Infant Mortality in Ohio:

Presentation to the Ohio Hospital Association

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Senior Policy Advisor, ODH
Assoc. Prof.: OSU Dept. of OB/Gyn
Assoc. Prof: NCH, Adolescent Med.

April 23, 2014
## 10 US States with most births: 2010

<table>
<thead>
<tr>
<th>#</th>
<th>State</th>
<th># Births: 2010:</th>
<th>2010 Overall IMR:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>California</td>
<td>510,198</td>
<td>4.7</td>
</tr>
<tr>
<td>2</td>
<td>Texas</td>
<td>386,118</td>
<td>6.1</td>
</tr>
<tr>
<td>3</td>
<td>New York</td>
<td>244,375</td>
<td>5.1</td>
</tr>
<tr>
<td>4</td>
<td>Florida</td>
<td>214,590</td>
<td>6.5</td>
</tr>
<tr>
<td>5</td>
<td>Illinois</td>
<td>165,200</td>
<td>6.8</td>
</tr>
<tr>
<td>6</td>
<td>Pennsylvania</td>
<td>143,321</td>
<td>7.2</td>
</tr>
<tr>
<td>7</td>
<td>Ohio</td>
<td><strong>139,128</strong></td>
<td><strong>7.7</strong></td>
</tr>
<tr>
<td>8</td>
<td>Georgia</td>
<td>133,947</td>
<td>6.4</td>
</tr>
<tr>
<td>9</td>
<td>North Carolina</td>
<td>122,350</td>
<td>7.0</td>
</tr>
<tr>
<td>10</td>
<td>Michigan</td>
<td>114,531</td>
<td>7.1</td>
</tr>
</tbody>
</table>
Infant Mortality:

**Definition:** The death of any live born baby prior to his/her first birthday.

“The most sensitive index we possess of social welfare . . .”

Julia Lathrop, *Children’s Bureau, 1913*
Healthy People 2020
A Resource for Promoting Health and Preventing Disease Throughout the Nation

Infant Mortality Rate Goal: 6/1000
2010
Ohio Infant Mortality Rate - 2010

Healthy People 2020 IMR Goal: 6

DEATHS PER 1,000 LIVE BIRTHS

- OVERALL: 7.7
- WHITE: 6.4
- BLACK: 15.5
2010 Infant Mortality Rates: Ohio c/w USA

<table>
<thead>
<tr>
<th></th>
<th>OVERALL</th>
<th>WHITE</th>
<th>BLACK</th>
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</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>7.7</td>
<td>6.4</td>
<td>15.5</td>
</tr>
<tr>
<td>USA</td>
<td>6.14</td>
<td>5.19</td>
<td>11.6</td>
</tr>
</tbody>
</table>

ODH/NCHS
2010 Infant Mortality Rates: Ohio c/w USA

<table>
<thead>
<tr>
<th></th>
<th>Ohio</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERALL</td>
<td>7.7</td>
<td>6.14</td>
</tr>
<tr>
<td>WHITE</td>
<td>6.4</td>
<td>5.19</td>
</tr>
<tr>
<td>BLACK</td>
<td>15.5</td>
<td>11.6</td>
</tr>
</tbody>
</table>

ODH/NCHS
2010 Infant Mortality Rates: Ohio c/w USA

If Ohio’s 2010 IMR was the same as the Nation’s 2010 IMR, 214 baby’s would have been saved.

<table>
<thead>
<tr>
<th></th>
<th>OVERALL</th>
<th>WHITE</th>
<th>BLACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>7.7</td>
<td>6.4</td>
<td>15.5</td>
</tr>
<tr>
<td>USA</td>
<td>6.14</td>
<td>5.19</td>
<td>11.6</td>
</tr>
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</table>

NCHS/ODH

214 babies

120 babies

91 babies
Ohio 2010 IMR c/w USA IMR from 1995, 1996

<table>
<thead>
<tr>
<th></th>
<th>Overall:</th>
<th>White:</th>
<th>Black:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995/USA</td>
<td>7.6</td>
<td>6.3</td>
<td>15.1</td>
</tr>
<tr>
<td>2010/Ohio</td>
<td>7.7</td>
<td>6.4</td>
<td>15.5</td>
</tr>
<tr>
<td>1996/USA</td>
<td>7.3</td>
<td>6.1</td>
<td>14.7</td>
</tr>
</tbody>
</table>

Ohio’s Overall, White, and Black IMR’s for 2010 are comparable to USA IMR’s for 1995!

ODH/NCHS
## IMR in 50 largest US cities, 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>City</th>
<th>IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Detroit, MI</td>
<td>13.5</td>
</tr>
<tr>
<td>1</td>
<td>Cleveland, OH</td>
<td>13.5</td>
</tr>
<tr>
<td>2</td>
<td>Baltimore, MD</td>
<td>12.0</td>
</tr>
<tr>
<td>3</td>
<td>Memphis, TN</td>
<td>11.7</td>
</tr>
<tr>
<td>4</td>
<td>Philadelphia, PA</td>
<td>10.5</td>
</tr>
<tr>
<td>5</td>
<td>Indianapolis, IN</td>
<td>9.7</td>
</tr>
<tr>
<td>6</td>
<td>San Juan, PR</td>
<td>9.5</td>
</tr>
<tr>
<td>7</td>
<td>Milwaukee, WI</td>
<td>9.4</td>
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<td>8</td>
<td>Fort Worth, TX</td>
<td>9.0</td>
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<tr>
<td>9</td>
<td>Jacksonville, FL</td>
<td>8.2</td>
</tr>
<tr>
<td>10</td>
<td>Arlington, TX</td>
<td>8.2</td>
</tr>
<tr>
<td>11</td>
<td>Oklahoma City, OK</td>
<td>8.1</td>
</tr>
<tr>
<td>12</td>
<td>District of Columbia</td>
<td>7.9</td>
</tr>
<tr>
<td>13</td>
<td>Nashville-Davidson, TN</td>
<td>7.8</td>
</tr>
<tr>
<td>14</td>
<td>Columbus, OH</td>
<td>7.6</td>
</tr>
<tr>
<td>15</td>
<td>Colorado Springs, CO</td>
<td>7.6</td>
</tr>
<tr>
<td>16</td>
<td>Dallas, TX</td>
<td>7.5</td>
</tr>
<tr>
<td>17</td>
<td>Chicago, IL</td>
<td>7.5</td>
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<tr>
<td>18</td>
<td>Fresno, CA</td>
<td>7.4</td>
</tr>
<tr>
<td>19</td>
<td>Tulsa, OK</td>
<td>7.3</td>
</tr>
</tbody>
</table>
2010 INFANT DEATHS CONFIRM NEED FOR ACTION

Ohio lags behind many states, nation and most developed countries

Ohio’s high infant mortality rate has stayed the same from 2006 through 2010 and hasn’t changed substantially in over a decade, according to the latest figures released by the Ohio Department of Health’s Center for Public Health Statistics and Informatics. The infant mortality rate, the number of live-born babies per thousand who die before their first birthday, is widely considered the most important index of the overall health of a society and how well that society cares for its women and children. Ohio’s rate of 7.7 is higher not only than that of most other states but also the preliminary U.S. rate of 6.14. Each one of the 1,068 Ohio infant deaths in 2010 represents a family tragedy and often a financial blow to Ohio’s businesses and taxpayers.

The National Center for Health Statistics ranks Ohio as having the eleventh highest rate of infant mortality among the states. Ohio’s rate also exceeds the rates of all surrounding states for 2008, the latest year available for comparison with other states.

There is also a substantial difference in how infant mortality impacts babies of different races. Ohio’s African-American babies are dying at more than twice the rate of white babies. Ohio’s death rate for white infants in both 2009 and 2010 was 6.4, higher than the preliminary 2010 national rate of 5.19. During this same time period, the rate for Ohio’s African-American infants increased from 14.2 to 15.5, exceeding the preliminary national rate of 11.6. This disparity, or difference in the rate of death for African-American babies compared to white babies, is a major concern to those working to reduce infant deaths.
California’s Infant Mortality Rate Reaches Historic Low

• 5/22/2012

• California’s infant mortality rate has reached a record low, announced Dr. Ron Chapman, state health officer and director of the California Department of Public Health (CDPH). In 2010, the most recent year data are available, the rate was 4.7 infant deaths per 1,000 live births, down from 4.9 infant deaths per 1,000 live births in 2009. Infant mortality is defined as the number of deaths in infants under one year of age.

• B-IMR: 9.5, W-IMR: 4.1
During 2010 the NYC B-IMR: 8.6, W-IMR: 2.8

Figure 11. Infant Mortality Rate, New York City, 1898-2010

The infant mortality rate reached a new historic low of 4.9 infant deaths per 1,000 live births in 2010.
2010 Infant Mortality Rate, United States

National Rate: 6.2
Healthy People 2020 Objective: 6.0
Ohio ranks #47

Source: National Center for Health Statistics
2010 White Infant Mortality Rate, United States

National Rate: 5.2
Ohio ranks #38

Source: National Center for Health Statistics
2010 Black Infant Mortality Rate, United States

Source: National Center for Health Statistics

National Rate: 11.6

#50: Indiana
#49: Ohio*
#48: Wisconsin
#47: Virginia
#46: Michigan
What if we graded States by their rank?

State Rankings and Grades:

<table>
<thead>
<tr>
<th>Rank Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>1-10</td>
<td>A</td>
</tr>
<tr>
<td>11-20</td>
<td>B</td>
</tr>
<tr>
<td>21-30</td>
<td>C</td>
</tr>
<tr>
<td>31-40</td>
<td>D</td>
</tr>
<tr>
<td>41-50</td>
<td>F</td>
</tr>
</tbody>
</table>

What would Ohio’s grade be?

- Overall IMR rank in 2010: #47
- White IMR rank in 2010: #38
- Black IMR rank in 2010: #49*
From 2000-2010:
• Ohio’s Overall IMR got 3% worse and
• USA Overall IMR improved by 11%
• Gap or disparity between Ohio and the Nation increased.

Healthy People 2020 goal for Infant Mortality: 6/1000
2011
Ohio Infant Mortality Rate - 2011

DEATHS PER 1,000 LIVE BIRTHS

OVERALL: 7.9
WHITE: 6.3
BLACK: 15.8
HISPANIC: 5.7

ODH
Ohio Infant Mortality Rate – 2011 (c/w Ohio Rates from 2010)

<table>
<thead>
<tr>
<th></th>
<th>Total:</th>
<th>White:</th>
<th>Black:</th>
<th>Hispanic:</th>
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</thead>
<tbody>
<tr>
<td>2010</td>
<td>7.9</td>
<td>6.3</td>
<td>15.8</td>
<td>5.7</td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ODH
Ohio Infant Mortality Rate – 2011
(c/w USA , 2011)

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>6.05</td>
<td>5.05</td>
<td>11.42</td>
<td>5.27</td>
</tr>
<tr>
<td>USA</td>
<td>6.05</td>
<td>5.05</td>
<td>5.27</td>
<td>5.27</td>
</tr>
</tbody>
</table>

ODH/NVSS
Recent Declines in Infant Mortality in the United States, 2005–2011

Marian F. MacDorman, Ph.D.; Donna L. Hoyert, Ph.D.; and T.J. Mathews, M.S.

Key findings

- Following a plateau from 2000 through 2005, the U.S. infant mortality rate declined 12% from 2005 through 2011. Declines for neonatal and postneonatal mortality were similar.
- From 2005 through 2011, infant mortality declined 16% for non-Hispanic black women and 12% for non-Hispanic white women.

Infant mortality is an important indicator of the health of a nation (1,2). This report describes the recent decline in the U.S. infant mortality rate from 2005 through 2011. Changes in infant mortality rates over time are examined by age at death, maternal race and ethnicity, cause of death, and state. The linked birth/infant death data set (linked file) is generally the preferred source for infant mortality rates by race and ethnicity (3,4). This is particularly important for racial and ethnic groups other than non-Hispanic white, non-Hispanic black, and Hispanic. For these three groups, rates calculated from the mortality and linked files have been very similar for many years, and trends are unlikely to differ (3–5). Thus, data from the mortality file are used for this analysis because of their greater timeliness (3,6). Data for 2011 are preliminary (6). Because preliminary data are not available by state, data for the 2005–2010 period were used for the geographic analysis.

http://www.cdc.gov/nchs/data/databriefs/db120.pdf
Recent Declines in Infant Mortality in the United States, 2005-2011

- Following a plateau, from 2000 through 2005, the US IMR declined 12% from 2005-2011.
  - Declines in the neonatal and postneonatal mortality rates were similar
- From 2005-2011 IMR declined
  - 16% for Black women
  - 12% for White women
  - 9% for Hispanic women
- IMR declined for 4 of the 5 leading causes of infant death from 2005-2011.
New Targets for Infant Mortality

Based on recent trends, SACIM recommends that the targets should be “five-five by fifteen” and “four-five by twenty” – that is, aim to reduce the infant mortality to 5.5 per 1,000 by 2015, and to 4.5 by 2020.

Trend in U.S. Infant Mortality Rate, Actual and Projected to 2020

Turning up the Volume on Infant Mortality: Every Baby Matters!
Areas to address to improve Infant Mortality:

1. Prematurity
2. Congenital Anomalies
3. Sudden Unexplained Infant Deaths
4. Drug/Etoh Use During Pregnancy
5. Breastfeeding
6. Smoking cessation
7. Care Issues
8. Family Planning
9. Policy
10. Decreasing Teen Birth Rate
11. Education/Marketing
12. Eliminating Racial Disparity in Birth Outcomes
13. SDOH/Lifecourse
14. Fund Raising
15. Violence (Domestic/Childhood, i.e., Shaken Baby)
16. BEST BABY ZONES
Areas to address to improve Infant Mortality:

1. Prematurity
2. Congenital Anomalies
3. **Sudden Unexplained Infant Deaths / Safe Sleep**
4. Drug/Etoh Use During Pregnancy
5. Breastfeeding
6. Smoking cessation
7. Care Issues
8. Family Planning
9. Policy
10. Decreasing Teen Birth Rate
11. Education/Marketing
12. Eliminating Racial Disparity in Birth Outcomes
13. SDOH/Lifecourse
14. Fund Raising
15. Violence (Domestic/Childhood, i.e., Shaken Baby)
16. BEST BABY ZONES
Triple Risk Model

Critical Period of Development

First 6 months
- Most rapid growth
- Transition from intrauterine environment
- Vulnerable (premature, ill)

(Adapted from Filiano and Kinney, 1994)
Triple Risk Model

Critical Period of Development

First 6 months

Vulnerable Infant

Possible Brainstem Dysfunction

(Adapted from Filiano and Kinney, 1994)
Triple Risk Model

Critical Period of Development

Vulnerable Infant

Environmental Stressors

First 6 months

Tummy/Side Sleep Position

Smoking Exposure

Soft Bedding

Overheating

Bed sharing

Possible Brainstem Abnormality

(Adapted from Filiano and Kinney, 1994)
Triple Risk Model

- **Critical Period of Development**
  - First 6 months
  - Tummy/Side Sleep Position
  - Smoking Exposure
- **Environmental Stressors**
  - Soft Bedding
  - Overheating
  - Bed sharing
- **Vulnerable Infant**
  - Possible Brainstem Abnormality

- **HIGHEST RISK FOR SLEEP RELATED DEATH**

(Adapted from Filiano and Kinney, 1994)
Modifiable Risk Factors

Modifiable risk factors:

- Smoking
- Prematurity
- Alcohol and Illicit drugs
- Hypoxia
- Growth restriction

Extrinsic Risk factors:

- Prone/Side sleep position
- Soft Bedding
- Overbundling/Overheating
- Bed sharing
- Bed sharing + smoking or alcohol

Environmental Stressors
Level A Recommendations:

1. Back to sleep for every sleep
2. Use a firm sleep surface
3. Room-sharing without bed-sharing is recommended
4. Keep soft objects and loose bedding out of the crib
5. Pregnant women should receive regular prenatal care
6. Avoid smoke exposure during pregnancy and after birth
7. Avoid alcohol and illicit drug use during pregnancy and after birth
8. Breastfeeding is recommended
9. Consider offering a pacifier at nap time and bedtime
10. Avoid overheating
11. Do not use home cardiorespiratory monitors as a strategy for reducing the risk of SIDS
12. Expand the national campaign to reduce the risks of SIDS to include a major focus on the safe sleep environment and ways to reduce the risks of all sleep-related infant deaths, including SIDS, suffocation, and other accidental deaths; pediatricians, family physicians, obstetricians, and other primary care providers should actively participate in this campaign.
SIDS and Other Sleep-Related Infant Deaths: Recommendations for a Safe Infant Sleeping Environment:
PEDIATRICS: vol #128, #5, October 2011

Level B Recommendations:

1. Infants should be immunized in accordance with recommendations of the AAP and Centers for Disease Control and Prevention.
2. Avoid commercial devices marketed to reduce the risk of SIDS
3. Supervised, wake tummy time is recommended to facilitate development and to minimize development of positional plagiocephaly
Level C Recommendations:

1. Health care professionals, staff in newborn nurseries and NICUs, and child care providers should endorse the SIDS risk-reduction recommendations from birth *(start during provision of prenatal care)*

2. Media and manufacturers should follow safe-sleep guidelines in their messaging and advertising

3. Continue research and surveillance on the risk factors, causes, and pathophysiological mechanisms on SIDS and other sleep-related infant deaths, with the ultimate goal of eliminating these deaths entirely
SIDS Rate and Sleep Position, 1988-2003
(Deaths per 1,000 Live Births)

Year | SIDS Rate | Percent Back Sleeping
--- | --- | ---
1988 | 1.4 | 0
1989 | 1.39 | 0.5
1990 | 1.3 | 1
1991 | 1.3 | 1.5
1992 | 1.2 | 50
1993 | 1.17 | 100
1994 | 1.03 | 0
1995 | 0.87 | 26.9
1996 | 0.74 | 35.3
1997 | 0.77 | 53.1
1998 | 0.72 | 55.7
1999 | 0.67 | 64.4
2000 | 0.62 | 66.6
2001 | 0.56 | 71.6
2002 | 0.57 | 71.1
2003 | 0.53 | 72.8


Source: NCHS/CDC
Areas to address to improve Infant Mortality:

1. Prematurity
2. Congenital Anomalies
3. Sudden Unexplained Infant Deaths
4. Drug/Etoh Use During Pregnancy

5. Breastfeeding

6. Smoking cessation
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16. BEST BABY ZONES
“Breastfeeding and human milk are the normative standards of infant feeding and nutrition. Given the documented short- and long-term medical and neurodevelopmental advantages of breastfeeding, infant nutrition should be considered a public health issue and not only a lifestyle choice. The American Academy of Pediatrics reaffirms its recommendation of exclusive breastfeeding for about 6 months, followed by continued breastfeeding as complementary foods are introduced, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant”.
Breastfeeding and the Use of Human Milk:

PEDIATRICS: vol 129, #3, March 2012

<table>
<thead>
<tr>
<th>Healthy People Targets:</th>
<th>2007</th>
<th>2010 Target:</th>
<th>2020 Target:</th>
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</thead>
<tbody>
<tr>
<td>Any Breastfeeding:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever:</td>
<td>75.0</td>
<td>75</td>
<td>81.9</td>
</tr>
<tr>
<td>6 months:</td>
<td>43.8</td>
<td>50</td>
<td>60.5</td>
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<tr>
<td>1 year:</td>
<td>22.4</td>
<td>25</td>
<td>34.1</td>
</tr>
<tr>
<td>Exclusive Breastfeeding:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>To 3 mo.</td>
<td>33.5</td>
<td>40</td>
<td>44.3</td>
</tr>
<tr>
<td>To 6 mo.</td>
<td>13.8</td>
<td>17</td>
<td>23.7</td>
</tr>
<tr>
<td>Worksite lactation support:</td>
<td>25</td>
<td>---</td>
<td>38.0</td>
</tr>
<tr>
<td>Formula use in first 2 days:</td>
<td>25.6</td>
<td>---</td>
<td>15.6</td>
</tr>
</tbody>
</table>
Percentage of births with breastfeeding at discharge (by County, 2010)
Breastfeeding and the Use of Human Milk:

PEDIATRICS: vol 129, #3, March 2012

Infant Benefits:

1. Risk of hospitalization for lower respiratory tract infections in the first year is reduced 72% in infants exclusively breastfed for more than 4 months.

2. Any breastfeeding is associated with a 64% reduction in the incidence of nonspecific gastrointestinal tract infections, and this last for at least 2 months after cessation of breastfeeding.

3. Necrotizing Enterocolitis: feeding preterm infants human milk is associated with a significant reduction (58-77%) in the incidence of NEC.

4. Sudden Infant Death Syndrome and Infant Mortality: breastfeeding is associated with a 36% reduced risk of SIDS...independent of sleep position.

a. Calculated that more than 900 infants lives may be saved in the USA if 90% of mothers exclusively breastfed for 6 months.
Breastfeeding and the Use of Human Milk:
PEDIATRICS: vol 129, #3, March 2012

Infant Benefits: (continued)

5. Allergic Disease: There is a protective effect of exclusive breastfeeding for 3-4 months in reducing the incidence of clinical asthma, atopic dermatitis, and eczema by 27% in a low-risk population and up to 42% in infants with positive family history.

6. Celiac Disease: reduction of 52% in the risk of developing celiac disease in infants who were breastfed at the time of gluten exposure.
   a. The critical protective factor appears to be not the timing of the gluten exposure but the overlap of breastfeeding at the time of the initial gluten ingestion.

7. Inflammatory Bowel Disease: breastfeeding is associated with a 31% reduction in the risk of childhood inflammatory bowel disease.

8. Obesity: there is a 15-30% reduction in adolescent and adult obesity rates if any breastfeeding occurred in infancy c/w no breastfeeding.
Infant Benefits: (continued)

9. Diabetes: Up to **30% reduction in the incidence of type I diabetes mellitus** is reported for infants who exclusively breastfed for at least 3 months.

10. Childhood Leukemia and Lymphoma: There is a **reduction in leukemia** that is correlated with the duration of breastfeeding.
   a. If breastfed for 6 months:
      i. 20% reduction in the risk of acute lymphocytic leukemia
      ii. 15% reduction in the risk of acute myeloid leukemia

11. Neurodevelopmental Outcomes: (confounded by differences in parental education, intelligence, home environment, and SES)...adjusted outcomes of intelligence scores and teacher’s ratings are significantly greater in breastfed infants.

12. Preterm infants: The potent benefits of human milk are such that all preterm infants should receive human milk (mother’s own, fresh or frozen, fortified appropriately for the infant weighing less than 1.5kg)
   a. Lower rates of sepsis and NEC
   b. Fewer hospital readmissions
   c. Improved neurodevelopmental outcomes
Breastfeeding and the Use of Human Milk:

PEDIATRICS: vol 129, #3, March 2012

Maternal Benefits:

1. Decreased postpartum blood loss and more rapid involution of the uterus.
2. Increase in child spacing (secondary to lactational amenorrhea)
3. Decrease in postpartum depression
4. Decrease in the rate of abuse/neglect
5. Inconclusive regarding overall effect of breastfeeding and rate of weight loss.
6. In mothers w/o GDM, breastfeeding duration was associated with a decreased risk of type II diabetes mellitus...for each year of breastfeeding, there was a decreased risk of 4-12%.
7. Cumulative lactational experience correlates with a reduction in both breast (primarily premenopausal) and ovarian cancers
   a. Cumulative duration of breastfeeding of longer than 12 months is associated with a 28% decrease in breast cancer and ovarian cancer.
Economic Benefits:

1. “A detailed pediatric cost analysis based on the AHRQ report concluded that if 90% of US mothers would comply with the recommendation to breastfeed exclusively for 6 months, there would be a savings of $13 billion per year.”

a. These savings do not include those related to a reduction in parental absenteeism from work or adult deaths from diseases acquired in childhood, such as asthma, type I diabetes mellitus, or obesity-related conditions.
Breastfeeding and the Use of Human Milk:

PEDIATRICS: vol 129, #3, March 2012

Contraindications to Breastfeeding:

1. Mothers who are + for human T-cell lymphotrophic virus type I or II
2. Mothers with untreated Brucellosis
3. Mothers with active (infectious) untreated tuberculosis
   a. BF can resume when mother has been treated for two weeks and is documented that she is no longer infectious.
4. Active HSV on the breast
   a. Expressed milk can be used because there is no concern about these infectious organisms passing through the milk.
5. Mothers who develop Varicella 5 days before through 2 days after delivery should be separated from their infants, but their expressed breast milk can be used for feeding.
6. In 2009 the CDC recommended that mothers acutely infected with H1N1 influenza should temporarily be isolated from their infants until they are afebrile, but they can provide expressed milk for feeding.
2012:
The number of Ohio resident births has stabilized after declining over past 5 years.

- **2007 to 2011**: declined by 12,760 births (-8.5%)
- **2011 to 2012**: increased by 255 births (+0.2%)

Source: Live birth certificates, Office of Vital Statistics, Ohio Department of Health
The number of Ohio resident infant deaths is slowly declining over time from 1,163 in 2007 to 1,045 in 2012.

- 2007 to 2010: declined by 95 infant deaths (-8.2%)
- 2010 to 2011: increased by 22 infant deaths (+2.1%)
- 2011 to 2012: decreased by 41 infant deaths (-3.8%)

Source: Death certificates, Office of Vital Statistics, Ohio Department of Health
### Infant mortality, Ohio residents, 2007-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Infant deaths</th>
<th>Births</th>
<th>Infant Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,163</td>
<td>150,784</td>
<td>7.71</td>
</tr>
<tr>
<td>2008</td>
<td>1,144</td>
<td>148,592</td>
<td>7.70</td>
</tr>
<tr>
<td>2009</td>
<td>1,109</td>
<td>144,569</td>
<td>7.67</td>
</tr>
<tr>
<td>2010</td>
<td>1,068</td>
<td>139,034</td>
<td>7.68</td>
</tr>
<tr>
<td>2011</td>
<td>1,086</td>
<td>138,024</td>
<td>7.87</td>
</tr>
<tr>
<td>2012 (provisional)</td>
<td>1,045</td>
<td>138,279</td>
<td>7.56</td>
</tr>
</tbody>
</table>

Source: Office of Vital Statistics, Ohio Department of Health

\[
\text{IMR} = \left( \frac{\text{# infant deaths}}{\text{# live births}} \right) \times 1,000
\]
Infant mortality rates, Ohio and US, 1990-2012

Source: Office of Vital Statistics, Ohio Department of Health
Infant mortality rates by race, Ohio residents, 2007-2012

Black/White disparity declined from 2.49 higher in 2011 to 2.19 higher in 2012

Source: Office of Vital Statistics, Ohio Department of Health
X = HP 2020: IMR Rate Goal = 6
Ohio Infant Mortality Rates, 2010-2012, Total, White, Black:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>White</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>7.7</td>
<td>6.42</td>
<td>15.47</td>
</tr>
<tr>
<td>2011</td>
<td>7.87</td>
<td>6.41</td>
<td>15.96</td>
</tr>
<tr>
<td>2012</td>
<td>7.56</td>
<td>6.37</td>
<td>13.98</td>
</tr>
</tbody>
</table>

Source: Office of Vital Statistics, Ohio Department of Health, HP 2020 Goal for IMR = 6.0
Definitions and Timeline of Infant Mortality:

- **Birth** 28 Days
- **1 Year**

- **Neonatal Death**
  - Anomalies
  - Preterm births
  - About 2/3 of infant deaths

- **Post-Neonatal Death**
  - Sudden Unexpected Infant Deaths
  - About 1/3 of infant deaths

**Infant Death**

[2/3 of all Childhood deaths (deaths between birth and 18yo) occur during the first year of life: infant mortality]
Neonatal and Post-neonatal mortality rates, Ohio residents, 2007-2012

Source: Office of Vital Statistics, Ohio Department of Health
HP 2020 goals: x = NMR of 4.1, Y= PNMR of 2.0
Neonatal and Post-neonatal mortality rates by race, Ohio residents, 2007-2012

Source: Office of Vital Statistics, Ohio Department of Health
HP 2020 goals: \( x = \text{NMR of 4.1}, \ Y = \text{PNMR of 2.0} \)
B/W: NMR is 2.1, PNMR is 2.27
Ohio Neonatal Mortality Rates, 2010-2012, Total, White, Black:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>White</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>5.21</td>
<td>4.51</td>
<td>9.84</td>
</tr>
<tr>
<td>2011</td>
<td>5.25</td>
<td>4.18</td>
<td>11.01</td>
</tr>
<tr>
<td>2012</td>
<td>5.18</td>
<td>4.42</td>
<td>9.29</td>
</tr>
</tbody>
</table>

The NMR is down 1.3% for all races with a 5.7% increase among whites and a 15.6% decrease among blacks.

Source: Office of Vital Statistics, Ohio Department of Health, x = HP 2020 Goal for NMR of 4.1
The PNMR is down 9.9% for all races with a 12.2% decrease for whites and a 5.3% decrease among blacks.

Pre-term birth rates by race, Ohio, 2007-2012

Source: Office of Vital Statistics, Ohio Department of Health

2020 Goals:
Y = MoD: 9.6%
X = HP: 11.4%
Low birth weight rates by race, Ohio, 2007-2012

Source: Office of Vital Statistics, Ohio Department of Health
X = HP 2020 Goal: 7.8%
“Peek” at 1st 6 months of 2013:

<table>
<thead>
<tr>
<th>Age</th>
<th>2012</th>
<th>2013</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate</td>
<td>350</td>
<td>353</td>
<td>+3</td>
</tr>
<tr>
<td>Postneonate</td>
<td>167</td>
<td>145</td>
<td>-22</td>
</tr>
</tbody>
</table>

Source: Office of Vital Statistics, Ohio Department of Health
Ohio IMR: 1980-2012 (total)

* 2012 data is preliminary
Ohio IMR: 1980-2012 (total, white, “non-white/black”)

* 2012 data is preliminary
Ohio IMR: 1980-2012 (white and “non-white/black”)

* 2012 data is preliminary
If the preliminary black IMR for 2012 of 13.98 is “finalized”, it will represent an historic low for black infant mortality in Ohio.

* 2012 data is preliminary
Ohio IMR: 1980-2012 (white & “non-white/black”)

* 2012 data is preliminary
The preliminary Ohio black IMR in 2012 remains higher than the Ohio white IMR was in 1980! There is about a 40 year interval for the b-imr to “catch-up” to where the w-imr was. That means, if we continue at this pace that it will be 2052 before black babies born in Ohio experience the same rate of survival as white babies do today.

* 2012 data is preliminary
Ohio Infant Mortality: Just the Facts:

• FACT: Ohio is #7 for the number of babies delivered in the United States

• FACT: in 2010, Ohio ranked #38 for White infant mortality rate

• FACT: in 2010, Ohio ranked #47 for Overall infant mortality rate

• FACT: in 2010, Ohio ranked #49 for Black Infant mortality rate, making us next to the worst State in the Nation for a Black baby to be born

• FACT: WE CAN DO BETTER!
It’s a medical problem... so why should I get involved?

It’s too complicated

It cost too much money

There’s death behind that door so I don’t want to go there...

Ohio Infant Mortality

It’s all because of behavior

THOSE families just don’t care

It’s just the way that it is

It can’t be fixed
This is the way infant mortality and reducing racial disparities in birth outcomes look to some of us.

If we can avoid being overwhelmed...we can learn how to overcome our “Goliath.”
Infant Mortality:

- Premature Births
- Congenital Anomalies
- SUID
- Maternal pregnancy Complications
- Placental or cord anomalies
Infant Mortality:

- Premature Births
- Congenital Anomalies
- SUID
- Maternal pregnancy Complications
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Social Determinants/Lifecourse:
Disparities in Birth Outcomes:

Social Determinants of Health:

- Racism
- Fatherless households
- Poverty
- Limited Access to Care
- Under-Education
- Lower graduation rates
- Teen Births
- Nutrition
- Substance Use
- Family Support
- Poor Working Conditions
- Weathering
- Housing
- Incarceration rates
- Unemployment
- Hopelessness
- Stress
- Smoking
- "Medical baggage"
- Weathering
- Nutrition
- Under-Education
- Limited Access to Care
- Fatherless households
- Poverty
- Racism

A. R. James
Social Determinants of Health

“The conditions in which people are born, grow, live, work and age. The SDOH influence our health more than anything else. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels. The social determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status seen within and between countries... (States, and different groups within local communities)”

The World Health Organization
Disparities in Birth Outcomes:

Social Determinants of Health:

- Racism
- Fatherless households
- Poverty
- Limited Access to Care
- Under-Education

Housing
No Insurance
Neighborhoods
Incarceration rates
Unemployment
Hopelessness

Policies
“Medical baggage”
Smoking

Stress
Substance Use

Weathering

Family Support
Poor Working Conditions
Teen Births
Nutrition

Lower graduation rates

A. R. James
What You can do:

Statewide:
• Promote Breastfeeding
• Safe Sleep
• Smoking Cessation
• Progesterone/OPQC
• Preconception/Inter-conception care
• Decrease incidence of unintended/unwanted pregnancies
  — Birth Spacing
• Presumptive Eligibility
• Join the Ohio Collaborative to Prevent Infant Mortality
• Join in with local hospital efforts to improve infant mortality
• Medicaid Expansion: Ohio became the 25th State to expand health care access

Community
• Initiate community conversations about infant mortality
• Join existing efforts in your communities:
  — CFHS
  — MoD
  — OIMRI: 14 sites
  — Ohio Institutes for Equity in Birth Outcomes: 9 sites
  — Healthy Babies: 2 sites
• Assist with clinical penetrance AND improve social well-being in the most under-resourced segments of your communities
• Broaden the infant mortality conversation to include SDOH/Lifecourse perspectives
  — Education (graduation rates), Employment, Crime Rates, Parks and Recreation, Housing, Public Safety
  — Incarceration Rates, Poverty
• Figure out ways to encourage COLLABORATION
  — Collaboration: “an unnatural act performed by non-consenting adults”
• TURN UP the VOLUME/EVERY BABY MATTERS!
We cannot solve this for Ohio, we have to solve this with Ohio
We cannot solve this for Ohio, we have to solve this with Ohio
We cannot solve this for Ohio, we have to solve this with Ohio
11/28/2012: 1st Ohio Infant Mortality Summit
Turning up the Volume on Infant Mortality
Every Baby Matters!
Every Baby Matters...

- White, Black, Brown, or Yellow
- Rich or Poor
- Rural or Urban
- From the North, South, East or West
- Republican or Democrat
- From a family that is “Right-to-Life” or “Pro-Choice”
- Citizen or Immigrant
- Teen or Older Mom
- Whether or not Mom uses drugs, drinks Alcohol, or smokes cigarettes
- College graduate or not, our position is that...

Any baby who takes his or her first breath within the borders of Ohio is our responsibility and we can and must do better!
MoD Conf.: Columbus, Cincinnati, Cleveland
Every Baby Matters!
Arthur.James2@osumc.edu
(614) 293-4929