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HEPATITIS A OUTBREAK TRACED TO CONSUMPTION OF WALLIS LAKE OYSTERS

On Monday, February 10, 1997 the AIDS/Infectious Diseases Branch of the NSW Health Department received from South West Sydney Public Health Unit reports of four cases of hepatitis A. Three of these cases had travelled to the mid-north coast of NSW and two reported having consumed oysters while there. All Public Health Units in NSW were asked to initiate active surveillance for hepatitis A, and to inquire from cases about history of travel and food consumption. Eighteen notifications were received on February 10, and 150 cases had been notified by Friday, February 14 with an onset after January 21. This preliminary report outlines an ongoing investigation of this outbreak that has involved staff of Public Health Units, laboratories, general practitioners, the Department of Fisheries, the Environment Protection Authority, local councils, oyster growers, patients, and the NSW Health Department's Epidemiology and Surveillance, Environmental Health, Food and Nutrition and AIDS/Infectious Diseases Branches.

EPIDEMIOLOGY AND CLINICAL FEATURES OF HEPATITIS A

Hepatitis A virus is a small RNA virus from the genus picornaviradae[1]. It is resistant to many disinfection techniques, is commonly found in sewage, and may persist in the environment for weeks. Infection is by the faecal-oral route. After an incubation period of 2-6 weeks, infection causes a 1-2 week illness characterised by fever, malaise, anorexia, nausea and abdominal pain, followed by jaundice. The virus is shed in the faeces late in the incubation period and during the symptomatic stages of the illness. Viral shedding peaks with onset of jaundice and becomes negligible probably a week after this. The usual mode of spread is person-to-person, and is facilitated by poor hygiene and sanitation.

The disease is often mild or unnoticed in children but is more severe in adults. Overall mortality is less than 1 per cent, but is reported to be as high as 2.7 per cent in people aged >50 years[2]. Point source outbreaks linked to infected food handlers or consumption of sewage-contaminated shellfish – particularly oysters – are well described[3]. Immunity to hepatitis A after natural infection is common and lifelong. Improved levels of sanitation in developed countries have led to a large proportion of the population escaping mild childhood disease, but paradoxically have increased the likelihood of severe disease later in adult life.

THE INVESTIGATION

Early interviews with cases indicated that some had eaten oysters bought from the mid-north coast of NSW. When we interviewed the cases using a standard questionnaire, we found that more than 70 per cent reported eating oysters during the incubation period. A matched case-control study on February 14 showed a strong association between illness and consumption of oysters

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Contents

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THE NSW HEPATITIS C LOOKBACK PROJECT

Susanne Benjamin
Hepatitis Lookback Unit, NSW Blood Bank

This article describes the NSW Hepatitis C Lookback Project, the aim of which is to identify recipients of blood products which were possibly contaminated with the hepatitis C virus (HCV), establish whether infection with HCV has ensued, and facilitate recipients' access to clinical and other services where appropriate.

The development of hepatitis in some patients a few months after transfusion has been a world-wide problem. Routine screening of blood donors for the hepatitis B antigen has been done in Australia since the early 1970s to ensure that blood from carriers is excluded from use. Despite this and the use of other exclusion criteria, the problem of post-transfusion hepatitis has persisted.

Before 1990 these cases of "serum" hepatitis were categorised as non-A, non-B hepatitis. In the late 1980s the hepatitis C virus was discovered and a serological test was subsequently developed to detect evidence of the virus. HCV is recognised to be the predominant cause of non-A, non-B hepatitis, and the infection which results is referred to as hepatitis C[1]. Since acute hepatitis C is usually subclinical, it is difficult to determine accurately when infection occurred. Thus, when a blood donor is identified as HCV positive, every component donated should be treated as potentially infectious. Since the introduction of hepatitis C antibody screening of all blood donations, clinical post-transfusion hepatitis has been virtually eliminated in Australia.

DEFINING "LOOKBACK"

"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. Where a component has been transfused, a "lookback" investigation includes identification of the recipient and testing for evidence of infection. Identification of people with transfusion-acquired infection is important to ensure they receive clinical management and counselling. It is an onerous task, limited by the accuracy of records and changes which occur with the passage of time.

HEPATITIS C LOOKBACK IN NSW

Serological testing for HCV began in NSW in February 1990. With its introduction, a number of routine blood donors were identified as hepatitis C positive and lookback was initiated on some components for hepatitis C. Until recently the extent of this process was limited. After prolonged discussions by State and Commonwealth health authorities, it was agreed late in 1995 that an extended donor-triggered HCV lookback should proceed nationwide. In NSW this is being undertaken as a joint endeavour of the NSW Red Cross Blood Transfusion Service (BTS) and NSW Health Department's AIDS/Infectious Diseases Branch.

The project, which is managed by the Hepatitis Lookback Unit at the BTS, was designed to review all donations made by HCV positive donors, in all 28 Blood Banks in NSW, as far back as 1983. An HCV positive donor is defined as a blood donor who has tested both anti-HCV antibody positive by enzyme-linked immunosorbent assay (EIA) and immunoblot. The database of donors requiring Lookback is yet to be finalised. Estimates suggest there will be more than 800 donors in the cohort.

KEY POINTS – HEPATITIS C LOOKBACK

- Acute hepatitis C infection is usually subclinical.
- Before the discovery of the hepatitis C virus and the advent of serological screening to detect its presence, it was possible for a person with hepatitis C to be a hidden infection risk and donate blood.
- HCV is recognised as the major cause of post-transfusion non-A non-B hepatitis.
- Since the introduction of hepatitis C antibody screening of all blood donations, clinical post-transfusion hepatitis has been virtually eliminated in Australia.
- The Hepatitis C Lookback Project aims to identify recipients of blood contaminated with the hepatitis C virus and facilitate access to appropriate counselling and medical advice.

Information on the fate of implicated blood products is to be gathered from institutions to which blood was dispatched. Where a product was transfused, the Hepatitis Lookback Unit will trace recipients and screen them for evidence of HCV. It is planned that clinical activities including recipient testing, ongoing care such as specialist referral, follow-up testing, and testing of intimate contacts, will be managed by the recipient's family doctor. Due to the difficulties in establishing a diagnosis and the low risk of transmission to close contacts, no further tracing will be done if a recipient is deceased.

WHAT IS THE HEPATITIS C LOOKBACK TRYING TO ACHIEVE?

Hepatitis C causes inflammation of the liver and can be transmitted via blood and other body fluids. The striking feature of HCV is its ability to persist in the host, and studies indicate it is a disease with a long latency, with the mean interval for exposure to onset of symptoms being 13 years. Chronic hepatitis occurs in the majority (>70 per cent) of people infected by HCV[3]. After several years some of those with persistent infection develop liver failure and/or hepatocellular carcinoma[4].

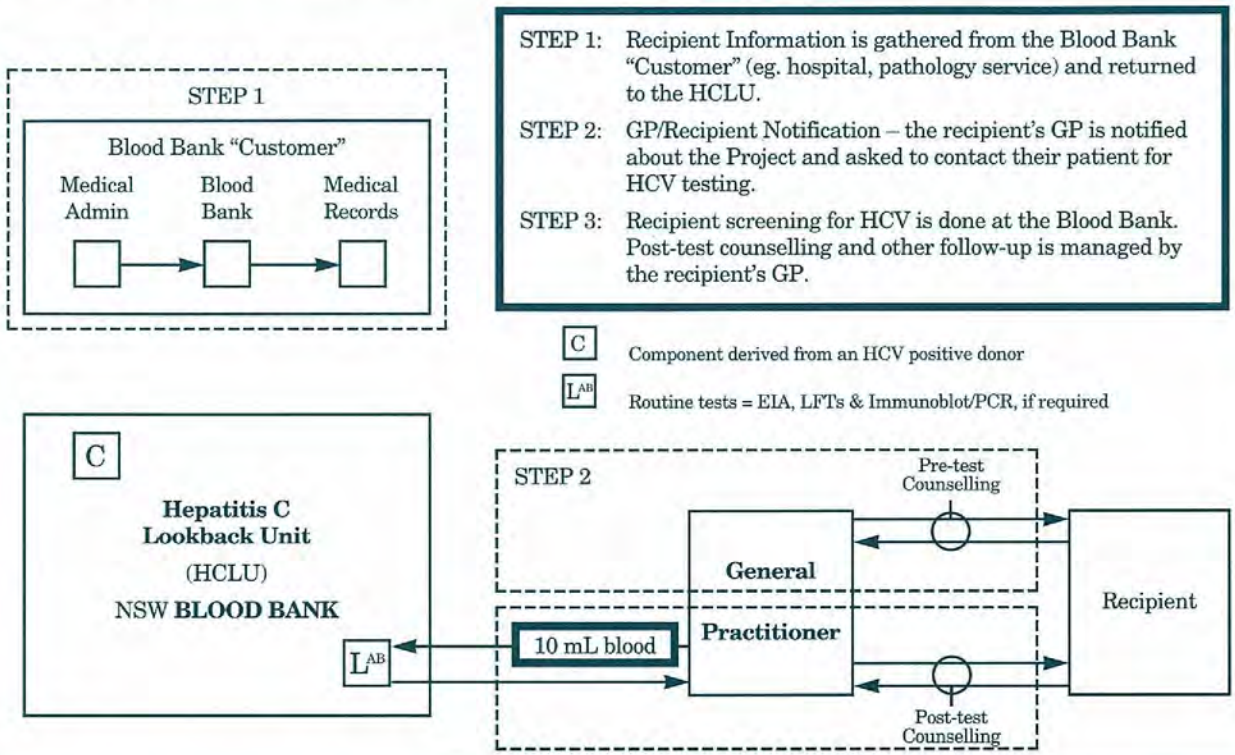
Given the insidious nature of chronic hepatitis C infection, the Australian Red Cross believes it has a public health duty to identify people who have acquired hepatitis C infection from transfusion, to ensure they have every opportunity to receive appropriate care. Early access to medical treatment and counselling is likely to reduce the risk of transmission of the virus and provide the opportunity possibly to minimise long-term effects of chronic infection.

Recipients will learn about HCV and the Lookback Project from their general practitioner (GP). It is acknowledged that GPs are likely to have limited detailed knowledge about the virus, so the Hepatitis C Lookback Unit will distribute information to these doctors at the time of testing and provide additional resources as required. Information provided routinely will include brochures from the Hepatitis C Council and the Transfusion Related AIDS and Infectious Diseases Unit (TRAIDS). The Hepatitis C Council offers a general Information and Support Line service to the wider community, and TRAIDS has a specific responsibility to offer crisis counselling and long-term

FIGURE 1

LOOKBACK PROCESS

This flow diagram illustrates the process of tracing a component suspected to have been contaminated with an infectious agent. In the case of the Hepatitis Lookback Project the agent is the hepatitis C virus.



counselling to clients who have acquired an infection through a medical procedure.

More information on the Hepatitis C Lookback Project may be obtained from Dr Susanne Benjamin, Hepatitis Lookback Unit, NSW Blood Bank, on (02) 9229 4349 or (02) 9229 4444.

The Blood Bank thanks all those who have assisted in this and other Lookback work.

1. Ismay SL, Thomas S, Fellows A, Keller A, Kenrick KG, Archer GT, Wylie BR, Cossart Y. Post-transfusion hepatitis revisited. *Med J Aust* 1995; 163:74-77.
2. Alter HJ. To C or not to C: these are the questions. *Blood* 1995; 85(7):1681-1695.
3. Tong MJ, NS El-Farra, Reikes AR, Co RL. Clinical Outcomes after Transfusion Associated Hepatitis C. *New Engl J Med* 1995; 332:1463-1466.
4. Alter HJ, Purcell RH, Shih JW et al. Detection of antibody to hepatitis C virus in prospectively followed recipients with acute and chronic non-A non-B hepatitis. *New Engl J Med* 1989; 321:1494-1500.

PUBLIC HEALTH EDITORIAL STAFF

The editor of the *NSW Public Health Bulletin* is Dr Michael Frommer, Director, Centre for Research and Development, NSW Health Department. Dr Lynne Madden is production manager.

The *Bulletin* aims to provide its readers with population health data and information to motivate effective public health action. Articles, news and comments should be 1,000 words or less in length and include a summary of the key points to be made in the first paragraph. References should be set out using the Vancouver style, the full text of which can be found in *British Medical Journal* 1988; 296:401-5.

Please submit items in hard copy and on diskette, preferably using WordPerfect, to the editor, *NSW Public Health Bulletin*, Locked Mail Bag 961, North Sydney 2059. Facsimile (02) 9391 9029.

Please contact your local Public Health Unit to obtain copies of the *NSW Public Health Bulletin*. The *Bulletin* can be accessed via the Internet from the NSW Health Department's World Wide Website, at http://www.health.nsw.gov.au/public-health/phb/phb.html

Back issues can be obtained from the Better Health Centre, Locked Mail Bag 961, North Sydney 2059. Telephone: (02) 9954 1193, Facsimile (02) 9955 5196.

THE NSW PUBLIC HEALTH OFFICER TRAINING PROGRAM PLACEMENTS, 1997

Four Public Health Officers completed their competencies and have left the program.

They are:
Suzanne Blogg
Hugh Burke
Gerard Fitzsimmons
Jeannine Liddle

All four have been successful in securing positions and we wish them well in their careers.

Four new trainees joined the program in February 1997.

They are:
Mark Bartlett
Larissa McIntyre
Julianne Quaine
Sarah Thackway

TABLE 1

1997 PUBLIC HEALTH OFFICER PLACEMENTS

YEAR	NAME	FIRST PLACEMENT FEB-AUG	SECOND PLACEMENT AUG-JAN
1st	Mark Bartlett	Western Sector Public Health Unit Western Sydney Area Health Service	Western Sector Public Health Unit Western Sydney Area Health Service
1st	Larissa McIntyre	Centre for Disease Prevention & Health Promotion, Public Health Division	To be determined
1st	Julianne Quaine	Health Improvement Branch Performance Management Division	Health Improvement Branch Performance Management Division
1st	Sarah Thackway	Epidemiology & Surveillance Branch Centre for Research & Development Public Health Division	Epidemiology & Surveillance Branch Centre for Research & Development Public Health Division
2nd	Seham Tawfick Girgis	Needs Assessment & Health Outcomes Unit (NAHOU) Central Sydney Area Health Service	To be determined
2nd	Anthony Hogan	Illawarra Public Health Unit Illawarra Area Health Service	Illawarra Public Health Unit Illawarra Area Health Service
2nd	Katherine Jong	NSW Cancer Council Kings Cross	NSW Cancer Council Kings Cross
2nd	Mary Osborn	Far West Rural Health Training Unit, Broken Hill Contract & Service Performance Branch Performance Management Division	Far West Rural Health Training Unit, Broken Hill Contract & Service Performance Branch Performance Management Division
2nd	Michele Puech	Epidemiology & Surveillance Branch Centre for Research & Development Public Health Division	Epidemiology & Surveillance Branch Centre for Research & Development Public Health Division
3rd	Deborah Baker	South West Centre for Public Health Greater Murray Area Health Service	To be determined
3rd	Tony Butler	Centre for Clinical Policy & Practice Public Health Division	Centre for Clinical Policy & Practice Public Health Division
3rd	Stephen Conaty	AIDS & Infectious Diseases Branch Centre for Disease Prevention & Health Promotion, Public Health Division	AIDS & Infectious Diseases Branch Centre for Disease Prevention & Health Promotion, Public Health Division
3rd	Valerie Delpech	North Coast Public Health Unit Northern Rivers Area Health Service	North Coast Public Health Unit Northern Rivers Area Health Service
3rd	Veth Guevarra	Central Sydney Public Health Unit Central Sydney Area Health Service	Central Sydney Public Health Unit Central Sydney Area Health Service
3rd	Stephen Hooppell	Leave without pay	To be determined
3rd	Glenis Lloyd	Environmental Health, Food & Nutrition Branch, Centre for Disease Prevention & Health Promotion, Public Health Division	To be determined

METHOD FOR EVALUATING RESEARCH AND GUIDELINE EVIDENCE

Jeannine Liddle,
Centre for Clinical Policy and Practice

The NSW Health Department has published a monograph entitled *Method for Evaluating Research and Guideline Evidence* (MERGE)[1]. The monograph sets out a standardised approach to the process of reviewing and incorporating scientific evidence into clinical practice guidelines. MERGE is intended to assist in the application of principles for the development of guidelines, as proposed by the National Health and Medical Research Council's Quality of Care and Health Outcomes Committee. These principles are:

- Clinical practice guidelines should be based on the best available evidence.
- The method used to synthesise the evidence should be the strongest available.
- Guidelines should contain a statement concerning the strength of evidence[2].

MERGE was written with input from epidemiologists working in Australia, the Cochrane Collaboration and clinician members of the NSW Health Department's Expert Panel on Diabetes Guidelines Working Group. The monograph consists of a series of checklists for evaluating the quality of evidence both from individual studies and intervention guidelines. It includes examples related to the management of diabetes.

Copies of MERGE can be obtained from the Better Health Centre, 162 Blues Point Road, North Sydney, NSW 2060. Facsimile: (02) 9955 5196, telephone: (02) 9954 1193.

MERGE is also available on the NSW Health Department website: http://www.health.nsw.au/public health

1. Liddle J. Williamson M, Irwig L. Method for Evaluating Research and Guideline Evidence. NSW Health Department, Sydney, December 1996.
2. NHMRC Quality of Care and Health Outcomes Committee. Guidelines for the development and implementation of clinical practice guidelines. Australian Government Publishing Service, Canberra, October 1995.

Hepatitis A outbreak

► Continued from page 1

(unadjusted matched odds ratio 7, p<0.001). In the great majority of instances where the source of the oysters was known, it was Wallis Lake. That day, a public warning was issued, linking the outbreak to consumption of Wallis Lake oysters. In collaboration with the oyster industry and other government departments, harvesting of these oysters was ceased and steps towards a voluntary recall of the product were begun.

As of March 9, 1997, we had received more than 370 notifications of hepatitis A cases with onset after January 21 (almost four times the number expected for this time of year). Over a similar period, excess cases were also recorded in Queensland, South Australia, Victoria and the Australian Capital Territory. One death – that of a man aged 77 years – has been attributed to the epidemic. The peak reported date of onset was February 3 (28 cases), and the peak reported date of oyster purchase among cases who ate oysters on a single occasion during their incubation period was January 4. Hepatitis A virus was identified by polymerase chain reaction amplification (PCR) techniques in a batch of oysters taken from a Wallis Lake oyster lease on February 18.

Wallis Lake (one of the estuarine Great Lakes on the mid-north coast of NSW, in the Forster-Tuncurry area) is one of the largest oyster growing areas in Australia. During the Christmas and New Year period, the distribution of the Sydney Rock Oyster (the species grown in Wallis Lake) was extensive. An environmental audit of the Lake and environs is in progress. An inter-Departmental task force, chaired by the Chief Health Officer, is working on the definition of criteria to be fulfilled before the lake can be reopened for oyster harvesting.

A more complete report of the outbreak investigation will appear in a future issue of the *NSW Public Health Bulletin.*

1. Melnick JL. History and Epidemiology of Hepatitis A virus. *JID* 1995; 171(suppl 1):S2-8.
2. Benenson AS (Ed). Control of Communicable Diseases Manual (16th Edition). American Public Health Association.
3. Desenclos JA, Klontz KC, Wilder MH et al. A multistate outbreak of hepatitis A caused by the consumption of raw oysters. *Am J Public Health* 1991; 81:1268-1272.

FIGURE 2

REPORTS OF SELECTED INFECTIOUS DISEASES, NSW, 12 MONTHS TO DECEMBER 1996 BY MONTH OF ONSET (WITH HISTORICAL COMPARISON)

Due to data collation problems, historical rubella data are unavailable, and figures printed in previous *Bulletins* may have been inaccurate.

Jan 96-Dec 96 **Mean Jan 93-Dec 95**

INFECTIOUS DISEASES

TRENDS

Reports of **pertussis** continued to increase in NSW in the latter quarter of 1996 (see below), and reports of **hepatitis A,** while down on historical levels across the State, increased in the west of the State through to the end of December (Figure 2). A much larger point source outbreak was identified in February (see page 1 in this issue). An increased number of largely unrelated cases of **meningococcal disease** was reported in December. Reports of people diagnosed with **AIDS** leaped to 85 in December (Table 2), thanks to enhanced surveillance by clinical and public health staff around the State. Accurate counting of the burden of HIV disease is vital to ensure that resources are provided for HIV services; the Commonwealth provides funding for HIV services on a capitation basis.

THREE NSW CHILDREN DIE FROM WHOOPING COUGH IN THREE MONTHS

On January 5, 1997, a six-week-old boy, who lived in rural NSW, died of pertussis infection. The baby was admitted to his local hospital on January 3 and transferred to an Adelaide children's hospital for treatment before he died. The boy's siblings and mother were also diagnosed with a pertussis-like illness. A preliminary study by the local Public Health Unit indicated immunisation rates among infants in the boy's community were poor. A local immunisation campaign and clinic were held in mid-January to help protect other children at risk.

The infant's death was the third from pertussis in three months. Late in 1996 two infants (one from Sydney, one from rural NSW) also died from pertussis. Both were aged <2 months.

Reports of pertussis cases in NSW have been increasing in recent months (Figure 2). In 1996, 1,109 cases were reported, including 152 in December (Table 2). In January 1997 doctors from the New Children's Hospital reported an alarming increase in pertussis cases, including several children who required intensive care.

In response to the deaths, the Department issued a warning to parents urging them to ensure their children were up to date on all their immunisations, and to seek early medical care if the children developed symptoms suggestive of pertussis. Doctors are urged to report suspected cases to Public Health Units and, with the assistance of PHU staff, to identify close contacts of cases who may require erythromycin antibiotic prophylaxis.

ARBOVIRUS WARNING

Arbovirus infections are a common cause of illness among rural residents of NSW. The two most commonly reported arboviruses in the State are Ross River virus and Barmah Forest virus. Both cause similar symptoms, and have similar modes of transmission and prevention.

Ross River virus infections

The 1996 outbreak of Ross River virus infection was the largest recorded in recent years. From January 1, 1996 until mid-January 1997, 1,112 cases of Ross River virus were reported, including 1,049 reported between January 1 and December 31, 1996. In previous years the numbers of notified cases were: 242 in 1995, 334 in 1994, 595 in 1993, 328 in 1992 and 306 in 1991. Since January 1996 most cases have been reported from the north coast, New England area, and western and south-east areas of NSW. Cases were evenly distributed by sex, few children were reported with infection, and incidence peaked in middle age (Table 4). Most cases were reported in February and March, and reports steadily declined to a low in September (Figure 3). Reports of Ross River virus infection began to increase again in January 1997.

Barmah Forest virus infections

Serological testing for Barmah Forest infection has been widely available only since 1994. In NSW since January 1996, 172 cases have been reported, including 166 in 1996. In previous years, the numbers of notified cases were: 285 in 1995, 41 in 1994, and 25 in 1993. Since January 1996, most cases have been reported from the north coast, and a few cases have been reported from New England. In contrast to Ross River virus infection, most Barmah Forest cases lived on the north coast, were men (relative risk 1.4, $p<0.02$), and a greater proportion were aged 35 years or more (relative risk 2.2, $p<0.001$) (Table 4). The reasons for these differences require further analysis, but may merely reflect differences in the demographic structure of the populations affected by the outbreaks. Most cases were reported in March and April, declining to a low in November (Figure 3).

Transmission and symptoms

Both viruses are transmitted by mosquitoes. There is no evidence that the infections are spread by direct person-to-person contact. Major outbreaks have been reported across Australia. Ross River virus infections have also been reported in the Pacific Islands.

Symptoms usually begin 3-11 days after the bite of an infected mosquito, and include arthritis, mainly in the wrists, knees, ankles and small joints of the hands and feet. The arthritis is often followed up to 10 days later by a maculopapular rash, mainly on the trunk and limbs. The rash does not usually itch, and resolves after 7-10 days. Swollen lymph nodes are often present in the neck, and fever may be absent. A few patients report pins and needles or tenderness in the palms and soles. Infection is followed by recovery and immunity to reinfection[1]. Many people can be infected without symptoms, however, and disease is rarely reported in children.

Reporting

Under the Public Health Act 1991, laboratories are required to notify PHUs of people diagnosed with arbovirus infections. It is likely that many cases of infection will not be notified to PHUs, because many infected people will have mild symptoms and will not consult a doctor, let alone have a blood test.

Prevention

Because arbovirus infections tend to occur in large outbreaks, and there is no specific treatment, prevention is the key to control. No vaccine has been developed to protect against Ross River virus or Barmah Forest virus infections.

Personal prevention measures include:

- education about the disease, its spread and control;
- wire screening of sleeping and living areas, including use of mosquito nets;
- avoidance of mosquitoes during the hours of biting (around and soon after sunset);

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TABLE 2

INFECTIOUS DISEASE NOTIFICATIONS FOR NSW RECEIVED IN DECEMBER 1996, BY AREA HEALTH SERVICES

Condition	Area Health Service																	Period	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	Total for Dec**	Total to date**
Blood-borne and sexually transmitted																			
AIDS	11	5	1	4	2	1	1	4	52	–	–	–	–	–	–	–	1	85	503
HIV infection*	HIV infection reported bi-monthly																		
Hepatitis B – acute viral*	–	–	1	–	–	1	–	–	2	–	–	–	–	–	–	–	–	4	46
Hepatitis B – other*	40	28	98	4	76	5	5	3	38	1	3	1	–	–	–	3	4	312	4,934
Hepatitis C – acute viral*	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	22
Hepatitis C – other*	49	26	156	57	99	19	21	16	130	6	10	13	9	24	–	6	12	653	9,236
Hepatitis D – unspecified*	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	2	11
Hepatitis, acute viral (NOS)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Gonorrhoea*	1	3	1	–	–	–	–	1	18	1	1	3	2	–	–	–	–	31	536
Syphilis	1	1	4	1	10	–	–	–	3	–	1	2	2	1	2	–	–	28	748
Vector-borne																			
Arboviral infection*	–	–	2	1	2	–	4	–	1	2	8	1	1	–	1	4	2	29	1,260
Malaria*	–	1	4	–	1	1	–	2	2	–	–	–	–	–	–	1	–	12	216
Zoonoses																			
Brucellosis*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Leptospirosis*	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	1	–	3	30
Q fever*	–	–	–	–	–	–	1	–	–	1	2	5	10	–	5	–	1	25	284
Respiratory/other																			
Legionnaires' disease	–	2	1	–	1	–	–	–	–	–	–	–	–	1	–	–	–	5	67
Meningococcal (invasive) infection	–	3	1	3	–	2	1	–	2	–	–	2	–	–	–	–	–	14	162
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Mycobacterial tuberculosis	–	3	7	–	4	–	–	2	4	–	–	–	–	1	–	–	–	21	425
Mycobacteria other than TB	1	2	7	1	5	3	–	–	4	–	–	–	–	–	–	–	1	24	445
Vaccine-preventable																			
Adverse event after immunisation	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	1	3	47
H.influenzae (invasive) infection	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	13
Measles	–	1	2	–	1	1	2	–	2	1	–	–	–	–	–	–	–	10	204
Mumps*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	28
Pertussis	6	29	15	19	6	7	20	3	16	1	1	16	4	–	3	5	1	152	1,109
Rubella*	1	4	3	2	–	2	1	2	4	–	1	1	–	–	–	–	6	27	651
Faecal-oral																			
Cholera*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Foodborne illness (NOS)	–	–	–	–	–	–	49	–	–	–	–	–	2	–	1	–	–	52	225
Gastroenteritis (instit)	–	–	–	–	–	–	57	–	–	–	–	–	1	–	–	–	–	58	569
Hepatitis A	4	–	8	–	4	–	3	1	2	1	1	2	4	1	5	1	1	38	980
Listeriosis*	–	–	–	–	2	1	–	–	1	–	–	–	–	–	–	1	–	5	20
Salmonellosis (NOS)*	5	24	12	7	7	4	5	5	17	4	2	6	2	3	–	5	4	112	1,226
Typhoid and paratyphoid*	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	3	40

* lab-confirmed cases only
** includes cases with unknown postcode

Abbreviations used in this Bulletin:
CSA Central Sydney Health Area, SES South Eastern Sydney Health Area, SWS South Western Sydney Health Area, WSA Western Sydney Health Area, WEN Wentworth Health Area, NSA Northern Sydney Health Area, CCA Central Coast Health Area, ILL Illawarra Health Area, HUN Hunter Health Area, NRA Northern Rivers Health Area, MNC Mid North Coast Health Area, NEA New England Health Area, MAC Macquarie Health Area, MWA Mid West Health Area, FWA Far West Health Area, GMA Greater Murray Health Area, SA Southern Health Area, OTH Interstate/Overseas, U/K Unknown, NOS Not Otherwise Stated.

Please note that the data contained in this Bulletin are provisional and subject to change because of late reports or changes in case classification. Data are tabulated where possible by area of residence and by the disease onset date and not simply the date of notification or receipt of such notification.

TABLE 3

INFECTIOUS DISEASE NOTIFICATIONS FOR NSW RECEIVED IN JANUARY 1997, BY AREA HEALTH SERVICES

Condition	Area Health Service																	Period	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	Total for Jan**	Total to date**
Blood-borne and sexually transmitted																			
AIDS	4	5	2	1	4	2	6	12	32	1	–	–	–	1	–	2	1	79	79
HIV infection*	7	1	–	–	–	1	–	1	11	–	2	–	–	–	–	–	–	45	45
Hepatitis B – acute viral*	–	–	1	–	–	1	–	–	1	–	–	–	–	–	–	–	–	2	2
Hepatitis B – other*	46	35	51	5	94	2	6	5	26	7	5	5	–	2	–	1	–	290	290
Hepatitis C – acute viral*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hepatitis C – other*	63	54	125	42	81	25	33	12	134	35	13	8	–	3	–	11	29	670	670
Hepatitis D – unspecified*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hepatitis, acute viral (NOS)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Gonorrhoea*	9	3	7	–	3	1	–	–	25	–	1	2	–	–	–	–	–	51	51
Syphilis	10	1	4	1	1	–	–	–	14	2	1	3	–	2	–	–	–	39	39
Vector-borne																			
Arboviral infection*	–	1	1	–	1	–	5	1	1	6	15	6	–	4	5	58	1	105	105
Malaria*	2	–	2	–	1	–	1	–	–	2	–	1	–	–	–	1	2	12	12
Zoonoses																			
Brucellosis*	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	1
Leptospirosis*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1
Q fever*	–	–	1	–	–	–	1	1	1	4	2	7	–	–	–	–	1	17	17
Respiratory/other																			
Legionnaires' disease	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1
Meningococcal (invasive) infection	–	1	2	1	–	1	–	1	4	1	–	–	–	–	–	–	–	11	11
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mycobacterial tuberculosis	–	5	3	–	4	–	–	1	2	–	–	–	–	–	–	–	–	15	15
Mycobacteria other than TB	10	–	2	2	4	1	–	–	5	–	1	1	–	–	–	2	–	28	28
Vaccine-preventable																			
Adverse event after immunisation	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2	4	4
H.influenzae (invasive) infection	–	–	–	1	–	1	–	2	–	–	–	–	–	–	–	–	–	4	4
Measles	–	–	2	–	–	1	1	1	1	1	1	–	–	–	–	–	–	8	8
Mumps*	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	4	4
Pertussis	10	23	27	12	15	6	16	5	18	3	6	8	–	6	–	9	1	165	165
Rubella*	4	7	2	–	1	–	–	–	6	2	–	1	–	–	–	–	–	23	23
Faecal-oral																			
Cholera*	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Foodborne illness (NOS)	20	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	21	21
Gastroenteritis (instit)	–	–	–	–	–	–	43	–	–	–	–	–	–	–	–	–	–	43	43
Hepatitis A	4	3	7	2	4	–	8	1	3	5	5	7	–	3	–	–	2	54	54
Listeriosis*	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	3
Salmonellosis (NOS)*	5	17	18	12	2	2	10	5	27	13	4	5	–	1	–	4	8	133	133
Typhoid and paratyphoid*	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1

* lab-confirmed cases only
** includes cases with unknown postcode

Infectious diseases

► Continued from page 7

- when going outside during the biting hours, wearing loose-fitting long sleeves and long pants, and applying insect repellents on exposed skin;
- elimination of breeding sites around houses and destruction of mosquito larvae; and
- destruction of mosquitoes by residual and space spraying of houses.

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LYSSAVIRUS INFECTION STUDY

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The NSW Health Department has undertaken a retrospective study to determine whether cases of encephalitis for which no cause was recorded may have been due to lyssavirus infection. The impetus for this study arose from the investigation of the death of a Queensland woman from encephalitis attributed to lyssavirus infection.

Until 1996 there had been no reports of *Lyssavirus* infection acquired in Australia by humans or animals. A genotype of *Lyssavirus* causes rabies, and two human cases of rabies were reported in Australia – one in 1987, and the other in 1990. Both cases were linked to exposures overseas (in India[1] and South East Asia[2] respectively).

In 1996 a new genotype of *Lyssavirus* was discovered in two species of fruit bats in NSW and Queensland[3], and reportedly also in an insectivorous yellow-bellied sheath-tail bat. This virus is genetically distinct from the other six genotypes of *Lyssavirus*. Laboratory studies have shown that rabies vaccine and rabies immunoglobulin protected laboratory animals against infection with the newly identified *Lyssavirus* genotypes[4], suggesting they would also protect against infection in humans similarly exposed.

Little is known about the pathogenesis, transmissibility or epidemiology of the virus in bats. It does appear, however, that *Lyssavirus* infection gives rise to clinical disease in bats[4], and has caused encephalitis (and subsequent death) in a Queensland woman who was bitten and scratched by bats[5]. Following from the identification of the newly identified *Lyssavirus* which caused this death, the October 1996 issue of the *NSW Public Health Bulletin* gave recommendations from Lyssavirus Expert Group of the Communication Diseases Network Australia and New Zealand on dealing with patients who had been in contact with bats.

The investigation of previously unexplained cases of encephalitis is being undertaken because, until now, *Lyssavirus* infection may not have been suspected. We searched death records in the NSW Registry of Births, Deaths and Marriages for deaths between 1985 and 1995 of people aged <60 years who died of unexplained encephalitis. In addition, neuropathologists and forensic pathologists in the State were asked to recall these and other cases of unexplained encephalitis in recent years. Where possible, brain tissue will be submitted for testing for *Lyssavirus* at the Australian Animal Health Laboratory in Victoria. Results of this investigation will be reported in a future issue of the *Bulletin*.

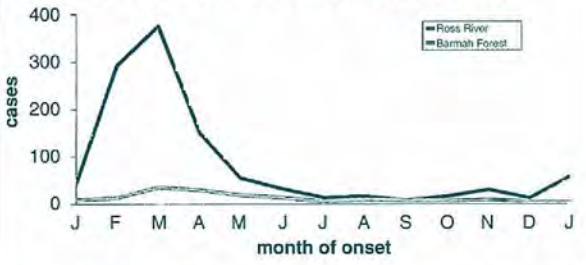
TABLE 4

REPORTED CASES OF BARMAH FOREST INFECTION AND ROSS RIVER VIRUS INFECTIONS, NSW, JANUARY 1, 1996 TO MID-JANUARY 1997

	Barmah Forest N (%)	Ross River N (%)
Sex		
male	102 (59)	552 (50)
female	70 (41)	558 (50)
Age (years)		
<15	1 (1)	34 (3)
15-24	10 (6)	105 (9)
25-34	17 (10)	224 (20)
35-44	57 (33)	268 (24)
45-54	38 (22)	214 (19)
55-64	20 (12)	144 (13)
>64	26 (15)	117 (11)
unknown	3 (2)	6 (1)
Place of residence		
Sydney	5 (3)	34 (3)
North Coast	138 (80)	314 (28)
New England	15 (9)	267 (24)
Hunter	1 (1)	80 (7)
Central Coast	1 (1)	10 (1)
Illawarra	2 (1)	12 (1)
Central West NSW	0 (0)	24 (2)
Western NSW	4 (2)	220 (20)
South Western NSW	2 (1)	138 (12)
South Eastern NSW	4 (2)	13 (1)
Total	172 (100)	1,112 (100)

FIGURE 3

REPORTS OF ROSS RIVER VIRUS AND BARMAH FOREST VIRUS INFECTIONS, NSW, JANUARY 1996 TO JANUARY 1997, BY MONTH OF ONSET



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