Parvovirus B19 infection and its significance in pregnancy

GLGilbert
Centre for Infectious Diseases and Microbiology, Institute of Clinical Pathology and Medical Research, Westmead Hospital, Westmead, New South Wales, 2145
Email: lyng@icpmr.wsahs.nsw.gov.au

Abstract

Parvovirus B19 causes prolonged epidemics of erythema infectiosum, particularly in primary school-aged children. Infection causes clinically significant anaemia in individuals with high red cell turnover, including the fetus. Approximately 40% of women of childbearing age are susceptible, and annual seroconversion rates vary from 1.5% during endemic periods to 10-15% during epidemics. Infection occurs in around 50% of susceptible women exposed at home and 20-30% following occupational exposure (for example, at a primary school). Maternal infection in the first half of pregnancy is associated with 10% excess fetal loss and hydrops fetalis in 3% of cases (of which up to 60% resolve spontaneously or with appropriate management). No congenital abnormalities or long-term sequelae have been attributed to parvovirus B19 infection. The overall risk of serious adverse outcome from occupational exposure to parvovirus B19 infection during pregnancy is low (excess early fetal loss in 2-6/1,000 pregnancies and fetal death from hydrops in 2-5/10,000 pregnancies). It is not recommended that susceptible pregnant women be excluded routinely from working with children during epidemics. ***Commun Dis Intell*** **2000;24:69-71.**

Keywords: parvovirus B19, pregnancy, erythema infectiosum, hydrops fetalis

Clinical features and pathogenesis

The clinical features and pathogenesis of parvovirus B19 have been described in two reports.[1,2] Human parvovirus B19 causes an acute, usually self-limiting, infection which is often asymptomatic. The usual clinical manifestation is erythema infectiosum (fifth disease), characterised by a mild prodrome – mild fever, malaise, myalgia – followed by a biphasic rash. A bright red malar eruption, 'slapped cheek syndrome', with circumoral pallor is followed by a maculopapular rash on the extremities and trunk, which fades to a reticular appearance and often recurs, transiently, for weeks. In adult women particularly, parvovirus infection can cause symmetrical polyarthralgia or arthritis, predominantly affecting peripheral joints,

ISSN 0725-3141
Volume 24
Supplementary
March 2000

Contents

cont'd next page

which usually lasts 1-3 weeks or occasionally longer.

The virus primarily infects erythroid precursors and causes haemolytic anaemia, which is subclinical and spontaneously reversible in otherwise normal people. In individuals with high red cell turnover, as in sickle cell anaemia, parvovirus infection can cause acute aplastic crisis, which can be life threatening but is ultimately self-limiting. In people who are immunocompromised, parvovirus infection can cause chronic infection and red cell aplasia or pancytopenia. Fetal infection is usually benign and self-limiting but, in a small proportion, causes severe anaemia and hydrops fetalis, usually in the second trimester.

Epidemiology

The spread of parvovirus B19 is by the respiratory route and usually occurs immediately before the onset of rash. The incubation period is from one to three weeks. Epidemics of erythema infectiosum occur over extended periods. Limited evidence suggests that approximately two-yearly epidemic periods alternate with endemic periods of similar length.[3] Young children are most commonly involved, but 30-50% of adults are susceptible. The only local data are from a recent study in Victoria, which demonstrated a two-yearly endemic/epidemic periodicity. The highest rates of infection were in children aged 5-9 years and 60% of women of child-bearing age (20-39 years) were immune (Heath Kelly, personal communication). Annual seroconversion rates among women of childbearing age vary from about 1.5% during endemic periods, to about 10 times higher during epidemics.[4]

The risk of infection generally depends on the degree of exposure to children. It is highest (at least 50%) in susceptible women with an infected child at home. Generally, primary school teachers and child-care workers are at somewhat greater risk of infection (10-30%) than the general population (10-15%) during epidemics, depending on the ages, number of children and degree of contact.[4-7] Nosocomial transmission of parvovirus from chronically infected, immunocompromised patients or those with acute aplastic crisis to health care workers can occur, but the risk is apparently low and difficult to distinguish from community spread.[8,9]

Potential consequences of parvovirus B19 infection during pregnancy

Asymptomatic fetal infection occurs in up to 50% of cases following proven maternal infection in pregnancy.[10] The small risk of fetal damage is virtually confined to the first half of pregnancy. There is an excess early fetal loss, following maternal infection in the first 20 weeks, of about 15% compared with a background rate of 5%; that is, the excess is about 10%.[11] Approximately 3% of maternal infections between 9 and 20 weeks are complicated by hydrops fetalis, due to severe anaemia and cardiac failure. When it occurs, hydrops presents, on average, around 5 weeks (range 2-17) after maternal infection.[11,12] Chronic congenital anaemia, following intrauterine transfusion for hydrops fetalis, has been reported.[1] No specific developmental abnormalities or increase in their incidence, and no long-term sequelae in otherwise normal infants, have been attributable to maternal parvovirus infection.[11,13] The risks of occupational exposure of a pregnant woman, to parvovirus B19 infection during an epidemic, are summarised in Figure 1.

Diagnosis of parvovirus infection

Pregnant women who have been exposed to parvovirus infection (erythema infectiosum/fifth disease) should be offered serological testing for parvovirus-specific IgG to determine their susceptibility.

The diagnosis of parvovirus infection is usually made, serologically, by demonstration of IgG seroconversion and/or the presence of parvovirus IgM. IgM is usually detectable within 1-3 weeks of exposure and lasts for 2-3 months. Various serological methods are available, of which enzyme immunoassay and immunofluorescence are most commonly used. The sensitivities of IgM assays vary; they are highest in adults with typical acute parvovirus infection and arthropathy but lower in children. They are generally highly specific (specificity at least 95%) in asymptomatic controls but false positive results can occur (specificity 70-85%) in patients with other acute infections, including rubella.[14]

Management of proven maternal parvovirus infection in pregnant women

No intervention is available to prevent fetal infection or damage. Because of the low risk of fetal damage neither termination of pregnancy nor amniocentesis for diagnosis of asymptomatic intrauterine fetal infection is recommended. Repeated ultrasound examination by an experienced specialist to detect hydrops is recommended.[12,15] If hydrops is detected, further assessment is indicated to determine the need for treatment (intrauterine transfusion).

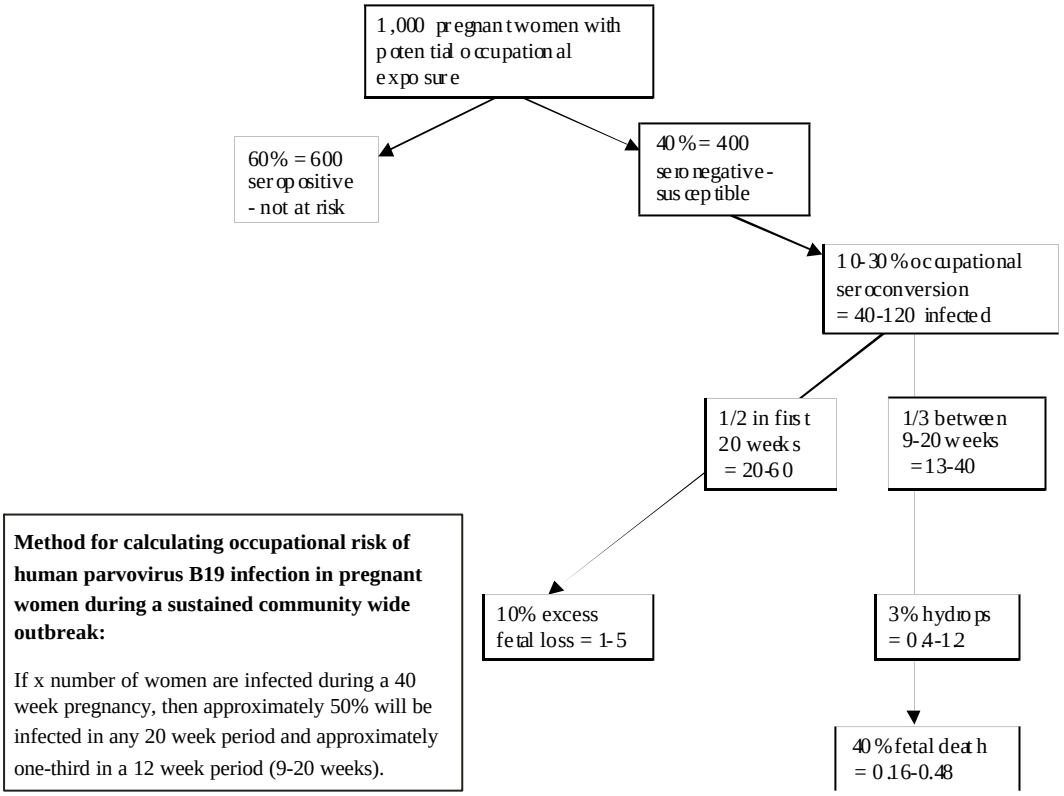
The role of parvovirus infection in hydrops fetalis

Parvovirus is implicated in 5-15% of cases of non-immune hydrops fetalis. Investigations for possible previous maternal parvovirus infection include maternal history of viral illness or contact, serological testing for maternal parvovirus IgG seroconversion* and IgM (the latter is often negative by the time hydrops develops). The diagnosis of intrauterine parvovirus infection can be confirmed by amniocentesis and polymerase chain reaction for parvovirus DNA, if indicated.

* Serum collected at the time of presentation should be tested for IgG in parallel with stored serum collected for antenatal screening (if available; laboratories generally store serum from pregnant women for at least 12 months).

Contents, *continued*

Figure 1. Risks of occupational exposure of 1,000 pregnant women to parvovirus B19 infection during an epidemic (all data are approximate).



Outcome from hydrops fetalis

Hydrops should be managed by a specialist with experience in intrauterine transfusion. Limited data from several reviews indicate the following outcomes, depending on the severity of fetal anaemia and hydrops:[12,15,16]

- spontaneous resolution in about one-third of cases;
- fetal death occurs within a few days of diagnosis in about one-third of cases;
- intrauterine transfusion in about one-third of cases, with a success rate of about 80% and fetal death in a small minority; and
- there is circumstantial evidence that the prognosis can be significantly improved by intrauterine transfusion in cases with severe anaemia and hydrops.

Conclusion

Parvovirus B19 infection is generally benign. There is a small risk of serious adverse sequelae in some high risk individuals, including the fetus. However, the low risk following infection in pregnancy does not justify routine exclusion of susceptible pregnant women from working with children during epidemics.

References

1. Brown KE, Young NS. Parvovirus B19 in human disease. *Annu Rev Med* 1997;48:59-67.
2. Young NS. B19 parvovirus. *Baillieres Clin Haematol* 1995;8:25-56.
3. Gay NJ, Hesketh LM, Cohen BJ et al. Age specific antibody prevalence to parvovirus B19: how many women are infected in pregnancy? *Comm Dis Rep* 1994;CDR Review. 4:R104-R107.
4. Valeur-Jensen AK, Pedersen CB, Westergaard T et al. Risk factors for parvovirus B19 infection in pregnancy. *JAMA* 1999;281:1099-105.
5. Gillespie SM, Carter ML, Asch S et al. Occupational risk of human parvovirus B19 infection for school and day-care personnel during an outbreak of erythema infectiosum. *JAMA* 1990;263:2061-5.
6. Carter ML, Farley TA, Rosengren S et al. Occupational risk factors for infection with parvovirus B19 among pregnant women. *J Infect Dis* 1991;163:282-5.
7. Harger JH, Adler SP, Koch WC, Harger GF. Prospective evaluation of 618 pregnant women exposed to parvovirus B19: risks and symptoms. *Obstet Gynecol* 1998;91:413-20.
8. Dowell SF, Torok TJ, Thorp JA et al. Parvovirus B19 infection in hospital workers: community or hospital acquisition? *J Infect.Dis* 1995;172:1076-9.
9. Ray SM, Erdman DD, Berschling JD, Cooper JE, Torok TJ, Blumberg HM. Nosocomial exposure to parvovirus B19: low risk of transmission to healthcare workers. *Infect Control Hospital Epidemiol* 1997;18:109-14.
10. Koch WC, Harger JH, Barnstein B, Adler SP. Serologic and virologic evidence for frequent intrauterine transmission of human parvovirus B19 with a primary maternal infection during pregnancy. *Pediatr Infect.Dis J* 1998;17:489-94.
11. Miller E, Fairley CK, Cohen BJ, Seng C. Immediate and long term outcome of human parvovirus B19 infection in pregnancy. *Brit J Obstet Gynaecol* 1998;105(2):174-8.
12. Schild RL, Bald R, Plath H, Eis-Hubinger AM, Enders G, Hansmann M. Intrauterine management of fetal parvovirus B19 infection. *Ultrasound Obstet Gynecol* 1999;13:161-6.
13. Rodis JF, Rodner C, Hansen AA, Borgida AF, Deoliveira I, Shulman RS. Long-term outcome of children following maternal human parvovirus B19 infection. *Obstet Gynecol* 1998;91:125-8.
14. Cohen BJ, Bates CM. Evaluation of 4 commercial test kits for parvovirus B19-specific IgM. *J Virol Methods* 1995;55:11-25.
15. Rodis JF, Borgida AF, Wilson M et al. Management of parvovirus infection in pregnancy and outcomes of hydrops: a survey of members of the Society of Perinatal Obstetricians. *Am J Obstet Gynecol* 1998;179:985-8.
16. Fairley CK, Smoleniec JS, Caul OE, Miller E. Observational study of effect of intrauterine transfusions on outcome of fetal hydrops after parvovirus B19 infection. *Lancet* 1995;346:1335-7.

Change to calendar month publication date

From April 2000 onwards, *Communicable Diseases Intelligence* will be produced each calendar month.

This replaces the previous 4-weekly production schedule, and corresponds to the new schedule presenting surveillance data by calendar month periods.

Supplementary issue of *CDI*

In order to adjust to the new calendar month schedule, an extra March 2000 Supplementary issue is presented.

World TB Day

World TB Day, celebrated 24 March this year, united the global community of people concerned about Tuberculosis.

The theme for 2000, 'Forging new partnerships to stop TB', called for outreach beyond the TB community to include new partners in the fight against TB. For more information, see the NPIN Web Spotlight at http://www.cdcnpin.org/spotlight.htm

Disease activity in Victoria

Martyn Kirk

Team Leader, Monitoring and Assessment Team, Communicable Diseases Section, Public Health Division, Department of Human Services, GPO Box 4057, Melbourne 3000

Email: martyn.kirk@dhs.vic.gov.au

Meningococcal infection

There were 4 cases of meningococcal infection in Victoria with onset in February. Two cases were male and the median age was 23 years (range 16 to 57 years). Two cases presented with meningitis and 2 with septicaemia. Three isolates were group C and 1 was group B.

Viral meningitis

Victoria is currently experiencing a widespread outbreak of viral meningitis. Where viral studies have been complete, this has been shown to be predominantly due to the enterovirus ECHO 30. The last such outbreak of echovirus 30 occurred in the summer of 1993-94. The current outbreak appears to have surpassed levels experienced at that time. Enterovirus is not a notifiable disease in Victoria. The Department has issued a public health alert to medical practitioners and hospitals advising them of the outbreak, the nature of the illness, and the importance of treating and notifying suspected cases of bacterial meningitis.

Legionellosis

In Victoria this year, there have been 37 cases notified as at 26 March 2000 compared to 32 for the same period last year. Thirty-four of these were due to *L. pneumophila 1*, one due to *L. pneumophila 4*, one due to *L. longbeachae*, and one due to *L. micdadei*. Three of the 37 cases died as a result of their infection. The Communicable Diseases Section identified three distinct outbreaks; one in the Thomastown area, one in Carlton/Fitzroy, and one in the Central Business District of Melbourne. The Department was unable to identify a definitive source for any of the clusters, although cooling towers in the surrounding areas were tested and disinfected. There has also been some clustering of other cases. It is suspected that the increased use of the rapid urinary antigen test for diagnosis may have assisted in the identification of the clusters and resulted in an increase in notifications.

Department of Human Services Web Site:
http://www.dhs.vic.gov.au/

See what's new in Infectious Diseases in Victoria:
http://www.dhs.vic.gov.au/phd/vidb/index.htm

Editorial comment

Legionellosis

Lp-1 antigens can be detected in the urine of infected patients using a commercially available radioimmunoassay (RIA) or enzyme immunoassay (EIA). This test has several advantages for detecting Lp-1. It is rapid, highly specific for Lp-1 infection and it may remain positive for days or weeks after initiation of antibiotics. It is not an appropriate test for the diagnosis of legionellosis caused by other serogroups of *L. pneumophila* or other legionellae.[1]

Table 1 presents commonly used diagnostic tests for *Legionella* and compares sensitivity, specificity and diagnostic utility. Genetic probes and nucleic acid amplification techniques are promising alternatives to these methods although clinical experience with these techniques is currently limited.[2]

References

1. Chang F-Y, Jacobs SL, Colodny SM, Stout JE, Yu VL. Nosocomial Legionnaires' disease caused by *Legionella pneumophila* serogroup 5: Laboratory and epidemiologic implications. *J Infect Dis* 1996;174:1116-1119.
2. Fiore AE, Butler JC. Detecting nosocomial Legionnaire's disease. *Infect Med* 1998;15:625-630, 633-635.
3. Edelstein PH. Legionnaire's disease. *Clin Infect Dis* 1993;16:741-749.

Table I. Diagnosis of legionnaires' disease[3]

Test	Sensitivity	Specificity	Advantages	Disadvantages
Culture	Varies	100%	Comparison with other clinical and environmental isolates.	Some species harder to culture. Needs specialised culture media. Ability to culture varies among laboratories. Requires sputum or tissue specimen.
Urine antigen (RIA or EIA)	60% to 80% (Lp-1 only)	>99%	Rapid. Detectable even after antibiotics initiated. May remain detectable for days to weeks after onset.	Only detects disease due to Lp-1. RIA requires radioisotope-capable facility.
IFA (4-fold rise in titer)	60% to 80%	95% (Lp-1) Unknown for other species	Retrospective diagnosis possible if acute-phase sera available.	Seroconversion often delayed beyond 4 weeks. Immunosuppressed may not seroconvert. Sensitivity and specificity likely reduced in non-Lp-1 strains. Single specimen elevated titers are nonspecific. Requires convalescent-phase specimen to demonstrate 4-fold rise in titer.
DFA	25% to 75%	95%	Rapid. May remain positive after antibiotics initiated.	Requires specific antisera. Requires experienced laboratory personnel. Polyvalent antisera less specific. Requires sputum or tissue specimen.

DFA = direct fluorescent antibody assay
EIA = enzyme immunoassay
IFA = immunofluorescent antibody assay
Lp-1 = *Legionella pneumophila* serogroup 1
RIA = radioimmunoassay.

Detection of the exotic mosquito *Culex gelidus* in the Northern Territory

Peter Whelan, Gwenda Hayes, Jane Carter, Andrea Wilson, and Bernadette Haigh
Medical Entomology Branch, Territory Health Services, Darwin, Northern Territory

Keywords: mosquito, vector, Cusex gelidus, Japanese Encephalitis, Northern Territory

The Medical Entomology Branch (MEB) of Territory Health Services (THS) has confirmed the presence of established breeding populations of the exotic mosquito *Culex gelidus* in the towns of Katherine, Batchelor and Darwin in the Northern Territory (NT) of Australia. It is also probably present in Alice Springs. While there are no immediate public health risks, it adds to the number of pest and potential disease vector mosquitoes in the Northern Territory.

The detection follows the first detection of this species in Australia at Brisbane in June 1999.[1] Subsequent collections have been made in Makay, Cairns and possibly Daintree in Queensland (Scott Ritchie, personal communication).

The first indication of the existence of *Cx. gelidus* in the Northern Territory was from a single adult mosquito collected on 16 February 2000 in Alice Springs in the weekly carbon dioxide baited traps, as part of the NT wide adult mosquito monitoring program. MEB staff initially identified the specimen as *Cx. vicinus*. However a review of the results indicated that there were no previous records of this species south of Tennant Creek, approximately 450 kilometres to the north. The specimen from Alice Springs was examined and found to be different from typical *Cx. vicinus*. *Culex vicinus* adults are very similar to *Cx. gelidus* in appearance with a cover of frosty white scales over the front two-thirds of the top of the thorax, and a number of other characteristics. Increased vigilance was placed on the identification of *Cx. vicinus* from Alice Springs and other collections.

MEB adult trap collections detected 89 *Cx. vicinus* adults from Katherine on 9 March 2000 during MEB aerial operations to combat widespread mosquito breeding following the February flooding. A review of these results indicated this number was outside the expected relative numbers of this species in this area. A detailed examination of these specimens indicated they were similar to the Alice Springs *Cx. vicinus* specimen. They conformed to the published descriptions of *Cx. gelidus.* There was however, uncertainty over a discriminating character in published taxonomy keys; the apicolateral pale patches on the tergites of the abdomen. It was decided that the resolution of the uncertainty required link bred specimens of adults from larvae from the Katherine area. Live larvae were collected from the Katherine Dairy area on 20 March. The larvae were examined on 20 March and conformed to the published descriptions of *Cx. gelidus*. The identification of adults was indicated on 21 March with *Cx. gelidus* reared from a pupa collected with the larvae. Link bred specimens reared on 23 March confirmed the presence of *Cx. gelidus* in the Northern Territory.

Discussions with Prof Richard Russell on 21 March confirmed there was a potential problem in the identification of adult specimens of *Cx. gelidus* using the standard taxonomic key and particularly with specimens that were partially rubbed. Samples of larvae and adults of *Cx. gelidus* have been sent to Prof Russell for verification.

The larvae collections from Katherine on 20 March indicated prolific breeding in the dairy wastewater effluent, the meatworks wastewater ponds and the sewerage overflow area. All these areas had been aerially treated with Bti insecticide approximately a week earlier.

A survey of wastewater ponds in the Darwin area was started on 22 March and detected large numbers of *Cx. gelidus* larvae in a piggery waste water pond in the rural area on 22 March. Prolific breeding was also found in a primary sewerage pond in Batchelor, approximately 70 kilometres south of Darwin on 23 March. The survey of wastewater ponds in the Darwin area is continuing and further surveys will be made in other towns in the NT.

An examination of records of weekly adult trap collections of *Cx. vicinus* in Katherine indicated an increase in this species starting 29 January 1999 from 9 to 29, and 81 over a three week period in the vicinity of the meatworks and the dairy. This may indicate a recent colonisation of the area by *Cx. gelidus*, but could also be related to seasonal conditions. The MEB will be examining all *Cx. vicinus* records in the NT and reviewing all larval and adult reference specimens of *Cx. vicinus* and *Cx. quinquefasciatus* to determine the earliest records of *Cx. gelidus* in the NT.

The review of specimens collected before the aerial spraying in Katherine revealed *Cx. gelidus* larvae in a tyre at the Katherine dairy. The dairy and meatworks have commercial road transport links to Queensland and this could indicate a mode of transport of larvae between the two areas. Adults and larvae could feasibly be moved in spare tyres or cabins with the road transport of cattle or people between Queensland and the Northern Territory, and within the NT.

The low numbers of adult *Cx. gelidus* in traps at the locations of the wastewater ponds in both Katherine and Darwin, at times of prolific larval numbers, indicate that carbon dioxide baited traps are not accurate indicators of high larval populations. These traps probably do not detect moderate numbers of adults unless they are immediately adjacent to the breeding site. This has implications for quarantine surveillance and other collections of this and similar species. The current NT experience suggests that the most practical method to establish the distribution of this species is to conduct larval surveys of wastewater ponds and to base the presence on identification of larvae.

The taxonomic keys to differentiate between adult *Cx. gelidus* and *Cx. vicinus* in the Australasian region need revision. The differentiation between adult females of these species and *Cx. vicinus* can be made on the erect scales on

the vertex of the head, which are cream in *Cx. vicinus* and white in *Cx. gelidus*. *Culex vicinus* is also generally bigger and darker, with darker integument on the pleura, a shorter proboscis, narrower basal pale bands on the tergites and not produced markedly in the midline, and mostly dark scaling on the sternal segments of the abdomen.

The larvae are distinct from *Cx. quinquefasciatus*, with *Cx. gelidus* having no lateral tuft on the siphon, a more barrel shaped siphon, and unequal anal papillae.[1] The *Cx. gelidus* also have stout head hair compared with *Cx. quinquefasciatus*, which is more filamentous. The best differential identifications between all species can be made on larvae.

Culex gelidus is found in India, China, Thailand, Indonesia, Timor and Irian Jaya.[2] Larvae have been found in freshwater ground pools, rivers, marshes and containers, sometimes in dirty water, and sometimes with considerable organic matter. It has been reported as a voracious biter of humans and to enter houses,[3] while others have reported it as having a preference for larger domestic animals with little preference for humans.[4]

Japanese encephalitis (JE) virus has been isolated from *Cx. gelidus* in several countries. It is considered important in maintaining JE in pig mosquito cycles in Sarawak and has been suggested as one of the most important vectors of JE in South East Asia.[5] It is at least a potential vector of JE.[6]

Culex gelidus is now a potentially very important mosquito in the NT for THS, Department of Primary Industries and Fisheries, primary producers, and local governments. It has been found breeding prolifically in wastewater ponds in dairies, sewerage treatment facilities, abattoirs, piggeries and ponding in ground pools contaminated with organic pollution, often in close proximity to urban areas. Its presence associated with piggeries is of particular concern as it could play a very important role in the amplification of JE if and when it occurs in the NT. Known breeding sites should be controlled. The distribution of the larvae in wastewater ponds in the NT indicates that the design and maintenance of wastewater ponds in a weed free condition is critical in the control of larval populations. The presence of this species in habitats of both *Cx annulirostris* and *Cx. quinquefasciatus*, and the possible replacement in habitats of the latter, indicates a new landscape for mosquito pest and disease potentials in northern Australia.

The present distribution of *Cx. gelidus* in the NT indicates that eradication may not be practical or possible. No attempt at eradication should be considered until the distribution and range of breeding sites is known. It could be much more widely distributed in Queensland and could even be present in Western Australia. The most pressing need is to conduct larval surveys in northern States and the NT to determine the current distribution. It is important to try to establish where and when this species entered Australia. The determination of the introduction and spread in the NT may be possible from weekly adult monitoring from all major towns and other regular collections, and the maintenance of a reference collection of larval and adult mosquito specimens. There should then be a national consensus on the status of this species, and a review of the detection and surveillance methods in Australia to detect further importations and subsequent spread of other species of mosquitoes.

References

1. Muller M. Detection of Culex gelidus. *Brisbane Bulletin of the Mosquito Control Association of Australia* 1999;11:2.
2. Lee D, Hicks M, Debenham M et al. The Culicidae of the Australasian region, Vol 7. Entomology monograph No 2, University of Queensland and University of Sydney, 1989. Australian Government Publishing Service.
3. Bonne-Wepster J. Synopsis of a hundred common non anopheline mosquitoes of the Greater and Lesser Sundas, the Moluccas and New Guinea. Documenta *Med Geogr Trop* 1954:6;1-29; Part II, 162-190; Part III, 208-246; Part IV, 347-394.
4. Colless DH . Notes on the culicine mosquitoes of Singapore VII. Host preference in relation to the transmission of disease. *Ann Trop Med Parasit* 1959;53:251-258.
5. Srivanakarn S. A revision of the subgenus *Culex* in the Oriental Region. (Diptera:Culicidae). Contributions of the *American Entomological Institute* 1976;12:2.
6. Bram R . Contributions to the mosquito fauna of South East Asia. II. The genus *Culex* in Thailand (Diptera:Culicidae). Contributions of the American Entomological Institute 1967;l2:1.

Massive effort to deliver one billion doses of polio vaccine in India

Polio eradication is now a key global goal and will be the second disease ever to be eradicated after smallpox. Significant achievements have been made since the launch of the polio eradication initiative in 1988. The number of polio cases has fallen from an estimated 350,000 in 1988 to some 6,700 reported cases in 1999 and the number of polio-endemic countries has fallen from 125 to 30. Polio has been eradicated from the Americas, Europe, the countries of the Western Pacific, much of the Middle East and disappeared from most of northern and southern Africa. Currently polio cases are concentrated in parts of Africa and the Indian sub-continent. Historically India has accounted for more than half of the world's polio cases and the challenge now in India is in eight densely populated States, in particular Uttar Pradesh, Bihar, West Bengal and the city of Delhi.

As part of a global campaign to eradicate the disease, billed 'Every Child Counts', a massive public health initiative to eradicate polio has been developed in India. A national immunisation day was launched on the 26 March 2000 as part of an intensified phase of the campaign in India. This year India has doubled the number of monthly national immunisation day rounds from two to four throughout the country and added in two more rounds in eight high-risk States. One billion doses of polio vaccine have been delivered to the nation's children in the last 12 months.

Currently there is a shortfall of US $300 million out of a total of US $1billion needed to achieve eradication in 2005. With the eradication of polio and the eventual cessation of polio immunisation, the world will save US $1.5 billion per year.

Further information can be obtained from the following internet websites:

WWW Virtual Library Public Health at:
http://www.ldb.org/vl/index.htm

WWW Virtual Library Circumpolar Peoples at:
http://www.ldb.org/vl/cp/index.htm

Yellow fever vaccination for the Hajj

As mentioned in the previous issue of *CDI*, at the request of the Department of Health and Aged Care, the Department of Foreign Affairs and Trade has obtained advice from the Government of Saudi Arabia concerning the yellow fever vaccination requirements for pilgrims to the Hajj.

The policy of the Saudi Government is that all pilgrims arriving in Saudi Arabia are required to be vaccinated for yellow fever, irrespective of their country of origin.

The Department of Health and Aged Care has been advised by the Saudi Embassy in Canberra that Australian applicants for the special Hajj visa are required to submit a valid yellow fever vaccination certificate with their visa application. A visa will not be granted if the applicant has not been vaccinated for yellow fever.

The Department will liaise with CSL Ltd, the only Australian supplier of yellow fever vaccine, to ensure as much as possible that there is sufficient supply of vaccine in Australia at the start of each year in order to meet the additional demand resulting from the Saudi policy.

Polio free 2000

Register now

It's time to act

Australia and the rest of the World Health Organization's Western Pacific Region (WPRO) are movingrapidly towards the certification of polio eradication. The Victorian Infectious Diseases Reference Laboratory (VIDRL) is coordinating wild poliovirus containment in Australia. A team led by Mrs Margery Kennett and Dr Heath Kelly is now preparing a National Plan for Polio Containment, which is required for certification of polio eradication. The Plan includes two main components - a national search for medical/biological laboratories and a national inventory. All laboratories will be contacted regardless of size and focus.

Your cooperation is vital for this certification. You are invited to register with us now so that we can contact you and provide further information. Please contact:

Ms Nittita Prasopa-Plaizier,
National Coordinator of polio containment and AFP surveillance on:
Phone: 03-9342 2603
Fax: 03 9342 2665
Email: nittita.prasopa-plaizier@nwhcn

Further changes to presentation of NNDSS data

In the last issue an additional set of summary tables presenting data by date of onset for each calendar month was introduced for the National Notifiable Diseases Surveillance System. In this issue, a further refinement is introduced. From this issue on Table 1 will present 'date of notification' data, which is a composite of three components: (i) the true onset date from a clinician, if available, (ii) the date the laboratory test was ordered, or (iii) the date reported to the public health unit. Data for February 2000, by date of notification, are presented in Table 1 of this issue and are discussed in the highlights section. Table 2 presents data by report date for weeks 5 to 8, ending 27 February 2000, for information only. In Table 2 the report date is the date the public health unit received the report.

Table 1 now includes the following summary columns: total current month 2000 data; the totals for previous month 2000 and corresponding month 1999; a 5 year mean which is calculated using previous, corresponding and following month data for the previous 5 years (MMWR Weekly Feb 25, 2000:49(07);139-146); year to date figures; the mean for the year to date figures for the previous 5 years; and the ratio of the current month to the mean of the last 5 years.

Communicable Diseases Surveillance

Highlights

Communicable Diseases Surveillance consists of data from various sources. The National Notifiable Diseases Surveillance System (NNDSS) is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The *CDI* Virology and Serology Laboratory Reporting Scheme (LabVISE) is a sentinel surveillance scheme. The Australian Sentinel Practice Research Network (ASPREN) is a general practitioner-based sentinel surveillance scheme. In this report, data from the NNDSS are referred to as 'notifications' or 'cases', whereas those from ASPREN are referred to as 'consultations' or 'encounters' while data from the LabVISE scheme are referred to as 'laboratory reports'.

Vaccine preventable diseases (VPDs)

A total of 297 notifications were received with a notification date in February. Notification numbers for the different VPDs overall remained stable and as noted in previous reports, most were the result of continuing pertussis activity in most States and Territories. There were no cases of diphtheria or *Haemophilus influenzae* type b. The number of mumps and rubella cases were stable. Most rubella cases occurred in males aged 20-24 years (Figure 1).

Pertussis cases in this period (255) had decreased when compared with January cases (380) and the five year mean (468), but was similar to February 1999 (260). The decrease in the number of cases was in New South Wales, Queensland and Tasmania. Cases of pertussis occurred in all age groups with peaks in those aged 10-14 years and those aged 40-44 years (Figure 2). There was a male to female ratio of 0.8:1. Immunisation status information was mostly provided for those aged 0-4 years. The majority of cases aged 0-4 years were described as partly immunised (Figure 2). For cases in the 10-14 year age group and 40-44 year age group immunisation status was mostly not provided. Of note amongst those aged 10-14 years, a small proportion of cases occurred in those fully immunised and a slightly greater proportion in those partly immunised.

Figure 1. Notifications of rubella, February 2000, by age group and sex

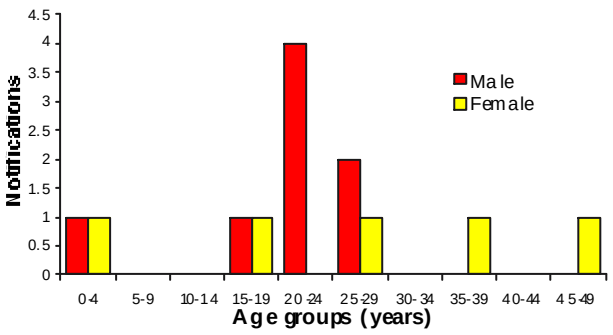
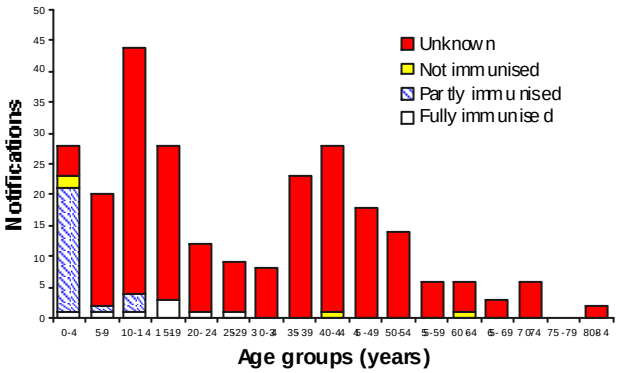


Figure 2. Notifications of pertussis, February 2000, by age group and immunisation status



A total of 24 reports of meningococcal disease were received with a notification date in February; similar to numbers from February last year (18) and the 5 year mean (22), but showing a decrease when compared with January (45). Most cases occurred in those under 30 years with a predominance in those aged 0-4 and 15-19 years. Overall the ratio of males to females was 1.2:1. Serotype information was provided for 63% (15/24) of cases. Of the 15 notifications for which serotype information was provided, the following was found: serotype B (n=6, 40%), serogroup C (n=7, 46%), serogroup Y (n=1, 7%) and serogroup W (n=1, 7%).

Bloodborne diseases

There were 1,949 notifications of hepatitis C diagnosed in February 2000 that were not already on the State and Territory notifiable diseases systems. This was an increase from January 2000 (1,520), February last year (1,862) and for the mean of the last 5 years (1,329). Of these, 25 were identified to be incident cases. The majority of the incident notifications were in the 15-29 year old age group (72%) and the male to female ratio was 1.3:1.

Gastrointestinal diseases

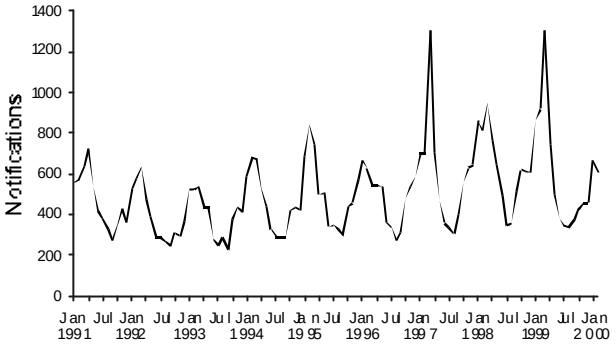
There were 609 notifications of salmonellosis with a notification month of February 2000. This was a decrease from January 2000 (666), February last year (917) and for the mean of the last 5 years (834) (Figure 3). Thirty-two percent (226 cases) were in the 0-5 year age group with an overall male to female ratio of 1:1.

There were 5 notifications of typhoid with a notification month of February 2000. Of the four States reporting SLTEC/VTEC there were 5 cases, all from South Australia. There was also 1 case of HUS in New South Wales.

Quarantinable diseases

From 1 January 1998 to 29 February 2000, a total of 8 cases of cholera have been reported to NNDSS (Box 1). There were 3 cases from New South Wales, 3 from Victoria, and 1 each from Queensland and South Australia. Cases were aged from 2 to 66 years with a male to female ratio of 1.3:1. One case of cholera was confirmed as a locally transmitted case, and the source of infection was unknown for another case in Victoria. The remainder of cases were acquired overseas. The detail of the source of infection and serotype are shown in Box 1.

Figure 3. Notifications of salmonellosis, January 1991 to February 2000, by date of notification



There were no cases of plague, rabies, yellow fever or viral haemorrhagic fever with a notification month of February 2000

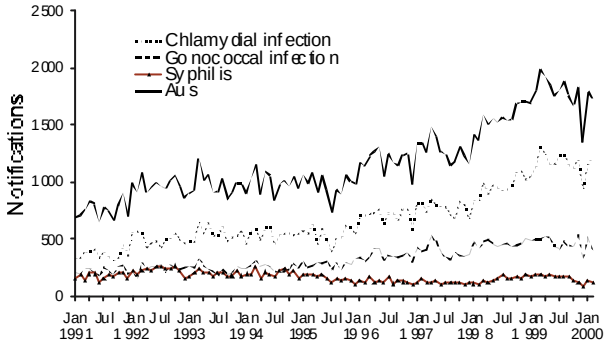
Sexually transmissible diseases (STDs)

There were 1,728 notifications of sexually transmissible diseases with a notification month of February 2000, which is similar to January 2000 (1,793) and February last year (1,804) but is less than the mean for the last 5 years (1,363) (Figure 4). The notifications were in all age groups with a male to female ratio of 2.5:1. The increase in notifications of sexually transmitted diseases is mainly due to the increased notifications for chlamydial infection. This, however, may only be a reflection of increased testing rather than disease incidence.

Box 1. Notifications of cholera, January 1998 to February 2000, by source of infection and serotype

Reporting State/Territory	Age	Sex	Date of notification	Date of report	Source of infection	Organism
NSW	66	M	29/01/98	9/02/98	Bali	01 - el tor - ogawa
Qld	25	F	2/03/98	10/03/98	Bali	01 - el tor - ogawa
Vic	41	M	13/05/98	15/05/98	Bali	01 - el tor - ogawa
Vic	38	M	25/09/98	9/10/98	UK	1
NSW	14	M	29/01/99	3/02/99	NSW	01 - el tor - ogawa
NSW	2	F	3/04/99	8/04/99	India	01 - el tor - ogawa
Vic	66	M	23/08/99	23/08/99	Jakarta	01 - ogawa
SA	40	F	28/02/00	9/03/00	Bali	139

Figure 4. Notifications of sexually transmissible diseases, January 1991 to February 2000, by date of notification, and disease



Vectorborne diseases

There were 49 notifications of dengue with a notification month of February 2000. This was the same as for January 2000 (49), but an increase from February last year (21) and for the mean for the last 5 years (25) (Figures 5 and 6). The notifications were in all age groups with a male to female ratio of 1:1. The increase was mainly in Queensland (31) and Northern Territory (14) due to both imported cases and local transmission in Queensland, and elsewhere from imported cases mainly from East Timor.

There were 548 notifications of Ross River virus infection with a notification month of February 2000, which was an increase from January 2000 (536) but was less than for February last year (668) and for the mean for the last 5 years (887). The majority of notifications were in Queensland and Western Australia (70%) and mainly in the 25-49 year age group (64%), with a male to female ratio of 0.8:1

There were 88 notifications of malaria with a notification month of February 2000, which was an increase from January 2000 (71) and for the mean for the last 5 years (82),

Figure 5. Notifications of dengue, January 1991 to February 2000, by date of notification

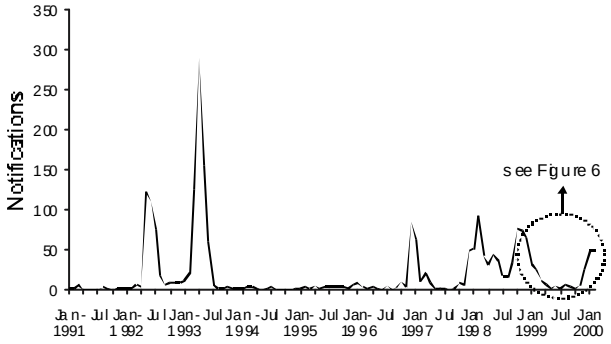


Figure 6. Notifications of dengue, January 1999 to February 2000, by date of notification

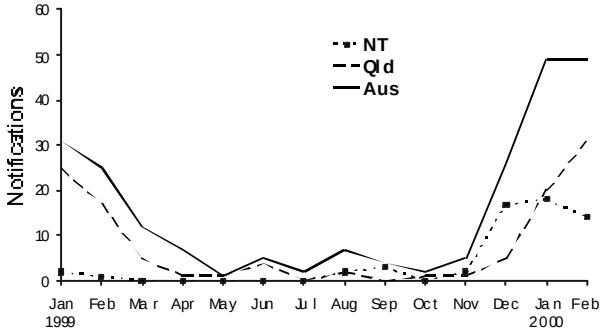


Figure 7. Notifications of malaria, January 1991 to February 2000, by date of notification

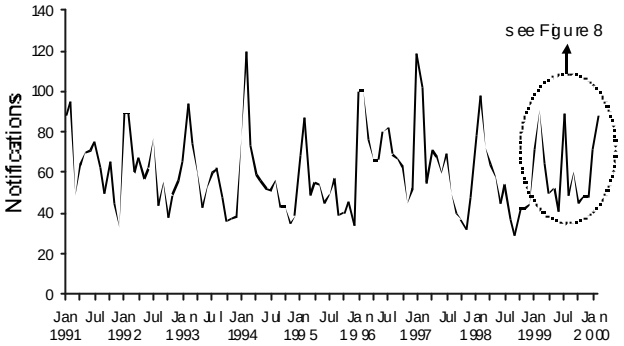
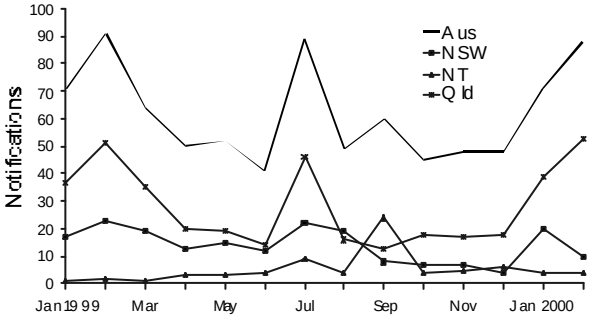


Figure 8. Notifications of malaria, January 1999 to February 2000, by date of notification



but was less than for February last year (91) (Figures 7 and 8). Of the cases, there were 55 from *P. vivax*, 22 *P. falciparum*, 2 *P. ovale* and 2 *P. malariae*. The majority of notifications were in Queensland (53) from returning service personnel from East Timor and from PNG students. The majority of notifications were in the 15-29 year age group (53%) with a male to female ratio of 3.3:1.

Other diseases

There were 33 notifications of legionellosis with a notification month of February 2000; the majority being in Victoria (60%). This was more than the notifications for January 2000 (17), and for the mean for the last 5 years (20) but was similar to February last year (38). The age for the notifications ranged from 25–79 years and the male to female ratio was 1.8:1. These cases were associated with an outbreak in Victoria.

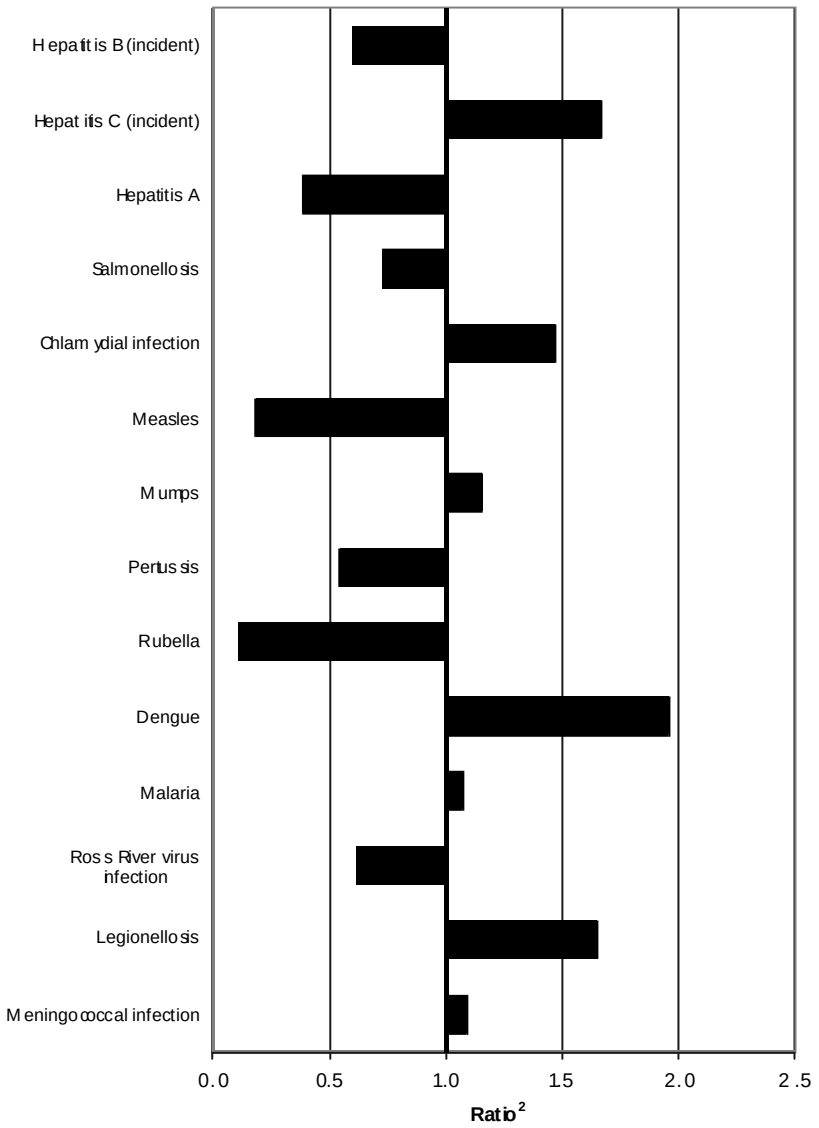
Tables

There were 7,075 notifications to the National Notifiable Diseases Surveillance System (NNDSS) with a notification date in February 2000 (Table 1). Data by date of report for weeks 5 to 8, ending 27 February 2000, are included in this issue of *CDI* (Table 2). The number of reports for selected diseases[1] have been compared with a 5 year mean, calculated using January to March data for the previous 5 years* (Figure 9).

The Australian Sentinel Practice Research Network (ASPREN) data for weeks 5 to 8, ending 27 February 2000, are included in this issue of *CDI* (Table 3).

As this is a supplementary issue, LabVISE tables are not included.

Figure 9. Selected[1] diseases from the National Notifiable Diseases Surveillance System, comparison of provisional totals for the period 1 to 29 February 2000 with historical data[2]



1. Selected diseases are chosen each calendar month according to current activity
2. Ratio of current month total to mean of last 5 years as defined above*

Table 1. Notifications of diseases received by State and Territory health authorities in the period 1 to 29 February 2000, by date of notification

Disease	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total Feb 2000[1]	Total Jan 2000[1]	Total Feb 1999[1]	Last 5 years mean	Year to date 2000	Last 5 years YTD mean	Ratio*
Bloodborne															
Hepatitis B (incident)	0	5	0	6	0	1	2	1	15	27	26	25	42	51	0.6
Hepatitis B (unspecified)[2]	4	219	0	55	0	2	45	93	418	536	553	579	954	1,096	0.7
Hepatitis C (incident)	1	3	0	0	6	0	4	11	25	13	28	15	38	27	1.7
Hepatitis C (unspecified)[2]	21	650	4	277	41	37	751	143	1,924	1,507	1,862	1,314	3,431	2,579	1.5
Hepatitis D	0	0	0	0	0	0	0	0	0	0	1	2	0	3	-
Gastrointestinal															
Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Campylobacterosis[3]	10		10	297	135	19	300	130	901	1,134	1,024	1,000	2,123	2,015	1.0
Haemolytic uraemic syndrome	0	1	0	0	0	0	0	0	1	1	7	2	2	2	0.5
Hepatitis A	0	13	5	24	6	0	19	27	94	124	178	245	218	535	0.4
Hepatitis E	0	0	0	0	0	0	0	0	0	0	0	2	0	1	-
Listeriosis	0	2	0	2	1	1	1	0	7	10	4	7	17	15	1.0
Salmonellosis	7	94	36	215	37	15	126	79	609	666	917	834	1,275	1,533	0.7
Shigellosis[3]	0	0	6	11	1	1	9	14	42	42	51	70	84	141	0.6
SLTEC,VTEC[4]	0	0	0	0	5	0	0	0	5	4	4	3	9	3	1.7
Typhoid	0	1	0	1	0	0	3	0	5	9	9	10	14	23	0.5
Yersiniosis[3]	0	0	0	5	3	0	1	0	9	9	13	18	18	62	0.3
Quarantinable															
Cholera	0	0	0	0	1	0	0	0	1	0	0	*	1	1	1.0
Plague	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Viral haemorrhagic fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
YellowFever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Sexually transmissible															
Chancroid	0	0	0	0	0	0	0	0	0	0	0	*	0	0	-
Chlamydial infection[5]	21	187	51	390	63	33	295	170	1,210	1,149	1,130	824	2,359	1,599	1.5
Donovanosis	0	0	0	0	0	0	0	0	0	5	0	5	5	11	-
Gonococcal infection[6]	0	72	71	79	14	0	73	99	408	511	492	368	919	770	1.1
Lymphogranuloma venereum	0	0	0	0	0	0	0	0	0	0	0	*	0	0	-
Syphilis[7]	1	41	10	54	0	0	0	4	110	128	182	146	238	281	0.8

Disease	ACT	NSW	NT	Qld	SA	Tas	Vic	WA	Total Feb 2000[1]	Total Jan 2000[1]	Total Feb 1999[1]	Last 5 years mean	Year to date 2000	Last 5 years YTD mean	Ratio*
Vaccine preventable												-			
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	-	0	0	-
Haemophilus influenzae type b	0	0	0	0	0	0	0	0	0	3	3	-	5	9	-
Measles	1	1	0	7	0	0	1	1	11	8	14	-	60	116	0.2
Mumps	1	2	1	0	2	0	3	6	15	12	9	-	13	25	1.2
Pertussis	5	77	0	42	17	29	83	2	255	392	260	-	468	1,036	0.5
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	-	0	0	-
Rubella[8]	0	6	0	4	1	0	4	0	15	17	23	-	133	295	0.1
Tetanus	0	0	0	0	1	0	0	0	1	1	0	-	1	1	1.0
Vectorborne															
Arbovirus infection NEC	0	0	0	0	0	0	7	0	7	2	7	2	10	19	0.7
Barmah Forest virus infection	0	24	1	27	0	0	3	5	60	51	60	51	89	143	0.7
Dengue	0	3	14	31	0	0	1	0	49	49	49	49	25	57	2.0
Malaria	0	10	4	53	3	1	16	1	88	71	88	71	82	183	1.1
Ross River virus infection	0	60	27	278	38	0	40	105	548	536	548	536	887	1,476	0.6
Zoonoses															
Brucellosis	0	0	0	0	0	0	0	0	0	2	1	3	2	7	-
Hydatid infection	0	0	0	2	0	0	1	0	4	2	1	2	6	4	2.0
Leptospirosis	0	1	0	4	0	0	2	0	7	20	28	18	27	31	0.4
Ornithosis	0	0	0	0	1	0	10	0	11	3	10	7	14	13	1.6
Q Fever	0	5	0	35	0	0	1	0	43	30	41	41	82	70	1.0
Other															
Legionellosis	0	0	0	5	5	0	20	3	33	17	38	20	50	39	1.7
Leprosy	0	0	0	0	0	0	0	0	0	0	0	2	0	2	-
Meningococcal infection	0	10	1	2	0	0	6	5	24	45	18	32	69	45	1.1
Tuberculosis	0	21	4	2	0	0	0	5	32	41	75	67	73	168	0.4
Total	80	1,508	245	1,908	381	139	1,907	907	7,075	7,186	7,868	7,478	14,261	14,499	

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
2. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the number of tests being carried out.
3. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
4. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC).
5. WA: genital only.
6. NT, Qld, SA, Vic and WA: includes gonococcal neonatal ophthalmia.
7. Includes congenital syphilis.
8. Includes congenital rubella

NN Not Notifiable.
NEC Not Elsewhere Classified.
- Elsewhere Classified.
* Ratio = ratio of current month total to mean of last 5 years as described above*

Table 2. Notifications of diseases received by State and Territory health authorities for weeks 5 to 8, by date of report*, February 2000

Week number	5	6	7	8	Year to
Week ending on	6 February 2000	13 February 2000	20 February 2000	27 February 2000	date
Disease[1]					
Bloodborne					
Hepatitis B (incident)	7	6	2	5	45
Hepatitis B (unspecified)[2]	132	97	140	80	977
Hepatitis C (incident)	8	7	4	9	49
Hepatitis C (unspecified)[2]	402	725	486	434	3,525
Hepatitis D	0	0	0	0	0
Gastrointestinal					
Botulism	0	0	0	0	0
Campylobacterosis[3]	217	271	276	247	2,081
Haemolytic uraemic syndrome	1	0	0	0	2
Hepatitis A	28	31	30	18	216
Hepatitis E	0	0	0	0	0
Listerosis	0	1	4	3	17
Salmonellosis	164	146	200	143	1,272
Shigellosis[3]	14	9	9	11	75
SLTEC,VTEC[4]	0	2	1	0	9
Typhoid	4	1	4	1	17
Yersiniosis[3]	0	3	3	1	16
Quarantinable					
Cholera	0	0	0	0	0
Plague	0	0	0	0	0
Rabies	0	0	0	0	0
Viral haemorrhagic fever	0	0	0	0	0
Yellow Fever	0	0	0	0	0
Sexually transmissible					
Chancroid	0	0	0	0	0
Chlamydial infection[5]	292	299	344	345	2,374
Donovanosis	1	0	0	0	3
Gonococcal infection[6]	114	109	128	115	928
Lymphogranuloma venereum	0	0	0	0	0
Syphilis[7]	48	33	25	42	275
Vaccine preventable					
Diphtheria	0	0	0	0	0
Haemophilus influenzae type b	1	0	1	0	4
Measles	3	1	4	3	18
Mumps	4	3	4	3	28
Pertussis	80	119	109	71	788
Poliomyelitis	0	0	0	0	0
Rubella[8]	2	2	2	4	32
Tetanus	0	2	0	0	2
Vectorborne					
Arbovirus infection NEC	0	0	0	4	6
Barmah Forest virus infection	13	20	14	20	107
Dengue	13	17	5	15	83
Malaria	24	33	17	22	149
Ross River virus infection	130	194	162	170	1,076

Table 2. Notifications of diseases received by State and Territory health authorities for weeks 5 to 8, by date of report*, February 2000 (continued)

Week number	5	6	7	8	Year to
Week ending on	6 February 2000	13 February 2000	20 February 2000	27 February 2000	date
Disease[1]					
Zoonoses					
Brucellosis	0	0	0	0	3
Hydatid infection	0	0	1	1	4
Leptospirosis	2	11	0	2	33
Ornithosis	1	1	7	1	14
Q Fever	10	14	12	16	94
Other					
Legionellosis	6	9	6	11	47
Leprosy	0	0	0	0	0
Meningococcal infection	11	6	8	2	75
Tuberculosis	17	19	13	17	117
Total	1,749	2191	2,021	1,816	14,561

1. Totals comprise data from all States and Territories. Cumulative figures are subject to retrospective revision so there may be discrepancies between the number of new notifications and the increment in the cumulative figure from the previous period.
2. Unspecified numbers should be interpreted with some caution as the magnitude may be a reflection of the number of tests being carried out.
3. Not reported for NSW because it is only notifiable as 'foodborne disease' or 'gastroenteritis in an institution'.
4. Infections with *Shiga*-like toxin (verotoxin) producing *E. Coli* (SLTEC/VTEC).
5. WA: genital only.
6. NT, Qld, SA , Vic and WA: includes gonococcal neonatal ophthalmia.
7. Includes congenital syphilis.
8. Includes congenital rubella

NN Not Notifiable.

NEC Not Elsewhere Classified.

\- Elsewhere Classified.

* Date of report is the date the public health unit received the report.

Table 3. Australian Sentinel Practice Research Network reports, weeks 5 to 8, 2000

Week number	5		6		7		8	
Week ending on	6 February 2000		13 February 2000		20 February 2000		27 February 2000	
Doctors reporting	65		66		69		62	
Total encounters	7,636		8,684		8,630		7,571	
Condition	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters	Reports	Rate per 1,000 encounters
Influenza	10	1.3	13	1.5	16	1.9	12	1.6
Chickenpox	12	1.6	14	1.6	9	1.0	9	1.2
Gastroenteritis	65	8.5	95	10.9	79	9.2	77	10.2
Gastroenteritis with stool culture	17	2.2	14	1.6	13	1.5	7	0.9
ADT immunisations	44	5.8	64	7.4	76	8.8	61	8.1

The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia New Zealand. The system coordinates the national surveillance of more than 40 communicable diseases or disease groups endorsed by the National Health and Medical Research Council (NHMRC). Notifications of these diseases are made to State and Territory health authorities under the provisions of their respective public health legislations. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 2000;24:6.

ASPREN currently comprises about 120 general practitioners from throughout the country. Between 7,000 and 8,000 consultations are reported each week, with special attention to 14 conditions chosen for sentinel surveillance in 2000. CDI reports the consultation rates for five of these. For further information, including case definitions, see CDI 2000;24:7-8.

Additional Reports

Sentinel Chicken Surveillance Programme

Sentinel chicken flocks are used to monitor flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin which cause the potentially fatal disease Australian encephalitis in humans. Currently 27 flocks are maintained in the north of Western Australia, seven in the Northern Territory, nine in New South Wales and ten in Victoria. The flocks in Western Australia and the Northern Territory are tested year round but those in New South Wales and Victoria are tested only from November to March, during the main risk season.

Results are coordinated by the Arbovirus Laboratory in Perth and reported bimonthly. For more information see CDI 2000;24:8-9.

AK Broom,[1] J Azuolus,[2] L Hueston,[3] JS Mackenzie,[4] L Melville,[5] DW Smith[6] and PI Whelan[7]

1. Department of Microbiology, The University of Western Australia
2. Veterinary Research Institute, Victoria
3. Virology Department, Westmead Hospital, New South Wales
4. Department of Microbiology, The University of Queensland
5. Berrimah Agricultural Research Centre, Northern Territory
6. PathCentre, Western Australia
7. Department of Health and Community Services, Northern Territory

January/February 2000

Sentinel chicken serology was carried out for 25 of the 27 flocks in Western Australia in January and February 2000. The first MVE virus activity of the wet season was detected in both the Kimberley and Pilbara regions in January 2000. Seroconversions to MVE virus occurred in the Wyndham and Fitzroy Crossing flocks in the Kimberley region and at Paraburdoo in the Pilbara. There have been further seroconversions in February at Wyndham, Kununurra, Fitzroy Crossing and Broome in the Kimberley and Karratha, Harding Dam, Tom Price, Paraburdoo, Ophthalmia Dam and Newman in the Pilbara. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 4 . A number of the later seroconversions have not yet been confirmed. Media warnings have been issued by the Health Department of Western Australia to warn residents in the Kimberley and Pilbara regions of the increased risk of disease. Additional warnings were also sent out by the Regional Public Health Units to Aboriginal communities in the region.

It should be noted that there are now only 27 flocks in Western Australia as the flock at Pardoo in the Pilbara is no longer part of the program.

Serum samples from all 7 of the 7 Northern Territory sentinel chicken flocks were tested in the laboratory in January 2000 and from 5 flocks in February 2000. There were 4 seroconversions to flaviviruses (3 to MVE and 1 to flavivirus only) in the Beatrice Hill Farm flock (east of Darwin) in February 2000.

There have been no seroconversions to flaviviruses in the New South Wales and Victorian sentinel chicken flocks over this period.

Details of the locations of all chicken flocks are given in *CDI* 2000;24:8-9.

Table 4. Flavivirus seroconversions in Western Australian sentinel chicken flocks in January and February 2000

	January 2000			February 2000		
Location	**MVE**	**MVE/KUN**	**KUN**	**MVE**	**MVE/KUN**	**KUN**
Kimberley						
Wyndham	1					1#
Kununurra				2	1	1
Fitzroy Crossing	4			1		
Broome*				3#		
Pilbara						
Karratha				3#	1#	
Harding Dam*				1		
Tom Price				4		
Paraburdoo	4			1#	1#	
Ophthalmia Dam				2	1	
Newman				3		

* 2 flocks of 12 chickens at these sites

\# result not yet confirmed

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

Bulletin Board

Meningococcal disease workshop
Meningococcal disease in Australia
Surveillance and vaccine policy - 2000 and beyond
14-15 April 2000
The New Children's Hospital
Westmead, New South Wales
Contact: Kate Wyllie
Fax: 02 9845 3082
Email: katew2@nch.edu.au

Australian Society for Infectious Diseases Meeting
16-19 April 2000
Fairmont Resort Leura
Organisers: Dart Associates:
Phone: 02 94189396
For scientific content: Contact Tom Gottlieb,
Concord Hospital
Phone: 02 9767 7533
Fax: 02 9767 7868 or
Email: Tom@micr.crg.cs.nsw.gov.au

Australian Infection Control Association
First Biennial Conference
Infection Control Beyond 2000
3-5 May 2000
Hilton Adelaide International, South Australia
Contact: AICA 2000 Secretariat
PO Box 1280 , Milton, Queensland 4064
Phone: 07 3369 0477
Fax: 07 3369 1512
Email: aica2000@im.com.au
Website: http://www.aica.org.au/aica2000.htm

Australian School of Environmental Studies
Arbovirus Research in Australia
3-7 July 2000
Couran Cove Nature Resort, Gold Coast, Queensland
Contact Dr Michael Brown
Queensland Institute of Medical Research
PO Box Royal Brisbane Hospital
Herston, Queensland, 4029
Website: http://www.mcaa.org.au

Royal North Shore Hospital
Outpatient Parenteral Therapy - beyond 2000
17-22 September 2000
Fairmont Resort
Leura, New South Wales
Phone: 02 9956 8333
Fax: 02 9956 5154
Email: confact@conferenceaction.com.au

The Australasian Society for HIV Medicine
12th Annual Conference
16-19 November 2000
The Carlton Crest, Melbourne, Victoria
Phone: 02 9382 1656
Fax: 02 9382 3699
Email: B.Pearlman@unsw.edu.au

The CDI Bulletin Board is provided as a service to readers. Every effort has been made to provide accurate information, but readers are advised to contact the relevant organisation for confirmation of details. Information about the availability of resources is included when space allows. Inclusion of a resource on the Bulletin Board does not imply endorsement of the resource by either the Communicable Diseases Network Australia New Zealand or the Commonwealth Department of Health and Aged Care.

Contributions to the Bulletin Board are invited from those organisations with forthcoming events relevant to communicable disease control.

Overseas briefs

Source: World Health Organization (WHO)
This material has been summarised from information on the WHO Internet site. A link to this site can be found under 'Other Australian and international communicable diseases sites' on the CDI homepage.

Lassa fever in United Kingdom

The diagnosis of Lassa fever in a 50 year old British national who had been working for the peacekeeping effort in rural Sierra Leone has been confirmed by virological tests performed at the Enteric and Respiratory Virus Laboratory at the Central Public Health Laboratory, London. He became ill with fever on 21 February and was airlifted to Freetown. He remained unwell, and on 5 March was evacuated to the UK by air ambulance. He was admitted to the Hospital for Tropical Diseases, London, and then transferred to Coppetts Wood Hospital, where he is being managed in high security isolation facilities. The patient's condition is reported to have improved slightly, but he remains seriously ill. Monitoring of close contacts is continuing, and will be carried out through the potential incubation period of the illness. Tests for other known viral haemorrhagic fevers have so far proved negative.

Cholera in Madagascar - Update

From 1 December 1999 until 13 March 2000, a total of 15,173 cases of cholera with 860 deaths (case-fatality rate 5.7%) has been reported. The epidemic is spreading and now affects six provinces: Toliary, Antananarivo, Antsiranana, Mahajanga, Toamasina and Fianarantsoa.

WHO is undertaking a mission to support the Ministry of Health in its efforts to respond to the epidemic.

Meningococcal disease in Ethiopia

An outbreak of meningococcal meningitis has been reported, affecting two neighbouring districts of Ethiopia: Kobo District of Amhara Region and Alamata District of the Tigray Region. Between 30 January and 12 March 2000, 81 cases and 3 deaths were reported from Kobo District, and cerebrospinal fluid (CSF) examinations of 21 specimens yielded *Neisseria meningitidis*. The number of cases peaked between 14 and 20 February and is reported to have declined to low levels by 12 March. During a vaccination campaign running from the 14 to 27 February, 36,344 people were vaccinated. Between 7 February and 9 March 2000, 48 cases and 6 deaths were reported from the Alamata District. In this district, 35,132 people have received vaccination.

Viral haemorrhagic fever/Marburg in Democratic Republic of Congo

On 13 March WHO received notifications of possible Marburg haemorrhagic fever in 8 persons from Durba, Province Orientale, Democratic Republic of Congo (DRC). Clinical samples from 6 patients have been sent to the National Institute for Virology (NIV), South Africa, and so far 3 have been confirmed positive by virological tests. Initial tests on the 3 other samples were negative, but other tests are still in progress. The availability of samples from the 2 other cases is not known at this time.

Since November 1999, there have been 30 notifications of possible Marburg disease from the vicinity of Durba. Twelve of these were negative after extensive laboratory tests, leaving a current total of 18 cases; 11 of which are confirmed, and 7 of which are currently classified as suspect cases because: no sample was available (2), the status of samples is unknown (2), or results are pending (3). Illness has proved fatal in 8 confirmed cases and in 4 suspect cases. Dates of illness onset for the 30 notifications range from 9 November 1999 to 7 March 2000. Disease onset dates for confirmed cases range from 8 January to 24 February 2000. The confirmed cases worked as gold miners (6), housewives (3), a farmer and a nurse.

Disease activity is clearly still continuing in the area and appears to be linked to the gold mine in Durba. Surveillance is continuing, but the security situation in the area and poor communications and transport mean that information is only available intermittently. The situation is being closely monitored by the WHO country offices in Kinshasa and Kampala, the WHO African Regional Office in Harare and WHO Headquarters in Geneva.

Editor: Angela Merianos **Associate Editor:** Jenny Thomson

Deputy Editor: Corrine Rann

Editorial and Production Staff

Gail Bird, Margo Annan-Eyeson, Ming Lin, David Witteveen

Editorial Advisory Board

Charles Watson (Chair), Mary Beers, Margaret Burgess, Scott Cameron, John Kaldor, Margery Kennett, Cathy Mead

Subscriptions

CanPrint, PO Box 7456, Canberra Mail Centre, ACT, 2610; Fax: +61 2 6295 4888 (Overseas) or (02) 6295 4888 (Australia).

Website

http://www.health.gov.au/pubhlth/cdi/cdihtml.htm

Contributions

Contributions covering any aspects of communicable diseases are invited. All contributions are subject to the normal refereeing process.
Instructions to authors can be found in *CDI* 2000;24:5.

Contacts other than subscriptions

CDI is produced every four weeks by the National Centre for Disease Control, Department of Health and Aged Care, GPO Box 9848, Canberra, ACT, 2601; Fax: (02) 6289 7791, Phone: (02) 6289 8245; email: cdi.editor@health.gov.au.

This journal is indexed by *Index Medicus* and Medline.