

**GROUPS AT RISK AND  
EXTENT OF INFECTION IN  
THESE GROUPS**

Since the discovery of Hepatitis C virus and development of a diagnostic assay to detect antibodies against it, the major pathways of transmission have been reasonably well defined. Needle and equipment sharing among injecting drug users and transfusion of blood products before the introduction of screening for Hepatitis C have accounted for most infections in developed countries. Other modes of parenteral transmission (non-sterile medical and dental equipment, needlestick exposure in the healthcare setting, and skin penetration practices such as tattooing or acupuncture) and mother-to-child transmission occur, but their population impact has not been reliably estimated. Sexual and household contact have been the subject of conflicting reports as to their likelihood of transmission of the virus (Dore, Kaldor and McCaughan, 1997:333).

The Hepatitis C Virus Projections Working Group has estimated that, of all infections, 80% were due to injecting drugs, 7% due to receipt of infected blood and 13% due to other transmission routes. Of incidence HCV infections in 1997 the Working Group estimated that 91% were due to injecting drugs, 0% to receipt of infected blood and 9% due to other reasons (Hepatitis C Virus Projections Working Group, 1998:8). The following discussion reviews these “at risk” population groups and the extent of Hepatitis C amongst each group.

### **3.1 INJECTING DRUG USERS**

Injecting drug use is the most commonly identified risk factor for Hepatitis C infection in Australia. It was initially thought that transmission of the Hepatitis C virus occurred with reusing or sharing needles and syringes. However, it is now generally accepted that transmissions can occur without actually sharing needles and syringes - any equipment used in the injecting process may be contaminated with minute traces of infected blood including spoons, filters, tourniquets and alcohol swabs. The situation where this is most likely to occur is when two or more people inject together. Wodak spoke on this form of transmission during the course of his evidence. He referred to,

*a growing suspicion that there is more to the transmission of Hepatitis C than blood-to-blood transmission in the conventional sense. . . We now think that in the case of Hepatitis C often the transmission involves blood which is not apparent - microscopic dots of blood which cannot be seen. Evidence to support this is suggestive rather than conclusive and it involves videos of drug injectors who are injecting according to practices that we think satisfy the need to keep HIV under control (Wodak evidence, 2 October 1997).*

Wodak cited the following example taken from these videos: someone compressing a colleague’s vein with their finger or thumb and after the colleague has successfully injected, commencing work on their own veins without washing their hands. Wodak observed that such practices are not a problem in terms of HIV transmission, but they are “more than enough” to transmit the Hepatitis C virus (Wodak evidence, 2 October 1997).

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The risk of Hepatitis C infection from injecting drug use begins in the first few years of an injecting career. Crofts, Louie, Rosenthal and Jolley (1996:1188) go so far as to suggest that the risk begins with the very first injection. The Royal College of Nursing, Australia's submission noted that the group at "most" risk of acquiring Hepatitis C infection are young people who are considering injecting drug use.

Because of this risk to new injecting drug users and because of continued recruitment to injecting, Crofts *et al* (1996:1188) suggest that the HCV epidemic amongst injecting drug users will not "mature out".

The strongest single predictor of risk among users is duration of injecting (MacDonald, Crofts and Kaldor, 1996:139). Advancing age is also associated with higher risk of HCV seropositivity but largely through its association with duration of injecting (NHMRC, 1997:5). Crofts *et al*'s 1993 study documents the increase risk of HCV with duration of injecting and age (see Table Seven).

**TABLE SEVEN**  
**PERCENTAGE OF INJECTING DRUG USERS SEROPOSITIVE FOR HCV**

DURATION OF INJECTING YEARS	PERCENTAGE OF INJECTING DRUG USERS					
	MEN	< 25 YEARS	25-29 YEARS	30-34 YEARS	35+ YEARS	TOTAL
0 - 4		37%	25%	67%	0	37%
5 - 9		67%	63%	67%	100%	67%
10 - 14		-	100%	93%	100%	90%
15+		-	100%	100%	90%	93%
<b>Total</b>		<b>46%</b>	<b>64%</b>	<b>88%</b>	<b>90%</b>	<b>70%</b>
DURATION OF INJECTING YEARS	WOMEN	< 25 YEARS	25-29 YEARS	30-34 YEARS	35+ YEARS	TOTAL
	1 - 4		35%	60%	0	100%
5 - 9		75%	70%	100%	100%	77%
10 - 14		-	100%	83%	67%	90%
15+		-	100%	70%	100%	83%
<b>Total</b>		<b>46%</b>	<b>82%</b>	<b>73%</b>	<b>93%</b>	<b>65%</b>
<b>TOTAL</b>		<b>46%</b>	<b>71%</b>	<b>83%</b>	<b>91%</b>	<b>68%</b>

Source: Crofts and Hopper *et al*, 1993:238

Other factors associated with injecting drug use that have been shown to be associated with high HCV risk include opiate use (as opposed to stimulant use), prison history, and heterosexual orientation, but not a history of sex work (MacDonald, Crofts and Kaldor, 1996:139).

Established cases of Hepatitis C that are attributed to injecting drug use often refer to practices that occurred decades ago. As Wodak informed the Committee:

*I commonly see patients in their late forties and early fifties who are now well-established in life and prosperous, working in the private sector, with family responsibilities and in every way they are conventional citizens. With a little bit of probing it emerges that there was a temporary period of three months adolescent rebellion thirty years ago when they lived in Kings Cross and injected drugs. Now they have presented with cirrhosis and they are Hepatitis C positive and there is no other cause for Hepatitis C (Wodak evidence, 2 October 1997).*

Wodak and Crofts put it a little more colourfully:

*many a temporary injecting drug user of yesteryear has now metamorphosed into a middle-aged yuppie with liver disease of insidious onset (Wodak and Crofts, 1996:181),*

with the result that the connection of these cases with injecting drug use and needle sharing is “easily overlooked” (Wodak and Crofts, 1996:181).

These observations were reflected in submissions received by the Committee from HCV+ people who, at some time in their past, injected drugs:

*I experimented with IV drugs a couple of times nearly 25 years ago like many of my generation in the sixties and early seventies. Drugs didn't change my life I'm pleased to say, but I'm afraid Hepatitis C has. There's the possibility that I'll die prematurely in the next few years (Submission 8).*

### **3.1.1 PREVALENCE OF HEPATITIS C AMONGST INJECTING DRUG USERS**

Cross-sectional surveys and cohort studies among injecting drug users in Europe have found seroprevalances of HCV of 60 - 80% (Wodak and Crofts, 1996:181). HCV rates amongst injecting drug users in the United States tend to be lower. Wodak suggested to the Committee that this could be due to the “very different moral and legislative climate” in the United States with people less prepared to identify that they are, or in the past have been, injecting drug users (Wodak evidence, 2 October 1997).

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In Australia, estimates of Hepatitis C prevalence among injecting drug users also vary. MacDonald, Crofts and Kaldor for example cite a range of 50-90 percent (1996:139) while MacDonald and Kaldor cite 60-80 percent (undated:26). The NHMRC reported results of studies ranging from 30% to 85% (NHMRC, 1997:3). Farrell considers prevalence amongst injecting drug users to be “alarmingly high”:

*Seventy to ninety percent of actively injecting drug users are infected with Hepatitis C. However for every person currently injecting there may well be three or four others who have experimented with drugs at some time earlier in their lives (cited in Schering-Plough submission).*

In giving evidence before the Committee, Dr Wodak claimed that two-thirds of Australian injecting drug users were already infected with Hepatitis C before 1971 (Wodak evidence, 2 October 1997). In his estimation, between 80 and 90 per cent of newly diagnosed Hepatitis C cases and those with established Hepatitis C are injecting drug users (Wodak evidence, 2 October 1997).

Prevalence results from the Victorian Injecting Drug Users Cohort Study (VICS) study are reproduced in Table Eight. As the table shows, approximately two-thirds of subjects were found to have been infected with HCV. Prevalence did vary over time but there was no discernible (ie statistically significant) trend (Crofts and Aitken, 1997:18).

**TABLE EIGHT**  
**PREVALENCE OF HEPATITIS C IN A COHORT OF VICTORIAN INJECTING DRUG USERS**  
**1990-1995**

	POSITIVE AT FIRST TEST		ANNUAL PREVALENCE (%)					
	Number	Prevalence (%)	1990	1991	1992	1993	1994	1995
HCV	321	62.4	81.0	70.4	72.9	67.7	71.1	69.6

Source: Crofts and Aitken, 1997:18

HCV seroprevalence rates amongst people attending needle and syringe exchanges are available from the National Centre in HIV Epidemiology and Clinical Research. Data for 1995 and 1996 are recorded in Table Nine.

**TABLE NINE**  
**HCV SEROPREVALENCE AMONG PEOPLE ATTENDING NEEDLE AND SYRINGE PROGRAMS**  
**1995 AND 1996**

STATE	NO OF IDUs SEEN		NO OF HCV+ %	
	1995	1996	1995	1996
ACT	74	139	61	74
New South Wales	1,029	1,026	85	83
Queensland	555	710	40	46
Victoria	467	422	53	70
Other	248	395	58	60
<b>TOTAL</b>	<b>2,373</b>	<b>2,692</b>	<b>63</b>	<b>66</b>

Source: National Centre in HIV Epidemiology and Clinical Research, 1997:54

These data show the greatest increases in rates of HCV seroprevalence to come from the ACT and Victoria. The data source does not offer any suggestions for these increases, nor does it explain the 2% decrease in NSW statistics.

The prevalence of Hepatitis C amongst injecting drug users is so high that Crofts suggests that:

*by the time injecting drug users have been injecting for several years, their chances of having been exposed to HCV approach 100% (Crofts, 1994:235).*

Kaldor supported the results of Crofts' study. As he stated in evidence before the Committee:

*prevalence increases with the duration of injecting. With those who have been injecting for about seven to eight years, the prevalence approaches 80 per cent . . . Even people who have been injecting for three years or less the prevalence is of the order of 25 per cent. There is a steady and clear increase according to how long one has apparently been injecting according to the self-reporting injecting status. The two main conclusions . . . are that, first, people who have been injecting in the last three or four years, all have Hepatitis C. Second, of those who started injecting in the last three or four years, about 25 per cent already have Hepatitis C which is consistent with the high incidence (Kaldor evidence, 3 October 1997).*

Loxley's study provides similar findings. The 1994 Australian Study of HIV and Injecting Drug Use (ASHIDU), which is the largest Australian study of Hepatitis C in injecting drug users with 872 respondents equally distributed across Adelaide, Melbourne, Perth and Sydney, found that 15% of respondents were infected with Hepatitis C after injecting for up to two years; 25% up to four years; 40% up to eight years and 80% after more than eight years (Loxley, 1997:54). As Loxley notes:

*figures like these have fuelled a research interest in people in the early stage of their injecting career, and the first transition to injecting (Loxley, 1997:54).*

### **3.1.2 PREVALENCE OF HEPATITIS C AMONGST NSW INJECTING DRUG USERS**

In their submission to this Inquiry, NUAA suggested that at least 80,000 injecting drug users in NSW are Hepatitis C positive. They base their assessment on 200,000 Australians being Hepatitis C positive, 44% of whom live in NSW and the estimation that over 90% of positive people contract the virus by unsafe injecting practices (NUAA submission).

Given the limited data available on prevalence of Hepatitis C amongst injecting drug users, the Committee considers there to be a need for further research to establish accurate prevalence figures for this population group. ANCARD's Hepatitis C Subcommittee has identified cross-sectional studies of prevalence in priority populations including young recently initiated injecting drug users and needle exchange clients to be a research priority. The Committee agrees that it is important these groups be included in any prevalence studies conducted.

#### **RECOMMENDATION 10:**

That the Minister for Health commission a prospective, longitudinal cohort study to ascertain the **prevalence** of Hepatitis C amongst injecting drug users (including young recently initiated injecting drug users and clients of the needle and syringe program) in metropolitan and rural New South Wales. This study is to be in addition to the general population prevalence studies proposed in Recommendation 2.

### **3.1.3 INCIDENCE OF HEPATITIS C AMONGST INJECTING DRUG USERS**

The annual incidence rate of Hepatitis C amongst injecting drug users from a number of developed countries has been assessed as ranging from 10-40% (Wodak and Crofts, 1996:181). The incidence of Hepatitis C in injecting drug users in Australia ranges from 15 - 20 per 100 person-years. Wodak (1997a:284) has suggested 15 per 100 person-years (Wodak, 1997a:284) and 20 per 100 person-years in evidence before the Committee (Wodak Evidence, 2 October 1997). As he explained in evidence:

*if we start off on 2 October 1997 with 100 uninfected drug users who are starting to inject today, we can expect in a year's time that 20 of them will be infected. The next year 20% of the other 80 users will be infected and so on (Wodak evidence, 2 October 1997).*

This pattern of transmission is responsible for up to 10,000 new infections related to injecting drug use occurring each year (Wodak and Crofts, 1996:181). Not surprisingly Wodak and Crofts conclude that:

*the importance of the epidemic of Hepatitis C among injecting drug users has to date been seriously underestimated (Wodak and Crofts, 1996:183).*

The Victorian Injecting Drug Users Cohort Study (VICS) is the first (and as of 1998, only) longitudinal cohort study of injecting drug users carried out in Australia which monitors the incidence and prevalence of blood borne viruses (including HCV) in a field recruited cohort of injecting drug users in both metropolitan and rural Victoria (including prison inmates as will be discussed). Preliminary results of the study were reported in 1993 (Crofts, Hopper, *et al*). More detailed, longitudinal results became available in 1997 (Crofts and Aitken).

In 1993 Crofts and colleagues reported HCV RNA being detected in 48% of subjects - 61% of whom were HCV seropositive and 5% seronegative (Croft and Hopper *et al*, 1993:239). Subsequent retesting of the seronegative subjects found that five had seroconverted to HCV. The crude incidence rate of HCV infection in this population group was calculated to be 19.6 infections per 100 person-years (Crofts and Hopper *et al*, 1993:239).

The 1997 study reported incidence of Hepatitis C from 1990-1995 with an overall rate of 10.7 per 100 person-years. As Table Ten shows, there was a downward trend in HCV incidence over the period, however the trend was not statistically significant (Crofts and Aitken, 1997:18).

**TABLE TEN**  
**BIENNIAL INCIDENCE OF HEPATITIS C IN A COHORT OF VICTORIAN INJECTING DRUG USERS 1990-1995**

	<b>1990-91</b>	<b>1992-93</b>	<b>1994-95</b>	<b>OVERALL</b>
<b>Seroconverters</b>	5.0	8.0	6.0	19.0
<b>Person-years at risk</b>	30.1	73.4	74.1	117.6
<b>Incidence (per 100 person-years)</b>	16.6	10.9	8.1	10.7

Source: Crofts and Aitken, 1997:18



The Committee was impressed with the thoroughness of the `VICS study, in particular the longitudinal nature of the study and its attempt to ascertain both incidence and prevalence.

### 3.1.4 INCIDENCE OF HEPATITIS C AMONGST NSW INJECTING DRUG USERS

One of the largest studies on the incidence of Hepatitis C amongst injecting drug users in terms of the number of recorded seroconversions comes from New South Wales. The study was conducted at the Kirketon Road Clinic, Kings Cross from 1992 to 1995. Dr Ingrid van Beek, Director of the Kirketon Road Clinic and principal researcher for this study, gave evidence before the Committee and provided Members with data over a five year period, rather than the three year period as in the published study.

The retrospective cohort study found an incidence rate of Hepatitis C of 20.9 per 100 person-years (31 seroconversions) among 152 injecting drug users initially negative for Hepatitis C virus. An additional 14 injecting drug users have seroconverted to Hepatitis C subsequent to the formal study, bringing to 45 the number of people who were initially HCV-negative but who have subsequently become HCV-positive. The incidence rate is measured at 18 per cent which has not changed over the five year period (van Beek evidence, 6 November 1997).

Table Eleven reports the seroconversions among Sydney based injecting drug users broken down for risk factors. As the Table shows the two most at risk groups in this study were injecting drug users aged less than 20 years (with an incidence rate of 75.6 per 100 person-years) and those with a history of imprisonment (with an incidence rate of 60.8 per 100 person-years).

**TABLE ELEVEN**  
**RISK FACTORS FOR HEPATITIS C VIRUS SEROCONVERSION AMONG INJECTING DRUG USERS**

<b>VARIABLE</b>	<b>SEROCONVERSIONS</b>	<b>TOTAL</b>	<b>INCIDENCE PER 100 YEARS</b>
<b>Gender:</b>			
Men	15	63	26.2
Women	14	85	15.9
Transsexual	2	4	70.3

VARIABLE	SEROCONVERSIONS	TOTAL	INCIDENCE PER 100 YEARS
<b>Age at test:</b>			
< 20 years	13	31	75.6
20-29 years	17	110	14.7
> 30 years	1	11	6.6
<b>Shared equipment since last test:</b>			
No	9	80	11.9
Yes	22	72	30.2
<b>History of imprisonment:</b>			
Yes	12	25	60.8
No	15	118	12.5
<b>Overall Number</b>	31	152	20.9

Source: van Beek *et al*, 1998

While the published study reported the incidence of Hepatitis C in the under 20 year old group to be 75.6 per cent, subsequent data reported to the Committee by van Beek suggest the rate to be 89 per cent (van Beek evidence, 6 November 1997). She considers this rate to be “staggering” and as she commented to Committee Members:

*cause for great concern, particularly when it is considered that this was measured in a group of people attending a service which has a focus of HCV prevention and measured in a group of people who attended over time. For us to measure incidence, we can do that only if people have at least two tests for HCV, so it requires something of an on-going relationship. That we are seeing that sort of incidence in that group of people leads us to be particularly concerned about the people who are not accessing prevention programs (van Beek evidence, 6 November 1997).*

During the course of giving evidence, van Beek identified three reasons for the high rates amongst this age group:

- i. the infection is being transmitted very early in people’s injecting drug use careers and that services such as ours by and large tend to have engaged such people a year or two into their drug using careers, by which stage it is often already too late;

- ii. the very high prevalence of the disease means that even very low levels of needle sharing are likely to result in transmission of the infection compared with HIV where the pool of infection is still so small (van Beek evidence, 6 November 1997); and
- iii. injecting drug users who know they are HIV positive tend to “remove” themselves from the risk-taking, drug-using population and take “additional” care that they do not share their injecting equipment with others. However van Beek considers that injecting drug users do not see Hepatitis C as a “serious thing” and they do not remove themselves from the sharing population (van Beek evidence, 6 November 1997). Further, as has been discussed, the long lead time of the disease to manifest itself means that people can have Hepatitis C and continue to share unwittingly exposing those they share with to the Hepatitis C virus.

As has been discussed, it is generally accepted that the risk of contracting Hepatitis C increases with time - the longer one injects, the greater the risk. For so many young people to have the disease so early on in their injecting career suggests that a prevalence rate of 100% amongst injecting drug users could be achieved amongst young injecting drug users earlier than experts had believed.

In identifying the limitations of the study, the authors suggested that the high incidence among subjects recruited in the study’s particular clinical setting may not be representative of Hepatitis C incidence among injecting drug users more generally. As Kirketon Road Centre provides HIV and Hepatitis C virus prevention services, its clients may differ from injecting drug users who do not attend the Centre. On the other hand, the Centre’s location in Kings Cross, may result in the recruitment of injecting drug users at higher risk (van Beek *et al*, 1998).

Kaldor commented upon the Kirketon Road study during the course of his evidence. He noted that:

*the extent to which this represents injecting drug users in general is impossible to state because this is a group of injecting drug users and it may be that the ones we see in these studies are a particularly high risk group, or it may be that they are at a lower risk. I would say they would be at the higher end, given the way the population has been selected* (Kaldor evidence, 3 October 1997).

Table Eleven shows that those with a history of imprisonment are five times more likely to contract Hepatitis C than those who have not been in prison. As van Beek told the Committee, it is not possible on the basis of available data to determine whether the period of imprisonment was between the last negative and first positive test result (which is why these results are reported here rather than Section 3.2.4 which examines the incidence of Hepatitis C in the corrections system). As van Beek noted:

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*it is possible that those who are incarcerated are at a higher risk, more disorganised and chaotic, and that this is a correlate rather than a casual relationship. However, the fact that the magnitude is in the order of five times would suggest it is perhaps more than that, but that cannot be said for sure (van Beek evidence, 6 November 1997).*

However, as van Beek notes, the association deserves further investigation specifically to assess whether preventing the spread of Hepatitis C should be better dealt with in the prison setting. The issue of prevention of Hepatitis C in the correction system is discussed in detail in Section 10.2.

The study concludes that the extremely high incidence of Hepatitis C virus among subjects under 20 years of age is a “major public health concern”. Van Beek *et al* refer to Crofts’ study reviewed above (Crofts and Aitken, 1997) which shows a decline (albeit non significant) in the incidence of Hepatitis C virus. Van Beek proposes that the absence of a similar decline in this study among an inner city population of injecting drug users already attending an HIV prevention service “strongly suggests” that current efforts aimed at the prevention of blood borne viral transmission are “inadequate” to stem Hepatitis C virus infection (van Beek evidence, 6 November 1997). Van Beek assured the Committee however, that she is not suggesting existing strategies should be dropped:

*it is particularly important to continue to send a message of safe injecting practices to those who are injecting . . . we should not be directing anything away from existing strategies; we should be adding to them and extending our focus (van Beek evidence, 6 November 1997).*

The issue of preventative strategies for injecting drug users will be pursued in full in Section 10.1.

**RECOMMENDATION 11:**

That the Minister for Health commission a prospective, longitudinal cohort study to ascertain the **incidence** of Hepatitis C amongst injecting drug users (including young recently initiated injecting drug users and clients of the needle and syringe program) in metropolitan and rural New South Wales. This study is to be in addition to the general population incidence studies proposed in Recommendations 4.

**RECOMMENDATION 12:**

That the prospective, longitudinal cohort study to ascertain the incidence and prevalence of Hepatitis C amongst injecting drug users proposed in Recommendations 10 and 11 be based upon the Victorian Injecting Drug Study and, like the Victorian model, be conducted by an independent agency.

### 3.2 PRISONERS

Many prison entrants have histories of drug use, including injecting. NUAAs submission suggested that up to 85% of inmates are in prison on drug-related offences. A proportion of these prisoners continue their drug taking behaviour while in prison (Crofts, Thompson, *et al*, 1996:20). Given the blood borne nature of Hepatitis C transmission, this practice puts those who inject drugs while in prison at risk of contracting Hepatitis C. In addition to injecting drug use, a second major risk behaviour for HCV transmission in prisons is tattooing. This practice is illegal within the corrections system and is therefore inevitably undertaken using unsterile equipment and techniques.

During the course of this Inquiry, a number of attributes, unique to prison life, were identified as facilitating the spread of Hepatitis C amongst this population group. Crofts, for example, has noted that:

*prisons take people from diverse settings who would not otherwise meet, create the opportunity to spread blood borne viruses among them and then send them back to their original networks as potential sources of infection (Crofts, 1997:116).*

In addition, as Dolan notes, a very high level of mixing occurs in prisons. She documents that:

*in NSW there are about 6,000 inmates on a daily basis. There are 14,000 people entering prison each year. They are transferred 20,000 times. The dynamic turnover will be conducive for the transmission of infections not only in prison but beyond to the general community (Dolan, 1997:353).*

ANCARD has suggested that:

*it is naive to suggest that injecting drug use does not occur in the prison setting. The prison population is at a significantly higher risk for blood borne . . . diseases than the public and have few opportunities to avoid infections. Anecdotal evidence suggests that on returning to the community, prisoners may resume their injecting drug behaviours . . . with people who would normally be at low risk. It is therefore necessary to emphasise the fact that the transmission of Hepatitis C within the prison setting has a major impact on the transmission of Hepatitis C in the whole community (ANCARD submission to the NSW Parliamentary Inquiry into Safe Injecting Rooms, attachment to their submission to this Inquiry).*

The following discussion looks at the incidence and prevalence of Hepatitis C in the state's corrections setting with particular reference to rates of Hepatitis C amongst those who inject drugs and/or receive a tattoo while in prison.

### **3.2.1 PREVALENCE OF HEPATITIS C IN PRISONS**

Overseas studies report prevalence rates of HCV among prison entrants to be high: 38% in a Maryland study and 46% in Norway (NHMRC, 1997:6). Within Australia, Crofts and colleagues have been responsible for some of the most thorough research of Hepatitis C amongst prisoners (see for example Crofts and Stewart, 1995; Crofts and Thompson *et al*, 1996; Crofts and Hooper, 1997).

In Crofts *et al*'s 1995 study all entrants to the Victorian corrections system from October 1991 to September 1992 were offered Hepatitis C screening. Results suggested the overall prevalence of Hepatitis C to be 39.1%. The rate was higher in women (66.7%) and injecting drug users (65.3%) with the highest seroprevalence rate being amongst women with a history of injecting drug use (84.8%) (Crofts and Stewart, *et al*, 1995:286).

A subsequent study by Crofts and colleagues (Crofts, Thompson *et al*, 1996) was based on an extension of the VICS study that has been discussed. It recruited and followed injecting drug users inside Melbourne's Pentridge Prison. Self-identified injecting drug users were tested for, amongst other factors, HCV antigen and by PCR for HCV RNA. The majority of subjects (88%) were positive for HCV antibody, of whom 75% were PCR positive. Two of six HCV antibody negatives were PCR positive. The overall prevalence of Hepatitis C was calculated to be 92% of participants (Crofts, Thompson *at al*, 1996:23).

### **3.2.2 PREVALENCE OF HEPATITIS C IN NSW PRISONS SYSTEM**

In its submission to the Inquiry, the NSW Department of Corrective Services advised the Committee that studies of Hepatitis C in the correctional system show "alarming rates" of Hepatitis C amongst NSW correctional inmates (NSW Department of Corrective Services submission). The submission noted that these:

*studies have confirmed Hepatitis C infection rates of between 40-60% for male inmates and 70-80% for female inmates (with female inmates accounting for approximately 5% of the overall inmate population) (NSW Department of Corrective Services submission).*

Two studies attempting to ascertain the prevalence of Hepatitis C in the state's corrections system were brought to the attention of Committee Members. The first study was conducted by Butler and colleagues amongst prison entrants in the second half of 1994. The study found 37% of inmates to be positive for HCV antibodies.

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These results are in line with comparable Victorian studies already discussed. Extrapolating these results, Butler *et al* suggest there to be over 2,000 inmates in the NSW corrections system who are HCV+ (Butler *et al*, 1997:129). Such figures confirm a comment made in the NSW Department of Corrective Services' submission which suggested that the Department has to deal with "probably the greatest concentration of Hepatitis C positive people anywhere in NSW, possibly Australia" (NSW Department of Corrective Services submission).

A subsequent survey based on a cross-sectional, random sample of 800 prisoners from all NSW gaols was conducted in 1996. As Butler informed the Committee:

*the main reason for doing the study was the total lack of baseline data on blood-borne communicable diseases on prisoners. So it was seen as essential to carry out the survey (Butler evidence, 23 March 1998).*

Overall, the prevalence of Hepatitis C was found to be 38% amongst prisoners tested (Butler evidence, 23 March 1998) with one-third of male participants and two-thirds of female inmates who participated in the survey testing positive for HCV antibodies (Butler, 1997:42). Butler suggested to the Committee that the discrepancy between males and females appears:

*quite shocking when one first looks at it, but it probably indicates that females tend to be incarcerated for drug-related offences whereas males are incarcerated for drug-related offences and also for sex offences, violence, driving offences, etc. That explains the huge discrepancy. However it [the prevalence] is still pretty high amongst both groups (Butler evidence, 23 March 1998).*

Inmates testing positive for HCV antibodies were tested for the presence of Hepatitis C RNA using a PCR test. Over two-thirds of both males (76%) and females (65%) were found to be PCR+, indicating a high proportion of inmates with Hepatitis C antibodies are also viraemic (Butler, 1997:443). Such results have important implications for transmission as those testing PCR+ are at greater risk of transmitting the disease than those testing negative.

In evidence before the Committee, Butler observed that:

*I think the prevalence has been a bit of a shock. I remember speaking to someone about this in 1994 . . . The estimate was about 11 per cent. Suddenly, the estimate is about 33 per cent. That is a bit of a shock and they have not geared up for that. The data we are collecting is a start in the process (Butler evidence, 23 March 1998).*

The Committee concurs with Butler: the rate of Hepatitis C in the state's corrections system is shocking, and his study is a start. The Committee considers it vital that this

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process of gathering data to ascertain the prevalence of Hepatitis C amongst prisoners continues on a regular basis. The Committee was particularly impressed with the PCR component of Butler's study as these results have provided information not able to be ascertained from antibody testing alone. The Committee would like to see all further studies incorporate PCR testing. In promoting the incorporation of PCR testing the Committee is aware of the possibility that some inmates may misunderstand their PCR status, particularly if it is negative. The Committee does not wish to see inmates lulled into a false sense of security that could arise if they considered themselves to not be at risk of infecting others and therefore engage in unsafe practices.

**RECOMMENDATION 13:**

That the Minister for Corrective Services and the Minister for Health ensure the prevalence of Hepatitis C in the state's corrections system is ascertained through ongoing monitoring and research.

**RECOMMENDATION 14:**

That the Ministers for Health and Corrective Services ensure adequate funding is allocated to ongoing monitoring and research of the prevalence of Hepatitis C in the state's corrections system.

**RECOMMENDATION 15:**

That the testing proposed in Recommendation 13 incorporate PCR testing to ascertain the viraemic status of HCV+ prison inmates.

**3.2.3 INCIDENCE OF HEPATITIS C IN PRISONS**

Crofts *et al's* 1995 study found the incidence rate of Hepatitis C in the Victorian corrections system to be 18.3 per 100 person-years. In men who injected drugs and were aged less than 30 years the rates were higher: 21 and 41 per 100 person-years respectively (Crofts and Stewart *et al*, 1995:287). Conversion to Hepatitis C was inversely associated with length of time in prison: in those whose length of stay was one month or less, the incidence was 65% a year compared with 26% a year in those whose stay was over one month ( $p < 0.01$ ) (Crofts and Stewart *et al*, 1995:287).

**3.2.4 INCIDENCE OF HEPATITIS C IN NSW PRISONS SYSTEM**

Butler informed the Committee that, to date, there have not been any studies in New South Wales to determine the incidence of Hepatitis C in the state's corrections system



(Butler evidence, 23 March 1998). Ascertaining incidence rates would necessitate measures taken over a period of time or Hepatitis C status ascertained as prisoners entered and exited prison. To date, Hepatitis C exit levels amongst the general prison population are not known. Selvanera suggested to the Committee that:

*the exit level for Hepatitis C is perhaps the area in which more research needs to be done so that we can gain a better understanding of the level of infection that takes place while in prison (Selvanera evidence, 23 March 1998).*

Professor Lloyd informed the Committee that he had undertaken preliminary (and as yet unpublished) research that substantiated Crofts's incidence rates of one in five per annum (Lloyd evidence, 30 March 1998). He considers his results demonstrate "a frighteningly high transmission incidence" (Lloyd evidence, 30 March 1998). During evidence, he also referred to another study (awaiting publication) he and gastroenterologist colleague Dr Paul Haber had undertaken. The study documents four individuals who, on entry to prison and on at least one other occasion months later, received Hepatitis C negative test results but who subsequently became infected during their time in prison (Lloyd evidence, 30 March 1998).

At the First Australasian Conference on Hepatitis C held in Sydney last year, it was observed that:

*there still has not been one proven and published case of hepatitis transmission occurring in an Australian prison (Dolan, 1997:353).*

Lloyd's research suggests it to be only a matter of time before such a claim is outdated as such a comment is, in the Committee's opinion, more a reflection on limited research than the absence of Hepatitis C transmission in the country's corrections system.

In addition to Lloyd, other witnesses commented on the transmission of Hepatitis C within the corrections system. Harper, an Acting Clinical Nurse Consultant with Corrections Health Service, informed Members that:

*I believe that there will clearly be some evidence to show that Hepatitis C has been contracted in gaol through people sharing needles and syringes. There is no question about that: it merely has to be substantiated (Harper evidence, 23 March 1998).*

Lloyd also observed that:

*I feel very suspicious, although we do not have good data, that a lot of transmission is happening in the prisons. If that fact is put together with*

*the fact that the average length of stay is six or seven months, then prisons could generously be regarded as a hotbed of transmission back out into the community (Lloyd evidence, 30 March 1998).*

At the time of giving evidence, Lloyd informed the Committee that he had a proposal for a research study with the Ethics Committees of Corrections Health Service and the Department of Corrective Services. It is intended that the prospective cohort study would identify a large group of approximately 1,000 HCV- inmates and follow them for the period of their imprisonment. The study would attempt to ascertain how common Hepatitis C transmission is in the corrections system and identify factors associated with transmission. The results would provide “key information to sensible harm minimisation strategies” (Lloyd evidence, 30 March 1998). Lloyd told the Committee that:

*we need to know if half of the transmissions are happening from barber’s shears, or whatever else it may be. Deep down I am sure that the majority of it is related to drug use but even there we need to know if there are practical things that we can do to minimise transmission (Lloyd evidence, 30 March 1998).*

Lloyd was, however, experiencing difficulties in gaining approval for his study. He informed the Committee that:

*perhaps predictably that application is meeting with controversy in the Department of Corrective Services Ethics Committee. We are yet to see whether we are to win out but, as yet, we do not have approval to do the study (Lloyd evidence, 30 March 1998).*

The week before tabling this Report, Lloyd advised that approval for the study had been obtained from the Corrections Health Ethics Committee (Lloyd correspondence, 1 November 1998). At that time, he was hoping to gain NHMRC funding to proceed with the project in 1999.

The Committee sees a very real need for the type of information Lloyd’s research seeks to ascertain. While the Committee is not in a position to recommend his particular research project be approved and funded, the Committee is concerned that difficulties have been experienced in gaining approval. The fact that the research may be controversial is not grounds for procrastination.

The Committee recommends a study be undertaken to ascertain the incidence and modes of transmission of Hepatitis C in the state’s corrections system.

**RECOMMENDATION 16:**

That the Minister for Corrective Services, in conjunction with the Minister for Health, commission an independent study of the incidence and modes of transmission of Hepatitis C in the state's corrections system. This study is to be in addition to the population incidence study proposed in Recommendation 4.

**RECOMMENDATION 17:**

That the Ministers for Health and Corrective Services ensure adequate funding is allocated to ongoing monitoring and research of the incidence and modes of transmission of Hepatitis C in the state's corrections system.

**RECOMMENDATION 18:**

That the independent study of Hepatitis C incidence proposed in Recommendation 16 be conducted on a regular basis to ensure information on the incidence and modes of transmission of Hepatitis C in the state's corrections system is gathered over time.

**3.2.5 INJECTING DRUG USERS IN PRISON**

Considerable research has documented the intricate relationship between prisoners, injecting drug use and Hepatitis C (see for example, Crofts 1997; Dolan, 1997; Cregan, 1998). In summary, available research suggests that:

- approximately one half of all injecting drug users have histories of imprisonment (Loxley et al, 1995; Crofts, 1997:116);
- approximately one half of all prisoners have histories of injecting drug use (Crofts, 1995; Crofts, 1997:116); and
- approximately one half of all imprisoned injecting drug users inject in prison (Crofts and Thompson *et al*, 1996; Crofts, 1997:116).

It is difficult to generalise on the impact of imprisonment upon drug use and practices as the Committee was informed that:

*People's patterns of drug use change in prison; some people reduce their injecting and others will switch. It is often drugs of opportunity versus choice. Some people commence injecting while incarcerated; they may not have injected prior to prison. Others will reduce or increase their*

*injecting. So it can change from outside patterns of drug use as well and through periods of incarceration drug use will often change (Butler evidence, 23 March 1998).*

It has been suggested to the Committee that prison policy may actually facilitate the transmission of blood borne viruses such as Hepatitis C in a number of ways including:

- sharing of injecting equipment is much more common in prison than outside where access to clean needles and syringes is relatively freely available through established and accessible Needle and Syringe Exchange Programs (Crofts, 1997:116). As a result:

*when [inmates] do inject they are likely to be forced into equipment sharing networks, among whom the majority of members are likely to be already HCV-positive (Cregan, 1998:5);*

- surveillance policies tend to induce a need for secrecy and speed to avoid detection and punishment (Cregan, 1998:5). As a result the cleaning that does occur may not be effective in preventing the transmission of blood borne viruses such as Hepatitis C. The Committee understands that bleach is not always readily available and there is some debate over the efficacy of bleach. Further, as Crofts has documented, some prisoners report that a request for bleach to disinfect injecting equipment is often followed the next day by a urine test (Crofts, 1997:116);
- prison drug policies can modify not only frequency and patterns of drug use but choice of drug. For many, the drugs used are dependent upon availability rather than preference. In terms of the transmission of blood borne viruses such as Hepatitis C, a drug such as cannabis, which is smoked, is relatively safer than a drug which is injected. For many prisoners however, cannabis is not a drug of choice for two reasons: i) the bulky nature of cannabis makes it more difficult to obtain in jail than powder drugs because trafficking is easier to detect and it is less profitable to import on a per unit volume; and ii) the speed with which drugs clear from the body's system differs. Cannabis, for example, does not clear quite so quickly as heroin. Efforts to detect drug use, such as urine testing, may result in prisoners choosing to inject heroin rather than smoke cannabis which, given the length of time taken to clear from the system, can be detected through urinalysis.

The Committee was informed that, given these two factors, prisoners are more likely to make heroin the drug of choice because of the drawback associated with using relatively safer drugs such as cannabis. As Cregan observes, these factors:

*Lead to the anomalous situation where cannabis, which is smoked and therefore safer in terms of viral transmission, is currently subject to heavier disincentives to its use than heroin and other injectable drugs which represent the highest of all risks for HCV transmission (Cregan, 1998:5).*

During the course of this Inquiry, the Committee gained an understanding of the prevalence of needles and syringes in the prisons system from both prisoners and medical practitioners along with viewing slides of confiscated equipment. The Committee received several submissions from prisoners in NSW Correctional Centres providing Committee Members with first hand insights into drug use in the state's corrections system. One described his experiences to the Committee in the following way:

*one day I was shocked to witness three inmates of the Special Care Unit borrow and share a syringe from an inmate who was HIV positive . . . three months later . . . I noticed the same men sharing needles with a different group of men. I then realised just how quickly blood borne viruses could spread at a rapid rate throughout the prison system (Submission 63).*

This prisoner went on to note that:

*I've used needles that have to be sharpened on a match box prior to use they're that blunt. I've also seen syringes that are so old that the rubber on the plunger has gone hard or perished and had to be replaced by a piece of rubber thong - not what you'd call real sterile (Submission 63).*

As a practising clinician in the prison system, Professor Lloyd told Committee Members that:

*in my clinic the other day I saw a man who was in a wing with several hundred other prisoners. In that wing, for two or three months prior, he knew of only one fit, only one needle and syringe. He estimated that it had been reused many hundreds of times, probably thousands. It is the perfect opportunity for viral transmission; you could not ask for it to be better. That is why I have little or no doubt that a huge amount of transmission goes on in prisons (Lloyd evidence, 30 March 1998).*

During the course of taking evidence, the Committee was shown a series of slides of syringes, needles and other injecting paraphernalia confiscated from inmates. The Committee saw, for example, slides of syringes hidden in transistor radios, pens and books (Butler evidence, 23 March 1998). As the Committee heard:

*one hears stories of needles being separated and one person carrying one little bit around and another person carrying another bit, just in case they get busted (Butler evidence, 23 March 1998).*

The Committee also heard from a Clinical Nurse Specialist with Corrections Health that:

*we have had problems when guys have got needles stuck in their veins, they have had abscesses and they do not rotate veins. It is dreadful. Their veins are scarred and they cannot be accessed. It is shocking (Parsons evidence, 23 March 1998).*

In his submission to the Committee, Wodak discussed the risk of Hepatitis C to prisoners who are injecting drug users. He noted that:

*In prison, equipment is severely worn by extensive use and modified by attempts to conceal this equipment. All of these factors have the effect of increasing the likelihood of Hepatitis C transmission (Wodak submission).*

Further, as Wodak noted:

*networks of injecting drug users who share in the community these days are small and fairly stable. That is, injecting drug users in the community usually only share with their sexual partner and one or two close friends. In prison, there is random sharing with large numbers of total strangers who change rapidly over time (Wodak submission).*

### **3.2.6 RATES OF HEPATITIS C AMONGST PRISONERS WHO INJECT DRUGS**

In the available studies on Hepatitis C and prison inmates it is often difficult to tease out the results of Hepatitis C in prisoners from that of Hepatitis C amongst prisoners who inject drugs. The study by Crofts and Hopper *et al*, does, however, make such a distinction, the results of which are reported in Table Twelve.

**TABLE TWELVE**  
**HEPATITIS C IN PRISON ENTRANTS ACCORDING TO INJECTING STATUS**  
**VICTORIA, OCTOBER 1991 - SEPTEMBER 1992**

	<b>USERS OF INJECTING DRUGS</b>	<b>NOT USER OF INJECTING DRUGS</b>
<b>Men HCV+</b>	63.6%	16.0%
<b>Women HCV+</b>	84.8%	26.4%
<b>All men and women HCV+</b>	65.3%	16.3%

Source: Crofts and Hopper *et al*, 1997:186

As these data demonstrate, the prevalence of Hepatitis C amongst prison entrants is significantly higher in those with a history of injecting drug use than those who have not engaged in injecting drug use. For males, the prevalence of Hepatitis C amongst injecting drug users is approximately four times higher than the prevalence of the disease amongst non injecting drug users. For women, the rate is approximately three times higher for those who inject drugs.

Incidence data from another of Crofts' studies shows Hepatitis C incidence rates for injecting drug users (38.2 per 100 person-years) that are significantly higher than the incidence rates for non injecting drug users (5.9 per 100 person-years). These data are recorded in Table Thirteen.

**TABLE THIRTEEN**  
**INCIDENCE OF HEPATITIS C INFECTION AMONGST INMATES ACCORDING TO DRUG USE**  
**OCTOBER 1991 - SEPT 1992**

	<b>NUMBER INITIALLY SERONEGATIVE</b>	<b>NUMBER OF SEROCONVERTERS</b>	<b>INCIDENCE RATE PER 100 PERSON-YEARS</b>
<b>Drug Users</b>	47	8	38.2
<b>Not Drug Users</b>	72	2	5.9

Source: Crofts and Stewart *et al*, 1995:287

No comparable data are available for the NSW corrections system. The data that are available suggest that 90% of inmates who had injected for more than ten years are HCV+ (Butler evidence, 23 March 1998). Approximately 86% of female inmates testing HCV+ had a history of injecting drugs compared with 81% of male inmates (Butler, 1997:42). Butler's 1994 study found that 66% of those who reported a history of injecting drug use were HCV+ (Butler *et al*, 1997:129).

### **3.2.7 TATTOOING IN PRISONS**

Within the NSW corrections system tattooing is an illegal activity. However, as the Committee heard:

*Tattooing is very common in prison ... it occurs in prison under circumstances where there is no monitoring and there are no infection control guidelines and where Hepatitis C infection is guaranteed (Wodak evidence, 2 October 1997).*

The Committee also heard that:

*the rate of tattooing is quite high in prisons due to boredom and other things. . . people having tattoos while inside is becoming a major Hepatitis C risk factor* (Vumbaca evidence, 23 March 1998).

Slides of tattooing guns shown to Committee members during the course of the inquiry showed a toothbrush frame attached to a cassette player with a needle inserted in the end (Butler evidence, 23 March 1998). Such a mechanism was described to the Committee as “brutal” (Butler evidence, 23 March 1998).

The Committee also heard that:

*inside the prisons the tattoo guns are made from gutted tape-recorders and the like and cannot be cleaned properly. We have found that a lot of inmates are not aware that there is a risk of Hepatitis C with tattoos* (Vumbaca evidence, 23 March 1998).

The 1996 study by Crofts and Thompson *et al* discussed above, also examined skin piercing and tattooing practices of prison inmates. The study was, however, limited to those with a history of injecting drug use.

In Crofts’ study, approximately 94% of subjects had skin piercing in sites that included the ear, nipple, nose and foreskin (Crofts and Thompson *et al*, 1996:5). Six inmates (19%) had had their tattoo done by a professional while 46% used “other” means and 61% had done the skin piercing themselves. Instruments used for non-professional skin piercing included sewing needles, studs, safety pins, hot pins and copper wire. Some made no attempt to reduce infectious hazard while others heated the needle with a match or a lighter, washed the needle in disinfectant or simply wiped it (Crofts and Thompson *et al*, 1996:5).

Approximately 97% of the sample had been tattooed, most having at least one tattoo at an unregistered premise and at least one while in prison (61%) or a Juvenile Justice Centre (21%) (Crofts and Thompson *et al*, 1996:5). Almost one-half reported that their last tattoo had been while in prison. Multiple tattooing while incarcerated was common: three respondents reported more than 200 tattoos while in prison (Crofts and Thompson *et al*, 1996:5). The equipment used was always a sewing needle for skin penetration mostly with a gun using a motor derived from a walkman or cassette player. In five cases no gun was used and the tattooing had been done by hand.

Approximately 21% of respondents claimed that the person who had performed their last tattoo had some knowledge of infection control, on the basis that they had worked professionally as a tattooist, or they used disinfectant or heat on the needle. Two-thirds reported that the equipment had previously been used by someone else and two-thirds of respondents said that the same pot of dye would have been used for tattooing others



(Crofts and Thompson *et al*, 1996:5). Those who were last tattooed in prison “universally” reported boredom or “killing time” as a motivating factor (Crofts and Thompson *et al*, 1996:6).

In conclusion, Crofts and Thompson *et al* note that:

*the majority of prisoners had been tattooed while in prison or a juvenile justice centre under very unsterile conditions, with the same tattooing equipment often being reused on multiple people with little or no effective attempt at sterilisation between. The potential for spread of blood-borne viruses in these populations is obviously therefore very high, especially a virus which is very infectious and at a very high prevalence, such as HCV* (Crofts and Thompson *et al*, 1996:25).

### 3.2.8 TATTOOING IN NSW PRISONS

The results of the Inmate Health Survey released by NSW’s Corrections Health Service show that 51% of female respondents and 57% of male respondents were tattooed (Corrections Health Service, 1997:82). Table Fourteen shows the location where the tattooing occurred: most respondents obtained their tattoos whilst in the community. Males (20%) were more likely than females (6%) to report being tattooed in gaol (Corrections Health Service, 1997:82).

**TABLE FOURTEEN**  
**LOCATION OF TATTOOING**

	<b>MALES (%)</b>	<b>FEMALES (%)</b>
<b>Community</b>	46	79
<b>Prison</b>	6	20
<b>Both</b>	15	35

Source: Corrections Health Services, 1997:82

### 3.2.9 CONCLUSION

The issue of Hepatitis C amongst inmates of the corrections system, particularly amongst those who also engage in injecting drug use or tattooing, is complex. Dolan has noted that the study of Hepatitis transmission in the prison setting is “a difficult but important task”. (Dolan, 1997:347). She considers the difficulty to lie in:

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*gaining access to inmates, obtaining representative samples and reliable reports of risk behaviours and collecting conclusive evidence of Hepatitis transmission in prison (Dolan, 1997:347),*

while the issue is important:

*because the high level of inmate turnover means that hepatitis transmission in prison threatens hepatitis control in the community when inmates are released (Dolan, 1997:347).*

Clearly, given the numbers of those already infected and the potential risk for infection, there is a need for decisive and prompt action. The Department of Corrective Services can no longer turn a blind eye to the injecting drug practices of its inmates when it is this specific behaviour that is responsible for so many inmates becoming infected or put at risk.

Crofts argues that sentencing prisoners to Hepatitis C infection as well as to the loss of liberty is a violation of human rights (Crofts, 1997:116). The Committee fully agrees with this statement and, as will be discussed in Chapter Ten, proposes a number of measures to address the transmission of Hepatitis C in the corrections system.

### **3.3 RECIPIENTS OF INFECTED BLOOD AND BLOOD PRODUCTS**

Given the blood borne nature of Hepatitis C transmission, recipients of infected blood and blood products are potentially a primary 'at risk' group. The Committee received submissions from a number of people who had acquired Hepatitis C medically. As one person wrote to the Committee:

*I have never used drugs, I do not have tattoos, I have had only one partner . . . I had surgery 11 years ago and something went wrong. I was given 10 units of blood (Submission 20).*

During the 1980s, the NSW Blood Bank (as it was then known) introduced a number of screening mechanisms as a public health response to the HIV/AIDS epidemic (these are described in Section 10.4). While it was not appreciated at the time, these actions were to have significance far greater than the possibility of transmitting HIV in that they assisted in limiting the spread of HCV through blood transfusion.

Serological testing for HCV became available in 1990 shortly after the discovery of the virus. Australia was the second country in the world to test blood transfusions and blood products for the Hepatitis C virus with the NSW Blood Bank introducing HCV antibody screening in February 1990 (Benjamin evidence, 10 October 1997). Such a response at both the national and state level was, according to Wodak "part of our commendably early response to this [HCV] epidemic" (Wodak evidence, 2 October 1997).

In Australia, the incidence of acquiring Hepatitis C through blood or blood products prior to screening was 1% (NHMRC, 1997:5). The incidence rate has reduced significantly as a result of the strict screening procedures. The current risk of HCV transmission through blood transfusion has been assessed by the NHMRC to be:

*extremely low, and although still possible, clinical post-transfusional hepatitis has been virtually eliminated in Australia* (NHMRC, 1997:3).

The Blood Bank has established the Hepatitis Lookback Unit which seeks to identify those who, prior to 1990, may have received blood contaminated with the Hepatitis C virus. The NSW Red Cross Blood Bank informed the Committee that "lookback" is:

*the process of tracing blood products released by a blood bank for normal use. The term is often associated with tracing components suspected to have been contaminated with an infectious agent* (NSW Red Cross Blood Bank submission).

The main functions of the Hepatitis Lookback Unit are to:

- trace components released for normal use when a donor is identified as HCV+ (referred to as case triggered lookback); or
- investigate the HCV status of donors where a recipient believes they have been infected following a blood transfusion (known as donor triggered lookback) (NSW Red Cross Blood Bank submission).

The Lookback program is a joint project with the NSW Health Department and the Red Cross. The project has the support of both State and Federal Health Ministers. As Dr Benjamin, then Head of the Unit, told the Committee:

*it is important that there was both a state and a federal commitment to proceeding with such a large exercise and many countries around the world who were faced with the same problem have decided not to do Lookback because it is so expensive and extremely difficult* (Benjamin evidence, 10 October 1997).

At the time of making their submission to this Inquiry in October 1997, the Blood Bank advised that 365 people had been identified through the Hepatitis C Lookback Program. Of this number:

- 186 cases had been identified through case triggered lookback; and
- 179 cases have been identified through the Hepatitis Lookback Project (Blood Bank submission).

These figures do not, however, fully reflect all who may have received Hepatitis C. The

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process of conducting donor triggered lookback is ongoing. In addition, of those who received HCV+ infected blood:

*approximately fifty per cent of people who receive transfusions will have died twelve months after the treatment and that is because the majority of transfusions are given to sick people. It is not the transfusion (Benjamin evidence, 10 October 1997).*

Those alive and subsequently diagnosed as being HCV+ range from those who are quite elderly to children as young as eight years of age. As Table Fifteen shows, these people are scattered throughout the state.

**TABLE FIFTEEN**  
**RESIDENTIAL LOCATION OF PEOPLE WITH TRANSFUSION TRANSMITTED HEPATITIS C**

<b>REGION</b>	<b>NUMBER OF CASES</b>
<b>Metropolitan Health Services:</b>	
South Eastern Sydney	53
Central Sydney	51
Northern Sydney	69
Western Sydney	34
South Western Sydney	33
Central Coast	21
Hunter	17
Wentworth	14
Illawarra	16
<b>Subtotal</b>	<b>308</b>
<b>Regional Health Services:</b>	
New England	6
Northern Rivers	4
Mid North Coast	10
Far West	1
Macquarie	1
Mid Western	4
Greater Murray	4
Southern	6
<b>Subtotal</b>	<b>36</b>
<b>Other:</b>	
ACT	4
Interstate	17
<b>TOTAL</b>	<b>365</b>

Source: NSW Blood Bank submission

Dr Benjamin informed the Committee that some of those who acquired Hepatitis C through blood transfusion are proceeding with legal action. This issue will be discussed in further detail in Section 9.3.2.

### **3.4 PEOPLE BORN OVERSEAS**

Professor Farrell considers the second largest group of HCV+ people in Australia to be immigrants, particularly those from southern European countries, the Middle East and parts of Asia (Farrell submission). In his opinion, the majority of these patients acquired HCV from inappropriate medical use of unsterile (nondisposable) needles and glass syringes in their childhood, usually between 40 to 60 years ago (Farrell submission).

Wodak noted before the Committee that, in some developing countries there is a “poorly understood” high prevalence of Hepatitis C which, in countries such as Egypt and Vietnam, can range from 5 - 8% (Wodak evidence, 2 October 1997). Like Farrell, Wodak suggested the high prevalence to be related to poor infection control practices in the health care system with many of these countries unable to afford sterile needles and syringes (Wodak evidence, 2 October 1997). As he illustrated:

*at 10 o'clock in the morning the only electricity generator in town will break down and there is no way of sterilising needles and syringes. People have injections and vaccinations throughout the day and the equipment is not properly sterilised . . . In some of these countries also traditional ways of skin piercing, both tattooing and scarification, would be other ways that Hepatitis C would be transmitted (Wodak evidence, 2 October 1997).*

Further anecdotal evidence was given to the Committee by Ms Janice Pritchard-Jones who noted that:

*quite often the Italian patients tell you they can remember standing out in the street as children and the army coming around and vaccinating all the kids, and they just used the same needle for all the kids until the needle was blunt. The Egyptian men tell you of being in the army and Nasser wanting to vaccinate the army at the time for schistosomiasis and the same needle was used (Pritchard-Jones evidence, 2 October 1997).*

The Committee was not able to ascertain the prevalence or incidence of Hepatitis C amongst various ethnic communities as these data are not available. While anecdotal evidence was presented during the course of evidence, the Committee is not aware of any empirical data.

### 3.5 HEALTH CARE WORKERS AND THEIR PATIENTS

Given the blood borne nature of Hepatitis C transmission, health care workers and their patients are at risk of exposure to the virus. Within the health care setting, transmission of HCV can occur in one of three ways:

- patient to health care worker;
- health care worker to patient; and
- patient to patient.

Cases of HCV transmission have been reported for each of these three modes of transmission (see MacDonald, Crofts and Kaldor, 1996 for an extensive literature review). As the Committee heard from the Chairman, Infection Control Advisory Committee, Royal Australian College of Surgeons (RACS), Dr Richard West:

*it has been established there is a risk of transmission of Hepatitis C in a hospital setting from patients to health care workers, from health care workers to patients and from patients to patients and that has now been established and substantiated by a number of documented papers (West evidence, 28 November 1997).*

#### 3.5.1 TRANSMISSION FROM PATIENT TO HEALTH CARE WORKER

The submission from the RACS reported seroprevalence studies showing that health care workers are at “increased risk” of acquiring HCV infection. Early studies that used a first generation anti-hepatitis C virus without confirmatory testing found a two to three fold increase in the prevalence of HCV infection in health care workers (RACS submission). As the submission explained though, when more sensitive testing became available and was used 2% of 861 clinical health care workers were shown to be positive for anti-HCV, a rate four times higher than that seen in volunteer blood donors. The submission reviewed available literature on the issue which can be summarised as follows:

- a case control study of dentists found a four fold excess risk resulting from occupational exposure;
- the risk of HCV transmission to health care workers from needle stick injury from source patients with HCV antibodies ranges from 2-10%. As West stated in evidence:

*the problem with Hepatitis C is that . . . if you get a needle stick injury the sero-conversion rate is about two to ten percent, probably around about six percent which we think is high and concerning (West evidence, 28 November 1997);*

- there has been one case reported of HCV transmission from a blood splash to the conjunctiva (RACS submission).

The submission also reported that there are a number of Resident Medical Officers in the state's health care system who have seroconverted following needle stick injuries (RACS submission).

An extensive multicentric national survey of more than 15,000 surgical procedures has suggested there to be a 34.8% lifetime risk to surgeons of contracting HCV infection in the operating room, given the current level of application of universal precautions (Pietrabissa, 1997). As will be discussed in Section 10:3, this risk could be reduced to 16.6% with the adoption of preventative strategies. While West considers the risk proposed by Pietrabissa to be "very high" he does acknowledge that the article was published in the very reputable *World Journal of Surgery* (West evidence, 28 November 1997) and therefore must be given credibility.

Dr West informed the Committee it is estimated that approximately 1400 health care workers in the United States develop Hepatitis B and Hepatitis C each year and of these approximately 400 die (West evidence, 28 November 1997). As he informed the Committee:

*we do not know the figures in Australia at the moment. We have not got enough research and we have not got accurate figures* (West evidence, 28 November 1997).

However, it is estimated that one percent of surgeons may be HCV+ which, given that there are 4000 surgeons in Australia would equate to 40 to 50 surgeons being Hepatitis C positive (West evidence, 28 November 1997).

### **3.5.2 TRANSMISSION FROM HEALTH CARE WORKER TO PATIENT**

Dr West expressed the following concerns of the RACS to the Committee:

*as surgeons, as clinicians, we are concerned that patients are getting infected with Hepatitis C. We are concerned with how they are getting infected. We are a little concerned that there is the possibility they may be getting infected during hospital procedures . . . We are concerned with the patients . . . some action needs to be taken to do something about the problem* (West evidence, 28 November 1997).

The RACS submission summarised a number of relevant cases including:

- a reported case of a cardiac patient in the UK who developed HCV infection following surgery, the probable source of infection being a HCV+ health care worker;

- a cardiac surgeon in the UK with chronic Hepatitis C who transmitted the virus to five of his patients during open heart surgery between 1988 and 1993; and
- a Barcelona cardiac surgeon who transmitted the virus to patients during surgery. Of the 220 patients surveyed, five are confirmed HCV+ (RACS submission).

In evidence, Crofts referred to “multiple reports” in the scientific literature of outbreaks of Hepatitis C in patients in haemodialysis units. He cited a case study from Japan where Hepatitis C outbreaks were occurring despite investigations which revealed no overt breaches of infection control procedures. It was found, however, that the nurses were taking pathology specimens from haemodialysis patients straight to the hospital’s pathology labs on the next floor. Having used a swab to stop the bleeding after taking the blood, the nurses’ gloves were contaminated. The nurses would then press the lift button, effectively contaminating the lift button and those who subsequently pressed the button (Crofts evidence, 28 November 1997). Such is the virulency of the Hepatitis C virus.

West noted during the course of his evidence that:

*the problem with many of these [health care worker to patient] studies is that it is a very difficult disease to pick up because the patients do not often get terribly sick. They actually picked up the one in Barcelona because they were doing a survey of post-operative infections (West evidence, 28 November 1997).*

In commenting upon the transmission of Hepatitis C from health care workers to patients, Wodak commented to the Committee that:

*We do not conduct much surveillance in that area and this is an area of great concern, the spread from health professionals to patients . . . it is an area of great complexity and concern (Wodak evidence, 2 October 1997).*

### **3.5.3 TRANSMISSION FROM PATIENT TO PATIENT**

In its submission to this Inquiry, the Royal College of Nursing, Australia noted the high incidence of Hepatitis C amongst patients on haemodialysis. The submission suggests that:

*Haemodialysis patients have a higher incidence of Hepatitis C than their peritoneal dialysis counterparts and the incidence of infection increases with the length of time on dialysis (Royal College of Nursing, Australia submission).*



Supporting data provided to the Committee is reproduced in Table Sixteen. The submission suggests blood transfusion and cross infection to be the probable causes for the higher incidence of Hepatitis C amongst this population group.

**TABLE SIXTEEN**  
**HEPATITIS C STATUS OF PATIENTS ON MODES OF DIALYSIS IN NSW, MARCH 1997**

	HCV ANTIBODY STATUS: +VE	HCV ANTIBODY STATUS: -VE	STATUS NOT DETERMINED
Continuous Ambulatory Peritoneal Dialysis	13	559	35
Home Haemodialysis	21	378	8
Home Intermittent Peritoneal Dialysis	n/a	39	3
Hospital Haemodialysis	22	452	4
Hospital Intermittent Peritoneal Dialysis	n/a	3	n/a
Satellite Haemodialysis	25	356	2

Source: Australia and New Zealand Dialysis and Transplant Registry. Data provided in Royal College of Nursing, Australia submission.

The submission also included information, although no analysis, on the Hepatitis C status of dialysis and functional (successful) transplantation patients. This information has been reproduced in Table Seventeen.

**TABLE SEVENTEEN**  
**HEPATITIS C STATUS OF AUSTRALIAN DIALYSIS AND TRANSPLANT PATIENTS, MARCH 1997**

	HCV ANTIBODY STATUS: +VE	HCV ANTIBODY STATUS: -VE	STATUS NOT DETERMINED
Dialysis	185 (3.8%)	4,599 (93.9%)	111 (2.3%)
Functional Transplant	155 (3.4%)	3,112 (69.2%)	1232 (27.4%)

Source: Australia and New Zealand Dialysis and Transplant Registry. Data provided in Royal College of Nursing, Australia submission.

The RACS submission reported an episode of HCV nosocomial infection involving five patients who had undergone surgery in western Sydney, New South Wales (RACS submission). This case is also reviewed by (for example) MacDonald, Crofts and Kaldor (1996) and MacDonald and Kaldor (undated). The patients were detected following routine notification of two patients who presented with acute Hepatitis C infection after undergoing minor surgical procedures in the same operating session. Genotyping showed that the five patients with HCV antibodies were infected with HCV genotype 1a. Only one patient, the first in the surgical session, reported a history related to potential prior exposure to HCV. It was proposed that transmission had occurred through blood in respiratory secretions via anaesthetic circuitry (MacDonald, Crofts and Kaldor, 1996: 140) although as MacDonald and Kaldor note, the mechanism of transmission was not “clearly identified” (undated:27). They conclude that this cluster of possible patient to patient transmission of HCV “highlights uncertainties” surrounding HCV transmission (MacDonald and Kaldor, undated:27).

### **3.6 MOTHER-TO-CHILD TRANSMISSION**

Several studies have documented mother-to-child (or vertical) transmission of the Hepatitis C virus with rates varying from 0 - 9% (see MacDonald, Crofts and Kaldor, 1996 and MacDonald and Kaldor, undated for comprehensive literature reviews). The US based Centers for Disease Control however, have estimated the likelihood of perinatal transmission to be “low”, in the order of 5-6% (Dienstag, 1997:69S). MacDonald, Crofts and Kaldor (1996:144) suggest that the rate of transmission from HCV from mother-to-child appears to be lower than the rate of transmission of HIV and Hepatitis B.

The NHMRC study noted that the reported studies of mother-to-child HCV transmissions have been carried out on relatively small cohorts. The Council concluded that it is not possible to draw firm conclusions from the available studies (NHMRC, 1997:10). The report identified a need for large, long-term prospective studies to examine the effect of viral load and genotype, maternal health, mode of delivery, breastfeeding and other associated factors, on transmission (NHMRC, 1997:10, 13). Given the current uncertainty, Sladden *et al* propose that:

*people with Hepatitis C who are contemplating having children would be advised to seek medical advice regarding their HCV-RNA PCR status, hepatic enzyme function and clinical symptoms as markers of viral activity (Sladden et al, 1997:293).*

This issue is pursued more fully in Section 8.1.6.

While limited, the following remarks have been made about mother-to-child Hepatitis C transmission:

- in utero: having reviewed the available data, Dienstag concludes that:

*currently data are considered insufficient to warrant any special treatment or unusual precautions for pregnant women with chronic Hepatitis C and their children (Dienstag, 1997:69S);*

- labour and delivery: MacDonald, Crofts and Kaldor (1996:144) note there is “limited information” about the effect of mode of delivery on HCV transmission; and
- breastfeeding: while noting that individual cases of breast fed infants contracting HCV have been documented, MacDonald and Kaldor observe that:

*there is little information about the role of breast feeding in modifying transmission of HCV from mother to child because of the small numbers of infants in individual studies and the low rate of HCV transmission in these studies (undated:28).*

Dienstag concludes that breast feeding is not to be discouraged amongst mothers which chronic Hepatitis C (Dienstag, 1997:69S).

In summary, Dienstag suggests that:

*data are insufficient to support the interdiction of pregnancy in women with chronic Hepatitis C, screening of pregnant women for HCV infection is not recommended and breast feeding is permitted (Dienstag, 1997:69S).*

### **3.7 SKIN PENETRATION: TATTOOS AND ACUPUNCTURE**

There are a number of skin penetration activities that potentially pose a risk of Hepatitis C transmission including tattooing, skin piercing, electrolysis, beauticians, folk medicine and acupuncture.

The presence of tattoos has been independently associated with an increased risk of HCV infection (MacDonald, Crofts and Kaldor, 1996:139). A number of studies have demonstrated higher prevalence of HCV among persons who have had a tattoo but who have never injected drugs. The NHMRC 1997 report cites Kaldor’s study which found a 27-fold increase in HCV prevalence among blood donors with tattoos (NHMRC, 1997:6). The risk of HCV infection increases with the number of tattooed sites and tattooing done by a non-professional, rather than a professional, tattooist. The NHMRC report suggests that a similar risk exists for other body piercing activities if the equipment was not sterile (1997:6).

### 3.8 OTHER MODES OF HEPATITIS C TRANSMISSION

In addition to the modes of transmission discussed above, three other modes of transmission have been identified: sexual and household transmission and unapparent inoculation. These three are discussed below.

#### 3.8.1 SEXUAL TRANSMISSION OF HCV

Given the blood borne nature of Hepatitis C transmission, it is generally recognised that HCV is not a sexually transmitted disease. However, the evidence is not conclusive. On one hand, several studies support a role for sexual transmission of Hepatitis C. Approximately 10% of persons with reported cases of acute Hepatitis C in the United States report a history of potential sexual exposure. Anecdotal cases of sexual transmission have been reported, and HCV nucleotide sequence homology has been observed in viral isolates from sexual partners (Dienstag, 1997:66S).

However, other observations weigh against sexual transmission of HCV infection. Sexual transmission is negligible in sex-partner studies; alternative risk factors account for many cases of apparent sexual transmission between sexual partners; the prevalence of HCV infection in high-risk groups is much lower than that of other sexually transmitted infections; and the risk of apparently sexually transmitted HCV infection does not always correlate with intensity and duration of sexual exposure (Dienstag, 1997:66S).

Comprehensive reviews of available research are found in (for example) MacDonald, Crofts and Kaldor (1996), MacDonald and Kaldor (undated) and NHMRC (1997). MacDonald and Kaldor (undated:27) conclude that:

*From all available evidence, the rate of sexual transmission appears to be low, particularly in comparison with blood borne transmission, and the rate of sexual transmission for HIV and HBV.*

Wodak made a similar observation when giving evidence to the Committee:

*Sexual transmission is of very low prevalence. A very low proportion of new cases. There is argument about whether it is very, very low or just very low, but it certainly would not be more than one per cent of all new transmissions (Wodak evidence, 2 October 1997).*

Dienstag, in presenting at the US National Institutes of Health Consensus Development Conference on the management of Hepatitis C, concluded that “a consensus is difficult to draw among the many studies reported to date of sexual transmission of Hepatitis C” (Dienstag, 1997:67S). In view of the inconclusive evidence, the NHMRC called for further studies on the role of sexual contact in the transmission of HCV (NHMRC, 1997:12).

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### **3.8.2 HOUSEHOLD OR INTRAFAMILIAL TRANSMISSION OF HCV**

Transmission of HCV to household contacts of people with HCV infection has been investigated in cross-sectional prevalence studies. MacDonald, Crofts and Kaldor note that the prevalence of HCV in this group is “low”, however, they conclude that it is “difficult” to rule out blood borne transmission through items such as razors and toothbrushes as the route of transmission (MacDonald, Crofts and Kaldor, 1996:142). Dienstag noted that studies, particularly those from the United States, have failed to demonstrate any serologic or virologic evidence of HCV transmission to nonsexual partners within households (Dienstag, 1997:69S).

The NHMRC report stated that it seems “reasonable” to conclude that household contact, that does not involve blood or sexual exchange, is epidemiologically “insignificant” (NHMRC, 1997:9). Similarly Dienstag concludes that current data “do not support” household exposure as a risk factor for HCV infection (Dienstag, 1997:69S). MacDonald and Kaldor (undated:28) are more cautious stating that “it is not yet possible to make a conclusive statement about household transmission”.

### **3.8.3 UNAPPARENT INOCULATION**

The Committee was advised that there is a small percentage of people who have Hepatitis C but who do not have any of the known risk factors - they have, for example, never lived overseas, had a blood transfusion, medical procedure or tattoo, or injected drugs (Wodak evidence, 2 October 1997). In such cases, transmission is usually attributed to what is called unapparent inoculation.

### **3.8.4 CONCLUSION**

While injecting drug use is by far the major transmission route for HCV the Committee is aware that sexual and vertical transmission have yet to be conclusively proven. Clearly, as the NHMRC has suggested (1997:12-13) there is a need for further research in at least these two areas to determine exactly how HCV infection is transmitted between sexual partners and from mother to child. The importance of understanding the role these routes may play in transmission has been noted by Dienstag:

*once risk factors for sexual and perinatal transmission, rare as they are, are delineated more accurately, public health officials may be in a better position to make recommendations about limiting transmission of HCV infection in these epidemiologic settings (Dienstag, 1997:69S).*

### 3.9 CONCLUSION

This chapter's discussion has clearly identified injecting drug users, both past and current and those in prison, as the primary population group at risk of contracting Hepatitis C. As Kaldor noted in evidence, there are "probably not other striking patterns or pockets of higher risk in other parts of the population" (Kaldor evidence, 3 October 1997).

The significance of injecting drug users as the primary 'at risk' population group has been succinctly summarised by Crofts who has noted that:

*The major risk group, injecting drug users, is unpopular and finds public advocacy more difficult, often for compelling legal reasons . . . The apparently very low rate of sexual transmission means that the general community does not feel as threatened by Hepatitis C. Hepatitis C lacks the drama and novelty that the HIV epidemic had in abundance, thus making the task of capturing the attention of the public and policy makers much more difficult. The challenge of bringing Hepatitis C under control faces formidable epidemiological, microbiological and political obstacles (Crofts, 1996:231).*