A research note on the mortality consequence of denying all wanted induced abortions*

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Abstract

In this research note, I estimate one component of the mortality impact of denying all wanted induced abortions in the U.S. This estimate quantifies the magnitude of an increase in pregnancy-related death which would occur solely due to the greater mortality risk of continuing pregnancy to term compared to having a legal induced abortion. Using published statistics on pregnancy-related mortality ratios, births, and abortions, I estimate U.S. pregnancy-related deaths by race/ethnicity before and in first and subsequent years of a total abortion ban. I estimate deaths after a total abortion ban by assuming all induced abortions are denied, assuming each abortion denied averts 0.8 births, and increasing exposure to pregnancy-related mortality accordingly. I find that in the first year of ban, estimated pregnancy-related deaths would increase from 675 to 724 (49 additional deaths, 7% increase), and in subsequent years to 815 (140 additional deaths, 21% increase). Non-Hispanic Black women would experience the greatest increase in deaths (33% increase in subsequent years). Estimated pregnancy-related deaths would increase for all race/ethnicities examined. Denying all wanted induced abortions in US would increase pregnancy-related mortality substantially, even if unsafe abortion does not increase.

Introduction

Recently passed laws in three U.S. states attempt to ban abortion at any gestation and eight states have passed laws banning abortion at six weeks gestation (Guttmacher Institute 2021). These laws, coupled with a rightward shift in the U.S. Supreme Court heighten the need to estimate the mortality benefits of legal induced abortion in the U.S. (Nash 2019). Popular attention focuses on anticipated increases in potentially unsafe abortion outside the clinical context and resulting pregnancy-related deaths (Cummings 2018; Durkin 2019), but the mortality burden of a total or nearly total abortion ban would also include additional pregnancy-related mortality due to the fact that childbirth in the U.S. carries substantially greater mortality risk than does legal induced abortion (Raymond and Grimes 2012). Thus, policies that end or radically curtail the legal provision of abortion care could increase pregnancy-related deaths simply by increasing exposure to the risks of carrying a pregnancy to term because wanted abortions are denied. In this research note, I describe how denying all wanted U.S. induced abortions would increase exposure to risk of pregnancy-related death by causing more pregnancies to be carried to term and estimate how this increase in exposure would impact the annual number of pregnancy-related deaths by race/ethnic group.

No U.S. state has enforced a total or nearly total abortion ban for more than a few weeks (White et al. 2021) in recent decades, so the mortality impact of totally banning abortion cannot be measured directly. And inference from historical evidence is of limited salience because pregnancy-related mortality before *Roe v. Wade* legalized abortion nationwide was largely due to unsafe abortion (Cates et al., 1978; Cates & Roach, 1976), the prevalence of which would likely be different under a contemporary total ban. This prevalence is particularly difficult to project because of recent advances in safer self-managed medication abortion (Aiken et al. 2017). Though it is explicitly criminalized in five states (if/when/how 2019) and not known to be widely used, organizations supporting self-managed abortion already operate in the U.S., (Aiken et al. 2020) providing a safer alternative than those people resorted to before *Roe*. Additional mortality due to unsafe abortion under a possible total ban is unknown and unlikely to be similar to that pre-*Roe*.

However, published statistics on the numbers of induced abortions in the U.S. make it possible to estimate the additional number of pregnancies that would be carried to term if all abortions were denied. Applying published pregnancy-related mortality ratios (PRMRs) to these additional pregnancies carried to term and subtracting the lower mortality risk of the legal induced abortions denied, it is possible to estimate part of the mortality consequence of totally banning induced abortion. Any increases in pregnancy-related mortality due to increased unsafe abortion would be in addition to this estimate. In that sense, this estimate forms a lower bound on the mortality impact of banning all abortion in the U.S.

Methods

Relying on the most recent published statistics for U.S. pregnancy-related mortality for pregnancies ending in birth and induced abortion, population-level births, and estimated abortions, I estimate annual pregnancy-related deaths by race/ethnicity under three conditions:

at baseline, for the first year during which all induced abortions are denied, and during subsequent years of denials.

In the first year all abortions are denied, some additional pregnancy-related deaths will not occur until the following year. Induced abortion (and thus abortion denial) commonly occurs early in pregnancy but the majority of pregnancy-related mortality risk occurs late in pregnancy. Therefore, I estimate additional pregnancy-related deaths separately for first and subsequent years. After the first year, assuming no changes in population, the deaths from abortions denied in the prior year would balance the deaths occurring in the subsequent year.

I generate estimates separately for race/ethnic groups whose counts of abortions may be estimated from published statistics: non-Hispanic white, non-Hispanic Black, Hispanic, and other non-Hispanic people. PRMRs are available for births to non-Hispanic white, non-Hispanic Black, and Hispanic people but not for the remainder category of births to all other non-Hispanic people. Therefore, I apply the overall PRMR to this group.

Estimating baseline pregnancy-related deaths

I use births and abortions from 2017 and PRMRs from 2014-2017 to represent conditions at baseline because this the most recent year for which a national estimate of the number of abortions is available and the latest period for which PRMRs are available by race/ethnicity.

I estimate pregnancy-related deaths in 2017 based on 2017 births by race/ethnicity and PRMRs by race/ethnicity for the period 2014-2017.(Division of Reproductive Health 2020; Martin et al. 2018) This provides an estimated baseline level of pregnancy-related mortality before a total ban.

Estimating pregnancy-related deaths after total abortion ban

The most complete statistics on abortion service delivery in the United States come from the Guttmacher Institute. Estimated total abortions is available for 2017, but the most recent year with estimated abortions by race/ethnicity is 2014.(Jerman, et al., 2016) Total estimated abortions in 2017 is 7% lower than the total in 2014.(Jones et al. 2019) Therefore, I reduce the estimated number of 2014 abortions received by women in each race/ethnicity by 7% to estimate 2017 abortions by race/ethnicity.¹ These represent the numbers of abortions received at baseline and the numbers which would be denied if induced abortion were totally banned in the U.S.

To estimate additional births if all abortions are denied, I assume each abortion denied averts 0.8 births (a number less than 1 because of miscarriage and return of fecundability).(Potter 1972)

For the first year of a ban, I must also estimate the fraction of additional pregnancy-related deaths which would occur in the same calendar year as abortion denial. I begin by assuming a uniform distribution of abortions across calendar months and that all terminations occur at 8 weeks gestation, the modal gestational age of abortion in the U.S.(Jones & Jerman, 2017b).

¹ Distributing the 7% overall decline from 2014 to 2017 proportionally across race/ethnic groups according to the change in abortions by race/ethnic group between 2008 and 2014 yielded very similar results.

Based on these assumptions, I calculate the fraction of pregnancy-related deaths associated with abortions denied in each calendar month which would occur in the same calendar year, based on published fractions of pregnancy-related deaths by timing relative to delivery. I estimate 42% of pregnancies ending in abortion in the first year would reach 40 weeks' gestation during the same year in subsequent years (all abortions denied in May or earlier $.42 = 5/12$). Following published statistics regarding the timing of pregnancy-related deaths with respect to delivery, (Petersen et al. 2019) I estimate that 83% of deaths associated with these 42% of pregnancies would occur in the same calendar year.² Following a similar approach, I estimate 5% of the deaths associated with the 58% of pregnancies continued after abortion denials in June or later would occur in the same year.³ Thus, to estimate the impact of denying all abortions in the first year, I estimate deaths for each race/ethnicity group as if counts of births increased by 30% of estimated abortions denied in the first year. $30 = 0.8 \times (0.42 \times 0.83 + 0.58 \times 0.05)$ and as if counts of births increased by 80% of estimated abortions in subsequent years.

Since PRMRs include any mortality due to induced abortion in the numerator but not the denominator, I apply published PRMRs for pregnancies ending in induced abortion (Raymond and Grimes 2012) to estimated abortions by race/ethnicity in 2017 and subtract the resulting estimates from the estimated deaths for each race/ethnicity in both the first year of a ban and subsequent years of a ban.

The difference in pregnancy-related deaths estimated for the 2017 baseline and for the first and subsequent years of a ban is an estimate of the additional pregnancy-related mortality resulting from denying all wanted induced abortion in the US, assuming no additional mortality associated with unsafe terminations and assuming all pregnancies are continued because of abortion denial.

To compare estimated levels of pregnancy-related death before and after an abortion ban across groups while capturing the contribution of level of fertility and population size, I estimate the probability that a 15 year old will die from a pregnancy-related cause if the prevailing fertility and pregnancy-related mortality rates continue for her reproductive life, assuming negligible mortality before age 50. (Wilmoth 2009) To estimate this probability at the 2017 baseline, I calculate the probability for each race/ethnic group r such that the probability

² This estimate is the result of distributing deaths over time based on when abortions denied would reach term. It includes all deaths during pregnancy (31.3% of pregnancy-related deaths), all deaths on the day of delivery (16.9% of pregnancy-related deaths), all deaths 1-6 days postpartum (18.6% of pregnancy-related deaths), most deaths 7-24 days postpartum (21.4% of pregnancy related deaths – note that only for abortions denied in December would some of these deaths would occur in the next year), and a very small fraction of deaths 43-365 days postpartum (11.7% of deaths – note that even for abortions denied early in the year an overwhelming majority of these deaths would occur in the next year, since these pregnancies would not reach term until late in the first year).

³ For these pregnancies – which would not reach term during the first year – I assume for simplicity that pregnancy-related deaths during pregnancy occur with a uniform distribution across months of pregnancy and for each month calculate the fraction of the 9 months of pregnancy which would occur in the first year of a ban. I apply these percentages to the 31.3% of pregnancy related deaths occurring during pregnancy over the first year to generate the fraction of additional pregnancy-related deaths associated with these pregnancies which would occur in the first year of a ban.

is 1 in $\frac{100,000}{(TFR_{2017,r})(PRMR_r)}$, where $TFR_{2017,r}$ is the published total fertility rate for race/ethnic group r in 2017.

To estimate the probability after all wanted abortions are denied (for subsequent years), I begin by estimating $TFR_{post,r}$ as the product of the TFR for race/ethnicity r in 2017 and that race/ethnicity's ratio of estimated births after all wanted induced abortions are denied and births in 2017:

$$TFR_{post,r} = TFR_{2017,r} \left(\frac{Births_{2017,r} + 0.8(Abortions\ denied_r)}{Births_{2017,r}} \right)$$

Where $Births_{2017,r}$ the published number of births for race/ethnic group r in 2017 and $Abortions\ denied_r$ is the estimated number of abortions in race/ethnic group r in 2017. Then the risk of death is 1 in $\frac{100,000}{(TFR_{post,r})(PRMR_r)}$.

This study was determined not human subjects research by an Institutional Review Board.

Results

In the first year in which all wanted induced abortions in the U.S. are denied, the estimated annual number of pregnancy-related deaths would increase from 675 to 724 (49 additional deaths, 7% increase), and in subsequent years to 815 (140 additional deaths, 21% increase). Non-Hispanic Black people would experience the greatest increase in pregnancy-related deaths (33% increase in subsequent years), but estimated pregnancy-related deaths would increase for all race/ethnicities (see Table). Because the estimated deaths before and after a ban are based on the same population and fertility rates, percentage increases also reflect increases in the annual risk of dying from pregnancy-related causes.

In terms of risk of dying from pregnancy related causes, denying all wanted induced abortion would be associated with an increase in risk from 1 in 3300 to 1 in 2800 among all women. Among non-Hispanic Black women, the increase in risk would be from 1 in 1300 to 1 in 1000.

Conclusion

Annual pregnancy-related deaths in the U.S. are estimated to increase if all wanted legal induced abortions are denied, even if people denied legal access to abortion do not resort to unsafe procedures. Both in terms of the number of additional deaths and in terms of the increase in risk, the additional mortality burden is estimated to be greatest among non-Hispanic Black women. Structural racism is a fundamental cause of maternal health inequity (Bailey et al. 2020; Crear-Perry et al. 2021; Krieger et al. 2020) and Black women already experience excessive levels of pregnancy-related mortality (Division of Reproductive Health 2020). Increasing Black women's exposure to the risk of pregnancy-related mortality because their wanted abortions are denied would exacerbate an existing public health crisis.

This analysis is limited by reliance on abortion rates from 2014 and 2017. If U.S. abortion numbers continue to decline (Jones & Jerman, 2017b) impacts could be smaller. The mortality impact of denying all wanted induced abortions could also be smaller if many who are denied abortion turn to effective protocols for self-managed abortion and thus successfully terminate

their own pregnancies. Impacts could be larger if reliance on unsafe abortion methods increases or if PRMRs increase. However, applying prevailing PRMRs to pregnancies currently ending in abortion is conservative insofar as women who receive abortion have higher prevalence of factors associated with elevated risk of pregnancy-related mortality compared to women who carry to term.(Jones & Jerman, 2017b; Raymond & Grimes, 2012). And allowing each abortion denied to contribute only a fraction of a birth to the hypothetical number of births if all abortions are denied is also conservative.(Potter 1972) The results presented here use demographic estimation methods to estimate the consequence of banning induced abortion for pregnancy related mortality. They do not reflect actual counts of pregnancy-related deaths.

These estimates describe how denying wanted abortions will increase exposure to the mortality risks of pregnancy and quantify the effect of denying all wanted abortions in the U.S. as of 2017. While a total ban on abortion at the federal level is possible, the logic underlying these results also sheds light on the possible consequence of state-level total or nearly total bans on induced abortion. In short, denying all (or nearly all) wanted abortions will expose more people to the mortality risks of carrying their pregnancies to term and thereby increase pregnancy-related deaths.

By estimating this effect separately for the first and subsequent years of all abortions being denied, the results highlight for any future researchers that the full impact on pregnancy-related mortality of any future bans of this kind will likely not be observed until the second year.

Proposed legislation sometimes – though not always – includes exceptions under which abortions are not denied to victims of rape or incest or if abortion is required to save the pregnant person's life. When such exceptions are afforded to Medicaid recipients they are very rarely utilized.(U.S. Government Accountability Office 2019) Similarly, bans on abortion as early as 6-weeks gestation may lead to widespread abortion denials, since this is before many people know they are pregnant(Kost and Lindberg 2015), only some abortion providers perform terminations at such early gestations(Jones and Kooistra 2011), and most abortion-seekers experience delays either due to restrictive laws or logistics.(Jones & Jerman, 2016)

In this research note I estimate how denying all wanted abortions in the U.S. would increase pregnancy-related deaths to illustrate how denying wanted abortions may increase pregnancy-related deaths. But any state-level total or nearly total ban on abortion could cause more maternal deaths by the process illustrated here if pregnant people do not successfully access abortion via self-management or in another state. Similarly, other abortion bans (banning abortions sought for specific reasons or at specific gestations) will also cause more deaths if they cause more pregnancies to be brought to term.

References

- Aiken, A. R., Digol, I., Trussell, J., & Gomperts, R. (2017). Self reported outcomes and adverse events after medical abortion through online telemedicine: population based study in the Republic of Ireland and Northern Ireland. *BMJ: British Medical Journal*, 357, j2011.
- Aiken, A. R., Starling, J. E., van der Wal, A., van der Vliet, S., Broussard, K., Johnson, D. M., et al. (2020). Demand for self-managed medication abortion through an online telemedicine service in the United States. *American journal of public health*, 110(1), 90–97.
- Bailey, Z. D., Feldman, J. M., & Bassett, M. T. (2020). How structural racism works—racist policies as a root cause of US racial health inequities.
- Cates Jr, W., Rochat, R. W., Grimes, D. A., & Tyler Jr, C. W. (1978). Legalized abortion: Effect on national trends of maternal and abortion-related mortality (1940 through 1976). *American Journal of Obstetrics and Gynecology*, 132(2), 211–214.
- Cates, W., & Rochat, R. (1976). Illegal abortions in the United States: 1972-1974. *Family Planning Perspectives*, 86–92.
- Crear-Perry, J., Correa-de-Araujo, R., Lewis Johnson, T., McLemore, M. R., Neilson, E., & Wallace, M. (2021). Social and structural determinants of health inequities in maternal health. *Journal of Women's Health*, 30(2), 230–235.
<https://doi.org/10.1089/jwh.2020.8882>
- Cummings, W. (2018, September 5). Feinstein mistakenly says 200,000 to 1,200,000 women died in illegal abortions decades ago. *USA Today*.
<https://www.usatoday.com/story/news/politics/onpolitics/2018/09/05/kavanaugh-confirmation-feinstein-illegal-abortion-number/1206409002/>. Accessed 2 July 2021
- Division of Reproductive Health. (2020, November 25). Pregnancy Mortality Surveillance System. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. <https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm>. Accessed 18 February 2021
- Durkin, E. (2019, May 19). “Women will die”: how new abortion bans will harm the most vulnerable. *The Guardian*. <https://www.theguardian.com/us-news/2019/may/19/abortion-ban-alabama-women-of-color-poor>. Accessed 2 July 2021
- Guttmacher Institute. (2021). *State bans on abortion throughout pregnancy*. Guttmacher Institute. <https://www.guttmacher.org/state-policy/explore/state-policies-later-abortions>. Accessed 4 March 2021
- if/when/how. (2019). *Roe’s unfinished promise: 2019 update*. if/when/how: Lawyering for reproductive justice.
<https://www.ifwhenhow.org/download/?key=HMCEbeY0e3ZvskAaKDHFfBODE2M8y2iN0UqE8qvnWqAcZRmyO6OjKjzbiFWEPExA>. Accessed 2 July 2021

- Jerman, J., Jones, R., & Onda, T. (2016). *Characteristics of U.S. abortion patients in 2014 and changes since 2008*. New York: Guttmacher Institute.
- Jones, R., & Jerman, J. (2016). *Time to appointment and delays in accessing care among US abortion patients*. New York: The Guttmacher Institute.
- Jones, R., & Jerman, J. (2017a). Population group abortion rates and lifetime incidence of abortion: United States, 2008–2014. *American Journal of Public Health*, 107(12), 1904–1909.
- Jones, R., & Jerman, J. (2017b). Abortion incidence and service availability in the United States, 2014. *Perspectives on sexual and reproductive health*, 49(1), 17–27.
- Jones, R., & Kooistra, K. (2011). Abortion incidence and access to services in the United States, 2008. *Perspectives on Sexual and Reproductive Health*, 43(1), 41–50.
<https://doi.org/10.1363/4304111>
- Jones, R., Witwer, E., & Jerman, J. (2019). *Abortion incidence and service availability in the United States, 2017*. New York: Guttmacher Institute.
<https://doi.org/10.1363/2019.30760>. Accessed 4 March 2021
- Kost, K., & Lindberg, L. (2015). Pregnancy intentions, maternal behaviors, and infant health: investigating relationships with new measures and propensity score analysis. *Demography*, 52(1), 83–111.
- Krieger, N., Van Wye, G., Huynh, M., Waterman, P. D., Maduro, G., Li, W., et al. (2020). Structural racism, historical redlining, and risk of preterm birth in New York City, 2013–2017. *American journal of public health*, 110(7), 1046–1053.
- Martin, J., Hamilton, B., Osterman, M., Driscoll, A., & Drake, P. (2018). *Births: Final data for 2017*. (No. vol 67 no 8). Hyattsville, MD: National Center for Health Statistics.
- Nash, E. (2019). Abortion rights in peril — what clinicians need to know. *New England Journal of Medicine*, 381(6), 497–499. <https://doi.org/10.1056/NEJMp1906972>
- Petersen, E. E., Davis, N. L., Goodman, D., Cox, S., Mayes, N., Johnston, E., et al. (2019). Vital Signs: Pregnancy-Related Deaths, United States, 2011–2015, and Strategies for Prevention, 13 States, 2013–2017. *Morbidity and Mortality Weekly Report*, 68(18), 423.
- Potter, R. G. (1972). Births averted by induced abortion: An application of renewal theory. *Theoretical Population Biology*, 3, 69–86.
- Raymond, E. G., & Grimes, D. A. (2012). The comparative safety of legal induced abortion and childbirth in the United States. *Obstetrics & Gynecology*, 119(2), 215–219.
- U.S. Government Accountability Office. (2019). *Medicaid : CMS Action Needed To Ensure Compliance with Abortion Coverage Requirements* (No. GAO-19-159).
<https://www.gao.gov/assets/700/696338.pdf>. Accessed 4 March 2021
- White, K., Kumar, B., Goyal, V., Wallace, R., Roberts, S. C. M., & Grossman, D. (2021). Changes in Abortion in Texas Following an Executive Order Ban During the Coronavirus Pandemic. *JAMA*, 325(7), 691–693. <https://doi.org/10.1001/jama.2020.24096>

Wilmoth, J. (2009). The lifetime risk of maternal mortality: concept and measurement. *Bulletin of the World Health Organization*, 87, 256–262.

Table. Estimated annual pregnancy-related deaths in the U.S. before and after a hypothetical ban on induced abortion, assuming zero increase in unsafe abortion.

Race/ ethnic group	A. PRMR 2014- 2017, per 100,000 births ^a	B. Number of births, 2017 ^b	C. Number of estimated deaths before ban ^c	D. Number of estimated abortions before ban (denied after ban) ^d	E. Additional deaths, first year of ban ^e (N, % increase)		F. Additional deaths, later years of ban ^f (N, % increase)		G. Before total abortion ban, annual rate expressed as lifetime risk ^g	H. Later years of total abortion ban, annual rate expressed as lifetime risk ^h
NH White	13.4	1,992,461	267	334,060	11	4%	33	13%	1 in 4,500	1 in 3,900
NH Black	41.7	560,715	234	238,000	28	12%	78	33%	1 in 1,300	1 in 1,000
Hispanic	11.6	898,764	104	213,940	6	6%	18	18%	1 in 4,300	1 in 3,600
NH other	17.3	403,560	70	76,310	3	5%	10	14%	n/a ⁱ	n/a
Total	17.3	3,855,500	675	862,300	49	7%	140	21%	1 in 3,300	1 in 2,800

Notes

^a National pregnancy-related mortality ratios (PRMRs) by race-ethnic group 2014-2017.(Division of Reproductive Health 2020) Note that the PRMR for the non-Hispanic other category is the overall PRMR because the compositions of the births and abortions in this category do not align with the subgroups for which PRMRs are available.

^b Published total births by race/ethnic group. Non-Hispanic other includes all births to individuals who were not identified as non-Hispanic white, non-Hispanic Black, or Hispanic of any race. This partitioning of births by race/ethnicity was selected because it was the most precise one for which annual abortions may be estimated based on published estimated totals.

^c Estimated pregnancy-related deaths before a ban, calculated as $\frac{(Births_r)(PRMR_r)}{100,000}$ using births from Column B and PRMR from Column A. Rounded to the nearest whole number. Note that the Total in this column is the sum of deaths from all race/ethnic groups.

^d Estimated abortions in 2017 calculated as 93% of estimated abortions by race/ethnic group from 2014 (Jones et al. 2019; Jones and Jerman 2017b) (most recent year for which race/ethnic group-specific estimates of counts or rates of abortions are available) and total estimated abortions from 2017 (Jones et al. 2019). Assumes declines do not vary across groups. Rounded to the nearest 10.

^e Estimated as follows for each race/ethnic group (r):

$$\frac{0.3(Abortions\ denied_r)(PRMR_r)}{100,000} - \frac{(Abortions\ denied_r)(0.7)}{100,000}$$

Where abortions denied are the estimated abortions before a ban from Column D and 0.7 represents estimated mortality related to pregnancies ending in induced abortion in the U.S. (Raymond and Grimes 2012)

^f Calculated as above, but using 0.8 instead of 0.3, since each abortion denied is estimated to yield 0.8 of a birth in subsequent years.

^g Estimated probability that a 15 year old will die from a pregnancy-related cause if the prevailing fertility and PRMRs continue for her reproductive life, assuming negligible mortality before age 50. Estimated for each race/ethnic group (r) by: $\frac{100000}{(TFR_{2017,r})(PRMR_r)}$. Rounded to nearest 1 in 100.

^h Estimated probability that a 15 year old would die from a pregnancy-related cause if current PRMRs continue for her reproductive life and prevailing fertility rates in her race/ethnic group increased due to all induced abortions being denied, such that the total fertility rate for her race/ethnic group became:

$$TFR_{post,r} = TFR_{2017,r} \left(\frac{Births_{2017,r} + 0.8(Abortions\ denied_r)}{Births_{2017,r}} \right)$$

Where $TFR_{pre,r}$ is the published total fertility rate for race/ethnic group r in 2017, $Births_{pre,r}$ the published number of births for race/ethnic group r in 2017, and $Abortions\ denied_r$ is the same as the estimated number of abortions in race/ethnic group r in 2017. Then the risk of death is 1 in $\frac{100,000}{(TFR_{post,r})(PRMR_r)}$ (rounded to nearest 1 in 100).

ⁱ The population non-Hispanic other is heterogenous and does not align with published TFRs. Thus the probability is not estimated for this group.