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The epidemiology of viral hepatitis among people who inject drugs: Results of global systematic reviews

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Abstract

Background—Injecting drug use (IDU) is an important risk for viral hepatitis transmission. Detailed, transparent estimates of the scale of the problem at regional and global levels have never been made. We report national, regional and global prevalence and population size estimates for hepatitis C (HCV) and hepatitis B (HBV) among people who inject drugs.

Methods—Systematic search of peer-reviewed (Medline/Embase/PsycINFO) and grey literature databases, conference abstracts and online resources, with a widely distributed call for additional data. From 4386 peer-reviewed and 1019 grey literature sources, 1125 were reviewed in full. Studies were extracted to a customised database and graded according their methods. Serological reports of HCV antibodies/anti-HCV, HBV antibodies/anti-HBc, and/or HBV surface antigen/HBsAg among IDUs samples with n>40 participants, <100% HIV-positive, and sampling frames that did not exclude participants on the basis of age or sex were included. Using endorsed decision rules, prevalence estimates were calculated with anti-HCV and anti-HBV as proxies for exposure and HBsAg for current infection. These were combined with IDU population sizes to estimate the number of HBV and HCV positive IDUs.

Findings—Eligible reports of anti-HCV among IDUs were located for 77 countries. Prevalence was 60–80% in 26 countries and >80% in 12. We estimate worldwide about 10.0 million (range 6.0–15.2M) IDUs might be anti-HCV positive. China, (1.6M), the USA (1.5M) and the Russian

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Contributions
PN & LD developed the overall methodology for use in the reviews. HH and DDJ developed the methodology and oversaw data extraction for the HCV Synthesis Project, and provided this for use in this review. DH maintained the customised database. PN & DH conducted literature searches, extracted data and provisionally selected reports for use in generating estimates. PN & LD decided on the final set of reports, with advice from BC; these were reviewed by HH, DDJ, DH & BM. BM developed the methodology and generated regional and global estimates; these were reviewed by PN & LD. PN & LD led the writing of the manuscript; HH, DDJ, DH, BC & BM commented and contributed text. PN generated the maps. All authors had access to all data used in this review. All authors gave approval for the manuscript to be submitted.

Conflicts of interest
LD and BM have received grant money and have acted as independent consultants to the World Health Organization, UNAIDS and the United Nations Office on Drugs and Crime. DDJ has been funded by, and acted as a consultant to, the WHO. LD received an untied educational grant (2006–2008) from Reckitt Benckiser to conduct a post-marketing surveillance study of buprenorphine-naloxone in the treatment of heroin dependence in Australia.

Federation (1.3M) had by far the largest such populations. HBsAg reports were found for 59 countries, ranging from 5–10% in 21 countries and over 10% in 10. Worldwide, 6.4 million IDU might be anti-HBc positive (2.3–9.7M), and 1.2 million (0.3–2.7M) HBsAg positive.

Interpretation—The prevalence of anti-HCV among IDUs is far greater than HIV. Viral hepatitis clearly poses a challenge to public health. Variation in the coverage and quality of existing research creates uncertainty around estimates. Better and more complete data and reporting are required to estimate the scale of the problem, to inform efforts to prevent and treat HCV and HBV among IDUs.

Introduction

Injecting drug use (IDU) is an important public health issue across the globe: it was estimated that in 2007 16 million people worldwide injected drugs (range 11–21 million)[1]. Much of the estimated burden of disease attributable to the use of illicit drugs is likely due to blood-borne viral infections through unsafe drug injection[2]. Hepatitis B and C viruses (HBV and HCV) are even more efficiently spread by these means than HIV [3].

Around 80% of individuals exposed to HCV develop chronic infection[4]; 3–11% of those with chronic HCV infection will develop liver cirrhosis within 20 years[5], with associated risks of liver failure and hepatocellular carcinoma (HCC)[6]. HCV transmission is increasingly driven by IDU[7], but in many developing countries unsafe medical injections and transfusions are predominant sources of infection. The emergence of IDU in settings where the prevalence of HCV is high (Africa, the Middle East and South East Asia) presents an additional threat.

HBV is highly contagious through parenteral, sexual and vertical (perinatal transmission) routes. Around 5% of adults exposed to HBV develop chronic HBV infection (CHB)[4]; most of the 350 million chronically infected people worldwide were infected in childhood[8]. Cirrhosis and death due to HCC are important sequelae of CHB[9].

Despite its higher prevalence and transmissibility, viral hepatitis has received far less global attention than HIV. The World Health Organization (WHO) called prevention and control efforts “successful but fragmented….[with no] comprehensive strategy for viral hepatitis”[10]. At the WHO’s 63rd World Health Assembly in May 2010, a resolution was passed to establish “goals and strategies for disease control, increasing education and promoting screening and treatment” of people infected with HBV and HCV (p.3)[10]. The WHO argues that IDUs are a particularly important group that need to be specifically targeted for prevention and treatment of HBV and HCV[10]. For such efforts to be appropriately scaled and targeted, policymakers and healthcare professionals need accurate and detailed data on the size of the population concerned, as has been undertaken for HIV[1].

There have been no global systematic reviews of HBV prevalence among IDUs[11]. Previous reviews of HCV among IDUs have been selective in their geographic coverage[12], have not provided sources or estimation methods[13] or did not make population size estimates[14]. Here, we report a systematic search and critical review of the peer-reviewed and grey literature on anti-HCV, anti-HBV and HBsAg among IDUs, presenting the best available country-level data, and the first regional and global estimates of the number of IDUs living with HCV and HBV.

We do not present estimates of chronic hepatitis A, D or E viral infection (HAV, HDV, HEV). Chronic HAV infection does not occur, and in developing countries most adults are immune, making epidemics uncommon, although with increased sanitation this epidemiological pattern may be changing in some populations[15]. HDV has been associated

with IDU; however, the extent of the literature on HDV (which requires concurrent HBV for infection to be established) is far more limited and the diversity in prevalence, even in high-HBV prevalence countries, makes extrapolation across countries problematic[16]. HEV is enterically transmitted and HEV data for IDUs is scarce.

Method

Our review was conducted in accordance with the methods outlined by the Global Burden of Disease (GBD) project (www.globalburden.org) and complied with PRISMA guidelines relevant to a descriptive review of this nature[17]. Our searches comprised multiple stages of searches of the peer-reviewed and grey literature, international consultations and expert critique and review, as undertaken in the review of HIV among IDUs[1] (LD and BM). Data from the *HCV Synthesis Project* (led by HH) were also provided for review and inclusion. This was a systematic global review of published and unpublished sources containing reports of HCV infection and co-occurring HBV infection in IDUs until 2006; its methods have been described in detail[18].

Search strategy

Peer-reviewed literature databases (Medline, EMBASE, and PsycINFO) were searched in November 2010 using search strings developed in consultation with specialist drug and alcohol librarians (**webappendix 1**). English language abstracts were included; translations were sought for promising non-English papers. Searches were updated in May 2011.

Grey literature and online databases were searched, including websites of drug surveillance systems, regional harm reduction networks, and country-specific ministries of health. Methods to identify and systematically search these sources have been described previously and utilised in earlier systematic reviews by us[19, 20]. Grey literature sources comprised 14% (18/127) of those ultimately used to generate regional estimates. Grey literature searching concluded in May 2011.

To identify further studies, an email was sent in December 2010 to GBD Illicit Drug Use Expert Group members (www.gbd.unsw.edu.au/gbdweb.nsf/page/ExpertGroups), UN agency staff, relevant international email lists, and other contacts of our team (n~300 initial recipients). It was redistributed by staff from the WHO, UNODC, US Centers for Disease Control (CDC), and the EMCDDA. The email requested information that might inform estimates of the prevalence of hepatitis among IDUs (**webappendix 2** shows an example). By June 2011, replies were received from 61 experts regarding 52 countries in all 12 world regions. This included data on 14 countries across eight regions that were ultimately reported here. Data were received, and clarification sought, until June 2011.

Data extraction and selection

Documents were catalogued using Endnote X4. Figure 1 shows the search process and flow chart. Search results were systematically screened by two authors. Studies in the HCV Synthesis Project database were automatically included. Other references were reviewed if the title or abstract indicated the document contained relevant information on the prevalence of HCV or HBV among IDUs. 1125 documents (peer-reviewed and grey literature) were reviewed in full. Data were considered eligible where mention was made of the number or prevalence of hepatitis-infected IDUs in a country or sub-national area.

Information was extracted on: (1) study methods (specimen type, eligibility criteria, recruitment and enrolment dates, and recruitment methods and locations); (2) Participant characteristics (age range, gender breakdown); and (3) hepatitis reports (number of participants tested, number and proportion testing positive for anti-HCV, anti-HBV and

HBsAg, and reports broken down by age and gender). Detailed methodological information was used to grade and select studies for inclusion given that study methodology is thought to strongly influence descriptive methodology[18]. Extracted information was initially reviewed by two authors, and valid reports included in a Microsoft Access database, and reviewed by another author. Data were graded as outlined in Table 1.

For this paper, high and low reports of each sero-marker were selected for each country in accordance with the decision rules described in Text box 1. These were entered into Microsoft Excel by one author and independently reviewed by two others. Provisional reports were circulated to all authors for review and comment. External checks were made with specific requests to experts in countries where additional data or clarification were required.

Viral hepatitis prevalence data

Existing reports on HCV prevalence among IDU are based predominantly on serological testing for hepatitis C antibodies (anti-HCV). A positive anti-HCV test result can indicate acute, chronic or resolved HCV infection. A polymerase chain reaction (PCR) test is used to test for HCV viraemia, indicating current infection, however PCR test results are rarely reported in epidemiological studies. This review focuses exclusively on reports of anti-HCV prevalence.

HBV studies were included if they reported serological testing for HBsAg or anti-HBc. HBsAg indicates active (either acute or chronic) infection, but ~95% of adults with acute HBV infection will clear the virus, lose HBsAg and develop anti-HBc and hepatitis B surface antibodies (anti-HBs). Clearance rates for HBV may be lower for IDUs however, as more may go on to be chronically infected than the general population; this may relate to repeated exposure, or lower immunity due to poorer health and other viral infections[21]. The presence of anti-HBc indicates previous exposure; it is also a more durable marker than HBsAg. To clearly determine whether HBV infection was resolved or resulted in immunity, or to determine vaccination-related immunity, the results of multiple tests in combination would be assessed but this is rarely available in population-level or other large-scale epidemiological studies.

Injecting drug use prevalence

IDU and HIV prevalence data were drawn from a systematic review previously undertaken on behalf of the *Reference Group to the UN on HIV and Injecting Drug Use*[1] (the 'Reference Group'), adhering to international guidelines for systematic reviews[22], with decision rules and estimates approved by all Reference Group members. During the course of a subsequent review of HIV prevention, treatment and care for people who inject drugs, updated prevalence data for some countries were submitted to the Reference Group[23]. These data were included in our current analysis, along with more recent data on IDU and HIV prevalence reported by EMCDDA and UNAIDS. Overall we included updated estimates for the following countries: IDU population size (Belarus, Brazil, Croatia, Cyprus, Czech Republic, Greece, Nepal, Philippines, and Ukraine) and HIV prevalence (Croatia, Cyprus, Mauritius, Moldova, Norway, Pakistan, Portugal, Sierra Leone, Somalia, Swaziland, Togo, Ukraine, the UK and Zimbabwe).

Statistical analysis

Data were also entered into MapInfo 10 to generate maps of prevalence estimates for IDU and hepatitis among IDUs. Following the collation of country-specific estimates, regional and global estimates for 2010 were derived. All authors reviewed the resulting estimates; regional or country-specific queries were made with experts where clarification was

required. Prevalence of IDU was assumed to be the same in 2010 as in the year of the estimate. UN Population Division estimates of 2010 population size 15–64 years were used[24]. Regional estimates were derived through estimation of regional-specific, weighted estimates of the prevalence of IDU and hepatitis infection and uncertainty bounds, using methods previously endorsed by the Reference Group[1]; **webappendix 3** provides further detail. Regional groupings were based on previous UNAIDS categorisations to facilitate comparability with the Reference Group HIV review[1].

Results

Anti-HCV reports among IDUs meeting inclusion criteria were found for 77 of the 152 countries/territories where IDU has been reported (Figure 2; Tables 2–6; see **webappendix 4** for sources); these 77 countries collectively hold 82% of the world's estimated IDU population. Anti-HCV prevalence varied greatly: midpoint reports ranged from 9.8% to 97% (Tables 2–6). Anti-HCV prevalence was estimated at 60–80% among IDUs in 26 countries, and 80% or higher in a further 12. The countries with the largest estimated populations of IDUs (China, Russia, and the USA) had midpoint estimates of anti-HCV prevalence amongst IDUs of 67.0%, 72.5% and 73.4% respectively (Tables 2, 3, 4). No studies were located for Caribbean countries or Pacific Island States and Territories (Tables 4, 5).

Reports of HBV exposure (anti-HBc positive) had been made in 43 countries comprising 65% of the world's IDU population (see **webappendix 5** for map). Levels varied widely across countries, from 4.2% (Slovenia) to 85% (Mexico) (Tables 2–6). Prevalence of HBsAg had been measured in 59 countries accounting for 73% of the world's IDU population (Tables 2–6; Figure 3). The highest levels of HBsAg were in countries (mostly in Asia) known to have endemic HBV in the general population. HBsAg prevalence reports among IDUs varied within countries quite markedly (for example, in the USA, HBsAg reports ranged from 3.5% to 20%; in Iran, from 3.7% to 30.9%; Tables 4, 3).

Data quality varied across all three hepatitis indicators, with only 19 countries having eligible 'A' grade reports for at least one marker, and few of those being truly national (Tables 2–6, "Grade" columns). In many countries, prevalence reports came from samples from different sites ('B1' grade). For most countries, we were able to use reports produced since 2000, however one in four countries had only older HBV reports (Tables 2–6, "Year of report" columns).

Extrapolating to all countries, we estimate that in 2010 about 10.0 million IDUs (range 6.0–15.2 million) were anti-HCV positive (table 7; a midpoint prevalence of 67.0% among all IDUs globally). This was around 3.5 times larger than the 2.8 million IDUs (range 0.8–6.2 million) estimated to be living with HIV (see webappendix6).

The largest HCV-positive IDU populations were estimated to be living in Eastern Europe (2.3 million; range 1.2–3.9 million) and East and South-East Asia (2.6 million; range 1.8–3.6 million). The three countries with the largest IDU populations, China, the Russian Federation and the USA, were estimated to have 1.6, 1.3 and 1.5 million IDUs living with HCV, respectively.

We estimate that globally in 2010, 1.2 million IDUs were HBsAg-positive (range 0.3–2.7 million), with an IDU population-weighted, global prevalence of 8.4%. The largest populations by region are estimated to be East and South-East Asia (0.3 million; range 0.1–0.7 million) and Eastern Europe (0.3 million; range 0.1–0.5 million). The large range around all these estimates reflects the uncertainty resulting from prevalence varying among different sub-populations of IDUs, across different recruitment settings, and geographically.

Discussion

This is the first global systematic review of HCV and HBV infection among people who inject drugs and the first to produce regional and global population estimates. We estimate midpoint populations of IDUs who may be HCV-positive of around 10.0 million, and those who are HBsAg-positive of around 1.3 million. Clear geographic differences exist in prevalence. Eastern Europe, and East and South East Asia are estimated to hold the largest populations of IDUs infected with viral hepatitis.

It is important to note that the population size estimates reported here refer to the estimated number of anti-HCV, anti-HBc or HBsAg-positive people who are current or recent injecting drug users not people who have ever injected drugs. This is the same methodology undertaken for HIV previously[1]. Many people who inject drugs cease injecting at some point[25], so the current estimates cannot be interpreted as the total number of cases of HCV or HBV attributable to IDU. Given the limitations in current knowledge of the natural history of IDU (such as the range in duration of injecting, and the likelihood and timing of resuming IDU following cessation), particularly in low and middle-income countries, it is not possible to make defensible regional and global estimates of the number of *former* IDUs, and the numbers of whom may be anti-HCV, anti-HBc and HBsAg-positive. An estimate of the burden of chronic viral hepatitis among current IDUs is essential for assessing secular trends in the risk of infection, the impact of control strategies, and the importance of implementing these, as well as implications for future burden of disease and health care requirements.

Efforts to prevent, treat and reduce harms related to liver disease among IDUs are essential, particularly in situations where HIV has successfully been prevented or managed, since the larger numbers of IDUs infected with HCV, and significant morbidity arising from this infection, mean that the health and economic costs of HCV transmitted by IDU may be as high as (or higher than) those of HIV. HCV treatment remains under-utilised, however[10]. Part of the reason for this is the high cost, which will remain a significant barrier to increasing treatment coverage in resource poor settings until this is reduced. There is increasing attention on this issue among international groups who are advocating for cost reductions, generic manufacturing, and changes to licensing conditions[10, 26]. Not long ago, the high cost of HIV antiretrovirals similarly prevented access in high prevalence, low-income countries: in recognition of this barrier, there are growing efforts to bring viral hepatitis treatments into the same (lower cost) access framework as HIV antiretrovirals[10]. Another barrier is the toxicity of HCV treatment, although a large number of new HCV drugs are being developed, which will revolutionise HCV treatment in the next few years[27].

Greater attention needs to be paid to reducing the impact of other causes of liver disease progression in people chronically infected with viral hepatitis. This includes addressing alcohol use problems, and providing HAV and HBV vaccination, particularly given evidence that liver related disease will become a major cause of mortality as IDUs age[28].

Evidence regarding the impact of needle and syringe programs[29] and provision of other injecting paraphernalia upon prevention of HCV infection is limited, yet reduction of risk remains paramount, particularly during the period of initiation to injecting, when HCV incidence is highest[6, 14]. The potential for HCV treatment to reduce HCV prevalence among IDU populations and in this way reduce the force of infection acting on susceptible members of these populations has been supported by mathematical modelling[30]. This potential role of HCV treatment in the prevention of HCV transmission among IDU populations warrants further investigation.

Although significant variability in HBsAg prevalence reports was observed, prevalence typically reflected the differences in the prevalence of HBV infection in the general population. In low-intermediate prevalence countries, the prevalence of HBsAg in IDU was typically <10%, whereas in high-HBV prevalence countries, prevalence of HBsAg among IDUs was in the order of 10–20% (e.g. East and South-East Asia). Given the high prevalence of chronic HCV infection in IDUs, HBV infection is particularly likely to represent HBV/HCV co-infection, which is associated with more rapid progression of liver disease and attendant mortality[31]; this is similarly the case for coinfection between HIV and viral hepatitis[32].

Effective treatments for CHB are available, which reduce progression of liver disease and complications such as HCC[33]. However, antiviral therapy for CHB is often of indefinite duration, and access to modern, potent drugs with high resistance barriers is limited in many high prevalence, resource-poor settings. Barriers to accessing treatment and care for CHB result in poor outcomes for those affected, and ongoing transmission to susceptible contacts.

Vaccination against HBV must be prioritised for all susceptible IDU, especially those already infected with HCV. However, selective vaccination programs against HBV in this group have often been characterised by low uptake and difficulty reaching most at-risk individuals[34]. A significant reduction in the burden of HBV infection amongst IDU is expected in countries with universal infant vaccination programs once these individuals reach the age at which acquisition through IDU is most common. Correctional facilities provide one opportunity to vaccinate, treat and reduce the transmission of viral hepatitis in a population with high levels of IDU, HBV, and HCV, many of whom cycle in and out of the community[35].

Limitations of existing data

There are a number of important limitations of existing data. One issue concerns the way in which HCV and HBV infection are measured and reported across studies: reporting was typically on only one (or perhaps two) markers, making estimates of the true prevalence of chronic HBV and HCV difficult. Without the measurement and reporting of multiple markers (anti-HCV plus HCV RNA-PCR, or HBsAg plus anti-HBc and ideally anti-HBs) it is not possible to make more accurate estimates of chronic infection, past infection, susceptibility or immunity. For HCV, we have estimated the number of current IDUs who are anti-HCV positive: this is not a measure of total chronic HCV infection, but rather HCV *exposure* among IDUs, given that a minority (perhaps 20%) of those infected with HCV (who would test positive for anti-HCV) are likely to have cleared the virus[4].

For HBsAg, wide ranges in reports that met inclusion criteria were observed. In addition, where anti-HBc was not reported it was not possible to determine what proportion of HBsAg positive individuals were acutely infected and within the window period prior to anti-HBc seroconversion. Future studies should include both markers to allow a more accurate understanding of study results. Additional sample details including country of birth and ethnicity would also assist interpretation[36]. An additional limitation of existing data concerns a lack of data on the age range of samples and individuals duration of drug injecting history and hence period of elevated exposure to viral hepatitis, which would permit more accurate understanding of varying prevalence of both HCV and HBV among samples. The reliance upon older studies, with less accurate serological testing modalities, small sample sizes, and those conducted in countries where laboratory capacity is limited, increases uncertainty about the validity of both HCV and HBV reports.

A final issue concerns the representativeness of IDU samples. Some studies of HBV and HCV recruited “lifetime” IDUs, whereas others recruited “current” or “past year” IDUs.

They also were recruited from a variety of locations: prisons, drug treatment centres, outpatient clinics and other medical settings, where IDUs may differ in their risk behaviour and exposure to viral hepatitis. Further, convenience sampling is most often used, so it is possible that the samples do not represent the IDU population from which they are drawn. Data were also typically sub-national, from a limited number of locations that may or may not be representative of the epidemic nationally, particularly in larger countries where there may be considerable geographic variation, potentially limiting national representativeness.

Limitations of this review

We have used the same methods as in our previous reviews, which have been detailed elsewhere[1]. As those previous investigations also revealed, limitations include the current concentration of peer-reviewed literature from high-income countries, the review being conducted by a small team, and the greater potential for papers in languages other than English to be overlooked. As we did for the earlier reviews we attempted to address these limitations by consulting widely with experts and stakeholders, seeking unpublished reports and verification of the data and reports included and enlisting the support of UN and other agencies, who facilitated access to data and contact with relevant in-country personnel.

Conclusions

The response to blood borne virus transmission among IDUs has primarily focussed on HIV. Maintaining and strengthening the response to HIV among IDUs remains crucial, but the significance of viral hepatitis must receive greater recognition than is currently the case. Investment in, and development of, comprehensive and effective strategies to prevent the transmission of viral hepatitis, and reduce resultant morbidity and mortality among IDUs, are urgently required. The Viral Hepatitis resolution of the 63rd World Health Assembly[10] requested that the Director-General collaborate with all relevant stakeholders in supporting surveillance, prevention, and treatment goals, especially in developing countries. It is essential that policies and strategies for addressing viral hepatitis include IDUs, who are at elevated risk and often have poorer access to services. The current review has provided estimates of the scale of this problem at country, regional and global levels. These findings should inform efforts to efforts to accurately scale and appropriately target the response.

Text box: Decision rules for data selection and extraction processes

Selection, grading and clarification of hepatitis reports

- Hepatitis reports were restricted to serological test results for anti-HCV, anti-HBc and HBsAg.
- Hepatitis B reports that did not specify a specific serological marker were reviewed by BC (infectious disease physician) and assigned a serological maker or excluded, as appropriate.
- If hepatitis reports were available from the same sample(s) and same site(s) in multiple years, only the most recent report was selected.
- Hepatitis reports from one city were assumed to be from a single site unless otherwise stated.
- Hepatitis reports were assumed to be single site and single sample type unless otherwise stated.
- If calculation or typographical errors were detected in source documents, reports were recalculated and clarified with authors where possible.

Grade and date-based selection of reports

- If grade A (multi-sample multi-site) reports were available, we selected the range of these and did not select lower graded reports. If recent reports (2000 onwards) were available, older (pre-2000) reports were not selected.
- If grade A reports were unavailable, we selected the range of recent reports of the next highest grade. Older reports were selected if no recent reports were available.
- Recent grade B (B1/multi-site single sample, or B2/single sample multi-site) reports were selected in preference to older grade B reports. Recent grade C reports were selected in preference to older grade B reports. Older grade C reports were selected if no grade B reports were available.
- Pre-1990 reports were selected only if later reports were unavailable.

Additional selection and exclusion criteria

- Reports from case notifications (grade D), self-report studies (grade E) or unspecified methodologies (ungraded) were excluded.
- Reports of genetic or saliva testing, or residue from syringes were excluded.
- Reports from 100% HIV-positive IDU samples were excluded.
- Reports from studies restricted to ‘young’ IDUs, and baseline descriptions of studies of primarily HCV or HBV-negative IDUs (some seroincidence studies) were excluded.
- Reports from studies excluding IDUs of either gender were excluded if mixed gender reports were available.
- Reports of any hepatitis marker among IDUs that were lower than the general population prevalence for that marker were excluded.
- Reports based on test results of fewer than 40 IDUs were excluded.

IDU prevalence reports and estimates

- Mathers et al[1] detail the selection of IDU prevalence reports and generation of IDU estimates.

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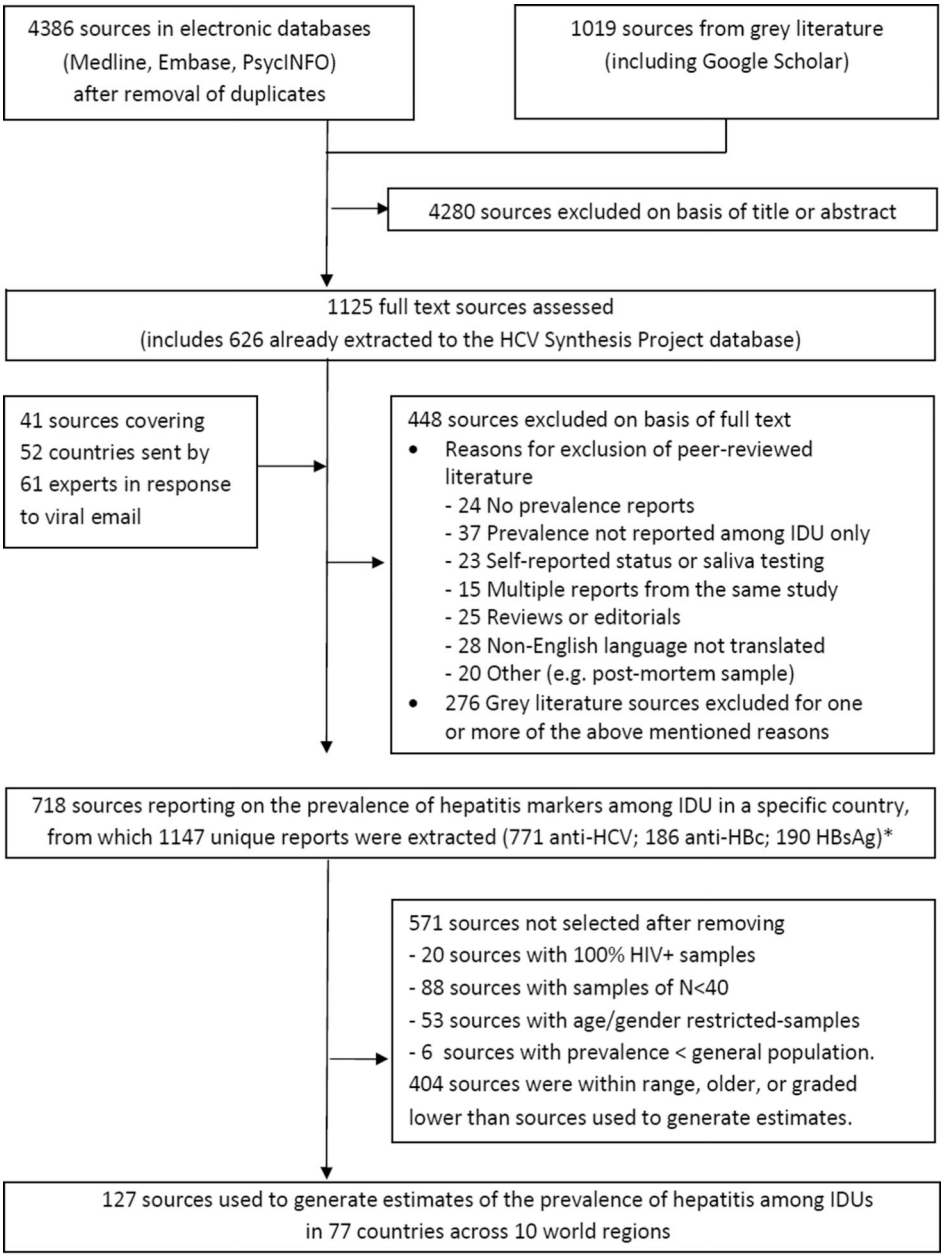

Figure 1.
Outline of systematic review process

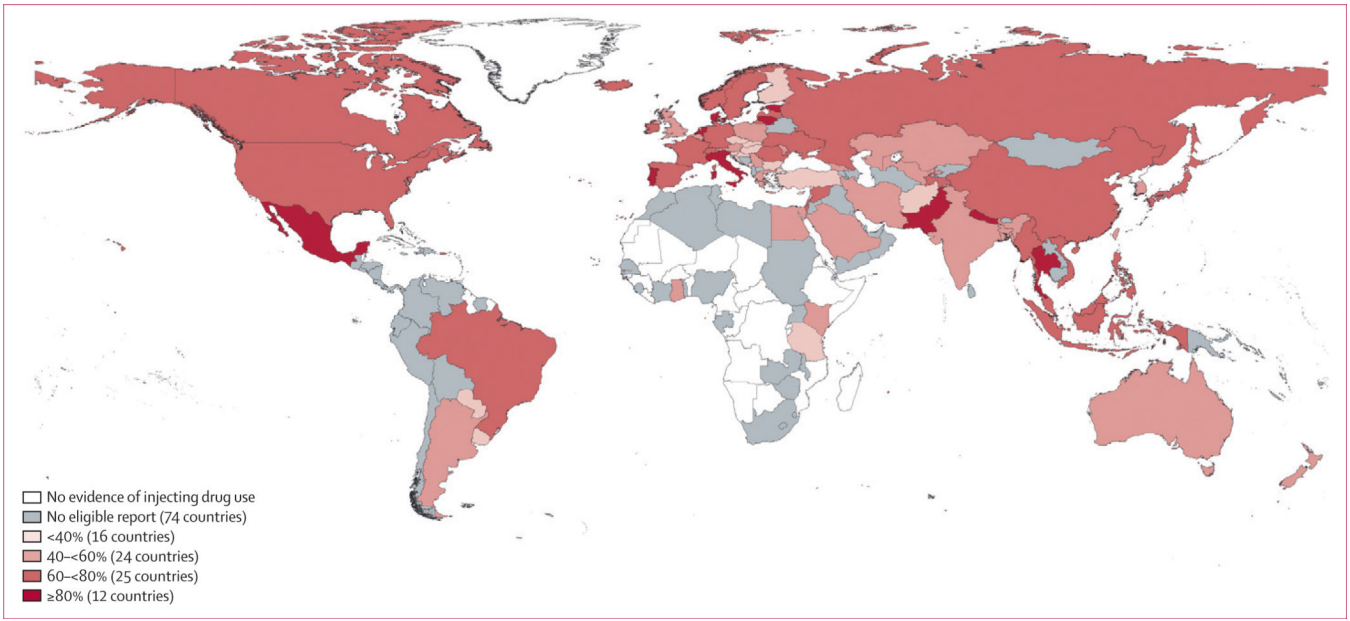

Figure 2.
Prevalence of hepatitis C antibodies in injecting drug users

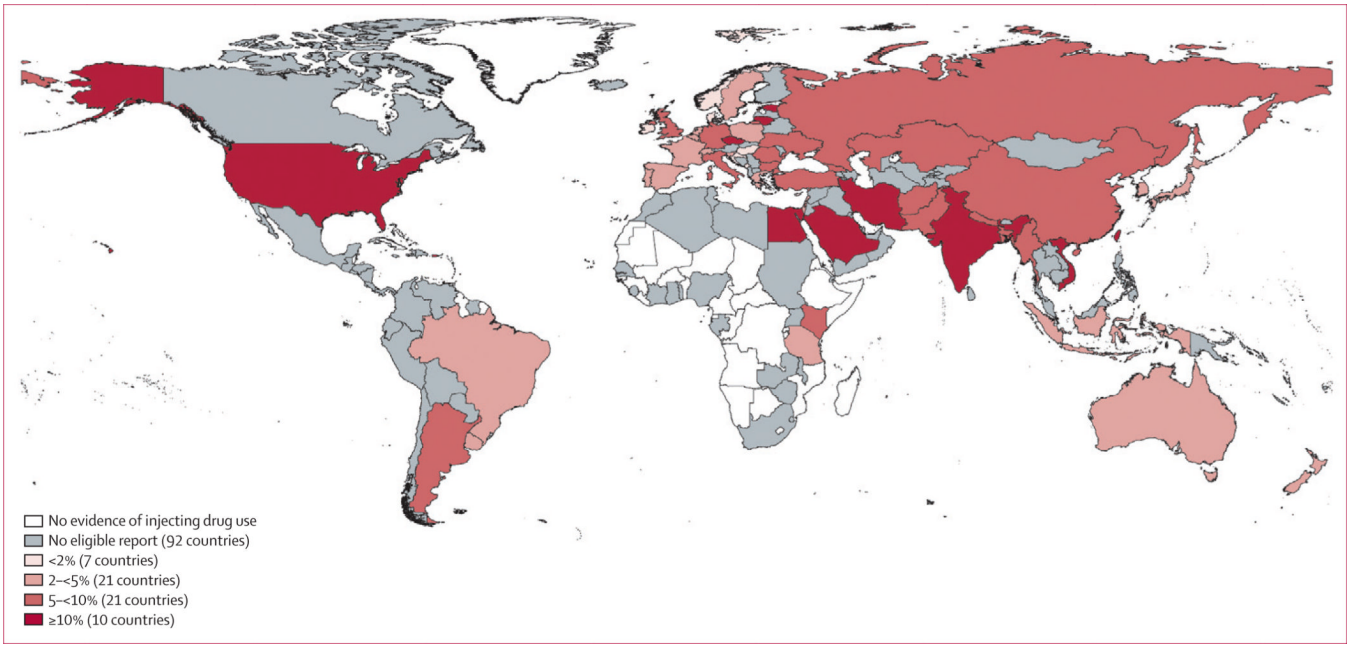

Figure 3.
Prevalence of hepatitis B surface antigen in injecting drug users

Table 1

Classification system used in the evaluation of study methodologies

Grade	Hepatitis prevalence data
A	Multi-site seroprevalence study with >1 sample types (e.g. needle-syringe programmes, drug treatment centres, incarcerated IDUs)
B	**B1** Seroprevalence study, single sample type and multiple sites
	B2 Seroprevalence study, multiple sample types and a single site
C	Seroprevalence study, single sample type
D	Registration or notification of cases of hepatitis infection
E	Prevalence study using self-reported hepatitis status, saliva or RNA testing only
Ungraded	Report with methodology unknown

No hierarchical relationship was assumed between B1 & B2. ‘D’, ‘E’ and ungraded data have not been included in the estimates presented here.

Table 2

Prevalence of hepatitis C antibodies (anti-HCV), hepatitis B core antibodies (anti-HBc) and surface antigen (HBsAg) among IDUs in Europe

	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Eastern Europe															
Armenia		--	NK	--			--	NK	--			--	NK	--	
Azerbaijan		--	NK	--			--	NK	--			--	NK	--	
Belarus		--	NK	--			--	NK	--			--	NK	--	
Bosnia & Herzegovina		--	NK	--			--	NK	--			--	NK	--	
Bulgaria	2006, 2008	17.9	37.7	57.5	B1,B2	2003	--	6	--	B2	2008, 2006	5.5	*8.6*	11.6	B2, B1
Croatia	2008, 2007	27.1	36.6	46	A	2008, 2007	7.5	13.8	20	A	2008, 2007	0.0	*0.4*	0.8	A
Czech Republic	2001*, 2002–03	20.8	25.3	29.7	A		--	NK	--		2010	--	15.1	--	C
Estonia	2002	--	*90.5*	--	C	2004, 2007	76.8	*81.0*	85.1	C	2004	--	21.3	--	C
Georgia	1997–98	--	58.2	--	B1	1997–98	--	51.3	--	A	2002–03	--	7.2	--	A
Hungary	2008	--	22.6	--	A	--	--	NK	--		2008	--	0.5	--	A
Latvia	2007	--	74.4	--	C	2007	--	55.8	--	C	--	--	NK	--	
Lithuania	2005	85	*89.4*	93.7	B1,B2		--	NK	--		2005	9.5	*11.2*	12.9	B2,B1
Moldova	2007	--	42.7	--	B1		--	NK	--			--	NK	--	
Poland	2005	43.7	*53.9*	64.0	A	2005	24.4	*40.1*	55.7	A	2005	1.2	*4.9*	8.5	A
Romania	2007, 2009	65.6	*74.3*	83	B2, B1		--	NK	--		2009, 2006	5	*6.9*	8.8	B1
Russian Federation	2008	49	72.5	96	B1	2002	--	38	--	C	2002	--	9	--	C
Slovakia	2002	--	32.5	--	C	2002	--	6.3	--	C		--	NK	--	
Ukraine	2005	60.9	67	73	C	2005	--	46.7	--	C	2005	--	6.7	--	C
Western Europe															
Albania		--	NK	--			--	NK	--			--	NK	--	
Andorra		--	NK	--			--	NK	--			--	NK	--	
Austria	2008	--	47.1	--	A	2008	--	19.0	--	A	--	--	NK	--	
Belgium	2008	27	*55.0*	82.7	B1, B2	2004, 2008	16.7	*37*	57.3	C	2008	1.9	*3.0*	4.0	B1
Denmark	1996	--	85	--	B2	2007	--	*65*	--	C	2007	--	1.3	--	C
Finland	2007	20.7	*21.1*	21.4	B1		--	NK	--			--	NK	--	

	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
FYR of Macedonia		--	NK	--			--	NK	--			--	NK	--	
France	2006	--	73.8	--	A	1995	26.9	*41.6*	56.2	C	1995, 1992	3.4	*4.8*	6.2	C
Germany	2001–03	--	75.0	--	C	2001–03	--	53.0	--	C	1994, 92–93	6	7.2	8.4	B2
Greece	2008	44.9	*50.2*	55.5	A	2008	14.6	*20.5*	26.3	B1	2008	2.3	*2.5*	2.7	B2
Iceland	1990–93	--	63	--	C		--	NK	--			--	NK	--	
Ireland	2003, 2001	72.3	*74.6*	76.9	C	2003	--	17.5	--	B1	2003	--	0.0	--	C
Italy	2000, 05–07	72.9	*81.1*	89.3	B1	2000, 2005	39.8	55.1	70.4	B1	1992–93, 90–91	0.9	*5.1*	9.3	C
Luxembourg	2005	--	81.3	--	A	2005	--	24.7	--	A	2005	--	3.9	--	A
Malta	2006	--	33.1	--	B2		--	NK	--	--		--	NK	--	
Monaco		--	NK	--			--	NK	--			--	NK	--	
Montenegro	2008, 2005	22	*37.8*	53.6	C		--	NK	--		2008	--	0	--	C
Netherlands	2008	--	86.2	--	A	1999	--	67.5	--	A	2000	--	3.0	--	A
Norway	2008	68.4	*71.3*	74.1	A	2008	--	41.0	--	A	2008	--	1.2	--	A
Portugal	2009	--	83.1	--	B1	2000	--	53.7	--	C	2009	--	*2.9*	--	B1
San Marino		--	NK	--			--	NK	--			--	NK	--	
Serbia	2008	45	57	69	C		--	NK	--			--	NK	--	
Slovenia	2002, 2008	21.0	21.7	22.3	B1	2008	--	4.2	--	B1	2002	--	3.4	--	B1
Spain	2003, 1999–01	73.3	79.6	85.9	B1	2003	--	22.5		B1	2006	1.8	*3.6*	5.3	C
Sweden	2007	62.0	*75.1*	88.2	A	2006	--	52.1	--	C	2006	--	2.3	--	C
Switzerland	2002	--	78.3	--	B1	2000–02	--	83.3	--	C	1996	--	4	--	C
United Kingdom	2004, 2009	47	*50.5*	54	A	2003–05	--	32	--	A	1996–00	0^	*8.9*	17.8	C

Countries in Western Europe for which no reports of IDU identified: Liechtenstein. Notes: For source documents for all figures listed in tables see **webappendix 4.** NK – although IDU has been identified or IDU prevalence estimated, no eligible studies of HCV or HBV among IDUs were located. When more than one year or grade is given, these are listed in order of the estimate they refer to, i.e. lower followed by upper.

^ 100% HAV+ sample.

* Publication year minus three; year of estimate not stated. Estimates received for Scotland and Wales are not reported within

Table 3

Prevalence of hepatitis C antibodies (anti-HCV), hepatitis B core antibodies (anti-HBc) and surface antigen (HBsAg) among IDUs in Asia

Country	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
East & SouthEast Asia															
Brunei		--	NK	--			--	NK	--			--	NK	--	
Cambodia		--	NK	--			--	NK	--			--	NK	--	
China[#]	2010	60.9	*67*	73.1	B1	2002–03	--	36.5	--	C	1999–2000	3.8	*9.6*	15.4	C
Indonesia	2007–09	--	77.3	--	C	2007–09	--	57.6	--	C	2007–09	--	2.9	--	C
Japan	1993–94, 93	55.0	*64.8*	74.5	C		--	NK	--		1993–94, 93	2.0	*3.2*	4.3	C
Lao PDR		--	NK	--			--	NK	--			--	NK	--	
Malaysia	2006–07	--	67.1	--	B1		--	NK	--			--	NK	--	
Mongolia		--	NK	--			--	NK	--			--	NK	--	
Myanmar	2009	--	79.2	--	B1		--	NK	--		2009	--	9.1	--	B1
Philippines	2002	--	70	--	C		--	NK	--			--	NK	--	
Republic of Korea	2005	--	57	--	C	2005	--	51	--	C	1994–95	--	4.0	--	C
Singapore	2005–06	--	42.5	--	C		--	NK	--		2005–06	--	8.5	--	C
Taiwan	2001	--	41	--	B2	1984, 1986	11.3	*50.7*	90	C	2005	--	16.7	--	C
Thailand	2000	--	89.8	--	B2	1996	--	76.5	--	C	--	--	NK	--	
Timor Leste		--	NK	--			--	NK	--			--	NK	--	
Viet Nam	2003	--	74.1	--	B1		--	NK	--		1993	--	19.5	--	B1
South Asia:															
Afghanistan	2008	--	36.0	--	A		--	NK	--		2008	--	*5.8*	--	A
Bangladesh	1999–2005	--	*48.2*	--	A	1996–97	--	31.8	--	C	2002	--	9.4	--	C
Bhutan		--	NK	--			--	NK	--			--	NK	--	
India	2006	--	41.0	--	B1		--	NK	--		2006	2.7	*10.2*	17.8	C
Iran (Islamic Republic)	2007, 2001	34.5	*50.2*	65.9	B2	2001–02	--	61.2	--	B2	2001, 06–07	3.7	*17.3*	30.9	B2
Maldives		--	NK	--			--	NK	--			--	NK	--	
Nepal	1997–2002, 1997	80.5	*87.3*	94.0	C	1993[*]	--	82.0	--	C	1996–97	5.5	*5.8*	6.0	C

Country	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Pakistan	2003–04	75.0	*84.0*	92.9	B1		--	NK	--		2004, 2003	6.0	*6.8*	7.5	C
Sri Lanka		--	NK	--			--	NK	--			--	NK	--	
Central Asia:															
Kazakhstan	2005	--	58.8	--	C	2002	--	79.5	--	A	2002	--	7.9	--	A
Kyrgyzstan		--	NK	--			--	NK	--			--	NK	--	
Tajikistan	2004	--	61.3	--	C		--	NK	--			--	NK	--	
Turkmenistan		--	NK	--			--	NK	--			--	NK	--	
Uzbekistan	2001	--	51.7	--	A		--	NK	--			--	NK	--	

Countries in East and South East Asia for which no reports of IDU identified: Democratic People's Republic of Korea (North Korea). Notes: For source documents for all figures listed in tables see **webappendix 4.** NK – although IDU has been identified or IDU prevalence estimated, no eligible studies of HCV or HBV among IDUs were located. When more than one year or grade is given, these are listed in order of the estimate they refer to, i.e. lower followed by upper.

* Publication year minus three; year of estimate not stated.

A systematic review and meta-analysis by Xia and colleagues[45] was not included here as the source documents were in Chinese and could not be verified. In that review, the pooled prevalence was 61.4% (55.7–67.2) across 53 Chinese and two English language multi-region studies of HCV among IDUs in China.

Table 4

Prevalence of hepatitis C antibodies (anti-HCV), hepatitis B core antibodies (anti-HBc) and surface antigen (HBsAg) among IDUs in the Americas

Country	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Caribbean[#]															
Bahamas		--	NK	--			--	NK	--			--	NK	--	
Bermuda		--	NK	--			--	NK	--			--	NK	--	
Dominican Republic		--	NK	--			--	NK	--			--	NK	--	
Haiti		--	NK	--			--	NK	--			--	NK	--	
Jamaica		--	NK	--			--	NK	--			--	NK	--	
Latin America															
Argentina	2000–01	--	54.6	--	B1		--	NK	--		2000–01	--	8.6	--	B1
Bolivia		--	NK	--			--	NK	--			--	NK	--	
Brazil	2000–01	--	63.9	--	B1	1994–96	--	55.8	--	B2	2000	--	2.3	--	C
Chile		--	NK	--			--	NK	--			--	NK	--	
Colombia		--	NK	--			--	NK	--			--	NK	--	
Costa Rica		--	NK	--			--	NK	--			--	NK	--	
Ecuador		--	NK	--			--	NK	--			--	NK	--	
El Salvador		--	NK	--			--	NK	--			--	NK	--	
Guatemala		--	NK	--			--	NK	--			--	NK	--	
Honduras		--	NK	--			--	NK	--			--	NK	--	
Mexico	2005	96	*97.4*	98.7	B1	2005	--	85.0	--	B1		--	NK	--	
Nicaragua		--	NK	--			--	NK	--			--	NK	--	
Panama		--	NK	--			--	NK	--			--	NK	--	
Paraguay	2006	--	9.8	--	C		--	NK	--			--	NK	--	
Peru		--	NK	--			--	NK	--			--	NK	--	
Suriname		--	NK	--			--	NK	--			--	NK	--	
Uruguay	2003	--	21.9	--	C	2003	--	19.6	--	C	2003	--	4.5	--	C
Venezuela		--	NK	--			--	NK	--			--	NK	--	

Country	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
North America															
Canada	2005–08	51	*64*	77	A		--	NK	--			--	NK	--	
USA	2002–04, 2001	69.7	*73.4*	77	B2	2002–04	--	22.6	--	A	1992	3.5	*11.8*	20	B1, B2

Countries in Latin America for which no reports of IDU identified: Belize, Falkland Islands, Guyana. Countries in the Caribbean for which no reports of IDU identified: Anguilla, Antigua & Barbuda, Aruba, Barbados, British Virgin Islands, Cayman Islands, Cuba, Dominica, Grenada, Guadaloupe, Martinique, Montserrat, Netherlands Antilles, Saint Kitts & Nevis, Saint Lucia, Saint Vincent & Grenadines, Trinidad & Tobago Turks and Caicos Islands. Notes: For source documents for all figures listed in tables see **webappendix 4.** NK – although IDU has been identified or IDU prevalence estimated, no eligible studies of HCV or HBV among IDUs were located. When more than one year or grade is given, these are listed in order of the estimate they refer to, i.e. lower followed by upper.

[#]A study in San Juan, Puerto Rico found 89% HCV prevalence[46].

Table 5

Prevalence of hepatitis C antibodies (Anti-HCV), hepatitis B core antibodies (anti-HBc) and surface antigen (HBsAg) among IDUs in Oceania

Country	Prevalence of anti-HCV among IDUs (%)					Prevalence of anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Australasia															
Australia	1991–95, 90–91	41.2	*54.6*	68	A	1994, 90–91	18.9	*33*	47.0	A	1999–02, 05–08	2.9	*4.0*	5	B2, B1
New Zealand	2009	--	51.9	--	B1		--	NK	--		1994, 1991	1.2	*2.8*	4.4	C
Pacific Islands															
Fiji		--	NK	--			--	NK	--			--	NK	--	
French Polynesia		--	NK	--			--	NK	--			--	NK	--	
Guam		--	NK	--			--	NK	--			--	NK	--	
Kiribati		--	NK	--			--	NK	--			--	NK	--	
Micronesia (Fed. states)		--	NK	--			--	NK	--			--	NK	--	
New Caledonia		--	NK	--			--	NK	--			--	NK	--	
Papua New Guinea		--	NK	--			--	NK	--			--	NK	--	
Samoa		--	NK	--			--	NK	--			--	NK	--	
Solomon Islands		--	NK	--			--	NK	--			--	NK	--	
Tonga		--	NK	--			--	NK	--			--	NK	--	
Vanuatu		--	NK	--			--	NK	--			--	NK	--	

Countries in the Pacific region for which no reports of IDU identified: American Samoa, Cook Islands, Marshall Islands, Nauru, Niue, Palau, Pitcairn, Tokelau, Tuvalu. Notes: For source documents for all figures listed in tables see **webappendix 4.** NK – although IDU has been identified or IDU prevalence estimated, no eligible studies of HCV or HBV among IDUs were located. When more than one year or grade is given, these are listed in order of the estimate they refer to, i.e. lower followed by upper.

Table 6

Prevalence of hepatitis C antibodies (anti-HCV), hepatitis B core antibodies (anti-HBc) & surface antigen (HBsAg) among IDUs in the Middle East & Africa

Country	Prevalence of Anti-HCV among IDUs (%)					Prevalence of Anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Middle East and North Africa															
Algeria		--	NK	--			--	NK	--			--	NK	--	
Bahrain		--	NK	--			--	NK	--			--	NK	--	
Cyprus	2008	29.2	*39.6*	50.0	C		--	NK	--		2008	--	0.0	--	C
Egypt	1989–91, 1995	35.8	*49.4*	63.0	C	1989–91, 1995	53.6	*57.8*	62.0	C	1989–91, 1995	10.9	*13.5*	16.0	C
Iraq		--	NK	--			--	NK	--			--	NK	--	
Israel	2001–03*	--	67.6	--	C	1988–89, 1986	26.0	*39.0*	52.0	C	1988–89, 1986	0.0	*2.8*	5.5	C
Jordan		--	NK	--			--	NK	--			--	NK	--	
Kuwait		--	NK	--			--	NK	--			--	NK	--	
Lebanon	2000–02, 07–08	5.0	*28.9*	52.8	C		--	NK	--		2000–02, 07–08	0	*2.5*	5	C
Libyan Arab Jamahiriya		--	NK	--			--	NK	--			--	NK	--	
Morocco		--	NK	--			--	NK	--			--	NK	--	
Occ. Palestinian Terr.	2007*	--	45.3	--	C		--	NK	--		2007*	--	6.4	--	C
Oman		--	NK	--			--	NK	--			--	NK	--	
Qatar		--	NK	--			--	NK	--			--	NK	--	
Saudi Arabia	2002, 03–06	14.1	*49.8*	85.4	C	--	--	NK	--		1992–93	--	18.5	--	C
Sudan		--	NK	--			--	NK	--			--	NK	--	
Syrian Arab Republic	1999*	--	60.5	--	C	1999*	--	28.9	--	C		--	NK	--	
Tunisia		--	NK	--			--	NK	--			--	NK	--	
Turkey	2009	--	28.9	--	B1		--	NK	--		2009	--	5.2	--	B1
United Arab Emirates		--	NK	--			--	NK	--			--	NK	--	
Yemen		--	NK	--			--	NK	--			--	NK	--	
Sub Saharan Africa															
Cote d'Ivoire		--	NK	--			--	NK	--			--	NK	--	
Djibouti		--	NK	--			--	NK	--			--	NK	--	

Country	Prevalence of Anti-HCV among IDUs (%)					Prevalence of Anti-HBc among IDUs (%)					Prevalence of HBsAg among IDUs (%)				
	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade	Estimate year	Lower	Midpt	Upper	Grade
Gabon		--	NK	--			--	NK	--			--	NK	--	
Ghana	2004–05	--	40.1	--	B1		--	NK	--			--	NK	--	
Kenya	2000	42.2	*51.4*	60.6	B1, B2	--	--	NK	--		2000	--	6.4	--	B2
Malawi		--	NK	--			--	NK	--			--	NK	--	
Mauritius	2009	--	97.3	--	B1		--	NK	--		2009	--	9.0	--	B1
Nigeria		--	NK	--			--	NK	--			--	NK	--	
Senegal		--	NK	--			--	NK	--			--	NK	--	
Sierra Leone		--	NK	--			--	NK	--			--	NK	--	
South Africa		--	NK	--			--	NK	--			--	NK	--	
Swaziland		--	NK	--			--	NK	--			--	NK	--	
Tanzania, United Republic	2007	--	22.2	--	C		--	NK	--		2007	--	3.8	--	C
Togo		--	NK	--			--	NK	--			--	NK	--	
Uganda		--	NK	--			--	NK	--			--	NK	--	
Zambia		--	NK	--			--	NK	--			--	NK	--	
Zimbabwe		--	NK	--			--	NK	--			--	NK	--	

Countries in Africa for which no reports of IDU identified: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic), Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mozambique, Namibia, Niger, Republic of the Congo, Rwanda, Sao Tome & Principe, Seychelles, Somalia. Notes: For source documents for all figures listed in tables see **webappendix 4**. NK – although IDU has been identified or IDU prevalence estimated, no eligible studies of HCV or HBV among IDUs were located. When more than one year or grade is given, these are listed in order of the estimate they refer to, i.e. lower followed by upper.

* Publication year minus three; year of estimate not stated.

Table 7

Regional and global estimates of the numbers of IDUs who are anti-HCV, anti-HBc and HBsAg positive, 2010

Region	Estimated number of IDUs who are anti-HCV positive					Estimated number of IDUs who are anti-HBc positive					Estimated number of IDUs who are HBsAg positive				
	No. Countries with eligible reports	% ERIP with eligible reports	Lower	Mid	Upper	No. Countries with eligible reports	% ERIP with eligible reports	Lower	Mid	Upper	No. Countries with eligible reports	% ERIP with eligible reports	Lower	Mid	Upper
Eastern Europe	14	87	1,244,500	2,346,000	3,918,000	9	80	610,500	1,362,000	2,426,000	11	86	100,000	280,000	543,000
Western Europe	22	99	497,000	727,500	1,018,000	17	94	209,000	447,000	660,000	17	93	13,500	54,000	108,500
East and South East Asia	11	99	1,820,000	2,642,000	3,576,500	5	77	678,000	1,592,500	2,374,500	8	88	112,000	340,000	696,000
South Asia	6	99	233,000	354,500	532 000	3	45	158,000	370,500	565,000	6	99	20,000	71,500	154,500
Central Asia	3	81	91,500	146,000	213,000	1	40	59,500	145,500	226,500	1	40	6,000	21,500	46,000
Caribbean	0	0	--#	--	--	0	0	--#	--	--	0	0	--#	--	--
Latin America	5	67	83,500	132,500	194,500	3	60	386,500	926,000	1,425,000	3	45	12,500	43,500	90,500
Canada and United States	2	100	675,500	1,022,000	1,441,000	1	87	206,500	524,500	864,000	1	87	57,500	272,500	642,000
Pacific Island States & Terr.	0	0	--#	--	--	0	0	--#	--	--	0	0	--#	--	--
Australia and New Zealand	2	100	44,500	97,000	165,000	1	88	20,500	60,500	115,000	2	100	3,000	7,000	12,000
Middle East & North Africa	8	54	29,000	63,500	115,500	3	26	50,000	74,500	106,000	7	49	7,500	14,000	26,500
Sub-Saharan Africa*	4	25	206,500	800,000	1,524,000	0	0	136,000	821,500	1,666,500	3	19	11,500	106,500	296,500
Extrapolated global	**77**	**82**	**6,031,000**	**10,018,000**	**15,186,500**	**43**	**65**	**2,550,000**	**6,411,500**	**10,564,000**	**59**	**73**	346,500	1,229,000	2,654,500

Notes: ERIP: estimated regional IDU population. All figures rounded to nearest 500; global figure totalled from regional estimates prior to rounding. 2010 UN population division estimates were used to derive 2010 estimates of IDU population size.

*Sub-Saharan African IDU numbers and derived population estimates should be viewed with caution as IDU prevalence estimates were derived from three countries in the region (South Africa, Mauritius, Kenya). The estimated range of IDU was derived by applying the regional observed error; this large error band reflects the uncertainty around these estimates.

#Insufficient data to produce a region-specific estimate for IDU populations in this region; countries in this region were still included in global estimates.