Welcome

An Emerging Epidemic: The Public Health Response to Hepatitis C Infection among Young People who Use Drugs

In collaboration with the offices of Congresswoman Barbara Lee & Senator Elizabeth Warren, Congressmen Hank Johnson & Mike Honda, & the Congressional Hepatitis Caucus

April 24, 2014
11:30 AM—1:00 PM
Congressional Meeting Room South
Capitol Visitor Center
Speakers

Panelists:
Michael Botticelli, Acting Director
  White House Office of National Drug Control Policy (ONDCP)
Wilson Compton, MD, MPE, Deputy Director
  National Institute on Drug Abuse (NIDA), National Institutes of Health (NIH)
Jennifer Havens, PhD, MPH, Center on Drug & Alcohol Research
  University of Kentucky College of Medicine
Sheila Guilfoyle, Viral Hepatitis Prevention Coordinator
  Wisconsin Division of Public Health

Moderator:
Rachel McLean
Michael Botticelli
White House Office of National Drug Control Policy (ONDCP)
Injection Drug Use and Hepatitis C

What Can We Do About It?

Wilson M. Compton, M.D., M.P.E.
Deputy Director
National Institute on Drug Abuse

NIH
National Institute on Drug Abuse
What is Hepatitis C?

• Hepatitis C Virus (HCV) is a blood-born virus that attacks the liver.
  – Transfusion risk IN THE PAST
  – Injection drug use risk
• Identified as a separate virus in 1989, improved testing has been available since the 1990s to readily identify infected persons.
• Chronic hepatitis C affects an estimated 2.7 to 3.9 million people in the U.S.
**Key Information:**

HCV remains infective up to 6 weeks in syringes/surfaces

HCV contamination remains infective on improperly cleaned surfaces
Deaths Resulting from Hepatitis C Infection Have Now Outpaced those from HIV

Annual age-adjusted mortality, 1999-2008
(from 21.8 million death records)

Long-Term Reductions in Reported Acute HCV Infections in USA, 1982-2008

Source: Viral Hepatitis and State Disease Surveillance, CDC
Recent Increases in Report Number of Acute HCV Infections in USA, 2000–2011

Source: National Notifiable Diseases Surveillance System (NNDSS)
Injection Drug Use Is Driving new HCV Infections

**IDUs are most vulnerable for acquiring HCV**
- 70% of IDUs test positive for HCV
- 90% of HIV-infected IDUs become co-infected with HCV

**Increased IDU due to switch from Rx opioids to heroin**
- There is a surge in HCV infection within young IDUs (18-25 year old) who transition from Rx opioids to heroin

**Most HCV-infected IDUs unaware of infection status**
- Infected people may be asymptomatic for many years after the initial infection until signs of cirrhosis or liver cancer develop, increasing their risk of transmitting HCV to others.
Recent Data from Several States: *Hepatitis C Virus Increased Among Adolescents and Young Adults*

Of cases with available risk data, injection drug use (IDU) was the most common risk factor for HCV transmission.

Although only a small number of these cases responded to further investigation…..

- 92% reported opioid analgesic abuse
- 89% reported heroin use
- 95% used opioid analgesics before switching to heroin
- During the preceding 6 months, the most frequently injected drugs were heroin (50%) and opioid analgesics (30%)

*CDC, MMWR, May 6, 2011/60(17); 537-541; CDC, MMWR, October 28, 2011/60(42):1457-1458*
Age Distribution of Confirmed Hepatitis C Cases: Massachusetts 2002-2009*

- 1,925 reports of HCV among persons 15-24 yrs.
- Cases from all areas of state; equally male:female, mostly white
- 72% past or current IDU, 84% injectors in past 12 mos.
- Other states are reporting similar increases

*MMWR 2011:60(17);537-541
Hepatitis C Case Counts by Age
Pennsylvania, 2010

CDC, Division of Viral Hepatitis
Rate of Newly Identified Chronic Hepatitis C by Sex and Age Group, Florida, 2003-2011

*Reported cases of confirmed, probable and suspect chronic hepatitis

Thanks to Beth Eichler, Fla. Dept. of Health and CDC, Division of Viral Hepatitis
Characteristics of “traditional” vs. “new/recent” IDUs

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>“Traditional” HCV Infected IDU</th>
<th>“New/Recent” HCV Infected IDU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mixed, 18-50</td>
<td>Young, &lt;25</td>
</tr>
<tr>
<td>Location</td>
<td>Urban</td>
<td>Suburban, Rural</td>
</tr>
<tr>
<td>Gender</td>
<td>Mostly Male</td>
<td>Male=Female</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>Minority</td>
<td>Non-minority</td>
</tr>
<tr>
<td>First Opioids</td>
<td>Heroin</td>
<td>Rx Opioids</td>
</tr>
</tbody>
</table>

CDC: Division of Viral Hepatitis
HCV, HIV and Opioid Addiction are Part of Syndemic of Intersecting Epidemics

**HCV, HIV, and opioid dependence are co-occurring epidemics.**

- Treatment of opioid addiction with buprenorphine increases uptake of HAART
- Stabilization of patients using buprenorphine + HAART allows for treatment for HCV co-infection
- Withholding HCV treatment in opioid dependent HIV/HCV coinfected individuals leads to end-stage liver disease, HCC, and liver-related mortality.
What can we do?

• **Prevention**
  – Testing *(now endorsed by US Preventive Services Task Force)*
  – Primary prevention
  – Drug Treatment as prevention, especially medications for the underlying opioid addiction
    • Buprenorphine, Methadone and Naltrexone

• **Treatment**
  – Vary treatment depending on individual genetics
  – Guidance for who to treat is pending
  – New drugs expected in late 2014
  – Cost is an issue

Evolution of HCV Therapy: Interferon to Direct-Acting Antivirals

Adapted from Strader DB, et al. Hepatology 2004;39:1147-71 and CDC, Division of Viral Hepatitis
HCV Test, Care, and Cure Continuum

~3 million persons living with HCV in the U.S.

Holmberg S, et al., NEJM, (2013)
Some **Barriers** to Improving Our National Response to HCV in Young Non-Urban IDUs

- Acute HCV infection may be asymptomatic (only 10%-20%); young IDUs tend not to seek treatment
- Young and nonurban IDUs hardest to reach (only ~12% success rate in doing interviews in Mass.)
- There may be no drug treatment availability
- There may be no antiviral treatment availability
- There may be no interest by IDU in drug/antiviral treatment
Viral Hepatitis Action Plan, updated 2014-2016

See also: Confronting the Emerging Epidemic of HCV Infection Among Young Injection Drug Users

American Journal of Public Health
May 2014; 104:816-821.

Authors from HHS Office of HIV/AIDS and Infectious Disease Polidy, NIDA, CDC, SAMHSA
Action Plan for the Prevention, Care, & Treatment of Viral Hepatitis, 2014-2016

Goals:

• Increase proportion who are aware of their hepatitis B virus infection, from 33% to 66%
• Increase in proportion who are aware of their hepatitis C virus infection, from 45% to 66%
• Reduce the number of new cases of HCV infection by 25%
• Eliminate mother-to-child transmission of HBV

Action Plan Priority Areas:

• Educate health care providers and communities to reduce health disparities
• Improve testing, care, and treatment to prevent liver disease and cancer
• Strengthen surveillance to detect viral hepatitis transmission and disease
• Eliminate transmission of vaccine-preventable viral hepatitis
• Reduce viral hepatitis caused by drug-use behaviors
• Protect patients and workers from health-care associated viral hepatitis
NIDA-Supported HCV Research

• Rapid HCV testing in care settings

• Utilization of case managers within a coordinated care framework

• Adaptation of HIV model of “treatment as prevention”

• Role of molecular biology and genetics in treatment development
NIDA: Ongoing Efforts in HCV Research

• Multidisciplinary approach

• 2013 Technical Consultation Meeting

• NIDA Symposium: “Managing HIV/HCV Infections in Substance Abusing Populations” (ASAM, 2014)
NIH Efforts: NIDDK and NIAID

– Hepatitis B Research Network
– Supporting follow-up and ancillary studies to completed HCV clinical trials
– NIDDK Intramural Program includes research on hepatitis B, C, and D therapy protocols
– Supporting development of next generation of HCV antiviral medications
– Hepatitis C Cooperative Research Centers
– Launched Phase I/II trial for HCV vaccine
– NIAID Intramural Program supports multi-faceted research on viral hepatitis
Now NIDA resources are with you wherever you go!

We’re connecting communities with a new mobile Web site that gives you drug-related information by topic, audience, and format—when you need it, where you need it.

The new mobile site (m.drugabuse.gov) provides:

- Easy access to NIDA’s resources through iPhone, Android, iPad, and other smartphones and tablets.
- A convenient way to find, view, request, and share publications—right in the palm of your hand.
- E-books of all publications to allow offline reading on all major e-readers, including Kindle and NOOK.
- New Spanish-language content on drugs of abuse and related topics.
The Emergence of Hepatitis C among Young PWIDs in Rural Appalachia

Jennifer R. Havens, PhD, MPH
Associate Professor
Department of Behavioral Science
Center on Drug and Alcohol Research
University of Kentucky College of Medicine

Source: National Survey on Drug Use and Health 2001 – 2011
Each fiscal year the Appalachian Regional Commission classifies each county into one of four economic levels based on the comparison of three county economic indicators (three-year average unemployment, per-capita market income, and poverty) to their respective national averages. See the reverse side for a description of each economic level.

Map Created: October 2003.
Rural Substance Abuse

- Little known about trends in drug use in rural Appalachia in particular
- Even fewer empirical reports around injection drug use and other medical consequences of drug use
- Specifically, HIV, HCV and other STI’s
Injection Drug Use among Rural Drug Users

- Previous research: injection drug use relatively rare among rural drug users in Appalachian Kentucky (Leukefeld et al., Substance Use and Misuse, 2002).

- More recent research suggested a much higher prevalence of injection among Appalachian drug users (>40%) (Havens et al., Drug and Alcohol Dependence, 2007).
IDU among Appalachian Drug Users

- Majority of rural IDUs reported injecting OxyContin® and other prescription drugs NOT designed for injection
- Fewer than 10% had ever injected heroin and/or cocaine
- Self-reported hepatitis C infection significantly higher among the IDUs versus non-IDUs (p<0.001)
  (Havens et al., Drug and Alcohol Dependence, 2007)
Limitations of Rural Substance Abuse Research

- Rural drug abuse research lacking:
  - People who inject drugs (PWIDs)
  - Infectious disease prevalence and incidence
  - Social network and geospatial factors in disease transmission
Social Networks among Appalachian People (SNAP) study

Purpose: determine prevalence and incidence of HCV, HIV and HSV-2 and other risk behaviors in relation to social network characteristics among rural prescription drug users

Follow-up at 6-, 12-, 18- and 24-months
Participants

- 500 rural out-of-treatment injection and non-injection drug users recruited and followed at 6-, 12-, 18- and 24-months post-baseline
- Storefront location in rural town
- Participants recruited via Respondent Driven Sampling (RDS)
Eligibility Criteria

- Age 18+
- English-speaking
- PWID (initial seeds)
- Use of at least 1 of the following drugs in prior 6 mo:
  - Rx Opiates (illicit use)
  - Cocaine
  - Heroin
  - Methamphetamine
Data Collection Procedures

- Interviewer-administered questionnaire
  - Computer-assisted personal interview (CAPI) via tablet PC
- Serologic testing (with pre- and post-test counseling)
  - HIV (with confirmatory testing)
  - HCV
  - HSV-2
## Participant Characteristics N=503

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
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<tbody>
<tr>
<td>Male</td>
<td>286</td>
<td>56.7</td>
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<tr>
<td>Age, median (IQR)</td>
<td>31 (26, 38)</td>
<td></td>
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<tr>
<td>Caucasian</td>
<td>474</td>
<td>94.2</td>
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<tr>
<td>Employed Full-Time</td>
<td>173</td>
<td>34.4</td>
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<tr>
<td>Lifetime Injection Drug Use</td>
<td>394</td>
<td>78.3</td>
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<tr>
<td>Substance</td>
<td>Lifetime</td>
<td>Past 30 Days</td>
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<tr>
<td>-------------------------------</td>
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<tr>
<td>Alcohol</td>
<td>499</td>
<td>99.2</td>
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<tr>
<td>Methadone (illicit)</td>
<td>476</td>
<td>94.6</td>
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<tr>
<td>Heroin</td>
<td>176</td>
<td>35.0</td>
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<tr>
<td>OxyContin</td>
<td>477</td>
<td>94.8</td>
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<tr>
<td>Oxycodone</td>
<td>482</td>
<td>95.8</td>
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<tr>
<td>Hydrocodone</td>
<td>488</td>
<td>97.0</td>
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<tr>
<td>Benzodiazepines</td>
<td>480</td>
<td>95.5</td>
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<tr>
<td>Methamphetamine</td>
<td>219</td>
<td>43.5</td>
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<tr>
<td>Cocaine</td>
<td>472</td>
<td>93.8</td>
</tr>
<tr>
<td>Marijuana</td>
<td>491</td>
<td>97.6</td>
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</tbody>
</table>
Proportion of Participants Injecting Drugs

Baseline 6-Month 12-Month 18-Month 24-Month

IDU
HCV+

Center on Drug and Alcohol Research
Drugs Initiated Injection With (n=394 Lifetime PWIDs)

<table>
<thead>
<tr>
<th></th>
<th>&lt;=25 n</th>
<th>&lt;=25 %</th>
<th>&gt;25 n</th>
<th>&gt;25 %</th>
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</thead>
<tbody>
<tr>
<td>OxyContin</td>
<td>58</td>
<td>66.3</td>
<td>133</td>
<td>43.2</td>
</tr>
<tr>
<td>Other Rx opiates</td>
<td>13</td>
<td>15.1</td>
<td>41</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>TOTAL ALL Rx opiates</strong></td>
<td><strong>71</strong></td>
<td><strong>82.5</strong></td>
<td><strong>174</strong></td>
<td><strong>56.5</strong>*</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Cocaine</td>
<td>13</td>
<td>15.2</td>
<td>104</td>
<td>33.7*</td>
</tr>
<tr>
<td>Heroin</td>
<td>2</td>
<td>2.33</td>
<td>18</td>
<td>5.8</td>
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</tbody>
</table>

*P<0.001
Initiation to Injection

Young and Havens, *Addiction*, 2012
Initiation to Injection by Age

- 41+ age group: Baseline: 75, Final: 85
- 31-40 age group: Baseline: 75, Final: 85
- 26-30 age group: Baseline: 80, Final: 85
- <=25 age group: Baseline: 70, Final: 85

The graph shows the comparison between Baseline and Final injection rates for different age groups, with the 41+ and 26-30 groups having the highest injection rates, followed by 31-40 and <=25 age groups, respectively.
Baseline Prevalence – HIV, HCV, HSV-2

- HIV: 0 Cases
- HCV: 222 Cases
- HSV-2: 59 Cases
- HCV/HSV-2: 33 Cases
HCV Prevalence by Age

*P<0.001 - <=25 vs other age groups
HCV Prevalence at 24-Months

Lifetime injectors: 67.1%

Recent injectors (past 6-months): 73.7%
Hepatitis C Correlates

Independent associations with HCV:
- Syringe sharing (aOR: 2.04, 95% CI: 1.20, 3.45)
- Years IDU (aOR: 1.04, 95% CI: 1.01, 1.07)
- Injecting Rx opiates (aOR: 2.37, 95% CI: 1.21, 4.63)
- Injecting Cocaine (aOR: 2.24, 95% CI: 1.41, 3.54)

Hepatitis C Incidence

- 24-Months: N=45
- 18-Months: N=10
- 12-Months: N=8
- 6-Months: N=19
- Baseline: N=222

Cumulative Cases: blue
Incident Cases: red
HCV Incidence – PWIDs

Lifetime injectors:

14.2 cases/100 person years

vs. 3.0 cases/100 PY for never injectors

Recent injectors (past 6-months):

18.6 cases/100 person years
Proportion of Incident Cases by Age Group

*P<0.001
HCV Incidence (per 100 PY) by Age Group
### HCV Incidence by Age Category

<table>
<thead>
<tr>
<th>Age</th>
<th>IRR</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=25 years</td>
<td>3.69</td>
<td>1.42, 9.63</td>
</tr>
<tr>
<td>26-30 years</td>
<td>2.24</td>
<td>0.81, 6.17</td>
</tr>
<tr>
<td>31-40 years</td>
<td>3.00</td>
<td>1.15, 7.85</td>
</tr>
</tbody>
</table>

*Referent Category: 40+ years*
Baseline HCV Prevalence in Drug Network
6-Month HCV Seroconversions in Drug Network
12-Month HCV Seroconversions in Drug Network
18-Month HCV Seroconversions in Drug Network
24-Month HCV Seroconversions in Drug Network
Probability of Heroin Initiation

Months in Study

\[ p(\text{Hazard}) \quad \text{95\% CI} \]
Heroin Initiation

- Predictors of heroin initiation at f/u:
  - Eigenvector centrality (aOR: 1.83, 95% CI: 1.21, 2.79)
  - Number days using in the past 30:
    - OxyContin (aOR: 1.03, 95% CI: 1.00, 1.06)
    - Cocaine (aOR: 1.12, 95% CI: 1.03, 1.22)
    - Methamphetamine (aOR: 1.19, 95% CI: 1.10, 1.29)
    - Marijuana (aOR: 1.03, 95% CI: 1.00, 1.06)
Conclusions

- HCV highly prevalent among PWIDs in Appalachia
- Additional incident cases at each visit
- Young IDUs particularly at risk for seroconversion
- Heroin use not prevalent...yet
Acknowledgements

- NIH/NIDA (R01-DA024598 and R01-DA033862)
- Drs. Carl Leukefeld, Carrie Oser, Rick Crosby, Michelle Lofwall, Sharon Walsh (Co-Investigators)
- Study Staff – Hazard and Lexington
- Study Participants
An Emerging Epidemic: The Public Health Response to Hepatitis C Infection Among Young People Who Use Injection Drugs

Sheila Guilfoyle
Viral Hepatitis Prevention Coordinator
Division of Public Health
Wisconsin Department of Health Services
National Alliance of State and Territorial AIDS Directors
Harm Reduction Coalition Briefing
Washington, DC
April 24, 2014
Cluster Investigations in Rural Wisconsin

- North Central six rural counties (2010)
  - Five acute HCV cases reported in a short period of time
  - All young adults who reported injection drug use
  - Resulted in a CDC *Notes from the Field*

- Manitowoc both HIV and HCV cases (2011)
  - Local public health did extensive interviews
  - Documented networks of injectors

- Electronic Laboratory Reporting (ELR) was key
Public Health Response

Partners

• Wisconsin DPH
  o Identified clusters
  o Coordinated investigation
  o Worked with State Laboratory of Hygiene on confirmatory testing
  o Provided training and technical assistance to local public health

• AIDS Resource Center of Wisconsin (ARCW)
  o Provided harm reduction services
  o Outreach testing
  o Interviewed cases that could not be located by public health

• CDC Division of Viral Hepatitis
  o Provided onsite assistance with intervention
  o Conducted quasi species analysis on blood specimens
  o Assisted with preparation of Notes From the Field

• Local Public Health Agencies
  o Interviewed cases for risk
  o Provided case follow-up
  o Vaccination and linkage to care
Public Health Response

• Increased outreach testing to young people who inject drugs (PWIDs).
• Piloted the HCV rapid test in harm reduction and outreach settings statewide.
• Integrated HCV testing with the HIV Testing Program.
• Provided training to local health department staff on disease intervention and case follow-up.
Viral Hepatitis Program Collaborations

• Community-based organizations
  o Testing and harm reduction services

• State Council on Alcohol and Other Drug Abuse
  o Heroin Subcommittee.

• Policy Development
  o Good Samaritan legislation

• Research
  o UW School of Medicine and Public Health: social networks HCV testing project
Hepatitis C Infection in Wisconsin

Scope of Disease in Wisconsin: Where

- There are 35,000 known HCV infections in people living in Wisconsin.
  - An estimated 1.3% of population is living with HCV or approximately 74,000 in Wisconsin.
- The majority of people with HCV live in the southeastern (52%) and southern (16%) regions of the state.
- Number reported has increased slowly since 2006.
- On average, 2,500 infections have been detected each year.

Prevalent HCV Cases in Wisconsin*

*2013 Data. Cases reported from the Department of Corrections and the Federal Correctional Institution are not shown.

Number of Cases
- 15 - 250
- 251 - 743
- 744 - 2,119
- 10,064
Scope of Disease in Wisconsin: Who

- Most (57%) of newly reported in 2013 and total known living with HCV (65%) are male.
- New reports in females have increased since 2003.
Scope of Disease in Wisconsin: Who

- The largest group (41%) of newly reported in 2013 are aged 50 and older.
- *New reports in young adults have increased five-fold since 2003.*
- Median age of reported cases has decreased.
  - 2003: Median age 47 years
  - 2013: Median age 44 years
Mortality Trends

Scope of Disease in Wisconsin: Persons with Injection Drug Use (PWID)

Reported Acute HCV Cases, Wisconsin, 2003-2013

Rates of Heroin Overdoses and Deaths, Wisconsin, 2008-2012*

*Source: Wisconsin hospital inpatient database, Wisconsin emergency department visit database, and Wisconsin resident death certificates, Office of Health Informatics, Division of Public Health, Wisconsin Department of Health Services. Rates were age-adjusted using the United States Standard 2000 population.
Rapid HCV Testing Program

- Project began in 2012.
- Four agencies serving clients statewide.
  - AIDS Network
  - AIDS Resource Center of Wisconsin
  - Public Health-Madison Dane County
  - 16th Street Community Health Center
- Provided testing and harm reduction services.
- Completed enhanced risk survey.
Scope of Disease in Wisconsin:

HCV Positive Persons with Injection Drug Use

Data from HCV rapid test participation, conducted at outreach sites in WI during 2011-2013. Data are limited to PWID.

**Reported Risk Behavior**
- Injection drug use in past 6 months: 88%
- Shared injection drug equipment: 85%
- Incarcerated: 77%
- Shared equipment in past 6 months: 53%
- Tattoo: 44%

**Race/Ethnicity**
- Non-Hispanic White: 82%
- Hispanic: 7%
- American Indian: 7%
- Non-Hispanic Black: 5%
Surveillance System Match: HCV/HIV Co-infections

- Approximately 900 HCV/HIV co-infections identified since 2000.
- 2.3% of HCV cases have HIV infection.
- 7.1% of HIV cases have HCV infection.
- Demographics of co-infected:
  - 77% Male
  - 45% Non-Hispanic Black
  - 56% Milwaukee Co. residence
- Risk: 60% reported IDU at the time of HIV report.
Summary

- Injection drug users can be reached.
  - Collaboration between public health and harm reduction programs enhances case finding.
  - Good correctional/jail health relationships are essential.
- Education regarding HCV is needed for providers, local health department staff, and injection drug users.
- The use of rapid HCV tests can be a powerful tool for HCV screening, prevention and initiating treatment in a population with high prevalence of HCV infection.
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• James Vergeront, MD, Director
  Wisconsin AIDS/HIV Program

• Lauren Stockman MPH
  Hepatitis C Epidemiologist
Thank You

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Thank You:

Senator Elizabeth Warren
Congresswoman Barbara Lee
Congressman Mike Honda
Congressman Hank Johnson
&
The Congressional Hepatitis Caucus