Our Mothers Are Dying: The Current State of Maternal Mortality in Hawai‘i and the United States

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Abstract

In the United States, maternal mortality, defined as all deaths during pregnancy, childbirth, and up to 365 days after the end of pregnancy, is among the highest of all developed nations. For every 1 maternal death, there are more than 100 life-threatening complications that occur related to pregnancy. However, maternal morbidity and mortality do not affect all mothers equally. Black and indigenous people are at the highest risk for pregnancy-related complications and death—they are up to 5 times as likely to die from childbearing than white women. To understand this nationwide epidemic, cases of maternal death must be thoroughly reviewed, including the medical, social, and societal circumstances surrounding them. The state of Hawai‘i formed the Maternal Mortality Review Committee in 2016 to review cases of maternal mortality, collect accurate data, and develop strategies for prevention. Twenty-five maternal deaths occurred in the state of Hawai‘i from 2015 to 2017. More than half of these deaths were deemed preventable. Combined data show that mental health disorders played a significant role in maternal mortality, and approximately a quarter of cases involved substance use. Twenty-three percent of maternal deaths occurred in Native Hawaiian and Pacific Islander women, even though they make up a smaller proportion of women in the state. The collection and analysis of these data are the first steps toward understanding and reducing maternal morbidity and mortality in Hawai‘i. Most notably, the striking ethnic disparities in maternal deaths and the preventable nature of many cases demand our immediate attention.

Keywords

maternal mortality, maternal morbidity, health disparities, racial/ethnic disparities, maternal mortality review committees

Abbreviations

ACOG = American College of Obstetricians and Gynecologists
CDC = Centers for Disease Control and Prevention
MMRC = Maternal Mortality Review Committees
MMRIA = Maternal Mortality Review Information Application
NHOPI = Native Hawaiian and Other Pacific Islander

Introduction

In 1986, the Centers for Disease Control and Prevention (CDC) initiated national surveillance of pregnancy-related deaths due to significant gaps in data surrounding causes of maternal mortality. The number of reported pregnancy-related deaths increased from 7.2 deaths per 100,000 live births at the outset of surveillance in 1987 to a high of 18.0 deaths per 100,000 live births in 2014.[1] The current maternal death rate in the United States is the highest among developed nations at approximately 700 cases per year and black and American Indian/Native Alaskan women are disproportionately affected. A black or indigenous woman is up to 5 times more likely to die in pregnancy or up to a year after pregnancy than her white counterpart.[2] Moreover, for every 1 maternal death, regardless of ethnicity, there are more than 100 women who suffer a serious life-threatening morbidity, such as stroke, eclampsia, or organ failure.

Efforts to review maternal deaths are not a novel practice. For nearly 100 years, many states and jurisdictions have funded Maternal Mortality Review Committees (MMRCs) for the purposes of prevention.[3] These are multi-disciplinary committees that convene to comprehensively review deaths of women during or within a year of pregnancy. MMRCs have access to clinical and non-clinical information, including vital records, medical records, and social service records to fully understand the drivers of maternal mortality, complications of pregnancy, and associated disparities.[4] This information serves as a foundation for developing impactful, targeted interventions. However, these groups have mostly worked independently, which impedes standardized data collection and information-sharing between committees. The rising rates of maternal deaths despite medical advances highlight the need for accurate data collection, standard definitions across review committees, and the inclusion of information regarding access to care in addition to race and ethnicity to implement strategies that effectively reduce maternal mortality. This article aims to increase awareness around this epidemic, describe the processes by which maternal deaths are reviewed, present state-level data, and to serve as a call to action to improve the safety of women.

Hawai‘i’s MMRC (HMMRC) was formed in 2016 and is comprised of a 22-member panel, including representatives from public health, social work, obstetrics and gynecology, anesthesiology, maternal-fetal medicine, emergency medicine, nursing, midwifery, forensic pathology, behavioral health, patient advocacy groups, and community-based organizations. The aims of HMMRC are to conduct comprehensive, multidisciplinary, and protected reviews of maternal deaths in the state, to identify factors associated with those deaths, and to make recommendations for systems changes to improve health care services for women in Hawai‘i. This article presents data from the review of maternal mortality cases in the state of Hawai‘I from 2015 to 2017.

Methods

The HMMRC convened in 2017 and reviewed maternal deaths occurring from 2015 to 2017. Their summary of this data is

presented here. As such, this article was determined to be non-human subject research. In addition to the data reviewed by HMMRC specific to Hawai‘i, pooled data from the western region of the American College of Obstetricians and Gynecologists (ACOG), known as ACOG District VIII, which includes data from Hawai‘i (2015–2016), Arizona (2016), Colorado (2008–2015), and Utah (2015–2016) are presented for comparative purposes.

HMMRC meets annually to review maternal deaths that occurred during the previous year. To ensure quality data review, the committee utilizes the Maternal Mortality Review Information Application (MMRIA). This application, developed by public health and medical experts, standardizes data collection, organizes information, and enables committees to comprehensively identify and assess maternal mortality cases. Moreover, MMRIA provides a repository for the collection of clinical and non-clinical information surrounding a woman's life and death, which helps facilitate review. It also includes documentation of committee deliberations on (1) whether the death was related to pregnancy, (2) if it could have been prevented, (3) factors that contributed to the death, and (4) recommendations to prevent future deaths. Lastly, MMRIA provides standardized indicators common to most pregnancy-related deaths that can be used for surveillance, monitoring, and examining maternal mortality. MMRIA defines maternal mortality terms as follows:[5]

Pregnancy-associated death – the death of a woman while pregnant or within 1 year of the termination of pregnancy, regardless of the cause. These deaths constitute "maternal mortality"; within this overarching category are pregnancy-related deaths and pregnancy-associated, but not related deaths.
Pregnancy-related death – the death of a woman while pregnant or within 1 year of the end of a pregnancy, regardless of the outcome, duration or site of the pregnancy–from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.
Pregnancy-associated, but not related death – the death of a woman during pregnancy or within 1 year of the end of pregnancy from a cause that is not related to pregnancy (eg, a pregnant woman dies in an earthquake).
Pregnancy-related mortality ratio – the number of pregnancy-related deaths per 100,000 live births.

Results

There were 25 cases of maternal mortality in the state of Hawai‘i from 2015–2017 that underwent review (Table 1). Fifty-two percent occurred on O‘ahu, and 48% occurred on neighbor islands, including Hawai‘i, Kaua‘i, and Maui. Hawai‘i is known to have a high prevalence of multi-ethnic individuals. Still, when stratified by a single-race identifier, 44% of deaths occurred in Native Hawaiian and Other Pacific Islander (NHOPI) women, 32% in Asian women, and 24% in all other races, which included white women. For comparison, in 2015, the racial demographics of women in Hawai‘i was 22% NHOPI, 38% Asian, and 21% white.[6] Almost two-thirds of deaths (64%) occurred in women less than 34 years. Maternal mortality was slightly lower among women with less than a high school education or a general education diploma (32%) compared to those with a college degree or higher (36%).

The HMMRC thoroughly investigated each maternal death and circumstances surrounding those cases (Table 2). Of the 25 deaths, 9 were pregnancy-related, 11 pregnancy-associated, but not related deaths, and 5 were unable to be determined. Nearly half (48%) of maternal deaths in Hawai‘i occurred from 43 days to 1 year after pregnancy ended. Causes of death included amniotic fluid embolism, disseminated intravascular coagulation, malignancy, mental health conditions, pre-eclampsia, cardiovascular disease, sepsis, and stroke. Due to the limited number of cases reviewed, and the confidential nature of the review, the exact numbers of each cause of death are not available. However, in ACOG District VIII, which includes Hawai‘i, the leading cause of pregnancy-related death was due to mental health conditions (43%), with the next leading causes being hemorrhage (11%) and cardiovascular conditions (11%).[7] In approximately one-quarter of maternal deaths in Hawai‘i, substance use was determined to have played a role.

In ACOG District VIII, it was determined that 80% of deaths were preventable, 18% were not preventable, and 2% were unable to be determined.[7] In comparison, the HMMRC determined that 56% of pregnancy-related deaths in Hawai‘i were preventable.

Table 1. Selected Characteristics of Maternal Mortality Cases — Hawai‘i, 2015–2017

	Number	Percent (%)
Total Cases	25	100
County of Residence		
Honolulu	13	52
Hawai‘i, Kaua‘i, Maui	12	48
Age		
24 years and younger	8	32
25–34 years	8	32
35 years and older	9	36
Race[a]		
Native Hawaiian and Other Pacific Islander	11	44
Asian	8	32
Other	6	24
Education Level		
Less than HS grad or GED	8	32
HS grad or GED	8	32
College/advanced degree	9	36

Abbreviations: HS, high school; GED, general education diploma
[a] Race was stratified into single-race categories.

Table 2. Hawai‘i Maternal Mortality Review Committee: Summary of 2015–2017 Mortality Cases

	Number	Percent (%)
Total Cases	25	100
Classification of Death		
Pregnancy-related	9	36
Pregnancy-associated	11	44
Unable to determine	5	20
Timing of Death		
Pregnant at time of death	6	24
Within 42 days	7	28
43 days–1 year	12	48
Mental Health Contributed		
Yes or probably	8	32
No	12	48
Unknown	5	20
Substance Use Contributed		
Yes or probably	8	32
No	8	32
Unknown	9	36
Death Preventable (Pregnancy-related Only)		
Yes	5	56
No	4	44

Discussion

These data, especially the high rates of preventable deaths as well as deaths occurring outside of what is traditionally considered the postpartum period, are supporting evidence that maternal morbidity and mortality is an urgent public health crisis. By establishing the HMMRC, the state of Hawai‘i has taken the first steps to approach this problem by collecting data that illustrate the disparities in maternal mortality across racial and ethnic lines. The HMMRC data show that NHOPI women suffer from pregnancy-related deaths at a disproportionate rate, analogous to what is happening at the national level with black mothers. Emerging data highlight that even when adjusted for education level, obesity, and neighborhood poverty level, racial disparities persist irrespective of access to care.[8] Thus, factors that cannot be measured or adjusted for, such as implicit bias and systemic racism, must be further explored and addressed.

In 2018, the Society for Maternal-Fetal Medicine published a special report and call to action to reduce racial and ethnic disparities in maternal morbidity and mortality rates in the United States through improving clinical care, addressing system-level barriers, and increasing minority representation in research.[9] The report included recommendations such as establishing algorithms to identify and properly manage high-risk minority women with pre-existing medical comorbidities like hypertension or diabetes before or early in pregnancy because they suffer from earlier end-organ damage compared to white women.[10] In addition to improving clinical care at the provider level, systems barriers to equitable care must be addressed by providing transportation to in-person visits and access to language-concordant care. Especially in Hawai‘i, where higher levels of maternal care centers are limited and English proficiency is not universal,[11] providing transportation vouchers and reliable interpreter services are vital to improving access to quality care. The report goes on to describe inequities even at the level of the research bench, where minorities are underrepresented both as subjects and as investigators in research. As such, the populations most affected by maternal mortality must be positioned in the center of understanding the cause and creating solutions.

The HMMRC and ACOG District VIII data identified mental health conditions and substance use as big targets for reducing maternal mortality. Accordingly, maternal health care must include access to behavioral health services to screen for and treat mental health conditions. Providing non-punitive rehabilitation programs will also enable more effective treatment of substance use disorder.[12,13] Finally, another avenue of great potential in addressing the maternal mortality crisis is advocacy. ACOG has spearheaded the “Momnibus,” a collection of federal House and Senate bills aimed at improving maternal outcomes. Specifically, these bills will incentivize states to continue Medicaid coverage for women up to 1 year after delivery, increase access to maternity care in rural and underserved areas, and support perinatal quality collaboratives. Similar bills have been introduced in the Hawa‘i state legislature this year. In Hawai‘i, many rural communities have limited access to services, including subspecialty care for medically complex conditions. Thus, there is a need for state legislation that supports increasing telehealth access, subspecialty care that includes access to behavioral health and addiction specialists, and extending Medicaid beyond the current provision of 60 days postpartum.

A limitation of this article is that it is a report of data collected over a relatively short amount of time and involves small numbers that can influence the conclusions drawn. Additional limitations are also those of vital statistics, which depends on the accuracy of cause-of-death information provided by the physician, medical examiner, or coroner. The current process of identifying maternal death is also limited in that cases associated with miscarriage and termination are not represented. These cases are equally important in studying maternal mortality, as women who present with miscarriages or terminations may differ from women who have live births. The strengths of this article are that it is the first to describe maternal mortality in the state of Hawai‘i and that it includes data on race.

Indeed, data from multiple MMRCs show that a significant number of maternal deaths are preventable. These data are sobering and should serve as an impetus for creating sustainable

change and solutions. Now that cases of maternal mortality have been identified and characterized, the next imperative step is to shift the focus and resources to changing the trajectory of this public health emergency. Specifically, this information can be used to inspire action in eliminating the racial disparities that are a reflection of the current health climate of the United States as a whole.

Conflict of Interest

None of the authors identify a conflict of interest.

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