Surviving the First Year: An Overview of Infant Mortality Data, Trends, and Intervention Opportunities

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Learner’s Objectives

Describe infant mortality in Tarrant County including causes, trends, and racial/ethnic disparities

Discuss the importance of preconception and interconception care to improve birth outcomes

Identify public health, policy, clinical and community-based strategies to reduce adverse birth outcomes

What is a fetal death?

- A spontaneous intrauterine death any time during pregnancy with no signs of life at birth, regardless of gestational age or birthweight
- Different reporting standards for different states
  - 20+ weeks gestation and/or 350 grams birthweight
  - 24+ weeks gestation
  - All periods of gestation

What is an infant death?

- The death of a baby before his or her first birthday
- Documented as an infant death if there are ANY signs of life at birth, regardless of gestational age, regardless of birthweight

Sources of Fetal-Infant Mortality Stats

- Vital Statistics
- Perinatal Periods of Risk (PPOR)
- Child Fatality Review (CFR)
- Fetal-Infant Mortality Review (FIMR)
US Compared to Selected Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>IMR 2015</th>
<th>IMR 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>5.87</td>
<td>5.27</td>
</tr>
<tr>
<td>Slovakia</td>
<td>5.02</td>
<td>4.70</td>
</tr>
<tr>
<td>Hungary</td>
<td>4.52</td>
<td>4.50</td>
</tr>
<tr>
<td>Greece</td>
<td>4.43</td>
<td>4.38</td>
</tr>
<tr>
<td>New Zealand</td>
<td>4.37</td>
<td>4.37</td>
</tr>
<tr>
<td>Poland</td>
<td>4.05</td>
<td>3.86</td>
</tr>
<tr>
<td>Portugal</td>
<td>3.70</td>
<td>3.67</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>3.62</td>
<td>3.55</td>
</tr>
<tr>
<td>Australia</td>
<td>3.45</td>
<td>3.43</td>
</tr>
<tr>
<td>Denmark</td>
<td>3.30</td>
<td>3.29</td>
</tr>
<tr>
<td>South Korea</td>
<td>3.28</td>
<td>2.63</td>
</tr>
<tr>
<td>Ireland</td>
<td>2.60</td>
<td>2.60</td>
</tr>
<tr>
<td>Switzerland</td>
<td>2.52</td>
<td>2.52</td>
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<tr>
<td>Netherlands</td>
<td>2.48</td>
<td>2.48</td>
</tr>
<tr>
<td>Israel</td>
<td>2.08</td>
<td>2.08</td>
</tr>
</tbody>
</table>

State Comparisons, 2013

<table>
<thead>
<tr>
<th>State</th>
<th>IMR 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest IMR</td>
<td>IA: 4.14</td>
</tr>
<tr>
<td>Highest IMR</td>
<td>WA: 9.65</td>
</tr>
</tbody>
</table>

Data source: Final Death Data for 2013, National Center for Health Statistics; NVSS Volume 64, Number 2. Published 02/16/16

Infant Mortality 1950-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>US IMR</th>
<th>TX IMR</th>
<th>TC IMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>40.0</td>
<td>35.0</td>
<td>30.0</td>
</tr>
<tr>
<td>1960</td>
<td>35.0</td>
<td>30.0</td>
<td>25.0</td>
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<tr>
<td>1970</td>
<td>30.0</td>
<td>25.0</td>
<td>20.0</td>
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<tr>
<td>1980</td>
<td>25.0</td>
<td>20.0</td>
<td>15.0</td>
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<tr>
<td>1990</td>
<td>20.0</td>
<td>15.0</td>
<td>10.0</td>
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<tr>
<td>2000</td>
<td>15.0</td>
<td>10.0</td>
<td>5.0</td>
</tr>
<tr>
<td>2010</td>
<td>10.0</td>
<td>5.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Data source: National Center for Health Statistics and Texas Department of State Health Services

Infant Mortality by Texas City, 2013†

<table>
<thead>
<tr>
<th>City</th>
<th>IMR 2013</th>
<th>Percent Change from 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fort Worth</td>
<td>8.59</td>
<td>10.98</td>
</tr>
<tr>
<td>Dallas</td>
<td>7.18</td>
<td>1.13</td>
</tr>
<tr>
<td>Houston</td>
<td>6.93</td>
<td>12.68</td>
</tr>
<tr>
<td>San Antonio</td>
<td>6.54</td>
<td>-7.10</td>
</tr>
<tr>
<td>Arlington</td>
<td>4.91</td>
<td>-24.11</td>
</tr>
<tr>
<td>El Paso</td>
<td>4.58</td>
<td>2.69</td>
</tr>
<tr>
<td>Austin</td>
<td>4.20</td>
<td>-7.08</td>
</tr>
<tr>
<td>Laredo</td>
<td>3.86</td>
<td>-36.09</td>
</tr>
</tbody>
</table>

Data source: Texas Department of State Health Services
**Infant Mortality by Race/Ethnicity, 2004-2013**

![Graph showing infant mortality rates by race/ethnicity from 2004 to 2013.](image)

**Data source:** Texas Department of State Health Services

**Leading Causes of Infant Death, 2011-2013**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Hispanic</th>
<th>Non-Hispanic Black</th>
<th>Non-Hispanic White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congenital malformations</td>
<td>24.4%</td>
<td>21.4%</td>
<td>22.2%</td>
</tr>
<tr>
<td>Neonatal abstinence complications of prematurity</td>
<td>15.4%</td>
<td>13.5%</td>
<td>16.1%</td>
</tr>
<tr>
<td>Sudden Infant Death Syndrome</td>
<td>10.0%</td>
<td>9.5%</td>
<td>10.0%</td>
</tr>
<tr>
<td>Disorders related to short gestation and low birth weight</td>
<td>9.1%</td>
<td>13.3%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Newborn affected by maternal complications of pregnancy</td>
<td>8.8%</td>
<td>11.4%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Environmental causes of neonatal deaths</td>
<td>4.4%</td>
<td>6.1%</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

**Data source:** Texas Department of State Health Services, 2011-2013

**Linked Birth-Infant Death File**

- Variables from the death certificate of each infant under 1 year of age are linked to variables from the birth certificate.
- Critical to properly examining the link between infant death and birth characteristics, including maternal and paternal demographic data, birth weight, gestation, prenatal care, maternal risk factors, etc.

**Prematurity and Low Birth Weight**

- The majority (59%) of infant deaths in TC are among babies born < 32 weeks gestation (very preterm) and more than half (58%) of all infant deaths are very low birth weight (VLBW < 1,500 grams).
- Very preterm babies have an IMR 110x higher than full term babies and VLBW infants have an IMR 128x higher than those of adequate birth weight.

**Demographic Differences**

- Mothers on Medicaid have higher IMR than those with private insurance (7.8 vs. 5.1).
- Non-Hispanic Black mothers with college degrees have IMR higher than Hispanics and Non-Hispanic Whites who did not finish high school (10.0 vs. 8.5 & 6.4).
- Mortality among babies of unmarried mothers is higher than among babies whose mothers are married (8.0 vs. 5.8).
- Mothers who are overweight/obese before pregnancy lose their infants at a higher rate than healthy weight mothers (7.8 vs. 5.6).

**Age at Death, 2011-2013**

- The majority (61%) of infant deaths in Tarrant County occur before the child is one week old.
WHAT PERINATAL PERIODS OF RISK TELLS US…

**Perinatal Periods of Risk (PPOR)**

- **Maternal Health/Prematurity**
  - Preconception Health
  - Health Behaviors
  - Prenatal Care

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

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

- **Infant Health**
  - Sleep Position
  - Breast Feeding
  - Injury Prevention

**PPOR Tells Us**

- Potentially 40% of fetal and infant deaths in Tarrant County are preventable
- Overall, 44% of excess deaths in Tarrant County occurred in the **Maternal Health/Prematurity** risk period
- Non-Hispanic Blacks had the highest excess fetal-infant death rate
- Intervention area with the greatest potential impact overall is **Maternal Health/Prematurity among Non-Hispanic Black women**

**WHAT CHILD FATALITY REVIEW TELLS US**

- Modifiable Risk Factors
  - Overall, Tarrant County mothers of VLBW infants were more likely to:
    - Smoke
    - Not attend a sufficient number of PNC visits
    - Be obese
  - Hispanic & NH-Black mothers were more likely to:
    - Not attend a sufficient number of PNC visits
    - Be teen mothers
    - Be overweight and obese
  - NH-White mothers were more likely to smoke
Child Fatality Review Tells Us

- The Tarrant County CFR Team only reviews child deaths reported to the Medical Examiner’s office (unnatural or suspicious cause of death)
- The majority of reviewed infant cases (those aged <12 months) included documentation of an unsafe sleep environment
- Unsafe sleep accounts for approximately 5% of all infant deaths in TC and is an immediately preventable cause of death

WHAT FETAL INFANT MORTALITY REVIEW TELLS US...

Fetal Infant Mortality Review (FIMR)

- **FIMR Data**
  - FIMR is a community-based and action-oriented process to improve service systems and resources for women, infants, and families
  - State legislation required
  - Systematic sampling of all fetal and infant death certificates - differs from Tarrant County Child Fatality Review which only reviews infant deaths referred to the Medical Examiners Office (primarily from suspicious or unnatural causes)
  - Chart abstractions done on all selected cases

Fetal and Infant Data

- **FIMR Data**
  - Chart abstraction of
    - Pregnancy Course / Prenatal Care Records
    - Maternal Labor, Delivery, & Postpartum Records
    - Newborn Assessment Record
    - Newborn Intensive Care Unit Record
    - Ambulatory Infant Care Record
    - Pediatric Emergency Department and/or Hospitalization Record
    - Fetal/Infant Death Certificate and Autopsy Record
    - Family interview conducted at home
  - FIMR cases examined by a diverse assembly of professionals who volunteer to serve on the Case Review Team (CRT)

FIMR Tells Us

- **55%** of mothers had documentation of a significant medical problem *predating* this pregnancy – Of those mothers:
  - Sexually Transmitted Diseases (27%)
  - Hypertension (15%)
  - Asthma (14%)
  - Iron Deficiency Anemia (12%)
  - Depression (9%)

FIMR Tells Us

- Did you get prenatal care as early as you wanted?
  - 72% Yes, 28% No
- If no, why?
  - Did not have enough money or insurance to pay for visits (56%)
  - Delay in getting CHIP / Medicaid (33%)
  - I could not get an appointment earlier in my pregnancy (28%)
FIMR Tells Us

- Among interviewed mothers who were late to prenatal care:
  - 48% reported they got prenatal care \textit{as early as they wanted}

\textbf{FIMR Recommendations}

- Intervention focus areas identified by the FIMR Case Review Team
  - The prevention of, proper screening for, and proper treatment of STDs
  - Promote and increase \textit{preconception / interconception care} to women within the context of the life course perspective with a focus on \textit{obesity} and \textit{chronic disease} abatement prior to planning a pregnancy

\textbf{FIMR Recommendations}

- Intervention focus areas identified by the FIMR Case Review Team
  - \textit{Kicks Counts} campaign promoting fetal movement monitoring by mothers throughout their pregnancy as well as instructing them on when and how to take action if needed
  - Promote access to and importance of health care through a \textit{medical home}

\textbf{FIMR Recommendations}

- Intervention focus areas identified by the FIMR Case Review Team
  - Promote \textit{inteiorlife plans}, how they can prevent unplanned pregnancies, and help women and men improve their health and socioeconomic circumstances so they are better prepared when and if they decide to have children
  - Promote the \textit{PRIDE initiative} in the community which provides STD/HIV prevention education to teenagers and young adults aged 13-24 years

\textbf{FIMR Recommendations}

- Intervention focus areas identified by the FIMR Case Review Team
  - Promote the Texas Healthy Baby public awareness campaign \textit{Someday Starts Now}
  - Educate the community about the statewide \textit{Medicaid Managed Care Advisory Committee} which serves as the central source for stakeholder input on the implementation and operation of Medicaid managed care
Preconception & Interconception Health

Traditional Approach

- Preconception: Prenatal care is too late—nine months is not enough time.
- Women’s health before, during, and between pregnancies is important to children’s health.
- Most women spend most of their life not pregnant.

Health People 2020 target: 77.9% of pregnant women to begin prenatal care in first trimester.

Texas, 2013:
- 62.4% of pregnant women entered prenatal care in first trimester.
- 52.6% of Black women entered in first trimester.

Critical Periods of Fetal Development:

- Central Nervous System
- Heart
- Arms
- Eyes
- Legs
- Teeth
- Palate
- External genitalia
- Ear

Missed Period
Mean Entry into Prenatal Care
Medicaid Funding (In Texas)


Total Spending 2004: $2.6 trillion  2019: $4.2 trillion

Four Goals

To assure that all U.S. women of childbearing age receive preconception care services – screening, health promotion, and interventions – that will enable them to enter pregnancy in optimal health.

To reduce risks indicated by a prior adverse pregnancy outcome through interventions that can prevent or minimize health problems for a mother and her future children.

To improve the knowledge, attitudes, and behaviors of men and women related to preconception health.

To reduce the disparities in adverse pregnancy outcomes.

CDC Recommendations to Improve Preconception Health

1. Individual responsibility across the life span.
2. Consumer awareness.
3. Preventive Visits
4. Intervention for identified risks.
5. Interconception care.
6. Pre-pregnancy check ups.
7. Health coverage for low-income women.
8. Public health programs and strategies.
9. Research.
10. Monitoring improvements.

Affordable Care Act

10 Essential Health Benefits of New Plans
- Ambulatory patient services
- Emergency services
- Hospitalization
- Maternity and newborn care
- Mental health and substance abuse disorder treatments, including behavioral health treatments
- Prescription drugs
- Rehabilitative and habilitative services and devices
- Laboratory services
- Pediatric services including dental care
- Preventive and wellness services and chronic disease management
ACA: Pregnancy and Maternity Care

- Pregnancy no longer pre-existing condition
- Tobacco cessation interventions
- Alcohol misuse screening
- Gestational diabetes
- Screening for STIs
- Folic Acid Supplements
- Iron deficiency anemia
- Breastfeeding supports
- Home visitation grants
- Vaccinations

2.4 Million Women

- Income below 100% FPL
- Reside in a state not expanding Medicaid

Current Status of State Individual Marketplace and Medicaid Expansion Decisions

Figure 1
In states that do not expand Medicaid under the ACA, there will be large gaps in coverage available for adults.

Figure 4
Parent Status and Gender of Adults in the Coverage Gap

Notable: Includes illegitimately born for county, for those who are pregnant or who haveugging are adults, and are unmarried

Total = 6 Million in the Coverage Gap
Life Course Approach

Takes into consideration the full spectrum of factors that impact an individual’s health through all stages of life (infancy, childhood, adolescence, childbearing age, elderly age)

Points to broad family, social, economic and environmental factors as underlying causes of persistent inequalities in health

Critical or sensitive periods of risk influence health and disease patterns and outcomes later in life

Potential cumulative effects of risk on health outcomes—you have to address children’s health to affect adult health

Health promotion and prevention interactions can be targeted to different stages in life

Connections exist between life stages

US Compared to Selected Countries

Reproductive Life Planning

Do you plan to have any (more) children?

How many children do you hope to have?

How long do you plan to wait until you (next) become pregnant?

How much space do you plan to have between your future pregnancies?
What are you doing now to achieve your goal? (avoid pregnancy until you are ready to become pregnant or getting ready for a healthy pregnancy)?

What can I do today to help you achieve your goal? (what resources, information, referrals, etc.)

Screen for social needs
Adjust Individual Disease risk
Address Social Determinants of Health
Co-locate Health and Social Services
Improve Referral Capacity
Healthy Start: Eliminating Disparities in Perinatal Health

US Department of Health and Human Services/ Health Resources and Services Administration/ Maternal and Child Health Bureau

Proposed by President George H.W. Bush (1991)
15 sites

2014: 101 sites across the country

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Infant Health Network
15 Year History Highlights

40 health, social services, education and community organizational and individual members

6 Officers-Chair, Co-Chair, Treasurer, Secretary, Member-at-Large, Past Chair

4 Sub-Committees
Events Planning
Infrastructure
Community Action Team-partnership with Healthy Start
Home Visitor Group

Annual Infant Health Summit, 250 average participants

Strong Partnership with Fatherhood Coalition

Raised awareness at local, state and national level and brought maternal and child health to the forefront in our community

Guided clinical and practice interventions through data, i.e., Perinatal Periods of Risk, vital statistics, evidence-based speakers

Led efforts to designate September as national Infant Mortality Awareness month

Spearheaded efforts to introduce Fetal Infant and Mortality Review legislation that created mechanism to create programs across the state
Moving Forward

1) Provide continuity of care before pregnancy and throughout life

2) Focus “well-person” visits on assessing and developing health building blocks.

3) Recognize and organize prenatal, intra-partum, well-child, and adult health visits around critical or sensitive periods of development.

4) Deploy public health nurses, social workers and other staff to serve as resources in non-health settings.

5) Develop community-wide resources to help link women, children and families to health enhancing services, supports and activities.

6) Develop the tools and support for providers to be able to link women, children, and families to health-enhancing services, supports and activities.

7) Invest in policies and programs that make it easier for the public, health care providers, and business and civic leaders to change the way they do business as usual to better promote health.

A NEW AGENDA FOR MCH POLICY AND PROGRAMS: INTEGRATING A LIFE COURSE PERSPECTIVE
Amy Fine, MPH; Milton Kotelchuck, PhD, MPH; Nancy Adess, MA; Cheri Pies, MSW, DrPH

Sheppard-Towner Act of 1921

- John Morris Sheppard (May 28, 1875 – April 8, 1943) was a Democratic U.S. Congressman and Senator from east Texas.
- “First legislative proposal made by the women of America since universal suffrage was granted.”
- First major piece of federal legislation passed in the United States to focus on infant and maternal health
- Provided Federal matching funds for services aimed to reduce maternal and infant mortality. The funding included: midwife training, visiting nurses for pregnant women and new mothers; distribution of statistic and hygiene information; health clinics, doctors and nurses, for pregnant women, mothers and children.
- Repealed in 1929

IGNORANCE KILLS BABES BY HUNDRED

Big Death Rate Due to Lack of Knowledge

All progress is precarious, and the solution of one problem brings us face to face with another problem.
Martin Luther King, Jr.

Thank You