Eliminating Preventable Maternal Deaths

The National Association of Nurse Practitioners in Women's Health (NPWH) supports coordinated and collaborative efforts at federal, state, local, and professional organization levels to eliminate preventable maternal deaths. A death is considered preventable if it is determined that there was some chance the death could have been averted by one or more changes to community, health facility, patient, provider, and/or system-level factors.[1] The latest estimates from the Centers for Disease Control and Prevention (CDC) highlight that 4 in 5 pregnancy-related deaths in the United States are preventable.[2] Despite this preventability, data from the National Vital Statistics System from 2018 to 2021 indicate that pregnancy-related mortality rates (PRMRs) have continued to climb.[3] The reported 2021 maternal mortality rate was 32.9 deaths/100,000 live births, nearly double the rate of 17.4/100,000 in 2018.[3] The PRMR in the US remains exceedingly high compared to all other resource-rich countries.[4]

NPWH advocates for legislation, policies, and initiatives that promote access to care and the establishment and implementation of evidence-based healthcare practices to improve maternal outcomes. Ongoing research is needed to identify factors contributing to maternal mortality and to establish effective preventive strategies.

Reducing disparities in maternal mortality must be a priority. NPWH supports action at all levels that addresses socioeconomic factors, barriers to access to quality healthcare, and implicit bias of healthcare providers (HCPs) and other healthcare workers, all of which contribute to disparities in healthcare services and health outcomes.

Women's health nurse practitioners (WHNPs) who provide care for women/birthing persons before, during, after, and in between pregnancies are uniquely qualified to address the known contributing factors for preventable maternal mortality and to optimize health outcomes. WHNPs who specialize in high-risk antepartum and postpartum care are particularly well suited to enhance health outcomes for women/birthing persons with identified maternal morbidity and mortality risks. NPWH advocates for the recognition of WHNPs as integral to the prevention of maternal mortality.[5]

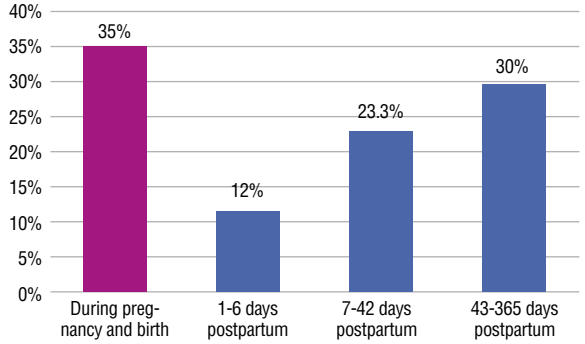
Background

In the US, a pregnancy-related death is defined as one that occurs during pregnancy or within 12 months of the end of a pregnancy that is causally related to the pregnancy.[6] This causality refers to deaths related to a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition due to the physiologic effects of pregnancy.[1]

Data from the 2017–2019 CDC Pregnancy Mortality Surveillance System (PMSS) report, which captures pregnancy-related maternal deaths up to 1 year postpartum in the US, indicated that cardiovascular (CV) conditions led to more than 32% of pregnancy-related deaths during this time. For the purpose of this data collection, CV conditions included cardiomyopathy, other cardiovascular conditions, and cerebrovascular accidents. Other leading causes of pregnancy-related deaths included infection, obstetric hemorrhage, amniotic fluid embolism, and hypertensive disorders of pregnancy.[6] Deaths attributable to suicide, drug overdose, homicide, and unintentional injury were not included in this analysis. Data from 36 maternal mortality review committees (MMRCs) indicated that during 2017–2019, 65.3% of pregnancy-related deaths occurred in the postpartum period (*Figure*).[7]

Notable disparities persist in maternal mortality rates.

Figure. 2017–2019 Pregnancy-related deaths in the first year postpartum (65.3%)[7]



Box 1. Percentages, rates, and leading underlying causes of pregnancy-related deaths by race and ethnicity[6,7]

Race/ethnicity	% Maternal deaths	Rate of maternal deaths per 100,000 live births	Leading underlying cause of death (shown by frequency)
AIAN	< 1%	32	Mental health conditions* Hemorrhage
Asian	3%	12.8	Hemorrhage Cardiac and coronary conditions Amniotic fluid embolism
Black, non-Hispanic	28%	39.9	Cardiac and coronary conditions Cardiomyopathy Embolism–thrombotic Hemorrhage Hypertensive disorders
Hispanic	13%	11.6	Mental health conditions Hemorrhage
NHOPI	< 1%	62.8	Amniotic fluid embolism
White	43%	14.1	Mental health conditions Hemorrhage Cardiac and coronary conditions Infection Embolism–thrombotic Cardiomyopathy

AIAN, American Indian or Alaska Native; NHOPI, Native Hawaiian and Other Pacific Islander.
*Mental health conditions include deaths from suicide, overdose/poisoning related to substance use disorder (SUD), and other deaths determined by maternal mortality review committees to be related to a mental health condition, including SUD.

Data from 2017–2019 demonstrate disparity in PRMRs for non-Hispanic Native Hawaiian or Other Pacific Islander, non-Hispanic Black, and American Indian/Alaska Native women/birthing persons at 4.4, 2.6, and 2.3 times higher, respectively, when compared to non-Hispanic White persons.[6,7] Percentages, rates, and leading underlying causes of maternal mortality are depicted in *Box 1*.

These disparities in maternal mortality are not fully understood and likely multifactorial. Substantial evidence indicates that implicit racial/ethnic bias among HCPs can affect patient–HCP interactions, treatment decisions, treatment adherence, and patient outcomes.[8,9] (Implicit biases are unconscious attitudes that can influence affect, behavior, and cognitive processes.) Structural racism also has led to other social disadvantages that create inequality in health.[10] More research is needed to fully understand what intervention strategies and policies will achieve the goal of eliminating inequalities within healthcare.

Differences in PRMRs are noted based on a person's geographic classification. Persons who live in rural counties are at greatest risk with PRMRs of 21.8 to 26.1 compared to persons who live in metropolitan areas with PRMRs of 14 to 18.6.[6] A 2022 March of Dimes report indicated that approximately 12% of births occurred in counties with limited or no access to maternity care. Of these maternity care deserts, 2 in 3 are in rural counties.[11]

The increasing number of pregnant persons in the US living with pre-existing health conditions such as obesity, hypertension, diabetes, chronic heart disease, mental illness, and substance use disorders (SUDs) is contributing to the risk of maternal mortality during pregnancy and in the first year postpartum.[6,11] These conditions are further influenced when persons have low socioeconomic status and lack of access to quality healthcare.[11]

The sharp rise in maternal mortality in 2021 may be explained by the significant number of maternal deaths due to Covid-19. Of the 1,205 maternal deaths that occurred in 2021, at least 401 were attributed to mothers who had Covid-19.[12] Furthermore, alterations in standard care practices, effects of having Covid-19, and the consequences of social determinants of health on maternal health disparities during the pandemic years may have led to morbidity that could impact future mortality rates

for years to come. MMRCs have begun to evaluate maternal deaths during the Covid-19 pandemic years, with the full effects of the pandemic not yet known.

Role of maternal mortality review committees

Maternal mortality review committees are multidisciplinary teams that use clinical and nonclinical information to expand their analysis of maternal deaths that occur during or within 1 year of pregnancy.[8] State-level MMRCs have expanded in recent years and, as of 2023, 49 states, the District of Columbia, New York City, Philadelphia, and Puerto Rico each have formal committees.[7,13]

The work of MMRCs has been instrumental in appreciating the true scope of the problem and planning targeted interventions to reduce maternal mortality. Beyond gathering data on causes of maternal mortality, a concerted effort to understand contributing factors and the potential for prevention of maternal deaths is critical. For each death, the committees answer six key questions: Was the death pregnancy-related? What was the cause of death? Was the death preventable? What were the critical contributing factors to the death? What are the recommendations and actions that address the contributing factors? What is the anticipated impact of the actions, if implemented?[14]

In the most recent collaborative report from 36 state MMRCs, preventability for pregnancy-related deaths was determined for 1,009 (99%) of 1,018 deaths.[7] Among these 1,009 deaths, 839 (64%) were determined to be preventable.[7] The MMRCs categorize contributing factors for preventable pregnancy-related deaths into five levels: community factors, health facility factors, patient factors, provider factors, and system-level factors. State-level recommendations for policy and practice changes are developed from these findings. Most deaths have more than one contributing factor and require more than one preventive strategy.

The comprehensive, multidisciplinary approach of MMRCs has facilitated recognition of mental health conditions, including SUDs, as a leading contributor to maternal deaths (occurring primarily in the first year postpartum).[7] Standardized MMRC data collection and decision forms have been expanded to include specific components regarding mental health and SUDs to help MMRC members better understand the role of mental health conditions in pregnancy-related deaths.[14]

The US Department of Health and Human Services is authorized through the 2018 Preventing Maternal Deaths Act to provide funding to states to establish and sustain MMRCs, disseminate findings, implement recommendations, and develop plans for ongoing HCP education to improve the quality of maternal care.[15] Shared information from MMRCs can inform policymakers and other stakeholders in their efforts to prioritize recommendations and provide resources to translate them into action. Information about state, city, and jurisdiction-level MMRC profiles can be found at **www.reviewtoaction.org/tools/networking-map**[A].

Translation of evidence into action

Translation of recommendations from MMRCs and other evidence-based sources into action, along with the study of outcomes, is crucial to eliminate preventable maternal deaths. The Alliance for Innovation in Maternal Health (AIM)—a national partnership of HCPs, public health professionals, and advocacy organizations—provides resources for this purpose with the creation of safety bundles focused on high-risk maternal conditions.[16] Safety bundles are evidence-based practices that, when consistently acted on by the healthcare team, have been shown to improve patient outcomes.[17] Each AIM safety bundle has five domains: readiness, recognition, response, reporting/systems learning, and respectful, equitable, and supportive care.[18] AIM provides support and technical assistance at state and healthcare system levels to implement the bundles. These bundles and other resources for translating evidence into action are listed in *Box 2*.

Federal and state legislation has extended the Medicaid program used for about 4 in 10 births. Federal law requires states to provide pregnancy-related coverage up to 60 days postpartum.[34] Federal-level bills have been introduced to extend Medicaid coverage eligibility to include 1 year of postpartum care, such as the American Rescue Plan Act state plan option, which became effective on April 1, 2022.[37] State Medicaid extension implementation action and plans can be found at **www.kff.org/medicaid/issue-brief/medicaid-postpartum-coverage-extension-tracker/**[B].[38]

Extended Medicaid coverage to 12 months allows for postpartum care to be an ongoing process tailored to each individual's needs rather than a single encounter and may provide the support needed to prevent maternal mortality that occurs beyond the first 60 days postpartum. Extended coverage facilitates improved monitoring for signs/symptoms of maternal complications, especially mental health concerns that may occur later in the postpartum period, and allows for the opportunity for education, counseling, and referrals, as well as a coordinated transition to routine wellness care in the first year postpartum.

Box 2. Evidence-based resources for clinical practice

Alliance for Innovation in Maternal Health Care patient safety bundles[18]
- Obstetric hemorrhage
- Severe hypertension in pregnancy
- Safe reduction of primary cesarean birth
- Cardiac conditions in obstetric care
- Care for pregnant and postpartum people with substance use disorder
- Perinatal mental health conditions
- Postpartum discharge transition
- Sepsis in obstetrical care

California Maternal Quality Care Collaborative toolkits[19]
- Toolkit to Support Vaginal Birth and Reduce Primary Cesareans – 2022
- Improving Health Care Response to Obstetric Hemorrhage – 2022
- Improving Health Care Response to Hypertensive Disorders of Pregnancy – 2021
- Mother & Baby Substance Exposure Initiative Toolkit – 2020
- Improving Diagnosis and Treatment of Maternal Sepsis – 2020
- Improving Health Care Response to Maternal Venous Thromboembolism – 2018
- Improving Health Care Response to CVD in Pregnancy and Postpartum – 2017

ACOG Postpartum Toolkit[20]
Racial disparities in maternal mortality in the United States: The postpartum period is a missed opportunity for action – 2018

Black Mamas Matter Alliance, Center for Reproductive Rights[21]
A toolkit for advancing the human right to safe and respectful maternal health care – 2018

ACOG practice bulletins, committee opinions, and clinical practice guidelines[22–33]
- Chronic hypertension in pregnancy – 2019
- Clinical guidance for the integration of the findings of the Chronic Hypertension and Pregnancy Study – 2022
- Gestational hypertension and preeclampsia – 2020
- Pregnancy and heart disease – 2019
- Prepregnancy counseling –2019
- Optimizing postpartum care – 2018
- Thromboembolism in pregnancy – 2018
- Screening and diagnosis of mental health conditions during pregnancy and postpartum – 2023
- Treatment and management of mental health conditions during pregnancy and postpartum – 2023
- Opioid use and opioid use disorder in pregnancy – 2017
- Obesity in pregnancy – 2021
- Importance of social determinants of health and cultural awareness in the delivery of reproductive health care – 2018

ACOG and Society for Maternal-Fetal Medicine[34]
Obstetric Care Consensus no. 8. Interpregnancy care – 2019

SMFM Consult Series #47: Sepsis during pregnancy and the puerperium[35] – 2019

AWHONN POST-BIRTH warning signs education program[36] – 2021

ACOG, American College of Obstetricians and Gynecologists; AWHONN, Association of Women's Health, Obstetric and Neonatal Nurses; CVD, cardiovascular disease; SMFM, Society for Maternal-Fetal Medicine.

Implications for women's healthcare and WHNP practice

WHNPs provide healthcare for women/birthing persons before, during, after, and in between pregnancies in a variety of settings. The care they provide before and in between pregnancies places them at the forefront to assess for and address known risk factors for maternal complications prior to pregnancy. *Box 3* highlights risk factors that can be identified prior to a pregnancy and mitigated by care that meets individualized needs. With the recognition that more than half of pregnancy-related deaths occur in the first year postpartum, the role of WHNPs in the transition from postpartum to routine wellness care is crucial to continue to monitor physical, social, and psychological health.

The inclusion of WHNPs as active members on MMRCs and in leading research and evidence-based practice initiatives can facilitate progress in the goal of eliminating preventable pregnancy-related deaths. A concerted effort at addressing community, health facility, patient, provider, and system-level factors is needed.

Box 3. Risk factors for maternal complications that can be identified prior to a pregnancy and mitigated by person-centered care

- Cardiovascular disease
- Diabetes
- History of postpartum depression
- History of preeclampsia
- Hypertension
- Intimate partner violence
- Mental health conditions, eg, depression (including postpartum depression), suicidal ideation/attempts, post-traumatic stress disorder
- Obesity
- Potential for short interpregnancy interval (< 18 months between births)
- Socioeconomic vulnerabilities, eg, lack of stable housing, access to food, transportation, financial resources, health insurance, health literacy
- Substance use disorders
- Thrombophilia or history of thromboembolism during pregnancy

NPWH leadership

NPWH will provide leadership to ensure:

- Continuing education (CE) programs and other evidence-based resources are available for nurse practitioners (NPs) to learn and update knowledge regarding causes, contributing factors, and strategies to eliminate preventable maternal mortality.
- CE programs and other evidence-based resources on strategies for NPs to recognize and address racial/ethnic biases in themselves and at their healthcare facilities are available.
- Collaborative engagement with other professional organizations continues to facilitate the development, implementation, and evaluation of multidisciplinary

best practices that will eliminate preventable maternal mortality.

- Advocacy for WHNPs to be active members on MMRCs.
- Local, state, and federal data collection, analysis, and planning to address maternal care shortages include recognition of WHNPs as key prenatal and postpartum care providers.
- Policies at all levels support access to quality care for women/birthing persons throughout the reproductive-age continuum.
- Research moves forward in all aspects of prevention of maternal mortality. ■

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Web resources

A. www.reviewtoaction.org/tools/networking-map

B. www.kff.org/medicaid/issue-brief/medicaid-postpartum-coverage-extension-tracker/

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