NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
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PREGNANCY-ASSOCIATED MORTALITY IN NEW YORK CITY, 2020

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INTRODUCTION

The New York City Maternal Mortality Review Committee's (MMRC) vision is to reduce preventable maternal mortality and eliminate racial disparities related to historical and purposeful under-resourcing of communities and the long-standing social determinants of health they endure as sequelae, thereby addressing other adjacent inequities as well. The Committee's mission is to gain a holistic understanding of the contributing factors leading to death by reviewing each woman and birthing person's story and to use the information gathered during the review to inform recommendations to prevent future deaths.

This report provides pregnancy-associated maternal mortality data and MMRC recommendations based on the Committee's 2022 review of 51 maternal deaths that occurred in 2020. This report is responsive to Local Law 188, which requires annual reporting on population-level pregnancy-associated mortality and recommendations to reduce pregnancy-associated deaths[1]. Pregnancy-associated deaths include deaths from any cause during pregnancy or within one year from the end of pregnancy, regardless of the outcome of the pregnancy. Each year since 2001, the NYC Health Department has conducted surveillance of pregnancy-associated deaths to develop five-year pregnancy associated mortality reports. Since 2018, the Health Department has reported the data annually on the Health Department's website and on the NYC open data source portal.

Between 2016 and 2020, the overall 5-year Pregnancy-Associated Mortality ratio (PAMR) was 42.9 deaths per 100,000 live births. Over the same time, the PAMR was 4 times higher for Black (101.1 deaths per 100,000 live births) compared to White women and birthing people (23.9 deaths per 100,000 live births). In January 2018, in response to the ongoing maternal mortality crisis in which Black women and birthing people are at highest risk of unjust and preventable mortality, the Health Department convened the NYC Maternal Mortality Review Committee (MMRC) to conduct a multi-disciplinary committee review of all pregnancy-associated deaths[1] to women and birthing people residing in NYC and those living in rest-of-state who died in NYC. The Committee follows the Center for Disease Control's (CDC) best practice guidelines for Review Committees used by 39 states and jurisdictions across the country. New York State (NYS) Department of Health reviews deaths that occurred in rest-of-state through a second Committee using the same CDC guidelines. The NYC Health Department shares data annually with the NYS Health Department, which uses the NYC data to publish statewide reports.

DATA SUMMARY

In 2020, there were 100,022 live births and 51 pregnancy-associated deaths of women and birthing people who resided in New York City or resided outside of NYC in NYS but died in New York City limits. The pregnancy-associated mortality ratio was 51.0 deaths per 100,000 live births[2]. Of these

[1] Pregnancy-associated death: The death of a person from any cause during pregnancy or within one year from the end of pregnancy. These deaths are subset into three categories: pregnancy-related, pregnancy-associated, but not related, and unable to determine pregnancy-relatedness.

[2] Pregnancy-associated and pregnancy-related mortality ratios should be interpreted with caution as the numbers of deaths each year are very small. It is recommended to review a minimum of five years of data in one dataset to obtain more reliable mortality ratios, and to then compare trends over five-year intervals.

51 deaths, 29 were pregnancy-related[3], 12 were pregnancy-associated but not related[4] and 10 for which pregnancy-relatedness could not be determined[5]. The pregnancy-related mortality ratio was 29.0 deaths per 100,000 live births.

In 2020, mental health conditions (n=11, 21.6%) were the leading underlying[6] cause of pregnancy-associated deaths; 9 of these deaths were poisonings/overdoses related to substance use disorder and 2 were suicide deaths. Infection (n=9, 17.7%) was the second leading cause of death; over two-thirds of these infection deaths were caused by COVID-19 (n=6). Hemorrhage (n=6, 11.8%) was the third leading cause of death.

Over one-third (n=19, 37.3%) of all maternal deaths occurred during pregnancy or on the day of childbirth. In contrast, the majority occurred postpartum (n=32, 62.7%) – 9.8% of postpartum deaths happened within a week after childbirth, 13.7% occurred 7–42 days after the end of pregnancy, and 39.2% occurred in the late postpartum period (43–365 days after the end of pregnancy) (Table 1).

Table 1. Underlying causes of death, timing of death and pregnancy-relatedness of maternal deaths, New York City, 2020

	Pregnancy-associated deaths (All) n (%)	Pregnancy-related deaths n (%)
Total	**51 (100)**	**29 (100)**
Pregnancy-relatedness		
Pregnancy-related	29 (56.9)	29 (100)
Pregnancy-associated, but not-related	12 (23.5)	-
Unable to determine	10 (19.6)	-
Underlying cause of death		
Mental health conditions	11 (21.6)	5 (17.2)
Overdose/poisoning related to substance use disorder	9	4
Suicide	2	1
Infection/Sepsis*	9 (17.7)	6 (20.7)
Hemorrhage	6 (11.8)	6 (20.7)
Cardiovascular conditions	4 (7.8)	2 (6.9)
Cardiac and coronary conditions	2	1
Cardiomyopathy	2	1
Homicide	4 (7.8)	0 (0.0)
Metabolic/endocrine conditions	4 (7.8)	4 (13.8)
Embolism – Thrombotic (Non-Cerebral)	3 (5.9)	3 (10.3)
Asthma/pulmonary conditions	2 (3.9)	0 (0.0)
Cancer	2 (3.9)	0 (0.0)
Other†	6 (11.8)	3 (10.3)
Timing of death		
During pregnancy	14 (27.5)	7 (24.1)
Day of childbirth	5 (9.8)	5 (17.2)

[3] Pregnancy-related death: The death of a person during pregnancy or within one year from the end of pregnancy that is due to a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy. Pregnancy-related deaths are a subset of pregnancy-associated deaths.

[4] Pregnancy-associated, but not-related death: The death of a person during pregnancy or within one year from the end of pregnancy that is due to a cause that is not related to the pregnancy.

[5] Death where Committee was unable to determine relation to pregnancy.

[6] The underlying cause of death refers to the disease or injury that initiated the chain of events leading to the death or the circumstances of the accident or violence which produced the fatal injury.

1-6 days after end of pregnancy	5 (9.8)	5 (17.2)
7-42 days after end of pregnancy	7 (13.7)	3 (10.3)
43 days-1 year after end of pregnancy	20 (39.2)	9 (31.0)
Preventability‡		
Preventable	34 (66.7)	21 (72.4)
Not preventable	11 (21.6)	6 (20.7)
Unable to determine	6 (11.8)	2 (6.9)

* Among 9 pregnancy-associated deaths due to infection or sepsis, 6 had an underlying cause of death of COVID-19. Among 6 pregnancy-related deaths due to infection or sepsis, 5 had an underlying cause of death of COVID-19.

† Other includes Amniotic Fluid Embolism, Unintentional Injury/Injury of Unknown Intent or Not Otherwise Specified, Anesthesia Complications, Liver and Gastrointestinal Conditions and Unknown Cause of Death.

‡ 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.

Table 2. Characteristics of maternal deaths, New York City, 2020

Characteristic	Pregnancy-associated deaths (All) n (%)	Pregnancy-related deaths n (%)
Total	**51 (100)**	**29 (100)**
Race/ethnicity*		
Black non-Latina	23 (45.1)	12 (41.4)
White non-Latina	8 (15.7)	4 (13.8)
Latina	13 (25.5)	9 (31.1)
Asian/PI non-Latina	6 (11.8)	4 (13.8)
Other or unknown	1 (2.0)	-
Borough of residence†		
Brooklyn	14 (27.4)	8 (27.6)
Bronx	16 (31.4)	9 (31.0)
Queens	11 (21.6)	8 (27.6)
Manhattan	3 (5.9)	1 (3.5)
Staten Island	2 (3.9)	-
Rest of State	5 (9.8)	3 (10.3)
Age at death (years)		
≤ 19	2 (3.9)	1 (3.5)
20 to 24	6 (11.8)	2 (6.9)
25 to 29	13 (25.5)	6 (20.7)
30 to 34	14 (27.5)	9 (31.0)
35 to 39	9 (17.7)	8 (27.6)
40 to 44	7 (13.7)	3 (10.3)
Education‡		
Less than high school	9 (17.7)	5 (17.2)
High school degree or GED	19 (37.3)	8 (27.6)
Some college	12 (23.5)	8 (27.6)
College graduate or higher	10 (19.6)	8 (27.6)
Unknown	1 (1.9)	0 (0.0)

* White, Black, Asian (including Pacific Islander) race categories exclude Latina ethnicity. Latina includes Hispanic or Latina of any race. 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.

† Borough of residence is based on the borough of residence at the time of death as listed on the death certificate. If this information was missing, the borough of residence listed on the birth or fetal death certificate was used to fill the missing value.

‡ Education is based on the total years of education completed at the time of death as self-reported on the birth or fetal death certificate. If there was no corresponding birth or fetal death certificate, or the data were missing, information recorded on the death certificate was used to fill the missing value.

Percent may not total 100 due to rounding.

MATERNAL MORTALITY REVIEW COMMITTEE RECOMMENDATIONS

Based on the review of 2020 deaths, the Committee selected 11 priority recommendations related to the top causes of death of Black and Latina women and birthing people (mental health conditions, infection, metabolic/endocrine conditions and hemorrhage). These 11 Committee recommendations are a citywide call-to-action for systems[7], facilities[8], providers[9], and communities[10] working to eliminate preventable maternal mortality and end racial/ethnic disparities in these deaths.

SYSTEMS LEVEL

1. Hospital systems should provide annual training and simulation to all providers (including emergency medicine, critical care, anesthesiologists, and obstetrical providers) treating pregnant or postpartum women and birthing people in the components of the Safe Motherhood Initiative ACOG District II Postpartum Hemorrhage Safety Bundle, and support and audit the appropriate implementation.
2. Hospital systems should ensure that they have robust referral systems in place for pregnant women and birthing people with complex chronic illnesses with appropriate sub-specialty doctors and nurses during pregnancy and inter-conception periods.
3. Health departments, in collaboration with community partners, should pilot a tiered level complex obstetric rehabilitation program model (including telehealth, alternate care platforms and home visits) for pregnant women and birthing people with significant chronic disease at hospital discharge.
4. Health departments should develop an education program, including anti-stigma training and training about racialized and class-based responses to behavioral health disorders, for providers who treat substance use or mental health disorders, addressing the comprehensive care needs of reproductive aged women and birthing people with substance use and mental health disorders.
5. Health departments should partner with professional organizations to implement a campaign to educate providers about the use and benefits of opioid agonist therapy in pregnancy and the risks of withdrawal for pregnant women and birthing people and their fetus during and after pregnancy.

FACILITY LEVEL

6. Birthing hospitals should provide counseling and guidance to all pregnant women and birthing people who seek alternatives to blood transfusion regarding blood transfusion alternatives and the components of the alternatives.

[7] Interacting entities that support services before, during, or after a pregnancy - ranges from healthcare systems and payors to public services and programs.

[8] A physical location where direct care is provided - ranges from small clinics and urgent care centers to hospitals with trauma centers.

[9] An individual with training and expertise who provides care, treatment, and/or advice.

[10] A grouping based on a shared sense of place or identity - ranges from physical neighborhoods to a community based on common interests and shared circumstances.

7. Healthcare facilities should develop and enforce systems to audit outpatient records during wellness visits for pregnant and postpartum women and birthing people with high-risk conditions for complete assessment and treatment plans.
8. Birthing facilities should develop a system of follow-up for missed appointments that includes exploring barriers to care and strategies to overcome the barriers (that respects the agency of the person) with a priority focus on pregnant and postpartum women and birthing people with chronic illnesses.

PROVIDER LEVEL

9. Primary care providers and specialists treating chronic illness or mental health disorders should ensure that women and birthing people are connected to providers offering comprehensive reproductive health care services.

COMMUNITY LEVEL

10. Community boards should assess the availability of walkable, affordable healthy food sources and safe spaces for exercise and play for adults and children, and plan for ongoing remediation.
11. Community-based organizations should create ongoing health information campaigns to educate the public on the long-term health implications of chronic illnesses in pregnancy and postpartum periods.

NYC HEALTH DEPARTMENT RECOMMENDATIONS

The Health Department will continue to conduct maternal mortality surveillance, which includes continuing to chair and support the functioning of the NYC Maternal Mortality Review Committee; report yearly maternal mortality data through the NYC Open Data platform and in an annual report, and post it to the Health Department website; continue to participate in the statewide Maternal Mortality and Morbidity Steering Committee; submit a dataset to NYS DOH for production of a statewide maternal mortality report; and develop a new 5-year pregnancy-associated mortality report and present data in a public webinar (2016-2020).

As per the recommendations in the 2022 report, the Health Department continued to chair and support the functioning of the NYC Maternal Mortality Review Committee (MMRC). Nine meetings were held throughout the year, and all 2020 deaths were reviewed by the end of 2022. The Health Department reported the 2020 cohort of deaths on the NYC Open Data platform and this report, which was posted to the Health Department's website. A webinar with five years of data (2016-2020) will be implemented following the finalization of the 2016-2020 five-year report in the fall of 2023. Staff continue participating in the NYS MMRC Steering Committee, and all 2020 data was made available to NYS DOH for a statewide report.