Hepatitis C, HIV, and Drug Use

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Incidence and Prevalence
Treatment and Outcomes
Selected Research Projects
Incidence and Prevalence

HCV
HIV
Drug Users
Undiagnosed Disease
HCV Incidence
Estimated Incidence of Acute HCV

Risk Factors for Acute Hepatitis C
United States, 1990-1993

- IV Drug Use: 38%
- Transfusions: 4%
- Hemodialysis: 1%
- Profession/Occupation: 2%
- Sexual/Household: 10%
- None: 1%
- Low Socioeconomic Status: 44%

Source: CDC Sentinel Counties Study of Acute Viral Hepatitis C
HCV Prevalence
Over 5.2 Million People Living With Chronic HCV in the US

Number of HCV Cases (millions)

<table>
<thead>
<tr>
<th>Category</th>
<th>NHANES Estimate</th>
<th>HCV Cases Not Included in NHANES*</th>
<th>Estimated Total HCV Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative estimate</td>
<td>3.2</td>
<td>1.9</td>
<td>5.2</td>
</tr>
<tr>
<td>Upper limit of estimate</td>
<td>3.8</td>
<td>3.8</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*Homeless (n=142,761-337,6100); incarcerated (n=372,754-664,826); veterans (n=1,237,461-2,452,006); active military (n=6805); healthcare workers (n=64,809-259,234); nursing home residents (n=63,609); chronic hemodialysis (n=20,578); hemophiliacs (n=12,971-17,000).

How many people in the U.S. have HCV?

(Armstrong et al, 2006; Chak et al, 2011)

4.1 Million

5.2 Million – 7.1 Million

Table 6. Estimated total prevalence of hepatitis C virus in the USA

<table>
<thead>
<tr>
<th>Population</th>
<th>Reported prevalence range</th>
<th>Estimated number in US population</th>
<th>Estimated range of HCV cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homeless</td>
<td>22.2–52.5%</td>
<td>640,067 (14)</td>
<td>142,761–337,610</td>
</tr>
<tr>
<td>Incarcerated</td>
<td>23.1–41.2%</td>
<td>1,613,656 (96)</td>
<td>372,754–664,826</td>
</tr>
<tr>
<td>Veterans</td>
<td>5.4–10.7%</td>
<td>22,915,943 (97)</td>
<td>1,237,461–2,452,006</td>
</tr>
<tr>
<td>Active military duty</td>
<td>0.48%</td>
<td>1,417,747 (98)</td>
<td>6,805</td>
</tr>
<tr>
<td>Healthcare workers</td>
<td>0.9–3.6%</td>
<td>7,200,950 (99)</td>
<td>64,809–259,234</td>
</tr>
<tr>
<td>Nursing home residents</td>
<td>4.5%</td>
<td>1,413,540 (85)</td>
<td>63,609</td>
</tr>
<tr>
<td>Chronic haemodialysis</td>
<td>7.8%</td>
<td>263,820 (80)</td>
<td>20,578</td>
</tr>
<tr>
<td>Haemophiliacs with transfusions before 1992</td>
<td>76.3–100%</td>
<td>17,000 (92)</td>
<td>12,971–17,000</td>
</tr>
</tbody>
</table>

Unaccounted number of HCV positive NHANES*: 1,921,748–3,821,668

Total: 5,191,748–7,091,668

Persons had chronic HCV infection. Peak prevalence of anti-HCV (4.3%) was observed among persons 40 to 49 years of age. A total of 48.4% of anti-HCV-positive persons between 20 and 59 years of age reported a history of injection drug use, the strongest risk factor for HCV infection. Of all persons reporting such a history, 83.3% had not used injection drugs for at least 1 year before the survey. Other significant risk factors included 20 or more lifetime sex partners and blood transfusion before 1992. Abnormal serum ALT levels were found in 58.7% of HCV RNA-positive persons. Three characteristics (abnormal serum ALT levels, any history of injection drug use, and history of blood transfusion before 1992) identified 85.1% of HCV RNA-positive participants between 20 and 59 years of age.

Limitations: Incarcerated and homeless persons were not included in the survey.

For author affiliations, see end of text.


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Prevalence of HCV in Select Populations

- Illicit drug users: ~300,000 (80%-90%) \(^2,3\)
- Alcoholics: ~240,000 (11%-36%) \(^5\)
- Incarcerated: ~330,000 to 860,000 (16%-41%) \(^1\)
- Homeless: ~175,000 (22%) \(^7\)
- Veterans: ~280,000 (8%) \(^8\)
- Living below poverty level: ~940,000 (3.2%) \(^6\)
- Children (6-18 years old): ~100,000 (0.1%) \(^9\)

HCV in Drug Users
HCV Prevalence in Selected Groups of Adults in the United States

- General population
  - Males: (17%)
  - Females: (9%)
- STD clients: (17%)
- First responders: (<1%)
- Surgeons, nurses: (9%)
- Snorted cocaine: (10%)
- Tattooed: (20%)
- Body pierced: (20%)
HCV Prevalence in Selected Groups of Adults by History of Injection Drug Use

- General population
- Males
- Females
- STD clients
- First responders
- Surgeons, nurses
- Snorted cocaine
- Tattooed
- Body pierced

Average Percent Anti-HCV Positive

No IDU
IDU

CRIT/FIT 2013
HCV Prevalence by Selected Groups
United States

- Hemophilia
- Injecting drug users
- Hemodialysis
- STD clients
- Gen population adults
- Surgeons, PSWs
- Pregnant women
- Military personnel

Average Percent Anti-HCV Positive

CRIT/FIT 2013
Reasons for High HCV Risk Among Injection Drug Users

- Contaminated needles
- Contaminated “works”
  - Syringes, cookers, cottons, rinse water
- Old (infected) mentor transmits to young initiate
- Unstable networks and supply

HIV Incidence and Prevalence
Estimated New HIV Infections in the United States, 2010, for the Most Affected Subpopulations
HIV Incidence by Transmission Category, United States - 2009

- Male-to-Male Sexual Contact (MSM): 61%
- Heterosexual Contact: 27%
- Injection Drug Use (IDU): 9%
- MSM/IDU: 3%
- Other: <1%

CRIT/FIT 2013
Diagnoses of HIV Infection among Adults and Adolescents, by Sex and Transmission Category, 2011—United States and 6 Dependent Areas

Males
N = 39,495
- Male-to-male sexual contact: 78%
- Injection drug use (IDU): 12%
- Male-to-male sexual contact and IDU: 6%
- Other: <1%

Females
N = 10,512
- Heterosexual contact: 86%
- Male-to-male sexual contact and IDU: 14%
- Other: <1%

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

a Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
b Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.

Diagnoses and deaths, No. (in thousands)

Year of diagnosis or death

Note. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting. Death may be due to any cause.

Note. All displayed data have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting. Data exclude men with HIV infection attributed to male-to-male sexual contact and injection drug use.
HCV and HIV – Comparative Prevalence and Incidence
Comparative Burden of Chronic HCV Infection in the United States

Number of Infected Individuals Versus Number Aware They Are Infected (diagnosed)

- **HIV**: 1.1 Million, 21% Undiagnosed
- **HBV**: ~800,000-1.4 Million, 65% Undiagnosed
- **HCV**: ~2.7-3.9 Million, 75% Undiagnosed

- Prevalence of HCV is 4 times greater than HIV and HBV

HIV=human immunodeficiency virus; HBV=hepatitis B virus; HCV=hepatitis C virus

Duration of Injection Drug Use and Prevalence of Blood-Borne Viruses

Incidence per 100 person-years of human immunodeficiency virus and hepatitis C virus infection by recruitment cohort in the AIDS Linked to the Intravenous Experience (ALIVE) cohort, 1988–2009.

Mehta S H et al. J Infect Dis. 2011;infdis.jiq112

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CRIT/FIT 2013
Undiagnosed Disease
Hepatitis C Is Often Undiagnosed

- Despite its high prevalence, HCV often remains undiagnosed

More than three fourths of those with hepatitis C are undiagnosed

Estimated Prevalence of Undiagnosed HIV Infection in the United States at the End of 2006

Percent undiagnosed by transmission category

- MSM: 23.5%
- IDU: 14.5% male, 13.7% female
- MSM/IDU: 12.1%
- HRHC: 26.7% male, 21.1% female
- Other: 17.6%

MSM = men who have sex with men  IDU = injection drug use  HRHC = high-risk heterosexual contact
Other = includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or identified

Treatment and Outcomes

Care Cascade
Barriers to Care

Care Cascade
HIV Care Cascade

Number and percentage of HIV-infected persons engaged in selected stages of the continuum of HIV care — United States

- 1,178,350 HIV-infected
- 941,950 HIV-diagnosed
- 725,302 Linked to HIV care
- 480,395 Retained in HIV care
- 426,590 On ART
- 328,475 Supressed viral load (≤200 copies/mL)

Source: Adapted from Morbidity and Mortality Weekly Report 60: 1618-1623, 2011
Gap between Clinical Trials and the Real-World

Fig. 1. Diagram of patient flow through treatment stages (HCV-selected samples).
Hepatitis C Care Cascade

1. Referral to a specialist/someone who can treat (from a primary care doctor, HIV clinic, opiate substitution clinic, needle exchange program)

2. Attending an appointment

- 1. Receive pre-treatment work-up
- 2. Meet eligibility criteria
- 3. Agree to initiate treatment

50% of infected persons in the US are unaware of their status

Chronic HCV infection

HCV diagnosis

Linkage to care

Treatment initiation

Viral clearance

Retention

Retention

Barriers to Care
Stepwise Barriers to Hepatitis C Treatment

HCV Infection

- Barriers:
  - Asymptomatic disease
  - Poor awareness/education
  - Lack of medical coverage
  - MD failure to screen/test

Diagnosis

- Barriers:
  - Non-adherence
  - MD failure to identify need for referral
  - Logistical concerns
  - Limited specialists availability

Treatment Initiation

- Barriers:
  - Patient fears/misunderstandings
  - Stigmatization
  - Substance abuse
  - Psychiatric comorbidity
  - Financial concern
  - Transportation/logistical concern
  - Communication difficulties

Referral to Specialist

Barriers to Treatment in Drug Users

Patient Barriers

• Low knowledge and motivation
• Lack of positive social support
• Unstable drug +/- alcohol use
• Unstable psychiatric illness
• Medical comorbidities
• Cognitive impairment
• Competing priorities
• Mistrust of healthcare system
• Interferon syringe - a trigger
• IFN effects mimic “dope sick”
• Drug-drug interactions
• Stigma
• Fragmented healthcare system

Provider and Structural Barriers

• Fragmented healthcare system
• Mistrust of drug users
• Incomplete knowledge and low motivation
• Competing priorities
• Practice does not accept all insurance plans
• Primary care provider who treats HIV/HCV may not be able to accept referrals from other PCPs
• Inadequate reimbursement for intensive models of care
• Interferon
• Liver biopsy
Selected Research Projects
HIV
Clinic Locations

Key
1: Melrose on Track, Melrose 9
2: SATP-Unit 1
3: SATP-Unit 3
4: Soundview
5: Trailer 1, Trailer 2, Van Etten
6: The Wellness Center at Port Morris

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Integrating HIV and HCV Care with Methadone Maintenance Therapy

**MMTP**

**Staff:**
- Physician (IM/FP), PA
- Part-time psychiatrist
- Substance Abuse Counselors, Nurses, and Medical Assistants
- Case Managers

**Services:**
- Opioid agonist therapy
- Comprehensive on-site 1\(^{o}\) care
  - General, HCV, HIV, Gyn
- Psych evaluation and treatment
- Support groups and peer educators
- Laboratory testing and EKGs
- Urine toxicology testing

**Hospital**
- Radiologist
- Hepatologist
- Transplant Center
- Pathologist
- Stress test, eye exam, etc.

**Lab**
Karina M. Berg, MD, MS
Substance Abuse Research Fellow ’04-’06
Robert Wood Johnson Physician Faculty Scholar ’06-09

- Robert Wood Johnson Physician Faculty Scholar award ’06-’09

- NIDA/NIMH K23 ’07-’11, to study:
  - Composite adherence model incorporating four measurement methods
  - Agreement and validity of different adherence self-report measures
  - Cognitive processes undertaken by drug users to answer adherence questions, including question interpretation, ability to remember medication taking, and answer editing

CRIT/FIT 2013
Directly Observed Treatment (DOT)
Distribution of Answers Using Different Self-Report Scales

Berg et al, IAPAC International Adherence Conference, 2008
● Adherence with HCV treatment using DOT in methadone clinics

NIDA K23, 2008-2013
Robert Wood Johnson Physician Faculty Scholar 2008-2011

● Evaluating care for HCV by addiction medicine physicians

NIDA R03 2002-2006

Integrating HCV Care with Methadone Maintenance Therapy

Retrospective chart review of on-site HCV treatment (pegylated interferon and ribavirin) provided to 73 drug users from 1/03 – 12/05

- 90% IDU
- 49% recently used illicit drugs
- 67% Latino, 21% Caucasian, 12% African American
- 32% HIV-infected
- 67% current psychiatric illness
- 38% attended HCV support groups

Litwin et al, Jour Subs Abuse Treatment, 2009
CRIT/FIT 2013
Integrating HCV Care with Methadone Maintenance Therapy: Results

HCV treatment outcomes:

- 86% completed at least 12 weeks of treatment
- 21% discontinued treatment due to adverse effects
- 45% sustained viral response (SVR)
- Genotype 2, mild/moderate liver disease on biopsy, non-smokers, employed, and completion of at least 80% planned duration of treatment were significantly associated with SVR
- HIV/HCV co-infected patients achieved equivalent SVR (43%) as HCV-monoinfected patients (46%)
- No association found between illicit drug use during HCV treatment and HCV virological outcomes

Litwin et al, Jour Subs Abuse Treatment, 2009
Integrating HCV Care with Methadone Maintenance Therapy
Harris, Arnsten, Litwin, Jour Addictive Med, 2010

- Retrospective chart review of all patients (n=291) in a single methadone clinic, 7/03 – 7/05
  - 60% male
  - 60% Hispanic, 27% Caucasian, 13% Black
  - Mean age = 47
- 289 (99%) screened for HCV Ab
  - 188 (65%) HCV Ab positive
  - 49 (17%) HIV/HCV co-infected
- 159 eligible for on-site care (insured by Medicaid)
  - 125 chose on-site HCV care
    - 83 HCV Ab positive
    - 25 biopsies performed
    - 45 (54%) reached a primary endpoint in 2 yrs
    - Of 21 treated, 38% achieved SVR
HCV Concurrent Group Treatment at Einstein
2009 - present
Why Group Treatment?

Synergy with participation of medical provider
Address patient and provider barriers to treatment
HCV Group Treatment Model

Health Educator / Peer

- Sets up room: coffee, snacks
- Side effect and depression surveys done
- Weights taken
- Group discussion co-facilitated by Health Educator and Peer

Provider

- Conducts semi-private individual visits
- Vitals and focused physical
- Addresses adverse effects and adherence
- Administers peg interferon injections and growth factors as needed
- Answer group questions

Conclude with patient milestones, updates and peer-led meditation
Group Treatment in Action
Group Treatment Benefits

For Patients

- Social support is built-in to treatment
- Misconceptions addressed
- Reassurance by concurrent participation of peers
-  fear of side effects: side effects normalized
- Directly administered peg
- Weekly oral meds dispensed
- Support for recovery
- “Upward spiral”

For Providers

- Frequent contact: providers and peers
- Co-management of cohort enhances expertise and confidence
- Multidisciplinary
- Natural mentoring opportunity
- Break from “the usual”
U.S. Response to HIV and Viral Hepatitis Epidemics (Edlin, 2011)

Hepatitis C infection is at least five times more prevalent as HIV infection in the United States, yet funding lags far behind.