Surveillance for Emerging Threats to Pregnant People and Infants Network – Hepatitis C

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Centers for Disease Control and Prevention (CDC)

Coalition for Global Hepatitis Elimination
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Jurisdictions Funded for Hepatitis C

Puerto Rico
USVI
City of Houston
CA
AZ
NV
WA
NE
KS
AR
MO
IA
MN
KY
TN
GA
FL
PA
NY
NJ
MI
City of Chicago
Los Angeles County
New York City
City of Philadelphia

Jurisdictions and partners are supported through either a cooperative agreement or contractual mechanism. Jurisdictional cooperative agreements are funded through the Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC).
Inclusion Criteria

- Pregnant people who have at least one positive HCV RNA test during pregnancy, or one year prior to pregnancy without evidence of treatment or clearance
  - And infants/children resulting from that pregnancy
- Infants and children meeting the CSTE case definition for perinatal HCV*
  - And their birth parents
- Pregnancy outcomes that occurred during 2018-2021

*Council for State and Territorial Epidemiologists case definition for perinatal HCV: Infant who has a positive test for HCV RNA nucleic acid amplification test (NAAT), HCV antigen, or detectable HCV genotype at ≥2 months and ≤36 months of age and is not known to have been exposed to HCV via a mechanism other than perinatal.
Case Ascertainment and Data Sources

**Maternal**
- Vital statistics,
  - National Notifiable Diseases Surveillance System case reports and investigations,
  - Medical records

**Birth**
- Vital statistics,
- Medical records

**Infant follow up**
- Medical records

**Laboratory**
- Electronic laboratory reporting (ELR)

Possible existing data sources: All data expected to be obtained from existing records; no new data collection are conducted for SET-NET.
## Snapshot of General Variables Collected on all Mother-Baby Pairs

<table>
<thead>
<tr>
<th>Maternal dataset</th>
<th>Birth dataset</th>
<th>Follow-up dataset</th>
<th>Laboratory dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Date of birth</td>
<td>• Pregnancy outcome</td>
<td>• Infant mortality</td>
<td>• Maternal and infant STORCH testing</td>
</tr>
<tr>
<td>• Race/ethnicity</td>
<td>• Gestational age</td>
<td>• Anthropometry (e.g., height, weight, head circumference)</td>
<td></td>
</tr>
<tr>
<td>• Pre-pregnancy conditions (e.g., diabetes)</td>
<td>• Infant sex</td>
<td>• Physical exam findings</td>
<td></td>
</tr>
<tr>
<td>• Alcohol and tobacco use in pregnancy</td>
<td>• Anthropometry (e.g., height, weight, head circumference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pregnancy complications (e.g., gestational diabetes)</td>
<td>• Physical exam, birth defects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Hepatitis C Virus: Snapshot of Modular Variables

Maternal dataset
- HCV treatment before and during pregnancy
- Invasive testing during pregnancy

Birth dataset
- Risk factors for mother-to-child transmission (e.g., prolonged rupture of membranes)
- Neonatal abstinence syndrome

Follow-up dataset
- Infant liver function testing
- Clinical diagnosis of liver disease

Laboratory dataset
- Maternal HCV testing (before and during pregnancy)
- Maternal HIV testing
- Infant/child HCV testing (e.g., HCV RNA, HCV antibody)
Preliminary Data
Characteristics of Pregnant People with HCV (n=3,725)

- Median age **29 years** (IQR 26-33)
- **89%** White, non-Hispanic
- **87%** with ≥1 prenatal care visit
  - 47% initiated prenatal care in first trimester
- **80%** had reported substance use in pregnancy

Timing of first positive HCV RNA result

<table>
<thead>
<tr>
<th></th>
<th>Pre-pregnancy³</th>
<th>First trimester</th>
<th>Second trimester</th>
<th>Third trimester⁴</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>1102 (30%)</td>
<td>948 (25%)</td>
<td>845 (23%)</td>
<td>782 (21%)</td>
</tr>
</tbody>
</table>

1. Substance use was defined as reported use of alcohol, tobacco, cannabis, illicit opioids, or other illicit substances during pregnancy. Kentucky and Massachusetts have not completed systematic abstraction of substance use variables and were excluded from this data point.

2. 48 people had HCV RNA testing during pregnancy but exact dates were not available.

3. Includes 1 year prior to last menstrual period

4. Includes delivery and up to 14 days postpartum

Data are preliminary and subject to change.
HCV Treatment

3,725 pregnancies

89 (2.4%) with treatment reported

7 (7.9%) with treatment date reported

<5 with treatment before pregnancy

<5 with treatment during pregnancy

Data are preliminary and subject to change after medical record abstraction is complete.
Multiple Pregnancies impacted by HCV

- 3% (99/3666) of persons within our cohort have had multiple pregnancies with HCV infection during the surveillance period (2018-2021)
- Median time between pregnancies was 7.1 months (IQR: 4.0-14.2)
  - ≥3 months between pregnancies for 86%
  - ≥8 months between pregnancies for 48%
Birth Outcomes among People with Hepatitis C in Pregnancy — Three U.S. States, 2018-2020

1,155 pregnancies
1,171 infants

84% reported substance use during pregnancy with tobacco and illicit opioids being the most frequently reported.

Birth outcomes among pregnancies with HCV infection

- Preterm (<37 weeks): 19%
- Small-for-gestational age: 13%
- NICU (among term infants): 26%
- Birth defects: 4%
- Neonatal abstinence syndrome: 26%

Data are preliminary and subject to change after medical record abstraction is complete.
Hepatitis C Virus Testing Characteristics among Children with Perinatal Hepatitis C, 2018-2020

Data are preliminary and subject to change after medical record abstraction is complete.

Children aged ≥20 months born to HCV+ persons in seven U.S. jurisdictions
N=2,266

Children appropriately tested for HCV
n=408

Children with confirmed perinatal hepatitis C
n=47

Children with unknown testing status
n=1,858

Children expected to have perinatal hepatitis C
n=84

131 (5.8%, [95% confidence interval, 95-176]) children born to HCV+ persons

1. Children with confirmed perinatal hepatitis C
2. Children with unknown testing status
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.