Reducing Infant Mortality: a Perinatal Periods of Risk Analysis of Fetal-Infant Mortality in King County, WA

Adverse Birth Outcomes Advisory Committee
Governor’s Interagency Council on Health Disparities
February 26, 2015
Perinatal Periods Of Risk (PPOR) Approach – Why?

• A *simple approach* that can be used by communities nationwide.

• An approach that can *identify preventable deaths* in the community.

• An approach that can *target resources* for prevention activities.

• An approach that can *mobilize the community* to action.
The cells in the PPOR MAP help indicate the actions needed.

These four groups are given labels that suggest the primary preventive strategy for preventing the deaths in that group.
Maternal Health/Prematurity

Issues

• Preconceptional Health

• Health Behaviors

• Perinatal Care

Interventions

• Perinatal outreach and education to promote early entry to high quality prenatal care and provide support

• Pre- and post-conception genetic counseling

• Promote access to health care, substance abuse treatment
Maternal Care

Issues
• Access to high quality, continuous prenatal care
• High-risk referral as needed
• Management of medical conditions

Interventions
• Perinatal outreach to promote early entry to high quality, continuous prenatal care
• System of care for high risk pregnancies, with uniform transport policies, accessible to all
Newborn Care

Issues

- Access to neonatal intensive care
- Early and continuous neonatal care
- Pediatric surgery

Interventions

- Early post-birth visits
- Outreach to promote ongoing pediatric care
- Advanced neonatal care
- System of care for high risk infants, with uniform transport policies, accessible to all
Infant Health

Issues
• Sudden Unexplained Infant Death (SUID), Sleep position
• Breast-feeding
• Accidents/injury
• Child abuse/neglect
• Infection

Interventions
• Safe to Sleep campaigns
• Car seat safety
• Breastfeeding
• Ongoing family support
• Access to a medical home
• Reduce substance use
Definitions and Data Sources

• Fetal death (Fetal Death Certificates)
  – 24+ weeks gestation, 500+g birthweight

• Infant death (Linked Birth-Infant Death File data)
  – Neonatal (0-27 days)
  – Postneonatal (28 days - 1 year)

• Live births: remainder of live birth cohort (Birth Certificate data)
Included in the Analysis

- **Fetal Deaths**
  - 24+ weeks gestation
  - 500 grams or more
- **Infants**
  - 500 grams or more
- **Excludes spontaneous and induced abortions**
Study Population

- Births to King County residents
- Comparison to Washington State

- Analysis Groups
  - White non-Hispanic
  - African American non-Hispanic
  - American Indian/Alaskan Native
  - Hispanic
  - Asian and Pacific Islander
AIAN in Washington State

• 29 Federally Recognized Tribes
• 3 Tribes with Pending Federal Recognition
• 2 Urban Indian Health Organizations: Spokane & Seattle

• Population: 198,998
• Non reservation Population: Approx. 83% (2010 Census)
• ¾ live in urban areas; 1 in 5 live in King County

Population Data Source: US Census Bureau, 2010 Census; 2009-2011 American Community Survey
Black/African Americans in Washington State

- Population: 325,004
- Almost half live in King County
- 1 in 5 speak a language other than English at home (1 in 3 in King County)
- About 1 in 4 live in poverty

Population Data Source: US Census Bureau, 2010 Census; 2009-2013 American Community Survey
Steps for PPOR Analysis

1. Identify reference group
   King County, white non-Hispanic; age 20+ years; 13+ years education

2. Calculate birthweight proportionate mortality rates (BWPMR) in each cell for both groups

   \[
   BWPMR = \frac{\text{# deaths in cell}}{\text{# births (still+live) in matrix}} \times 1,000
   \]

3. Calculate excess mortality: BWPMR for group of interest minus BWPMR for standard.

   \[
   BWPMR_{(\text{group of interest})} - BWPMR_{(\text{reference})}
   \]
Perinatal Periods Of Risk (PPOR) Use

• Examine the four “Periods of Risk”
• Identify the groups and periods of risk with the most deaths and the highest rates.
• Use a comparison group to estimate “excess or preventable deaths” for these groups and periods of risk.
• Comparison group: white non-Hispanic; > 20 years of age; > 13 years of education
King County Excess FIMR
(Deaths/1000 Births) 2008-2012

White NH (0.2)

African-Am NH (5.6)

AI/AN NH* (8.4)

API (1.1)

Hispanic (2.4)

King County (2.1)

*Washington analysis
Perinatal Periods of Risk Identifies Number of Preventable Deaths
King County, WA 2008-2012

*Washington State data shown/ King County preventable deaths ~ 9 overall.
Numbers do not add to total due to missing information for some deaths.
NH=non-Hispanic, AIAN=American Indian/Alaska Native NH, API=Asian/Pacific Islander NH.

<table>
<thead>
<tr>
<th></th>
<th>King NH</th>
<th>White NH</th>
<th>African Am. NH</th>
<th>AIAN*</th>
<th>API</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mat. Health/ Prematurity</td>
<td>71</td>
<td>21</td>
<td>18</td>
<td>19</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Maternal Care</td>
<td>66</td>
<td>6</td>
<td>15</td>
<td>16</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Newborn Care</td>
<td>57</td>
<td>25</td>
<td>13</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Infant Health</td>
<td>70</td>
<td>-40</td>
<td>16</td>
<td>31</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>265</strong></td>
<td><strong>12</strong></td>
<td><strong>62</strong></td>
<td><strong>71</strong></td>
<td><strong>28</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>
Perinatal Periods of Risk Identifies Number of Preventable Deaths Washington State 2008-2012

<table>
<thead>
<tr>
<th></th>
<th>WA State</th>
<th>White NH</th>
<th>African Am. NH</th>
<th>AIAN</th>
<th>API</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mat. Health/Prematurity</td>
<td>316</td>
<td>153</td>
<td>49</td>
<td>19</td>
<td>23</td>
<td>48</td>
</tr>
<tr>
<td>Maternal Care</td>
<td>310</td>
<td>105</td>
<td>36</td>
<td>16</td>
<td>31</td>
<td>47</td>
</tr>
<tr>
<td>Newborn Care</td>
<td>136</td>
<td>78</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>Infant Health</td>
<td>381</td>
<td>229</td>
<td>32</td>
<td>31</td>
<td>19</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,143</strong></td>
<td><strong>565</strong></td>
<td><strong>123</strong></td>
<td><strong>71</strong></td>
<td><strong>74</strong></td>
<td><strong>180</strong></td>
</tr>
</tbody>
</table>

Numbers do not add to total due to missing information for some deaths.
NH=non-Hispanic, AIAN=American Indian/Alaska Native NH, API=Asian/Pacific Islander NH.
Preconception Health
Health Behaviors
Perinatal Care
+ EXPAND STRATEGIES to address social factors giving rise to disparities

Prenatal Care
High Risk Referral Obstetric Care

Perinatal Management
Neonatal Care
Pediatric Surgery

Safe Sleep
Breast Feeding
Substance Use
Injury Prevention
Perinatal Periods of Risk Identifies Preventive Action Opportunities

Maternal Health/ Prematurity

- Preconception Health
- Health Behaviors
- Perinatal Care
- + EXPAND STRATEGIES to address social factors giving rise to disparities

Diving deeper,
Birth weight distribution accounts for 54% of the statewide African American excess mortality rate compared to an average statewide of 28%. This suggests that the excess deaths are due to a higher frequency of prematurity/very low birth weight.

AIAN excess deaths due to higher mortality rates among very low birth weight babies.
Most infant deaths occur in the neonatal period

- Neonatal: 70%
- Postneonatal: 30%

King County, 2008-2012
Causes of Infant Mortality

**WA State**
- SIDS, 301
- Prematurity, 344
- Other Infection, 270
- Other Misc., 95
- Maternal Conditions, 19
- Congenital Anomalies, 494
- Labor & Delivery Cond., 473

**King County**
- SIDS, 92
- Prematurity, 77
- Other Infection, 68
- Other Misc., 8
- Maternal Conditions, 4
- Congenital Anomalies, 115
- Labor & Delivery Cond., 121
Lack of Social Support During Pregnancy, by Race/Ethnicity, King County, 2007-2011

No one to....

<table>
<thead>
<tr>
<th>Activity</th>
<th>African American NH</th>
<th>American Indian/Alaska Native NH</th>
<th>Asian/PI NH</th>
<th>Hispanic</th>
<th>White NH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan me $50</td>
<td>33</td>
<td>35</td>
<td>22</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>Help me if need to be in bed</td>
<td>*</td>
<td>*</td>
<td>16</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td>Take me to clinic/doctor's if needed a ride</td>
<td>*</td>
<td>*</td>
<td>15</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Talk with about my problems</td>
<td>*</td>
<td>*</td>
<td>16</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>Lack full support</td>
<td>41</td>
<td>33</td>
<td>37</td>
<td>31</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Pregnancy Risk Assessment Monitoring System
High Level of Stressful Life Events (6+) in the year before birth, by Race/Ethnicity, King County, 2007-2011

- **King County Overall**: 4
- **Black/African American NH**: 10
- **AIAN**: 14
- **Asian/PI**: 2
- **Hispanic**: 5
- **White NH**: 2

Source: Pregnancy Risk Assessment Monitoring System
Perinatal Periods of Risk Identifies Preventive Action Opportunities

Infant Health

Safe Sleep
Breast Feeding
Substance Use
Injury Prevention

Diving deeper:
What causes of death are contributing to excess mortality in this box?
Leading Causes of Postneonatal Mortality

King County

- SIDS, 80
- Congenital Anomalies, 28
- External Causes, 18
- Other Infection, 43
- Prematurity, 6
- Other Misc., 6
- Labor & Delivery Cond., 4
- Maternal Conditions, 0
Leading Causes of Postneonatal Mortality, 2008-2012

- Congenital Anomalies, 146
- SIDS, 263
- External Causes, 118
- Prematurity, 20
- Other Infection, 153
- Other Misc., 58
- Labor & Delivery Cond., 16
- Maternal Conditions, 1

Seattle & King County
Postneonatal Mortality Causes, WA State

- **White NH**
  - Congenital Anomalies
  - Prematurity
  - Other Infection
  - Labor & Delivery
  - Maternal Cond.
  - Other Misc.

- **African American NH**
  - Congenital Anomalies
  - Prematurity
  - Other Infection
  - Maternal Cond.
  - Other Misc.
  - Labor & Delivery

- **AIAN NH**
  - Congenital Anomalies
  - Prematurity
  - Other Infection
  - Maternal Cond.
  - Labor & Delivery
  - Other Misc.

- **API NH**
  - Congenital Anomalies
  - Prematurity
  - Other Infection
  - Maternal Cond.
  - Labor & Delivery
  - Other Misc.

- **Hispanic**
  - Congenital Anomalies
  - SIDS
  - Maternal Cond.
  - Labor & Delivery
  - External Causes
  - Other Infection
  - Other Misc.
INSTITUTIONALIZED RACISM/Historical Trauma

- Discrimination
  - Health Care
  - Housing
  - Legal System
  - Employment
  - Refused care over IHS status

- Poverty
  - Affordable Housing
  - Moving frequently
  - Adequate Education
  - Employment
  - Access to Health Care
  - Perceived as wealthy

- Abuse
  - Institutional
  - Interpersonal
  - Cycles
  - Substance

- Internalized Racism
  - Hopelessness
  - Self-hatred and blame
  - Inability to see family/community as support
  - Ancestry seen as hindrance to life’s goals

STRESS

Direct Effects: Endocrine System Response - Increased cortisol levels, decreased immune function, increased vulnerability to infection, trigger onset of labor

Indirect Effects: Maternal Behaviors - Smoking, alcohol, substance use, poor nutrition, survival supersedes wellness

DISPARITIES IN BIRTH OUTCOME

Adapted from M. Dalila, IntraAfrikan Konnections
What More Needs to be Done:

- Use PPOR data to target prevention efforts and support the work of the community

- Support women
  - Recognize the impact of adverse childhood experiences across the life span
  - Prevention focus on pre-conception health, health behaviors, and specialized perinatal care services
  - Sustain programs that provide for early and continuous prenatal care services, referral of high-risk pregnancies and good medical management of medical problems

- Support infants
  - Support SIDS risk reduction, access to a medical home, injury prevention, early childhood development

- Support families
  - Invest in early childhood development, wrap-around support of families to address multiple needs

- Support communities
  - Foster community and individual resilience and social support
Thank you!

Eva Wong
Assessment, Policy Development & Evaluation Unit
Public Health-Seattle & King County
eva.wong@kingcounty.gov
206-263-8785