PERINATAL HEPATITIS B & C, PHILADELPHIA

Danica Kuncio, MPH
Viral Hepatitis Epidemiologist
Philadelphia Dept. of Public Health

NASTAD TA Meeting
October 20th, 2015
PERINATAL HBV
What We Know

Without PEP (HBlg and 3-4 dose series of HBV vaccine):
• ~40% of infants born to HBsAg+ mothers will develop chronic infection (without PEP)
• 25% of infants infected perinatally will die prematurely from HBV-related complications (cancer, cirrhosis)

With PEP:
• ~1% of infants develop HBV

In Philadelphia:
• <1 HBsAg+ infant/year
• Majority of cases (found) are API immigrants
  • Increase in African-born refugees and immigrants may put more infants at risk
Case Identification

• In 2008, the Health Department noticed it was not reaching the CDC projections for identified HBsAg-positive mothers
• Needed a strategy to identify missing cases

[Graph showing PHBPP Case Capture and CDC Estimates, Philadelphia.]

- Pairs Followed
- CDC Point Estimate
- CDC Lower Limit

* CDC Estimates not Known
Case Identification: pre-2008

1. Provider reporting - call/fax
2. Rule-Out-Pregnancy (ROP)

Issues
1. Provider reporting is unreliable
2. Requires new HBV test to be performed during pregnancy
3. Relies on adequate reporting of positive tests
4. Risk of human error during the internal ROP process (~60% success reaching woman/provider)
Capture Recapture: post-2008

To determine if a woman is a PHBPP case requires that she:

1. Gave birth/is pregnant
2. Has a chronic HBV infection

1. **Births to Philadelphia Residents**
2. **Hepatitis B Laboratory/Surveillance Data (HBV data)**
3. **PHBPP Data**
   - Identification of previously identified mothers and HBV cases
Capture Recapture

PHBPP Mother-Infant Pair Capture and CDC Estimates, Philadelphia

- Capture Recapture
- Traditional Surveillance
- CDC Point Estimate
- CDC Lower Limit

*CDC Estimate for 2006
†CDC Estimate for 2011
Capture-Recapture Starts a Trend of Improvement

1. Fix internal snags
2. Identify problem reporters (or testers)
3. Improve laboratory reporting (ELR, etc.)
4. Identify cases in their first pregnancy → next pregnancy she is verified as infectious

Thus, we can expect that fewer and fewer cases will be identified using this method.
Other Approaches?

1. LRPS Working Group with CDC
   - Commercial labs to report positive HBsAg tests with a concurrent positive pregnancy test
   - ALL jurisdictions can receive Quest/Labcorp/Mayo

2. HBig Data from Birth Hospitals

3. Pregnancy registries

4. Birth Certificates

5. Others…
Case-Finding Efforts: More Automation

2013

- HEP Program: 2%
- Vaccine Registry: 1%
- LRPS: 5%
- Capture Recapture: 13%
- OOJ: 2%
- Provider Calls: 77%

N=178

2014

- HEP Program: 3%
- Vaccine Registry: 4%
- LRPS: 45%
- Capture Recapture: 17%
- OOJ: 1%
- Provider Calls: 29%

N=168
What We Know

• Vertical transmission is the primary route of pediatric hepatitis C virus (HCV) infection

• ~5-10% of children born to HCV+/HIV- women will develop chronic infection >18 months of age
  • 10-20% transmission rate for children born to coinfectected mothers

• Pediatric HCV can result in liver disease, cancer, cognitive delays, liver transplant

• Antiviral HCV treatment is approved for children ≥3 years of age.
  • DAA not yet approved for use in children, but more tolerable (IFN-free) and successful in adults
Maternal Screening Guidelines

• ACOG/CDC recommends:
  • Screening pregnant woman with HCV risk factors (including injection-drug use, tattoos, risky sexual behaviors)

• However, 50 -75% of HCV+ people in US are unaware of their infection

• Population of HCV-positive women of child-bearing age is increasing
Hepatitis C Cases By Age

All reported Cases In Philadelphia; age at testing
Infant Screening Guidelines

AASLD Guideline for testing infants born to HCV+ women:

- Anti-HCV Antibody (Ab) >18 months

  OR

- HCV RNA >8 weeks & again after 12 months
Study Goals

To assess:

1. The number of HCV-positive women giving birth in Philadelphia
2. The proportion of infants being tested for HCV
3. The number of HCV-positive infants
4. The number of Untested infants
5. The estimated number of Unidentified HCV-positive Infants
# Methods – HCV Capture Recapture

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Records</td>
<td>All Births to Philadelphia Residents in 2011-2013; Child &gt;18 months of age</td>
</tr>
<tr>
<td>HCV Registry</td>
<td>All Reported HCV Tests for Philadelphia Residents</td>
</tr>
<tr>
<td>Immunization Registry</td>
<td>Vaccination for Children and Adults in Philadelphia</td>
</tr>
<tr>
<td>Negative RNA Data</td>
<td>Reportable Since July 2014; Commercial Lab Data 2012-Present</td>
</tr>
<tr>
<td>Infant Hospital Testing</td>
<td>Negative Ab and RNA Performed at Pediatric Facilities</td>
</tr>
<tr>
<td>Negative Ab Testing</td>
<td>Commercial Lab Data from 2012-Present</td>
</tr>
</tbody>
</table>
What We Found

59,683 Birth Records

4,665 HCV(+) Women

605 Births to HCV(+) Women

1% Tested Infants N=90

15% Testing Info for Infants born to HCV(+) Women

<table>
<thead>
<tr>
<th></th>
<th>All Births N=59,683</th>
<th>HCV+ Mothers N=651</th>
<th>P-value &lt;0.05</th>
<th>Tested Infants N=90</th>
<th>Untested Infants N=515</th>
<th>P-value &lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Insurance</td>
<td>54%</td>
<td>67%</td>
<td>*</td>
<td>73%</td>
<td>66%</td>
<td></td>
</tr>
<tr>
<td>Black Race</td>
<td>47%</td>
<td>25%</td>
<td>*</td>
<td>16%</td>
<td>27%</td>
<td>*</td>
</tr>
<tr>
<td>Education: &lt;=High school</td>
<td>71%</td>
<td>87%</td>
<td>*</td>
<td>94%</td>
<td>86%</td>
<td>*</td>
</tr>
<tr>
<td>Married</td>
<td>36%</td>
<td>19%</td>
<td>*</td>
<td>10%</td>
<td>21%</td>
<td>*</td>
</tr>
<tr>
<td>HCV Prenatal test</td>
<td>--</td>
<td>54%</td>
<td>--</td>
<td>69%</td>
<td>52%</td>
<td>*</td>
</tr>
</tbody>
</table>
HCV Infant Outcomes

Estimate for vertical transmission of HCV:

\[(5\% \times HCV \text{ Mothers}) - \text{Identified HCV+ Infants} = \text{Unidentified HCV+ Infants}\]
Study Takeaway

Vertical transmission of HCV is occurring in Philly

- **15%** of infants born to HCV+ women are tested

- **≥26 infants** infected with HCV are undiagnosed

- **54%** of HCV+ women are screened during pregnancy
Next Steps?

1. Education for providers and HCV+ pregnant mothers

2. Regulation changes
   • Mandated reporting of pregnant HCV+ women
   • Universal HCV screening of pregnant mothers?

3. Development of a perinatal HCV prevention program (similar to perinatal HBV)

4. Using other data sources to identify infants at-risk of perinatal HCV
Philadelphia Activities

1. Health Alert to all city providers

2. Pilot Project
   • Catch-up testing: identify babies untested >18 months of age
   • Contact mother and provider to recommend HCV screening for infant

3. Perinatal HCV posters to all VFAR sites

4. In-services with Pediatric Specialists
Thank You!

Acknowledgments
Kendra Viner
Caroline Johnson
Claire Newbern

Contact
Danica Kuncio
Danica.kuncio@phila.gov