

Estimates of chronic hepatitis B virus infection in the Northern Territory

Nicholas Wood,¹ Josephine Backhouse,^{1,2} Heather F Gidding,^{1,2} Gwendolyn L Gilbert,^{1,2} Gary Lum,³
Peter B McIntyre¹

Recent estimates of the prevalence of chronic hepatitis B virus (HBV) infection obtained from the first national serosurvey in Australia in 1996–99 range from 91,500 to 163,500 persons (0.49%–0.87%).¹ A large proportion of these infections is known to occur in selected populations, including Indigenous people. Studies in the 1980s and early 1990s estimated that nearly half of all Indigenous schoolchildren had serological markers of HBV infection.^{2,3} A recent report showed that HBV notification and hospitalisation rates in Australia are at least four times higher in Aboriginal and Torres Strait Islander people.⁴ The seroprevalence of HBV infection is likely to differ significantly from the national rate in some areas, particularly the Northern Territory, where approximately 25 per cent of the population is Indigenous and universal infant HBV immunisation has been in place since 1990.⁵

The first national serosurvey established baseline seroprevalence of HBV markers for Australia¹ – derived from sera collected opportunistically from laboratories around Australia between July 1996 and May 1999. States and territories were sampled proportionally to their populations,¹ so not all sera collected from Northern Territory laboratories were tested. In the present study, all available sera from the Northern Territory—mainly from Royal Darwin Hospital—were tested for HBV core antibody (HBcAb) (n=150), and HBV surface antibody (HBsAb) (n=161). Sera in which HBcAb was detected were tested for HBV surface antigen (HBsAg). Population prevalence was calculated by weighting the age-specific prevalence estimates by the age distribution of the 1998 Northern Territory population. Table 1 shows that in 1996–1999 the population prevalence of HBsAb was 41 per cent

(30.1–51.2%), HBcAb 28 per cent (16.4–39.3%), and HBsAg 0.8 per cent (0–1.7%). These are the first estimates of HBV prevalence since the introduction of universal HBV immunisation in the Northern Territory in 1990. The significantly (0.005) higher prevalence of HBsAb in 1–4-year-olds, compared with the national serosurvey (Table 2) reflects the impact of the Northern Territory immunisation program (a national infant program commenced in 2000, after these sera were collected).

The estimated rate of chronic HBV infection in the Northern Territory (0.8%) was similar to that in the national serosurvey. Although the status of subjects whose sera were collected is not known, it was estimated that approximately 50 per cent would be Indigenous people (personal communication, Dr Gary Lum, Director, Northern Territory Government Pathology Service). Compared with the national serosurvey, there was a higher proportion with evidence of past infection (HBcAb positive) at all ages (Table 2). This was particularly noticeable for children aged under nine years, in whom the proportions were more than 15 times higher in the Northern Territory than nationally, even though hepatitis B infections in this age group are preventable by current vaccination programs. Although the number of sera tested was small and individual clinical data are not available, the prevalence in a random sample of Northern Territory Indigenous children, including those from remote regions, would be likely to be higher. More specific studies are needed to examine the impact of the hepatitis B immunisation program in the Northern Territory in more detail.

1. National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases, Westmead, New South Wales
2. Centre for Infectious Diseases and Microbiology, Institute of Clinical Pathology and Medical Research, University of Sydney, Westmead, New South Wales
3. Northern Territory Government Pathology Service, Tiwi, Northern Territory

Corresponding author: Dr Nicholas Wood, Clinical Fellow, National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases, Locked Bag 4001, Westmead NSW 2145. Telephone: +61 2 9845 1429. Facsimile: +61 2 9845 1418. Email: Nicholw3@chw.edu.au

Table 1. Results of the Northern Territory serosurvey for hepatitis B, 1996 to 1999

Age group	HbsAb		HBcAb		HBsAg*		
	Number tested	%pos (95% CI)	Number tested	%pos† (95% CI)	Number tested	%pos‡§	% pos‡ (adjusted est)¶
1–4	28	71.4 (51.3–86.8)	29	13 (3.9–31.7)	3	3.4	3.6
5–9	21	33.3 (14.6–57)	18	11 (1.4–34.7)	1	0	0
10–14	21	33.3 (14.6–57)	21	24 (8.2–47.2)	5	0	0
15–19	49	38.8 (25.2–53.8)	49	34.7 (21.7–49.6)	14	6.1	6.6
20–39	19	47.4 (24.4–71.1)	14	28.5 (8.4–58.1)	2	0	0
Over 40	23	26.1 (10.2–48.4)	19	36.8 (16.3–61.6)	7	0	0
Total¶	161	40.6 (30.1–51.2)	150	27.9 (16.4–39.3)	32	0.8	0.8

CI Confidence intervals.

* Testing for HBsAg was restricted to sera positive for HBcAb.

† %positive or weakly positive (n=7) for HbCAb.

‡ %pos (percentage of sera positive for HBsAg) = number of sera positive for HBsAg x 100 ÷ number of sera tested for HBcAb.

§ There were insufficient sera to confirm the HBsAg status of two subjects, (aged 41 and 17 years, both female). These subjects were excluded from the analysis.

¶ Adjusted est = adjusted estimate of prevalence—missing results distributed according to the distribution of known results.

¶¶ Age group specific prevalence estimates have been weighted by the age distribution of the 1998 Northern Territory population to obtain a population prevalence.

Table 2. Comparison of Australian and Northern Territory serosurvey results for hepatitis B, 1996 to 1999

Age group	HBsAb		HBcAb	
	Australia %pos (95% CI)	Ratio Northern Territory:Australia	Australia %pos (95% CI)	Ratio Northern Territory:Australia
1–4	37.8 (32.9–42.9)	1.9	0.3 (0–1.4)	43.3
5–9	25.2 (21.3–29.3)	1.3	0.6 (0.1–0.7)	18.3
10–14	25.9 (22.0–33.0)	1.3	2.0 (0.4–2.6)	12
15–19	26.8 (22.7–31.2)	1.4	2.9 (1.5–5)	12
20–39	29.9 (24.3–34.7)	1.6	7.9 (1.7–18.2)	3.6
Over 40*	26.8 (21.1–33.1)	0.9	11.1 (5.7–18.4)	3.3
Total†	28.7 (27.0–30.4)	1.4	6.9 (5.4–8.5)	4.1

* National serosurvey results only include those aged 40–59 years, Northern Territory serosurvey results include those age 40–84 years.

† National serosurvey results for the total include those aged 1–59 years, Northern Territory serosurvey results include those aged 1–84 years.

References

- O'Sullivan BG, Gidding HG, Law M, Kaldor JM, Gilbert GL, Dore GJ. Estimates of chronic hepatitis B virus infection in Australia, 2000. *Aust N Z J Public Health* 2004;28:212–216.
- Gardner ID, Wan X, Simms PA, Worswick DA, Burrell CJ, Mathews JD. Hepatitis B virus markers and staff in Northern Territory schools. *Med J Aust* 1992;156:638–641.
- Burrell CJ, Cameron AS, Hart G, Melbourne J, Beal RW. Hepatitis B reservoirs and attack rates in an Australian community. *Med J Aust* 1983;2:492–496.
- National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases. Vaccine preventable diseases and vaccination coverage in Aboriginal and Torres Strait Islander people, Australia, 1999 to 2002. *Commun Dis Intell* 2004;28 Suppl 1.
- Kaldor JM, Plant AJ, Thompson SC, Longbottom H, Rowbottom J. The incidence of hepatitis B infection in Australia: an epidemiological review. *Med J Aust* 1996;165:322–326.