HIV Infection Linked to Injection Use of Oxymorphone in Indiana, 2014–2015

County-Level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States

Van Handel, Michelle M. MPH; Rose, Charles E. PhD; Hallisey, Elaine J. MA; Kolling, Jessica L. MPH; Zibbell, Jon E. PhD; Lewis, Brian BS; Bohm, Michele K. MPH; Jones, Christopher M. PharmD, MPH; Flanagan, Barry E. PhD; Siddiqi, Azfar-E-Alam MD, PhD; Iqbal, Kashif MPH; Dent, Andrew L. MA, MBA; Mermin, Jonathan H. MD, MPH; McCray, Eugene MD; Ward, John W. MD; Brooks, John T. MD

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1 November 2016 - Volume 73 - Issue 3 - p 323–331
doi: 10.1097/QAI.00000000000001098
Epidemiology and Prevention
Vulnerability to Rapid Dissemination of HIV/HCV Infections Among Persons Who Inject Drugs: Ranked index using regression model coefficients
Vulnerability Assessment

41 counties identified as vulnerable

Need for Increased Outbreak Detection in Rural Counties at High Risk for Hepatitis C and HIV Infection in TN

CDC identified the incidence of acute HCV infection among persons ≤ 30 years old in TN, KY, VA, and WV.

- Hep C cases have been rising rapidly in TN.
- This parallels the rise in opioid addiction including heroin use.
- This means an increasing number of people are at risk for hepatitis and HIV infections.

Scott County, IN had 185 new HIV infections through August 2015 associated with IV opioid use. This county usually has <1 new HIV infection per year. CDC identified 220 counties similar to Scott County, IN in risk of Hepatitis C and HIV transmission.

- TN is home to 41 of the 220 high-risk counties.
- 20% of our population resides in these counties.
- This means that TN is at significant risk of a Hepatitis C and HIV outbreak in these 41 counties.
- IN spent over $16M through August 2015 to stop the outbreak in just one county.
- Early detection and intervention in just one of Tennessee’s 41 high risk counties could avert over $16M in state expenditures.
VH Program at TDH

- Formerly Housed in HAI

- Integrated with HIV/STD Program, March 2015
  - Prior to State Funding, Leveraged HIV Funds

Diagram:

- Communicable & Environmental Diseases and Emergency Preparedness
  - Director and State Epidemiologist
    - TIM JONES, MD

- HIV/STD Programs - Medical Director
  - Carolyn Wester, MD, MPH

- HIV/STD Director
  - Dr. Shanell McGoy

- HIV Prevention Director
  - Melissa Morrison

- STD Prevention Director

- HIV/STD Epi Director
  - Dr. Meredith Brantley

- Ryan White Pt B Director
  - Tonya King

- HOPWA Director
  - Trang Wadsworth

- VH Hep Director
  - Lindsey Sizemore
Surveillance Working Group Overview

• Purpose
  – To elicit regional feedback on feasibility of VH surveillance
    • Central Office vs. Regional Responsibilities

• Schedule
  – October 15, 2015
    • Hepatitis Case Definitions
    • Developing Investigation Algorithms
  – October 22, 2015
    • Reporting Requirements, Investigation Tools
    • New NBS Hepatitis Page Builder Pages
  – November 5, 2015
    • NBS User Manual
    • Planning for In-Person Field Trainings
• Purpose
  – To develop user-friendly, comprehensive, standardized VH reporting and investigation tools

• Currently
  – Immunizations
    • HAV and Perinatal HBV
  – HIV/STD/VH
    • Non-Perinatal HBV and HCV
Field Investigation Tools

- Letters to Providers
  - HBV/HCV Case Records Request (HBV and HCV)
  - Pregnancy Status Inquiry (HBV)
  - Public Health Authority

- Standardized Case Report Form (CRF) for HBV and HCV
  - Case Report Details
  - Patient History
  - Contact Management
  - Education and Prevention
    - Note: NBS Page Builder Pages and CRF were synchronized
  - Case Classification Quick Reference Tables

- Pre and Post-Test Counseling

- 2x2 Tables for Case Classification
HBV Quick Reference Table

Hepatitis B

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Symptomatic</td>
<td>Jaundice and/or ALT &gt;100</td>
<td>HBsAg (+)</td>
<td>IgM anti-HBc (+)</td>
</tr>
</tbody>
</table>

- **Acute, Confirmed:**
  - Seroconversion: (-) HBsAg within 6mos prior to a (+) HBsAg, HBeAg/HBV NAT; OR
  - All Boxes checked (I, II, III, and IV) OR
  - Boxes I, II, and III checked with unknown IgM anti-HBc

- **Acute, Probable:**
  - [Box I, and/or Box II], plus Box III checked with unknown IgM anti-HBc*; OR
  - Boxes III and IV checked

- **Chronic, Confirmed:**
  - (-) IgM anti-HBc and one (+) of the following: HBsAg, HBeAg, or HBV NAT; OR
  - (+) HBsAg, HBeAg, HBV NAT two times ≥ 6 months apart (any combo)

- **Chronic, Probable:**
  - One (+) of the following: HBsAg, HBeAg, or HBV NAT

*While a (-) IgM anti-HBc would make this “Chronic, Confirmed”, an absent IgM anti-HBc is not the same as a (-) IgM anti-HBc.
### HBV Ab Quick Reference Table

<table>
<thead>
<tr>
<th>(-) or Unknown HBsAg, plus...</th>
<th>Existing investigation in NBS (HAV or HCV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>(+) IgM anti-HBc</td>
<td>Associate labs with existing investigation</td>
</tr>
<tr>
<td>(+) anti-HBc</td>
<td>Associate labs with existing investigation</td>
</tr>
<tr>
<td>(+) anti-HBs</td>
<td>Associate labs with existing investigation</td>
</tr>
<tr>
<td>(+) anti-HBe</td>
<td>Associate labs with existing investigation</td>
</tr>
</tbody>
</table>

**Exception:** If these labs are received on a woman of reproductive age, a field investigation will need to be conducted to determine pregnancy status and, if pregnant, acquire additional HBV labs for definitive case status determination.
Hepatitis C Quick Reference Table

<table>
<thead>
<tr>
<th></th>
<th>Symptom(s) plus either</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) jaundice or b) ALT &gt;200 IU/L</td>
</tr>
<tr>
<td>No or Unknown</td>
<td>Yes</td>
</tr>
<tr>
<td>HCV Ab(+) only</td>
<td>Chronic, Probable</td>
</tr>
<tr>
<td>HCV NAT(+) or HCV Ag(+)</td>
<td>Chronic, Confirmed</td>
</tr>
</tbody>
</table>

Acute
- Seroconversion: (-) HCV Ab, HCV Ag, or HCV NAT followed by a (+) of any of these within 12 months (see test conversion table below) = Acute, Confirmed

Test Conversion within 12 Months Combinations

<table>
<thead>
<tr>
<th>First Result</th>
<th>Second Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) HCV Ab</td>
<td>(+) HCV Ab, (+) HCV Ag or (+) HCV NAT</td>
</tr>
<tr>
<td>(-) HCV Ag</td>
<td>(+) HCV Ag or (+) HCV NAT</td>
</tr>
<tr>
<td>(-) HCV NAT</td>
<td>(+) HCV Ag or (+) HCV NAT</td>
</tr>
</tbody>
</table>

Chronic:
- (+) HCV Ab, (-) RNA, and no other labs on file or the same results previously = Chronic, Probable
- (+) HCV Ab, (-) RNA, and prior (+) RNA = Chronic, Confirmed
- (-) HCV Ab, standalone = Chronic, Not a Case
- (-) HCV RNA, standalone = Chronic, Not a Case
Capacity to Conduct VH Surveillance

- **Acute** HBV and HCV
  - All Clinically Suspected Cases
  - Field-investigated by Regions

- HBV-Positive Women of Reproductive Age (11-50)
  - Evaluated for Pregnancy
  - Field-investigated by Regions

- **Perinatal** HBV
  - Field-investigated by Regions

- **Chronic** HBV
  - NBS-investigated by Regions

- **Chronic** HCV
  - Lab Reportable
    - 1/1/16 – Functionally
    - 1/1/17 – Lawfully
  - NBS-investigated by Central Office
Centralized HCV Lab Processing

• Manually Received (Central Office, ~2,000/Month)
  – If existing case
    • Associate labs and change case status, as needed
  – If not an existing case
    • Create investigation, assign case status, associate labs, and create CDC notification

• Electronically Received
  – Regions mark as ‘reviewed’ (e.g. orphan)
  – Central Office responsibility (~3,000-5,000 per month)
  – If existing case
    • Associate labs and change case status, as needed
  – If not an existing case
    • Create investigation, assign case status, associate labs, and create CDC notification
VH Trainings and Monthly Calls

• VH Surveillance Trainings
  – First Quarter 2016; In Person; All 13 Public Health Regions
  – Focused on New NBS Pages, Standardizing Investigations, and Case Definitions
  – Starting in 2017: Occur Every March or As Requested

• VH Monthly Calls
  – 4th Thursday of Each Month
  – Variety of Topics (i.e. Hierarchy of Field Investigations, HCV Testing Update, etc.)
Surveillance Data Snapshot: HBV

- Acute (Confirmed Only)
  - 2013: 260
  - 2014: 233
  - 2015: 245
  - 2016: 200 (23%)

- Chronic (Confirmed Only)
  - 2013: 532
  - 2014: 535
  - 2015: 486
  - 2016: 557 (5%)
Surveillance Data Snapshot: HCV

- **Acute (Confirmed Only)**
  - 2013: 98
  - 2014: 126
  - 2015: 175
  - 2016: 146 (↑49%)

- **Chronic (Confirmed Only)**
  - 2013: 1,782
  - 2014: 3,385
  - 2015: 7,394
  - 2016: 10,442 (↑486%)
## Surveillance for Chronic HCV, Tennessee

<table>
<thead>
<tr>
<th>Case Classification</th>
<th>2013</th>
<th>2014</th>
<th>2015*</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Confirmed</strong></td>
<td>1,782 (44%)</td>
<td>3,385 (50%)</td>
<td>7,394 (59%)</td>
<td>10,442 (50%)</td>
</tr>
<tr>
<td></td>
<td>2,234</td>
<td>3,421</td>
<td>5,244</td>
<td>10,496</td>
</tr>
<tr>
<td><strong>Probable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,016</td>
<td>6,806</td>
<td>12,638</td>
<td>20,938</td>
</tr>
</tbody>
</table>

*Central Office Chronic HCV Surveillance Efforts Began On 7/1/15*
HCV High Risk Surveillance Overview

• Investigate newly reported positive HCV laboratory reports received at TDH indicative of chronic HCV

• Focus on one group due to increase in HCV among women of reproductive age and the potential for vertical transmission
  – 18-45 year old women
  – Excluding:
    • HBV co-infected
    • Anyone tested at a LHD (ordering and reporting provider)
    • Acute cases
    • NDR cases < 30 years old
    • Plasma and blood donation centers
    • Jails (either provider or patient address on lab)

• Conducted by Central Office staff
HCV High Risk Surveillance Objectives

• To assess pregnancy status from providers and to obtain additional risk factor information from patients

• To provide education to infected individuals
  – Ab +
    • Referral to Health Department for RNA testing
  – RNA +
    • Referral to Viral Hepatitis Case Navigator
HCV High Risk Surveillance Results

Stay Tuned!
HCV CBO Testing Program Overview

- Rapid Antibody Test Kits Provided
  - CBOs serving at risk-populations
  - Currently 7 CBOs; 33% positivity rate
HCV CBO Testing Program Training Materials

- Developed and Provided In-Person by Central Office Staff
  - Overview
  - Screening and Diagnosis
  - Device Training
  - Results and Messaging
  - Linkage to Care
    - Refer to LHD for Confirmatory Testing

- Onboards New CBOs
  - Ongoing Quality Assurance
  - Refresher Every 2 Years
HCV CBO Testing Program Reporting Documents

- Monthly Aggregate Spreadsheet
  - Total # Tests Conducted
  - # Positive
  - Aggregate Demographic and Risk Factor Information

- CBO HCV Ab Testing Form (Positives Only)
  - In Lieu of PH-1600
  - Person Level Data