Perinatal Periods of Risk Approach:

The Omaha Experience
Births, 1995-1997
The Data

- What is the data source?
- How good is the data?
Data Source

- 1995-97 NCHS linked birth and infant death certificates
- 1995-97 NCHS fetal death certificates
- Restricted to:
  - maternal residents of Omaha at birth
  - birthweight $\geq 500$ grams for all births
  - gestation $\geq 24$ weeks for fetal deaths
- Imputations of the birthweight / gestational age if possible
Percentage of Unknown Information on Vital Records
Omaha, Nebraska, 1995-97
The Feto-Infant Mortality Map

- What does the feto-infant mortality map look like for Omaha?
- How does the map change over time?
- How does it differ by race and ethnicity?
Feto-Infant Mortality
Omaha, Nebraska, All Races
1995-97

201 Feto-Infant Deaths
16,713 Fetal Deaths & Live Births
Feto-Infant Mortality
Omaha, Nebraska, All Races
1995-97

Feto-Infant Mortality Rate

\[
\frac{201 \times 1,000}{16,713} = 12.0 \text{ deaths per 1,000 births}
\]
Feto-Infant Mortality
Omaha, Nebraska, All Races
1995-97

- Maternal Health/Prematurity: 44%
- Maternal Care: 25%
- Newborn Care: 15%
- Infant Health: 16%
The Feto-Infant Mortality Map

- What does the feto-infant mortality map look like for Omaha?
- How does the map change over time?
- How does it differ by race and ethnicity?
### Feto-Infant Mortality Rates

Omaha, Nebraska, 1989-91 to 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>1989 to 1991</th>
<th>1995 to 1997</th>
<th>Percent Decline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Health/Prematurity</td>
<td>4.5</td>
<td>5.1</td>
<td>-15%</td>
</tr>
<tr>
<td>Maternal Care</td>
<td>3.4</td>
<td>3.1</td>
<td>10%</td>
</tr>
<tr>
<td>Newborn Care</td>
<td>2.2</td>
<td>1.9</td>
<td>15%</td>
</tr>
<tr>
<td>Infant Health</td>
<td>3.8</td>
<td>2.0</td>
<td>48%</td>
</tr>
<tr>
<td>Feto-Infant Mortality</td>
<td>13.9</td>
<td>12.0</td>
<td>13%</td>
</tr>
</tbody>
</table>
The Feto-Infant Mortality Map

- What does the feto-infant mortality map look like for Omaha?
- How does the map change over time?
- How does it differ by race and ethnicity?
### Number of Events by Population Group

**Omaha, NE, 1995-97**

<table>
<thead>
<tr>
<th></th>
<th>Number of Feto-Infant Deaths</th>
<th>Number of Fetal Deaths &amp; Live Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>201</td>
<td>16,713</td>
</tr>
<tr>
<td>White</td>
<td>125</td>
<td>11,789</td>
</tr>
<tr>
<td>Black</td>
<td>52</td>
<td>2,860</td>
</tr>
<tr>
<td>Hispanic</td>
<td>17</td>
<td>1,566</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>71</td>
<td>7,186</td>
</tr>
</tbody>
</table>
# Feto-Infant Mortality Rates

Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>Maternal Health/ Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Feto-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>5.1</td>
<td>3.1</td>
<td>1.9</td>
<td>2.0</td>
<td>12.0</td>
</tr>
<tr>
<td>White Race</td>
<td>4.5</td>
<td>2.6</td>
<td>1.8</td>
<td>1.7</td>
<td>10.6</td>
</tr>
<tr>
<td>Black Race</td>
<td>7.7</td>
<td>5.6</td>
<td>2.1</td>
<td>2.8</td>
<td>18.2</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>3.9</td>
<td>2.6</td>
<td>2.0</td>
<td>1.4</td>
<td>9.9</td>
</tr>
</tbody>
</table>
Excess Feto-Infant Mortality Internal Reference

- What is the excess feto-infant mortality for Omaha?
- How does it differ by race and ethnicity?
Internal Reference Group

- Defined by maternal characteristics
  - 20 or more years of age
  - 13 or more years of education
  - Non-Hispanic white women
Excess Feto-Infant Mortality
Omaha, Nebraska, 1995-97

All Races

3.1 1.9 2.0

3.1 1.9 2.0

2.6 2.0 1.4

0.4 0.1 0.6

12.0 - 9.9 = 2.1

Reference

Excess

5.1 3.9 1.2
Excess Feto-Infant Mortality Rates
Internal Ref, Omaha, Nebraska, 1995-97

36 Excess Deaths
Excess Feto-Infant Mortality
Internal Reference

- What is the excess feto-infant mortality for Omaha?
- How does it differ by race and ethnicity?
## Feto-Infant Mortality Rates
Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>Maternal Health/Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Feto-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>5.1</td>
<td>3.1</td>
<td>1.9</td>
<td>2.0</td>
<td>12.0</td>
</tr>
<tr>
<td>White Race</td>
<td>4.5</td>
<td>2.6</td>
<td>1.8</td>
<td>1.7</td>
<td>10.6</td>
</tr>
<tr>
<td>Black Race</td>
<td>7.7</td>
<td>5.6</td>
<td>2.1</td>
<td>2.8</td>
<td>18.2</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>3.9</td>
<td>2.6</td>
<td>2.0</td>
<td>1.4</td>
<td>9.9</td>
</tr>
</tbody>
</table>
### Excess Feto-Infant Mortality Rates
Internal Ref, Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>Maternal Health/Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Feto-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>1.2</td>
<td>0.4</td>
<td>-0.1</td>
<td>0.6</td>
<td>2.1</td>
</tr>
<tr>
<td>White Race</td>
<td>0.6</td>
<td>0.0</td>
<td>-0.2</td>
<td>0.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Black Race</td>
<td>3.8</td>
<td>3.0</td>
<td>0.1</td>
<td>1.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Excess Feto-Infant Mortality
Internal Ref, Omaha, Nebraska, 1995-97

- White: 9%
- Black: 67%
- Other: 24%
Excess Feto-Infant Mortality
External Reference

- What is the excess feto-infant mortality for Omaha?
- How does it differ by race and ethnicity?
**External Reference Group**

- Defined by **maternal characteristics**
  - 20 or more years of age
  - 13 or more years of education
  - Non-Hispanic white women
- **12 U.S. cities** with adequate reporting
- **25th percentile** for group-specific mortality rates
Excess Feto-Infant Mortality
Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>All Races</th>
<th>External Reference</th>
<th>Excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1</td>
<td>2.2</td>
<td>3.0</td>
</tr>
<tr>
<td>3.1</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>1.9</td>
<td>1.0</td>
<td>0.9</td>
</tr>
<tr>
<td>2.0</td>
<td>1.2</td>
<td>0.8</td>
</tr>
</tbody>
</table>

12.0 - 5.8 = 6.2
Overall Feto-Infant Mortality Rate
Omaha, Nebraska, 1995-97

52% Excess Mortality
External Reference Group

18% Excess Mortality
Internal Reference Group
Excess Feto-Infant Mortality Rates
External Ref, Omaha, Nebraska, 1995-97

103 Excess Deaths

- Maternal Health/Prematurity: 48%
- Maternal Care: 14%
- Newborn Care: 14%
- Infant Health: 13%
Excess Feto-Infant Mortality
Internal Reference

- What is the excess feto-infant mortality for Omaha?
- How does it differ by race and ethnicity?
## Feto-Infant Mortality Rates
Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>Maternal Health/Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Feto-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>5.1</td>
<td>3.1</td>
<td>1.9</td>
<td>2.0</td>
<td>12.0</td>
</tr>
<tr>
<td>White Race</td>
<td>4.5</td>
<td>2.6</td>
<td>1.8</td>
<td>1.7</td>
<td>10.6</td>
</tr>
<tr>
<td>Black Race</td>
<td>7.7</td>
<td>5.6</td>
<td>2.1</td>
<td>2.8</td>
<td>18.2</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>3.9</td>
<td>2.6</td>
<td>2.0</td>
<td>1.4</td>
<td>9.9</td>
</tr>
<tr>
<td>External Reference</td>
<td>2.2</td>
<td>1.5</td>
<td>1.0</td>
<td>1.2</td>
<td>5.8</td>
</tr>
</tbody>
</table>
### Excess Feto-Infant Mortality Rates
External Ref, Omaha, Nebraska, 1995-97

<table>
<thead>
<tr>
<th>Groups</th>
<th>Maternal Health/Prematurity</th>
<th>Maternal Care</th>
<th>Newborn Care</th>
<th>Infant Health</th>
<th>Feto-Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Races</td>
<td>3.0</td>
<td>1.6</td>
<td>0.9</td>
<td>0.8</td>
<td>6.2</td>
</tr>
<tr>
<td>White Race</td>
<td>2.3</td>
<td>1.2</td>
<td>0.8</td>
<td>0.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Black Race</td>
<td>5.5</td>
<td>4.1</td>
<td>1.1</td>
<td>1.6</td>
<td>12.4</td>
</tr>
<tr>
<td>Internal Reference</td>
<td>1.7</td>
<td>1.2</td>
<td>1.0</td>
<td>0.2</td>
<td>4.1</td>
</tr>
<tr>
<td>External Reference</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Excess Feto-Infant Mortality
External Ref, Omaha, Nebraska, 1995-97

- White: 55%
- Black: 34%
- Other: 11%
Omaha Conclusions

- Few unknowns on vital records
- **GAP:** Maternal Health/Prematurity & Maternal Care
- **GAP:** Black women
- **GAP:** Omaha to U.S. reference group