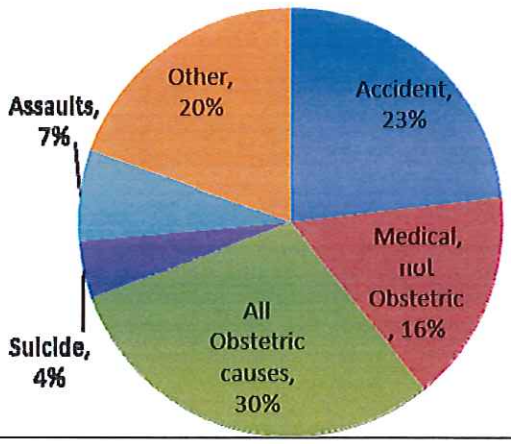
Pregnancy-Associated Mortality in Michigan 2013

Table 1: Mortality per 100,000 live births

Year	N	Pregnancy Associated	Pregnancy -Related	Not Preg.-Related
2005	71	55.7	24.3	31.4
2006	63	49.4	17.2	32.1
2007*	86	68.7	25.6	43.1
2008*	79	65.2	21.4	43.7
2009*	72	61.4	26.4	35.0
2010*	86	75.0	36.6	38.4
Total	459	62.3	25.1	37.2

Figure1: Most Frequent Cause of Death, 2005-2010



* Provisional results pending vital records verification and MMMS Committee review. Data Source: Maternal Linked File, Division for Vital Records and Health Statistics, MDCH

The death of a woman during pregnancy, during labor/delivery or after delivery is a tragedy for her family, community and society as whole. Pregnancy-associated mortality, sub-divided into pregnancy-related and non-pregnancy related (see box page 2) is a primary indicator of the overall health status of women, the effectiveness of obstetrical care and the health care system. After many decades of declining mortality, pregnancy-associated mortality is increasing across the United States, including in Michigan (Table 1). Although improvements in case ascertainment and surveillance may account for part of this increase, other factors such as increasing prevalence of comorbidities, substance use and loss of providers, may be influencing this rate. Because these are sentinel events, case review is essential to identify policy, system, provider, community and patient factors that may have affected the outcome. The goal of these reviews is to learn more about the conditions that lead to such deaths, identify modifiable risk factors and to share recommendations with policy makers, maternal health stakeholders and health care providers in the hope that the information will be used to prevent future deaths.

Based on ICD-10 coding on the death certificate (and prior to committee review), obstetric-related and accidents were the most prevalent causes of pregnancy-associated mortality (Figure 1).

Comparison between states is problematic because there is considerable variation in the quality and consistency of reporting. Some difference in rates has been associated with underreporting of pregnancy-associated mortality, especially if based solely on identification through the death certificate. Implementation of the revised death certificate, issued in 2003, includes a pregnancy status checkbox for deceased females with the intent to improve the completeness of maternal mortality data,varies by state. Finally, the rate may more appropriately be referred to as a ratio as the rate as stillbirths are excluded and infants in multiple birth sets over represented in live birth numbers.

With these limitations in mind and using the death certificate ICD-10 Codes for cause of death, state comparisons can be made (Table 2). Pregnancy-related mortality is high and disproportionately affects Non-Hispanic African American women.

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Table 2: Pregnancy-Related Mortality, by race-ethnicity per 100,000 live births, 1999-2010**

	Overall	NH White	NH African American	Rate Difference	Rate Ratio
Michigan	22.2	16.6	50.8	34.3	3.1
US	15.6	11.5	35.8	24.3	3.1

NH= Non-Hispanic

Pregnancy-Related Mortality in Michigan compared to other states

- Overall 8th highest
- NH White 11th highest
- NH African American 3rd highest (tied with New Jersey)
- Racial Disparity 15th highest

**Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2010 on CDC WONDER Online Database, released January 2013. Data are compiled from Compressed Mortality File 1999-2010 Series 20 No. 2P, 2013. Accessed at http://wonder.cdc.gov/cmf-icd10.html on Oct 23, 2013 1:59:43 PM

Live Birth Files for 1999-2010 were accessed from the same source

Michigan Maternal Mortality Surveillance (MMMS)

Systematic surveillance of pregnancy-associated mortality began in Michigan in 1950 as collaboration between the Michigan Department of Health (now the Michigan Department of Community Health [MDCH]), the Committee on Maternal and Perinatal Health of the Michigan State Medical Society (MSMS) and the Chairs of the Departments of Obstetrics and Gynecology of the medical schools in Michigan. It was known as the Michigan Mortality Study until 2004, when the new case ascertainment method and adjustments in the overall process necessitated the name change to Michigan Maternal Mortality Surveillance (MMMS).

Pregnancy-Associated Deaths†

The death of a woman while pregnant or within one year of termination of pregnancy from any cause, divided into Pregnancy-Related and not-Pregnancy Related

Pregnancy-Related†

The death of a woman while pregnant or within one year of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Not Pregnancy-Related†

The death of a woman while pregnant or within one year of termination of pregnancy due to a cause unrelated to pregnancy

† Centers for Disease Control and Prevention (CDC) and American College of Obstetrics and Gynecology (ACOG)

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