38	14.29 ±2.78	16.16 ±3.02
Unemployment (% of state civilian population aged ≥ 16 y)	7.63 ±1.72	7.91 ±1.49	7.67 ±1.54	7.36 ±2.042
College graduates (% of state population aged ≥ 25 y)	28.66 ±5.87	33.36 ±6.19	27.47 ±5.33	26.01 ±3.7
Non-Hispanic White (% of state population)	75.99 ±13.63	71.13 ±19.99	80.45 ±8.30	75.84 ±10.26
Residence in urban county (% of state population)	74.11 ±14.89	77.97 ±19.92	76.22 ±13.58	69.17 ±10.02
Foreign-born population (% of state population)	9.25 ±6.12	13.10 ±7.35	8.95 ±5.71	6.47 ±3.52
Medicaid expenditure per capita (2011 US $)	3226 ±1170	3961 ±1412	3371 ±933	2518 ±691
Births to women aged ≥ 35 y, %	15.96 ±4.17	19.69 ±3.91	15.65 ±3.53	13.18 ±2.26
Births covered by Medicaid, %	40.64 ±9.06	38.75 ±8.44	41.09 ±7.50	41.51 ±11.07
Medicaid expansion status				
Yes	30 (58.81)	14 (93.33)	11 (64.71)	5 (26.29)
No	21 (41.19)	1 (6.67)	6 (35.29)	14 (73.71)

Note. All estimates for MM and LMM exclude data from California.

[a]Federal poverty level is according to the US Census Bureau's American Community Survey.

TABLE 2— States and Maternal Death by Tertile of State Abortion Policy Composite Index: United States, 2015–2018

Abortion Policy Index	No. of States	States	TMM (n = 3785), No. (%)	MM (n = 2524), No. (%)	LMM (n = 962), No. (%)
Low	15	CA, CT, DC, HI, IL, MD, ME, MT, NH, NJ, NM, NY, OR, VT, WA	1004 (26.53)	499 (19.77)	206 (21.41)
Moderate	17	AK, AZ, CO, DE, FL, IA, KY, MA, MN, NV, OH, PA, RI, TN, WI, WV, WY	999 (26.39)	714 (28.29)	285 (29.63)
High	19	AL, AR, GA, ID, IN, KS, LA, MI, MO, MS, NC, ND, NE, OK, SC, SD, TX, UT, VA	1782 (47.08)	1311 (51.94)	471 (48.96)

Note. LMM = late maternal mortality; MM = maternal mortality; TMM = total maternal mortality. All counts of MM and LMM exclude data from California.

Figure A (available as a supplement to the online version of this article at http://www.ajph.org).

In adjusted models, a 1-unit increase in abortion policy composite index was associated with a 7% increase in TMM (ARR = 1.07; 95% CI = 1.02, 1.12; Table 3). States with a licensed physician requirement had a 51% higher TMM (ARR = 1.51; 95% CI = 1.15, 1.99) and a 35% higher MM (ARR = 1.35; 95% CI = 1.09, 1.67), and states with restrictions on public funding for abortion had a 29% higher TMM (ARR = 1.29; 95% CI = 1.03, 1.61) compared with the states without these policies.

Associations between the remaining abortion policies and TMM and MM were not statistically significant. Associations between LMM and abortion restrictions were also not statistically significant.

Results from the fully adjusted models with the interaction terms for race revealed an association between the abortion policy composite index and TMM for non-Hispanic White (ARR = 1.06; 95% CI = 1.02, 1.11) but not non-Hispanic Black or Hispanic populations (Table 4).

Results from sensitivity analysis with an age-restricted sample were consistent with the primary analysis (see Tables B–D, available as supplements to the online version of this article at http://www.ajph.org). Adjusted associations between the abortion policy composite index and TMM remained significant, although attenuated in magnitude (ARR = 1.06; 95% CI = 1.02, 1.11). Attenuation of the associations between mandated licensed physicians as sole providers of abortion services and increased TMM and MM was evident in the age-restricted analysis as well (ARR = 1.48; 95% CI = 1.14, 1.92 for TMM and ARR = 1.28; 95% CI = 1.02, 1.60 for MM). Association between restriction on public funds for abortion

TABLE 3— Associations Between Total Maternal Mortality (TMM), Maternal Mortality (MM), and Late Maternal Mortality (LMM) and Abortion Policies: United States, 2015–2018

	TMM, ARR (95% CI)	MM, ARR (95% CI)	LMM, ARR (95% CI)
Abortion policy composite index	1.07 (1.02, 1.12)	1.02 (0.94, 1.10)	1.01 (0.95, 1.08)
State abortion policies (yes vs no)			
Mandated counseling	1.13 (0.90, 1.43)	0.98 (0.78, 1.23)	1.00 (0.77, 1.31)
Waiting period	1.16 (0.97, 1.38)	1.05 (0.77, 1.43)	0.99 (0.72, 1.36)
Ultrasound requirement	1.20 (0.96, 1.49)	1.07 (0.75, 1.52)	0.94 (0.70, 1.26)
Parent involvement for minors	1.09 (0.81, 1.46)	0.94 (0.70, 1.25)	1.25 (0.95, 1.63)
Gestational age restrictions	1.10 (0.94, 1.29)	0.91 (0.72, 1.14)	0.89 (0.70, 1.13)
Licensed physician requirement	1.51 (1.15, 1.99)	1.35 (1.09, 1.67)	1.12 (0.87, 1.45)
Private insurance coverage limited	1.26 (0.99, 1.59)	1.21 (0.93, 1.58)	1.20 (0.85, 1.70)
Public funds restricted	1.29 (1.03, 1.61)	1.09 (0.80, 1.49)	1.19 (0.87, 1.63)

Note. ARR = adjusted rate ratio; CI = confidence interval. All estimates for MM and LMM exclude data from California. All models adjusted for state-level poverty, unemployment, % population with bachelor's degree or higher, % non-Hispanic White population, % urban population, % foreign-born population, Medicaid expansion status, Medicaid expenditure per capita, average % of births covered by Medicaid, and average % of births to women aged 35 years or older.

TABLE 4— Associations Between Race-Specific Total Maternal Mortality (TMM), Maternal Mortality (MM), and Late Maternal Mortality (LMM), and Abortion Policy Composite Index, 2015–2018

	Non-Hispanic White			Non-Hispanic Black			Hispanic		
	TMM	MM	LMM	TMM	MM	LMM	TMM	MM	LMM
Abortion policy composite index, ARR (95% CI)	1.06 (1.02, 1.11)	1.05 (0.95, 1.15)	0.99 (0.92, 1.07)	0.98 (0.89, 1.08)	0.95 (0.80, 1.13)	0.99 (0.85, 1.15)	1.01 (0.94, 1.06)	0.98 (0.86, 1.13)	0.91 (0.79, 1.15)
No. of maternal deaths	1 728	1 165	489	1 210	848	312	615	366	115
No. of live births	8 082 036	7 564 573		2 233 216	2 139 606		3 626 302	2 733 569	

Note. ARR = adjusted rate ratio; CI = confidence interval. All estimates for MM and LMM and counts of deaths and live births in these columns exclude data from California. All models adjusted for state-level poverty, unemployment, % population with bachelor's degree or higher, % non-Hispanic White population, % urban population, % foreign-born population, Medicaid expansion status, Medicaid expenditure per capita, average % of births covered by Medicaid, and average % of births to women aged 35 years or older.

care and TMM was also marginally diminished in magnitude (ARR = 1.28; 95% CI = 1.04, 1.58). Finally, as we found in the primary analysis, there was a significant association between the abortion policy composite index and TMM among the non-Hispanic White population (ARR = 1.05; 95% CI = 1.01, 1.09).

DISCUSSION

Access to abortion care has been endorsed as a human right and a critical component of reproductive health services.[30] Restrictive abortion policies have been internationally recognized as a risk factor for maternal mortality,[10] yet more than 1000 laws or regulations restricting access to abortion care have been enacted in the United States since the 1973 Supreme Court decision in *Roe v. Wade*, with 483 of these restrictions enacted in the past decade.[31] Using the most recent and revised NCHS maternal mortality data, we examined the associations between the state abortion policy context and maternal death. We found that states with a higher number of abortion-restricting policies had a 7% increase in TMM. In addition, states with a licensed physician requirement had a 51% higher TMM and a 35% higher MM, and restrictions on state Medicaid funding for abortion was associated with a 29% higher TMM. These findings contribute to the growing evidence documenting the detrimental impact of a restrictive reproductive rights climate on maternal and infant health.[5,15,16,20,21]

Our findings suggest the cumulative impact of abortion restrictions on maternal death, adding to a limited body of empirical studies linking rising maternal mortality and reduced access to reproductive health services in the United States.[5] Our study is among the first to provide empirical evidence of an association between maternal death and state abortion policy climate. Of concern, we evaluated the status of state abortion restrictions in 2015, and subsequent years have seen numerous additional restrictions imposed in many, mostly Southern and Midwestern, states.[31,32] In 2019 alone, an unprecedented number of abortion restrictions were proposed across the United States, with 59 enacted in 19 states.[32]

On a macro level, states with higher numbers of abortion regulations and worse maternal mortality also have adverse confounding factors that have been shown to negatively affect maternal health.[6,7,33] In this study, states with highest numbers of abortion-restricting laws had the worst socioeconomic conditions. Such harmful social context, characterized by high poverty, a lack of health care safety net and paid family leave, systemic racism, and historical disinvestments in comprehensive community-oriented primary care, particularly in communities of color, are root causes of persistent racial inequities in maternal death.[33] Moreover, abortion-restricting policies often co-occur with other policies that seek to regulate women's sexuality and bodily autonomy—including limited access to publicly supported contraceptive services and supplies, lack of publicly funded family planning services, and inadequate sex education—despite their negative associations with sexual and reproductive health.[20,28]

We found that 2 abortion restrictions—requirement for licensed physician and prohibitions against use of Medicaid funds to pay for abortion care—are particularly prominent potential contributors to maternal death risk. A requirement that an abortion should be performed by a licensed physician—enforced by 39 states in 2015—is part of targeted and medically unnecessary requirements on abortion providers aiming to severely reduce the number of abortion providers and

thereby limit access to abortion care. Research shows that properly trained advanced practice nurses and physician assistants can competently perform abortion procedures,[34] and this restriction is one of many aimed at these professions that prevents them from addressing gaps in reproductive health care. Restrictions on Medicaid funds to pay for abortion care—imposed by 34 states in 2015—increase out-of-pocket costs, thus making abortion inaccessible to many low-income people. At the federal level, the Hyde Amendment prohibits the use of federal funds to pay for abortion procedures through Medicaid (except in cases of rape, incest, or life endangerment); however, the remaining 16 states use their own Medicaid funds to extend abortion care to low-income Medicaid enrollees. Research shows that abortion-seeking people living in states with Medicaid coverage bans experience higher financial barriers and prolonged abortion seeking, which increase the likelihood of being forced to carry a pregnancy to term.[24]

Our results indicate that risk of death during pregnancy and up to 1 year postpartum (TMM) is elevated in states with restrictive abortion climates. In this analysis, we were not able to identify how this relationship is sensitive to the timing of death relative to pregnancy as associations in the time-stratified outcomes of MM (during pregnancy and up to 42 days postpartum) and LMM (43 days to 1 year postpartum) were not significant. Maternal deaths are relatively rare events, and stratification by timing of death—in combination with the additional exclusion of California, the most populous state in the nation—may have had a negative impact on statistical power.

In addition, when stratified by race/ethnicity, the association between the abortion policy composite index and TMM was significant among non-Hispanic White population but not Black or Hispanic. Previous evidence has shown that women of all races and ethnicities experience negative impacts of abortion clinic closures and gestational age limits,[5] and, thus, our findings should be interpreted with caution. Counts of maternal deaths were considerably smaller among non-Hispanic Black and Hispanic populations compared with non-Hispanic Whites, potentially limiting power in stratified outcomes. The implications of a restrictive abortion climate on maternal health among non-Hispanic Black and Hispanic populations warrant further examination of contextual, policy, and provider factors (e.g., missed or delayed diagnosis, inadequate access to, or lack of continuity, of care) that may be more prevalent in these groups.

Study Limitations

This analysis had several limitations. First, we used an ecological, cross-sectional study design to increase the precision of our estimates and to minimize heterogeneity bias. As such, we avoided conclusions of causality. Second, we have relied on vital statistics to identify cases of maternal death, which are susceptible to misclassification when incorrect *ICD-10* code was assigned for underlying cause of death.[35] Moreover, evidence shows that misclassification most often results in overreporting of maternal deaths, especially among older women.[3,35] While we demonstrated consistency in findings across 2 age-restricted samples, the possibility of misclassification remains. Third, we acknowledge the possibility of residual confounding by state-level factors we were not able to measure. In addition, we cannot explore mortality among subgroups of women based on pregnancy intention in these data (i.e., separately among those whose pregnancy was intended and those who continued an unintended pregnancy). Finally, while we conducted the analysis at the state level, a geographic unit that does not capture local-area variations in abortion access, our findings have relevant implications for abortion-related policy decisions that occur at the state level.

Public Health Implications

In the context of persistently elevated maternal mortality and expanding state-level restrictions on reproductive health care access, we found associations between state abortion policy context and TMM. It is critical that state-level policies related to women's access to comprehensive reproductive health care services, including abortion, are evidence-based and guided by the primary goal of improving women's health and reducing maternal mortality. Our study provides evidence that decreasing the number of abortion restrictions across the states may reduce incidence of death during pregnancy and postpartum among all women in the United States. AJPH

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CONTRIBUTORS

D. Vilda designed the study, completed the analyses, and led the writing. M. E. Wallace supervised the study and assisted with the analyses and article writing. C. Daniel, M. Goldin Evans, C. Stoecker, and K. P. Theall contributed to the interpretation of the results and the writing of the article.

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The authors have no conflicts of interest to report.

HUMAN PARTICIPANT PROTECTION

This study relied on secondary data containing no personal identifiers; therefore, no institutional review board approval was necessary.

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