

# Maine Maternal and Infant Mortality Review (MIMR)

## Annual Report to the Legislature for 2008

Submitted by the  
Department of Health and Human Services  
Maine CDC, Division of Family Health  
February, 2009

### Background

In 2005 the 122<sup>nd</sup> 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.” (Maine Department of Health and Human Services, 2008, p. 1)

The initiating legislation required 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 2008 report discusses:

- state and national data regarding infant mortality
- activities and accomplishments of the Maternal and Infant Mortality Review Panel
- the Panel's anticipated activities for 2009.

### State and National Data

In a recent Data Brief, the Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS) reports that the infant mortality rate in the United States is higher than other developed countries and that the gap between the United States and those with the lowest rates appears to be growing. NCHS also reports that during the past century the infant mortality rate was on a general decline, but that between 2000 and 2005 the decline had stopped. (MacDorman, 2008).

The NCHS states that this is a concern because: “Infant mortality is one of the most important indicators of the health of a nation, as it is associated with a variety of factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices.”

(MacDorman, October 2008, p. 1)

NCHS reported different mortality rates according to race and ethnicity but suggests that some of the difference may be due to other “risk factors for infant mortality such as preterm and low birthweight delivery, socioeconomic status, access to medical care etc.” (Ibid, p. 3)

NCHC also reports that: “Preterm birth (births at less than 37 completed weeks of gestation) is a key risk factor for infant death. The percentage of preterm births has increased rapidly in the United States in recent years. From 2000 to 2005, the percentage of preterm births increased from 11.6% to 12.7% - a 9% increase.” (Ibid)

Accounting for 68.1% of all infant deaths in the United States, the Centers for Disease Control and Prevention’s *National Vital Statistics Reports* report for deaths in 2005 found the ten leading causes of infant death to be:

- 1) “Congenital malformations, deformations and chromosomal abnormalities (congenital malformations);
- 2) Disorders related to short gestation and low birth weight, not elsewhere classified (low birthweight);
- 3) Sudden infant death syndrome (SIDS);
- 4) Newborn affected by maternal complications of pregnancy (maternal complications);
- 5) Newborn affected by complications of placenta, cord and membranes (cord and placental complications);
- 6) Accidents (unintentional injuries);
- 7) Respiratory distress of newborn;
- 8) Bacterial sepsis of newborn;
- 9) Neonatal hemorrhage; and
- 10) Necrotizing enterocolitis of newborn.”

(Kung, 2008, p. 11.)

## **March of Dimes Premature Birth Report Card**

On November 12, 2008 the March of Dimes released their first *Premature Birth Report Card* in which they compared state premature birth rates to objectives set by *Healthy People 2010*. As a whole, the nation received a grade of D from the March of Dimes. Maine ranked 7<sup>th</sup> and received a grade of C with a preterm birth rate of 10.7%. (March of Dimes, Press release, November 12, 2008).

According to the March of Dimes' report card for Maine, "Maine's preterm birth rate is 40% higher than the Healthy People 2010 objective of 7.6% and increased by more than 17% between 1995 and 2005." (March of Dimes, Fact Sheet, November 12, 2008).

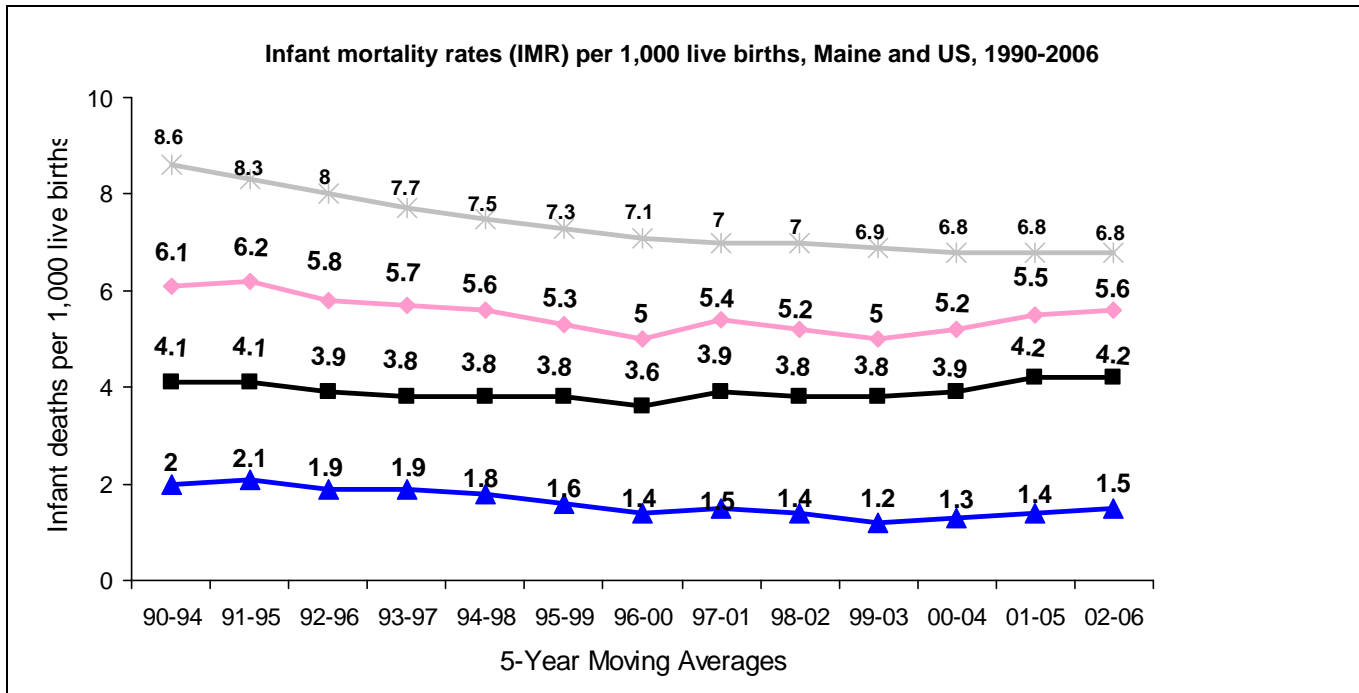
Maine's March of Dimes Report Card goes on to discuss several areas of concern. These include: The lack of health insurance coverage for 11.3% of Maine women of childbearing age; the fact that 26.4% of women of childbearing age are smokers; and the rising rate of late preterm births, 7.8%, which can be linked to the scheduling of c-sections and early induced labor at 34 to 36 weeks of gestation. (Ibid)

The March of Dimes Report Card has several recommendations that relate to actions that can be taken by state policymakers and health professionals. First, "expand access to health insurance coverage for women of childbearing age and ... support smoking cessation programs as part of maternity care." Second, the March of Dimes recommends that hospitals and health care providers: "...voluntarily assess c-sections and inductions which occur prior to 39 weeks gestation to ensure consistency with professional guidelines." (Ibid).

## **Maine's Infant Mortality Data**

Each year there are approximately 14,000 babies born to Maine residents and each year about 80 infants die. Between 2002 - 2006, there were 391 infant deaths in Maine. The 2002 - 2006 infant mortality rate in Maine was 5.6 per 1,000 live births. Three of every four deaths to infants in Maine during this period occurred during the neonatal period (birth to 28 days of life). Maine's 5-year average infant mortality rate has been increasing since the 5 year average for the period between 1999-2003.

**Chart 1**



—\*— US IMR —◆— Maine IMR —■— Maine Neonatal —▲— Maine Post-neonatal

source: Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2007, March). *Maine Vital Records Data Files*. Data from 2006 are preliminary.

Data from 2002-2006 indicate no statistically significant differences between Maine’s public health districts on their rates of infant mortality.

**Table 1**

| DISTRICT   | Infant Deaths | Rate per 1000 Live Births | Lower 95% Confidence Interval | Upper 95% Confidence Interval |
|------------|---------------|---------------------------|-------------------------------|-------------------------------|
| York       | 58            | 5.5                       | 4.2                           | 7.1                           |
| Cumberland | 83            | 5.5                       | 4.4                           | 6.8                           |
| Western    | 70            | 6.5                       | 5.1                           | 8.2                           |
| Mid Coast  | 38            | 4.9                       | 3.5                           | 6.7                           |
| Central    | 45            | 5.1                       | 3.7                           | 6.8                           |
| Penquis    | 57            | 6.6                       | 5.0                           | 8.6                           |
| Downeast   | 18            | 4.1                       | 2.4                           | 6.5                           |
| Aroostook  | 22            | 6.4                       | 4.0                           | 9.7                           |
| MAINE      | 391           | 5.6                       | 5.0                           | 6.2                           |

\*preliminary data

source: Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2008, November). *Maine Vital Records Data Files*.

The leading causes of death to children under age 1 in Maine between 2001-2005 were due to congenital anomalies and disorders due to short gestation and low birthweight. Between 2001-2005, SIDS was the third leading cause of infant death.

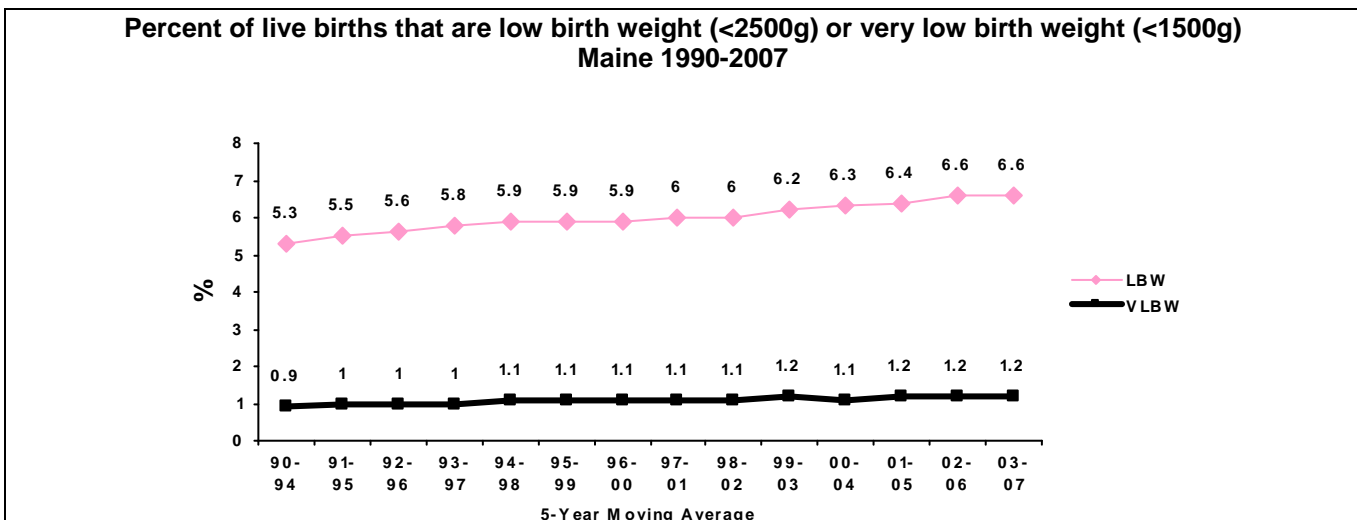
**Table 2**

| Leading Causes of Infant Mortality<br>Maine, 2001-2005 |
|--|
| Congenital Anomalies (n=92)                            |
| Short Gestation (n=66)                                 |
| SIDS (n=32)  |
| Maternal Pregnancy Comp. (n=22)                        |
| Placenta Cord Membranes (n=20)                         |
| Bacterial Sepsis (n=15)                                |
| Intrauterine Hypoxia (n=13)                            |
| Neonatal Hemorrhage (n=9)                              |
| Labor /Delivery Complications (n=8)                    |
| Unintentional Injury (n=8)                             |

source: U. S. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2005). *Web-based Injury Statistics Query and Reporting System (WISQARS)* [online]. Available: [www.cdc.gov/ncipc/wisqars](http://www.cdc.gov/ncipc/wisqars).

Low birth weight is one of the leading causes of mortality and morbidity among infants. The percent of low-birth weight infants born in Maine has been steadily increasing over time since 1990; the proportion of very low-birth weight births has not increased significantly over the same time period.

**Chart 2**



source: Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2008, March). *Maine Vital Records Data Files*.

**Table 3**

**Low birth weight (<2500g) births as a percent of live births by district, Maine 2007**

| DISTRICT   | Total Live Births | Number | Percent of Live Births | Lower 95% Confidence Interval | Upper 95% Confidence Interval |
|------------|-------------------|--------|------------------------|-------------------------------|-------------------------------|
| York       | 2104              | 125    | 5.9%                   | 4.9                           | 7.0                           |
| Cumberland | 2972              | 191    | 6.4%                   | 5.5                           | 7.3                           |
| Western    | 2286              | 147    | 6.4%                   | 5.4                           | 7.4                           |
| Mid Coast  | 1532              | 94     | 6.1%                   | 4.9                           | 7.3                           |
| Central    | 1785              | 128    | 7.2%                   | 6.0                           | 8.4                           |
| Penquis    | 1819              | 124    | 6.8%                   | 5.7                           | 8.0                           |
| Downeast   | 883               | 52     | 5.9%                   | 4.3                           | 7.4                           |
| Aroostook  | 725               | 31     | 4.3%                   | 2.8                           | 5.7                           |
| MAINE      | 14,106            | 892    | 6.3%                   | 5.9                           | 6.7                           |

source: Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2008, November). *Maine Vital Records Data Files*.

In 2007, the percent of low birth weight babies born in Aroostook District was statistically significantly lower than the state average and lower than the district with the highest LBW percent, Central District. There were no other statistically significant differences between districts in low birth weight births.

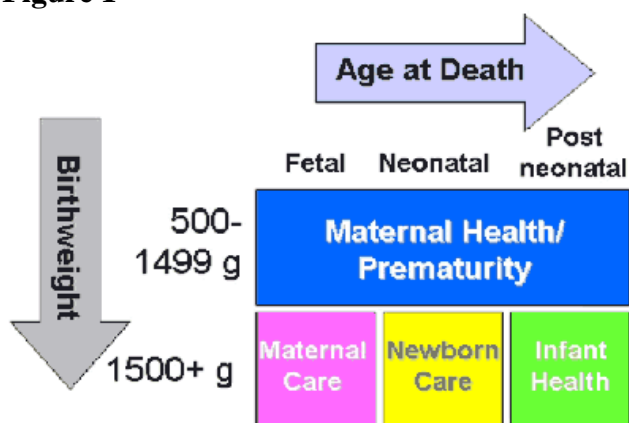
As part of the efforts of Maine’s Maternal and Infant Mortality Review Panel, we continue to examine data on the health of Maine’s infants to examine ways to improve birth outcomes at the systems level. Ongoing analyses are planned for the coming year to investigate the timing and adequacy of prenatal care, access to care for pregnant teens, and the appropriateness of care for very low birth weight infants.

We are also in the process of conducting a Perinatal Periods of Risk (PPOR) analysis. Since 1998, PPOR has been used by communities throughout the United States to address health disparities and the complex social, psychological, environmental and biological factors that contribute to poor birth outcomes. Combining the parameters of weight and age at death, the PPOR method links deaths to four areas that suggest the primary preventive direction for the deaths for that group: Maternal Health/Prematurity, Maternal Care, Newborn Care, and Infant Health (Figure 1).

The four periods of risk represent potential gaps in the maternal and child health systems that lead to fetal-infant mortality, and therefore can serve as a basis for action. For example, if the highest rate of excess deaths in Maine can be attributed to Infant Health, prevention approaches to be considered include promoting safe sleep, breastfeeding, and injury prevention, whereas if the highest rate of excess deaths can be attributed to Maternal health/Prematurity, then primary prevention activities such as promoting healthy preconception behaviors, and access to high quality perinatal care would have the greatest impact in improving birth outcomes.

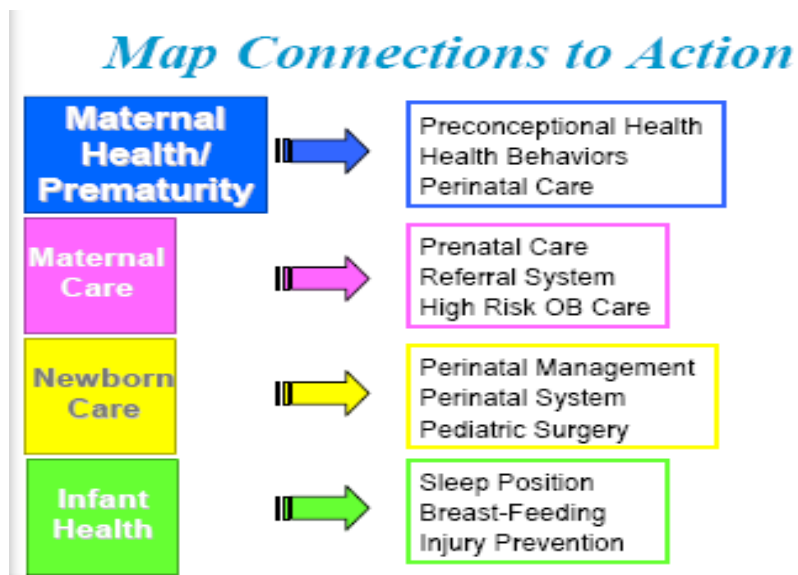
The PPOR analysis will be presented to the MIMR panel and will help guide the selection of cases to review and action steps which could help improve birth outcomes in the state.

**Figure 1**



source: CityMatch (2008). *What is PPOR, Perinatal Periods of Risk Approach in U.S. Cities.* ¶ 3. [online]. Available: [http://www.citymatch.org/ppor\\_index.php](http://www.citymatch.org/ppor_index.php) [2008, Nov. 1].

Figure 2



source: CityMatch. (n.d.). *Perinatal Periods of Risk Approach: The U.S. Urban Experience A New Community Approach to Fetal & Infant Mortality*. p. 14. [online]. Available: <http://webmedia.unmc.edu/community/citymatch/PPOR/howto/PPORGeneralDescription.pdf>.

## Activities and Accomplishments in 2008

1. A 32-member Review Panel has been named and appointed.
2. MIMR Panel members have signed confidentiality agreements.
3. Rules have been formally adopted (Me. Dep't of Health and Hum. Serv., 10 144 CMR 700).
4. The data system for tracking MIMR case reviews, which is modeled after the database recommended by the American College of Obstetricians and Gynecologists (ACOG), has been updated and loaded onto a computer designated solely for the MIMR Panel.
5. MIMR Panel *Procedures Manual and Guidelines* have been approved by the Panel.
6. Consent forms for release of medical records and for participation in a home interview, for both infant and maternal deaths, have been developed and approved by the Panel.
7. The Panel was convened June 24, 2008 and a “mock” maternal death case was reviewed. Feedback was provided on the MIMR *Procedures Manual and Guidelines* as well as related materials.
8. A new Panel Chair has been appointed.



9. Two brochures have been developed: *Information for Families*, and a general brochure describing how the Panel operates, *A Program to Reduce Infant and Maternal Deaths in Maine*.
10. Information about the Panel has been drafted to post on the Maine CDC website.
11. A sample letter from the Director of the Maine CDC to the mother and/or family, inviting participation in a review, has been developed.
12. Information on bereavement services has been collected to provide to mothers and families.
13. A sample letter from an agency dedicated to improving maternal and child health, inviting a family to participate in the review, has been drafted.
14. “A central registry of statewide organizations dedicated to improving the health of mothers and infants by preventing birth defects, premature births, and maternal and infant mortality” has been developed. (Me. Dep’t of Health and Hum. Serv., 10 144 CMR 700- 4.2).

### **Planned Activities for 2009**

1. Provide bereavement training to public health nurses who will be involved in the home interviews, panel members and other interested parties in order to ensure that all components of the program, especially the case reviews and family interviews, demonstrate sensitivity to and understanding of the grieving process.
2. Continue the process to invite families to participate in a Panel review.
3. Continue to monitor statistical data for trends in maternal 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.
4. The Panel will review information that becomes available as a result of a Perinatal Periods of Risk (PPOR) analysis that is being conducted by the Department. The analysis involves combining the parameters of weight and age at death and linking deaths to four areas that suggest the primary preventive direction for the deaths.
5. Quarterly Panel meetings are planned with a first infant case scheduled for review in February 2008.
6. At the end of the year, the Panel will review and evaluate its operating procedures and make appropriate changes to its *Procedures Manual and Guidelines*.

## Recommendation

The legislation authorizing the Maternal and Mortality Review Panel contains a provision that repeals the statute on January 1, 2011. Given the limited number of cases that can be reviewed by the Panel during each of its meetings, (about 2 cases per meeting) it is unlikely that there will be a significant number of cases during 2009-10 to identify any trends in the infant or maternal health care delivery systems on which to base any recommendations to health care providers or policymakers. It is therefore recommended that legislation be passed no later than April of 2010 to extend the repeal date to January 1, 2015 or later.

## References

CityMatch (2008). *What is PPOR, Perinatal Periods of Risk Approach in U.S. Cities*. [Online]. Available: [http://www.citymatch.org/ppor\\_index.php](http://www.citymatch.org/ppor_index.php) [2008, Nov. 30].

CityMatch. (n.d.). *Perinatal Periods of Risk Approach: The U.S. Urban Experience A New Community Approach to Fetal & Infant Mortality* [Online]. Available: <http://webmedia.unmc.edu/community/citymatch/PPOR/howto/PPORGeneralDescription.pdf> [2008, Dec 2].

Kung, H.-C., Hoyert, D. L., Xu, J., & Murhpy, S. L. (2008, April 24). Deaths: Final data for 2005. *National Vital Statistics Reports*, 56(10).

MacDorman, M.F., & Mathews, T.J. (2008, October). *Recent trends in infant mortality in the United States*. (NCHS Data Brief No. 9). Hyattsville, MD: National Center for Health Statistics.

Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2008, March). *Maine Vital Records Data Files*. Augusta, ME: Maine Department of Health and Human Services.

Maine Department of Health and Human Services, Maine CDC Office of Data Research and Vital Statistics. (2008, November). *Maine Vital Records Data Files*. Augusta, ME: Maine Department of Health and Human Services.

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.

March of Dimes. (2008, November 12). *March of Dimes (Maine) 2008 Premature Birth Report Card (Fact sheet)* [Online]. Available: <http://www.marchofdimes.com/padpetition/reportcards/english/ME.pdf> [2008, Dec 2].

March of Dimes. (2008, November 12). *Nation Gets a "D" as March of Dimes Releases Premature Birth Report Card* (Press release). [Online]. Available: <http://www.prnewswire.com/mnr/marchofdimes/35821/> [2008, Dec 2].

Me. Dep't of Health and Hum. Serv., 10 144 CMR 700.

U. S. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2005). *Web-based Injury Statistics Query and Reporting System (WISQARS)* [Online]. Available: <http://www.cdc.gov/ncipc/wisqars>. [2008, Nov 1].

U. S. Department of Health and Human Services. (2000, November). *Healthy People 2010*. Rockville, Maryland: Office of Disease Prevention and Health Promotion.

## **Maternal and Infant Mortality Review Panel Members**

Shannon Bonsey, Deputy Director, Penquis CAP

Kolawole Bankole, Minority Health Program Coordinator, City of Portland

Erika Lichter, Epidemiologist, MeCDCP

Sheryl Peavey, Director, Early Childhood Systems Initiative, OCFS

Jay Naliboff, Panel Chair

Kelley Bowden, Perinatal Outreach Education, Maine Medical Center

Michelle Mathieu, Director, Health Information Services, Northern Maine Medical Center

Julie Keen, Certified Nurse Midwife

Laurie Caton-Lemos, Instructor, University of Maine

Dwight Littlefield, Public Health Nurse Consultant, Maine CDC

Rick Hobbs, Maine Academy of Family Physicians

Michael Pinette, OB/GYN Associates

Mark Brown, Neonatology Section - Kelley 6, EMMC

Margaret Greenwald, Chief Medical Examiner

Allen Sockabasin, Wabanaki Mental Health Association

Peg Bradstreet, Clinical Nurse Specialist, Maine Medical Center

Nicky Blanchard, Statewide Program Coordinator, MECEDV

Lisa Sockabasin, Director, Office of Minority Health, Maine CDC

Shirley Perron, Nurse Manager: Family Birthing Unit, St. Mary's Reg Med Ctr

Sharon Schulburger, Director, Program Services, March of Dimes

Richard Aronson, Director, Center for Humane Worlds

Ellie Mulcahy, Director, Genetics Program/MIMR Panel Coordinator, MeCDCP

Arabella Perez, Project Director, Thrive: Trauma Informed System of Care

Anna Love, State Police - Public Safety

Karen Mosher, Clinical Director, Kennebec Behavioral Health

Kathleen Clark, Discovery House

Jennifer Hayman, Hospitalist

Nora Bowne, Program Director, WIC, MeCDCP

Thomas Saviello, State Representative