Perinatal Periods of Risk:
The Miami-Dade County Experience

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Background and History:

• Perinatal Periods of Risk (PPOR) is a comprehensive approach to help communities use data to reduce infant mortality

• Helps identify periods of risk and primary prevention areas for feto-infant death

• Originates from an assessment tool created for developing countries by Dr. Brian McCarthy and colleagues at the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC)

• Adapted and modified for use in the US by a City MatCH working group
“If some mothers and babies in our community or elsewhere in the nation already are achieving optimal birth outcomes in terms of lower feto-infant mortality, why should not all mothers and babies experience similar levels of lower mortality?”
Background Continued:

• Stage 1: Readiness
• **Stage 2: Data and assessment**
• Stage 3: Strategy and planning
• Stage 4: Implementation
• Stage 5: Monitoring and evaluation
• Stage 6: Investment
Analytical Preparation:

- A group with optimal birth outcomes is identified in the community and used as a benchmark to identify excess deaths.
- PPOR uses birth certificate data, death certificate data, and linked infant death data to map periods of risk and identify excess deaths as well as opportunity gaps.
Infant Mortality Rate in Miami-Dade County and Florida, 2000-2017

Rate/1,000 live births

Year


Miami-Dade White
Miami-Dade Black
Florida White
Florida Black
Perinatal Periods of Risk Approach

Target and Reference Group in Miami-Dade

**Target Group:** Non-Hispanic Black including Haitian
- Live Birth-Infant Death Data: Non-Hispanic Black including Haitian
- Fetal Death Data: 24 weeks and above, Birthweight 500 grams and Above

**Reference Group:** Non-Hispanic White and Hispanic Aged 20 and above, education: high school and above
- Live Births-Infant Death Data: Non-Hispanic White and Hispanic
- Fetal Death Data: 24 weeks and above, Birthweight 500 grams and Above
Perinatal Periods of Risk Approach

Data Selection:

• Miami-Dade County Residents’ Live Birth 2014-2016 cohort data with birthweight 500 grams and above

• Miami-Dade County Residents’ Fetal Death data with gestation age 24 weeks and above; birthweight 500 grams and above
Perinatal Periods of Risk Approach

- Maternal Health/Prematurity
  - Preconception Health
  - Health Behaviors
  - Perinatal Care

- Maternal Care
  - Prenatal Care
  - High Risk Referral
  - Obstetric Care

- Newborn Care
  - Perinatal Management
  - Neonatal Care
  - Pediatric Surgery

- Infant Health
  - Safe Sleep
  - Breast Feeding
  - Injury Prevention

Birthweight:
- 500-1499 g
- 1500+ g

Age at death:
- Fetal Death
- Neonatal
- Post-neonatal

Maternal Health/Prematurity
Perinatal Periods of Risk Approach

Map Fetal-Infant Mortality, Miami-Dade, 2014-2016 Live Births Cohort and Fetal Deaths All Race/Ethnicity

Age at Death

Birthweight

500-1499 g

1500+ g

Maternal Health/Prematurity: Fetal=114, Infant=170

284 (2.9)

Maternal Care 187 (1.9)

Newborn Care 75 (0.8)

Infant Health 85 (0.9)

Fetal Neonatal

Post Neonatal

631 Fetal-Infant deaths
Fetal=301
Infant=330

97204 Live Births and Fetal Deaths

Total Fetal and Infant Mortality Rate = 6.5 /1,000

12% 30%

13% 45%
Perinatal Periods of Risk Approach

Map Fetal-Infant Mortality, Miami-Dade, 2014-2016 Live Births Cohort and Fetal Deaths Non-Hispanic White & Hispanic Mothers aged 20 and above, Education--High school and above

Age at Death

Post

Fetal

Maternal Health/
Prematurity: Fetal=44, Infant=84

128 (2.0)

Neonatal

Newborn Care
37 (0.6)

Infant Health
39 (0.6)

Neonatal

500-1499 g

1500+ g

Maternal Care
78 (1.2)

282 Fetal-Infant deaths

Fetal=122

Infant=160

65572 Live Births and Fetal Deaths

Total Fetal and Infant Mortality Rate =4.3/1,000

13% 45% 28% 14%
Perinatal Periods of Risk Approach

Map Fetal-Infant Mortality, Miami-Dade, 2014-2016
Non-Hispanic Black and Haitian

Age at Death

Fetal
Maternal Health/
Prematurity: Fetal=49, Infant=59
108 (5.6)

Neonatal
Maternal Care
76 (3.9)

Newborn Care
27 (1.4)

Infant Health
37 (1.9)

Post

Birthweight

500-1499 g

1500+ g

19383 Live Births and Fetal Deaths

Total Fetal and Infant Mortality Rate = 12.8/1,000

248 Fetal-Infant deaths
Fetal=125
Infant=123

43% 15%

11% 31%
### Perinatal Periods of Risk Approach

<table>
<thead>
<tr>
<th>Group</th>
<th>Maternal Health/ Prematurity</th>
<th>Maternal Newborn Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Fetal-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miami-Dade Overall</td>
<td>284 (2.9)</td>
<td>187 (1.9)</td>
<td>75 (0.8)</td>
<td>85 (0.9)</td>
<td>631 (6.5)</td>
</tr>
<tr>
<td>NonHispanic Black</td>
<td>108 (5.6)</td>
<td>76 (3.9)</td>
<td>27 (1.4)</td>
<td>37 (1.9)</td>
<td>248 (12.8)</td>
</tr>
<tr>
<td>NonHispanic White &amp; Hispanic</td>
<td>128 (2.0)</td>
<td>78 (1.2)</td>
<td>37 (0.6)</td>
<td>39 (0.6)</td>
<td>284 (4.3)</td>
</tr>
</tbody>
</table>

NonHispanic Black includes Haitian
## Excess Fetal-Infant Mortality in Targeted Group Compared to Reference Group, Miami-Dade County, 2014-2016

<table>
<thead>
<tr>
<th>Group</th>
<th>Maternal Health/ Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Fetal-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NonHispanic Black</td>
<td>5.6</td>
<td>3.9</td>
<td>1.4</td>
<td>1.9</td>
<td>12.8</td>
</tr>
<tr>
<td><strong>Reference Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NonHispanic White &amp; Hispanic</td>
<td>2</td>
<td>1.2</td>
<td>0.6</td>
<td>0.6</td>
<td>4.3</td>
</tr>
</tbody>
</table>

**Excess Rate and Number**

In the Target Group

<table>
<thead>
<tr>
<th></th>
<th>Maternal Health/ Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Fetal-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.6</td>
<td>2.7</td>
<td>0.8</td>
<td>1.3</td>
<td>8.5</td>
</tr>
</tbody>
</table>

NonHispanic Black includes Haitian
Perinatal Periods of Risk Approach

- **Maternal Health/Prematurity**
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- **Infant Health**
  - Safe Sleep
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  - Injury Prevention

**Birthweight**
- 500-1499 g
- 1500+ g

**Age at death**
- Fetal Death
- Neonatal
- Post-neonatal
Reduce Infant Mortality among Black Mothers

- **Infant Mortality** represents many factors surrounding birth, including but not limited to: the health of the mother, health services accessibility, prenatal care and the services delivered to the mother and infant care.

- In addition, high infant mortality rates are considered preventable and thus can be influenced by various education and care programs.
Infant Mortality Rates for Selected Top 3 Causes of Death by Mother’s Race/Ethnicity, Miami-Dade County, 2005-2016

Extremely low birth weight accounted for 26% of Perinatal Conditions (P00-P96)
Infant Deaths from Congenital Malformations in Miami-Dade, 2005-2016
Infant Deaths from extremely low birthweight or extreme immaturity in Miami-Dade, 2005-2016
Birthweight and Infant Mortality Rates
Miami-Dade County, 2005-2016

Infant Mortality Rate/1,000

<table>
<thead>
<tr>
<th>Birthweight (grams)</th>
<th>Infant Mortality Rate/1,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;500</td>
<td>805.9</td>
</tr>
<tr>
<td>500-1499</td>
<td>119.5</td>
</tr>
<tr>
<td>1500-2499</td>
<td>10.2</td>
</tr>
<tr>
<td>2500+</td>
<td>1.3</td>
</tr>
</tbody>
</table>
Percent of Low Birthweight (<2,500 grams) by Mother’s Race/Ethnicity
Miami-Dade County, 2005-2016

Non-Hispanic White: 7.3%
Non-Hispanic Black: 13.6%
Hispanic: 7.3%
Percent of Preterm Birth (<37 weeks) by Mother’s Race/Ethnicity
Miami-Dade County, 2005-2016

- Non-Hispanic White: 8.8%
- Non-Hispanic Black: 14.3%
- Hispanic: 9.3%
<table>
<thead>
<tr>
<th><strong>Low Birthweight</strong></th>
<th><strong>Infant Mortality</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Social Demographic Characteristics: Age, Race/Ethnicity, Education, Marital Status, Low Income</td>
<td>Mother’s Social Demographic Characteristics: Age, Race/Ethnicity, Education, Marital Status, Low Income</td>
</tr>
<tr>
<td>Congenital Anomalies</td>
<td>Congenital Anomalies</td>
</tr>
<tr>
<td>Preterm</td>
<td>Preterm and Low Birthweight</td>
</tr>
<tr>
<td>Previous Preterm Birth</td>
<td>Previous Poor Outcome</td>
</tr>
<tr>
<td>Low Weight Gain during Pregnancy</td>
<td>Low Weight Gain during Pregnancy</td>
</tr>
<tr>
<td>Unintentional Pregnancy, Stress/Depression, Substance use</td>
<td>Breast Feeding</td>
</tr>
<tr>
<td>Chronic Disease/Condition</td>
<td>Unintentional Pregnancy, Stress/Depression, Substance use</td>
</tr>
</tbody>
</table>
Using unlinked data to Compare Miami-Dade County’s Selected Indicators With Broward, Palm Beach and State Average 2008-2017
Infant Deaths Per 1,000 Live Births in Miami-Dade, Broward, Palm Beach And Florida, 2008-2017
Percent of Live Births Under 2500 Grams (Low Birth Weight)


- Miami-Dade
- Broward
- Palm Beach
- Florida
Percent of Live Births Under 1,500 Grams (Very Low Birth Weight),

Year:
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

Percent:
- Miami-Dade
- Broward
- Palm Beach
- Florida
Percent of Preterm Birth with Low Birth Weight

Year


Percent

Miami-Dade Broward Palm Beach Florida
Percent of Live Births with Adequate Prenatal Care (Kotelchuck index)
Percent of Mothers who initiate breastfeeding

![Graph showing the percent of mothers who initiate breastfeeding from 2008 to 2017 for Miami-Dade, Broward, Palm Beach, and Florida. The graph indicates a generally increasing trend over the years, with slight fluctuations.](image-url)
Infant Deaths From Perinatal Conditions
Per 100,000 population

Year
Rate/100,000
0 50 100 150 200 250 300 350 400

Miami-Dade
Broward
Palm Beach
Florida
Infant Deaths From Congenital & Chromosomal Anomalies Per 100,000 Live Births

Year:
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

Rate/100,000:
- Miami-Dade
- Broward
- Palm Beach
- Florida

Florida Health
High Density Area of Infant Deaths
Miami-Dade County, 2005-2016
Hotspot Analysis of Infant Deaths with 3D visualization
Miami-Dade County, 2005-2016
Questions?
Questions?