# COMMUNICABLE DISEASES INTELLIGENCE

ISSN 0725 - 3141 VOLUME 20 NUMBER 18 2 September 1996


## CONTENTS


| ARTICLES | Page |
|---|---|
| Enhanced surveillance for incident cases of hepatitis C in Australia, 1995<br>Ross Andrews and Margaret Curran | 384 |
| Editorial: Hepatitis C surveillance<br>Stephen Locarnini and Jeremy McAnulty | 388 |
| **OUTBREAK** | |
| Invasive meningococcal disease outbreak in western Sydney | 389 |
| **CORRESPONDENCE** | |
| Toxic shork syndrome testing | 389 |
| **NOTICES TO READERS** | |
| Public Health Association of Australia Inc.Fifth National Immunisation Conference | 390 |
| Fourth National Symposium on Hepatitis C and Related Viruses Including Hepatitis G | 390 |
| Correction - Meningococcal disease in Australia | 390 |
| **OVERSEAS BRIEFS** | 390 |
| **COMMUNICABLE DISEASES SURVEILLANCE** | 391 |





Contributions covering any aspect of communicable diseases are invited. Instructions to authors can be found in CDI 1995; 20: 13.

CDI is produced fortnightly by the AIDS/Communicable Diseases Branch, Department of Health and Family Services, GPO Box 9848 Canberra ACT 2601, Fax: (06) 289 7791 Telephone : (06) 289 1555





CDI is available on the CDI Bulletin Board System on (06) 281 6695, and via Internet on 'ftp://ftp.health.gov.au' in directory /pub/CDI and on 'http://www.health.gov.au' in '/hfs/pubs/cdi/cdihtml.htm.'

# ENHANCED SURVEILLANCE FOR INCIDENT CASES OF HEPATITIS C IN AUSTRALIA, 1995

*Ross Andrews*[1,2] *and Margaret Curran*[1] *for the Communicable Diseases Network Australia New Zealand*

## Abstract

An enhanced surveillance system for identification of incident cases of hepatitis C and risk factors for infection was established on a trial basis in 1995 by the Communicable Diseases Network Australia New Zealand. There were 138 incident cases of hepatitis C identified by participating States and Territories. From the notifications of hepatitis C received, a rate of 7.8 incident cases per 100,000 population was estimated for 1995. However, the estimate is unreliable due to a range of factors including the variance in methods used by the States and Territories (particularly for case ascertainment), response bias and the presence of duplicates among the total notifications of hepatitis C. This report identifies a number of areas where surveillance of hepatitis C could be improved. ***Comm Dis Intell* 1996;20:384-388.**

## Background

Hepatitis C is a notifiable disease in all States and Territories. Since the introduction of testing for hepatitis C virus (HCV) in early 1990, the National Notifiable Diseases Surveillance System has received in excess of 39,000 notifications from States and Territories (unpublished data). It is not known how many of these were incident cases. Identification of incident cases is difficult since a laboratory test alone can not distinguish an incident case from a prevalent case and the vast majority of new infections are mild or asymptomatic[1,2].

Risk factors for infection with HCV in Australia include a history of injecting drug use (IDU), blood transfusion prior to the introduction of screening (February 1990), occupational exposures such as needlestick injuries, and unsterile tattooing practices. In Australia and elsewhere many infections have had no identified risk factor[2,3,4].

As recommended by the National Hepatitis C Action Plan[3], the Communicable Diseases Network Australia New Zealand (CDNANZ) undertook to improve surveillance of hepatitis C by identifying incident cases and risk factors for infection. An enhanced surveillance system was trialed in 1995.

The aim of this report is to outline the methods and results of the enhanced surveillance system, estimate the number of incident cases among the total notifications of HCV received in 1995, report on the notified risk factors, and comment on the feasibility of maintaining this form of surveillance for hepatitis C.

## Methods

The enhanced surveillance system incorporated a revised definition for incident cases of hepatitis C, follow-up by States and Territories of seropositive tests to differentiate incident from prevalent cases, and collection of risk factor information. Although a core protocol was proposed, States and Territories implemented varying approaches.

CDNANZ defined an incident case of hepatitis C as:

a) demonstration of documented seroconversion to HCV when the most recent negative specimen was within the last 12 months;

or

b) demonstration of an anti-HCV positive test or HCV polymerase chain reaction (PCR) positive test, **and** a clinical illness consistent with acute hepatitis C within the last 12 months where other causes of acute hepatitis can be excluded.

All other cases were classified as prevalent or unspecified. The reporting period was based on the date of initial notification of HCV to the State or Territory.

### Data collection

All States and Territories received notifications of cases who had tested positive to HCV from either medical practitioners or laboratories, or both. Western Australia is the only State that did not require laboratory notification.

From 1 January 1995, the Australian Capital Territory, Northern Territory, South Australia and Victoria sent questionnaires to all medical practitioners who either notified a case of HCV or initiated a positive HCV test result that was subsequently notified by the laboratory. Tasmania sent questionnaires for all HCV notifications received from 1 October 1995. Queensland did not participate. New South Wales sent questionnaires for a systematic sample of one in 20 notifications received in 1995 by regional public health units. Western Australia followed up an

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estimated 80-90% of positive HCV tests conducted after 1 July 1995 (D. Jones, personal communication). In Western Australia, two major laboratories distributed questionnaires to medical practitioners attached to positive HCV test results.

The information requested in the questionnaires varied between States and Territories for both case ascertainment and risk factor information.

States and Territories took varying approaches to case ascertainment. For example, incident cases reported by medical practitioners in South Australia were contacted directly for a semi-structured personal or telephone interview. Where previous negative tests were indicated, the laboratory was contacted to confirm the test result and date. For cases of clinical illness, responses were checked to confirm that symptoms were consistent with clinical illness and records were checked for previous positive results. In New South Wales, although a range of information was requested, a case was considered to be incident if the practitioner ticked the relevant box.

**Risk factor information**

South Australia sought risk factor information from the patient, others sought the information through the medical practitioner.

The enhanced surveillance system specifically required information on injecting drug use, skin penetration in a non-medical setting, receipt of blood or blood products, medical procedures, and other. However, the information requested by States and Territories varied. Some States and Territories asked if the case was a current injecting drug user, others asked if the case had ever injected drugs. New South Wales asked only if the case shared drug injecting equipment. In terms of skin penetration in a non-medical setting, some States and Territories asked only about tattooing, others included ear or body piercing or acupuncture. New South Wales included acupuncture as a medical procedure. South Australia and the Northern Territory did not explicitly seek any information on medical procedures.

Responses were not mandatory in the risk factor fields so it was not clear whether responses other than 'Yes' meant the case did not have the risk factor or if the risk factor was unknown.

**Estimate of incident cases among total notifications**

Each State and Territory provided information on the total number of HCV notifications received in 1995 ($HCV_{total}$), the number of questionnaires distributed to medical practitioners and the number of responses. An estimated number of incident cases ($I_e$) among the total notifications was calculated thus:

$$I_e = (\text{incident cases} / \text{responses}) \times HCV_{total}$$

This assumed that the incidence of HCV in the non-responders was the same as the incidence of HCV in the responders. A sensitivity analysis was conducted to assess non-response bias for each State and Territory.

The Australian Bureau of Statistics' 1994 estimates of mid-year populations for the participating States and Territories were used as the denominator for calculating the annual rate of incident cases.

**Revised data**

New South Wales indicated that data previously reported for the first quarter of 1995 contained some prevalent cases[5]. Amended data were provided and are included in this report.

## Results

In 1995, 138 incident cases of HCV were reported to the enhanced surveillance system. Practitioner response rates ranged from 53% in Victoria and the Northern Territory to 87% in the Australian Capital Territory. From the notifications of hepatitis C received by each State and Territory in 1995, an annual rate of 7.8 incident cases per 100,000 population was estimated (Table 1).

**Table 1. Identified incident cases of hepatitis C by State and Territory, 1995**

| State or Territory | Total number of HCV notifications in 1995[1] | Number of questionnaire responses (response rate %) | Number of incident cases identified | Estimated number of incident cases[2] | Estimated rate of incident cases per 100,000 population[2] |
|---|---|---|---|---|---|
| Australian Capital Territory | 423 | 370 (87) | 7 | 8 | 2.7 |
| New South Wales[3] | 8320 | 264 (63) | 30 | 945 | 15.6 |
| Northern Territory | 312 | 164 (53) | 5 | 10 | 5.6 |
| South Australia | 2185 | 2149 (83) | 33 | 34 | 2.3 |
| Tasmania[4] | 265 | 58 (79) | 1 | 5 | 1.0 |
| Victoria | 4301 | 2300 (53) | 49 | 92 | 2.0 |
| Western Australia[5] | 1346 | 357 (80) | 13 | 49 | 2.9 |
| TOTAL | 17152 | 5662 | 138 | 1143 | 7.8 |

1. Refers to all HCV notifications in 1995, not just incident cases.
2. Estimates may be unreliable - see discussion.
3. NSW investigated 5% of total notifications.
4. Tas investigated notifications from 1 October 1995, 73 questionnaires distributed.
5. WA investigated notifications from 1 July 1995, estimated 449 questionnaires distributed.

In New South Wales, 11% of the questionnaire responses were identified as incident cases compared with 2 - 4% in other States and Territories. South Australia, Western Australia and the Australian Capital Territory indicated that some incident cases reported by medical practitioners did not meet the case definition and were excluded.

The 30 incident cases identified in New South Wales contributed 945 of the 1,143 estimated incident cases. Of the 30 cases, 14 had seroconverted in the previous 12 months, 13 were diagnosed on clinical grounds with a seropositive test and three had clinical illness as well as having seroconverted. South Australia advised that the ratio of seroconversion to clinical illness was 3:1. The one case identified in Tasmania was diagnosed on clinical grounds. Comparable information was not reported from other States and Territories.

A sensitivity analysis showed the estimated rate of incident cases would range from 5.0 per 100,000 if none of the non-responders were incident cases, to 10.8 per 100,000 if twice as many non-responders were incident cases. This only addresses non-response bias, not other biases that are inherent in the data.

Approximately 9% of the total notifications for 1995 were thought to be duplicates in New South Wales while the Australian Capital Territory indicated that about 20% were duplicates.

The median age for the identified incident cases was 26 years (range 1 to 68 years) with 80% between 15 and 34 years of age. The male:female ratio was 1.8:1.0. The age-sex distribution is shown in the Figure.

**Risk factors**

Of 138 incident cases, 84% had one or more risk factors for HCV. The remaining 16% (22) had no risk factors indicated; 13 were male and 9 were female, the median age was 31.5 years (range 15 to 51 years).

Injecting drug use was the most frequently reported risk factor (Table 2). Of those cases with reported risk factors, 91% reported IDU. The male:female ratio was 2.1:1 and the median age was 24.5 years.

Only 11 cases were reported to have risk factors which did not include IDU. One of these reported a medical procedure including receipt of blood or blood products in Pakistan. Of the two needlestick injuries, one was a rubbish collector and the other was not indicated.

A total of 21 reports indicated sexual contact with an HCV positive person or injecting drug user. There were 10 males and 11 females and the median age was 28 years.

**Figure. Identified incident cases of hepatitis C by age group and sex, 1995**

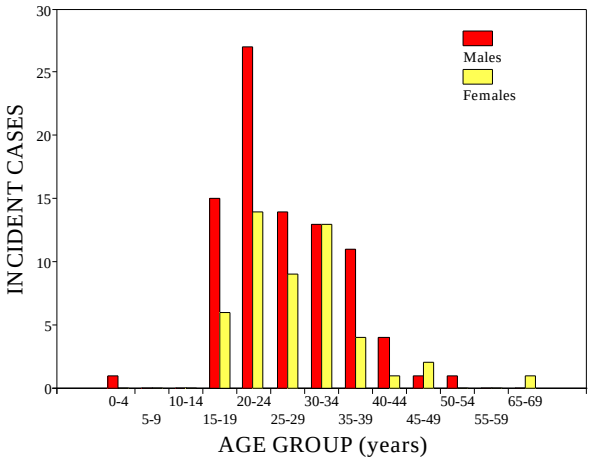


**Table 2. Risk factors for incident cases of hepatitis C infection, 1995**

| Risk factors | IDU | Not IDU | Total (% of total cases) |
|---|---|---|---|
| Injecting drug use only | 61 | - | 61 (44) |
| Skin penetration in a non-medical setting | 18 | 1 | 19 (14) |
| - and medical procedure | 1 | | 1 (1) |
| - and sexual contact HCV positive or IDU | | 2 | 2 (1) |
| - and other[1] | 4 | | 4 (3) |
| - and medical procedure and contact with HCV positive blood | | 1 | 1 (1) |
| Sexual contact HCV positive or IDU | 14 | 3 | 17 (12) |
| Needlestick injury | 1 | 2 | 3 (2) |
| One year old child, mother HCV positive | | 1 | 1 (1) |
| Medical procedure | | | |
| - and sexual contact HCV positive or IDU | 2 | | 2 (1) |
| - and received blood / blood products | | 1 | 1 (1) |
| Other[2] | 4 | | 4 (3) |
| No risk factors indicated | - | - | 22 (16) |
| TOTAL | 105 | 11 | 138 (100) |

1. Indicated as sharing needles or razor with an HCV positive person or contact with HCV positive blood.
2. Risk factor indicated as 'other' with no comment provided.

## Discussion

The enhanced surveillance system identified 138 incident cases of hepatitis C in 1995. However the estimate of 7.8 incident cases per 100,000 population is unreliable due to a range of factors including the variance in methods used (particularly for case ascertainment), response bias and the presence of duplicates among the total HCV notifications.

The data are limited to notifications of HCV received by States and Territories and include follow up of notifications over only three months in Tasmania, an estimated 80-90% sample over six months in Western Australia, and a five per cent sample from New South Wales.

The large proportion of mild or asymptomatic hepatitis C infections means that many incident cases will not be detected under the case definition used by this surveillance system unless they have documented seroconversion. Those who have documented seroconversion are perhaps predominantly those in screening programs such as drug and alcohol programs, sexually transmitted disease (STD) clinics, prisoners and to a lesser extent blood donors (those in high risk groups are actively discouraged from donating blood). There is likely to be a bias towards higher-risk populations as they are the most likely to be tested.

Those States and Territories where more tests are conducted and particularly those with greater numbers in screening programs may be more likely than others to detect a case through seroconversion.

While some States or Territories may have a higher incidence of HCV than others, it seems unlikely that the two most populous States, Victoria and New South Wales, could have an almost eight-fold difference in the rate of incident cases per 100,000 population.

In the absence of an agreed protocol for case ascertainment, some States and Territories may be overestimating the number of incident cases while others may be underestimating the number of incident cases. In New South Wales, where case ascertainment was based on the medical practitioner's response alone, a greater proportion of cases were diagnosed on a clinical basis than in South Australia, where individuals were followed up. Follow up of reported incident cases to confirm seroconversion or clinical illness can only reduce the number of cases identified as incident.

Response bias may contribute to incident cases being over represented among the returned questionnaires. Perhaps medical practitioners are less likely to respond if they believe a case is not incident or, conversely, are more likely to respond if they have diagnosed an acute case. While the sensitivity analysis provides a range from 5.0 to 10.8 estimated incident cases per 100,000 population, this does not account for other biases such as those caused by variations in case ascertainment and the presence of false positives and duplicates among the total notifications.

False positive hepatitis C tests have been reported[2]. Some laboratories in some States or Territories may notify an HCV positive result without undertaking supplementary testing. Although this is not a true confirmatory test[2], it should always be undertaken following an initial positive result. As has been indicated, there may be a number of duplicates among the total notifications received. The number of duplicates and the capacity for States and Territories to detect duplicates may vary. Given that each State and Territory checked for duplicates among the incident cases, the net effect of false positives and duplicates among the total notifications is to increase the estimated number of incident cases.

### Risk factors

Despite the lack of consistency in the risk factor information collected by States and Territories, the results were generally in accord with past experience[4]. The enhanced surveillance system did not identify any unusual mechanisms of transmission. The case definition and the practitioner's recognition of IDU as a risk factor for HCV may have contributed to an over representation of this group, particularly as the information was obtained from the medical practitioner rather than directly from the patient in most cases. Even so, the data suggest young male injecting drug users should be a target for prevention activities.

### The enhanced surveillance system

The enhanced surveillance system has been resource intensive and States and Territories have followed up over five thousand seropositive tests for relatively few cases meeting the incident case definition.

There is a need to identify incident cases of HCV and the risk factors associated with infection, particularly those infections acquired by unusual routes of transmission. However, the ability of the enhanced surveillance system to identify incident cases has been compromised by the variance in methods used by the States and Territories, particularly with respect to case ascertainment.

To have meaningful routine surveillance of hepatitis C, a number of factors should be considered:

1. Can the sensitivity of the case definition be improved to identify more incident cases? Consideration could be given to include cases who have received their first positive HCV test result. This may lead to identification of cases which are not true incident cases and would most probably mean increased resources being needed for arguable gain. Until a laboratory test is available to distinguish incident from prevalent cases, improving the sensitivity of the case definition may prove problematic.
2. An agreed protocol for case ascertainment. Is a case to be considered incident if a practitioner so indicates or should all reported incident cases be followed up to confirm seroconversion, clinical signs and the existence of any previous positive HCV test result?
3. Information is required as to how cases are identified, that is by seroconversion or by clinical illness.
4. All questionnaire responses, both those identified as incident and others should be reported to the surveil-

lance system, including risk factor data as recommended in the National Hepatitis C Action Plan[4]. In the development of the system it was decided that reporting of other than incident cases would be resource intensive. However, since States and Territories collected the data, reporting would enable comparison between incident and prevalent / unspecified cases and an age-sex profile of non-responders.

5. Agreement on the core questions to be asked for risk factors is essential so that uniform information is collected. Any agreement should include definitions for the risk factors.
6. The minimum data set should require mandatory responses for risk factors so that it is clear whether a case did not have the risk factor, or if the risk factor was unknown or not stated.

Routine surveillance may not be the most appropriate mechanism for gathering detailed epidemiological data on HCV. The South Australian approach of contacting the patient direct appears the most likely to gain reliable risk factor information. However this is not possible where notifications are de-identified as is the case in New South Wales. Perhaps surveillance should be confined to identifying incident cases with further prospective research to identify risk factors. Other approaches for estimating the incidence of HCV, and in particular collecting risk factor information, should be considered. Sentinel screening programs such as sexually transmitted disease clinics and methadone programs may be more appropriate mechanisms.

## Acknowledgements

We thank members of the Communicable Diseases Network Australia New Zealand and associated staff of the contributing States and Territories for their work in collecting the data and assistance in the preparation of this report. Thanks are also extended to Dr Helen Longbottom and Dr Ana Herceg, Commonwealth Department of Health and Family Services, and Dr Christine Roberts, National Centre for Epidemiology and Population Health.

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# EDITORIAL: HEPATITIS C SURVEILLANCE

*Stephen Locarnini*[1] *and Jeremy McAnulty*[2]

Hepatitis C has emerged as an important public health issue in Australia, with the number of notifications to the National Notifiable Diseases Surveillance System steadily increasing over time. However, it is not known what proportion of these notifications are incident cases. The incidence of infection in Australia has, until now, only been estimated in particular high risk groups such as injecting drug users (IDUs), where Crofts *et al.* predicted between 8,000 and 10,000 incident cases among IDUs each year[1].

The surveillance system outlined by Andrews and colleagues in this issue of *CDI* is commendable in that it is the first of its kind specifically designed to address the incidence issue. They found an estimated hepatitis C incidence of 7.8 per 100,000 population, ranging from 1.0 per 100,000 in Tasmania to 15.6 per 100,000 in New South Wales. However, this study raises a number of important issues and questions, including the reasons for the apparent high incidence in New South Wales compared with the rest of Australia.

The first problem to emerge is the low sensitivity of the surveillance system. Surveillance for hepatitis C virus (HCV) infection (and for other chronic infections with a large proportion of asymptomatic cases) is limited because it cannot capture the many incident cases who feel essentially well and do not seek serial HCV testing. As the majority (75%) of new infections of HCV do not have an associated clinical illness, surveillance data may underestimate the incidence by three- to four-fold[2]. Secondly, the extent of compliance with NHMRC testing algorithms that require repeat testing of initial reactors is unknown across Australia. False positive hepatitis C antibody tests are common[3], especially in low risk groups where the positive predictive value of testing is low. If a substantial number of these tests were not confirmed, then the potential for incorrectly inferring a seroconversion is considerable. Thirdly, the lack of standardisation of the questionnaire among States and Territories could generate bias. Fourthly, the total laboratory reports of hepatitis C cases includes duplicates, as much as ten per cent of prevalent notifications.

1. Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital, Fairfield, Victoria 3078.
2. New South Wales Department of Health, Sydney, New South Wales.

It is impossible from these data to determine the extent to which the true incidence in New South Wales is higher than the rest of the country. This can only be resolved when case definitions have been standardised, compliance with an agreed testing algorithm is evaluated, and the risk profiles of the populations tested (and so the tests' positive predictive values) are better understood.

So what does an incidence of 7.8 per 100,000 mean? If we assume that the number of incident cases is an underestimate by a factor of three, and that 75% were among IDUs, then we get approximately 4,000 new cases of hepatitis C in Australia per year, including 3,000 in IDUs. This figure is well below the estimate of Crofts and colleagues of 8,000 to 10,000[1].

Future epidemiological studies will need to better determine the reasons for the large State-to-State variation in the rates, accounting for differing methods of case ascertainment and laboratory testing strategies. This study highlights the importance of gathering epidemiological data on hepatitis C to help gain a better understanding of past and present transmission rates. Further epidemiological data are clearly required on risk behaviour to help plan prevention programs, as well as to anticipate resource requirements for control of HCV infection including therapeutic as well as vaccination strategies. Finally, other approaches for estimating the incidence of HCV infection in the Australian community, such as sentinel screening programs and studies in selected cohorts, should be pursued.

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# OUTBREAK

## Invasive meningococcal disease outbreak in western Sydney

*Bin Jalaludin*[1], *Marianne Kerr*[1], *Jane Jelfs*[2], *Tim Heath*[1,3], *Oanh Nguyen*[1], *Moira Hewitt*[3,4], *Rosemary Munro*[2] *and Anthony Capon*[1].

The Western Sector Public Health Unit was notified of ten cases of invasive meningococcal disease between 3 and 29 August 1996. The cases presented to the emergency departments of four hospitals in western Sydney, with seven of the cases presenting to one emergency department.

Six of the cases were males. Seven were between 14 and 21 years of age, and the other three cases were aged two years (two cases) and 46 years. Seven of the ten cases live in the same area in western Sydney. In eight of the ten cases there was an association with a nightclub in the area - either the cases themselves (three cases) or household contacts had been to the nightclub.

We isolated *Neisseria meningitidis* serogroup C serotype 2a subtype P1.5 from the cerebrospinal fluid and / or blood from seven of the ten cases. Isolates from three cases were identical on pulsed field gel electrophoresis. We are awaiting results on the remaining isolates. In two cases the cerebrospinal fluid and / or blood cultures were sterile. In the most recent case, it is too early to comment on the blood cultures. The exceptional laboratory support from Department of Microbiology and Infectious Diseases, South Western Area Pathology Service (SWAPS), a laboratory of The National Neisseria Network, and quick turn around time for typing of positive cultures and for performing pulsed field gel electrophoresis has enabled us to be better informed in our outbreak investigation and public health interventions.

At the time of writing, five cases are still in hospital, and no deaths have been reported. The outbreak investigation is continuing.

**Acknowledgements**

We thank Dr Jeremy McAnulty, NSW Health Department and Dr Mohamed Patel, National Centre for Epidemiology and Population Health for their expert advice in this investigation.

1. Western Sector Public Health Unit, 13 New Street, North Parramatta NSW 2151
2. South Western Area Pathology Service, Liverpool NSW
3. MAE Program, National Centre for Epidemiology and Population Health, Canberra ACT
4. Department of Community Medicine and Public Health, Westmead NSW

# CORRESPONDENCE

## Toxic shock syndrome testing

*Dr Michael Whitby, Department of Infectious Diseases, Infection Control and Sexual Health, Princess Alexandra Hospital and District Health Service, Ipswich Road, Woolloongabba, Queensland 4102.*

With reference to your recent *CDI* article on TSS (*CDI* 20;16:340), testing for TSS1 antibody can be obtained from:

Professor Pat Schlievert, Department of Microbiology, Medical School, University of Minnesota, United States of America. The fax number is +612 626 0623.

# NOTICES TO READERS

## Public Health Association of Australia Inc. Fifth National Immunisation Conference
### *New strategies for old problems*

**25-26 November, 1996**
**Novotel Hotel, Brighton Beach, Sydney**

The Conference will focus on new strategies for old problems. The old problems include pertussis, measles, adult immunisation and increasing the rate of immunisation in the community. The new strategies include improved vaccines (pertussis), new approaches (measles), increased awareness of adult immunisation and the impact of the Australian Childhood Immunisation Register.

Further information and registration papers can be obtained from PHA Conference Secretariat, GPO Box 2204, Canberra ACT 2601, telephone (06) 285 2373, fax (06) 282 5438.

## Fourth National Symposium on Hepatitis C and Related Viruses Including Hepatitis G

**Saturday 23 November 1996**
**St Vincent's Hospital, Melbourne**

The Symposium will be targeted at health care professionals involved with hepatitis C.

The scientific program includes:

**The viruses**: the virology of hepatitis C, G and related viruses; what is the significance of hepatitis G?; hepatitis G in Australia; hepatitis G - issues for the blood bank.

**Hepatitis C - current controversies**: what are the best treatments in 1997?; psychological effects of interferon; the hepatitis C virus (HCV) infected health care worker.

**Breakout sessions**: controlling the HCV epidemic amongst injecting drug users; liver transplantation for hepatitis C; practicalities of interferon therapy and sharing care; hepatitis C in children.

**Australian responses to HCV**: report from AHMAC Education and Prevention Committee; report from NHMRC Committee; implications for general practice, drug and alcohol programs, liver clinics, hepatitis C support groups / councils / foundations.

Registration forms for this Symposium can be obtained from Dr Katrina Watson, Department of Gastroenterology, St Vincent's Hospital, 41 Victoria Parade, Fitzroy, Victoria, 3065, telephone (03) 9288 3580, fax (03) 9288 3590.

## Correction - Meningococcal disease in Australia

On page 370 of *CDI* 20:17 under the heading *Antibiotic susceptibility patterns*, the third sentence should have read:

Although 72.5% of isolates showed a decreased susceptibility to penicillin (minimal inhibitory concentration (MIC) ≥ 0.06 mg / l), the data indicate that penicillin-based treatment regimes remain suitable for use in Australia.

# OVERSEAS BRIEFS

*Source: World Health Organization*

## Viral meningitis, Cyprus - update

The daily number of cases of coxsackievirus type B5 reported in the outbreak which commenced on 5 July 1996 and peaked on 31 July has now declined to one or two per day. Up to 21 August, 280 cases had been reported. Eighty-seven per cent (244 cases) were in children under 14 years of age, with 56% (157 cases) in children under five years old. There have been no deaths or cases of serious complications.

## Cholera in Mongolia - update

As of 19 August, 106 cases and eight deaths had been reported in the current outbreak of cholera which was first reported on 9 August. Most cases (84 cases, five deaths) were reported in Khutul District of Selenge Province. Cases also were reported in Darhan-Uul and Altanbulag in the same Province, in the capital Ulan Batar, Central Province in Zaamar District, Tuv Province and in Ulaantolgoi District in Orkhon Province.

## Cerebrospinal meningitis, Mozambique - update

There were 157 cases with nine deaths reported during July in the outbreak which was declared in Cabo Delgado province in the Northern Region in early July. Most cases (105) were from the district of Balama. Cases were also reported in the districts of Namuno (38) and Montepuez (12). Two cases were reported in Pemba City. The risk of epidemic spread is considered particularly high in the district of Montepuez (population of 190,000) and the provincial capital (Pemba City) and neighbouring districts. The Ministry of Health has provided drugs, antibiotics and health education. However, additional penicillin, oily chloramphenicol and vaccine are still needed.

## Enterohaemorrhagic *E. coli*, Japan - update

The outbreak of enterohaemorrhagic *Escherichia coli* (EHEC) infection in Sakai City has affected 6,309 school

children and 92 school staff members from 62 municipal elementary schools. Another 160 cases have been reported, mainly among family members of infected school children. No new cases have been reported since 8 August. The number of hospitalised patients peaked at 534 on 18 July and had decreased to 31 by 26 August. There were 101 patients diagnosed with haemolytic uraemic syndrome. Two, a ten year old girl and a 12 year old girl, have died. *E. coli* serotype O157:H7 was detected in patients' stool samples.

By 26 August 1996, *E. coli* serotype O157:H7 had been reported in 9,578 cases across Japan, resulting in 11 deaths. Although most of the infections are believed to be food-borne, the contaminated food was not identified with certainty except in a few isolated cases. Analysis of DNA patterns of the isolates from various sources suggests a heterogenous origin of contamination. Further information about the outbreak from Japan is posted on (http:www.nih.go.jp / yoken / iasr / 198 / tpc198.html).

# COMMUNICABLE DISEASES SURVEILLANCE

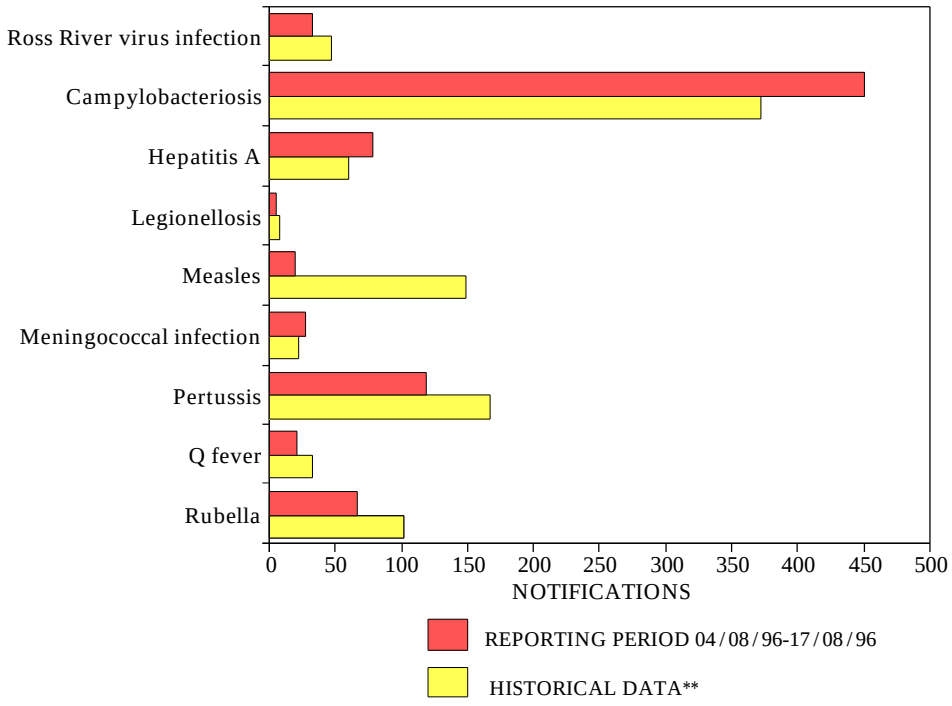
## National Notifiable Diseases Surveillance System

*The NNDSS is conducted under the auspices of the Communicable Diseases Network Australia-New Zealand. The system coordinates the national surveillance of 41 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 legislation. De-identified core unit data are supplied fortnightly for collation, analysis and dissemination. For further information, see CDI 1996;20:9-10.*

### Reporting period 4 to 17 August 1996

There were 1,831 notifications received for this two-week period (Tables 1, 2 and 3). The number of reports for selected diseases has been compared with average data for this period in the previous three years (Figure 1).

**Figure 1. Selected National Notifiable Diseases Surveillance System reports, and historical data[1]**




1. The historical data are the averages of the number of notifications in 9 previous 2-week reporting periods: the corresponding periods of the last 3 years and the periods immediately preceding and following those.

**Figure 2. Meningococcal infection notifications, 1991 to 1996, by month of onset**

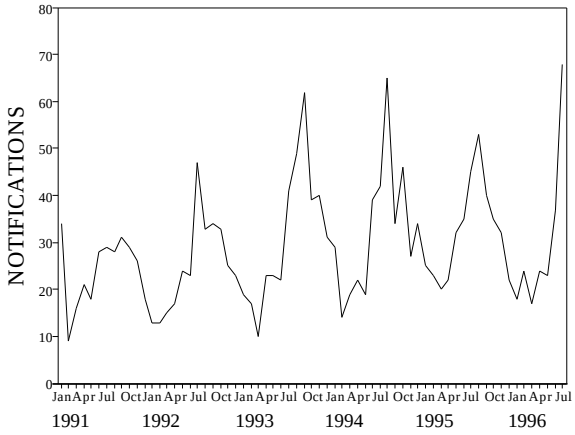
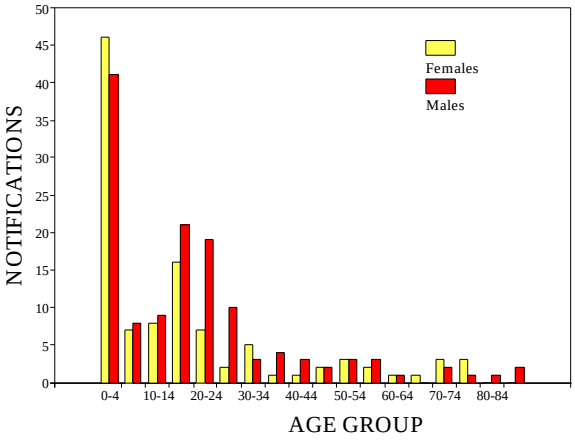



**Figure 3. Meningococcal infection notifications, 1996, by age group and sex**




There were 27 notifications of **meningococcal infection** received for the current fortnight. Recent reports include 68 cases with onset in July, the highest monthly total for the past 6 years (Figure 2). During 1996, population rates of notification have been similar for all States and Territories, although recent reports have included higher numbers from New South Wales. The highest number of notifications for 1996 were for children under 5 years of age; a secondary peak was seen in the 15-19 years age group (Figure 3).

The number of notifications of ***Haemophilus influenzae* type b infection** have remained at low levels over the past two years (Figure 4), but have not yet declined to the extremely low levels seen in some other countries with immunisation programs.

**Figure 4. *Haemophilus influenzae* type b infection notifications, 1991 to 1996, by month of onset**

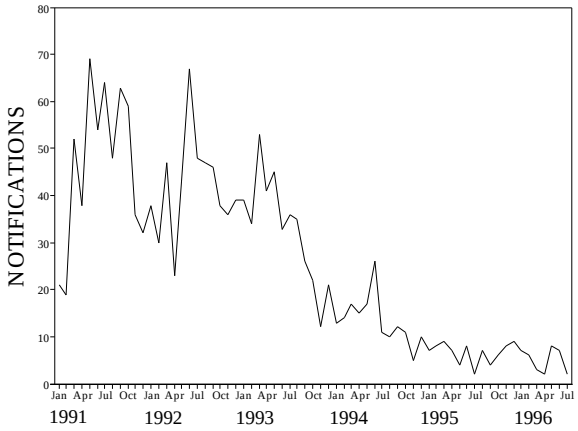



**Table 1. Notifications of diseases preventable by vaccines[1] recommended by the NHMRC for routine childhood immunisation, received by State and Territory health authorities in the period 4 to 17 August 1996**

| DISEASE | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | TOTALS FOR AUSTRALIA[2] This period 1996 | This period 1995 | Year to date 1996 | Year to date 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diphtheria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Haemophilus influenzae* b infection | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 40 | 49 |
| Measles | 1 | 5 | 0 | 4 | 0 | 3 | 5 | 1 | 19 | 32 | 300 | 972 |
| Mumps | 0 | 1 | 0 | NN | 1 | 2 | 2 | 0 | 6 | 3 | 76 | 96 |
| Pertussis | 0 | 28 | 0 | 25 | 19 | 3 | 42 | 1 | 118 | 134 | 1911 | 2636 |
| Rubella | 0 | 6 | 0 | 27 | 8 | 0 | 23 | 4 | 68 | 96 | 1593 | 1481 |
| Tetanus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |

NN Not Notifiable.

1. No notifications of poliomyelitis have been reported since 1986.

2. 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.

## Table 2. Notifications of other diseases[1] received by State and Territory health authorities in the period 4 to 17 August 1996

| DISEASE | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | TOTALS FOR AUSTRALIA[2] This period 1996 | This period 1995 | Year to date 1996 | Year to date 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arbovirus Infection (NEC)[3,4] | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 4 | 9 | 139 | 350 |
| Barmah Forest virus infection | 0 | 4 | - | 10 | 0 | 0 | - | - | 14 | 9 | 614 | 333 |
| Ross River virus infection | 0 | 5 | 4 | 17 | 0 | - | 0 | 6 | 32 | 25 | 7296 | 2247 |
| Dengue | 0 | 0 | 1 | 0 | 0 | - | 0 | 0 | 1 | 4 | 27 | 21 |
| Campylobacteriosis[5] | 7 | - | 5 | 86 | 112 | 22 | 162 | 56 | 450 | 418 | 7431 | 6514 |
| Chlamydial infection (NEC)[6] | 6 | NN | 25 | 107 | 0 | 20 | 60 | 37 | 255 | 221 | 4658 | 3901 |
| Donovanosis | 0 | NN | 0 | 0 | NN | 0 | 0 | 0 | 0 | 2 | 32 | 51 |
| Gonococcal infection[7] | 1 | 14 | 38 | 37 | 0 | 0 | 15 | 42 | 147 | 106 | 2413 | 1900 |
| Hepatitis A | 14 | 31 | 4 | 16 | 0 | 0 | 13 | 0 | 78 | 29 | 1541 | 984 |
| Hepatitis B incident | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 4 | 8 | 139 | 222 |
| Hepatitis C incident | 0 | 0 | 0 | - | 0 | - | - | - | 0 | 5 | 15 | 72 |
| Hepatitis C unspecified | 7 | NN | 9 | 107 | NN | 28 | 149 | 31 | 331 | 410 | 6005 | 5907 |
| Hepatitis (NEC) | 0 | 0 | 0 | 0 | 0 | 0 | 2 | NN | 2 | 1 | 16 | 16 |
| Legionellosis | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 8 | 120 | 133 |
| Leptospirosis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 156 | 84 |
| Listeriosis | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 38 | 43 |
| Malaria | 0 | 5 | 0 | 0 | 1 | 1 | 3 | 3 | 13 | 15 | 543 | 425 |
| Meningococcal infection | 0 | 10 | 0 | 8 | 1 | 3 | 4 | 1 | 27 | 17 | 241 | 214 |
| Ornithosis | 0 | NN | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 58 | 84 |
| Q fever | 0 | 8 | 0 | 11 | 0 | 0 | 0 | 2 | 21 | 22 | 337 | 297 |
| Salmonellosis (NEC) | 0 | 25 | 10 | 38 | 4 | 5 | 24 | 16 | 122 | 145 | 4010 | 4329 |
| Shigellosis[5] | 0 | - | 3 | 5 | 2 | 0 | 4 | 6 | 20 | 22 | 453 | 534 |
| Syphilis | 0 | 27 | 6 | 8 | 0 | 1 | 0 | 0 | 42 | 72 | 943 | 1240 |
| Tuberculosis | 2 | 10 | 1 | 4 | 0 | 2 | 10 | 0 | 29 | 36 | 716 | 721 |
| Typhoid[8] | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 2 | 56 | 44 |
| Yersiniosis (NEC)[5] | 0 | - | 0 | 6 | 2 | 0 | 2 | 0 | 10 | 8 | 165 | 230 |

1. For HIV and AIDS, see *CDI* 20;17:377. For rarely notified diseases, see Table 3 .
2. 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.
3. Tas: includes Ross River virus and dengue.
4. NT, Vic and WA: includes Barmah Forest virus.
5. NSW: only as 'foodborne disease' or 'gastroenteritis in an institution'.
6. WA: genital only.
7. NT, Qld, SA and Vic: includes gonococcal neonatal ophthalmia.
8. NSW, Vic: includes paratyphoid.

NN Not Notifiable.

NEC Not Elsewhere Classified.

- Elsewhere Classified.

## Table 3. Notifications of rare[1] diseases received by State and Territory health authorities in the period 4 to 17 August 1996

| DISEASES | Total this period | Reporting States or Territories | Year to date 1996 |
|---|---|---|---|
| Brucellosis | 1 | Vic | 24 |
| Chancroid | 0 | | 1 |
| Cholera | 0 | | 4 |
| Hydatid infection | 4 | ACT 1, NSW 2, Tas 1 | 29 |
| Leprosy | 0 | | 8 |

1. Fewer than 60 cases of each of these diseases were notified each year during the period 1988 to 1995.
2. No notifications have been received during 1996 for the following rare diseases: botulism; lymphogranuloma venereum; plague; rabies; yellow fever; or other viral haemorrhagic fevers.

## National Influenza Surveillance

*Australian Sentinel Practice Research Network; Communicable Diseases Intelligence Virology and Serology Reporting Scheme Contributing Laboratories, New South Wales Department of Health; Victorian Department of Health; World Health Organisation Collaborating Centre for Influenza Reference and Research.*

*National Influenza Surveillance is conducted from May to September each year. Data are combined from a number of sources to provide an indication of influenza activity. Included are sentinel general practitioner surveillance, absenteeism data from a national employer, and laboratory data from LabVISE and the World Health Organization Collaborating Centre for Influenza Reference and Research. For further information, see CDI 1996;20:9-12.*

The absenteeism rate recorded by Australia Post has fallen in recent weeks (Figure 5). No new data are available from the sentinel general practitioner schemes this fortnight (Figure 6).

There were 298 laboratory reports of influenza A received this fortnight, diagnosed by virus isolation (150), antigen detection (65), four-fold rise in titre (11) and single high titre (72). In July, 690 reports were received, the highest number for a single month ever recorded by this scheme (Figure 7). For the year to date, 1,121 reports of influenza A virus have been received, of which 50 were of the $H_3N_2$ subtype. No reports of $H_1N_1$ have been received by the LabVISE scheme this season. For 1996, 54% of reports of influenza A were received for children under the age of 5 years (Figure 8).

Few reports of influenza B continue to be received (Figure 9).

The World Health Organization Collaborating Centre for Influenza Reference and Research, Melbourne, has received 270 influenza isolates for characterisation from Australian laboratories so far this season. With the exception of three isolates (two strains of influenza B and one of influenza A $H_1N_1$), these were all influenza A $H_3N_2$ subtype viruses. The majority of the isolates characterised to date were antigenically close to A / Johannesburg / 33 / 94 or to A / Wuhan / 359 / 95. However there was evidence of some antigenic heterogeneity among isolates. Some strains which showed reduced reactivity with the current reference serum panel are being further investigated.

**Figure 5. Australia Post absenteeism, 1996, by week**

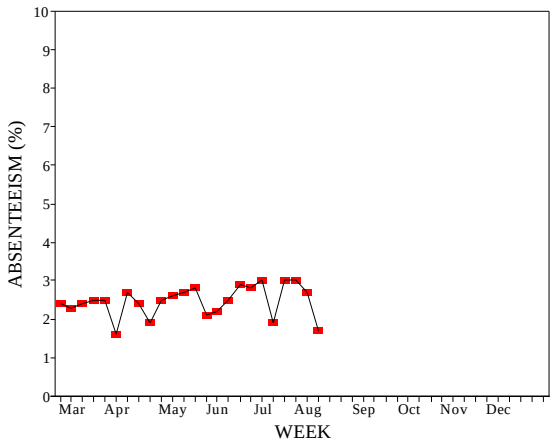



**Figure 6. Sentinel general practitioner influenza-like illness consultation reports per 1,000 encounters, 1996, by week**

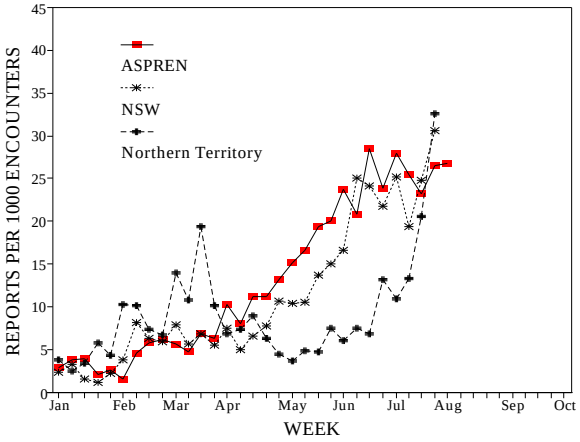



**Figure 7. Influenza A laboratory reports, 1991 to 1995 average and 1996 by month of specimen collection**

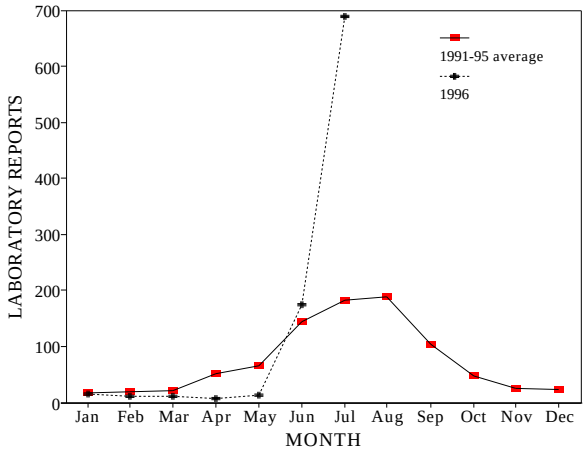



**Figure 8. Influenza A laboratory reports, 1996, by age group and sex**

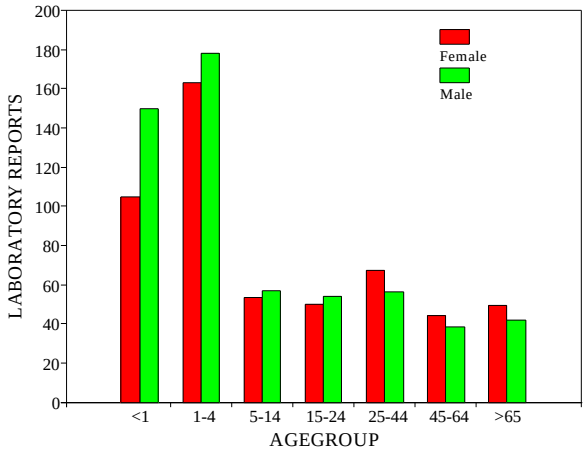
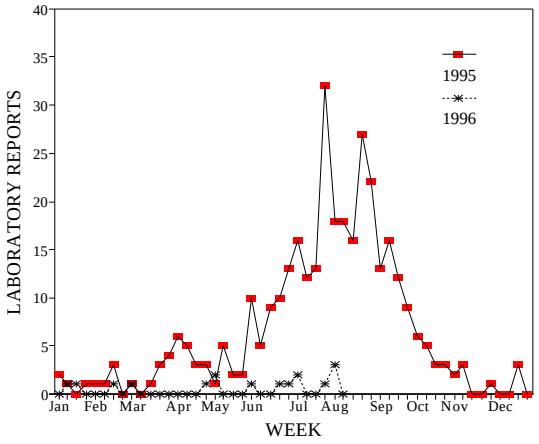


**Figure 9. Influenza B laboratory reports, 1996, by method of diagnosis and week of specimen collection**




Predominantly influenza A $H_3N_2$ isolates were also received from New Zealand. These were antigenically similar to the Australian isolates but a larger percentage of strains showed low reactivity with the reference serum panel.

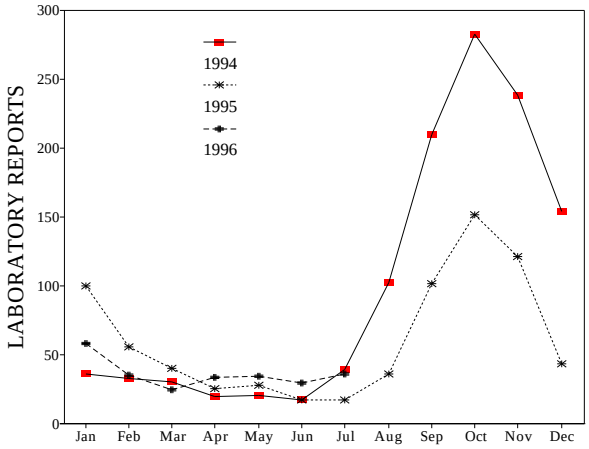
The small numbers of Australasian influenza A $H_1N_1$ and influenza B isolates characterised to date were A/Texas/36/91-like and B/Indiana/1/95-like respectively. B/Indiana-like strains reacted well with B/Beijing/184/95 antiserum but could be distinguished from the vaccine strain.

## LabVISE

*The Virology and Serology Reporting Scheme, LabVISE, is a sentinel reporting scheme. Twenty-one laboratories contribute data on the laboratory identification of viruses and other organisms. Data are collated and published in Communicable Diseases Intelligence each fortnight. These data should be interpreted with caution as the number and type of reports received is subject to a number of biases. For further information, see CDI 1996;20:9-12.*

There were 1,774 reports received in the *CDI* Virology and Serology Reporting Scheme this period (Tables 4 and 5).

**Figure 10. Rubella laboratory reports, 1994 to 1996, by month of specimen collection**




In the last fortnight 22 reports of **rubella virus** were received. Included were 5 females in the 15 to 44 year age group. The number of reports is average for the time of year (Figure 10).

One report of **coxsackievirus type B5** was received this fortnight. Recent outbreaks of meningitis due to this virus have been reported from Cyprus (280 cases) and England and Wales (95 cases).

Reports of **parainfluenza virus type 1** continue to fall while those for **parainfluenza virus type 3** have risen in recent months (Figure 11).

There were 486 reports of **respiratory syncytial virus** received this period. Diagnosis was by virus isolation (250), antigen detection (225) and single high titre (11). Four hundred and forty-six (94%) reports were for children under the age of 5 years. The number of reports is average for the time of year.

**Rotavirus** was reported for 127 patients this period, 29% of whom were under the age of one year and 93% under the age of 5 years. The number of reports received was slightly below average in the month of July (Figure 12).

**Figure 11. Parainfluenza virus type 1, 2 and 3 laboratory reports, 1995 to 1996, by month of specimen collection**

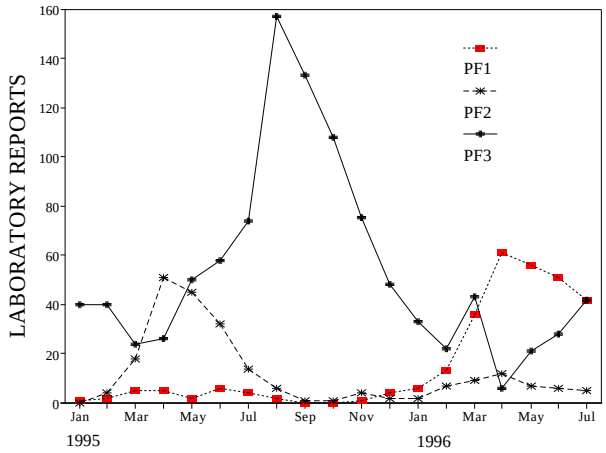



**Figure 12. Rotavirus laboratory reports, 1991 to 1995 average, and 1996, by month of specimen collection**

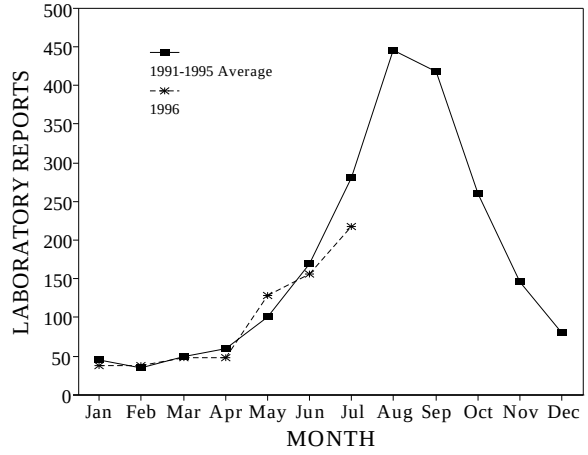


**Table 4. Virology and serology laboratory reports by State or Territory[1] for the reporting period 8 to 21 August 1996, historical data[2], and total reports for the year**

| | State or Territory[1] | | | | | | | | Total this fortnight | Historical data[2] | Total reported this year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | | | |
| MEASLES, MUMPS, RUBELLA | | | | | | | | | | | |
| Measles virus | | | | 1 | | | | | 1 | 16.0 | 36 |
| Mumps virus | | | | 1 | | | | | 1 | 3.0 | 29 |
| Rubella virus | | 2 | | 14 | 2 | | 2 | 2 | 22 | 18.7 | 374 |
| HEPATITIS VIRUSES | | | | | | | | | | | |
| Hepatitis A virus | | 1 | 1 | 2 | | | 1 | 3 | 8 | 14.5 | 313 |
| Hepatitis D virus | | | | 1 | | | | | 1 | .5 | 10 |
| Hepatitis E virus | | | | | | | | 1 | 1 | .5 | 2 |
| ARBOVIRUSES | | | | | | | | | | | |
| Ross River virus | | | 6 | 7 | 2 | | 1 | 5 | 21 | 6.7 | 3,050 |
| Barmah Forest virus | | | | 4 | | | 1 | | 5 | 2.7 | 170 |
| Dengue not typed | | | | | | | | 2 | 2 | .7 | 12 |
| ADENOVIRUSES | | | | | | | | | | | |
| Adenovirus type 1 | | | | | 1 | | 2 | | 3 | 2.3 | 14 |
| Adenovirus type 3 | | | | | 2 | | | | 2 | 1.2 | 62 |
| Adenovirus type 5 | | | | | | | 1 | | 1 | 1.3 | 4 |
| Adenovirus type 6 | | | | | 1 | | | | 1 | .2 | 1 |
| Adenovirus type 40 | | | | | | | | 2 | 2 | .0 | 26 |
| Adenovirus not typed / pending | | 6 | 1 | 29 | 10 | | 8 | 13 | 67 | 42.5 | 957 |
| HERPES VIRUSES | | | | | | | | | | | |
| Herpes simplex virus type 1 | | | | | | | 7 | 1 | 8 | 171.8 | 2,715 |
| Herpes simplex virus type 2 | | | | | | | 3 | 1 | 4 | 183.8 | 2,680 |
| Herpes simplex not typed / pending | | | | | | | 2 | | 2 | 19.2 | 292 |
| Cytomegalovirus | | 5 | 1 | 16 | 9 | | 24 | 10 | 65 | 64.8 | 1,153 |
| Varicella-zoster virus | | 3 | 1 | 24 | 9 | | 24 | 9 | 70 | 37.8 | 861 |
| Epstein-Barr virus | | 11 | 2 | 34 | 21 | | 8 | 22 | 98 | 57.5 | 1,400 |
| OTHER DNA VIRUSES | | | | | | | | | | | |
| Parvovirus | | | | 4 | | | 14 | | 18 | 4.2 | 121 |
| PICORNA VIRUS FAMILY | | | | | | | | | | | |
| Coxsackievirus B5 | | | | | | | 1 | | 1 | .2 | 2 |
| Echovirus type 7 | | | | | 1 | | 3 | | 4 | .0 | 7 |
| Poliovirus type 1 (uncharacterised) | | | | | | | 1 | | 1 | .8 | 12 |
| Poliovirus type 2 (uncharacterised) | | | | | | | 2 | | 2 | .5 | 13 |
| Rhinovirus (all types) | | 4 | | 12 | 1 | | 16 | 6 | 39 | 41.2 | 503 |
| Enterovirus not typed / pending | | | | 13 | | | 8 | 12 | 33 | 34.2 | 611 |
| ORTHO / PARAMYXOVIRUSES | | | | | | | | | | | |
| Influenza A virus | | 21 | 1 | 102 | 86 | | 38 | 45 | 293 | 95.2 | 1,110 |
| Influenza A virus $H_3N_2$ | | | | | | | 5 | | 5 | 8.8 | 50 |
| Influenza B virus | | 1 | | 1 | 1 | | | | 3 | 23.8 | 37 |
| Influenza virus - typing pending | | | | | | | | 2 | 2 | .5 | 3 |
| Parainfluenza virus type 1 | | 2 | | 9 | 9 | | 2 | 1 | 23 | 10.3 | 274 |
| Parainfluenza virus type 2 | | | | | 3 | | | | 3 | 2.7 | 57 |
| Parainfluenza virus type 3 | | 3 | | 7 | 1 | | 4 | 14 | 29 | 26.0 | 383 |
| Parainfluenza virus typing pending | | | | | | | | 1 | 1 | 3.2 | 11 |
| Respiratory syncytial virus | | 74 | | 63 | 127 | 5 | 115 | 102 | 486 | 327.7 | 3,176 |
| Paramyxovirus (unspecified) | | | | | | | 3 | | 3 | .0 | 15 |
| OTHER RNA VIRUSES | | | | | | | | | | | |
| HTLV-1 | | | | | | | | 2 | 2 | .0 | 6 |
| Rotavirus | | 50 | | | 10 | | 48 | 19 | 127 | 177.3 | 935 |
| Norwalk agent | | | | | | | 1 | | 1 | 1.8 | 32 |
| Small virus (like) particle | | | | | | | 1 | | 1 | .5 | 12 |

**Table 4. Virology and serology laboratory reports by State or Territory[1] for the reporting period 8 to 21 August 1996, historical data[2], and total reports for the year, continued**

| | State or Territory[1] | | | | | | | | Total this fortnight | Historical data[2] | Total reported this year |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ACT | NSW | NT | Qld | SA | Tas | Vic | WA | | | |
| OTHER | | | | | | | | | | | |
| *Chlamydia trachomatis* not typed | | 5 | 15 | 39 | 29 | 1 | 20 | 44 | 153 | 89.2 | 2,676 |
| *Chlamydia psittaci* | | | | | | | 4 | | 4 | 4.0 | 68 |
| *Mycoplasma pneumoniae* | | 10 | | 8 | 14 | | 11 | 9 | 52 | 23.3 | 471 |
| *Coxiella burnetii* (Q fever) | | 9 | | 2 | | | 4 | 4 | 19 | 5.5 | 135 |
| *Rickettsia australis* | | | | 3 | | | | | 3 | 1.0 | 15 |
| *Rickettsia tsutsugamushi* | | | 1 | 1 | | | 1 | | 3 | .8 | 8 |
| *Neisseria gonorrhoeae* | | | | | | | | 39 | 39 | .0 | 143 |
| *Bordetella pertussis* | | | | | | 1 | 7 | 1 | 9 | 19.2 | 319 |
| *Bordetella* species | | 1 | | 14 | | | | | 15 | 7.8 | 204 |
| *Cryptococcus* species | | | | | | | | 1 | 1 | .2 | 6 |
| *Leptospira* species | | 1 | | 1 | | | | | 2 | .2 | 44 |
| *Entamoeba histolytica* | | | | | | | 1 | | 1 | .0 | 13 |
| *Schistosoma* species | | | | | | | 6 | 5 | 11 | 3.7 | 204 |
| TOTAL | | 209 | 29 | 412 | 339 | 7 | 400 | 378 | 1,774 | 1,559.3 | 25,837 |

1. State or Territory of postcode, if reported, otherwise State or Territory of reporting laboratory.
2. The historical data are the averages of the numbers of reports in 6 previous 2 week reporting periods: the corresponding periods of the last 2 years and the periods immediately preceding and following those.

**Table 5. Virology and serology laboratory reports by contributing laboratories for the reporting period 8 to 21 August 1996**

| STATE OR TERRITORY | LABORATORY | REPORTS |
|---|---|---|
| New South Wales | Institute of Clinical Pathology & Medical Research, Westmead | 36 |
| | Royal Alexandra Hospital for Children, Camperdown | 52 |
| | Royal North Shore Hospital, St Leonards | 40 |
| | Royal Prince Alfred Hospital, Camperdown | 2 |
| | South West Area Pathology Service, Liverpool | 58 |
| Queensland | Queensland Medical Laboratory, West End | 241 |
| | State Health Laboratory, Brisbane | 200 |
| South Australia | Institute of Medical and Veterinary Science, Adelaide | 339 |
| Tasmania | Northern Tasmanian Pathology Service, Launceston | 7 |
| Victoria | Microbiological Diagnostic Unit, University of Melbourne | 19 |
| | Monash Medical Centre, Melbourne | 45 |
| | Royal Children's Hospital, Melbourne | 148 |
| | Victorian Infectious Diseases Reference Laboratory, Fairfield Hospital | 191 |
| Western Australia | PathCentre Virology, Perth | 191 |
| | Princess Margaret Hospital, Perth | 140 |
| | Royal Perth Hospital | 14 |
| | Western Diagnostic Pathology | 51 |
| TOTAL | | 1774 |