

# overview

**Blood-borne viral infections among injecting  
drug users in Ireland, 1995 to 2005**

# 4

**Jean Long**

**Health Research Board**

Please use the following citation:

Long J (2006) Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005. Overview 4. Dublin: Health Research Board.

Published by:

Health Research Board, Dublin

© Health Research Board 2006

ISSN 1649-7198

Copies can be obtained from:

Administrative Assistant

Drug Misuse Research Division

Health Research Board

Knockmaun House

42–47 Lower Mount Street

Dublin 2

t (01) 6761176 ext 127

f (01) 6618567

e dmr@hrb.ie

An electronic copy is available at: [www.hrb.ie/ndc](http://www.hrb.ie/ndc)

Copies are retained in:

National Documentation Centre on Drug Use

Health Research Board

Knockmaun House

42–47 Lower Mount Street

Dublin 2

t (01) 6761176 ext 175

e ndc@hrb.ie

## The Overview series

This publication series from the Drug Misuse Research Division (DMRD) of the Health Research Board (HRB) provides a comprehensive review of specific drug-related issues in Ireland. Each issue in the series will examine, in an objective and reliable manner, an aspect of the drugs phenomenon. It is envisaged that each issue will be used as a resource document by policy makers, service providers, researchers, community groups and others interested in the drugs area.

## Drug Misuse Research Division

The Drug Misuse Research Division (DMRD) is a multi-disciplinary team of researchers and information specialists who provide objective, reliable and comparable information on the drug situation, its consequences and responses in Ireland. The DMRD maintains two national drug-related surveillance systems and is the national focal point for the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). The Division also manages the National Documentation Centre on Drug Use. The DMRD disseminates research findings, information and news in Occasional Papers, in the Overview series, and in the quarterly newsletter *Drugnet Ireland*. Through its activities, the DMRD aims to inform policy and practice in relation to drug use.

## Health Research Board

The HRB is a statutory body with a mission to improve health through research and information. The HRB is responsible for promoting, commissioning and conducting medical, epidemiological and health services research in Ireland. The HRB carries out these roles, and adds value, through competitive funding of health research, participation in health research and maintaining national research databases on disability, mental health and drug misuse.

## Acknowledgements

The author would like to express sincere thanks to all those who contributed to this publication. Without the ongoing support of staff at the Health Protection Surveillance Centre and colleagues at the National Documentation Centre on Drug Use it would not have been possible to collate this information. Their co-operation is very much appreciated and valued. I would like to thank Dr Mary Cronin, Dr Suzanne Norris, Dr Kate O'Donnell, Dr Hamish Sinclair and Dr Lelia Thornton for their helpful comments on earlier drafts of this paper. I would also like to thank Ms Joan Moore for editing the work.

## Overview series publications to date

Long J, Lynn E and Keating J (2005) *Drug-related deaths in Ireland, 1990–2002*. Overview 1. Dublin: Health Research Board.

Connolly J (2005) *The illicit drug market in Ireland*. Overview 2. Dublin: Health Research Board.

Connolly J (2006) *Drugs and crime in Ireland*. Overview 3. Dublin: Health Research Board.

Long J (2006) *Blood-borne viral infections among injecting drug users in Ireland 1995 to 2005*. Overview 4. Dublin: Health Research Board.

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## Glossary of abbreviations

DMRD	Drug Misuse Research Division
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
ERHA	Eastern Regional Health Authority
HAART	Highly active antiretroviral therapy
HPSC	Health Protection Surveillance Centre, formerly known as the National Disease Surveillance Centre
HRB	Health Research Board
HSE	Health Service Executive
NDSC	National Disease Surveillance Centre, now known as the Health Protection Surveillance Centre
NICE	National Institute for Health and Clinical Excellence
NVRL	National Virus Reference Laboratory
PCR	Polymerase chain reaction
RNA	Ribonucleic acid

## Glossary of terms

**Incidence** is a term used to describe the number of new cases of disease or events that develop among a population during a specified time interval. For example, in 2001, ten opiate users living in a specific county sought treatment for the first time. The incidence is the number of opiate cases divided by the population living in the county (say 31,182 persons in this example) expressed per given number of the population, i.e., per 100, per 1,000, per 10,000, etc.

The calculation in this case is as follows:  $(10/31,182) \times 10,000$ , which gives an incidence rate of 3.2 per 10,000 of the specific county population in 2001.

**Prevalence** is a term used to describe the proportion of people in a population who have a disease or condition at a specific point or period in time. For example, in 2001, ten opiate users living in a specific county sought treatment for the first time, 20 opiate users returned to treatment in the year and five opiate users continued in treatment from the previous year; in total there are 35 people treated for problem opiate use in 2001. The prevalence is the total number of cases (35) divided by the population living in the county (31,182 persons) expressed per given number of the population, i.e., per 100, per 1,000, per 10,000, etc.

The calculation in this case is as follows:  $(35/31,182) \times 10,000$ , which gives a prevalence rate of 11.2 per 10,000 of the specific county population in 2001.

A **confidence interval** is the range of values (for example, proportions) in which the true value is likely to be found. By convention, a 95% confidence interval is usually calculated, that is, the range of values will include the true value 95% of the time.

In relation to hepatitis C, the **polymerase chain reaction (PCR) test** assesses whether the virus is still detectable in the blood and will show if a person has an ongoing infection.

## **1 Summary**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



## 1 Summary

The data presented in this publication describe what is known about blood-borne viral infections among drug users in Ireland. The data pertaining to injecting drug users are presented where possible, and where the data are not analysed by injecting status or where injecting status is not ascertained, the data on all drug users are presented.

The current and potential sources of data in Ireland on blood-borne viral infections are described.

The analysis presented in this Overview is based on disease notifications reported to the Health Protection Surveillance Centre (formerly known as the National Disease Surveillance Centre) during the period 1995 to 2005 and on ad hoc research studies.

This Overview will assist policy makers, service planners and public health practitioners to develop further appropriate responses to some of the consequences of injecting drug use.

### **The main observations and their implications are:**

The number of newly diagnosed cases of HIV among injecting drug users increased in 1999 and to date has remained at a higher level than in the early nineties, while the number of new AIDS cases diagnosed decreased. Around one-tenth of injecting drug users in drug treatment are HIV positive. Age, injecting practices and sexual practices are associated with HIV status. The increase in HIV infections over the last five years requires investigation. HIV treatment (HAART) is available to injecting drug users through genito-urinary medical units and infectious disease clinics in Ireland. In 2003, a study reported that a number of stable injecting drug users were suitable for treatment, but were not receiving treatment at the time of the study. Two studies demonstrated that decentralised treatment at drug treatment centre level achieved high uptake and compliance with HIV treatment.

Just under one-fifth of injecting drug users in treatment have ever been infected with hepatitis B and approximately 2% are chronic cases. Age, injecting practices and sexual practices are linked to hepatitis B status. The uptake and completion rates of hepatitis B vaccination are much higher in the HSE South Western Area (56%) and in Drug Treatment Centre Board (86%) cohorts for the period 2001 to 2003 than those reported in prisoners or at general practice in Ireland between 1998 and 2001. This possibly indicates an increase in hepatitis B vaccine coverage in recent years. There are no published data on the coverage of hepatitis B vaccine among injecting drug users outside the HSE Eastern Region. It is important to ensure that hepatitis B vaccine is administered as early as possible in a drug user's career; therefore, needle exchange and low-threshold methadone services require facilities to deliver this intervention on a daily basis.

Around 70% of injecting drug users attending drug treatment tested positive for antibodies to the hepatitis C virus. Injecting practices and prison history are associated with hepatitis C status. There are seven specialist hepatology centres for adults and one for children in Ireland. A number of studies demonstrated low rates of access to and uptake of treatment for hepatitis C among injecting drug users. Two small studies demonstrated that a decentralised approach to initial assessment at general practice level and hepatitis C treatment at drug treatment centres achieved higher uptake and compliance rates than the current centralised approach.

Little has been published in Ireland on the prevalence of co-infection with HIV and/or hepatitis B and/or hepatitis C. The two national prison surveys in the late nineties presented data on co-infection among prisoners. These data indicated that approximately one-fifth of prisoners testing positive for hepatitis C were also infected with either hepatitis B or HIV. Up-to-date information is required.

Both HIV co-infection and, independently, high rates of alcohol consumption among those infected with hepatitis C are associated with more rapid disease progression and higher death rates.

The principles of expanded and accessible harm reduction measures are documented in both the AIDS Strategy 2000 and the Mid-Term Review of the National Drugs Strategy and will lead to synergistic actions to stem the current increase in new HIV cases among injecting drug users. The publication of the HSE Eastern Region's hepatitis C strategy is awaited.

Newly diagnosed HIV cases are reported directly to the Health Protection Surveillance Centre (HPSC) through a case-based, extended surveillance system and staff at the HPSC collate these data on a six-monthly basis. Up to 2005, information on risk factors was not included in the data recorded on newly diagnosed cases of hepatitis B and hepatitis C, which makes it difficult to monitor the number of newly diagnosed cases of these infectious diseases among injecting drug users. It also means that Ireland has been unable to provide data to the European Monitoring Centre for Drugs and Drug Addiction on the incidence of hepatitis B and hepatitis C among injecting drug users. Action 39 of the European Union Drugs Action Plan requires member states to comply with the requirements of the key indicators to measure the drug situation. The incidence and prevalence of HIV, hepatitis B and hepatitis C among injecting drug users is one of the five key indicators. In recent years, the HPSC has improved the reporting of newly diagnosed cases of hepatitis B and hepatitis C. In 2006, hepatitis B data by risk factor status will be published.

There are a number of areas where further research is required. The data presented in this Overview indicate the need to record the risk factor status of newly diagnosed cases of hepatitis C. There is a need to set up a register to quantify the incidence and prevalence of hepatitis C among all heroin and cocaine users, including those who are in harm reduction and treatment services. The register should also permit the assessment of main risk factors (including drug-administration routes and prison exposure), treatment uptake and outcomes. Strategies to increase uptake of and compliance with HIV and hepatitis C therapy in both prison and community settings need to be implemented and monitored. The medical consequences of and interventions required to deal with hepatitis C

among injecting drug users need to be estimated. A system to monitor the national hepatitis B vaccine uptake is required to estimate coverage among prisoners, injecting drug users and sex workers. The effectiveness of needle exchange, opiate detoxification and opiate maintenance programmes in stabilising and reducing the incidence of hepatitis C needs to be quantified.



## **2 Introduction**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



## 2 Introduction

HIV, hepatitis B and hepatitis C are three blood-borne viruses that can be acquired through illicit injecting drug use. All three infections can lead to serious medical consequences. This overview is a synthesis of published research on blood-borne viral infections associated with injecting drug use. In the case of each infection, the facts known about the background, incidence, prevalence, risk factors, treatment and prevention are presented. With the exception of background and treatment, the review of issues is based substantially on the Irish literature. The current policy and strategy in Ireland pertaining to each infection are also reviewed. Gaps in current knowledge are identified and information-collection measures to fill these gaps are suggested. In order to permit the individual sections of the Overview on HIV, hepatitis B and hepatitis C to be read as separate papers, there is some repetition in each of these sections.

HIV is not a notifiable disease, but voluntary linked testing for antibodies to HIV was available in Ireland between 1985 and 2001; risk-factor status (such as injecting drug use) was recorded. Since July 2001, newly diagnosed HIV cases are reported through a case-based reporting system. The case-based system provides disaggregated data on all new HIV-positive cases. Important changes to infectious disease legislation were introduced in Ireland on 1 January 2004. The Infectious Diseases Regulations 1981 were amended to establish a revised list of notifiable diseases and, for the first time, their causative pathogens.<sup>1</sup> Case definitions were introduced for the first time in Ireland. Under the revised legislation, laboratory directors, as well as clinicians, are now required to report the named notifiable diseases. Except for the non-inclusion of HIV, the changes to the list of notifiable diseases are consistent with a European Commission decision on communicable diseases.<sup>2</sup> Hepatitis B has been on the list of notifiable diseases since 1981; the 2004 amendment to include laboratory directors as a source of notification was intended to increase the number and coverage of notifications. The inclusion of hepatitis C as a notifiable

disease (from 2004 onwards) provides important data on newly diagnosed cases of hepatitis C in the general population.

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) identifies drug-related infectious diseases as one of the five key indicators of drug misuse in Europe. In each member state there is a focal point for the collation of indicator data; the focal point in Ireland is the Drug Misuse Research Division (DMRD) of the HRB. The EMCDDA monitors the number of newly diagnosed cases (proxy for incidence) and prevalence of HIV, hepatitis B and hepatitis C among injecting drug users across Europe. At present, Ireland is unable to provide data to Europe on the incidence of hepatitis B and hepatitis C because the risk factor status of hepatitis B cases was not recorded until 2005, and the risk factor data for hepatitis C is still unavailable. Action 39 of the European Union Drugs Action Plan requires member states to comply with the requirements of the key indicators to measure the drug situation.<sup>3</sup> Enhanced surveillance is essential to identify such risk factors and to inform planning, prevention and treatment strategies. Risk-factor identification is required to fulfil the basic requirements of the EMCDDA's key indicator on drug-related infectious diseases.

Newly diagnosed HIV cases are reported directly to the Health Protection Surveillance Centre (HPSC) (formerly known as the National Disease Surveillance Centre) through a case-based, extended surveillance system, and staff at the HPSC collate these data on a six-monthly basis. All cases of hepatitis B and hepatitis C in Ireland are notified to the directors of public health in the Health Service Executive (HSE). On a weekly basis, these medical officers submit such notifications to the HPSC.

## **3 Data Sources**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



### 3 Data sources

Published data were sought on the incidence, prevalence and risk factors for HIV, hepatitis B and hepatitis C among injecting drug users in Ireland between 1995 and 2005, with data from earlier time periods included where necessary. The data pertaining to injecting drug users are presented where possible, and where the data are not analysed by injecting status or where injecting status is not ascertained, the data on all drug users are presented. Where appropriate, parameters (such as incidence and prevalence) were compared between injecting drug users and other risk populations and the general population. Newly diagnosed cases were used as a proxy for incidence where surveillance data are reported. Among the sources searched were: Medline, the HPSC website and its publications, the National Documentation Centre on Drug Use and reference lists in relevant publications. The Cochrane Library and National Institute for Health and Clinical Excellence (NICE) guidelines were used to identify best practice in the treatment of each infection.

Depending on the study objective, specific details were systematically extracted from each paper. The data extracted from incidence and prevalence studies were: year published, study design, study population, sample size, prevalence or incidence rate and method of ascertaining infection status. The data extracted from risk-factor studies were: year published, study design, study population, sample size and factors associated with testing positive for infection. The current standard of care or treatment for infection was extracted from Cochrane reviews or NICE guidelines. Using some of the sources listed above, all published research on access to and compliance with treatment for blood-borne viral infections in Ireland was reviewed. Current Irish policy and strategy documents were also reviewed.

The measures of infection reported in incidence and prevalence studies are explained in Table 1.

**Table 1 Parameters used to classify HIV, hepatitis B and hepatitis C infection status in studies presented in this Overview**

<b>Blood-borne viruses</b>	<b>Parameter</b>	<b>Purpose and meaning of each test</b>
HIV	Antibodies to HIV (Anti-HIV)	Antibody presence indicates ever having been infected with HIV.
Hepatitis B	Antibodies to hepatitis B core antigen (Anti-HBc)	Antibody appears 1–2 months after initial infection and indicates hepatitis B viral infection. The current infection status may be acute, chronic or resolved. This is a marker of current or past infection with hepatitis B.
	Hepatitis B surface antigen (HBsAg)	Antigen appears 1 month following exposure and a continued presence for six months or more indicates a chronic infection. Between 1% and 10% of adults who are infected with hepatitis B develop a chronic infection.
	Antibodies to hepatitis B surface antigen (Anti-HBsAg)	Antibody presence indicates a vaccine-induced immunity or a spontaneous recovery from infection.
Hepatitis C	Antibodies to the hepatitis C virus (Anti-HCV)	Antibody appears 3–6 months after initial infection and indicates previous or current hepatitis C viral infection. The current infection status may be acute, chronic or resolved. This is a marker of current or past infection with hepatitis C.
	Hepatitis C virus RNA PCR	The PCR test assesses whether the hepatitis C virus is still detectable in the blood and will show if a person has a current infection.



**Blood-borne viral infections among injecting  
drug users in Ireland, 1995 to 2005**



## 4 HIV

### 4.1 Introduction

This section presents an overview of published research on HIV associated with injecting drug use. The background, incidence, prevalence, risk factors, treatment and prevention are presented. With the exception of background and treatment, the review of issues is based substantially on the Irish literature.

### 4.2 Background

HIV (subsequently known as HIV1) was identified in 1981 and HIV2 was identified in 1986. The virus attaches itself to the CD4 particle of the T-lymphocytes. These T-lymphocytes co-ordinate the body's immune response. HIV may lead to a condition known as acquired immunodeficiency syndrome (AIDS). This condition generally occurs when the CD4 count is below 200 per millilitre and is characterised by the appearance of opportunistic infections. Such infections take advantage of a weakened immune system. The HIV virus is found in all body fluids and is transmitted via sexual intercourse (both heterosexual and homosexual), mother to foetus and baby, infected blood and blood products and procedures with unsterile needles, syringes and skin-piercing instruments. Best evidence available to date indicates that once an individual is infected he or she remains infected for life.

### 4.3 Newly diagnosed HIV cases

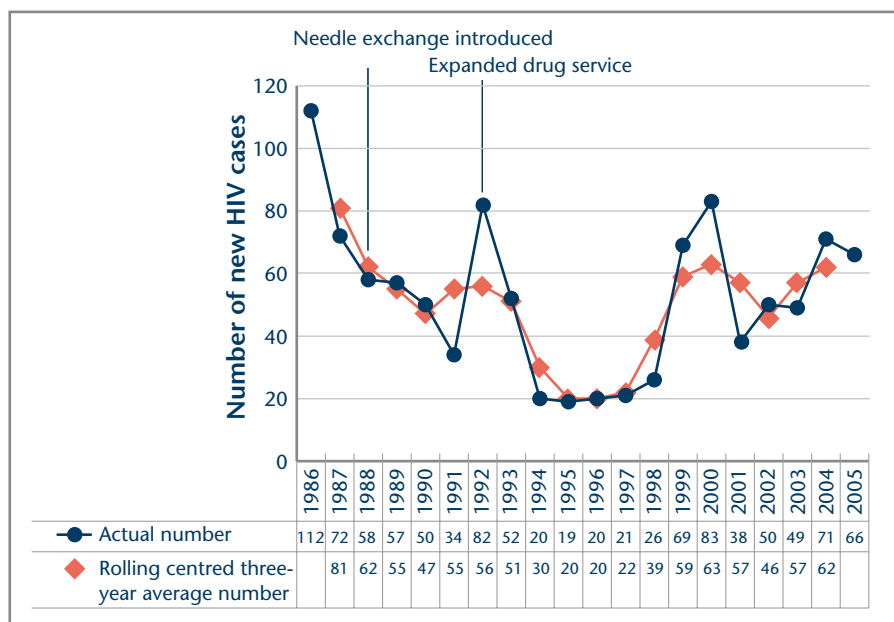
Voluntary linked testing for antibodies to HIV has been available in Ireland since 1985. By the end of 2005, there were 4,082 diagnosed HIV cases in Ireland, of which 1,270 (31%) were probably infected through injecting drug use.<sup>4</sup>

Figure 1 presents the number of new cases of HIV among injecting drug users, by year of diagnosis, reported in Ireland; data from 1982 to 1985 were excluded from the figure as these four years were combined in the source records. The data presented in Figure 1 are based on data reported to the Department of Health and Children,<sup>5</sup> the National Disease Surveillance Centre<sup>6</sup> and the Health Protection Surveillance Centre.<sup>4,7</sup> Kelly and Clarke<sup>8</sup> reported a fall in the number of HIV cases among injecting drug users between 1994 and 1998, with about 20 cases per year compared to about 50 cases each year in the preceding six years. In 1999, there was a sharp increase in the number of cases among injecting drug users, which continued into 2000, with 69 and 83 new cases respectively.<sup>9</sup> Between 2001 and 2003 there was a decline in the number of new injector cases (38, 50 and 49 respectively) when compared to 2000 but the number was higher than in 1998. In 2004, once again there was an increase (to 71 cases) in the number infected through injecting drug use compared to the preceding three years. In 2005 there were 66 cases infected through injecting drug use. It was difficult to interpret the trend due to the relatively small numbers diagnosed each year, so a smoother curve (red line in Figure 1) was calculated using a rolling centred three-year average. This curve presents an increase in the annual number of HIV cases in 1999; this higher number of cases was sustained between 2000 and 2004. This indicates a true increase in the number of cases.

Clarke and colleagues<sup>10</sup> reviewed the demographic data of new HIV-positive cases in Dublin diagnosed between January 1999 and December 2000. The authors reported that 40% of these cases were under 22 years old and that there was a clustering of cases in the Rialto (Dublin 8) area. Grogan and colleagues<sup>11</sup> ascertained the prevalence and incidence of blood-borne viral infections among heroin users attending methadone treatment services in the HSE South Western area (mainly the south western area of Dublin) in December 2001 by means of a retrospective review of participants' clinical and laboratory records. The researchers observed that there was a large pool of HIV-positive cases living in Dublin 8, while a very small number of HIV cases lived in Dublin 24 (E Keenan, personal

communication, 2003). Long *et al.*,<sup>12</sup> using two existing data sources, developed a hypothesis that the risk of acquiring HIV and hepatitis C is associated with area of residence and may be linked to cocaine use.

Of the 66 new HIV cases among injecting drug users reported to the Health Protection Surveillance Centre in 2005, 37 were male and 29 were female and the average age was 30.5 years. Of the 60 cases for whom place of residence was known, 55 lived in the HSE Eastern Region. The authors of the report on the 2004 data highlighted the need to continue to promote the use of harm reduction measures among injecting drug users.

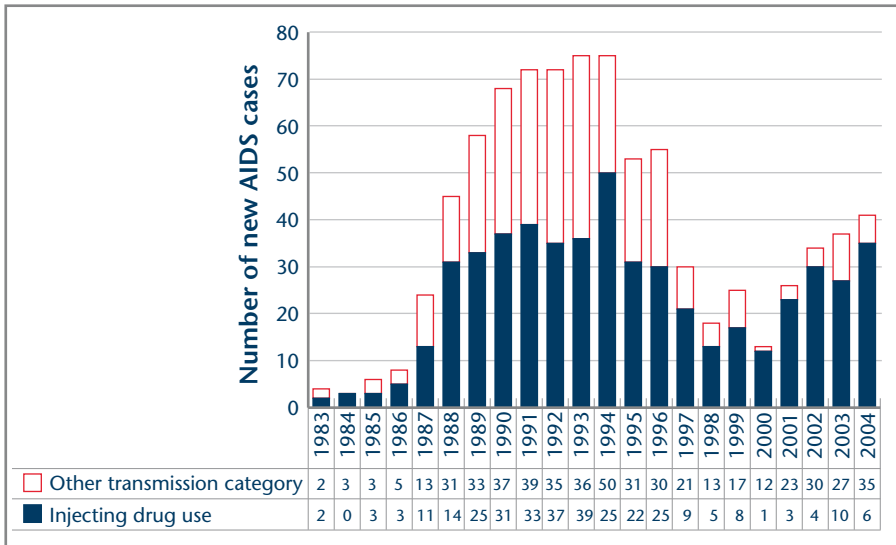


**Figure 1 Actual number and rolling average number of new cases of HIV among injecting drug users, by year of diagnosis, reported in Ireland, 1986 to 2005**

Adapted from data reported to the Health Protection Surveillance Centre

Between 1992 and 1998, Smyth *et al.*<sup>13</sup> estimated the incidence of HIV among 100 injecting drug users in Dublin who had an initial negative test and a repeat test within nine months. The authors reported that the incidence of HIV was 0.7 per 100 person years (95% CI 0.1 to 2.5).

Data on newly diagnosed case of AIDS and on deaths among those with AIDS are published every six months. The data presented in Figure 2 are based on data reported to the Department of Health and Children, the National Disease Surveillance Centre and the Health Protection Surveillance Centre. There were 846 cases of AIDS reported between 1983 and 2004 (Figure 2).<sup>14</sup> Of these, 316 (37%) reported that injecting drug use was a risk factor. Of these 316 cases, ten were men who had sex with men and injected drugs. Between 1983 and 1999, 78% of AIDS cases were resident in the Eastern Regional Health Authority area (now the HSE Eastern Region) and 15% were resident outside the area.<sup>5</sup>



**Figure 2 Number of new cases of AIDS among injecting drug users and others, by year of diagnosis, reported in Ireland, 1983 to 2004**

Adapted from data reported to the Health Protection Surveillance Centre

Therapy for the clinical management of persons with HIV has improved since the mid-1990s; as a result, the proportion of HIV cases developing AIDS decreased substantially between 1996 and 2000. Of the 846 AIDS cases between 1983 and 2004, 394 (46%) had died by the end of 2004. Of the 316 cases who had injecting drug use as a risk factor between 1983 and 2004, 173 (55%) died. Of those diagnosed with AIDS, the proportion of HIV-positive injecting drug users who died (55%) was higher than that of heterosexuals (26%) and that of men who had sex with men (47%). This indicates a probable lower survival rate among injecting drug users with HIV compared to counterparts with other risk practices.

## 4.4 Prevalence

Blood donors and antenatal women, who are routinely tested for blood-borne viral infections, may be used as proxy groups for the general population.

The prevalence of HIV was almost six per 100,000 (0.006%) new blood donors living in Dublin between 1996 and 2001 (E Laylor, personal communication, 2003). In April 1999, the Department of Health and Children, on the advice of the National AIDS Strategy Committee, introduced a policy of voluntary antenatal HIV testing in Ireland. As part of this programme, it is recommended that HIV testing be offered to all women who attend antenatal services. A system for monitoring and evaluating the routine antenatal testing programme was established in July 2001. Data are available from 2002 to 2004. The rate of HIV infection among pregnant women seeking antenatal care decreased from 0.31% in 2003 to 0.25% in 2004.<sup>15</sup>

Just over 1% of the new attendees registered at Trinity Court Drug Treatment Centre tested positive for HIV antibodies (Table 2). In a cohort of injectors attending Eastern Health Board (now the HSE Eastern Region) methadone clinics in 1997, the prevalence of HIV antibodies, based on laboratory reports, was 17%. Among heroin users attending methadone

**Table 2 Review of studies estimating the prevalence of HIV among drug users in Ireland, 1994 to 2005**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
1994 Johnson <i>et al.</i> <sup>16</sup>	Attendees at a Dublin needle exchange in 1991	81 injectors living in Dublin	Prevalence of anti-HIV* was 14.8%.	Status ascertained from oral fluid
1997 Dorman <i>et al.</i> <sup>17</sup>	Injecting drug users either in treatment or out of treatment	185 injecting drug users living in Dublin City	Prevalence of anti-HIV was 8.4%.	Status ascertained from both oral fluid and serum
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	735 injectors living in Dublin City	Prevalence of anti-HIV was 1.2%.	Status ascertained from serum
2000 Cullen <i>et al.</i> <sup>19</sup>	Review of records of clients attending methadone substitution clinics in a general practice setting	Injectors (457) and non-injectors (78) living in Dublin, Kildare & Wicklow: total 535 (of whom 344 had their HIV status recorded)	Of those who had HIV status recorded in their clinical notes, 8.7% had a documented HIV positive status.	Status ascertained from clinical notes
			The primary objective of this study was not to assess prevalence of HIV.	



**Table 2 Review of studies estimating the prevalence of HIV among drug users in Ireland, 1994 to 2005 (continued)**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
2001 Fitzgerald <i>et al.</i> <sup>20</sup>	Review of records of clients attending five methadone clinics in Dublin	90 clients, including injectors and non-injectors	Of those who had HIV status recorded in their clinical notes, 17% had a documented HIV positive status.	Status ascertained from laboratory or clinical notes
2000 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors	3.5% injectors tested positive for anti-HIV.	Status ascertained from oral fluid
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors	5.8% injectors tested positive for anti-HIV.	Status ascertained from oral fluid
2004 O'Sullivan <sup>23</sup>	Cross-sectional survey	64 injector opiate users in treatment attending Drug Treatment Centre Board	12% tested positive for anti-HIV	Status ascertained from serum and oral fluid
2005 Grogan <i>et al.</i> <sup>11</sup>	Retrospective review of methadone clients' laboratory records to December 2001 in the south-western area of Dublin	307 opiate users in methadone treatment whose injecting status was not known	11% tested positive for anti-HIV	Status ascertained from laboratory results in clinical charts

\* HIV can be detected through the presence of HIV 1 antibodies in the blood between three weeks and three months following infection, depending on the test used. The test for antibodies to the HIV virus used in these studies is a measure of ever having been infected with HIV.

substitution services in a general practice setting in Dublin, Kildare and Wicklow, 8.7% had a documented HIV-positive status. Among opiate users in opiate treatment between 2001 and 2003, 11% to 12% tested positive for HIV. The prevalence of HIV in the overall Irish prison population was lower than expected (at 2%). However, the prevalence of HIV among injector-inmates was 3.5%; this is 583 times greater than that among new blood donors and 14 times greater than that among women attending antenatal services, indicating the excess risk among injecting drug users.

## 4.5 Risk factors

In 1991, 55% of 106 injecting drug users attending needle exchange reported that they had either lent or borrowed needles in the month prior to the survey. Although not statistically significant, 88% of those who tested positive for HIV had shared needles in the month prior to the survey, compared to 51% of HIV-negative respondents.<sup>16</sup> In 1997, 186 injecting drug users who attended a drug treatment centre in Dublin reported several high-risk behaviours: 56% shared needles and, of these, 94% reported cleaning their equipment; however, less than half of them had cleaned their equipment effectively.<sup>17</sup> The authors of this study did not investigate whether these risk factors were associated with testing positive for HIV.

In more recent studies, older injectors were more likely to test positive for HIV than their younger counterparts (Table 3). Length of injecting history and needle-sharing status were also associated with testing positive for HIV (Table 3).

**Table 3 Review of studies identifying risk factors for HIV among injecting drug users in Ireland, 1998 to 2001**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population, sample size and statistical method</b>	<b>Factors associated with testing positive for HIV</b>
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	735 injectors living in Dublin City Bivariate analysis	1.5% of injectors aged 25 years or older tested positive for HIV compared to 0.8% of their younger counterparts.  2.7% of those who started injecting more than five years prior to the study tested positive for HIV, compared to 0.8% of those injecting less than five years.  3.8% of those who had started injecting before 1990 tested positive for HIV, compared to 0.6% of their less experienced injector counterparts.
2000 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors Multivariate analysis	Injectors aged 30 years or older were nine times more likely to test positive for HIV than their younger counterparts.  Injectors who reported using condoms when having sex with women were over 12 times more likely to test positive for HIV than those who did not use condoms.
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors Multivariate analysis	Injectors aged 30 years or older were eight times more likely to test positive for HIV than their younger counterparts.  Those who had shared needles in the month prior to imprisonment were almost six times more likely to test positive for HIV than those who had not.

## 4.6 Screening, treatment and prevention

HIV screening is conducted at drug treatment services and in the prison health service. Grogan *et al.*<sup>11</sup> estimated that 86% of clients attending drug treatment services in the HSE South Western Area had been tested for anti-HIV antibodies by December 2001.

There is currently no vaccine and no cure for this viral infection. The current standard of care for individuals who have HIV is a combination of highly active antiretroviral therapies commonly referred to as HAART.<sup>24,25</sup> Specialists recommend that this be commenced at an early stage of the infection and tailored to the individual's needs.

HIV treatment (HAART) is available to injecting drug users through genito-urinary medical units and infectious disease clinics in Ireland. Three treatment sites are situated in Dublin hospitals (St James's Hospital, Beaumont Hospital, and Mater Misericordiae Hospital), a fourth is based in University College Hospital, Cork, and a fifth in University College Hospital, Galway.<sup>26</sup>

As demonstrated in the study by Clarke *et al.*,<sup>27</sup> access to and uptake of treatment for HIV is better than that for hepatitis C among injecting drug users in the eastern region of Ireland, but remains far from ideal. The authors report that it is assumed (without significant evidence) that injecting drug users are unlikely to comply with treatment. These authors interviewed 150 clients who attended the Genito-Urinary Medicine and Infectious Diseases Department (GUIDE clinic) in St James's Hospital. All were HIV positive and had at some time injected drugs. Only 57% were receiving antiretroviral therapy. Of the 65 who were not receiving antiretroviral therapy, 50% fulfilled the standard criteria to commence therapy. This indicates that over 30 clients were suitable for treatment and were not receiving treatment at the time of the study. Compliance with HAART was associated with regular attendance at methadone treatment.

In Dublin, Clarke and Mulcahy<sup>28</sup> adapted the directly observed treatment approach (recommended by the World Health Organization (WHO) for the management of tuberculosis) in order to increase compliance with antiretroviral therapy among injecting drug users attending clinics for methadone maintenance. Each individual treated received a combination of medication tailored to his or her needs, administered in a daily or twice-daily dose. Of the 39 study participants, 90% were complying with treatment at three months, 80% at six months and 69% at 12 months. The authors acknowledged that they had no comparison group with which to compare their results; however, the compliance rates achieved in this study were in line with the international experience of compliance with directly observed tuberculosis treatment among the general population. In a subsequent study,<sup>29</sup> a higher level of compliance with antiretroviral therapy was reported among those attending methadone treatment services than among those not attending such services.

In relation to injecting drug users, the AIDS Strategy 2000<sup>30</sup> recommended that data on the HIV status of treated injecting drug users continue to be captured. According to this strategy document, drug treatment centres are important sites for the provision of HIV risk counselling, health education and other prevention messages. In order to increase the provision of these interventions, the strategy proposed a review of the role of counsellors with a view to expanding it to include HIV prevention. The strategy confirmed that methadone treatment would continue to be a central element in the range of treatment options for opiate users and recommended that the HSE continue to expand treatment and harm reduction services (including needle exchange). It recommended that the issue of homelessness among injecting drug users with HIV be addressed. In addition, the recommendations of the reports on hepatitis B, hepatitis C and HIV among Irish prisoners<sup>31, 32</sup> will be explored (by the strategy group) in order to prevent the spread of such infections in this environment. According to the strategy document, the range of services available to prevent and treat HIV in the community should also be available in prisons.

## 4.7 Policy and strategy

The 2005 mid-term review of the National Drugs Strategy introduced specific performance indicators on harm reduction for the first time in Ireland.<sup>33</sup> These indicators are:

- Harm reduction facilities available, including needle exchange where necessary, open during the day, and at evenings and weekends, according to need, in every local health office area; and
- Incidence of HIV in [injecting] drug users stabilised, based on 2004 figures.

The principles of expanded and easily accessible harm reduction services are common to both strategies and will lead to synergistic actions to stem the current increase in new HIV cases among injecting drug users. The Irish Prison Service has published a number of documents promoting health and drug treatment services in Irish prisons. The first recommendation in the report of the review group on the structure and organisation of prison services, published in 2001, is that similar care and treatment should be available in both the prison and community health services.<sup>34</sup> In order to implement this recommendation, considerable groundwork was undertaken during 2004 to develop formal service agreements in a number of areas.<sup>35</sup> For example, formal agreements were developed between Cloverhill and Wheatfield prison services and the health sector in order to provide consultant-led infectious disease and drug treatment services at these prisons from 2005 onwards.

The Irish Prison Service published its drugs policy and strategy in May 2006.<sup>36</sup> According to this strategy, there will be a close link between drug treatment services and other health care services to ensure adequate management of mental illnesses and blood-borne viral diseases. The strategy lists a number of treatment approaches for those who stop using drugs, but has no harm-reduction measures for injecting drug users who continue to use drugs. The treatment approaches will be adapted for

prisoners with special needs, including drug users with mental health problems or hepatitis C.

## 4.8 Conclusions

Newly diagnosed HIV cases are reported directly to the Health Protection Surveillance Centre (HPSC) (formerly known as the National Disease Surveillance Centre) through a case-based, extended surveillance system and staff at the HPSC collate these data on a six-monthly basis. The number of newly diagnosed cases of HIV among injecting drug users increased in 1999 and to date has remained at a higher level than in the early nineties, while the number of new AIDS cases diagnosed decreased. Around one-tenth of injecting drug users in drug treatment are HIV positive. Age, injecting practices and sexual practices are associated with HIV status. The increase in HIV infections over the last five years requires investigation. HIV treatment (HAART) is available to injecting drug users through genito-urinary medical units and infectious disease clinics in Ireland. In 2003, a study reported that a number of stable injecting drug users were suitable for treatment, but were not receiving treatment at the time of the study. Two studies demonstrated that decentralised treatment at drug treatment centre level achieved high uptake and compliance with HIV treatment.





## **5 Hepatitis B**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



## 5 Hepatitis B

### 5.1 Introduction

This section presents an overview of published research on hepatitis B associated with injecting drug use. The background, incidence, prevalence, risk factors, treatment and prevention are presented. With the exception of background and treatment, the review of issues is based substantially on the Irish literature.

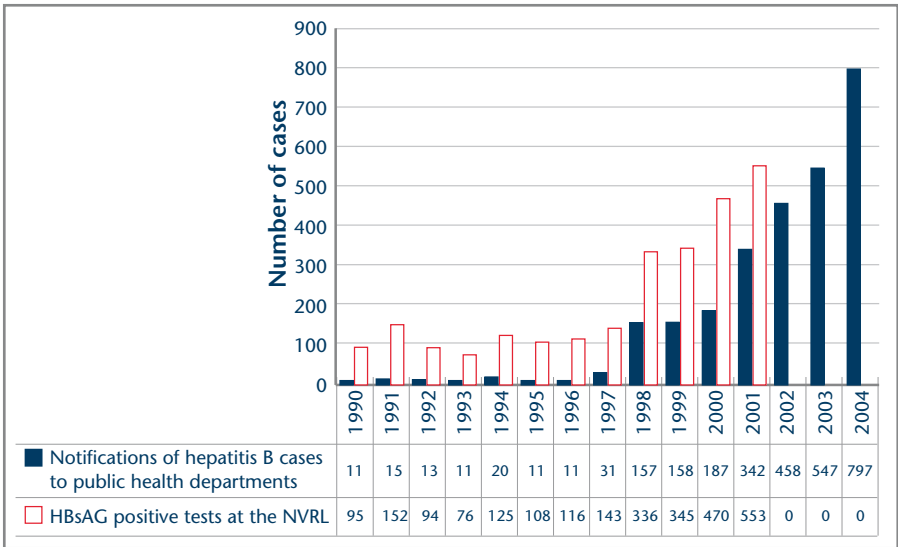
### 5.2 Background

Hepatitis B is an infection caused by the hepadnavirus. The incubation period usually lasts 6 to 26 weeks. The virus can be transmitted through blood, semen, vaginal secretions and saliva. The main routes for transmission are parenteral (through infected blood and blood products and contaminated needles and syringes), vertical (in utero or during childbirth) and sexual (particularly in those who engage in casual sex and in men who have sex with men). Between 1% and 10% of adults who are infected with hepatitis B develop a chronic infection. Hepatitis B virus is an important cause of liver disease, including acute hepatitis, chronic hepatitis, cirrhosis of the liver and primary hepatocellular carcinoma.

### 5.3 Newly diagnosed hepatitis B cases

Hepatitis B is a notifiable disease in Ireland and cases should be reported to the public health departments of the HSE area where the case is resident. Research on the incidence of hepatitis B in the period 1970 to 1987 clearly identifies the excess risk among injecting drug users in Ireland.<sup>37</sup> A number of laboratories in Ireland can identify hepatitis B, but the majority of cases are diagnosed at the National Virus Reference Laboratory (NVRL). Data from the NVRL show the number of chronic cases of hepatitis B identified for the first time each year. Between 1990 and 1996 there were about 100 cases identified for the first time each year.

From 1997 to 2000, there was a sharp increase in the number of cases identified for the first time; in 1997 there were 143 newly identified cases and in 2003 there were 547. Many of the newly identified cases were likely to be immigrants from moderate- to high-endemicity countries. In the HSE Southern Area between 2000 and 2002, 95% or more of hepatitis B cases diagnosed were asylum seekers from such countries.<sup>38</sup> Between 1990 and 2001, the numbers of notifications to the departments of public health were lower than the numbers of individuals who tested positive for the first time identified by the NVRL,<sup>39</sup> but followed the same increasing trend over time. Notifications increased in recent years and this increase was notable before the introduction of the new infectious diseases legislation in 2004 (Figure 3).<sup>40</sup> Up to the end of 2004, the notification system did not categorise cases by risk group or differentiate between new and previously diagnosed cases.



**Figure 3 Numbers of hepatitis B cases notified to the Health Protection Surveillance Centre<sup>40</sup> and hepatitis B (surface antigen positive) cases identified by the National Virus Reference Laboratory,<sup>39</sup> 1990 to 2004**

## 5.4 Prevalence

Hepatitis B prevalence is estimated using two markers in a person's blood. The presence of one marker, antibodies to the hepatitis B core antigen, indicates that a person is or has ever been infected with the hepatitis B virus. The presence of the second marker, hepatitis B surface antigen, indicates that a person has a chronic hepatitis B viral infection. The numbers with antibodies to hepatitis B core antigen are 10 to 100 times greater than the numbers who remain chronically infected with hepatitis B.

The prevalence of chronic cases of hepatitis B in the general population in Ireland is low. Between 1996 and 2001, just less than 17 in 100,000 (0.016%) new blood donors living in Dublin had a chronic hepatitis B infection (E Lawlor, personal communication, 2003). Between January 1998 and June 2000, the prevalence of hepatitis B carriage among Irish-born women attending antenatal services in a Dublin hospital was 0.03%; this was much lower than that reported among clients from countries outside the European Union attending the same antenatal service (4.0% to 5.3%).<sup>41</sup> The prevalence among women attending antenatal services is almost twice that among new blood donors living in Dublin. The national population prevalence for past exposure to hepatitis B, based on a postal survey in 18 district electoral divisions using a multi-stage stratified-cluster sampling technique, was 0.5% (95% CI 0.0–1.8).<sup>42</sup> The prevalence among the general population was over three times that among new blood donors living in Dublin.

The document *Immunisation guidelines for Ireland 2002* identified six high-risk populations in Ireland: sex workers and individuals who change sexual partners frequently, injecting drug users, prisoners, tattoo artists, immigrants from and migrants to countries with high endemicity rates, and homeless people.<sup>43</sup> Studies estimating the prevalence of blood-borne viruses among injecting drug users in Ireland tend to have been conducted using cohorts of drug users attending particular drug treatment services, or in the prison setting (Table 4).

**Table 4 Review of studies estimating the prevalence of hepatitis B among drug users in Ireland, 1998 to 2005**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	735 injectors living in Dublin city	1% tested positive for HBsAg*	Status ascertained from serum
2000 Cullen <i>et al.</i> <sup>19</sup>	Review of records of clients attending methadone substitution clinics in a general practice setting	Injectors (457) and non-injectors (78) living in Dublin, Kildare and Wicklow Sample: 535 (of whom 316 had their hepatitis B status recorded)	Of those who had hepatitis B status recorded in their clinical notes, 13.6% had a documented hepatitis B positive status. The primary objective of this study was not to assess prevalence of hepatitis B.	Status ascertained from clinical notes
2001 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors	18.5% tested positive for anti-HBc†	Status ascertained from oral fluid
2001 Fitzgerald <i>et al.</i> <sup>20</sup>	Review of records of clients attending five methadone clinics in Dublin	64 clients, including injectors and non-injectors	Of those who had hepatitis B status recorded in their clinical notes, 28.1% had a documented positive hepatitis B core antigen status; 5.1% had a documented HBsAg positive status.	Status ascertained from laboratory reports or clinical notes

**Table 4 Review of studies estimating the prevalence of hepatitis B among drug users in Ireland, 1998 to 2005 (continued)**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors	17.9% tested positive for anti-HBc.	Status ascertained from oral fluid
2004 O'Sullivan <sup>23</sup>	Cross-sectional survey	65 injector opiate users in treatment attending Drug Treatment Centre Board 63 injector opiate users in treatment attending Drug Treatment Centre Board	17% tested positive for anti-HBc; 0% tested positive for anti-HBsAg.	Status ascertained from serum
2005 Grogan <i>et al.</i> <sup>11</sup>	Retrospective review of methadone clients' laboratory records to December 2001 in the south-western area of Dublin	244 opiate users in methadone treatment; 299 opiate users in methadone treatment; These opiate users injecting status was not known	17% tested positive for anti-HBc. 2% tested positive for HBsAg.	Status ascertained from laboratory results

\* A continued presence of hepatitis B surface antigen (HBsAg) for six months or more indicates a chronic or carrier status. Best available evidence indicates that the long-term carrier rate, and hence infectivity, of someone who has ever been infected with hepatitis B is 10% for adults.

† The antibody to hepatitis B core antigen (anti-HBc) can be first detected two to three weeks following infection with hepatitis B virus and its presence indicates ever having been naturally infected with the virus.

From 1992 to 1997, 1% of new clients who attended Trinity Court Drug Treatment Centre tested positive for hepatitis B surface antigen. Among opiate users attending methadone substitution services in a general practice setting, 14% had a hepatitis B positive status documented in their clinical notes. In a cohort of opiate users attending Eastern Health Board (now the HSE Eastern Region) methadone clinics in the mid-nineties, the prevalence of hepatitis B surface antigen and antibodies to hepatitis B core antigen, based on laboratory reports or clinical notes, was 1.5% and 28% respectively. Two studies conducted between 2001 and 2003 reported that 17% of problem opiate users attending methadone treatment in Dublin tested positive for antibodies to hepatitis B. Two studies estimated the prevalence of past exposure to hepatitis B among the Irish prisoner population; almost one-fifth of injector-inmates tested positive for antibodies to hepatitis B core antigen. The prevalence of hepatitis B carriage is five to seven times higher among injecting drug users than among women attending antenatal services, which provides an estimate of the excess risk among injecting drug users. Overall, the prevalence of hepatitis B among injecting drug users has remained lower than expected. There are two possible reasons for this: the small number of cases with chronic infection, and the proactive hepatitis B vaccination programme in Irish prisons and drug treatment settings. In Ireland there are no published estimates of hepatitis B prevalence among injecting drug users who attend needle exchanges or those who do not attend drug services.

## 5.5 Risk factors

In 1998, Smyth *et al.*<sup>18</sup> reported that injectors who commenced injecting drug use before 1990 were more likely to be chronic cases of hepatitis B than those who started injecting after 1990 (Table 5). Among Irish prisoners, injecting drug use was the most important risk factor for testing positive for antibodies to hepatitis B core antigen (Table 5). In the prison setting, injectors who were older and had been injecting longer were more likely to test positive for antibodies to hepatitis B core antigen than their younger, less exposed counterparts. These findings indicate that these older



**Table 5 Review of studies identifying risk factors for hepatitis B among injecting drug users in Ireland, 1998 to 2001**

<b>Year published and authors</b>	<b>Study setting</b>	<b>Study population, sample size and statistical method</b>	<b>Factors associated with testing positive for hepatitis B</b>
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	735 injectors living in Dublin city Bivariate analysis	3.8% of those who started injecting pre 1990 compared to 0.8% of those who started post 1990.
2000 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors Multivariate analysis	Injectors 30 years or older were four times more likely to test positive than those who were less than 30 years old. Those who had injected for more than three years were three times more likely to test positive than those who were injecting less than three years. Injectors who had ever been treated for a sexually transmitted infection were twice as likely to test positive as those who had never been treated.
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors Multivariate analysis	Injectors 30 years or older were five times more likely to test positive than those who were less than 30 years old. Injectors who reported having had 10 or more sexual partners in the year prior to the survey were five to six times more likely to test positive than those who had one or two partners.

cases may have contracted hepatitis B infection during the epidemic among injecting drug users in the 1980s.<sup>37</sup> Among injector prisoners, sexual risk practices were also important determinants of hepatitis B infection status.

## 5.6 Screening, treatment and vaccination

### Screening

There are 10 genito-urinary medical units in hospitals throughout Ireland. Hepatitis B is classified as a sexually transmitted infection and may be diagnosed at these units. Because of the link between hepatitis B and injecting drug use, hepatitis B screening is also conducted at drug treatment services and through the prison health service. Grogan *et al.*<sup>11</sup> estimated that 68% of clients attending drug treatment services in the HSE South Western Area had been tested for antibodies to hepatitis B core antigen and 84% had been tested for hepatitis B surface antigen by December 2001.

### Treatment

Treatment for acute hepatitis B is mainly supportive. Interferon therapy has been used for the treatment of chronic hepatitis B. In 1990, Perillo *et al.*<sup>44</sup> reported that, of those treated with interferon alpha 2b for 16 weeks, 36% no longer had hepatitis e-antigen and hepatitis B viral DNA detected in their serum, compared to 7% of untreated controls. In the mid-nineties, Niederau *et al.*<sup>45</sup> followed up a prospective cohort of 103 treated individuals and 53 untreated individuals. The authors reported that hepatitis e antigen and hepatitis B viral DNA were no longer detected in 52% of those treated with interferon alpha, compared to 16% of the untreated cohort. Almost 10% of the treated group were no longer carriers of the hepatitis B virus, whereas none of the untreated group had lost their carrier status. Interferon is useful only for patients who have no immunodeficiencies. The National Institute for Health and Clinical Excellence (NICE) is developing clinical guidance notes on the treatment of chronic hepatitis B. The use of drugs such as adefovir, dipivoxil and pegylated interferon alpha-2a for the treatment of chronic hepatitis B will be covered in these guidance notes.<sup>46</sup>

## Vaccination

In Ireland, hepatitis B vaccine is recommended for several high-risk groups; prisoners and injecting drug users are two of the high-risk groups named in the *Immunisation guidelines for Ireland 2002*.<sup>43</sup> The safety, effectiveness and regimen of the vaccination programme are well established. There are several accelerated vaccine schedules. The current vaccine schedule, Day 0, Day 7, Day 21, with a booster at 12 months, results in 65% sero-protection at Day 28 and 99% protection at 13 months.<sup>47</sup> The effectiveness of hepatitis B vaccination among injecting drug users may be lower than that among the general population because of the generally poorer health status among this group, including HIV co-infection.<sup>48</sup> This does not mean that hepatitis B vaccine should not be administered to injecting drug users but that serum should be tested to ensure that the recipient has developed an appropriate immune response to the vaccine.

In Ireland, hepatitis B vaccine is free to all injecting drug users attending drug treatment centres, but is not necessarily free to all injecting drug users attending general practice. The vaccine has become easily available at drug treatment centres but is more difficult to access at general practice. In general, doctors caring for injecting drug users in the general practice setting must order an individual dose of vaccine for each injecting drug user they intend to vaccinate. Those injectors without a medical card must pay for the vaccine. This reduces the scope for opportunistic vaccination, which is considered an important strategy to achieve a high level of immunisation in a vulnerable group.

The coverage of hepatitis B vaccination for injecting drug users is not monitored on a continuous basis; the coverage estimates presented in this section were taken from ad hoc studies in particular settings such as needle and syringe exchange, treatment centre, prison and general practice (Table 6).

Fitzgerald *et al.*<sup>20</sup> reported that only 18% of clients attending five methadone clinics in the Dublin area in 1997 had one or more doses of hepatitis B vaccine documented in their medical record; only 15% had completed three doses of the vaccine.

**Table 6 Review of studies estimating the coverage of hepatitis B vaccine among drug users in Ireland, 2000 to 2005**

<b>Year published and authors</b>	<b>Study setting</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
1999 Allwright <i>et al.</i> <sup>31</sup>	Cross-sectional survey in 1998	1045 prison inmates, of whom 509 were injectors	29% (302/1045) reported that they had completed three doses of hepatitis B vaccine.	Self-reported status
2001 Fitzgerald <i>et al.</i> <sup>20</sup>	Review of client records attending five methadone clinics in Dublin in 1997	64 clients, including injectors and non-injectors	15% had three doses of hepatitis B vaccine documented in their clinical notes.	Status ascertained from laboratory reports or clinical notes
2000 Long <i>et al.</i> <sup>32</sup>	Cross-sectional survey in 1999	554 prison entrants, of whom 173 were injectors	10% (50/554) reported that they had completed three doses of hepatitis B vaccine.	Self-reported status
2003 Cullen <i>et al.</i> <sup>50</sup>	Review of records of clients attending methadone substitution clinics in a general practice setting. The baseline was in 2001 and follow-up in 2002	196 opiate users attending general practice	Of those who had hepatitis B vaccine status recorded in their clinical notes, 16% had completed three doses of hepatitis B vaccine at baseline. 36% of the intervention group had completed three doses of hepatitis B vaccine at follow up. 21% of the control group had completed three doses of hepatitis B vaccine at follow up.	Status ascertained from clinical notes

**Table 6 Review of studies estimating the coverage of hepatitis B vaccine among drug users in Ireland, 2000 to 2005 (continued)**

<b>Year published and authors</b>	<b>Study setting</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
2004 O'Sullivan <sup>23</sup>	Cross-sectional survey between 2002 and 2003	65 injector opiate users in treatment attending Drug Treatment Centre Board	86% tested positive for anti-HBs*	Status ascertained from serum
2005 Grogan <i>et al.</i> <sup>11</sup>	Retrospective review of methadone clients' clinical notes to December 2001 in the south-western area of Dublin	316 opiate users in methadone treatment whose injecting status was not known	56% had three doses of hepatitis B vaccine documented in their clinical notes.	Status ascertained from clinical notes

\* Anti-HBs indicates a vaccine-induced immunity or a full recovery from infection.

A study of 1,337 new clients attending the Health Promotion Unit at Merchants Quay in Dublin between 1 May 1997 and 31 October 1998 found that only 19% (of 1,308) clients reported having had one or more doses of hepatitis B vaccine.<sup>49</sup> The study did not ascertain how many doses of hepatitis B vaccine these clients had received. A higher proportion of male clients (22%) had received one or more doses of the vaccine than had their female counterparts (11%). Furthermore, a higher proportion of clients (30%) who had ever been in prison had received one or more doses of the vaccine than had the proportion that had never been in prison (8%). Since men are more likely to be imprisoned than women, it is likely that most of the clients attending the Health Promotion Unit at Merchants Quay had received their hepatitis B vaccination in prison. Of the 1,337 new clients, 370 completed a follow-up questionnaire three months after their initial contact with the Unit. The overall uptake of hepatitis B vaccine increased by 2% over the three-month period, from 16% to 18%.

It is Department of Justice, Equality and Law Reform policy that all prisoners should be offered hepatitis B vaccine. In 1998 and 1999, two studies estimated self-reported uptake and coverage of hepatitis B vaccine among prisoners.<sup>31, 32</sup> In 1998, 29% (302/1045) of respondents in the prison inmates survey reported completing three doses of hepatitis B vaccine, compared with 10% (55/554) in the prison entrants survey in 1999. The proportion that had completed three doses of the vaccine in the entrants survey increased to 13% (50/373) when those individuals who had never spent time in prison were excluded. In the prison inmates survey, an additional 19% (199/1045) had completed one or two doses of the vaccine, compared to 12% (66/554) in the prison entrants survey. In both surveys, uptake rates were higher among those who had spent more than three of the previous 10 years in prison. For example, in the entrants survey, only 4% (7/180) of respondents who had never spent time in prison had had one or more doses of hepatitis B vaccine, while 23% (52/228) of those who had spent between one day and three years in prison had accessed one or more doses, and 61% (52/85) of those who had spent more than three of the previous 10 years in prison had accessed

one or more doses of vaccine. In both prison surveys, uptake rates were higher among injecting drug users. For example, in the inmates survey a significantly higher proportion of injecting drug users (63%, 298/476) than non-injectors (36%, 201/561) had had one or more doses of hepatitis B vaccine.

It is important to note that, in both surveys, of the respondents who had previously spent time in prison, the vast majority who had accessed hepatitis B vaccine had done so while in prison: 91% (443/488) of respondents in the inmates survey and 82% (89/108) in the entrants survey.

In both prison surveys, a higher proportion of those who tested positive for antibodies to hepatitis B core antigen had one or more doses of hepatitis B vaccine than had antibody-negative respondents. In the entrants survey, 36% (13/36) of antibody-positive respondents, compared to only 20% (105/518) of antibody-negative respondents, had had one or more doses of vaccine. This indicates the need to administer vaccination as early as possible (at needle- and syringe-exchanges facilities, low-threshold services and treatment centres). Only a minority of needle exchanges and low-threshold services have medical personnel on hand to administer vaccinations; the limited provision of this important intervention for high-risk groups needs to be addressed.

In 2001 Cullen *et al.*<sup>50</sup> implemented a pilot project to improve the care of injecting drug users attending general practice who were at risk of hepatitis C. Prior to implementing the project, the authors did a baseline assessment that included hepatitis B vaccine coverage. Of the 196 respondents, only 16% had documented evidence of having received three doses of hepatitis B vaccine within a seven-month period. Self-reported hepatitis B vaccine coverage was higher than documented coverage: 23% had three doses, 11% had two doses and 14% had received one dose. At the end of the study in 2002, the completed vaccination rate in the intervention group was higher (36%) than that in the control group (21%).

In 2001, Grogan *et al.*<sup>11</sup> estimated that 81% of 316 clients in the HSE South Western Area for whom the hepatitis B vaccine was indicated had commenced a course of the vaccine and 177 (56%) had completed at least three doses.

Between 2002 and 2003, O’Sullivan<sup>23</sup> estimated that 86% of those attending the Drug Treatment Centre Board for whom the vaccine was indicated tested positive for anti-HBs, which indicated in these cases a vaccine-induced immunity.

## 5.7 Policy and strategy

The issue of hepatitis B infection and the association between injecting drug use and high-risk sexual behaviour are addressed in the sexual health strategy produced by the HSE Eastern Region.<sup>51</sup> The Steering Committee for this strategy recommended three levels of care to promote sexual health among the population. The primary level of care will promote informed decision-making and screening for sexually transmitted diseases (including hepatitis B); hepatitis B vaccine will be promoted in primary care services. The second level of care will be delivered by specialist general practitioners who will provide surgical methods of contraception and comprehensive primary care services for particular vulnerable groups, such as injecting drug users. The third level of care will provide consultant-led specialist genito-urinary medical services.

## 5.8 Conclusions

All cases of hepatitis B in Ireland are notified to the directors of public health in the Health Service Executive (HSE). Up to the end of 2004, the notification system did not categorise cases by risk group or differentiate between new and previously diagnosed cases. In 2005 an extended surveillance system for hepatitis B was introduced and information on newly diagnosed cases of hepatitis B, by risk factor status, will be available at the end of 2006. Just under one-fifth of injecting drug users in treatment have ever been infected with hepatitis B and approximately



2% are chronic cases. Age, injecting practices and sexual practices are linked to hepatitis B status. The uptake and completion rates of hepatitis B vaccination among injecting drug users are much higher in the HSE South Western Area (56%) and in Drug Treatment Centre Board (86%) cohorts for the period 2001 to 2003 than those reported in prisoners or at general practice in Ireland between 1998 and 2001. This possibly indicates an increase in hepatitis B vaccine coverage in recent years. There are no published data on the coverage of hepatitis B vaccine outside the HSE Eastern Region. It is important to ensure that hepatitis B vaccine is administered as early as possible in a drug user's career; therefore, needle exchange and low-threshold methadone services require facilities to deliver this intervention on a daily basis.



## **6 Hepatitis C**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



## 6 Hepatitis C

### 6.1 Introduction

This section presents an overview of published research on hepatitis C associated with injecting drug use. The background, incidence, prevalence, risk factors, treatment and prevention are presented. With the exception of background and treatment, the review of issues is based substantially on the Irish literature.

### 6.2 Background

In the 1970s a new type of hepatitis was identified and classified as non-A non-B hepatitis. Hepatitis C virus was identified in 1988 and the first test to identify the virus was developed in 1991. This virus is a single-stranded RNA virus belonging to the Flaviviridae family. The incubation period for hepatitis C ranges between two weeks and six months. There is evidence that the virus causes liver disease and may affect other organs such as the skin, thyroid and kidneys. Among the general population, evidence available to date indicates that 20% to 25% of individuals infected with hepatitis C clear the virus spontaneously. There are six genotypes for hepatitis C; treatment outcomes are dependent on genotype and other factors.

The main route of transmission is parenteral (through infected blood and blood products and contaminated needles and syringes), although there is evidence of vertical transmission (in utero or during childbirth) in approximately 5% of infected women. There is evidence that individuals who received infected blood and blood products have been infected. For example, almost 100% of haemophilia patients were infected prior to blood donor screening for hepatitis C. Injecting drug users are a high-risk group for hepatitis C; in a small number of reported cases the infection was acquired through tattooing and needle-stick injuries. Sexual transmission occurs rarely and seems to be associated with HIV co-infection and to be more common in those with multiple sexual partners.

Keating and colleagues<sup>52</sup> estimated the proportion of hepatitis C antibody-positive individuals with each genotype in a cohort of injecting drug users, and then estimated the proportion that spontaneously cleared the virus, using a PCR test. The PCR test assesses whether the virus is still detectable in the blood and will show if a person has an ongoing infection. The study followed the progress of a sample of hepatitis C antibody-positive individuals attending five drug treatment centres in Dublin. None of this cohort had tested positive for hepatitis B or HIV. Of the 496 hepatitis C antibody-positive participants in the sample, 191 (38.5%) were shown to be HCV RNA negative when re-tested, indicating that they had spontaneously cleared the virus. A higher proportion of women (47.4%) than men (34.5%),  $p < 0.01$ , cleared the virus spontaneously. A higher proportion of those with a history of jaundice (12.0%) cleared the virus spontaneously than did those that reported no history of jaundice (7.9%),  $p < 0.01$ . Neither age nor duration of injecting drug use were associated with spontaneous hepatitis C virus clearance. The rate of spontaneous viral clearance was higher than previously reported. Of the 299 PCR-positive samples that had their genotype determined, genotype 1 and genotype 3 were the most common (Table 7).

**Table 7 Number of PCR-positive samples, by genotype, of selected hepatitis C antibody-positive injecting drug users attending five drug treatment centres in Dublin**

Genotype	Number (%) Total = 299
1	146 (48.8)
2	6 (2.0)
3	145 (48.5)
4	2 (0.7)
5	0 (0.0)
6	0 (0.0)

Source: Keating *et al.*<sup>52</sup>

### 6.3 Newly diagnosed hepatitis C cases

Hepatitis C occurs mainly in two populations in Ireland: cohorts of individuals who became infected through infected blood and blood products, and injecting drug users. Under the reporting regulations in force up to the end of 2003, hepatitis C could be notified as 'viral hepatitis, type unspecified'. It was not a notifiable disease in its own right and there was no national surveillance system to monitor the incidence of this infection among the population. Among the changes to infectious disease legislation introduced on 1 January 2004 was the inclusion of hepatitis C in the list of notifiable diseases.<sup>1</sup>

There were 1,154 cases of hepatitis C reported in 2004, compared to 85 cases of 'viral hepatitis, type unspecified' in 2003.<sup>40</sup> In 2004, 954 cases were notified by the HSE Eastern Region and 200 cases were notified by the HSE areas outside the Eastern Region. Each of the seven HSE areas outside the Eastern Region reported cases of hepatitis C, ranging from five in the HSE North Western Area to 45 in the HSE Southern Area. Three out of every five hepatitis C cases reported were male. Of the 1,132 cases for whom age and gender were known, 83% were aged between 20 and 44 years. Of the 14,390 persons diagnosed with hepatitis C viral antibodies by the end of 2002 in Scotland (which has similar patterns of injecting drug use to Ireland), 90% of those for whom at least one risk factor was known had injected drugs.<sup>53</sup>

Between 1992 and 1998, Smyth *et al.*<sup>13</sup> estimated the incidence of hepatitis C among 100 injecting drug users attending treatment in Dublin who had an initial negative test and a repeat test within nine months. The authors reported that the incidence of hepatitis C was 66 per 100 person years (95% CI, 51 to 84); this is higher than estimates reported among injecting drug users living in other countries (16 to 38 per 100 person years). Between 2001 and 2002, Grogan *et al.*<sup>11</sup> reported that the incidence of hepatitis C was 24.5 per 100 person years (95% CI, 12.2 to 43.8) among opiate users (including some non-injectors) in the HSE South Western Area; this is lower than that reported by Smyth *et al.* but comparisons are difficult as it is not easy to ascertain the proportion of non-injectors in Grogan's sample. According to

unpublished data from the National Drug Treatment Reporting System, 73% of treated opiate users living in the HSE South Western Area between 2001 and 2002 were injectors.

## 6.4 Prevalence

Blood donors and antenatal women, who are routinely tested for blood-borne viral infections, may be used as proxy groups for the general population.

There is no national prevalence estimate available for hepatitis C in the general population. The prevalence of hepatitis C among new blood donors living in Dublin is low, at 28 per 100,000 (0.03%) between 1996 and 2001 (E Lawlor, personal communication, 2003). The prevalence of HIV and hepatitis B among the antenatal population was three times that among new blood donors living in Dublin. There is no reason not to believe that a similar risk ratio between new blood donors and antenatal women exists for hepatitis C.

A number of studies carried out in the past 10 years have estimated the prevalence of hepatitis C among injecting drug users. Prevalence estimates among injecting drug users attending community-based drug services range from 52% to 84% (Table 8). Hepatitis C is endemic among injectors in prison; the prevalence of hepatitis C antibodies among injecting inmates and entrants was 81% and 72% respectively (Table 8).

In Ireland there are no published prevalence estimates of hepatitis C among injecting drug users attending needle exchange or among those not attending drug services. However, the prevalence of hepatitis C is over 2,000 times higher among injectors attending drug treatment services than among new blood donors living in Dublin, indicating the excess risk among injecting drug users. If it is assumed that the prevalence among the antenatal population is three times that among new blood donors living in Dublin, then the antenatal population prevalence would be 0.1%, which is about 700 times lower than that among injecting drug users.



**Table 8 Review of studies estimating the prevalence of hepatitis C among drug users in Ireland, 1995 to 2005**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
1995 Smyth <i>et al.</i> <sup>57</sup>	Old and new attendees registered at Trinity Court Drug Treatment Centre in Dublin, August 1992 to August 1993	272 injectors living in Dublin city	Overall prevalence of anti-HCV* was 84%.	Status ascertained from serum
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre, Dublin, between 1992 and 1997	735 injectors living in Dublin city	Overall prevalence of anti-HCV was 61.8%.	Status ascertained from serum
	1993	160	67.6%	
	1994	177	61.0%	
	1995	152	63.2%	
	1996	118	52.5%	
	1997	116	62.1%	

\*Antibodies to the hepatitis C virus develop three months, on average, after the initial infection, but may take up to six months. The presence of hepatitis C antibodies (anti-HCV) indicates either previous or current infection.

**Table 8 Review of studies estimating the prevalence of hepatitis C among drug users in Ireland, 1995 to 2005 (continued)**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
1999 Smith <i>et al.</i> <sup>55</sup>	Between 1992 and 1997, new attendees registered at Trinity Court Drug Treatment Centre in Dublin	353 injectors living in Dublin and injecting less than 25 months	Prevalence of anti-HCV was 52.1%.	Status ascertained from serum
2000 Cullen <i>et al.</i> <sup>19</sup>	Review of records of clients attending methadone substitution clinics in a general practice setting	Injectors and non-injectors (78) living in Dublin, Kildare and Wicklow 535 (of whom 372 had their hepatitis C status recorded)	Of those who had hepatitis C status recorded in their clinical notes, 72.6% had a documented hepatitis C positive status. The primary objective of this study was not to assess prevalence of hepatitis C.	Clinical records
2000 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors	81.3% tested positive for anti-HCV.	Status ascertained from oral fluid
2001 Fitzgerald <i>et al.</i> <sup>20</sup>	Review of records of clients attending five methadone clinics in Dublin	99, including injectors and non-injectors, living in Dublin City	Of those who had hepatitis C status recorded in their clinical notes, 79% had a documented anti-HCV positive status.	Status ascertained from laboratory reports or clinical notes

**Table 8 Review of studies estimating the prevalence of hepatitis C among drug users in Ireland, 1995 to 2005 (continued)**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population and sample size</b>	<b>Study findings</b>	<b>Method of ascertaining status</b>
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors	71.7% tested positive for anti-HCV.	Status ascertained from oral fluid
2004 O'Sullivan <sup>23</sup>	Cross-sectional survey	65 injector opiate users in treatment attending Drug Treatment Centre Board	72% tested positive for anti-HCV.	Status ascertained from serum
2005 Grogan <i>et al.</i> <sup>11</sup>	Retrospective review of methadone client's laboratory records to December 2001 in the south-western area of Dublin	316 opiate users in methadone treatment whose injecting status was not known	66% tested positive for anti-HCV.	Status ascertained from laboratory results

## 6.5 Risk factors

Healy *et al.*<sup>54</sup> examined risk factors for infection among 296 women who attended Irish antenatal clinics and tested positive for hepatitis C between 1994 and 1999. The authors reported that 82% were infected through injecting drug use, 8% through heterosexual contact and 7% via blood and blood products. Allwright *et al.*<sup>21</sup> and Long *et al.*<sup>22</sup> reported that injecting drug use was the most serious risk factor for hepatitis C in Irish prisoners. Allwright *et al.*<sup>21</sup> and Smyth *et al.*<sup>13</sup> reported that spending time in prison was associated with an increased risk of testing positive for hepatitis C antibodies (Table 9). Length of time injecting appears to be strongly associated with contracting the infection (Table 9). For example, among drug users attending Trinity Court Drug Treatment Centre the prevalence of hepatitis C was 52% among those injecting for less than 25 months, compared to 84% among those injecting for 25 months or more.<sup>18, 55</sup> Also, the prevalence of hepatitis C was 65% among prison inmates injecting for less than 36 months, compared to 85% among those injecting for 36 months or more.<sup>21</sup> Practices such as injecting frequency and sharing needles were also associated with testing positive for hepatitis C (Table 9). Smyth *et al.*<sup>56</sup> examined the contribution to infection with hepatitis C of unsafe injecting practices and the social context of injecting in Dublin. In relation to the social context, individuals who injected in the home of another injecting drug user were almost five times more likely to test positive for hepatitis C than those who injected in their own home or in another place. Those individuals who injected in the company of close friends and family members were around three times more likely to test positive for hepatitis C than those who injected with acquaintances.

**Table 9 Review of studies identifying risk factors for hepatitis C among injecting drug users in Ireland, 1995 to 2005**

<b>Year published and authors</b>	<b>Study design</b>	<b>Study population, sample size and statistical method</b>	<b>Factors associated with testing positive for hepatitis C</b>
1995 Smyth <i>et al.</i> <sup>57</sup>	Old and new attendees registered at Trinity Court Drug Treatment Centre in Dublin, August 1992 to August 1993	272 injectors living in Dublin Bivariate analysis	94% of female injectors tested positive for hepatitis C, compared to 80% of male injectors. 95% of those injecting for two years or more tested positive for hepatitis C, compared to 70% of those injecting for less than two years.
1998 Smyth <i>et al.</i> <sup>18</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	735 injectors living in Dublin Multivariate analysis	Increased time since first injecting was associated with testing positive for hepatitis C. Injectors who spent more than €83 on drugs per day were 70% more likely to test positive for hepatitis C than those who spent €45 or less each day.
1999 Smyth <i>et al.</i> <sup>55</sup>	New attendees registered at Trinity Court Drug Treatment Centre in Dublin between 1992 and 1997	353 injectors living in Dublin and injecting for a period of less than 25 months Bivariate analysis	Those who started injecting after January 1994 were 63% less likely to test positive for hepatitis C than those who started pre-1994. Injectors who had commenced injecting 13 months or more ago were over twice as likely to test positive for hepatitis C as those injecting for 12 months or less. Injectors who were aged under 21 were 46% less likely to test positive for hepatitis C than their older counterparts.

**Table 9 Review of studies identifying risk factors for hepatitis C among injecting drug users in Ireland, 1995 to 2005 (continued)**

Year published and authors	Study design	Study population, sample size and statistical method	Factors associated with testing positive for hepatitis C
2000 Allwright <i>et al.</i> <sup>21</sup>	Cross-sectional survey	Prison inmates, of whom 509 were injectors Multivariate analysis	<p>Injectors who had spent more than three of the ten years prior to the survey in prison were almost three times more likely to test positive for hepatitis C than those who had spent less than three months in prison.</p> <p>Those who reported injecting illicit drugs for three or more years were almost three times more likely to test positive for hepatitis C than those who had injected for a shorter period.</p> <p>Those who shared needles in prison were almost three times more likely to test positive for hepatitis C than those who did not.</p> <p>Those who had injected 20 or more times in the month prior to the survey were three times more likely to test positive for hepatitis C than those who had not.</p>
2001 Long <i>et al.</i> <sup>22</sup>	Cross-sectional survey	Prison entrants, of whom 173 were injectors Multivariate analysis	<p>Women injectors were over three times more likely than men to test positive for hepatitis C.</p> <p>Those who had shared needles in prison were over six times more likely to test positive for hepatitis C than those who had not.</p> <p>Those who had injected 20 or more times in the month prior to the survey were over six times more likely to test positive for hepatitis C than those who had not.</p>

**Table 9 Review of studies identifying risk factors for hepatitis C among injecting drug users in Ireland, 1995 to 2005 (continued)**

Year published and authors	Study design	Study population, sample size and statistical method	Factors associated with testing positive for hepatitis C
2003 Smyth <i>et al.</i> <sup>13</sup>	Retrospective cohort study of new attendees registered at Trinity Court Drug Treatment Centre, Dublin, between 1992 and 1998 who tested negative for hepatitis C	313 injectors who tested negative for hepatitis C on admission to treatment Bivariate analysis	Injectors who had been in prison prior to the first test for hepatitis C had a higher incidence of infection than those who had not been in prison. Injecting all opiates (rather than smoking or eating some or all) resulted in a higher incidence of hepatitis C.
2005 Smyth <i>et al.</i> <sup>56</sup>	Smyth <i>et al.</i> examined the contribution to infection with hepatitis C of unsafe injecting practices and the social context of injecting in Dublin. Of the 242 participants who completed the questionnaire, 159 had a test for hepatitis C.	159 injectors tested for hepatitis C Multivariate analysis	Those who had injected more than 1,000 times were almost nine times more likely to test positive for hepatitis C than those who had injected less than 100 times.  In relation to the social context, individuals who injected in the home of another injecting drug user were almost five times more likely to test positive for hepatitis C than those who injected in their own home or another place.  Those individuals who injected in the company of close friends and family members were around three times more likely to test positive for hepatitis C than those who injected with acquaintances.

## 6.6 Knowledge, beliefs and behaviours

Smyth *et al.*<sup>58</sup> investigated the extent of knowledge about hepatitis C among injecting drug users attending drug services and found that over three-quarters of the respondents knew the main routes for transmission (i.e. sharing injecting equipment, sex, blood transfusion and vertical). The proportion responding correctly was lower when asked about activities with no recognised risk: only 44% recognised all three 'safe' activities (i.e. injecting without sharing, smoking rather than injecting, and kissing). Over one-third incorrectly believed that one could contract hepatitis C virus even while injecting safely. This misinformation is a major barrier to the observation of safe injecting practices by drug users.

Dillon<sup>59</sup> examined drug use among Irish prisoners; respondents reported a general lack of knowledge about HIV and hepatitis. Long *et al.*<sup>60</sup> reported that injector-prisoners had satisfactory knowledge about transmission, while non-injectors revealed a number of misconceptions (such as transmission via toilets, cups or glasses). In the study by Long and colleagues<sup>60</sup> a number of respondents reported that they sought information on blood-borne viruses from leaflets and books, which is consistent with Klee's<sup>61</sup> identification of sources of information about HIV accessed by injecting drug users in the late eighties. Klee also noted that injecting drug users were interested in information about their habits, and that this information provided them with a sense of control.

Long *et al.*<sup>62</sup> explored how prisoners (both injectors and non-injectors) dealt with the possibility of either contracting or testing positive for hepatitis C. Two dominant themes emerged: denial and fear. Injector-respondents dealt with the possibility by living in the moment; distancing its effects in time; generalising the condition to all injectors; and comparing its consequences to those of HIV. This process allowed them to continue injecting without acknowledging the risk to themselves. Most injector-respondents believed that hepatitis C was common among those who injected drugs and that, to date, its consequences had not been serious. The fears expressed by injectors and non-injectors were in the main well



founded. Fear of contracting a blood-borne virus, or the actual receipt of a diagnosis of viral infection, deterred a number of heroin users from starting or continuing to inject heroin. Similar numbers of injector and non-injector respondents reported that they feared contracting blood-borne viruses while in prison.

Cullen *et al.*<sup>63</sup> examined the experience of heroin users attending general practice with respect to risk practices for hepatitis C. The study questionnaire had a mix of closed and open questions. At the time of the study, 38 former or current heroin users were registered with the practice. Of these, 25 (66%) agreed to be interviewed. Those interviewed were more likely to be female and older than the other heroin users attending the practice. At the time of the study, 23 of the 25 participants were receiving methadone maintenance (14 at the practice and nine at specialised drug treatment centres). Twenty-two participants said that they had tested positive for hepatitis C, of whom 15 had consumed alcohol in the week prior to the study. Nine had consumed more than the recommended amount for their gender. The respondents identified ‘not sharing needles’, ‘adopting safe sexual practices’ and ‘not using drugs’ as ways to avoid hepatitis C transmission. Respondents who reduced their alcohol intake did so because they were concerned about their health, while those who increased their alcohol intake did so to substitute for heroin.

## 6.7 Burden of disease

Brennan *et al.*<sup>64</sup> ascertained that between 1999 and 2001 the Hospital In-Patient Enquiry (HIPE) scheme recorded 6,085 discharges from acute hospitals with hepatitis C as a primary or secondary diagnosis. This scheme is an event-based register so cases may be represented more than once. Of the 6,085 hepatitis C cases:

- 18% had hepatitis C as a primary diagnosis
- 57% had a diagnosis of chronic hepatitis C

- 21% had a diagnosis of problem opiate use
- 7% had a diagnosis of hepatitis B
- 24% had a diagnosis of HIV/AIDS
- 11% had a diagnosis of chronic liver disease or sequelae
- 0.4% had a diagnosis of liver cancer.

These data suggest the existence of a combination of blood-borne viral infections in some individuals, and indicate the damage that hepatitis C can do to the liver. It is important to note that injecting drug user status was not systematically recorded for all of these cases.

Kavanagh *et al.*<sup>65</sup> investigated the outcome of end-stage liver disease in injecting drug users infected with hepatitis C in Ireland by means of a cross-sectional survey of attendees at a HSE East Coast Area drug treatment clinic. Of 94 patients studied, 63 were male, 70 were hepatitis C antibody positive and 39 were PCR positive. Twenty-six had genotype 1 and eleven had genotype 2 or genotype 3. Most displayed factors associated with a poor prognosis: 72% were male, 83% were problem drinkers and 87% had abnormal liver blood tests. Using published data, the authors extrapolated that there were over 1,214 cases of cirrhosis nationally as a result of hepatitis C associated with injecting drug use, leading to approximately 35, 60 and 50 cases of hepatocellular carcinoma, hepatic decompensation and liver-related death respectively per annum. A high prevalence of hepatitis C infection in injecting drug users, compounded by a high frequency of poor prognostic co-factors, means that significant morbidity is experienced by this group.

## 6.8 Mortality

It is difficult to ascertain the annual number of deaths in Ireland as a result of hepatitis C because the ICD 9 coding scheme does not have a specific

code for hepatitis C cases. Brennan and colleagues<sup>64</sup> requested the Central Statistics Office to select cases where the primary cause of death was hepatitis ICD 9, category 070.4, 070.5 or 070.6. This allowed the authors to calculate the number of deaths with a primary diagnosis of hepatitis C using the diagnoses hepatitis ‘other specified’ or ‘unspecified’ as proxy diagnoses. Using these proxy codes, the authors estimated that 50 persons died as a result of hepatitis C between 1995 and 2002. Up to 2001, the numbers for each year fluctuated between three and seven cases, with a rise to 15 cases in 2003. The main risk factors for hepatitis C cannot be identified accurately on the basis of mortality data held by the Central Statistics Office; therefore, it is not possible to know how many of these deaths can be attributed to injecting drug use. This suggests the need for a special register to record the contribution of hepatitis C to premature death among injecting drug users.

## 6.9 Treatment and prevention

The hepatitis C virus has six major genotypes and several closely related sub-types. This has made it difficult to develop both effective treatment and vaccination. Genotype 1 and genotype 3 are the most common in Ireland.<sup>66, 52</sup> Treatment is more successful for genotype 3 than for genotype 1. Hepatitis C is a chronic illness that often has no overt symptoms, but this population is likely to experience significant morbidity in the future.

Manns *et al.*<sup>67</sup> conducted a randomised control trial of treatment options for chronic hepatitis C. The authors reported that, compared with standard interferon alpha and ribavirin, peginterferon alpha-2b and ribavirin achieved a higher sustained viral response rate (undetectable hepatitis C virus RNA in serum) at 24 weeks following treatment. The sustained viral response rate was significantly higher in the higher-dose peginterferon group (274/511, 54%) than in either the lower-dose peginterferon group (244/514, 47%) or the interferon group (235/505, 47%). Among patients with HCV genotype 1 infection, the corresponding sustained viral response rates were 42% (145/348), 34% (118/349), and 33% (114/343). The rate for patients with genotype 2 and genotype 3 infections was about 80%

for all treatment groups. This combination therapy is recommended as the most appropriate treatment for hepatitis C and is the current treatment regime in Ireland. The treatment offered is peginterferon by subcutaneous injection once weekly and ribavirin taken daily by mouth.

There are seven specialist hepatology centres for adults and one for children in Ireland:

- St James's Hospital (three consultants)
- St Vincent's Hospital (two consultants)
- Mater Misericordiae Hospital (one consultant)
- Beaumont Hospital (one consultant)
- University College Hospital, Galway (one consultant)
- University College Hospital, Cork (one consultant)
- St Luke's Hospital Kilkenny (one consultant)
- Our Lady's Hospital for Sick Children (one consultant).

There are a number of nurse specialists and counsellors supporting patients at these services. There is a liaison medical officer for hepatitis C based at the Drug Treatment Centre Board at Trinity Court in Dublin.

Dr Keating of the Drug Treatment Centre Board updated the booklet *Hepatitis C: A Guide for Drug Users and their Families* in 2003.<sup>68</sup> The information in this booklet is essential for drug users, particularly for injecting drug users at risk of or diagnosed with hepatitis C. It is also a useful tool for doctors, nurses and counsellors who educate drug users about hepatitis C. The booklet is laid out in a question and answer format that addresses issues commonly raised by patients and their

families. It provides updated information on the condition itself and on its treatment. The booklet also provides transparent information on the criteria for entering treatment and the side effects of treatment. It is generally recommended that treatment be offered to those who are both drug and alcohol free for six months, or stable on methadone and alcohol free for the same duration. The individual's living status is also a consideration and, ideally, a prospective patient should be living in stable accommodation. The author clearly states that therapy is not offered to those actively abusing drugs or alcohol.

The routine assessment procedures for hepatitis C are as follows: initially, the individual has a blood test to determine whether s/he has antibodies to the hepatitis C virus. If such antibodies are detected, the individual will have a PCR (polymerase chain reaction) test to determine whether the virus is still detectable in the blood; a positive PCR test indicates active chronic hepatitis C. The genotype will also be determined. Liver enzymes in blood will be measured; high enzyme levels indicate damage to the liver, though low levels do not necessarily indicate there is no liver damage. If PCR-positive, the hepatologist might recommend an ultrasound of the liver or a liver biopsy, or both.<sup>68</sup>

In 1996 and 1997, Smyth *et al.*<sup>69</sup> examined uptake of hepatitis C screening and assessment among injecting drug users in the eastern region of Ireland. They found that of the 119 clients offered a test for hepatitis C, only 48 (40%) proceeded to have such a test. Of the 48 who had the test, 20 tested positive for hepatitis C, of whom only five were seen by a consultant hepatologist. Of the 119 clients who started the hepatitis screening and assessment process, only 21 completed it. This indicated poor uptake of hepatitis C screening and follow-up. McMahon *et al.*<sup>70</sup> followed up 43 of 98 injecting drug users who dropped out of treatment (for problem drug use) to determine if they had subsequently completed an assessment of their hepatitis C status elsewhere. The authors reported that only seven (16%) had completed the assessment process at another service over a 26-month period. Overall, the findings of these studies demonstrate

that among injecting drug users there is very low uptake of hepatitis C screening and assessment. In a more recent study, Grogan *et al.*<sup>11</sup> estimated that 88% of clients attending drug treatment services in the HSE South Western Area had been tested for hepatitis C antibodies by December 2001. This study did not estimate the uptake of assessment opportunities by those testing positive for antibodies to the hepatitis C virus.

Both Dillon<sup>59</sup> and Long *et al.*<sup>60</sup> reported low access to treatment for hepatitis C in Irish prisons.

In 2002, Cullen *et al.*<sup>50</sup> examined uptake of care (including treatment) for hepatitis C by injecting drug users living in the HSE Eastern Region. Each injector had tested positive for hepatitis C and was receiving methadone therapy from a general practitioner. The authors reported that, of the 104 clients who were hepatitis C positive, 43% had discussed referral to a consultant hepatologist with their general practitioner, 32% had the referral process initiated by their general practitioner, 25% attended the specialist clinic, 13% had a liver biopsy and 3% commenced treatment for hepatitis C.

Cullen *et al.*<sup>63</sup> examined the experience of heroin users attending general practice with respect to investigation of and treatment for hepatitis C through in-depth interviews. Twenty-two participants said that they had tested positive for hepatitis C. Eight respondents reported neither drinking excessively nor using heroin in the previous six months and were therefore suitable for investigation. Only four of the eight suitable clients were referred for further investigations and one had commenced treatment. Some respondents had a negative perception of liver biopsy, though those who had undergone this investigation reported that the procedure was not as difficult to tolerate as expected. Many respondents had negative perceptions of antiviral treatment. The experience of care by medical and nursing personnel at secondary treatment services was mixed, with some having very positive experiences while others reported that the service providers were impersonal and withheld information. The authors concluded that there were a number of barriers to hepatitis C treatment

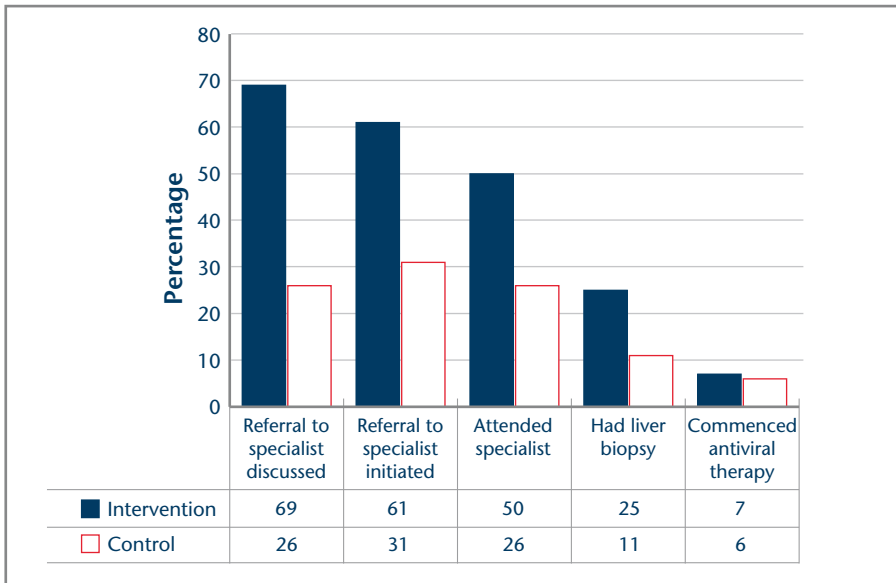
for injecting drug users and that these needed to be addressed so as to encourage uptake of treatment.

Cullen led the Dublin Area Hepatitis C Initiative Group who developed consensus guidelines on the management of hepatitis C in general practices in the Eastern Region.<sup>71</sup> The guidelines were produced in five stages: identification of key stakeholders; development of evidence-based draft guidelines; discussion of content; reaching consensus using the Delphi method; and review of guidelines by a sample of general practitioners. The guidelines are presented in a logical format, by key aspects of care, and include:

- General aspects of care, covering the means of transmission and actions to protect the client and others
- Prevention of, and care for clients with, other blood-borne or other hepatotoxic viral infections, including hepatitis A and B vaccination
- Screening for and presentation of hepatitis C test results, which include pre-test counselling, post-test counselling and explaining hepatitis results
- Initial management of patients infected with hepatitis C, which includes information on means of transmission, alcohol and drug use, nutrition, vaccination and weight reduction (where necessary)
- Subsequent management of patients with hepatitis C, which includes referral to a hepatology service, criteria for treatment and information required by the hepatology service.

The guidelines introduced flexibility around the period of time hepatitis C positive opiate users are required to be stable on methadone or opiate free, and provided clear referral processes and procedures. The guidelines were implemented in selected general practices with the assistance of a hepatitis C nurse specialist over a six-month period. The researchers randomly

allocated clients who had tested positive for hepatitis C to either an intervention or a control group. For the purposes of the results presented in this document, the numbers in the intervention and control groups were 72 and 35 respectively.<sup>50</sup> At the end of the six-month intervention period, the authors reported that increased numbers of clients had had referral to a specialist discussed, had had the referral process initiated and had attended the specialist clinic (Figure 4). Among the intervention group, only 25% had had a liver biopsy and 7% had commenced treatment for hepatitis C; these low uptake rates may be a reflection of the short time period over which the data were collected. The follow-up phase indicated that injecting drug users were interested in assessment for hepatitis C provided that clinical staff at general practice level actively supported them in seeking assessment.



**Figure 4 Comparison between an intervention and a control population in terms of selected indicators relating to the management of hepatitis C in a general practice setting**

Adapted from Cullen *et al.*<sup>50</sup>



In Ireland, the only published data on compliance with treatment for hepatitis C is a small on-site hepatitis C treatment pilot study that was commenced at the Drug Treatment Centre Board, in liaison with the infectious diseases unit in St James's Hospital. On 10 December 2003 at the Drug Treatment Centre Board, Dr Keating<sup>72</sup> presented the results of this pilot study that examined the potential for 'treating hepatitis C at the same location at which clients receive their methadone with a view to retaining the patients in treatment'. Dr Keating emphasised that any centre providing hepatitis C treatment required referral pathways to specialist hepatology and psychiatric care. Access to psychiatric care is required because many of those with hepatitis C may have a history of psychiatric illness, and because depression is a side effect of interferon (one of the two drugs used to treat hepatitis C). The specialist hepatology care included the services of a nurse-specialist and a medical officer. In May 2003, nine patients commenced treatment and, at the time of presenting, only one had defaulted. Dr Keating concluded that providing hepatitis C treatment at drug treatment centres was ideal as it improved patient compliance and permitted a rapid response to incidences of illicit drug use and psychiatric illness. Delivery of hepatitis C treatment alongside methadone treatment was also more convenient for clients. He also said that increased treatment costs at the drug treatment centres could be offset by reduced costs at hospital level. It should be noted that the study methods would have been strengthened by the inclusion of larger numbers of subjects and the recruitment of a comparison group receiving treatment through a specialist centre. The complete presentation can be accessed on line ([www.addictionireland.ie](http://www.addictionireland.ie)).

## 6.10 Policy and strategy

At present there is no policy or strategy that provides guidance on the management of hepatitis C among injecting drug users.

The findings of a consultation event held in June 2004 to assess the health and social care requirements for those with or at risk of acquiring hepatitis C were released in December 2004.<sup>73</sup> Over 70 people attended the event,

among them service planners, health and social care professionals and service users. The method used in the consultative process was ‘open space technology’. ‘Open space’ is a qualitative method used to enable a large and diverse group of people to explore complicated issues in a limited time by presenting participants with central themes. Organic and self-organising, the participants set a detailed agenda and subsequently facilitate qualitative discussion at impromptu workshops. The contents of the discussions are simultaneously documented. The central themes, presented in the invitation to this event, were: ‘What are the significant issues in formulating a region-wide policy on hepatitis C?’ and ‘What are the optimum approaches to these issues?’

With respect to the first of the central themes, participants identified 16 significant issues on the morning of the event and a workshop was organised for each issue. A small group discussion took place on each topic and a workshop facilitator recorded the issues raised during the discussion. These data were subsequently analysed using qualitative methods.

Four common themes emerged from the 16 workshops:

- **Health promotion**

There is a need to develop a set of consistent messages on modes of transmission, pathways to treatment and success of treatment, with such messages delivered through a variety of media.

- **Role of the media**

There is a need to ensure that the mass media provides accurate information to the general public and high-risk groups. It was suggested that the media use an approach that allays fears and reduces the stigma associated with the infection.

- **Service provision**

It was noted that access to and availability of services to prevent or treat hepatitis C should not be associated with mode of transmission. There is a need for equivalence of care between several

groups; for example, between those who acquired their infection through blood products and injecting drug users; between those who live in Dublin and those living outside Dublin; and between those in prison and those in the community. The information about, criteria for and pathways to treatment should be transparent and easily accessed. Expansion of nursing and psychology services to support those testing positive for hepatitis C is required.

- **Research, policy and planning**

In general, the participants emphasised the importance of an extended surveillance system to ascertain the extent of the problem but stressed that such a system must protect the identity of the individual. Participants also wanted research to develop best-practice protocols (including medical and complementary therapies) to manage this infection.

In the afternoon session, the process was repeated to explore optimum approaches to the themes identified in the morning. Eight actions were identified and a workshop was organised to deal with each action. A number of common themes emerged from the second set of workshops:

- **Peer support and prevention**

The importance of using peer groups in planning and developing prevention, harm reduction and treatment interventions was stressed. Peer-group insight and experience were considered very useful in ensuring that new approaches would be appropriate. It was also suggested that indicators be developed to monitor and evaluate prevention and harm reduction interventions.

- **Education and training**

The actions suggested were in line with the health promotion actions identified in the morning session.

- **Liaison, key workers, co-ordination and collaboration**  
A number of suggestions were made, including appointment of key workers (such as liaison nurses); development of transparent communication policies and procedures; improvement in access to services through multi-agency collaboration; and introduction of a monitoring group to ensure client-centred services.
- **Accessing services**  
Developments to make services more accessible and user-friendly were identified as a priority.
- **Psychological and complementary therapies**  
Respondents thought that psychological support and complementary therapies, in conjunction with medication, would be very beneficial to a client's quality of life.

The event represented an ongoing collaboration between two groups – the Hepatitis C Scientific Advisory Subgroup of the Blood Borne Virus Forum (a group of health and social care professionals with an interest in hepatitis C and related issues) and the HSE Eastern Region. At the launch of this report in December 2004, the ERHA area (now the HSE Eastern Region) presented its response to the findings and its plans for the future. The findings of the open space event are being used to help inform the draft HSE Eastern Region's hepatitis C strategy. It was indicated that a group convened to formulate a regional strategy on hepatitis C intends to audit the health services available to those with hepatitis C and to provide information on service availability and identify models of best practice both nationally and internationally. This strategy will be published in 2006.

As mentioned in the HIV section of this Overview, the Irish Prison Service published its drugs policy and strategy in May 2006.<sup>36</sup> The drug treatment approaches proposed in the strategy document will be adapted for prisoners with special needs, including drug users with mental health problems or hepatitis C.

## 6.11 Conclusions

Among the changes to infectious disease legislation introduced on 1 January 2004 was the inclusion of hepatitis C in the list of notifiable diseases. All cases of hepatitis C in Ireland are notified to the directors of public health in the Health Service Executive (HSE). Newly diagnosed cases of hepatitis C are not reported by risk factor status. Around 70% of injecting drug users attending drug treatment tested positive for antibodies to the hepatitis C virus. Injecting practices and prison history are associated with hepatitis C status. There are seven specialist hepatology centres for adults and one for children in Ireland. A number of studies demonstrated low rates of access to and uptake of treatment for hepatitis C among injecting drug users. Two small studies demonstrated that a decentralised approach to initial assessment at general practice level and hepatitis C treatment at drug treatment centres achieved higher uptake and compliance rates than the current centralised approach. The publication of the HSE Eastern Region's hepatitis C strategy is awaited.



## **7 Blood-borne viral co-infection**

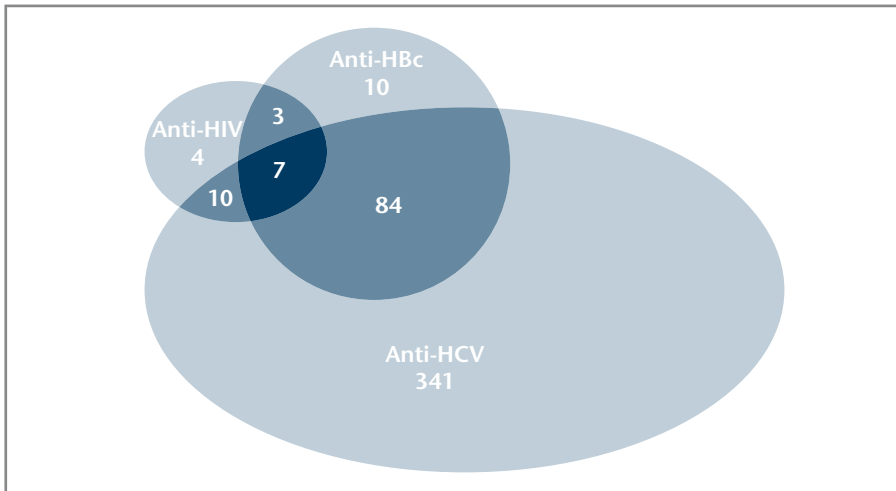
**Blood-borne viral infections among injecting  
drug users in Ireland, 1995 to 2005**





## 7 Blood-borne viral co-infection

The findings from international literature<sup>74</sup> indicate that infection with hepatitis C among HIV-positive persons increases the risk of progression to AIDS and death. Hepatitis C positive persons co-infected with HIV experience acceleration of their liver disease (on average at 15 years following transmission compared to 30 years in mono-infected persons) and earlier hepatocellular carcinoma (on average at 18 years following transmission). A major cause of death among HIV and hepatitis C co-infected persons is end-stage liver disease. In Ireland, little is published on the prevalence of co-infection with HIV and/or hepatitis B and/or hepatitis C. Two national prison surveys in the late nineties presented data on co-infection among prisoners. Prevalence was determined using antibody assays of oral fluid. Figure 5 shows the inter-relationship between the three infections for participants in the inmates survey: 38.5% (459/1193)



**Figure 5** Number of prisoners who tested positive for anti-HBc, anti-HCV and anti-HIV and the overlap between infections in a prison inmates survey, 1998

Adapted from Allwright *et al.*<sup>31</sup>

of prisoners tested positive for antibodies to one or more virus. Almost 9% (104/1193) tested positive for more than one virus. Most of those who tested positive for anti-HBc or anti-HIV also had antibodies to one or more of the other two viruses (94/104, 90.4%, and 20/24, 83.3%, respectively), while 22.9% (101/441) of those testing positive for anti-HCV had an additional infection.

As mentioned earlier, Brennan *et al.*<sup>64</sup> ascertained that there were 6,085 discharges from acute hospitals with hepatitis C as a primary or secondary diagnosis recorded by the Hospital In-Patient Enquiry scheme between 1999 and 2001. This scheme is an event-based register so cases may be represented more than once. Of the 6,085 cases:

- 7% also had a diagnosis of hepatitis B recorded;
- 24% also had a diagnosis of HIV/AIDS recorded.

These data suggest the existence of co-infection with blood-borne viruses. It is important to note injecting drug user status was not systematically recorded for all of these cases.

The drugs used to manage HIV may lead to increased hepatotoxicity in hepatitis C positive persons.<sup>74</sup> According to an international working group, these patients need to be managed by a team with expertise in infectious disease and hepatology. Both infections require treatment, but the approach will differ depending on the patient factors, such as age, body mass index, viral load, genotype, level of fibrosis and CD4 cell count. According to the international literature, barriers to treatment include active polysubstance or alcohol use. This is because active substance users demonstrate poorer compliance with treatment and higher discontinuation rates. Treatment for HIV and hepatitis C co-infection is available at St James's Hospital, Beaumont Hospital, Mater Misericordiae Hospital and University College Hospital, Cork.

## **8 Conclusion**

### **Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**



## 8 Conclusion

Hepatitis C is endemic among injecting drug users in Ireland and its incidence is higher than in populations of injecting drug users living in other countries, indicating that current harm reduction strategies are not effective in containing hepatitis C. It is the most common blood-borne infectious disease among injecting drug users in Ireland. The number of newly diagnosed cases of HIV among injecting drug users increased in 1999 and remained at a higher level since, indicating an increase in unsafe injecting practices that requires investigation. Among injectors, the prevalence of hepatitis B has remained relatively stable, possibly due to access to an effective vaccine. Access to and uptake of treatment for HIV and hepatitis C are less than desired, although small studies have shown that specific interventions can prove effective. This is an area that requires investment. The limited data available indicate that a number of injecting drug users are infected with more than one blood-borne virus. It has also been suggested that alcohol consumption among older opiate users has increased and this requires investigation. Alcohol consumption and dual infection are two factors that decrease survival rates among hepatitis C infected injecting drug users.

The data presented in this Overview indicate that there is a need for:

- Data on newly diagnosed cases of hepatitis C by risk factor status.
- A register to quantify the incidence and prevalence of hepatitis C for all heroin and cocaine users, including those who are in harm reduction and treatment services. The register should also permit the assessment of main risk factors (including drug-administration routes and prison exposure), treatment uptake and outcomes.
- Strategies to increase uptake of and compliance with HIV and hepatitis C therapy in both prison and community settings, and these need to be monitored.

- The medical consequences of hepatitis C and the interventions required to deal with this infection among injecting drug users to be estimated.
- Further improvement in the coverage of hepatitis B vaccination.
- A system to monitor the national hepatitis B vaccine uptake to estimate coverage among prisoners, injecting drug users and sex workers.
- The effectiveness of needle exchange, opiate detoxification and opiate maintenance programmes in stabilising and reducing the incidence of hepatitis C to be quantified.

## References

**Blood-borne viral infections among injecting drug users in Ireland, 1995 to 2005**





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