Vital Statistics and the Texas Birth Defects Registry

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Birth Defects Epidemiology & Surveillance Branch
Disclosure

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• The author of this presentation has no financial or other interests which pose a conflict of interest.
Outline

• The Birth Defects Epidemiology and Surveillance Branch, TX DSHS
  • Texas Birth Defects Registry
  • Research and other activities

• Importance of vital records data:
  • In gathering data for TBDR cases
  • In analyzing and using data
Birth Defects Epidemiology and Surveillance Branch
History

1991 Headlines
Texas Birth Defects Registry (TBDR): What It Is

1. One of the largest birth defects surveillance systems in the world.
   a. > 400,000 births per year.
   b. > 20,000 cases of birth defects per year.

2. Extensive quality control checks
   a. Includes review of 50% of records by clinical geneticists

3. Active surveillance system.

1991 Headlines
TBDR: What It Is
TBDR: Case Definition

• Infant or fetus with major structural or chromosomal birth defect.

• Diagnosed prenatally or in 1st year.

• Mother resident in Texas at delivery.
TBDR: What It Does With the Data

- Describe occurrence of birth defects in Texas
- Conduct cluster investigations
- Work with others in:
  - Research
  - Prevention
  - Linking families to available services
Vital Records: Help In Gathering Data for TBDR Cases
Gathering Data for TBDR Cases

<table>
<thead>
<tr>
<th>Certificates</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetal death</td>
<td>Help with case finding.</td>
</tr>
<tr>
<td>Birth</td>
<td>Identify birth location for cases found in 3rd facilities.</td>
</tr>
<tr>
<td>Birth, death, fetal death</td>
<td>Help with investigations of birth defect clusters.</td>
</tr>
</tbody>
</table>
Gathering Data for TBDR Cases

<table>
<thead>
<tr>
<th>Certificates</th>
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<tbody>
<tr>
<td>Birth, fetal death</td>
<td>Ascertain sociodemographic and maternal factors to help complete case abstraction records.</td>
</tr>
</tbody>
</table>
Gathering Data for TBDR Cases

1991 Headlines
Gathering Data for TBDR Cases
### Gathering Data for TBDR Cases

<table>
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<tr>
<th>Certificates</th>
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<tr>
<td>Birth, Fetal death</td>
<td>Determine when/where mothers with evidence of Zika virus infection during pregnancy have delivered.</td>
</tr>
<tr>
<td>Death</td>
<td>Identify children who have died; do not refer.</td>
</tr>
</tbody>
</table>
Gathering Data for TBDR Cases
Enhanced Surveillance for Zika-associated Birth Defects

Arboviral Case Investigation Forms

Laboratory Testing Reports

DSHS Zoonosis Control Branch
Enhanced Surveillance for Zika-associated Birth Defects

Arboviral Case Investigation Forms

Laboratory Testing Reports

Providers/Facilities

DSHS Zoonosis Control Branch

Local Health Departments

DSHS Birth Defects Epidemiology and Surveillance Branch

DSHS Vital Records Data
Enhanced Surveillance for Zika-associated Birth Defects

Arboviral Case Investigation Forms

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DSHS Zoonosis Control Branch

Local Health Departments

DSHS Birth Defects Epidemiology and Surveillance Branch

DSHS Vital Records Data

CDC US Zika Pregnancy Registry

CDC Birth Defects Surveillance

DSHS Regional Social Workers
Zika Pregnancy Registry (ZPR)  
Case Breakdown, Texas (12/1/2017)

Of 248 women with evidence of Zika infection during pregnancy:

<table>
<thead>
<tr>
<th>BIRTH DEFECT STATUS</th>
<th>FETUS/INFANT LAB TESTING COMPLETED</th>
<th>INCOMPLETE LAB TESTING</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lab Evidence of Zika Inf.</td>
<td>No Lab Evidence of Zika Inf.</td>
<td>Lab Testing Pending/Not Complete</td>
</tr>
<tr>
<td>Birth Defects Consistent w/ Zika</td>
<td>4</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Other Birth Defects</td>
<td>0</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>No Apparent Birth Defects</td>
<td>8</td>
<td>67</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>77</td>
<td>127</td>
</tr>
</tbody>
</table>
Vital Records: Help In Analyzing and Using TBDR Data
Analyzing and Using TBDR Data: Calculating Prevalence

<table>
<thead>
<tr>
<th>Certificates</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Birth, Fetal death</td>
<td>Serve as denominators used to calculate birth prevalence.</td>
</tr>
</tbody>
</table>
Calculating Prevalence
Calculating Prevalence

Gastroschisis Cases in Brazoria vs Harris Counties, 2010-2014

- Brazoria
- Harris
Calculating Prevalence

Gastroschisis Prevalence in Brazoria vs Harris Counties, 2010-2014
Birth Prevalence of Children With Gastroschisis by Year, Texas

![Graph showing the birth prevalence of children with gastroschisis by year in Texas. The x-axis represents the birth year from 1999 to 2013, and the y-axis represents cases per 100,000 live births. The graph shows an increasing trend from 1999 to 2007, followed by a slight decrease in 2009 and 2011 before stabilizing around 2013.]
Analyzing and Using TBDR Data: Controls for Case-Control Studies

<table>
<thead>
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<tbody>
<tr>
<td>Birth</td>
<td>Allows selection of controls for case-control studies of causes of birth defects.</td>
</tr>
</tbody>
</table>
Case-Control Study of Factors Associated with TE Fistula / Esophageal Atresia, Texas
Analyzing and Using TBDR Data: Additional Information

<table>
<thead>
<tr>
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<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth, Fetal death</td>
<td>Provides additional information beyond the medical record; allows us to look at sociodemographic factors.</td>
</tr>
</tbody>
</table>
Birth Defects Consistent with Prenatal Zika Exposure
Birth Defects Consistent with Zika, by Maternal Education, Texas, 2009-2013

Cases per 10,000 Live Births

<table>
<thead>
<tr>
<th>Maternal Education</th>
<th>Severe Microcephaly</th>
<th>Other Brain Abnormalities</th>
<th>NTDs and Early Brain Abnormalities</th>
<th>Eye Abnormalities</th>
<th>Consequences of CNS Dysfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>4</td>
<td>15</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; High school</td>
<td>3</td>
<td>20</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- NTDs: Neural Tube Defects
- CNS: Central Nervous System
Analyzing and Using TBDR Data
Geocoded Residence

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<tr>
<td>Birth, Fetal death</td>
<td>Geocoded residence allows analysis/research into environmental and sociodemographic factors.</td>
</tr>
</tbody>
</table>
Using Geocoded Residence
## Ambient Levels of Benzene and Spina Bifida, Texas 1999-2004

<table>
<thead>
<tr>
<th>Benzene Level (ug/m³)</th>
<th>Adj Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.12 – 0.45</td>
<td>1.00 (referent)</td>
</tr>
<tr>
<td>&gt;0.45 – 0.98</td>
<td>1.77 (1.04 - 3.00)</td>
</tr>
<tr>
<td>&gt;0.98 – 1.52</td>
<td>1.90 (1.11 – 3.24)</td>
</tr>
<tr>
<td>&gt;1.52 – 2.86</td>
<td>1.40 (0.82 – 2.38)</td>
</tr>
<tr>
<td>&gt;2.86 – 7.44</td>
<td>2.30 (1.22 – 4.33)</td>
</tr>
</tbody>
</table>

Lupo PJ et al. 2011 *Environmental Health Perspectives*
Proximity of Children with Birth Defects to Pediatric Genetics Clinics, Texas, 1999-2003

## Analyzing and Using TBDR Data

<table>
<thead>
<tr>
<th>Certificates</th>
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<tr>
<td>Death</td>
<td>Permits analysis of mortality/survival of children with birth defects.</td>
</tr>
</tbody>
</table>
Hypoplastic Left Heart Syndrome
Analyzing and Using TBDR Data

Hypoplastic Left Heart Syndrome Case-Fatality, Texas, 1999-2014

- Neonatal
- Post-neonatal
Analyzing and Using TBDR Data

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>N/A</td>
<td>Texas Health Data by the Center for Health Statistics allows easy dissemination of data.</td>
</tr>
</tbody>
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Analyzing and Using TBDR Data: Dissemination

http://healthdata.dshs.texas.gov/Registries/BirthDefects
Acknowledgements

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