



Paul R. LePage, Governor

Mary C. Mayhew, Commissioner

**Maine CDC
Maternal, Fetal
& Infant
Mortality Review
Panel (MFIMR)**



July1, 2011- June 30, 2012

Submitted to the Joint Standing Committee on Health and Human Services

**2012 Annual
Report**

**Maine CDC
Maternal, Fetal and Infant Mortality Review Panel (MFIMR)
2012 Annual Report to the Legislature**

TABLE OF CONTENTS

Executive Summary	3
Background and Panel	4
Panel Activities in 2012	5
Recommendations	7
Plans for 2013	8
Appendix A: Data Highlights	9
Appendix B: Panel Membership	14

EXECUTIVE SUMMARY

Background

In 2005, the 122nd Legislature passed *An Act to Establish a Maternal and Infant Death Review Panel* to examine issues related to maternal and infant deaths in Maine. In 2010, the 123rd Legislature amended this statute to authorize the Maternal and Infant Death Review Panel to review fetal deaths occurring after 28 weeks gestation, i.e., stillborn infants. With this change, the Panel is now referred to as the Maternal, Fetal and Infant Mortality Review Panel.

Purpose

The overall purpose of the Maine CDC Maternal, Fetal and Infant Mortality Review Panel (MFIMR), using a public health approach, is to strengthen community resources and enhance state and local systems and policies affecting women, infants and families, in order to improve health outcomes in this population and prevent maternal, fetal and infant mortality and morbidity. The infant mortality rate is a sensitive public health indicator of social health and well-being and of the extent to which a society invests in children as its most precious natural resource. By understanding the factors associated with maternal, fetal, and infant deaths, we will improve our ability as a state to most effectively direct prevention efforts and to take actions to promote healthy mothers and infants.

Highlights

This 2012 report summarizes relevant data contributing to perinatal outcomes, challenges, activities and recommendations of the MFIMR Panel.

The MFIMR Panel identified the following issues as needing in-depth investigation over the next five years (2013-2018):

- Factors that contribute to preterm birth, pregnancy loss, and strategies for prevention.
- Barriers to delivery of the highest risk infants (e.g. very low birth weight/premature) at Level III facilities.
- Sudden Infant Death and Sudden Unexpected Infant Death as emerging issues, including sleep related deaths.

Recommendations

Recommendations of the MFIMR Panel include facilitating educational efforts to increase awareness of the MFIMR Panel and factors contributing to maternal, fetal and infant deaths in Maine: preterm birth risk, access to high risk birth facility and to promote appropriate health, behavior and safety screening for all pregnant women, promote infant safe sleep practices, and screening of infants for Critical Congenital Heart Disease. Other recommendations include: conducting an ongoing assessment of the MFIMR process, particularly case ascertainment.

For more information on activities of the MFIMR Panel:

Contact Ellie Mulcahy, Panel Coordinator, Maine CDC, elleanor.a.mulcahy@maine.gov, or 207-287-4623
www.maine.gov/dhhs/mecdc/population-health/cshn/maternal-infant/index.html

FULL REPORT

Background

In 2005, the 122nd Legislature passed *An Act to Establish a Maternal and Infant Death Review Panel*. As stated in the Panel's *Procedures Manual and Guidelines* its purpose is to:

“...conduct thorough examinations of maternal and infant deaths in Maine. By understanding the factors associated with infant and maternal deaths, we will expand our capacity as a state to direct prevention efforts to the most effective and humane strategies possible and be able to take actions to promote healthy mothers and infants. The overall purpose of the program, using a public health approach, is to strengthen community resources and enhance state and local systems and policies affecting women, infants and families, in order to improve health outcomes in this population and prevent maternal and infant mortality and morbidity.”¹

In 2010, the 123rd Legislature amended this statute to authorize the Maternal and Infant Death Review Panel to review fetal deaths occurring after 28 weeks gestation, i.e., stillborn infants. With this change, the Panel will be referred to as the Maternal, Fetal and Infant Mortality Review Panel. The Legislature also repealed the sunset on the Panel allowing the Panel to continue its work beyond the original end date of January 1, 2011.

The legislation requires that an annual report be presented to the Department of Health and Human Services and to the legislative committee having jurisdiction over health and human services. This 2012 report discusses the MFIMR Panel's activities and areas of focus for state fiscal year 2012 (7/1/11-6/3/12) and provides some related state and national data regarding fetal, infant and maternal mortality.

The Panel

The Maine CDC MFIMR Panel is a multidisciplinary group of health care and social service providers, public health officials, law enforcement officers, parents, and other persons with professional expertise on maternal and infant health and mortality.

The Panel is scheduled to meet four times a year and takes a broad holistic approach to improving the quality of life for all of Maine's women, infants and families. The infant mortality rate is a sensitive public health indicator of social health and well-being, and of the extent to which a society invests in children as its most precious natural resource. The Panel gathers and reviews information relevant to infant and maternal mortality, including factors contributing to mortality, considers the strengths and weaknesses of the current maternal and infant health care delivery system, and makes recommendations to prevent future deaths and improve the overall health and safety of Maine's infants and mothers.

The following issues were identified as needing in-depth investigation over the next five years (2013 to 2018):

- Factors that contribute to preterm birth, pregnancy loss, and strategies for prevention.
- Barriers to delivery of the highest risk infants (e.g. very low birth weight/premature) at hospitals with appropriate facilities and professionals to provide the best chance of survival for the infant (i.e. Level III facilities).
- Sudden Infant Death and Sudden Unexpected Infant Death as an emerging issue, including sleep related deaths.

Maine CDC MFIMR Activities in State Fiscal Year 2012

The Maine CDC Maternal, Fetal and Infant Mortality Review Panel met three times in SFY 2012. During this past year the MFIMR Panel discussed data related to fetal deaths occurring at 28 weeks gestation or more and continued to address specific risk factors for fetal and infant mortality that have emerged as growing concerns in Maine. Areas of review included:

- Factors that contribute to preterm birth, pregnancy loss, and strategies for prevention.
- Barriers to delivery of the highest risk infants (e.g. very low birth weight/premature) at hospitals with appropriate facilities and professionals to provide the best chance of survival for the infant (i.e. Level III facilities).
- Sudden Infant Death and Sudden Unexpected Infant Death as an emerging issue, including sleep related deaths.

Actions to Strengthen Community Resources

- The Association of State and Territorial Health Officers has issued a President’s Challenge to reduce preterm birth rates by 8% by 2014. Maine has begun to collaborate with the Maine Chapter of the March of Dimes and representatives from several professional organizations to identify educational opportunities to increase awareness of the importance of preventing prematurity.²
- Safe sleep environments was identified as an issue needing focused attention thus a series of 1.5 hour training sessions was developed by Perinatal Outreach to use with birth hospitals. Across the state 14 of the 30 birthing hospitals have now received training on safe sleep. As a result many hospitals are developing institutional policies and modeling appropriate sleep position and environment. Another action of Maine CDC MFIMR Panel reviews has been the development of a Maine Chapter of Cribs for Kids. This program is available statewide through local Home Visiting Programs. A family or a doctor can identify a family with a need for a crib to significantly reduce the risk of an unsafe sleep situation. The DHHS, Maine Families, Home Visiting Program will do a home visit to determine eligibility and to establish a relationship with the family for support and education. So far approximately 251 cribs have been distributed to families in need since July 2010. Most funding has been provided through small grants by the Kohls Cares for Kids Foundation. Another 171 cribs have been acquired through a collaborative through Maine Families/Maine Children’s Trust for future distribution.³
- Educational efforts with healthcare providers statewide include promoting active screening for every pregnant woman for nutritional status, home security (permanent address), abuse and psychological issues, substance abuse and referrals to be offered to help with identified risk or needs. This is being accomplished through partnerships with Perinatal Outreach Education, healthcare provider professional organizations and Maine CDC Public Health Nursing. Discussions were held with the Perinatal Nurse Managers of Maine to increase awareness of these issues, including domestic violence, identifying screening tools and resources. A Snuggle ME guideline workgroup has expanded to include prenatal, intra-partum and postpartum care of women dealing with substance abuse.
- Perinatal Outreach Education promotes a postpartum visit to occur within 1 to 2 weeks following a fetal loss to follow up and check on maternal and paternal mental health. An objective assessment tool, Edinburgh Postnatal Depression Score, has been identified to be used to assess for depression

and healthcare providers are encouraged to ensure a referral to resources such as the Maine CDC PHN, Maine Families, bereavement support, and spiritual support.

- Peg Bradstreet, a Panel member and Clinical Nurse Specialist at Maine Medical Center led a discussion of perinatal loss and bereavement at a meeting of the Perinatal Nurse Managers of Maine in March 2012. A sample fetal or neonatal death checklist was developed for use when discharging a mother from the hospital to ensure referral to resources. Existing hospital bereavement packets were reviewed and found much consistency.

Additional Actions to Enhance State and Local Systems and Policies

- In January 2011, the Maine CDC Data, Research, and Vital Statistics implemented an electronic death certificate system. This new system includes information indicating if a woman's death was related to a pregnancy or a birth thus improving identification of maternal deaths. This new certificate is now implemented and all deaths with the exception of fetal deaths are being filed using the electronic system. Fetal deaths will continue to be filed using the paper version. The Maine CDC MFIMR Panel discussed the new electronic death certificate that will improve the timeliness and quality of the information on Maine death certificates and support a shorter turnaround time for obtaining certified copies for families and will promote uniformity in cause-of-death statistics. Upgrades to Maine's birth registration system have been identified and are in the planning stages. In the future, birth and death certificates will be able to be rapidly matched.
- Maine CDC monitors the percent of very low birth weight infants born at hospitals with facilities and professionals to provide the best chance of survival for the infant (i.e. Level III facilities). Discussions occurred with the Perinatal Nurse Managers of Maine to identify challenges to identifying and stopping premature labor and facilitating transport to Level III facilities.
- A previous case reviewed by the Panel involved an infant that died from a rare immune disorder, Severe Combined Immune Deficiency (SCID). A new screening test is being implemented in many states that can identify affected infants in the first week of life with this type of disorder allowing for treatment reducing mortality related to specific primary immune deficiencies. The Maine CDC Newborn Screening Program has convened a multidisciplinary workgroup to help with planning for implementation of SCID screening in 2013.
- To promote awareness of the Maternal Fetal & Infant Mortality Review Panel by birth hospitals and healthcare providers, updates on Panel recommendations are discussed with Perinatal Nurse Managers of Maine regularly. The Executive Summary of the 2011 Legislative Report and brochures were distributed to all birth hospitals and staff was encouraged to share information with colleagues and families experiencing a loss.

Challenges Experienced by the MFIMR Panel

- The number of MFIMR Panel meetings was less than planned due to limited staffing and the workload of the Panel Coordinator. A contract has been completed with a perinatal nurse to assist the Coordinator with case abstraction and some other activities, such as creating an accurate listing of healthcare providers caring for pregnant women and newborns.

- Statutory requirements providing a four month waiting period before contacting the family and requiring family consent to review records present challenges.
 - Identifying accurate contact information for families four or more months following a death continues to be difficult. Research to assure valid mailing address is a time consuming process and is performed using web and programmatic resources to avoid sending materials to the wrong family.
 - Challenges to inviting families to participate in the review process, include the fact that some families have moved since the death and many have unlisted phone numbers or only use cell phones.
 - Approximately twelve families were contacted by mail with no responses. All cases reviewed by the Panel were referred to the Panel Coordinator by a healthcare provider or the family contacted the Panel Coordinator after viewing the website.

Recommendations of the MFIMR Panel

Panel discussions identified several recommendations for the Maine CDC.

- Educational efforts will include promoting active screening for every pregnant woman for abuse, domestic violence and psychological issues, substance abuse and referrals to be offered to help with identified risk or needs. This can be accomplished through partnerships with Perinatal Outreach Education, healthcare provider professional organizations and Maine CDC Public Health Nursing and Maine Families.
- Due to the death of an infant caused by violence, the Panel requested a guest speaker be invited to an upcoming meeting to discuss screening for domestic violence and identification of community resources.
- Consider review of specific cases regarding the following topics: VLBW babies (<1500 grams) who were born and died at a Level I or Level II hospital, and Late Preterm Birth infants. Maternal case identification will improve as the new death certificates have been implemented.
- Complete a comprehensive analysis of infant deaths, including relevant risk factors such as smoking, substance abuse, and infant sleep environment and identifying opportunities for preventing future deaths.
- Complete an assessment of Maine CDC MFIMR processes, particularly case ascertainment.
- Increase awareness of MFIMR Panel and related activities and resources. This should include compiling an updated provider/stakeholder list to assist with distribution of materials and updates.
- Complete a review of birthing facilities in Maine related to capacity and resources to provide different levels of perinatal care. The 7th edition of guidelines for Perinatal Care (AAP and ACOG) is expected to be released in the Fall of 2012 and can be used as a resource to this review. The review should include a review of websites to identify those with reliable perinatal information.
- Screening for Critical Congenital Heart Disease for all newborns offers early identification of at risk infants with the opportunity for further evaluation and potential to reduce infant deaths to some congenital heart disease. Maine CDC should monitor state and regional efforts to implement such screening, including legislative efforts.

Plans for Maine CDC MFIMR Panel in 2013

Panel discussions identified several activities to be addressed in the coming year.

- Due to the death of an infant caused by violence, the Panel will invite a guest speaker, Dr. Eric Brown, Faculty at Family Practice Residency Program at EMMC, to an upcoming meeting to discuss screening and identification of community resources. Barrett Wilkinson, Portland Public Health, has been invited to present a training on intimate partner violence as a half-day session at the May 2013 Perinatal Nurse Managers Meeting.
- Concerns about screening for domestic violence and identifying resources present an opportunity for a presentation to the Perinatal Nurse Managers of Maine next year to discuss screening methods and resources in Maine. Many birthing hospitals will share updated practices for active screening for all women and identifying resources in the community.
- The "Infant Safe Sleep" recommendations from the AAP and other pertinent councils need to be adopted on a state-wide level, including updated standards, published in Oct. 2011.⁴ Perinatal Outreach Education will continue educational efforts at all birth hospitals regarding safe sleep recommendations. A plan is being developed with Substance Abuse and Mental Health services to coordinate similar educational sessions for Maine Families and substance abuse treatment providers on this topic for 2012-2013.
- A review of cases at the Chief Medical Examiner's Office will be conducted in fiscal year 2013 to include infant deaths in unsafe sleep environments for 2009-2010. There were 24 deaths fitting this definition during these two years. The data collected will be analyzed and compared to a previous study done for 2002-2006.
- Continue to monitor statistical data for trends in maternal, fetal and infant mortality; specifically the Panel will look at the timing and adequacy of prenatal care, access to care for pregnant teens, and the appropriateness of care for very low birth weight infants including distance from a Level III facility.
- Complete the comprehensive analysis of infant deaths, including relevant risk factors such as smoking, substance abuse, and infant sleep environment and identifying opportunities for preventing future deaths. The Panel will review the findings when available.
- The MFIMR Panel Coordinator will work with the Maine CDC CSHN Director and the Division of Population Health Medical Director to identify potential approaches and solutions for challenges to Panel activities.
- Continue to perform ongoing assessment of Maine CDC MFIMR processes, i.e. case ascertainment, provider and family information and bereavement resources. This may be done using a Quality Improvement approach to review the system. The Maine CDC will consult with National Fetal Infant Mortality Review Program (American College of Obstetrics and Gynecology) and other national organizations to identify areas for improvement and further development.
- Implement the Snuggle Me Guidelines for screening, and management of perinatal substance abuse in collaboration with Perinatal Outreach Education and the Perinatal Nurse Managers of Maine.
- Monitor statewide activities related to hospital-based screening for Critical Congenital Heart Disease (CCHD) and monitor proposed legislation for upcoming bills related to CCHD.

Appendix A

Data Highlights

The Maine CDC MFIMR Panel monitors statistical data for trends in maternal, fetal and infant mortality. Sources of Maine information include data compiled for the annual Maternal & Child Health (MCH) Title V Block Grant report and the MCH Strengths and Needs Assessment, which is updated every five years.⁵ Summaries of indicators related to several birth trends and infant mortality have been provided below.^a

Indicators of Fetal, Infant, and Maternal Mortality

Indicator	Maine Current Period	US Data	Maine Prior Period
Fetal Mortality Measures- Time Period	2007-2011⁶	2006⁷	2006-2010
Fetal mortality rate (per 1,000 live births and fetal deaths) 20+ weeks gestation	4.4	6.1	4.4
Number of Fetal deaths per year		25,972	
Range	48-65	--	48-65
Average	58	--	60
Gestational age at death			
Between 20 and 27 weeks	48.0%	51.1%	50.5%
At 28 weeks or more	52.0%	48.9%	49.5%
Infant Mortality Measures- Time Period	2006-2010⁸	2008⁹	2005-2009
Infant mortality rate (number of deaths under 1 year of age per 1,000 live births)	5.7	6.6	6.1
Neonatal mortality rate (number of deaths to infants less than 28 days per 1,000 live births)	4.2	4.3	3.9
Number of infant deaths per year	--	28,075	--
Range	66-89	--	74-97
Average	78	--	84
Distribution of Timing of Death (percent)			
< 24 hours after birth	43.4%	<i>0-7 days</i> 52.2%	43.0%
2-7 days after birth	14.8%	--	15.1%
8-27 days after birth	10.5%	12.8%	10.6%
28-365 days after birth	31.4%	35.0%	31.2%
Gestational Age at Birth among Infant Deaths (percent)			
Very preterm Infant (< 34 weeks gestation)	58.2%	57.3%	58.6%
Preterm (34-36 weeks gestation)	8.2%	9.9%	8.5%
Not preterm (37 weeks or more)	31.1%	32.8%	30.7%
Unknown	2.6%	-	2.1%
Maternal Mortality Measures Time Period	2001-2010¹⁰	2011¹¹	2000-2009

^a Maine birth data (preliminary) and fetal death data from 2011 and infant mortality data from 2010 were the most recent data available at the time of these analyses. In general, U.S. mortality data lag by several years. Five year averages were used for some analyses with small numbers of events.

Indicator	Maine Current Period	US Data	Maine Prior Period
Number of maternal deaths due to pregnancy-related causes	1	548 Rate - 12.7 deaths per 100,000 live births	2
Number of maternal deaths, women who died within one year of pregnancy, due to any cause	40	--	36
Infant Birth Measures- Time Period	2011¹²	2011¹³	2010
Number of live births	12,700	3,953,593	12,950
Percent of very low birthweight infants delivered at facilities for high-risk deliveries and neonates (Level III facility)	82.6%	<i>States range</i> 48.2% - 99.5% ¹⁴	79.9%
Percent low birthweight births, <2500 grams	6.7%	8.1%	6.3%
Percent of women with first trimester prenatal care	89.4%	<i>States range</i> 57% - 89% ¹⁵	89.0%
Percent preterm birth (less 37 weeks gestation)	8.3%	11.7%	8.2%
Infant Health Time Period	2010	2008	2009
Sleep Position - Percent of new moms who most often placed their infants on their backs to sleep	80.9% ¹⁶ (77.9-83.6%)	<i>States range</i> 55.9-86.0% ¹⁷	77.5% (76.2-78.7%)
Drug-Affected Newborns - Number of “drug withdrawal syndrome in newborn” coded on Maine birth hospitalization discharge records	Not yet available	--	262 ¹⁸

Indicators/measures monitored by MFIMR

Critical to the work of the MFIMR Panel is maintaining an awareness of data and trends related to fetal, infant, and pregnancy-related maternal deaths and birth outcomes in Maine, as well as nationally. The insights gained through case reviews coupled with population level data guide the MFIMR Panel’s efforts to improve the overall health and safety of Maine’s infants and mothers.

Fetal Mortality

Although the majority of fetal deaths occur before 20 weeks gestation for unknown reasons, it is important to look at the timing and causes we have the ability to impact for better pregnancy outcomes. In Maine, fetal mortality rates are based on deaths that occur in utero between 20 weeks gestation and birth (38 to 42 week pregnancy). An average of 58 fetal deaths occur each year in Maine; about half of Maine’s recorded fetal deaths occur between 20 and 27 weeks gestation. About 30% of fetal deaths of 20+ weeks of gestation have no recorded underlying cause of death. Four leading causes of death account for 62% of fetal deaths in Maine.

By rank, the leading causes of fetal deaths in Maine between 2007 and 2011 were:

1. Complications of the placenta, umbilical cord and membranes
2. Congenital malformations, deformations, chromosomal abnormalities
3. Maternal complications of pregnancy
4. Disorders related to short gestation and low birth weight

Infant Mortality

The infant mortality rate includes all deaths of infants from birth to 365 days of life. An average of 78 Maine babies die before their first birthday. Five leading causes of death account for 60% of infant deaths in Maine.

By rank, the leading causes of infant deaths in Maine between 2008 and 2010 were:

1. Disorders related to short gestation and low birth weight, not elsewhere classified (low birthweight)
2. Congenital malformations, deformations and chromosomal abnormalities (congenital malformations)
3. Newborn affected by complications of placenta, cord and membranes (cord and placental complications)
4. Unintentional injuries
5. Sudden infant death syndrome (SIDS)

Maternal Mortality

Although rare in Maine, across the country for every 100,000 births there are about 13 maternal deaths per year¹⁹. Maternal deaths attributed to direct obstetric causes include eclampsia and pre-eclampsia, hemorrhage and placenta previa, obstetrical tetanus, obstetric embolism, and other direct causes. Possible explanations for an observed national increase include a rise in the number of caesarean sections, particularly among women who have undergone several previous C-sections, and the rise in obesity.

Maternal mortality can also be measured using a more inclusive definition, that is, deaths to women within one year of pregnancy from any cause. Between 2001 and 2010 there were 40 deaths to Maine women who died within one year of pregnancy; 37.5% of these deaths were attributed to illness or disease, 47.5% to unintentional injuries such as motor vehicle crashes, and 12.5% to assault or suicide.

Infant Birth and Health

Maine's MFIMR Panel examines local, state, and national data on risk factors for poor birth and infant health outcomes to inform case selection and review. Many infant birth and health indicators are associated with infant health, illness, disability and death, and they are among the objectives of Healthy People 2020²⁰, Healthy Maine 2020, and the Maternal and Child Health Bureau's Title V Program.²¹ Emerging issues and those with the potential to improve infant outcomes through public health and policy approaches are monitored on a regular basis. Three of these issues are summarized below.

Delivery Facility for High Risk Births: Research has shown that very low birth weight and very preterm infants not born in level III hospitals are at increased risk of neonatal or pre-discharge death.²² Increasing the number of very low birth weight babies born at Level III hospitals may improve health outcomes for these infants. In Maine, 83% of very low birthweight infants were delivered at a Level III facility in 2011.

MFIMR Panel members have reviewed high-risk infant delivery patterns to determine the feasibility of system-related improvements in access to appropriate birth facilities.

Sleep position: For nearly two decades, the American Academy of Pediatrics (AAP) has recommended that infants be placed on their backs to sleep, because infants who sleep prone have an increased risk of dying from sudden infant death syndrome (SIDS).²³ More than eight of ten Maine mothers most often placed their infants on their backs to sleep (80.9%) in 2010.¹⁷ Using the recommended sleeping position is more common among mothers over the age of 20 and among women with higher educational attainment.

Drug affected babies: Another emerging issue that may impact infant and maternal health is the number of infants born who have been exposed to drugs in utero. This population is of concern because they are at increased risk for preterm birth, sudden unexpected infant death (SUID) and other causes of death. Based on Maine hospital discharge data, “drug withdrawal syndrome in newborn” (based on ICD-9-CM 779.5) was noted on 262 (2%) of the Maine birth hospitalization discharges in 2009.¹⁶ This represents a 19-fold increase since 2000, when 13 birth hospitalization discharges were noted to involve drug withdrawal syndrome. It is difficult to determine whether this noted increase represents true change in the incidence of drug withdrawal syndrome in newborns or is due, at least in part, to required reporting resulting in better recognition and diagnostic coding of the syndrome in more recent years.

¹ Maine Department of Health and Human Services. (2008). Maternal and Infant Mortality Review Panel Procedures Manual and Guidelines. Augusta, ME: Maine Department of Health and Human Services, p 1.

² Association of State & Territorial Health Officers, President’s Challenge: online <http://www.astho.org/healthybabies/>.

³ Personal communication, Jen Hayman, MD, Barbara Bush Children’s Hospital, Portland, Maine

⁴ Taskforce On Sudden Infant Death Syndrome, SIDS and Other Sleep-Related Infant Deaths: Expansion of Recommendations for a Safe Infant Sleeping Environment, *Pediatrics*; online 2011, DOI: 10.1542/peds.2011-2285.

⁵ Maine Department of Health and Human Services, Division of Family Health, Maternal and Child Health Services Title V Block Grant, State Narrative for Maine: Application for 2010 and Annual Report for 2008 and 2012 MCH Services application and the 2010 annual report. Available from Health Resources and Services Administration. <https://perfdata.hrsa.gov/MCHB/TVISReports/default.aspx>.

⁶ Maine Center for Disease Control & Prevention, *Maine Vital Records Data (Fetal Death Certificates)*. 2007- 2011.

⁷ MacDorman MF, Kirmeyer SE, Wilson EC. Fetal and perinatal mortality, United States, 2006. National vital statistics reports; vol 60 no 8. Hyattsville, MD: National Center for Health Statistics. 2012. Accessed 11/22/12 from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_08.pdf.

⁸ Maine Center for Disease Control & Prevention, *Maine Vital Records Data (Birth Certificates and Period Linked Birth/Infant Death data set)*. 2005-2010.

⁹ Mathews TJ, MacDorman MF. Infant mortality statistics from the 2008 period linked birth/infant death data set. National vital statistics reports; vol 60 no 5. Hyattsville, MD: National Center for Health Statistics. 2012 Accessed 11/22/12 from http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_05.pdf.

¹⁰ Maine Center for Disease Control & Prevention, *Maine Vital Records Data (Death Certificates)*. 2000- 2010.

¹¹ Xu JQ, Kochanek KD, Murphy SL, Tejada-Vera B. Deaths: Final data for 2008. National vital statistics reports; vol 59 no 10. Hyattsville, MD: National Center for Health Statistics. 2010. Accessed 12/05/12 from http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_10.pdf.

-
- ¹² Maine Center for Disease Control & Prevention, *Maine Vital Records Data (Birth Certificates)*. 2010, 2011.
- ¹³ Hamilton BE, Martin JA, Ventura SJ. Births: Preliminary data for 2011. National vital statistics reports web release; vol 61 no 5. Hyattsville, MD: National Center for Health Statistics. 2012. Accessed 12/02/12 from http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_05.pdf .
- ¹⁴ Maternal and Child Health Bureau. Title V Information System. National Performance Measure #17: Percent of very low birth weight infants delivered at facilities for high-risk deliveries and neonates. As reported by States in the Title V Block Grant FY 2011 Annual Report and FY 2013 Application; Form 11. Accessed 11/30/12 from <https://perfddata.hrsa.gov/MCHB/TVISReports/default.aspx>.
- ¹⁵ Maternal and Child Health Bureau. Title V Information System. National Performance Measure #18: Percent of infants born to pregnant women receiving prenatal care beginning in the first trimester. Accessed 11/30/12 from <https://perfddata.hrsa.gov/MCHB/TVISReports/default.aspx> .
- ¹⁶ Maine Department of Health and Human Services , Maine Center for Disease Control and Prevention, Pregnancy Risk Assessment Monitoring System, *2010 and 2009 PRAMS data*. Accessed 11/30/2012 from <http://www.maine.gov/dhhs/mecdc/public-health-systems/data-research/prams/>.
- ¹⁷ Centers for Disease Control and Prevention, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, PRAMS Online Data for Epidemiologic Research, C-PONDER, Sleep Behaviors, 2008 All State data, accessed 12/4/12 from <http://apps.nccd.cdc.gov/cPONDER/default.aspx?page=DisplayAllStates&state=0&year=9&category=23&variable=28>.
- ¹⁸ 2000-2009 Maine Hospital Discharge Data, using code ICD-9-CM 779.5. Analyzed by University of Southern Maine, Department of Applied Medical Sciences: Augusta Maine. 2011.
- ¹⁹ Xu JQ, Kochanek KD, Murphy SL, Tejada-Vera B. Deaths: Final data for 2007. National Vital Statistics Reports 2009, vol 58 no 19. Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System: Hyattsville, MD.2010. http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf.
- ²⁰ Department of Health and Human Services. *Healthy People 2020*. 2011. Accessed 11/29/11 from <http://www.healthypeople.gov/2020/topicsobjectives2020/default.aspx>.
- ²¹ Maternal and Child Health Bureau. Title V Information System. Performance Measure and Indicators. Accessed 11/30/12 from <https://perfddata.hrsa.gov/MCHB/TVISReports/default.aspx>.
- ²² Lasswell S. M., et. al, Perinatal Regionalization for Very Low Birth Weight and Very Preterm Infants, *JAMA*. 2010; 304(9): 992-1000.
- ²³ Moon RY; American Academy of Pediatrics, Task Force on Sudden Infant Death Syndrome. Policy statement: SIDS and other sleep-related infant deaths: expansion of recommendations for a safe infant sleeping environment. *Pediatrics*. 2011;128(5): 1030 –103. Available at <http://pediatrics.aappublications.org/content/early/2011/10/12/peds.2011-2284>. Accessed November 2, 2011.

Appendix B:

Maternal, Fetal and Infant Mortality Review Panel Members

Shannon Bonsey, Chief Operating Officer, Penquis CAP

Sheryl Peavey, Director, Early Childhood Systems Initiative, Maine CDCP

Jay Naliboff, Maine Chapter, American College of Obstetrics and Gynecology, Panel Chair

Kelley Bowden, Perinatal Outreach Education, Maine Medical Center, Panel Co-Chair

Laurie Caton-Lemos, Family Nurse Practitioner

Cheri Sarton, CNM, Instructor, University of Maine

Nell Tharpe, CNM, Public Health Nurse Consultant, Maine CDCP

Rick Hobbs, Maine Chapter, Academy of Family Physicians

Mary Connolly, Neonatology Section - Kelley 6, Eastern Maine Medical Center

Peg Bradstreet, Clinical Nurse Specialist, Maine Medical Center

Shannon King, Women's Health, Office of Minority Health, Maine CDCP

Shirley Perron, Contracted Perinatal Nurse

Kathy O'Connor, Perinatal Nurse, Southern Maine Medical Center

Ellie Mulcahy, Director, Genetics Program/MFIMR Panel Coordinator, Maine CDCP

Christopher Pezzullo, DO, Medical Director, Div. Population Health, Maine CDCP

Jennifer Hayman, Hospitalist, Maine Medical Center

Doug Dransfield, Retired Neonatologist

Ellen Bridge, Methodist Minister

Elizabeth Kubik, Clinical Psychologist

Denise Yob, Epidemiologist, USM/Maine CDCP

Ad Hoc members

Anna Love, State Police - Public Safety

Margaret Greenwald, Chief Medical Examiner

Lisa Socabasin, Director, Office of Minority Health, Maine CDCP

Michael Pinette, OB/GYN Associates