Annual Report on Maternal Mortality to New Hampshire Health and Human Services Oversight Committee

Calendar Year 2016-2017

Maternal and Child Health Section
Bureau of Population Health and Community Services
Division of Public Health Services
Department of Health and Human Services

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NH DIVISION OF
Public Health Services
Improving health, preventing disease, reducing costs for all

We wish to acknowledge and thank past and present members of the Northern New England Perinatal Quality Improvement Network (NNEPQIN) and the New Hampshire Maternal Mortality Review Panel (MMRP) for their participation and service to the Maternal Mortality Review Process in New Hampshire.

Special thanks for preparing this report:

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I. Executive Summary

RSA 132:30 established a New Hampshire Maternal Mortality Review Committee (MMRC) to conduct comprehensive, multidisciplinary reviews of maternal deaths for the purpose of identifying factors associated with the deaths and to make recommendations for the future in the areas of patient/family, community, provider, facility and/or systems around pregnant women.

In the years 2016 and 2017, the Maternal and Child Health (MCH) Epidemiologist (See Case Finding on page 3) found 18 potential maternal death cases (death of a woman while pregnant or within one year of the termination of pregnancy, regardless of cause). Twelve of these were investigated and reviewed and six needed further research into whether a pregnancy did precede the death. Initial investigation of NH records do not show a live birth and/or pregnancy for the six within the year prior to the deaths. All 12 of those reviewed were NH residents. Ten of the 12 cases were found by the committee to be "pregnancy associated but not related" and two were deemed "pregnancy-related" (the cause of death directly related to the pregnancy).

This report focuses on the 12 maternal deaths of New Hampshire (NH) residents reviewed for the years 2016-2017. These are women who have died while they were pregnant or within one year of a pregnancy ("pregnancy-associated"). All of the twelve reviewed deaths occurred in NH and were NH residents. Eleven of the twelve women died during the postpartum period and one was during pregnancy.

The leading cause of pregnancy-associated deaths in NH, 2016-2017 was accidental drug overdose. The cause of death in six of the 12 maternal deaths in the two-year period were listed by the medical examiner as overdoses. Another two of those remaining six cases had an additional cause of death listed that is related to past or present substance abuse and one other had a cause of death from conditions exacerbated by pregnancy or postpartum state by past substance abuse.

Three of the women were married at the time of death, eight of the women were single and one is unknown. Eight of the 12 women had Medicaid for insurance, three had private insurance and one was self-pay. All but one of the 12 mothers had documented mental health diagnoses.

Actionable recommendations in this report include:

- Promote the use by providers of the Northern New England Perinatal Quality Improvement Network's (NEEPQIN) Toolkit for the Care of Women with Substance Use Disorders- http://www.nnepqin.org/wp-content/uploads/2018/08/A-Toolkit-for-the-Perinatal-Care-of-Women-with-Substance-Use-Disorders-COMPLETE-PRINT-VERSION-rev08.29.18-1-1.pdf

- Public and provider awareness and education around increased risk of overdose in the postpartum period of women with a history of substance use disorder

- Provider and patient education about benzodiazepine/ opioid interaction.

Executive Summary Table			
2016-2017	**In-state deaths**		**Out-of-state deaths**
	Non-Residents	**NH Residents**	
Pregnancy-associated (total)	1	17	0
A. Pregnancy-associated, but not pregnancy-related	0	10	0
B. Pregnancy-related	0	2	0
C. Unknown if pregnancy-related	0	0	0
D. Case still under investigation	1	5	0

II. Introduction

RSA 132:30 established a New Hampshire Maternal Mortality Review Committee (MMRC) to conduct comprehensive, multidisciplinary reviews of maternal deaths for the purpose of identifying factors associated with the deaths and to make recommendations for the future in the areas of patient/family, community, provider, facility and/or systems around pregnant women.

RSA 132:30 IV provides that "The commissioner may delegate to the Northern New England Perinatal Quality Improvement Network (NNEPQIN) the functions of collecting, analyzing, and disseminating maternal mortality information, organizing and convening meetings of the panel, and other substantive and administrative tasks as may be incident to these activities. The activities of NNEPQIN and its employees or agents shall be subject to the same confidentiality provisions as those that apply to the panel." NNEPQIN is an active participant in the work to collect, abstract and analyze data on maternal deaths. NNEPQIN members provide the clinical expertise for the assessment of medical information obtained for review of cases.

This is the annual report on Maternal Mortality (MM) as required under RSA 132:30 V. The cases contained in this report were investigated and abstracted by the NNEPQIN Perinatal Outreach Coordinator (POC) and the New Hampshire Perinatal Nurse Coordinator (PNC). The PNC requests records from hospitals and offices in which the decedent had received medical care by letter and a copy of that letter is sent to the NNEPQIN POC. These requests are made to any facility or agency determined to have provided care to the individual in order. This collection is done in order to connect the relevant aspects of the woman's life and subsequent death. The PEC will contact each establishment within a few weeks of receipt of the letter and schedule a day for an in person visit to abstract information from the electronic patient record. In person, visits for collection and abstraction began in 2017. Prior to initiating in person visits, all records were sent by mail. The advantage of being able to visit in person (when facilities are able to accommodate the request) is to be able to assess the information contained in an electronic medical record and collect only the pertinent information. This allows avoidance of duplicate paperwork and decreases the amount of time it will take an abstractor to complete each case.

Program Update

The Maternal Mortality Coordinator and Maternal and Child Health Epidemiologist attended a training conducted by the CDC Foundation in June 2019. This group has been instrumental in gathering information from states regarding the Maternal Mortality Review Committees' processes and with this information developing a website for new and already established Review Committees to obtain information to improve and standardize reviews. This training focused on the use of the Maternal Mortality Information Application (MMRIA) as well as next steps in moving MMRC recommendations to action. This training brought together Coordinators and members of review committees from a multitude of states.

III. Definition of Maternal Death (from the CDC Foundation's *Review to Action website* at https://reviewtoaction.org/)

- ***Pregnancy-associated death:***
  - The death of a woman while pregnant or within one year of the termination of pregnancy, regardless of cause

- ***Pregnancy associated, but not related:***
  - The death of a woman during pregnancy or within one year of the end of pregnancy, from a cause that is not related to pregnancy

- ***Pregnancy-related:***
  - The death of a woman 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

IV. Methods

Case Finding

Here is a full list of methods of identification of maternal death cases per New Hampshire legislation (RSA 132:30).

- Direct report from a hospital, non-emergency walk-in care center, ambulatory surgical center, or birthing center
- Field on death certificate indicating pregnancy within one year of death
- O-code on death certificate
- Data linkage between death certificate and maternal information on certificate of live birth
- Exploratory data linkage between Medicaid claims and death certificate
- Case finding from a panel member and reported to the Department.
- Medical examiner's report
- Other source such as medical provider, family member, or media outlet

As is the case across the country, maternal deaths are most likely underreported. In particular, the death of a woman within the year of a pregnancy that did not end in a live birth may not be discovered because population-wide data sources for this information are limited.

Case Review

The NNEPQIN POC and the Division of Public Health Services, Maternal and Child Health (MCH) Perinatal Nurse Coordinator/ Maternal Mortality Coordinator take the information collected for each case and de-identify information after abstraction in order to prepare the summary of the events for the MMRC meeting. The MMRC meets on a semi-annual basis to review the maternal death cases. For each of the cases, the entire panel discusses the case findings. The discussion includes all aspects of the decedent's life and death and the potential areas in which an intervention may have altered the outcome. Due to the multidisciplinary committee the resulting recommendations are widely based and do not only consider the clinical aspect of pregnancy.

The 2016-2017 cases are the first cases in New Hampshire that were researched and deliberated by the committee using a system developed by the CDC Foundation under the name *Building US Capacity to Review and Prevent Maternal Deaths*. The CDC Foundation is committed to bringing Maternal Mortality Committees together to use a uniform method of reviewing maternal deaths. If all committees are able to answer the same key questions about maternal death cases this will lead to nationwide improvement opportunities around safety in pregnancy and the postpartum period. In order to achieve this goal the CDC Foundation has developed an application called the Maternal Mortality Review Information Application (MMRIA). The *Review to Action* website is also available to Maternal Mortality Coordinators and Committees to assist existing MMRCs to improve the review process as well as to encourage new committees to build a system to review maternal deaths. New Hampshire continues to be actively involved with the CDC Foundation's mission. New Hampshire is using the MMRIA application to store and analyze data as well as the process of review that can be found in the *Review to Action* website. The objective of the review of cases by the MM review committee is to arrive at a consensus on six key decisions about each case. These are as follows:

1) **Pregnancy relatedness of the death**
   Based upon the definitions in III

2) **Committee agreement with the cause(s) of death**
   Immediate; Contributing; Underlying cause

3) **Preventability**
   Patient/Family; Community; Provider; Facility; System

4) **Critical contributing factors to the death**
   List of potential factors provided for the committee

5) **Recommendations that address the contributing factors**
   For future prevention efforts

6) **Anticipated impact of the recommendations**

These decisions allow for future conversations about strategies for actionable change. The recommendations focus on five aspects of a woman's life and pregnancy. These are patient/family, community, provider, facility, and system based on each case.

Limitations

- A complete set of medical records is not always available to the NNEPQIN POC and the DHHS PNC when care was provided out-of-state. This issue did not affect the cases in 2016-2017. However, this situation continues to be limiting to many Maternal Mortality Review teams. There have been New England Region 1 meetings in order to focus on the ability to share information cross border to ensure that each death does have a complete review.

- Pregnancy-associated deaths that are the result of an alleged homicide are not reviewed until the criminal case is closed which could lead to long delays in the maternal mortality process. The deaths reviewed for 2016-2017 did not include any case of homicide.

V. Overview of all Pregnancy-Associated Maternal Deaths in New Hampshire, 2016-2017

The NH maternal death cases reviewed for 2016-2017 were all NH residents. The majority of the deaths occurred during the postpartum period. Table 1 and Table 2 illustrate the breakdown of the timing of the deaths in the postpartum period.

Pregnancy Status of 2016-2017 Reviewed Maternal Death Cases

One of the twelve pregnancy-associated deaths occurred in a woman who was pregnant. The other eleven occurred in women in the postpartum period.

Table 1. Pregnancy Status at Time of Death in NH Residents, 2016-2017 (N=12)

	Number
Pregnancy Status	
Pregnant	1
Postpartum	11

Table 2. Timing of Postpartum Deaths	
Months postpartum	**Number**
< 3 months	3
3-6 months	2
6-12 months	6

Cause and/or Manner of Pregnancy-Associated Deaths

The number of accidental drug overdoses or deaths caused by a medical issue exacerbated by past or present use of substances was nine. This was the leading cause of death among the maternal deaths reviewed for the two-year period of 2016-2017. Fifty percent of the deaths directly attributed to overdose were from fentanyl intoxication.

Demographic Characteristics for Pregnancy-Associated Deaths

The age range of mothers who died over this two-year period was 20-38 years old. Eleven of the twelve mothers were white. Eight of the women were single, three were married, and one marital status is unknown. There was one woman who did not graduate high school, seven who graduated high school or received a GED and four received some post-secondary education.

Table 3. Demographic Characteristics for Pregnancy-Associated Deaths in NH, 2016-2017 (N=12)	
	Number
Race	
White	11
Other	1
Ethnicity	
Hispanic	0
Non-Hispanic	12
Marital Status	
Married	3
Single	8
Unknown	1
Education	
Less than high school/GED	1
Completed high school/GED	7
More than high school	4
Unknown	0

Documented Risk Factors for Pregnancy-Associated Deaths

All of the 12 women had at least one risk factor (obesity, tobacco use, substance use, and/or mental health diagnosis). Both tobacco and a documented mental health diagnosis is recorded in 11 of the cases. Two women had a documented high BMI. A high BMI (overweight or obese) may place a person at greater risk for many health problems including heart disease, hypertension (high blood pressure), stroke, type 2 diabetes, and certain types of cancer.

Table 4. Documented Risk Factors for Pregnancy-Associated Deaths in NH, 2016-2017

	Number	
Tobacco Use		
Yes	11	
Denied	0	
Unknown	1	
Substance Use		
Documented in records	12	
No documentation found	0	
Mental Health Condition		
Documented in record	11	
No documentation	1	

VI. Pregnancy Related Maternal Deaths in New Hampshire Residents- 2016-2017

The MMRP reviews the circumstances of each pregnancy- associated death and then comes to a consensus and categorizes each death as "pregnancy-related" or "pregnancy- associated, but not related". In order to determine relatedness this question, "If this woman was not pregnant would she have died?" is discussed in the review of the case. This answer is often difficult to determine when discussing the deaths caused by overdose. The committee has the information that has been collected around the mother's life and death however true determination of "If she were not pregnant would she have died?" causes much deliberation. There are a number of questions that do not have a simple answer. These are some questions that arise in this discussion.

- Is the adjustment to motherhood a driver of a relapse to drug use?
- Does postpartum depression play a role in relapse?
- Is overdose due to usage of the same amount of a substance without understanding the physiological changes of pregnancy and how the postpartum body metabolizes the substance?

Determining pregnancy relatedness has been an issue for all states that are experiencing an increase in pregnancy associated overdose deaths. In order to assist the committees in making a decision on pregnancy relatedness in the case of overdose the Utah Maternal Mortality Committee members developed a protocol to use to assist in concluding whether the death was "pregnancy related" or only "pregnancy associated". This protocol was shared by the CDC Foundation with MM Coordinators to use or change as is appropriate to each state. Within the next year, New Hampshire will begin to use this algorithm or a variant of it decided upon by committee members.

VII. Summary of Maternal Mortality Review Committee Meetings

The following meetings occurred in 2017-2018:

November 2017:	MMRP review of six cases
November 2018:	MMRP review of five cases (finished review of 2016 cases)
March 2019:	MMRP review of one case (finished review of 2017 cases) (Visit and presentation from the CDC Foundation)
September 2019	Meeting to be scheduled

VIII. Recommendations

Screening & Counseling Women of childbearing age:

- Promote the best practice of routinely screening and counseling on the adverse effects of tobacco, alcohol, and substance use, especially during pregnancy

Prenatal and Post-Partum Care:

- Promote the best practice of routinely screening for risk factors including depression; tobacco, alcohol, and substance use; and domestic violence during pregnancy and post-partum using evidenced-based tools
- Increased knowledge for providers and patients about managed care services
- Reimbursement from Medicaid for in-office (Point of Care) case management
- Encourage use of the Northern New England Perinatal Quality Improvement Networks (NNEPQIN) Obesity in Pregnancy Guideline- Indications for EKG/ ECHO
- Promote the best practice of making referrals to home visiting programs as appropriate

Substance Use History in Pregnant Women:

- Public and provider awareness education around increased risk for postpartum overdose.
- Harm reduction education for all pregnant patients with a substance use disorder.
- Provider education on SHOUT as used in the "Zero Suicide" approach.
- Social workers/ medical personnel utilize immediate access to treatment for SUD using 211
- Provider and patient education about benzodiazepine/ opioid interaction.
  (Reference information in the Greater Manchester Mental Health brochure)

- Promote use of the Northern New England Perinatal Quality Improvement Network's (NNEPQIN) Substance Use Guidelines.
  (Consider echocardiogram for patients with injection drug related infection)
- Pregnant women who are incarcerated received Medicated Assisted Treatment (MAT)
- Planning and collaboration between prison and community providers for pregnant patients around post- release treatment transition

Existing Campaigns:

- Today Is For Me

VIII. Conclusion

The New Hampshire Maternal Mortality Review process focuses on all pregnancy-associated deaths that occurred in the state (in-state & out-of-state residents) and provides insight not only into maternal deaths related to pregnancy but also on all maternal deaths that occurred within one year of pregnancy. It is also important to review pregnancy-associated deaths in all NH residents that occurred out-of-state because a fair number of women seek care in our border states. The collection of records from out of state offices and hospitals does remain a barrier to completion of the review of cases. The work toward this goal will continue within Region 1 states, as well as nationally through the CDC Foundation, in order to assure review of all maternal deaths.

The Maternal Mortality Review Committee determines the "pregnancy relatedness" of each maternal death. The question that guides this determination is "If this mother was not pregnant (or postpartum) would she have died?" In the case of overdose deaths, this question is often difficult to answer for the MMRCs. The recommendations that will lead to change are not exclusively in the clinical setting but many opportunities lie in community and systems change. Review of cases allows direction for action toward education and change that will have an impact on decreasing pregnancy-associated deaths as well as addressing the general well-being of women during and after pregnancy. For NH the review of the 2016-2017 deaths shows needed support of women with substance use disorders, history of substance use disorders and co-occurring mental health conditions.

Identifying risk factors associated with deaths and recommending appropriate and actionable changes will improve maternal outcomes for women in NH. The two-year period discussed in this report points to the need for increased attention to the postpartum period, especially in the case of mothers with a history of a substance use disorder.

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