EPIDEMIOLOGY AND BURDEN OF HBV AND HCV

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UNIVERSITY HEALTH NETWORK, TORONTO, CANADA
CONTENTS

- Background
- Burden of HBV, HCV Infections
  - Prevalence, Incidence, Surveillance
- Complications and Natural History
- Burden of HBV, HCV Disease
  - Cirrhosis, HCC, Liver transplantation
- Global Burden in People Who Inject Drugs (PWID)
- Acknowledgements
Hepatitis Epidemic Profile: Burden and Response

- **Burden of infection (who, where, when)**
  - Incidence: new hepatitis infections per year
  - Prevalence: number of hepatitis infection at a specific time point

- **Burden of disease (who, where, when)**
  - Incidence/Prevalence of clinical events (acute hepatitis, cirrhosis, HCC)
  - Deaths and mortality

- **Response (efficacy, coverage, effectiveness)**
  - Prevention services
  - Treatment

Hatzakis A et al. 2014
Wiktor S et al. 2014
## Characteristics of main types of viral hepatitis infections

<table>
<thead>
<tr>
<th></th>
<th>Hep A</th>
<th>Hep E</th>
<th>Hep B ± D</th>
<th>Hep C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of transmission</strong></td>
<td>Contaminated food, water</td>
<td></td>
<td>Blood, sex, mother-to-child</td>
<td></td>
</tr>
<tr>
<td><strong>Number chronic infections</strong></td>
<td>0</td>
<td>Very few</td>
<td>~240 million</td>
<td>~188 million</td>
</tr>
<tr>
<td><em><em>Annual</em> deaths</em>*</td>
<td>103,000</td>
<td>56,000</td>
<td>786,000</td>
<td>499,000</td>
</tr>
</tbody>
</table>

*Source: Global Burden of Disease Study 2010 Lozano et al, Lancet 2012*
### Burden of infection and disease of HBV and HCV

<table>
<thead>
<tr>
<th></th>
<th>HBV</th>
<th>HCV</th>
<th>HIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic infections worldwide (WHO)</td>
<td>240m</td>
<td>188m</td>
<td>35.3m</td>
</tr>
<tr>
<td>Chronic infections in European Region (WHO)</td>
<td>13.3m</td>
<td>15m</td>
<td>2.2m</td>
</tr>
<tr>
<td>Mortality (deaths/year) worldwide</td>
<td>786,000</td>
<td>499,000</td>
<td>1.6m</td>
</tr>
<tr>
<td>Mortality (deaths/year) in WHO European Region</td>
<td>36,000</td>
<td>86,000</td>
<td>66,000</td>
</tr>
</tbody>
</table>

Number of deaths/year from selected conditions, 2010

- HIV/AIDS: 1.4 million deaths
- Viral hepatitis: 1.4 million deaths
- Tuberculosis: 1.2 million deaths
- Malaria: 0.8 million deaths

1.4 million people died in 2010 of viral hepatitis

Source: Global Burden of Disease Study 2010 Lozano et al, Lancet 2012
Estimated annual deaths from selected causes by region, 2010

Different patterns of mortality in different parts of the world

Number of deaths/year

- Asia Pacific
- Americas
- Europe
- Africa & ME

- Viral hepatitis
- HIV
- TB
- Malaria

Source: Courtesy of IHME – Global Burden of Disease Study
Viral Hepatitis (A, B, C, D, E) is the 8th leading global cause of death: 1.4 million deaths annually

HCV: 188 millions  ➔  37 million need treatment
HBV: 240 millions  ➔  72 million need treatment

Hatzakis A et al. 2014
HBV Facts (1)

- Hepatitis B virus (HBV) attacks the liver and can cause both acute and chronic disease.
- The virus is transmitted through contact with the blood or other body fluids of an infected person.
- HBV is 50-100 times more infectious than HIV.
- HBV can survive outside the body for at least 7 days.
- HBV is an important occupational hazard for health workers.
- Hepatitis B is preventable with a safe and effective vaccine.
Common modes of transmission include:

- Perinatal (from mother to baby at birth)
- Early inapparent childhood infections (close contact with infected individuals)
- Unsafe injection practices
- Blood transfusions
- Sexual contact
- Injecting drug use
- Occupational exposure of health care workers
HCV Facts (1)

- Hepatitis C virus (HCV) attacks the liver and can cause both acute and chronic disease.
- HCV is transmitted through contact with the blood of an infected person.
- HCV can remain infectious in dried blood samples for 16 hours.
- HCV infection is curable using increasingly effective antivirals.
- Currently, no vaccine is available to prevent HCV infection.
- Among HCV infected, 50-80% will develop chronic infection; among chronically infected up to 50% will develop cirrhosis (scarring of the liver) and 1-5% liver cancer within 20-30 years.
Transmission of HCV can occur:

- Receipt of contaminated blood transfusions, blood products and organ transplants.
- Injections with contaminated syringes.
- Needle-stick injuries in health care settings.
- Injection drug use.
- Being born to an HCV infected mother.
- Sexual contact (less common).
- Sharing personal items contaminated with infectious blood (less common).
Prevalence, Incidence, Surveillance

BURDEN OF HBV, HCV INFECTIONS
Global prevalence of chronic hepatitis B virus infection, 2005, adults (19-49 years)

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

HBsAg Prevalence
- <2% - Low
- 2-4% - Low intermediate
- 5-7% - High intermediate
- ≥ 8% - High
- Not applicable

Data Source: refer to data models described in manuscript
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization
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Source: Ott et al. Vaccine 2012
Geographical distribution of the HBV genotypes and sub-genotypes
Data quality of hepatitis-C prevalence studies

Most countries lacking good (or any) data

Source: Center for Disease Analysis and WHO
Anti-HCV Prevalence
(Reported + Extrapolated)

Viremic HCV Prevalence (Reported + Extrapolated)

Prevalence (Viremic)
- 0.0% - 0.6%
- 0.6% - 0.8%
- 0.8% - 1.3%
- 1.3% - 2.9%
- 2.9% - 7.8%

Genotype Distribution by Region

Prevalence (Viremic)
- 0.0%-0.6%
- 0.6%-0.8%
- 0.8%-1.3%
- 1.3%-2.9%
- 2.9%-7.8%

Hepatitis B prevalence in the general population of Europe: HBsAg

- <0.5
- 0.5 - <1
- 1 - <2
- 2 - <4
- 4 - <6
- 6 - <8
- ≥8
- No recent data
- Not included in review

Non-visible countries:
- Liechtenstein
- Luxembourg
- Malta

ECDC Technical Report, September 2010
Hepatitis C prevalence in the general population of Europe: Anti-HCV

Non-visible countries

- Liechtenstein
- Luxembourg
- Malta

ECDC Technical Report, September 2010
Estimated number of HBsAg-positive individuals by country, based on general population prevalence estimates.
Estimated number of anti-HCV positive individuals by European country, based on general population prevalence estimates

- Italy: 3000000
- Turkey: 1000000
- Spain: 900000
- France: 900000
- Romania: 700000
- Poland: 700000
- United Kingdom: 600000
- Germany: 500000
- Greece: 500000
- Bulgaria: 500000
- Netherlands: 400000
- Belgium: 400000
- Sweden: 400000

ECDC Technical Report, September 2010
<table>
<thead>
<tr>
<th>Population (2011)</th>
<th>Algeria</th>
<th>Egypt</th>
<th>Israel</th>
<th>Jordan</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.3 million</td>
<td>84 million</td>
<td>7.7 million</td>
<td>6.5 million</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>HBsAg</th>
<th>HCVAb</th>
<th>HBsAg</th>
<th>HCV Ab</th>
<th>HBsAg</th>
<th>HCV Ab</th>
<th>HBsAg</th>
<th>HCV Ab</th>
</tr>
</thead>
<tbody>
<tr>
<td>General population</td>
<td>2.15% (1998)</td>
<td>n/a</td>
<td>1.6% (2003)</td>
<td>14.7% (2008)</td>
<td>1.96% (2001–10)</td>
<td>9.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood donors</td>
<td>0.88% (2010)</td>
<td>0.21% (2010)</td>
<td>16.8% (2011)</td>
<td>0.1% (2011)</td>
<td>0.05% (2011)</td>
<td>0.7–1.5% (2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injecting drug users</td>
<td></td>
<td></td>
<td></td>
<td>3.5% (2008)</td>
<td>35.7% (2003–5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health-care workers</td>
<td></td>
<td>1.5% (2011)</td>
<td>16.4% (2011)</td>
<td>17.6% (HBc+) (1992)</td>
<td>1.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant women</td>
<td>1.8% (1998)</td>
<td>0.3% (1997)</td>
<td>4% (2010)</td>
<td>6.4% (2010)</td>
<td>1.7% (2005) (0.66% in Jewish and 2.84% in Arab populations)</td>
<td>4.3% (2001)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EU, European Union; HBsAg, hepatitis B surface antigen; HCV Ab, antibody against hepatitis C virus.
<table>
<thead>
<tr>
<th></th>
<th>Lebanon</th>
<th>Libya</th>
<th>Morocco</th>
<th>Tunisia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td></td>
<td>6 million</td>
<td>32.3 million</td>
<td>10 million</td>
</tr>
<tr>
<td><strong>HBsAg</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HCV Ab</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>General population</strong></td>
<td>1.69% (2011)</td>
<td>0.2% (2011)</td>
<td>2.2% (2013)</td>
<td>1.3% (2013)</td>
</tr>
<tr>
<td><strong>Blood donors</strong></td>
<td>0.7% (2007)</td>
<td>0.23% (2007)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Injecting drug users</strong></td>
<td>0.0-2% (2003-7)</td>
<td>52% (2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health care workers</strong></td>
<td>0.4% (1999)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pregnant women</strong></td>
<td>2.9% (1997)</td>
<td>0% (1997)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EU, European Union; HBsAg, hepatitis B surface antigen; HCV Ab, antibody against hepatitis C virus

Hatzakis A et al. JVH 2013
Prevalence estimates hepatitis B surface antigen and antibody against HCV for the non-EU Balkan states

<table>
<thead>
<tr>
<th></th>
<th>Herzegovina</th>
<th>Croatia</th>
<th>Kosovo</th>
<th>Servia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>3.8 million</td>
<td>4.4 million</td>
<td>1.7 million</td>
<td>7.2 million</td>
</tr>
<tr>
<td>HBsAg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCV Ab</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General population</td>
<td>Incidence reports only</td>
<td>0.29–0.89% (2011)</td>
<td>1.5% (2005)</td>
<td>1.3% (2005)</td>
</tr>
<tr>
<td>Blood donors</td>
<td></td>
<td>0.29% (2011)</td>
<td>0.09% (2010)</td>
<td>0.07% (2010)</td>
</tr>
<tr>
<td>Health care workers</td>
<td></td>
<td>0.4% (2006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant women</td>
<td></td>
<td>0.22% (2011)</td>
<td></td>
<td>0.5% (2011)</td>
</tr>
</tbody>
</table>

EU, European Union; HBsAg, hepatitis B surface antigen; HCV Ab, antibody against hepatitis C virus

Hatzakis A et al. JVVH 2013
Estimated number of HBsAg- and anti-HCV-positive individuals in the largest migrants groups, by European country

*no data on anti-HCV prevalence
Estimated number of HBsAg- and anti-HCV-positive individuals in the largest migrants groups, by country

*No data on anti-HCV prevalence*
HCV Prevalence and Genotype Distribution - Europe

Prevalence (Viremic)
- 0.0%-0.6%
- 0.6%-0.8%
- 0.8%-1.3%
- 1.3%-2.9%
- 2.9%-7.8%

Total Infected (Viremic)
- 0-200K
- 200K-650K
- 650K-1.9M
- 1.9M-3.5M

## Impact of immigration

### Estimated proportion of HBsAg prevalence attributable to immigration

<table>
<thead>
<tr>
<th>Country</th>
<th>Author</th>
<th>Estimated HBV prevalence in indigenous populations [a]</th>
<th>Estimated overall HBV prevalence [b]</th>
<th>Proportion of HBV prevalence attributable to immigration [(b-a)/b]</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>Cazel et al. 1976</td>
<td>0.44%</td>
<td>0.56%</td>
<td>22%</td>
</tr>
<tr>
<td>Sweden*</td>
<td>Christenson et al. 1997</td>
<td>2.00%</td>
<td>2.74%</td>
<td>27%</td>
</tr>
<tr>
<td>Sweden**</td>
<td>Lindh et al. 1993</td>
<td>0.02%</td>
<td>0.11%</td>
<td>81%</td>
</tr>
<tr>
<td>Denmark</td>
<td>Gjorup et al. 2003</td>
<td>0.03%</td>
<td>0.15%</td>
<td>80%</td>
</tr>
<tr>
<td>Netherlands***</td>
<td>Kretzschmar et al. 2002</td>
<td>0.002%</td>
<td>0.03%</td>
<td>94%</td>
</tr>
</tbody>
</table>

*Note that this prevalence is for the presence of anti-HBc- not specific to HBSAg marker

** Carriage was defined as HBsAg positivity in serum for at least 6 months

***Prevalence of HBV carrier estimated using mathematical model

COMPLICATIONS AND NATURAL HISTORY
## Complications (1)

### The risk of developing chronic hepatitis B infection after acute exposure

<table>
<thead>
<tr>
<th>Mode of transmission</th>
<th>Age of infection</th>
<th>Risk of Acute Icteric Hepatitis</th>
<th>Risk of chronic HBV infection</th>
<th>Lifetime risk of HCC*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal HBeAg-positive mother</td>
<td>Birth</td>
<td>&lt;1%</td>
<td>90%</td>
<td>15%-40%</td>
</tr>
<tr>
<td>Perinatal HBeAg-negative mother</td>
<td>Birth</td>
<td>5%</td>
<td>&lt;15%</td>
<td>15%-40%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>Between birth and age 2 years</td>
<td>&lt;10%</td>
<td>50%</td>
<td>15%-40%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>2-5 years</td>
<td>9%</td>
<td>30%</td>
<td>15%-25%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>5-10 years</td>
<td>10%</td>
<td>16%</td>
<td>15%-25%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>&gt;10 years</td>
<td>10%-33%</td>
<td>7%-14%</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

* In those with chronic HBV infection

McMahon BJ. Clin Liver Dis 2010; 14: 381
## Incidence of liver cirrhosis and HCC depending on phase of HBV infection

<table>
<thead>
<tr>
<th>Phase of infection</th>
<th>Liver cirrhosis(^a) (per year)</th>
<th>HCC(^a) (per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Immune tolerant</td>
<td>Rare</td>
<td>Rare</td>
</tr>
<tr>
<td>2. HBeAg-positive CHB (immune reactive)</td>
<td>2.4-3.5%</td>
<td>3-6% in those with cirrhosis</td>
</tr>
<tr>
<td>3. Low replicative</td>
<td>Rare if remain in this phase</td>
<td>0.06(^b)</td>
</tr>
<tr>
<td>4. HBe antigen-negative CHB</td>
<td>2.1-2.9%</td>
<td>3-6% in those with cirrhosis</td>
</tr>
<tr>
<td>5. HBsAg negative</td>
<td>Rare</td>
<td>0.02(^b)</td>
</tr>
</tbody>
</table>

\(^a\)Assuming no co-existent liver pathology

\(^b\)Substantially higher than in background uninfected population

Alter MJ. Hepatology, 2003; 39: 564
Chen JD. Gastroenterology, 2010;138:1747
Aspinalli EJ et al. Occup Med 2011; 61:531
Natural history of hepatitis C from retrospective, prospective and retrospective-prospective cohort studies (A)

### Retrospective studies

<table>
<thead>
<tr>
<th></th>
<th>9-29 years</th>
<th>17-55% (mean 42%)</th>
<th>1-23%</th>
<th>4-15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervals from exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cirrhosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver deaths</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Prospective studies

<table>
<thead>
<tr>
<th></th>
<th>8-16 years</th>
<th>7-16% (mean 11%)</th>
<th>0.7-1.3%</th>
<th>1.3-3.7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervals from exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cirrhosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver deaths</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seef LB. Hepatology, 2002;36:535.
Hatzakis A et al. JVH, 2011;18:S1
## Complications (4)

<table>
<thead>
<tr>
<th>Natural history of hepatitis C from retrospective, prospective and retrospective-prospective cohort studies (B)</th>
</tr>
</thead>
</table>

### Retrospective -Prospective Cohort Studies

- **Children and young men or women**
  - Exposure interval: 9-45 years
  - Cirrhosis: 0.3-5.9% (mean 2.1%)
  - HCC: 0
  - Liver deaths: 0-2.1%

- **Middle-aged people with post-transfusion hepatitis**
  - Exposure interval: 23 years
  - Cirrhosis: 15%
  - HCC: 1.9%
  - Liver deaths: 2.8%

---

Seef LB. Hepatology, 2002;36:535.
Hatzakis A et al. JVH, 2011;18:S1
Cirrhosis, HCC, Liver transplantation

BURDEN OF HBV, HCV DISEASE
Hepatocellular Carcinoma (HCC) worldwide

- Fifth most common cancer in men and seventh most common cancer in women.
- Third leading cause of cancer-related deaths.
- Most of burden of disease (85%) is borne in developing countries.
- Major risk factors are HBV and HCV.
Regional variation in the estimated age-standardized incidence rates of liver cancer.
Estimates of the attributable fraction of hepatocellular carcinoma due to infection with HBV or HCV, by WHO region

Perz JF et al. J Hepatol, 2006;45:529
(A) Estimated age-standardized incidence rates of liver cancer per 100,000 in 2008; WHO, GLOBOCAN, 2008. (B) Estimated age-standardized mortality rates per 100,000 for liver cancer in 2008; WHO, GLOBOCAN, 2008

Blachier M et al. J Hepatol, 2013; 58,3: 593 - 608
Age-adjusted incidence and 5-year survival rates for patients with hepatocellular carcinoma in the United States, 1973–2007

Europe: estimated HCV- and HBV-related HCC mortality rate per 100,000 men and women by country

<table>
<thead>
<tr>
<th>Country</th>
<th>HCV men</th>
<th>HCV women</th>
<th>HBV men</th>
<th>HBV women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>4.5</td>
<td>4.0</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Spain</td>
<td>3.0</td>
<td>2.5</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Austria</td>
<td>2.5</td>
<td>2.0</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.5</td>
<td>1.0</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Germany</td>
<td>1.0</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Greece</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
</tbody>
</table>
Europe: estimated HBsAg and anti-HCV prevalence in HCC patients, by country
Age-standardized death rates per 100,000 population from liver cirrhosis in European countries, males and females aged 20–64; WHO mortality database 2000–2002
Number of hepatitis deaths by virus type and disease outcome, 2010

Most deaths are due to chronic hepatitis B and C

Source: Global Burden of Disease Study 2010 Lozano et al, Lancet 2012

Wise M et al. Hepatology, 2007; 47: 4, 1128

Wise M et al. Hepatology, 2007; 47: 4, 1128
Primary indications for liver transplantation in Europe among patients with cirrhosis, 1988-2009

- Viral hepatitis: 40%
- Alcohol: 33%
- Primary biliary cirrhosis: 10%
- Autoimmune hepatitis: 4%
- Secondary biliary cirrhosis: 5%
- Viral hepatitis + Alcohol: 7%
- Unknown: 1%

EASL – Blachier M et al. 2013
Primary indications for liver transplantation in Europe among patients with viral hepatitis, 1988-2009

- **HBV** (24%)
- **HBV+HCV** (8%)
- **HBV+HDV** (4%)
- **HBV+HDV+HCV** (1%)
- **HCV** (63%)
GLOBAL BURDEN IN PEOPLE WHO INJECT DRUGS (PWID)
Global estimates of HBsAg prevalence in IDUs
Global estimates of anti-HCV prevalence in IDUs
<table>
<thead>
<tr>
<th>Region</th>
<th>Estimated number of IDUs anti-HCV positive</th>
<th>Estimated number of IDUs HBsAg positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Europe</td>
<td>2,346,000 (1,244,500-3,918,000)</td>
<td>280,000 (100,000-543,000)</td>
</tr>
<tr>
<td>Western Europe</td>
<td>727,500 (497,000-1,018,000)</td>
<td>54,000 (13,500-108,500)</td>
</tr>
<tr>
<td>East and Southeast Asia</td>
<td>2,642,000 (1,820,000-3,576,500)</td>
<td>340,000 (111,000-696,000)</td>
</tr>
<tr>
<td>South Asia</td>
<td>354,500 (232,500-532,000)</td>
<td>71,500 (20,000-154,500)</td>
</tr>
<tr>
<td>Central Asia</td>
<td>146,000 (91,500-213,000)</td>
<td>21,500 (6,000-46,000)</td>
</tr>
<tr>
<td>Caribbean</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Latin America</td>
<td>1,022,000 (675,500-1,441,000)</td>
<td>43,500 (12,500-90,500)</td>
</tr>
<tr>
<td>Canada and USA</td>
<td>1,673,500 (1,099,000-2,471,500)</td>
<td>272,500 (57,500-642,000)</td>
</tr>
<tr>
<td>Pacific Island states &amp; territories</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Australia and New Zealand</td>
<td>97,000 (44,500-165,000)</td>
<td>7,000 (3,000-12,000)</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>63,500 (28,500-115,500)</td>
<td>14,000 (7,500-26,500)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>800,000 (206,500-1,524,000)</td>
<td>106,500 (11,500-296,500)</td>
</tr>
<tr>
<td><strong>Extrapolated global</strong></td>
<td><strong>10,018,000 (6,031,000-15,186,500)</strong></td>
<td><strong>1,229,000 (346,500-2,654,500)</strong></td>
</tr>
</tbody>
</table>
Estimated number anti-HCV and HBsAg infected IDUs

Nelson PK et al. Lancet, 2011; 378
Global epidemiology of HBV and HCV in IDUs

- Global estimate of IDUs: 16 (11-21) m
- HCV Prevalence in IDUs: 20-90%
- Global estimate of HCV infected IDUs: 10.0 (6.0-15.0) m
- HBsAg prevalence in IDUs: 0-20%
- Global estimate of HBsAg positive IDUs: 1.23 (0.35-2.65) m
- Global estimate of HCV infected: 130-170 m
- Global estimate of chronic HBV: 350 m

Nelson PK et al. Lancet 2011; 378