

Epidemiology of hepatitis C virus infection in Australia

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Australian HCV notifications: 1990–2001

From 1990 HCV infection became a notifiable disease in all Australian state and territory health jurisdictions, with notifications rising rapidly to reach a level of approximately 20 000 new diagnoses by 1994 (Figure 1). Since 1994, this level of newly reported HCV diagnoses has been maintained, with cumulative notifications over the period 1990–2001 above 180 000.¹ The vast majority of notifications have been ‘unspecified’ (prevalent) HCV cases, with ‘incident’ (newly acquired) HCV cases (anti-HCV antibody positive following a negative test within the previous 12 months, or acute clinical hepatitis with positive anti-HCV antibody and other causes of acute hepatitis excluded) constituting between 154 and 587 cases per year over the period 1997–2001.¹ The generally asymptomatic nature of newly acquired HCV infection, irregular HCV testing of many people at increased HCV risk, and the resource intensive nature of enhanced HCV surveillance are explanations for the relatively low number of reported newly acquired HCV cases.

The highest rate of HCV notifications is among young adults (20–39 years) and males (65%), with relatively low rates among children and the elderly.¹ HCV notifications in younger age groups have a higher proportion of females, particularly newly acquired HCV cases (Figure 2).¹

Australian HCV transmission

Studies based on HCV notification data from 1993–1994,^{2,3} and a 1995 survey of antenatal women⁴ suggested that around 80% of all HCV infections in Australia had occurred through injecting drug use. Transfusion of blood products before 1990 was reported in 5–10% of HCV cases in these studies, although a higher figure was seen in early blood donor⁵ and liver clinic series.⁶ Other and ‘sporadic’ (unknown) modes of HCV transmission were reported in 10–15% of HCV cases notified,^{2,3} but higher in blood donor⁵ and liver

clinic series. A large proportion of ‘sporadic’ cases are among people born in countries of relatively high HCV prevalence, such as Egypt and Vietnam.⁶

The virtual elimination of blood transfusion acquired HCV infection since the introduction of screening in 1990, and continuing high HCV incidence among injecting drug users (IDUs)⁷ suggested that the proportion of IDU related parenteral HCV transmission would increase further. A recent analysis of newly acquired HCV cases in Australia over the period 1997–2000 in which approximately 90% were associated with a recent history of injecting drug use,⁸ supports this.

Tattooing and body piercing are generally considered risk factors for parenteral HCV transmission⁹ – more so when multiple and performed outside recognised parlours – but only tattooing has been epidemiologically linked to HCV infection in Australia.⁵ Occupational needlestick exposure is a further recognised mode of parenteral HCV transmission.¹⁰ However, its contribution to overall HCV transmission in Australia is likely to be small and HCV prevalence among health care workers approximates the estimated population prevalence.¹¹

Currently, no proven intervention for mother-to-child HCV transmission is available. In Australia there are approximately 250 000 annual births,¹² and an estimated 1% of antenatal women are anti-HCV antibody positive.⁴ Based on an estimated 50% HCV viraemia (HCV-RNA positive) among anti-HCV antibody positive antenatal women and a 6% mother-to-child HCV transmission from viraemic mothers,¹³ approximately 75 children will be born with HCV infection each year in Australia.

The contribution of sexual transmission to overall levels of HCV infection remains controversial.^{14,15} In the United States, the Center for Disease Control and Prevention (CDC) estimate that 20–25% of HCV transmission is associated with sexual contact.¹⁶ In contrast, Australian stud-

ies that have included a detailed HCV risk factor assessment indicate that less than 2% of HCV infection is associated with sexual contact.^{3,17} The proposed explanation for this contrasting picture is greater under reporting of injecting drug use in the USA compared to Australia, rather than different HCV transmission dynamics.⁹

Population groups with high HCV prevalence

There are several population groups in Australia who have clearly been demonstrated to be at high-risk of HCV infection.

People who inject illicit drugs

Australian studies indicate that the proportion of IDUs with HCV infection has been in the range 50–80% since the early 1970s.^{7,18-23} Factors associated with HCV infection among IDUs include:

- older age
- longer duration of injecting
- imprisonment, and
- frequent sharing of injecting equipment.^{18,22}

Based on cross sectional surveys (with dried blood spot HIV and HCV testing) in a network of needle and syringe program (NSP) sites throughout Australia, HCV prevalence among IDUs declined during the mid 1990s (63% in 1995, 51% in 1996, and 50% in 1997).²⁰ Furthermore, HCV prevalence among IDUs with less than three years duration of injecting declined from 22% in 1995 to 13% in 1997.²⁰ However, there is considerable evidence for ongoing and possibly increasing HCV risk among IDUs. Hepatitis C prevalence among IDUs with a duration of injecting less than three years in the NSP survey has increased from 13% in 1997 to 28% in 2001, with prevalence in female IDUs higher than male IDUs.¹ In addition to recent increases in HCV prevalence, the prevalence of injecting drug use has increased during the 1990s.²⁴ In the period 1988–1997, estimated dependent heroin injectors more than doubled, from approximately 33 000 to 70 000.²⁴

People in prison

The prevalence of HCV infection in prison populations in Australia is extremely high. The explanation is almost certainly high levels of injecting drug use, but blood-to-blood contact in tattooing and physical and sexual assaults may play a role.²⁵ Studies in Melbourne²⁶ and Sydney²⁷ showed HCV

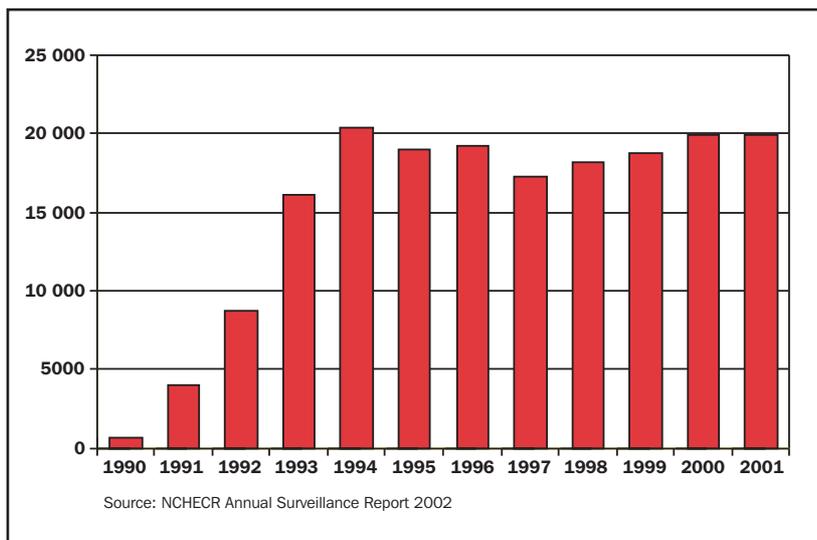


Figure 1. Hepatitis C notifications in Australia, 1990–2001

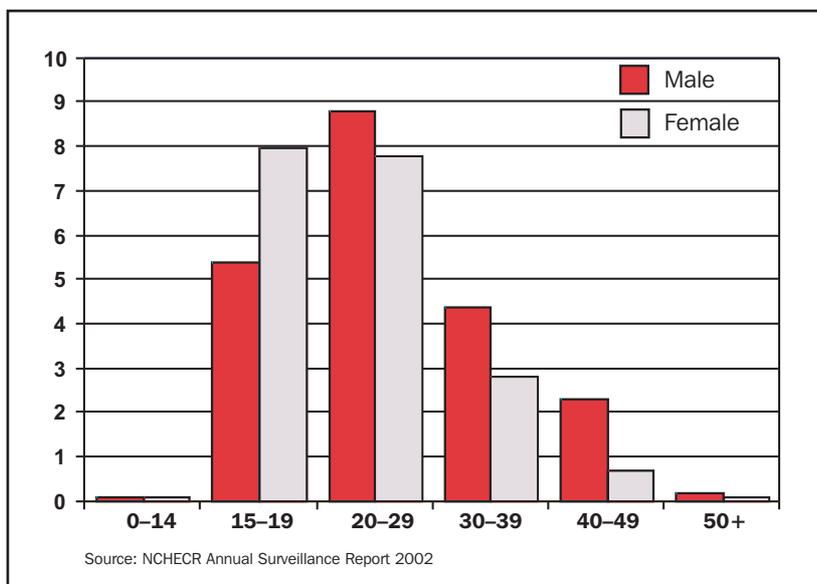


Figure 2. Rate per 100 000 of newly acquired hepatitis C, 2000

prevalence among prisoners of 37–39%, with an increase to approximately 65% among prisoners reporting a history of injecting drug use.

People who received blood products before HCV screening

People with a history of transfusion of blood products before the introduction of HCV screening in February 1990 were at risk of acquiring HCV infection. This risk was highest for those people (eg. male haemophiliacs) who received blood product transfusions from multiple donors. In 1990, an HCV prevalence of approximately 75% was reported among people with haemophilia in Melbourne.²⁸

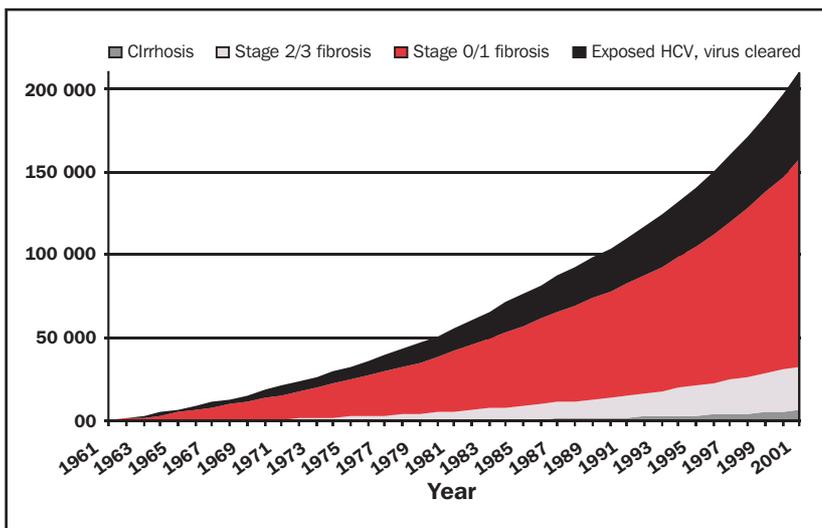


Figure 3. Estimates of hepatitis C epidemic in Australia

Since 1990, the risk of HCV related post-transfusion hepatitis has fallen dramatically. A recent study in Melbourne estimated the risk to be approximately one case per 250 000 donations.²⁹

People born in high prevalence countries

Broadly, regions of high HCV prevalence (>1.0%) include Asia, the Middle East, southern and eastern Europe, and parts of South America and Africa.³⁰

In these regions, a large component of HCV transmission has probably occurred through non-sterile medical, dental and other health care and traditional procedures that have involved blood-to-blood contact. In Egypt, where HCV prevalence is greater than 20% in many areas, unsafe injection practices related to mass schistosomiasis eradication campaigns from 1960–1987 appear to have contributed to rapid HCV spread.³¹

HCV genotype distribution

Several studies have documented the distribution of HCV genotypes within the Australian population.^{32–36} Based on these studies, the most prevalent HCV genotype is genotype 1 (55%), followed by genotype 3 (33%), genotype 2 (8%), genotype 4 (3%), and other genotypes (1%). Associations with HCV genotype include younger age or more recent HCV acquisition (genotype 3), and country of birth (Egypt: genotype 4, Southeast Asia: genotype 6). Although HCV genotype appears to have a limited impact on liver disease progression rates, it has a strong association with response to interferon based antiviral therapy.^{37,38}

Liver disease progression

Based on a recent review of the natural history of chronic HCV infection, risk of progression to cirrhosis is 7% and 20% after 20 and 40 years infection, respectively. Corresponding estimates for HCV related mortality are 1% and 4%.³⁹ However, liver disease progression is highly variable and certain subgroups of people with chronic HCV infection are at increased risk of advanced liver disease. Those groups include people with a heavy alcohol intake those who have co-infection with HIV or HBV, and those who have already progressed to moderate-severe hepatic fibrosis.³⁹

HCV estimates and projections

An estimated 210 000 people in Australia were living with HCV infection at the end of 2001, with estimated HCV incidence increasing from 11 000 in 1997 to 16 000 in 2001.⁴⁰ The number of people estimated to be living with HCV related cirrhosis in 2001 was 5900, and without effective therapeutic intervention was projected to increase to 12 800 by 2010. In Australia, approximately 35 000 people are estimated to have chronic HCV infection and clearly progressive liver disease – evidence of at least moderate hepatic fibrosis (*Figure 3*),⁴⁰ and should be strongly considered for HCV antiviral therapy. The risk of advanced liver disease complications is considerable in this group,⁴¹ therefore, a large proportion will need to access antiviral therapy in the near future if the burden of advanced disease over the next decade is to be limited in Australia.

Conclusion

The HCV epidemic in Australia continues to expand, fuelled by high levels of HCV transmission among IDUs. Despite the widespread introduction of harm reduction measures for IDUs in Australia since the late 1980s, HCV infection remains a constant risk, in particular among those who share injecting equipment, are imprisoned, or who are young. Although a minority of people with chronic HCV infection are estimated to progress to advanced liver disease complications, the expanding HCV epidemic is likely to lead to considerable increases in disease burden over the coming decades.

References are available for this update, email afp@racgp.org.au or visit our website: <http://www.racgp.org.au>

