Pregnancy-Related Deaths Among American Indian or Alaska Native Persons: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019

Susanna Trost, MPH; Jennifer Beauregard, MPH, PhD; Gyan Chandra, MS, MBA; Fanny Njie, MPH; Alyssa Harvey, BS; Jasmine Berry, MPH; David A. Goodman, MS, PhD

Maternal Mortality Review Committees (MMRCs) are multidisciplinary committees that convene at the state or local level to comprehensively review deaths during or within a year of pregnancy (pregnancy-associated deaths). MMRCs have access to clinical and nonclinical information (e.g., vital records, medical records, social service records) to more fully understand the circumstances surrounding each death, determine whether the death was pregnancy-related, and develop recommendations for action to prevent similar deaths in the future.

Understanding differences in the underlying causes of pregnancy-related death by race and ethnicity is important for identifying prevention opportunities to reduce inequities in maternal mortality. However, accurate classification of race and ethnicity can be challenging. The methodology for classifying race and ethnicity using MMRCs' data from the Maternal Mortality Review Information Application (MMRIA) is based on mother's race and ethnicity data from the birth or fetal death record, when available, and then from death records when a birth record or fetal death record was unavailable. In the data brief titled *Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019*[1], if Hispanic origin is noted, the race and ethnicity is classified as *Hispanic* regardless of race classification. For non-Hispanic persons, race was categorized into single-race classifications, and when *other race* or more than one race is noted, race was classified as *other/multiple races*.

Methodological decisions about racial classification can affect the size and characteristics of the population used in an analysis. Assessments from other groups[2,3,4] have demonstrated the importance of examining pregnancy-related deaths among all American Indian or Alaska Native (AIAN) persons, regardless of notation of Hispanic origin or other/multiple races.

This report uses data on pregnancy-related deaths of residents in 36 states from 2017 to 2019 shared with CDC through the Maternal Mortality Review Information Application (MMRIA) by using an alternate approach for classifying AIAN populations. This report describes pregnancy-related deaths among all AIAN, which includes non-Hispanic single-race AIAN, and AIAN in combination with any other race or ethnicity.

In *Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019*[1], 9 pregnancy-related deaths were classified as non-Hispanic single-race AIAN. As shown in Figure 1, by using an alternate approach to classifying available vital records information on race and ethnicity, 17 pregnancy-related deaths were classified as AIAN. While this alternate approach resulted in the increased identification of pregnancy-related deaths among AIAN persons, because of known limitations of vital records data for identifying AIAN persons[5], 17 is still likely an undercount of deaths among AIAN persons. This is, in part, because being an AIAN person indicates membership in a domestic sovereign nation, which is a political status and not only a categorization of race-ethnicity.

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1. Trost SL, Beauregard J, Njie F, et al. Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2022.

2. Improving Data Capacity for American Indian/Alaska Native (AIAN) Populations in Federal Health Surveys. HHS Office of the Assistant Secretary for Planning and Evaluation; 2019.

3. Best Practices for American Indian and Alaska Native Data Collection. Seattle, WA: Urban Indian Health Institute; 2020.

4. Joshi S, Warren-Mears V. Identification of American Indians and Alaska Natives in Public Health Data Sets: A Comparison Using Linkage-Corrected Washington State Death Certificates. *J Public Health Manag Pract*. 2019 Sep/Oct;25 Suppl 5, Tribal Epidemiology Centers: Advancing Public Health in Indian Country for Over 20 Years:S48-S53.

5. Anderson RN, Copeland G, Hayes JM. Linkages to improve mortality data for American Indians and Alaska Natives: a new model for death reporting? Am J Public Health. 2014 Jun;104 Suppl 3(Suppl 3):S258-62.

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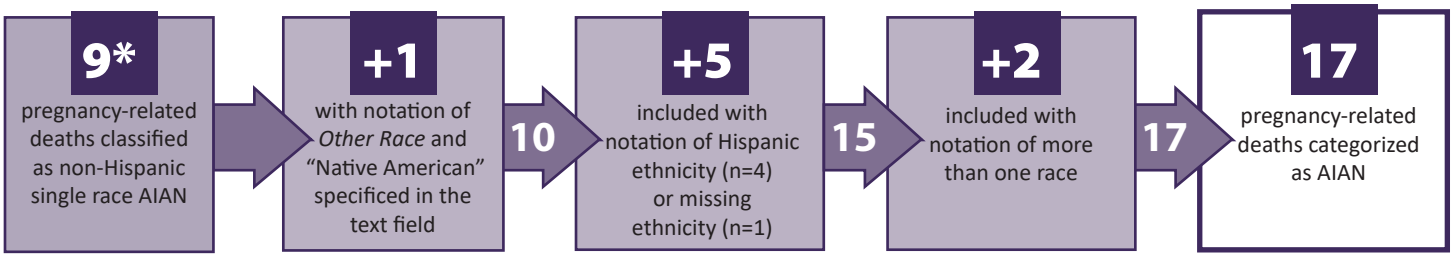
Figure 1. Classification of pregnancy-related deaths among American Indian or Alaska Native persons



*9 non-Hispanic single-race AIAN pregnancy related deaths as identified in the data brief *Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017–2019*

Mental health conditions and hemorrhage were the most common underlying causes of pregnancy-related death among all American Indian or Alaska Native persons for which underlying cause of death were available, accounting for 50% of deaths with a known underlying cause (Table 1).

Table 1. Underlying causes of pregnancy-related death among American Indian or Alaska Native persons, data from Maternal Mortality Review Committees in 36 US states, 2017–2019[1]

	N	%
Mental health conditions[2]	5	31.3
Hemorrhage[3]	3	18.8
Amniotic fluid embolism	2	12.5
Infection	2	12.5
Cardiac and coronary conditions[4]	1	6.3
Collagen vascular/autoimmune diseases	1	6.3
Conditions unique to pregnancy[5]	1	6.3
Injury[6]	1	6.3

[1]Specific cause of death was listed as *unknown* for 1 (5.9%) pregnancy-related death.

[2]Mental health conditions include deaths of suicide, overdose/poisoning related to substance use disorder, and other deaths determined by the MMRC to be related to a mental health condition, including substance use disorder.

[3]Excludes aneurysms or cerebrovascular accident (CVA).

[4]Cardiac and coronary conditions include deaths of coronary artery disease, pulmonary hypertension, acquired and congenital valvular heart disease, vascular aneurysm, hypertensive cardiovascular disease, Marfan Syndrome, conduction defects, vascular malformations, and other cardiovascular disease; and excludes cardiomyopathy and hypertensive disorders of pregnancy.

[5]For example, gestational diabetes, hyperemesis, liver disease of pregnancy.

[6]Injury includes intentional injury (homicide), unintentional injury, including overdose/poisoning deaths not related to substance use disorder, and injury of unknown intent or not otherwise specified.

Other reported underlying causes of death included amniotic fluid embolism (n=2, 12.5%), infection (n=2, 12.5%), cardiac and coronary conditions (n=1, 6.3%), collagen vascular/autoimmune diseases (n=1, 6.3%), conditions unique to pregnancy (n=1, 6.3%), and injury (n=1, 6.3%).

Approximately 12% of deaths occurred during pregnancy, 24% occurred on the day of delivery or within a week after delivery, 35% occurred 7–42 days postpartum, and 29% occurred in the late postpartum period (43–365 days postpartum, Table 2).

Table 2. Distribution of pregnancy-related deaths among American Indian or Alaska Native persons by timing of death in relation to pregnancy, data from Maternal Mortality Review Committees in 36 US states, 2017–2019*

	n	%
During pregnancy	2	11.8
Day of delivery	3	17.7
1–6 days postpartum	1	5.9
7–42 days postpartum	6	35.3
43–365 days postpartum	5	29.4

Among the 17 pregnancy-related deaths to American Indian or Alaska Native persons, a preventability determination was made by an MMRC for 15 deaths (88%). Among these deaths with a preventability determination, 14 (93%) were determined to be preventable (Table 3).

Table 3. Percentage of pregnancy-related deaths to American Indian or Alaska Native persons determined by MMRCs to be preventable, data from Maternal Mortality Review Committees in 36 US states, 2017–2019*

	n	%
Preventable	14	93.3
Not Preventable	1	6.7

*A preventability determination was missing (n=1) or unable to be determined (n=1) for a total of 2 (11.8%) pregnancy-related deaths.

Information presented in this brief should be interpreted with caution because it is based on small numbers. The presentation of the data weighed the potential risks of identifying individuals by reporting information based on small numbers versus the potential benefits of making information available for prevention of pregnancy-related deaths among AIAN communities. To minimize disclosure risks, data were aggregated across states (36 states) and across years (2017–2019), and disaggregation was limited (e.g., age groupings). Although these steps minimize risk of identifying individuals, we acknowledge that families and communities connected to a death may recognize an individual death included in this brief. The potential benefit of reporting this data is to provide potentially useful information for a population disproportionately impacted by pregnancy-related deaths. This lets AIAN communities determine what information is of use or not of use to their work preventing these tragic deaths. We hope that when a family or community believe they recognize their loved ones in this report, it is viewed as honoring their lives through the potential opportunities for preventing future AIAN deaths.

Data Sources and Methods

Data were shared for aggregate analysis by jurisdictional MMRCs through the Maternal Mortality Review Information Application (MMRIA). MMRIA supports standardized record abstraction, case summary development, documentation of committee decisions, and analysis. Data analyzed included information on pregnancy-related deaths that occurred from 2017 to 2019 among residents of 36 states; Alabama (2017–2018), Alaska (2019), Arizona (2017–2019), Arkansas (2018–2019), California (2019), Colorado (2017–2019), Connecticut (2017–2019), Delaware (2017–2019), Florida (2017–2019), Georgia (2017–2018), Hawaii (2017–2018), Illinois (2017–2019), Indiana (2017–2019), Kansas (2017–2019), Louisiana (2017–2019), Massachusetts (2017), Minnesota (2017–2018), Mississippi (2017–2019), Missouri (2017–2019), North Carolina (2018–2019), Nebraska (2017–2019), New Hampshire (2017–2019), New Jersey (2017–2019), New Mexico (2017–2019), New York (2018–2019; 2019 excludes NYC), Ohio (2017–2018), Oklahoma (2017–2019), Oregon (2018–2019), Pennsylvania (2018), Tennessee (2017–2019), Texas (2019), Virginia (2018), Washington (2017–2019), West Virginia (2017–2019), Wisconsin (2017), and Wyoming (2018–2019). In some states, only partial years of data were shared. Some states group review of deaths by cause of death and may have only reviewed some causes before sharing data with CDC. Sensitivity analysis did not indicate any major differences in underlying causes of death when data for those states were excluded.

We used race and ethnicity data from the birth or fetal death records, when available, and from death records when a birth record or fetal death record was unavailable. Race and Hispanic origin are reported separately on the birth, fetal, and death records; more than one race can be selected. Deaths with selection of *American Indian or Alaska Native* on the birth record, fetal death record, or death record were included as AIAN, regardless of Hispanic origin, selection of more than one race, or absence of Hispanic origin. When the race field was noted as *other*, the associated free text field was then manually reviewed to identify if the text indicated an AIAN pregnancy-related death. Pregnancy-related deaths determined by the MMRCs to be suicides were assigned an underlying cause of death of mental health conditions during analysis, if not already assigned this cause of death by an MMRC. Deaths where the MMRCs determined the means of fatal injury to be *overdose/poisoning*, and where the MMRCs determined that substance use disorder contributed to the death, were assigned an underlying cause of death of mental health conditions during analysis, if not already assigned this cause of death by an MMRC. Timing of death in relation to pregnancy was assigned by using the number of days between the date of death and the end of pregnancy, as documented by the MMRC abstractor or as calculated by using the number of days between the date of death on the death record and the date of birth or fetal death on the linked birth or fetal death record by CDC. MMRIA instructs MMRC abstractors to enter 0 number of days if the death occurs on the day of delivery. Deaths classified as occurring on the *day of delivery* occurred within 24 hours of the end of pregnancy. If the specific number of days was missing, deaths that the MMRC abstractor classified as *pregnant at the time of death*, or with the standard pregnancy checkbox on the death certificate marked as *pregnant at the time of death*, were classified as *during pregnancy*. We completed a manual review of narratives and abstracted records in MMRIA to confirm the classification of timing of deaths for all decedents, and recoded inaccurate timing of deaths. When available, the timing of death documented in the narrative was used to classify timing of deaths when deaths were missing a timing classification based on the number of days, abstractor-assigned category, and pregnancy checkbox. Deaths that did not have enough information to determine the exact timing of death were classified as *unknown*. Deaths without a narrative were classified as *missing*.

Definitions

Pregnancy-Related: A death during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. In addition to having a temporal relationship to pregnancy, these deaths are causally related to pregnancy or its management.

Preventability: A death is considered preventable if the committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, community, provider, facility, and/or systems factors. MMRIA allows MMRCs to document preventability decisions in two ways: 1) determining preventability as a "yes" or "no", and/or 2) determining the chance to alter the outcome by using a scale that indicates *no chance*, *some chance*, or *good chance*. Any death with a *yes* response or a response that there was *some chance* or a *good chance* to alter the outcome was considered *preventable*; deaths with a *no* response or *no chance* were considered *not preventable*.

About the authors

Susanna Trost is a CDC Foundation Field Employee assigned to the National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health; Fanny Njie, Alyssa Harvey, and Jasmine Berry are Oak Ridge Institute for Science and Education (ORISE) Fellows in the National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health; Jennifer Beauregard, Gyan Chandra, and David Goodman are with the National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health.

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