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**Communicable Diseases  
in the ACT  
1993-1997**

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## Executive Summary

Communicable diseases remain a significant public health priority nationally and internationally. The problems facing Australia today are diverse. Surveillance and notification of communicable diseases is an important public health activity and is required by legislation. ACT has introduced measures to improve notifications to the Notifiable Diseases Surveillance System. Under reporting of disease will always be a problem due to the nature of the surveillance system or the disease itself.

### **ACT notifications to the national notifiable diseases surveillance system (NNDSS)**

- ACT notifications to the NNDSS, showed a slight overall increase between 1993-97.
- Notifications show a seasonal reporting pattern with more notifications in winter and early spring.
- Rates of all notifications in the ACT were higher in the statistical subdivisions of North and South Canberra and Woden Valley. Reasons for this were not apparent.
- Notification rates for communicable diseases were highest for the 0-4 year age group, male and female rates were similar. High rates were also recorded in the 20-39 year age groups, rates for males were higher than the corresponding female rates.
- The largest decreases in notification rates were in campylobacteriosis, measles and rubella. The highest rates of disease were in the bloodborne and gastrointestinal/foodborne disease categories.
- Sexually transmitted diseases are showing an upward trend.
- Vectorborne and zoonotic diseases consistently show low rates in the ACT.

### **Bloodborne diseases**

- Hepatitis C is the most notified communicable disease in the ACT. Since the introduction of testing in 1990 there has been an incremental increase in the number of notifications, probably reflecting an increase in case ascertainment. The highest rates were recorded in men aged between the ages of 30-44 years.
- In Australia the incidence of human immunodeficiency virus (HIV) is low compared to the rest of the world and is decreasing. The prevalence is low and stable. The principal population affected is homosexual men, followed by intravenous drug users. Projections for the next 3-5 years indicate a continued decline in the epidemic. The ACT rate is the third highest in Australia. Most cases in the ACT and Australia have occurred in men aged 20-49 years.

### **Sexually transmissible diseases**

- The rate of chlamydial infection in the ACT has increased sharply since 1995 from 26.0 cases per 100,000 in 1995 to 37.7 in 1996 and 45.8 in 1997. This increase occurred in all states and territories. The peak incidence was recorded in the 20-24 year age group. Projections for 1998 indicate that 1998 will have the highest number of notifications recorded since 1991 for syphilis.

### **Gastrointestinal, food borne, waterborne disease**

- Gastrointestinal diseases constituted 30% of all disease notifications in the ACT during 1997. Most of these diseases in the ACT are reported by laboratories, hence there is considerable under reporting as laboratory investigations may not be carried out in a large proportion of cases.

- Rates for campylobacteriosis in the ACT have not reflected the overall increase seen in Australia.
- The rate of hepatitis A in 1997 was 17.1 per 100,000, which was slightly higher than the Australian rate of 16.1. Most cases in the ACT were present in clusters and were primarily associated with outbreaks.
- Well documented outbreaks of cryptosporidiosis attributed to drinking contaminated water or using contaminated swimming pools have occurred. Outbreaks occurred in January through to April in 1995 and 1998. The large peak in 1998 was associated with an outbreak of cryptosporidiosis in ACT swimming pools.

### **Vaccine preventable diseases**

- Overall rates decreased in the ACT between 1993-97. However the ACT rates of vaccine preventable diseases in 1997 (78.1 per 100,000 population) were slightly higher than the Australian rate (70.8). The extent to which this is due to better case ascertainment in the ACT is difficult to establish.
- The dramatic fall in *Haemophilus influenzae* type b is directly attributable to the vaccination campaign, which included a “catch up” program. Four cases of Hib (1 male and 3 female) were notified between 1994 and 1997 in the ACT. All of these cases were in children between 1 and 4 years of age. One child was not immunised and three children were only partially immunised.
- Notifications of measles in the ACT showed a peak in 1993 (60.9 notifications per 100,000 population) and then a decline to 3.3 in 1996, followed by a sharp increase in rate to 25.2 in 1997
- The rate of pertussis notifications in the ACT for 1997 was 37.1 per 100,000 population, the highest rate recorded in the ACT since 1991. The Australian rate in 1997 was 55.3 which is the highest recorded in Australia since 1991. Age specific notification rates for 1997 were highest for children under 14 years.

### **Tuberculosis**

- The rate of tuberculosis notifications in the ACT for 1997 was 3.2 per 100,000 population. This was lower than the Australian rate of 5.1 for that year. Drug susceptibility testing in Australia shows no notable changes in the prevalence of drug resistant strains in the Australian population.

### **Laboratory surveillance (Virology and Serology reporting Scheme)**

- The information from this scheme is useful for observation of general trends. Organisms reported to this scheme have been identified by laboratory procedures from clinical specimens.
- Respiratory syncytial virus and rotavirus infections were the most common organisms reported to the scheme.
- Influenza infection occurs annually during the winter months. Surveillance of influenza is important to detect emergence of new strains that need to be incorporated into the new vaccine.
- 1997 was a year of high influenza activity in Australia. Influenza B peaked before influenza A. Most cases of influenza A and B occurred in the 0-4 year age group.



# Communicable diseases in the ACT: 1993-97

## 1.0 Introduction

Communicable diseases remain a significant public health priority both within Australia and internationally. The problems facing Australia today are diverse. On the one hand they include increasing incidence of foodborne diseases, sexually transmitted diseases, vector-borne diseases and vaccine preventable diseases. On the other hand new and emerging disease such as bat lyssavirus, Bovine Spongiform Encephalopathy (BSE) and the emergence of antimicrobial resistant bacteria pose potential threats to public health.

The number of deaths caused through infectious and parasitic diseases fluctuates and tends to be very small in the ACT. Hospital morbidity data is of limited use in estimating prevalence of communicable diseases in the community as people suffering from these diseases are not usually admitted to hospital. Infectious and parasitic diseases accounted for 1.5 percent of hospital separations in 1996-97 and the average length of stay was 4.1 days in 1996-97<sup>1</sup>.

The "ACT Health Goals and Targets for the Year 2000" include the following:  
"Reduce the level of vaccine preventable disease by increasing access to vaccines."  
"Reduce the incidence of diseases transmitted sexually and by injecting drug use."  
"Reduce the incidence of other communicable diseases".

Notification of communicable diseases is an important public health activity. It prompts investigation and the use of interventions to control the spread of disease and also enables the effectiveness of existing control activities to be monitored. The recent outbreak of cryptosporidiosis in ACT swimming pools highlighted the importance of surveillance for disease and an effective public health response.

This publication, 20th in the Health Series, and the first communicable diseases publication, aims to present the current and past status of communicable diseases in the ACT. Reliable data have only been available since 1993 and in some cases 1994 from the ACT notifiable diseases database. The baseline data will assist in the monitoring of current strategies with regard to communicable diseases and guide the development of intervention strategies in the future.

### 1.1 Local, national, international perspective

Communicable disease control activities operate at a number of levels. Many such activities are initiated at a local, state or territory level necessitating local, state and territory based surveillance. Notification of communicable diseases is required under the legislation of each state or territory and hence varies between jurisdictions.

The ACT legislation for the surveillance and notification of notifiable diseases has been in place since 1930. Provisions are outlined in the Public Health (Infectious and Notifiable Diseases) Regulations, *Sexually Transmitted Diseases Act 1956* and *Tuberculosis Act 1950*, for the notification of certain infectious and communicable diseases. This legislation is soon to be repealed with the implementation of the Public Health Act 1997.



Surveillance of communicable diseases in the ACT has improved significantly since the establishment of the Communicable Diseases Network (a Commonwealth / State / Territory initiative), in 1989. The network developed a national list of notifiable diseases and agreed on disease case definitions to allow consistency of surveillance data between jurisdictions. The ACT has implemented Communicable Diseases Network recommendations, and has introduced other measures to improve notifications. Awareness of notification has increased with the establishment of communication networks between general practitioners, hospitals, and pathology departments. Simplification of the notification procedure has occurred by accepting phone and faxed reports for some diseases and providing reply paid envelopes.

National surveillance combines data from the State and Territory based systems. National surveillance is necessary for the identification and control of outbreaks which affect more than one jurisdiction. The data are also used to develop national control programs and policy development. National data is collated and used by the National Centre for Diseases Control (NCDC). NCDC reports to international collaborations such as the World Health Organisation.

A national approach to disease control requires strong links between all levels of government. This has been achieved through national networks such as the Communicable Diseases Network of Australia and New Zealand (CDNANZ). CDNANZ meets fortnightly by teleconference, which allows for rapid dissemination of local, national and international information. The CDNANZ is currently implementing the National Communicable Diseases Surveillance Strategy (NCDSS). This provides a strategic framework to strengthen the coordination and planning of surveillance activities. As part of the implementation of the strategy the Public Health Laboratory Network (PHLN) was convened in 1997. The PHLN is a network of public health laboratories whose aim is to enhance the capacity of laboratories to contribute to national surveillance.

## 1.2 Surveillance systems

Surveillance can be defined as the systematic, continued, careful watchfulness over health related data with appropriate analysis and inferences and the rapid dissemination of this information to those who need to know<sup>2</sup>. Surveillance of communicable diseases requires the presence of an established system of continual data collection, specific and sensitive enough to provide rapid, reliable information on disease trends. Local and national surveillance networks and centres facilitate early detection of disease as well as long term epidemiological analysis. These data form the foundation for future public health priorities, evidence-based policy development and best practice.

Surveillance systems currently in place in Australia and to which the ACT contributes include:

- National Notifiable Diseases Surveillance System
- Virology and Serology Laboratory Reporting Scheme
- National Influenza Surveillance
- Surveillance of Serious Adverse Events Following Vaccination
- HIV and AIDS surveillance
- Australian Gonococcal Surveillance Program
- National Mycobacterial Surveillance System
- Australian Mycobacterial Reference Laboratory Network
- Hib Case Surveillance Scheme
- Australian Meningococcal Surveillance Program
- National Antimicrobial Resistance Surveillance Program

- Australian Group on Antimicrobial Resistance

All of these systems rely on health-care providers, laboratories, hospitals and other public health personnel to report occurrence of the diseases. Whether or not relevant legislation exists to allow or require such reporting, this system of collectors must be informed, cooperative and resourced to contribute to surveillance systems. A number of these surveillance systems rely on voluntary reporting, hence only represent a proportion of the total number of cases which occur.

Patient confidentiality is maintained throughout all of the surveillance systems and stringent procedures are in place to ensure misuse of data does not occur.

#### *National Notifiable Diseases Surveillance System*

A notifiable disease is one for which regular, frequent and timely information regarding individual cases is considered essential for the prevention and control of the disease. Notifications of certain communicable and infectious diseases are required by states and territories under their public health legislation. Notifications for these diseases represent a more accurate picture of the level of the disease in the community, since problems of under reporting although significant, are reduced. The notifications are analysed at a local level (Communicable Diseases Control Program) and are forwarded to the National Centre for Disease Control to be included in the National Notifiable Diseases Surveillance System (NNDSS). The National Notifiable Diseases Surveillance System was established in its current form in 1991, under the auspices of the Communicable Diseases Network of Australia and New Zealand (CDNANZ). Data collected from the NNDSS is published monthly in the *Communicable Diseases Intelligence*.<sup>3</sup>

More than forty diseases or disease categories are included in the list of National Notifiable Diseases, largely as recommended by the NHMRC<sup>4</sup>. Surveillance case definitions adopted by the ACT are those produced by the NHMRC. This provides uniform criteria for reporting cases, which increases the specificity of reporting and improves comparability of diseases reported from different states and territories.

Sources of surveillance data include doctor, laboratory, childcare, schools and hospitals. Information from all these sources is necessary for appropriate surveillance of communicable diseases. The use of standard notification forms facilitates the collection and transmission of notifiable diseases data (refer to appendix). The data set does not include risk factors, nationality or clinical symptoms, in an attempt to minimise the amount of information that needs to be provided in an attempt to improve the level of compliance of notifications. Aboriginality is often difficult to ascertain as the information is unavailable (eg in the case of laboratory notifications) or under reported (as in the case of doctor and hospital notifications).

#### *Virology and Serology Laboratory Reporting Scheme (LabVISE)*

The Virology and Serology Laboratory Reporting Scheme (LabVISE) began operating in 1977. The scheme comprises 21 sentinel laboratories from all states and territories. The ACT has one laboratory that services the region reporting to the scheme, (ACT Pathology at The Canberra Hospital). The scheme provides valuable data on viruses and other organisms diagnosed in sentinel virology and serology laboratories. Data from this scheme represent only a proportion of the level of disease in the community. The information is useful however because of the nature of the diagnosis and the presence of diseases not included on the national notifiable diseases list. It should be emphasised that there are limits associated with relying solely on laboratory data for diagnosis of disease. Data used in this publication are preliminary data only.

### Data limitations

Under reporting of disease will always be a problem due to the nature of the surveillance system or the disease itself (eg HCV). All of the data collection systems rely on the informed cooperation of the system of collectors. The role of the private laboratory sector in notifications is very important and problems may arise when interstate laboratories service the ACT region. Problems also arise when laboratory tests that will better characterise an organism and provide better epidemiological information are required, but are not performed locally. A concerted effort in the ACT by the Communicable Diseases Control Program to encourage notifications of all notifiable diseases, scrutiny for duplicate reports and improved data recording has resulted in more reliable data being available since 1993.

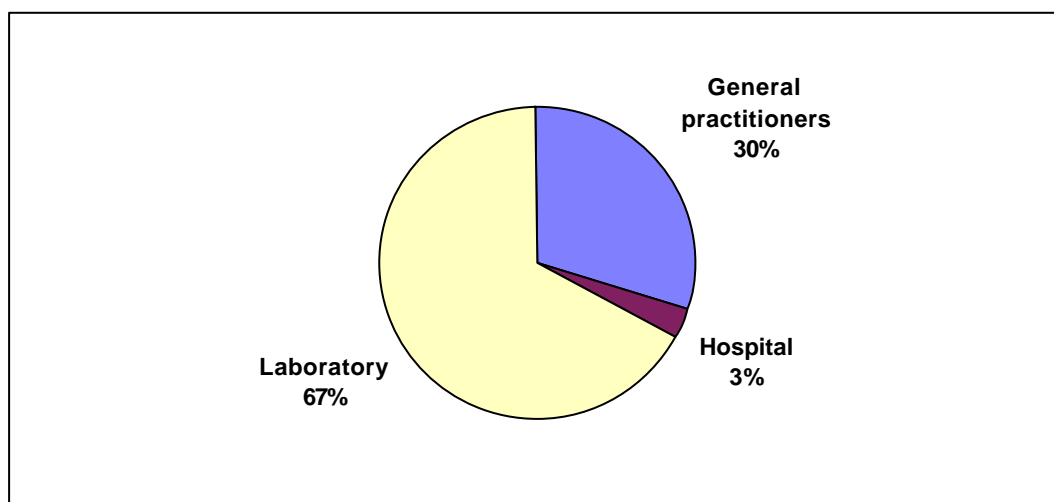
The number of notifications received may be influenced by several factors. Patients may fail to present with a disease or the disease may not get notified. Laboratory confirmation of the disease which would allow better case ascertainment, may not be performed. Conversely, diseases that can only be clinically diagnosed may be underestimated or overestimated if the clinical case definitions are not highly specific to the disease. There may be better case ascertainment for rarer diseases, than for common diseases without serious complications. The low numbers of cases of some disease states does not allow for accurate rate calculations and should be interpreted with caution. These issues should be considered in the interpretation of available data.



## 2.0 ACT notifications to the national notifiable diseases surveillance system

Notifications were received from hospitals, laboratories and medical practitioners. Data are collected by the Communicable Diseases Unit in the Health Protection Service, Population Health Group, ACT Department of Health and Community Care. The data were examined to ensure that cases are consistent with surveillance case definition and duplicate reports were deleted. Most notifications were from laboratories followed by general practitioners.

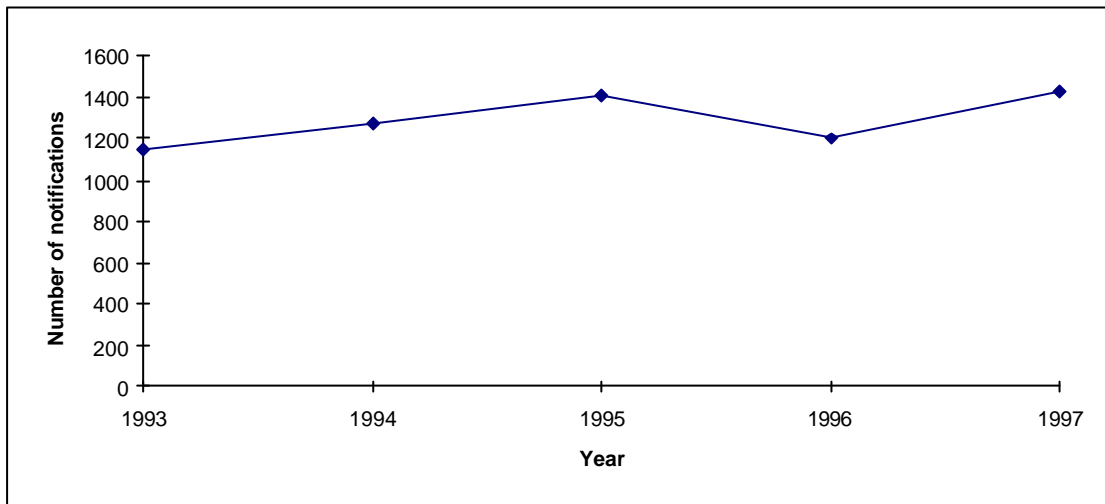
**Figure 1: Source of notifications, ACT, 1993-97**



Source: Notifiable disease data, ACT, 1997

ACT notifications to the NNDSS, showed a slight overall increase between 1993-97. There were 1,426 notifications during 1997, and 1,182 for the first half of 1998 (Figure 2). The projected increase in notifications for 1998, relative to other years, is attributable to the large increase in the first quarter of the year in the notifications of campylobacter and cryptosporidium. Although cryptosporidium was only officially added to the list of notifiable diseases in 1998, notifications of this disease have been made to the system prior to this.

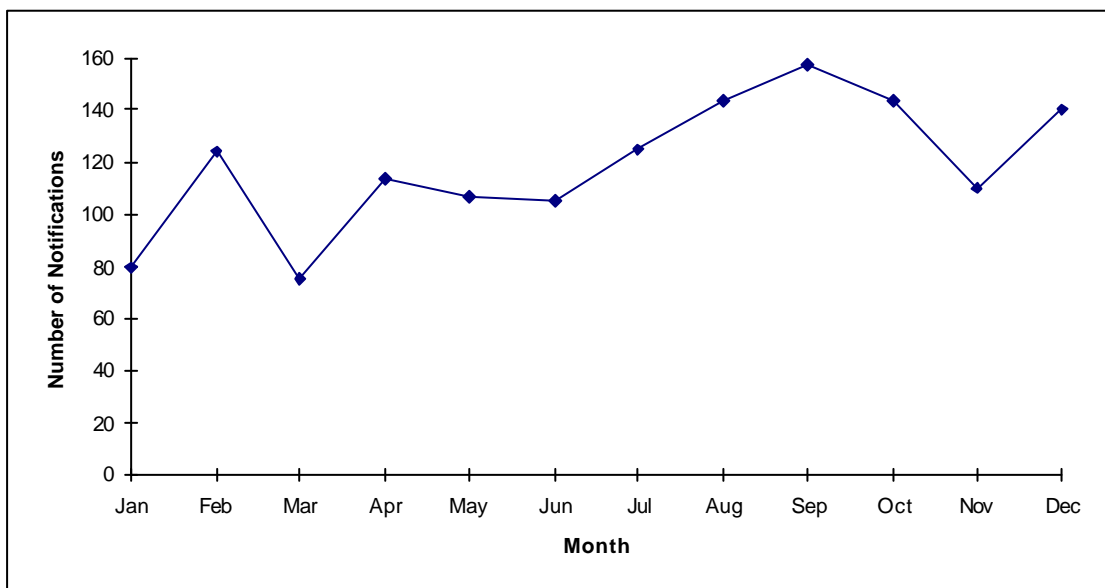
**Figure 2: Total notifications to NNDSS, ACT, 1993-97**



Source: Notifiable disease data, ACT, 1993-98

Notifications to the NNDSS show a seasonal reporting pattern with more notifications in winter and early spring (refer Figure 3).

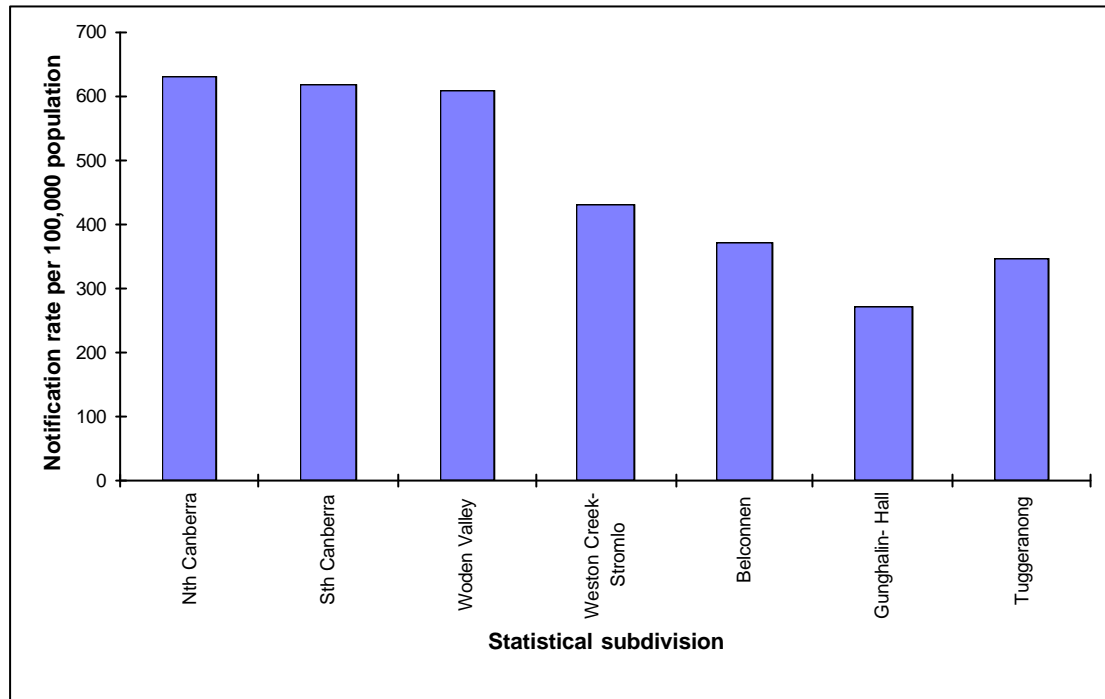
**Figure 3: Notifications by month of onset, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

Rates of all notifications in the ACT were higher in the statistical subdivisions of North and South Canberra and Woden Valley. Reasons for this were not apparent.

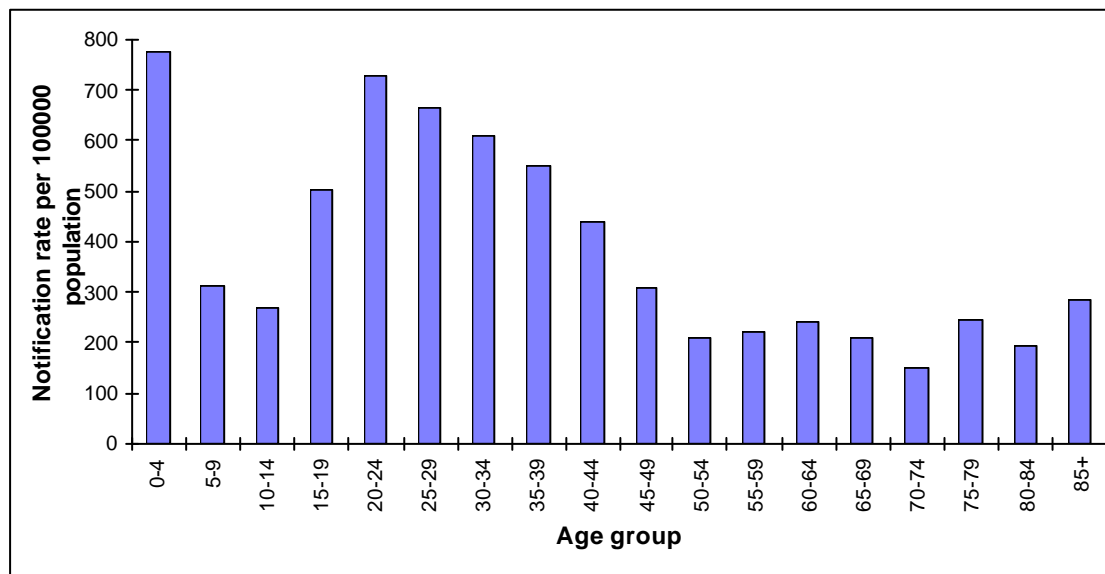
**Figure 4: Rate of notification by statistical subdivision, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

Notification rates for communicable diseases were highest for the 0-4 year age group, male and female rates were similar. High rates were also recorded in the 20-39 year age groups, rates for males were higher than the corresponding female rates.

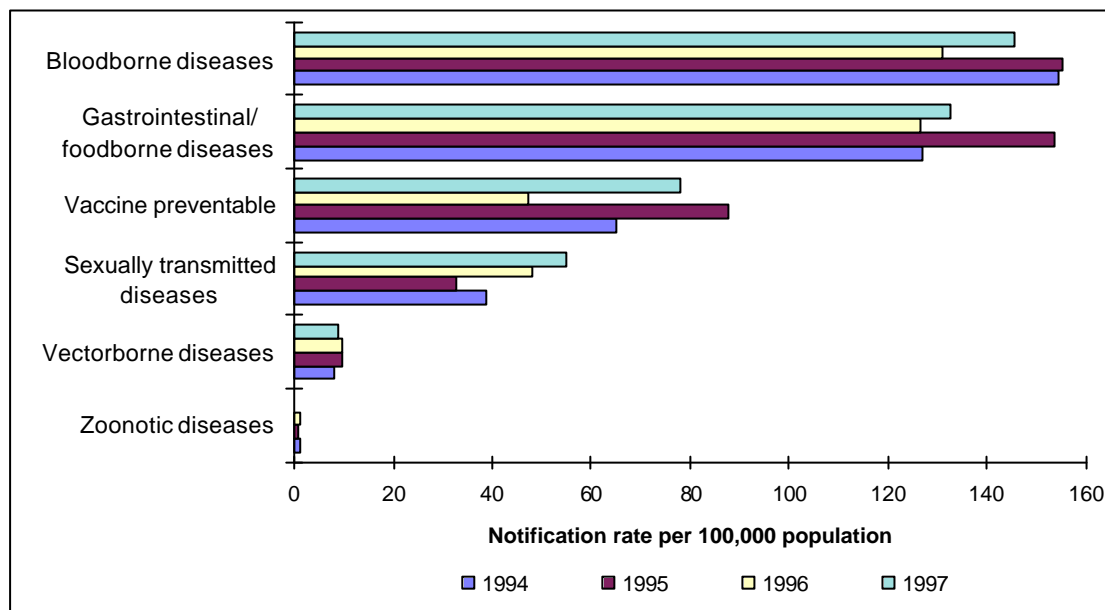
**Figure 5: Notification rates of communicable diseases by age group, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

A breakdown of specific notifiable diseases follows. Diseases with the highest rates of notifications in 1997 were hepatitis C- unspecified (102.6 per 100,000 ACT population) followed by campylobacteriosis (84.2), chlamydia infection (45.8) and pertussis (37.1). The largest increases in notification rates during the 1994-97 period were observed for pertussis, chlamydial infection, hepatitis A and salmonellosis. The largest decreases in notification rates were noticed in campylobacteriosis, measles and rubella.

**Figure 6: Notification rates by disease group, ACT, 1994-97**



Source: Notifiable disease data, ACT, 1997

The highest rates of disease were in the bloodborne and gastrointestinal/foodborne disease categories. Sexually transmitted diseases are showing an upward trend. Vaccine preventable diseases are not showing a consistent trend probably due to the epidemic cycles of these diseases. Vectorborne and zoonotic diseases consistently show low rates in the ACT.

**Table 1: National Notifiable Diseases Surveillance System, notifications by number and rates, ACT, 1993-97**

	1994		1995		1996		1997	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
<b>Bloodborne diseases</b>								
Hepatitis C - unspecified	309	102.7	328	107.8	266	86.5	318	102.6
Hepatitis C - incident	6	2	7	2.3	10	3.3	2	0.6
Hepatitis B - unspecified	121	40.2	90	29.6	97	31.5	111	35.8
Hepatitis B - incident	0	0	11	3.6	4	1.3	2	0.6
HIV infection	29	9.6	37	12.2	26	8.5	18	5.8
<b>Sexually transmissible diseases</b>								
Chlamydia infection (NEC)	89	29.6	79	26	116	37.7	142	45.8
Gonococcal infection	11	3.7	10	3.3	18	5.9	21	6.8
Syphilis	16	5.3	11	3.6	14	4.6	8	2.6
<b>Gastrointestinal disease</b>								
Campylobacteriosis	303	100.7	296	97.3	255	82.9	261	84.2
Salmonellosis (NEC)	42	14	83	27.3	60	19.5	72	23.2
Hepatitis A	17	5.7	14	4.6	62	20.2	53	17.1
Food poisoning	10	3.3	6	2	2	0.7	10	3.2
Shigellosis	8	2.7	7	2.3	3	1	5	1.6
Cryptosporidiosis	0	0	55	18.1	0	0	4	1.3
Legionellosis	0	0	1	0.3	2	0.7	2	0.6
Yersiniosis	0	0	1	0.3	0	0	2	0.6
Typhoid	1	0.3	2	0.7	2	0.7	1	0.3
Listeriosis	1	0.3	3	1	3	1	0	0.0
<b>Vaccine preventable diseases</b>								
Pertussis	19	6.3	32	10.5	33	10.7	115	37.1
Measles	113	37.6	48	15.8	10	3.3	78	25.2
Rubella	51	17	159	52.3	85	27.6	32	10.3
Meningococcal infection	6	2	11	3.6	8	2.6	9	2.9
Mumps	5	1.7	16	5.3	7	2.3	7	2.3
<i>Haemophilus influenzae</i> type b	1	0.3	1	0.3	2	0.7	1	0.3
<b>Vectorborne disease</b>								
Malaria	24	8	22	7.2	27	8.8	17	5.5
Ross River Virus	1	0.3	2	0.7	1	0.3	9	2.9
Dengue	0	0	0	0	1	0.3	1	0.3
Arbovirus infection (Barmah Forest virus)	0	0	5	1.6	1	0.3	1	0.3
<b>Zoonotic diseases</b>								
Brucellosis	0	0	0	0	0	0	0	0.0
Hydatid infection	2	0.7	0	0	4	1.3	0	0.0
Leptospirosis	1	0.3	0	0	0	0	0	0.0
Ornithosis	0	0	1	0.3	0	0	0	0.0
Q fever	0	0	1	0.3	0	0	0	0.0
<b>Quarantinable and other disease</b>								
Cholera	0	0	1	0.35	0	0	0	0.0
Tuberculosis	9	3	8	2.6	17	5.5	10	3.2

Note: Rate per 100,000 ACT population mid year estimate for that year  
*Rates for some diseases may be inaccurate due to the low number of cases*

NEC: Not elsewhere classified

Source: Notifiable disease data, ACT, 1994-98  
 National notifiable diseases data, NCDC, 1997

## 2.1 Bloodborne diseases

Bloodborne transmission is an important mechanism for the spread of a number of diseases notably, hepatitis B, hepatitis C, hepatitis D and HIV infection, although some of these can be spread by other mechanisms.

### 2.1.1 Hepatitis B

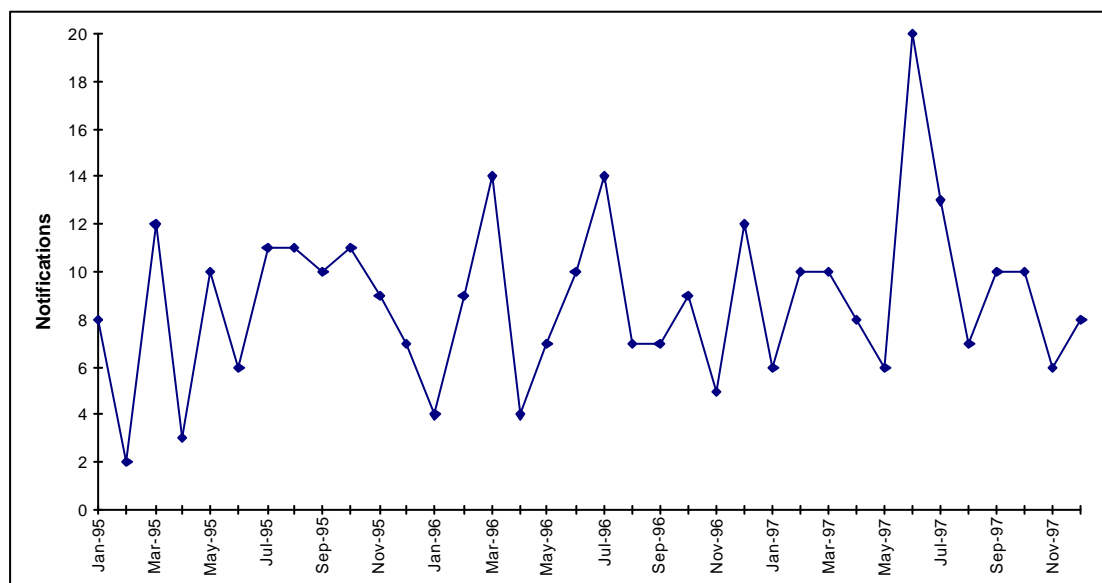
Hepatitis B (HBV) is a virus which can be transmitted by inoculation or mucosal contact with blood or body secretions from an infected individual. A small percentage of cases will develop chronic hepatitis B (carriers) and are at risk of developing chronic liver disease, cirrhosis and/or primary hepatocellular carcinoma. Among those who develop clinical disease, the severity varies greatly.

Surveillance case definition:

Hepatitis B surface antigen positive <b>and</b> <ul style="list-style-type: none"><li>• anti-hepatitis B core IgM antibody (anti-HBcAg IgM) positive</li></ul> <b>or</b> <ul style="list-style-type: none"><li>• demonstrated clinical illness consistent with acute viral hepatitis ( jaundice, elevated aminotransferase).</li></ul>
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Notifications of hepatitis B which are not accompanied by evidence of recent infection are classified as “unspecified”.

**Figure 7: Notifications of hepatitis B (incident and unspecified) by month, ACT, 1995-97**



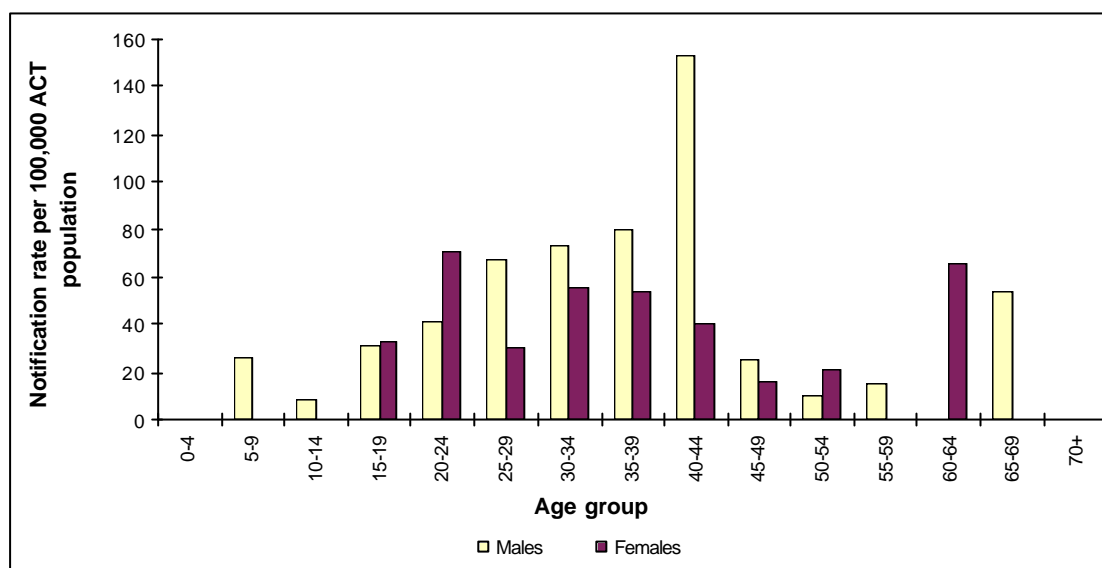
Source: Notifiable disease data, ACT, 1995-98

The notification rate for incident and unspecified hepatitis B was respectively 0.6 and 35.8 per 100,000 ACT population in 1997. The incident rate for the ACT was less than the Australian rate of 1.3. The incident rate for Hepatitis B in the ACT during 1995 was higher than the



subsequent years of 1996 and 1997. This is probably explained by the follow-up of all notifications in that year to determine whether cases were incident or unspecified.

**Figure 8: Notification rate of hepatitis B by age group and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

The male to female ratio of unspecified hepatitis B was 1.5:1 in 1997. The highest age group notification rate was recorded in males 40-44 years of age.

### 2.1.2 Hepatitis C

Hepatitis C has emerged as an important public health issue in Australia. Screening assays for hepatitis C antibody have only been available since 1990. Until 1993 no distinction had been made between incident and prevalent infection, hence it has been difficult to gauge current transmission levels of the virus.

Infections due to hepatitis C virus (HCV) are frequently asymptomatic. Infection may result in chronic carriage of the virus in at least 50 percent of cases. About 20 percent of these patients may develop cirrhosis of the liver within approximately 20 years and 5-10 percent of these will go on to develop liver cancer within 5-10 years. Symptoms and signs may include abdominal discomfort, loss of appetite, nausea, fever, tiredness, joint pain, dark urine and jaundice.

Risk factors for infection with HCV in Australia include a history of injecting drug use (IDU), blood transfusion (prior to the introduction of screening), occupational exposures such as needlestick injuries, and unsterile tattooing practices. HCV accounts for up to 90 percent of all transfusion-related cases of non A, non B hepatitis. In Australia as elsewhere, many infections have no identified risk factors<sup>5</sup>.

Since the introduction of testing in 1990 there has been an incremental increase in the number of notifications, probably reflecting an increase in case ascertainment. There is a need for more detailed epidemiological data on HCV.

Surveillance case definition:

<p><b>Unspecified:</b></p> <p>a) Demonstrated or documented seroconversion to HCV</p> <p>or</p> <p>b) Demonstration of anti-HCV positive or HCV PCR positive without meeting the acute definition</p> <p><b>Incident hepatitis C:</b></p> <ul style="list-style-type: none"> <li>As above, when the most recent negative specimen was within the last 12 months</li> </ul> <p><b>and</b></p> <ul style="list-style-type: none"> <li>a clinical illness consistent with acute viral hepatitis within the last 12 months and other causes of acute hepatitis can be excluded</li> </ul>
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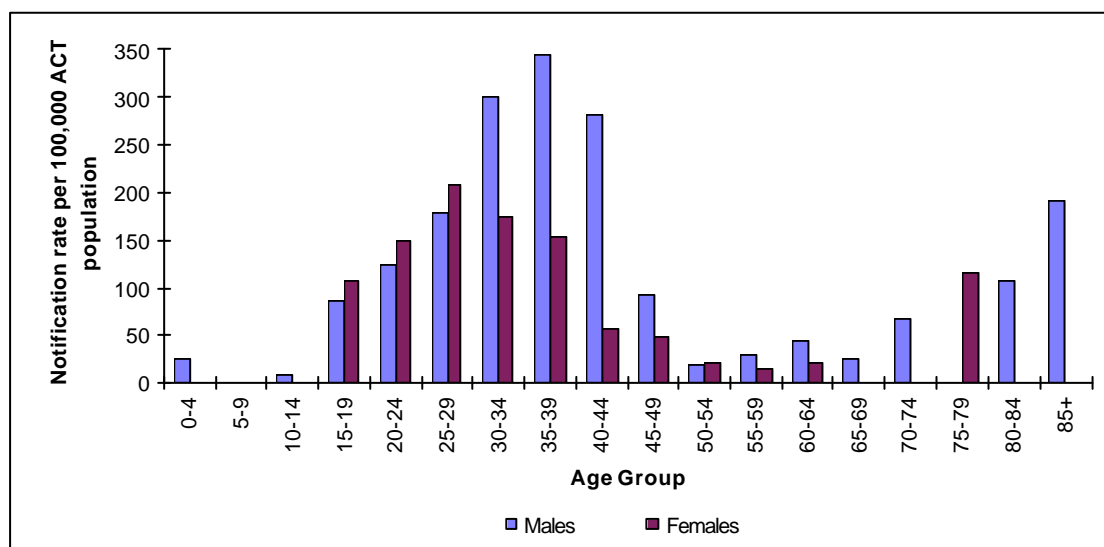
Notifications of hepatitis C which are not accompanied by evidence of recent infection are classified as “unspecified”. Hepatitis C often causes very mild or subclinical illness. In the absence of symptoms, ascertaining the time of infection currently requires the documentation of prior testing and seroconversion.

There were two notifications of incident hepatitis C and 318 notifications of “unspecified” hepatitis C in the ACT in 1997. This represents a notification rate of 102.6 per 100,000 population of unspecified hepatitis C. It is the most notified communicable disease in the ACT. Comparisons with Australia and previous years are difficult due to changes in laboratory testing procedures and the difficulty in determining the disease status of individuals. It is generally thought that the number of reports of incident hepatitis C is an underestimate due to the lack of case ascertainment for incident hepatitis C.

Pilot programs to determine the rate of incident cases have been conducted in the ACT. This involved the follow up of every hepatitis C notification to determine whether incident or unspecified. These programs resulted in better case ascertainment for the disease in the ACT, which explains the higher rates of notifications of incident cases in the ACT compared to the Australian rates.

The male to female ratio was 1.5:1 in 1997. The highest rates were recorded in men aged between the ages of 30-44 years.

**Figure 9: Notification rate of unspecified hepatitis C by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

### 2.1.3 Hepatitis (not otherwise specified)

There were no notifications of hepatitis D, E or hepatitis not elsewhere classified, during the period January 1993-July 1998.

Surveillance case definition:

Any other viral hepatitis not classified elsewhere in the NHMRC Surveillance Case Definitions.

### 2.1.4 Human immunodeficiency virus (HIV) infection

In Australia the incidence of human immunodeficiency virus (HIV) is low compared to the rest of the world and is decreasing. The prevalence is low and stable. The principal population affected is homosexual men, followed by intravenous drug users. Projections for the next 3-5 years indicate a continued decline in the epidemic<sup>6</sup>.

Surveillance case definition:

#### HIV infection

HIV antibody positive confirmed by a State or Territory HIV Reference Laboratory

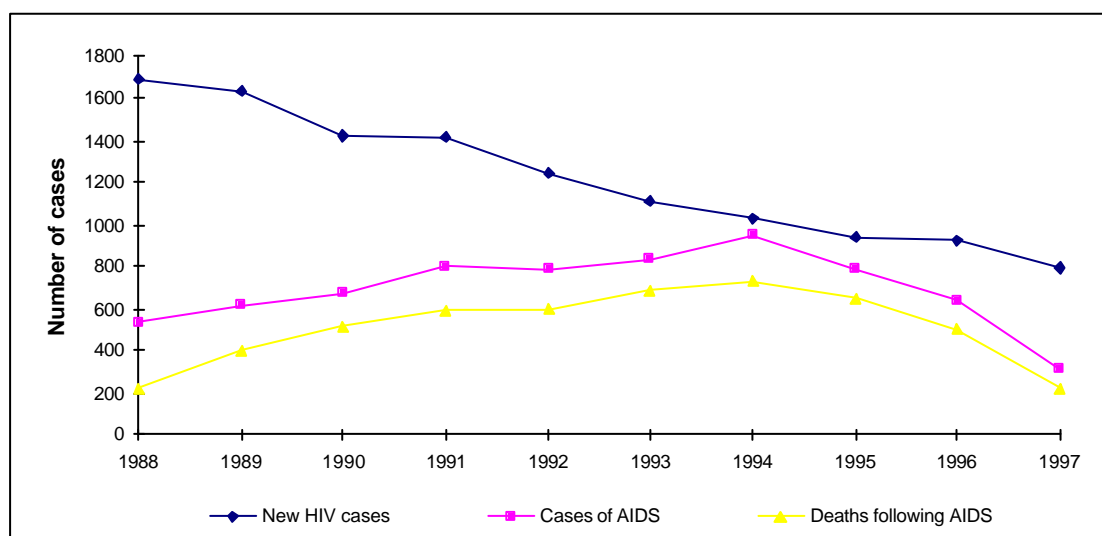
#### AIDS

Surveillance case definition as used by the National Centre in HIV Epidemiology and Clinical Research.

The ACT has reported a cumulative of 198 new diagnoses of HIV infection (178 male and 20 female) from 1988 up until the 31st December 1997. This represents a rate of 63.9 per 100,000 of the current population. This rate is the third highest in Australia after NSW and Victoria. Most cases in the ACT and Australia have occurred in men aged 20-49 years<sup>7</sup>.

The cumulative number of AIDS cases reported in the ACT to the 31st December 1997 was 87 (80 male, 7 female). The cumulative number of deaths following AIDS was 54 (52 male, 2 female).<sup>8</sup>

**Figure 10: HIV reports received by NCHECR, Aust, 1988-97**



Source: *National AIDS Register*, National Centre in HIV Epidemiology and Clinical Research, 1998

## 2.2 Sexually transmissible diseases

Diseases notified in this category in the ACT are chancroid, chlamydial infection, donovanosis, gonococcal infection, lymphogranuloma venereum and syphilis. In addition to these, there are other diseases which are sexually transmitted, eg genital herpes, human papilloma virus, mycoplasma, ureaplasma and parasitic infections, which are not subject to national surveillance.

### 2.2.1 Chlamydial infection (not otherwise specified)

Chlamydia is a urogenital infection caused by the bacterium *Chlamydia trachomatis*. *Chlamydia trachomatis* has been recognised as a major cause of nongonococcal urethritis and epididymitis in men, cervicitis and acute pelvic inflammatory disease in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns.

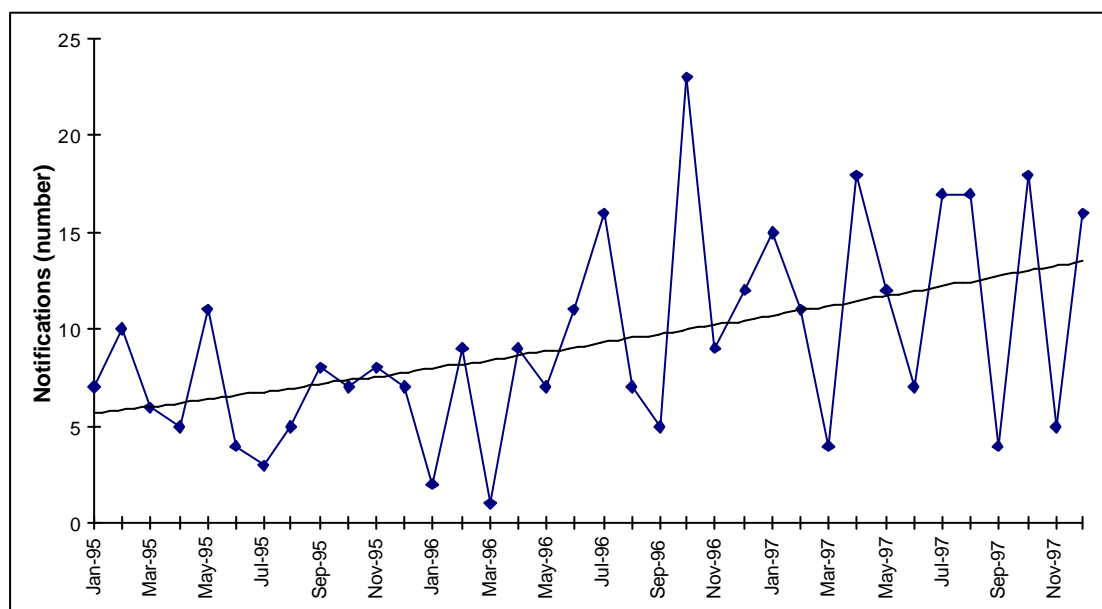
Surveillance case definition:

- a) Isolation of *Chlamydia trachomatis* from a clinical (genital ) specimen.  
or  
b) Demonstration of *Chlamydia trachomatis* in a clinical specimen by antigen detection methods.

The ACT rate for this disease was 45.8 cases per 100,000 population in 1997. The rate for the ACT has showed a sharp increase since 1995 from 26.0 cases per 100,000 population in 1995 to 37.7 in 1996 and 45.8 in 1997 (refer Table 1). Figure 12 indicates a definite increase in the actual number of notifications over the period 1995-97.

The adjusted rate in Australia for 1997 was 69.6 per 100,000 population and was 30 percent higher than the rate reported for 1995. This increase occurred in all states and territories.

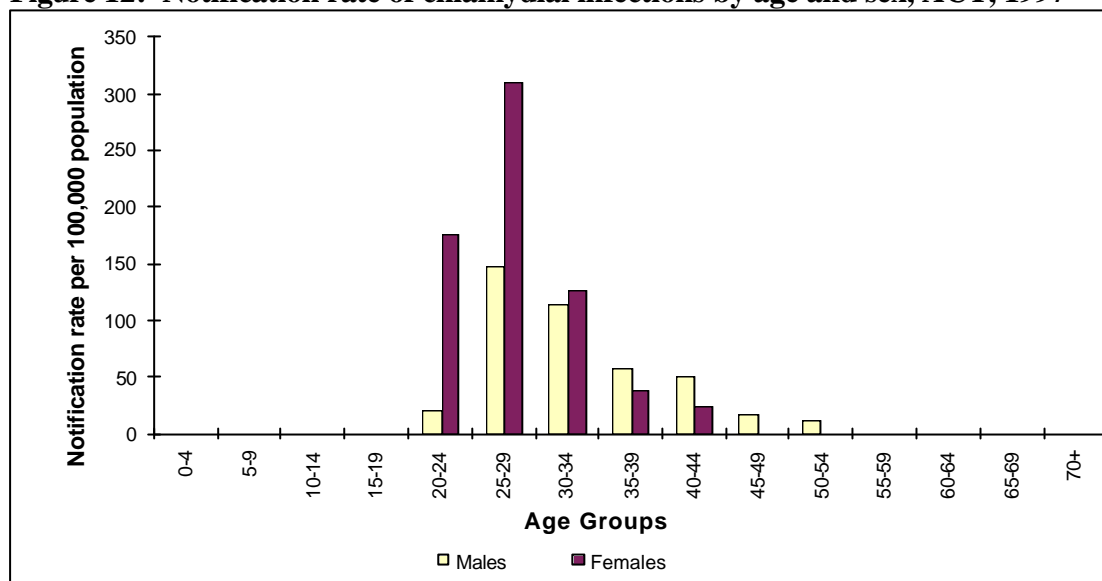
**Figure 11: Chlamydial notifications, by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1997

The male to female ratio for chlamydial disease in the ACT was 1:1.7 in 1997. The peak incidence of this disease for men and women was recorded in the 20-24 year age group.

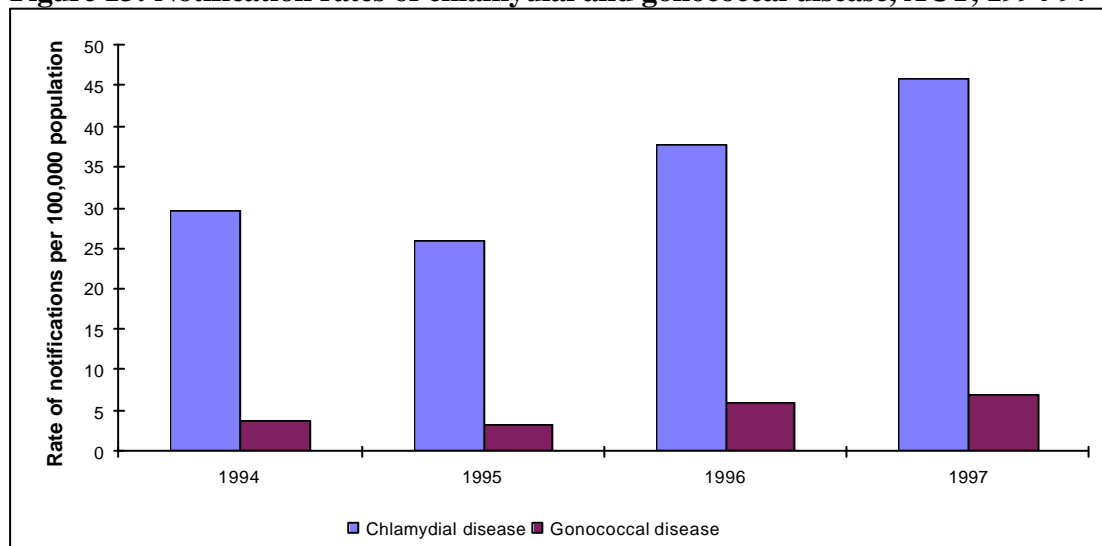
**Figure 12: Notification rate of chlamydial infections by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

Testing for chlamydial disease has improved due to the introduction of molecular based testing procedures in Australia which have improved sensitivity and specificity. This may have partially contributed to the increase in notification rate of the disease. An increase in the rate for gonococcal notifications (refer Figure 14) may indicate that this increase in chlamydial disease may be a result of an increase in incidence of some sexually transmitted diseases.

**Figure 13: Notification rates of chlamydial and gonococcal disease, ACT, 1994-97**



Source: Notifiable disease data, ACT, 1997

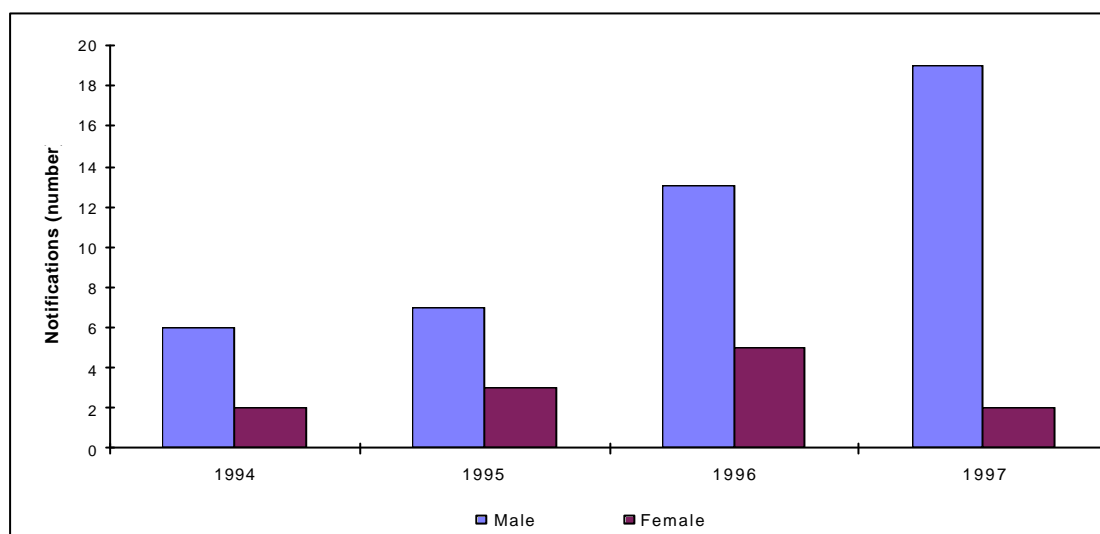
### 2.2.2 Gonococcal infection

Gonococcal infection is caused by the bacterium *Neisseria gonorrhoeae*. It is primarily a disease of the genital tract, transmitted by sexual contact. Purulent conjunctivitis may be present in newborns infected during vaginal delivery.

Surveillance case definition:

Isolation of *Neisseria gonorrhoeae* from a clinical specimen.

**Figure 14: Notifications of gonococcal disease, ACT, 1994-97**



Source: Notifiable disease data, ACT, 1997

There were 21 notifications of gonococcal disease in the ACT in 1997, and 19 for the first six months of 1998. The male to female ratio was 9.5:1. The predominance of males may be explained by the asymptomatic infection in women or the difficulty of identifying the organism from clinical specimens obtained from women. During 1997 the highest percentage of infections (66 %) were in men 20-34 years. There were no infections in children under 15 years of age.

The rate of gonococcal disease in 1997 was 6.8 per 100,000 ACT population. This rate is lower than the Australian rate of 23.3 per 100,000 in 1997. The highest rates for gonococcal disease were recorded in Australia during the 1970's and early 1980's, with a peak at 84.4 per 100,000 population in 1982.

### 2.2.3 Syphilis

Syphilis is an infectious disease caused by the bacterium *Treponema pallidum*. Although nonvenereal transmission of the disease may occur, in most cases syphilis is spread by sexual contact.

Syphilis has three stages which vary clinically:

- Primary syphilis is the early stage of the disease and is characterised by the presence of a chancre.
- Secondary syphilis is characterised by localised or diffuse mucocutaneous lesions, often with generalised lymphadenopathy.
- Latent syphilis refers to that stage of the disease when organisms persist in the body of the infected individual without causing symptoms or signs. Latent syphilis is subdivided into early, late and unknown categories based on the duration of the infection.

Neurosyphilis shows evidence of central nervous system infection with *T.pallidum*. Congenital syphilis is caused by infection in utero with *T.pallidum*

#### Surveillance case definition:

A compatible clinical illness or past history

**and**

- Demonstration of *Treponema pallidum* in clinical specimens by darkfield, fluorescent antibody or equivalent microscopic methods.

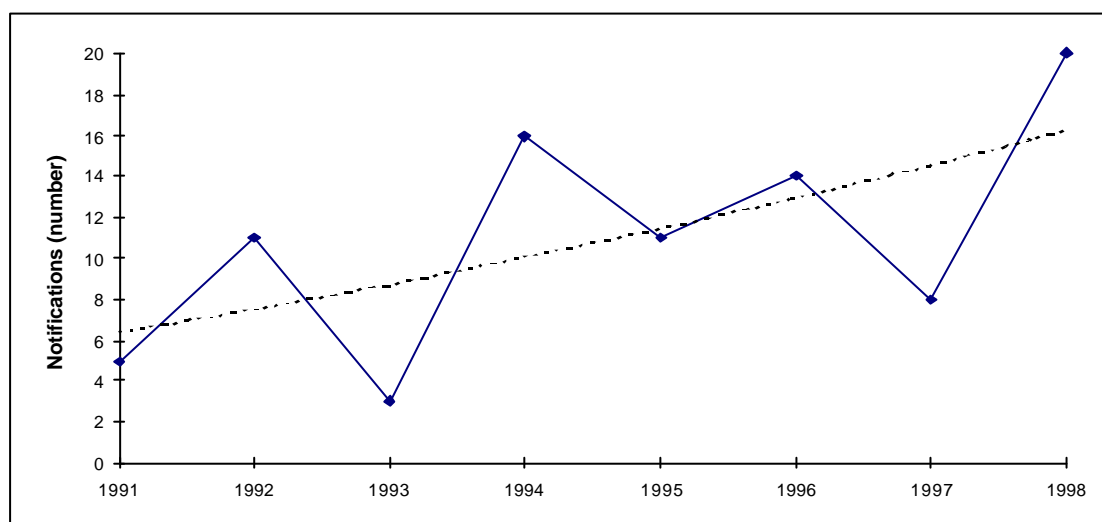
**or**

- Reactive treponemal tests (eg FTA-ABS, TPHA).

A total of 8 notifications of syphilis were made in 1997 in the ACT which was the lowest recorded since 1993. Projections for 1998 indicate that this year the ACT will have the highest number of notifications recorded since 1991. The rate of syphilis notifications in 1997 for the ACT was 2.6 per 100,000 population, which is lower than the Australian rate for that year (6.6).

The male to female ratio was 1:1. Over the period 1995-97 there were 28 cases of syphilis notified, 21 percent of which occurred in men over 60 years. There were no notifications in the under 15 year age group.

**Figure 15: Syphilis notifications, ACT, 1991-97, projection for 1998**



Source: Notifiable disease data, ACT, 1991-98

#### 2.2.4 Chancroid

Chancroid is an ulcerative painful lesion and inflammatory adenopathy. The disease is caused by infection with the bacterium *Haemophilus ducreyi*.

#### Surveillance case definition:

Isolation of *Haemophilus ducreyi* from a clinical specimen.

**or**

a) A clinically compatible illness characterised by painful genital ulceration and inflammatory inguinal adenopathy, where syphilis, granuloma inguinale and herpes simplex have been excluded.

**or**

b) A clinically compatible illness in a patient who is epidemiologically related to a laboratory confirmed case.

There were no cases of chancroid notified in the ACT between 1991-98.

There were a total of 10 cases of chancroid notified in Australia between 1991-97.

### 2.2.5 Donovanosis (Granuloma inguinale)

Donovanosis is a disease caused by the bacterium *Calymmatobacterium granulomatis*. The results are deep ulcerative lesions in the genital area.

Surveillance case definition:

- a) Demonstration of intracytoplasmic Donovan bodies on Wright or Giemsa stained smears or biopsies of clinical specimens.  
**or**  
b) A clinically compatible illness characterised by usually painless, beefy red, granulomatous or ulcerative lesions with rolled edges and a tendency to form scar tissue, where syphilis has been excluded.

There were no cases of Donovanosis notified in the ACT in the period 1993-1998. Those cases reported in Australia were from the statistical divisions in the tropical north.

### 2.2.6 Lymphogranuloma venereum

Lymphogranuloma venereum (LGV) is a chronic sexually transmitted disease caused by infection with L1, L2 and L3 serovars of *Chlamydia trachomatis*. The disease is characterised by genital lesions, suppurative regional lymphadenopathy, or haemorrhagic proctitis.

Surveillance case definition:

- a) Isolation of *Chlamydia trachomatis* serotype L1, L2 or L3 from a clinical specimen.  
**or**  
b) Demonstration (by immuno-fluorescence) of inclusion bodies in leucocytes aspirated from an inguinal lymph node (bubo).  
**or**  
c) A positive serological test for lymphogranuloma venereum strain of *Chlamydia trachomatis*, in the presence of a clinically compatible illness (one or more tender, fluctuant inguinal lymph nodes, or characteristic proctogenital lesions).

There were no cases of LGV reported in the ACT between 1993-97.

## 2.3 Gastrointestinal, food borne, waterborne disease

Gastrointestinal diseases constituted 30 percent of all disease notifications in the ACT during 1997. Most of the notifiable gastrointestinal diseases in the ACT are reported by laboratories, hence there is considerable under reporting as laboratory investigations may not be carried out in a large proportion of cases. Laboratories may not routinely test for all gastrointestinal pathogens eg *Aeromonas* species and *Yersinia* species. Although giardiasis and enterohaemorrhagic *Escherichia coli* infection are not on the list of notifiable diseases in the ACT, they are reported informally to the system. Recently enterohaemorrhagic *Escherichia coli* and haemolytic uraemic syndrome (HUS) have become nationally notifiable diseases.

### 2.3.1 Botulism (foodborne)

Botulism is a neuroparalytic disease produced by the neurotoxins of *Clostridium botulinum*.



#### Surveillance case definition:

A clinically compatible illness (diplopia, blurred vision, muscle weakness, paralysis, or bulbar palsy) with a history of exposure to a probable food source in the absence of a contaminated wound; AND one of the following:

- Isolation of *Clostridium botulinum* from faeces or other clinical specimen
- or
- Detection of *Clostridium botulinum* toxin in serum, faeces or a probable food source
- or
- Epidemiological linkage to other cases of confirmed foodborne botulism.

Botulism has been a national notifiable disease since 1992. There had been no reported cases in Australia until May 1998 when a case of infant botulism was reported in South Australia in a 6 month old female.

### 2.3.2 Campylobacteriosis

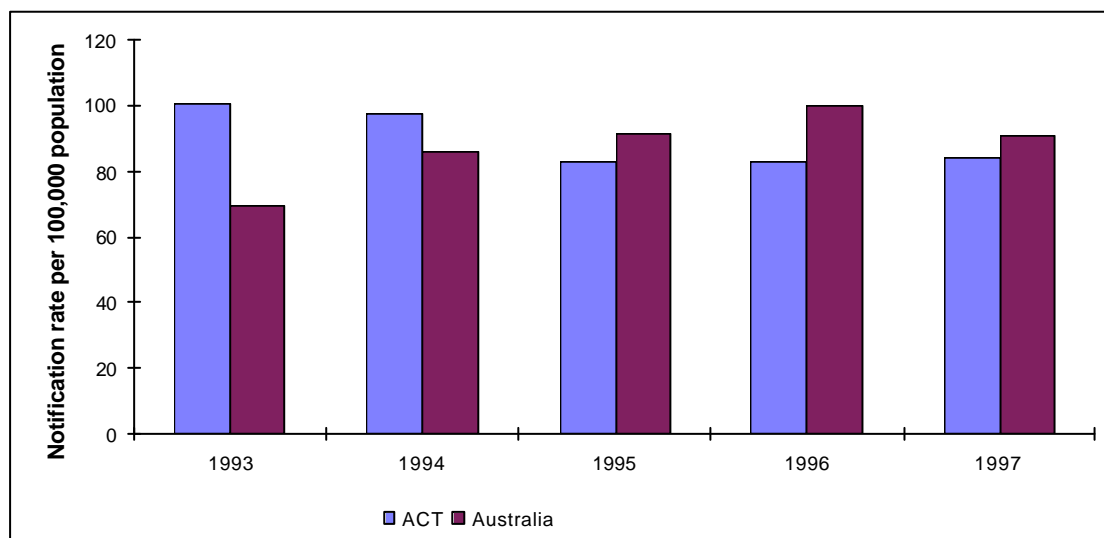
Campylobacteriosis, with relation to diarrheal disease is caused by the bacterium *Campylobacter jejuni*. It is the most common cause of bacterial gastroenteritis, however other species of campylobacter can cause gastrointestinal disease. Most infections probably result from the consumption of contaminated food and water. Unpasteurised milk, untreated surface water, defects in municipal water systems, undercooked meats (especially poultry) have all been implicated in outbreaks of campylobacteriosis.<sup>9</sup> Campylobacteriosis can cause a severe diarrhoeal illness.

#### Surveillance case definition:

Isolation of *Campylobacter* species from a clinical specimen.

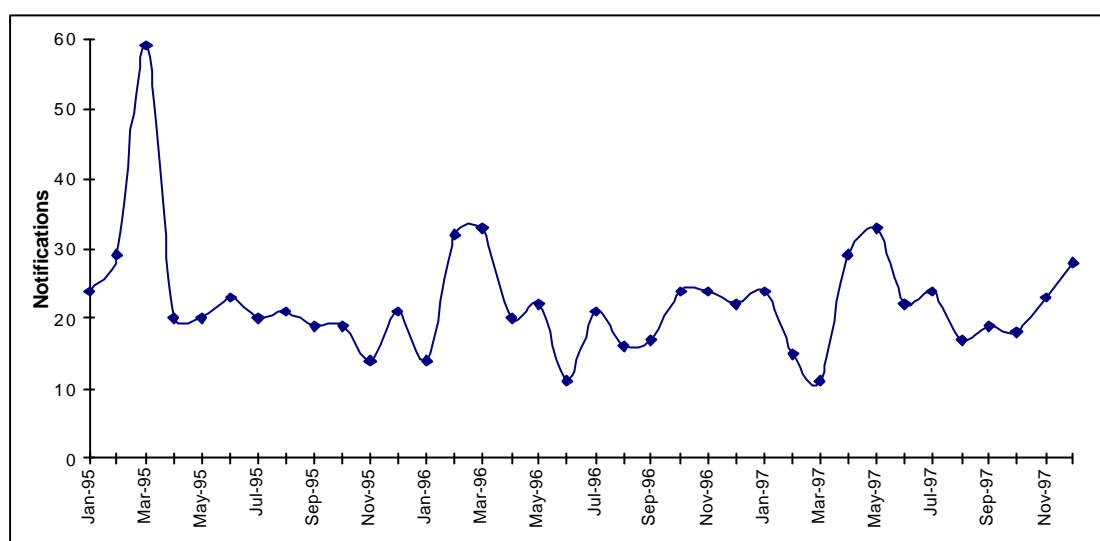
There were 261 notifications of campylobacteriosis in 1997 in the ACT, with a rate of notification of 84.2 per 100,000 population. Rates for campylobacteriosis in the ACT have not reflected the overall increase seen in Australia.

**Figure 16: Campylobacteriosis rates, ACT & Aust, 1993-97**



Source: Notifiable disease data, ACT, 1993-98  
National notifiable diseases data, NCDC, 1997

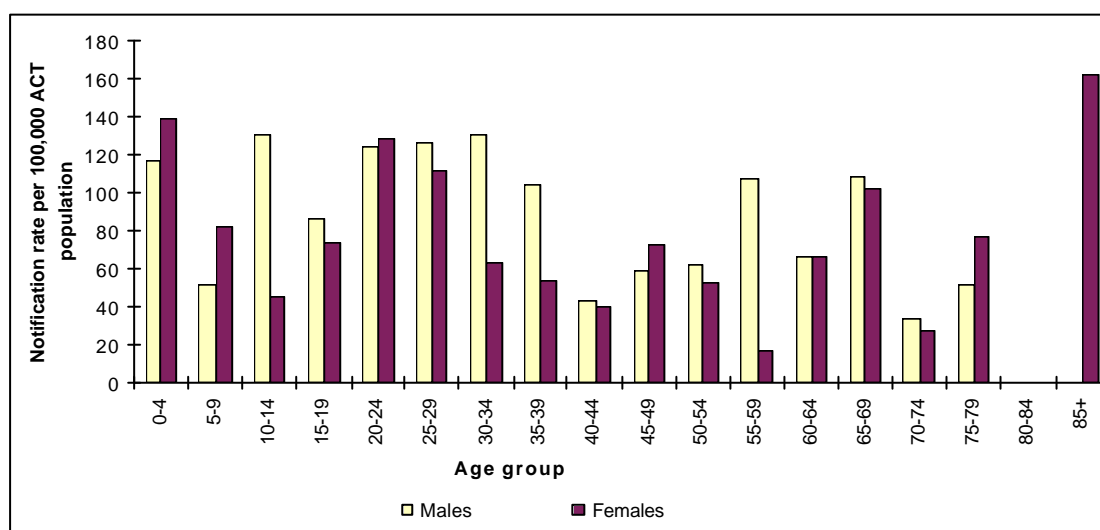
**Figure 17: Notifications of campylobacteriosis by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1995-98

Campylobacteriosis has shown peaks in February-March in previous years. However this was not evident in 1997 where a peak occurred later in April-May.

**Figure 18: Notification rate for campylobacteriosis by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1995-98

The male to female ratio in 1997 was 1.2:1. All age groups were affected, with the highest combined rate in the under 4 year age group. The rate for females greater than 85 years of age should be interpreted with caution due to the high degree of error associated with the low sample size.

### 2.3.3 Hepatitis A

Hepatitis A is an acute infection caused by the enterovirus hepatitis A (HAV). The spectrum of resultant disease ranges from asymptomatic infection (particularly in children) to the rarer presentation of fulminant hepatitis or prolonged, severe disease. HAV can be found in the faeces of infected individuals approximately 14 days prior to the onset of disease and up to 7 days after the

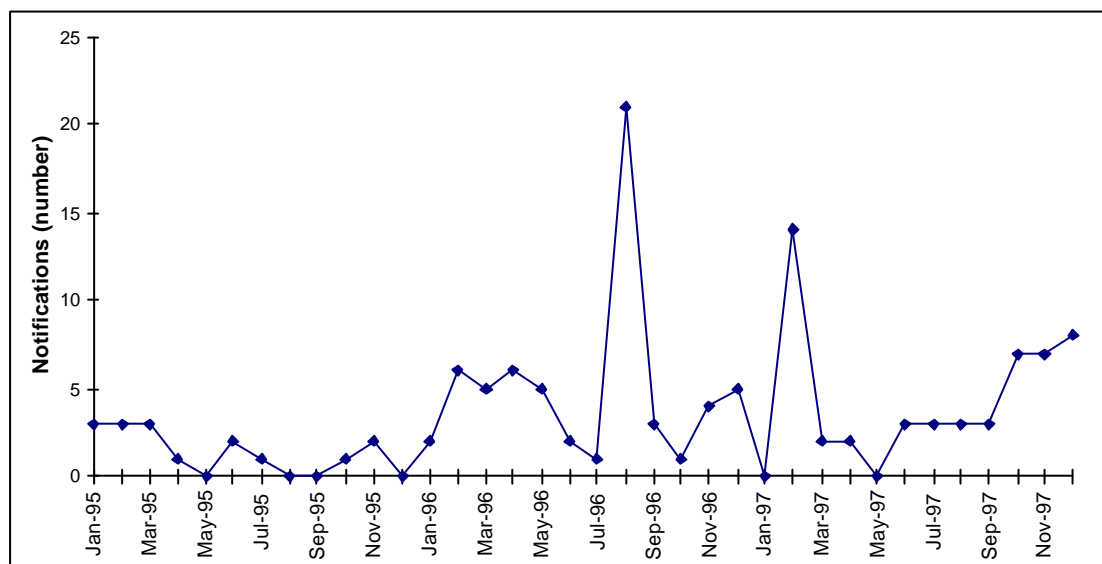
onset of jaundice. Transmission can occur during this period, usually by the faecal oral route. Common source outbreaks may occur as a result of contaminated food or water.

**Surveillance case definition:**

- a) Anti-HAV IgM positive, in the absence of recent vaccination
- or**
- b) Demonstration of a clinical case of hepatitis ( jaundice with or without elevated aminotransferase levels without a non infectious cause) and epidemiologically linked to a serologically confirmed case.

There were 53 notifications of hepatitis A in the ACT in 1997. The rate in 1997 was 17.1 per 100,000 population, which was slightly higher than the Australian rate of 16.1. Most cases in the ACT were present in clusters and were primarily associated with outbreaks. In 1996 the ACT recorded the highest rate of hepatitis A notifications (20.1) after the Northern Territory. This may reflect the active investigation of clusters and the identification of several asymptomatic cases.

**Figure 19: Notifications of hepatitis A, ACT, 1995-97**



Source: Notifiable disease data, ACT, 1993-98

The male to female ratio was 1.1:1 in 1997 in the ACT. Notifications were highest for the 25-49 year age group.

In 1996 an epidemic related to food contamination by an HAV infected food handler was followed by a secondary epidemic in a primary school. These outbreaks resulted in a higher than usual number of annual notifications. Forty eight percent of notifications for 1996 were in children 14 years of age or younger. In early 1997, a total of 9 cases of HAV were linked to a multi-state outbreak due to the consumption of contaminated oysters from the Wallis Lakes region. Two additional adult cases were notified in close contacts. The mean age of cases associated with this cluster was 36 years. A further outbreak of Hepatitis A in October 1997 occurred in children attending a primary school. No point source was identified. The background number of HAV notifications which were not epidemiologically linked to either of these outbreaks was still at least 30 percent higher than those reported in non-epidemic years and intravenous drug use was identified as a risk factor in several cases occurring in young adults. The results of an epidemiological study, revealed that from January 1997 to August 1998, 33 percent of HAV notifications in the ACT occurred in subjects who were IV drug users. Of these HAV notifications in IV drug users 25 percent were hospitalised and 25 percent were hepatitis C antibody positive. The risk factors for

transmission in this group were illdefined but both blood borne transmission through shared needle use and faecal oral transmission are possibilities<sup>10</sup>.

### 2.3.4 Listeriosis

Infection with *Listeria monocytogenes* primarily causes meningitis, encephalitis or septicaemia in non pregnant adults. At particular risk are elderly patients or individuals with a predisposing condition that lowers cell-mediated immunity. In pregnant women, *Listeria monocytogenes* often causes an influenza-like bacteraemic illness which if left untreated, may after a few days or weeks lead to amnionitis and infection of the foetus.

Although faecal carriage does occur, it is rarely associated with disease and *Listeria monocytogenes* is usually acquired by the ingestion of contaminated food. It is able to survive and multiply at low temperatures. High risk foods are generally those associated with storage in refrigerators for long periods of time eg pate, cold meat and chicken, soft cheeses, pre-prepared salads and raw or smoked seafoods. Most cases of listeriosis are sporadic although outbreaks due to contaminated food can occur.

Surveillance case definition:

Isolation of <i>Listeria monocytogenes</i> from a site which is normally considered sterile, including foetal gastrointestinal contents.
--

There were 8 notifications of listeriosis in the ACT over the period 1991-97. Rates were consistent with Australian rates. ACT rates need to be interpreted with caution due to the very low numbers of notifications.

The male to female ratio over this period was 1:1.6. Two cases were recorded in children in the 0-4 year age group and two cases in the greater than 65 year age group.

### 2.3.5 Salmonellosis (Not otherwise specified)

Salmonellosis is caused by the bacteria *Salmonella enterica* which has numerous serotypes. Other than infections caused by *Salmonella* Typhi or *Salmonella* Paratyphi, the infection usually presents as an acute, febrile enterocolitis with diarrhoea, nausea and sometimes vomiting, occasionally complicated by septicaemia or other systemic involvement.

*Salmonella* species are transmitted directly or indirectly from person-to-person or from the extensive animal reservoir, which includes all species commonly used for food. Foodborne outbreaks can involve items contaminated directly or indirectly.

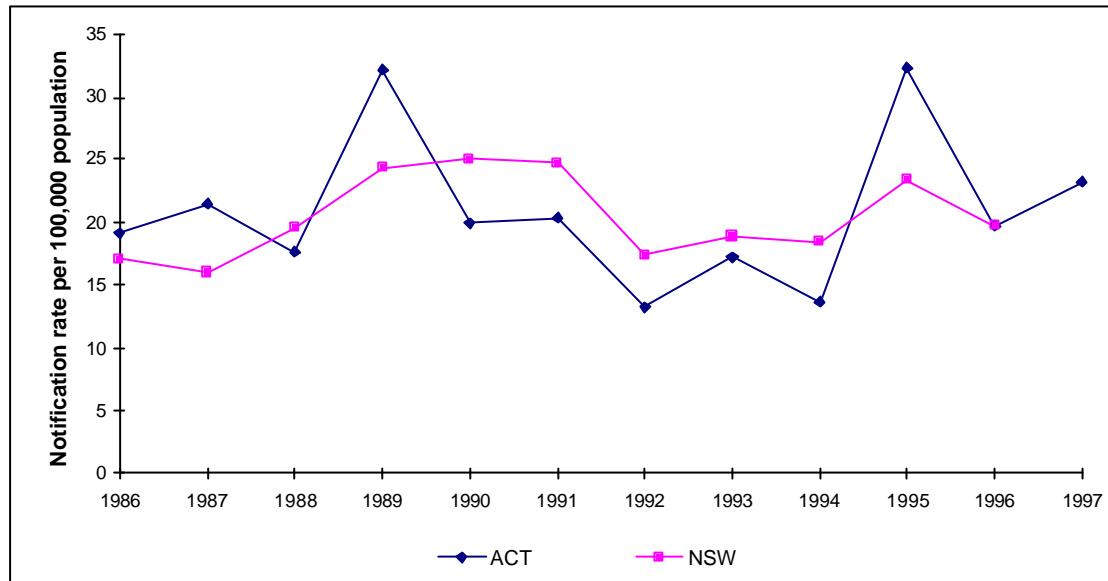
Salmonellosis tends to show a seasonal trend with higher numbers of notifications in the warmer months. Infections are categorised according to serotype and where appropriate, phage type. This information is useful in the investigation of outbreaks.

Surveillance case definition:

Isolation of <i>Salmonella</i> species (excluding S.Typhi and S.Paratyphi) from any clinical specimen.
--

There were 72 notifications of salmonellosis in the ACT in 1997. The rate of salmonellosis in the ACT was 23.2 per 100,000 population, compared to the Australian rate of 36.8 for that year.

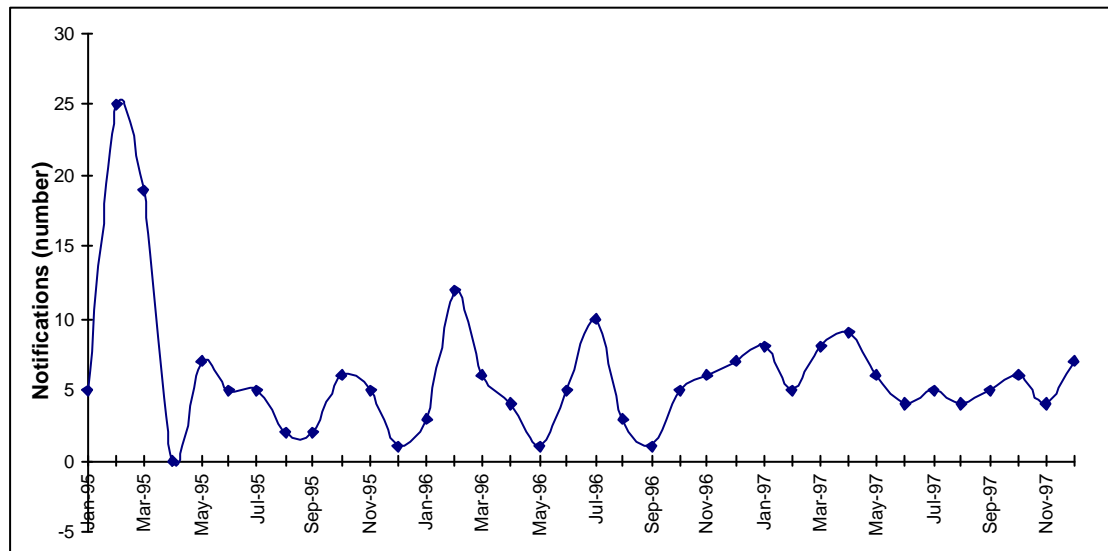
**Figure 20: Salmonellosis notification rates, ACT & NSW, 1986-97**



Source: *Human Annual report 1997*, National Enteric Pathogens Surveillance Scheme

Rates for salmonellosis peaked in the ACT during 1989 and 1995.

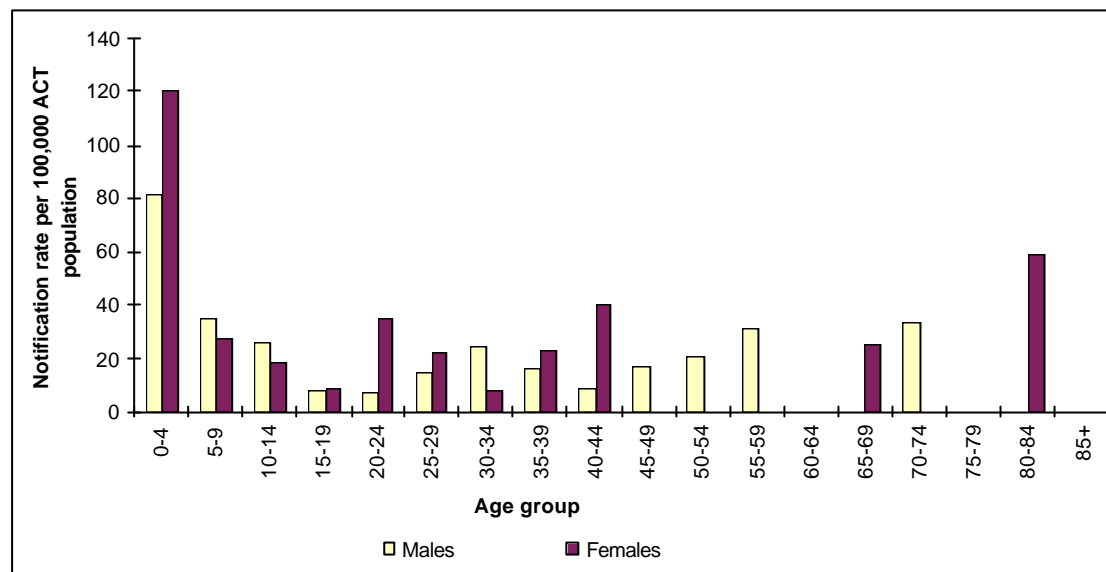
**Figure 21: Salmonellosis notifications by month, ACT, 1995-97**



Source: Notifiable disease data, ACT, 1993-98

Seasonal trends are evident in Australia, with peaks usually occurring in summer months. *Salmonella* Bredeney was associated with an outbreak between January and March 1995. Although food outlets were identified as being the source of the infections no common food source was identified. *Salmonella* Mbandaka was associated with an outbreak of salmonellosis in 1996 due to consumption of contaminated peanut butter.

**Figure 22: Notification rates of salmonellosis by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1997

The male to female ratio was 1:1 in 1997. The highest rates of disease were recorded in the 0-4 year age group.

The frequency of the various serovars isolated can be seen in Table 2. *Salmonella* Typhimurium phage types 135, 64 and 9 predominated. These phage types are common throughout Australia.

*Salmonella* Mbandaka was associated with an outbreak of salmonellosis in 1996 due to consumption of contaminated peanut butter. *Salmonella* Enteritidis and *Salmonella* Virchow are serovars commonly acquired overseas, mostly from Asian countries.<sup>11</sup>

**Table 2: Salmonella serovars, ACT, 1997**

Salmonella	Serovar	Number	% of ACT total
<i>Salmonella</i>	Typhimurium	38	56
	phage type 135	10	-
	phage type 64	6	-
	phage type 9	6	-
	phage type 4	3	-
	others	13	-
	<i>Salmonella</i>	Enteritidis	3
<i>Salmonella</i>	Infantis	3	4
<i>Salmonella</i>	Muenchen	3	4
<i>Salmonella</i>	Mbandaka	2	3
<i>Salmonella</i>	Newport	2	3
<i>Salmonella</i>	Saint-paul	2	3
<i>Salmonella</i>	Singapore	2	3
<i>Salmonella</i>	Virchow	2	3
<i>Salmonella</i>	Other serovars	11	16
TOTAL		68	100

Excludes S.Typhi and S. Paratyphi

Source: Notifiable disease data, ACT, 1997

### 2.3.6 Shigellosis

Shigellosis is caused by the *Shigella* species of bacterium. *Shigella* species cause classical bacillary dysentery characterised by severe cramping, abdominal pain, and diarrhoea with blood and mucus. This disease tends to occur in summer. Transmission can be from person to person or via contaminated food and water.

Case definition:

Isolation of *Shigella* species from any clinical specimen.

There were 5 notifications of shigellosis in the ACT in 1997. The notification rate of 1.6 per 100,000 population was lower than the Australian rate of 3.4. The average rate over the period 1994-97 in the ACT was 1.9 per 100,000 population, indicating a low incidence of the disease. The male to female ratio in the ACT was 1.5:1 in 1997. No particular age distribution was noted.

*Shigella* species can be serotyped. This is a useful epidemiological tool in the investigation of outbreaks. The following serotypes were identified in the ACT during 1997.

**Table 3: *Shigella* serotypes, ACT, 1997**

<b>Shigella</b>	<b>Serotype</b>	<b>Number</b>
<i>Shigella flexneri</i>	2a	2
<i>Shigella sonnei</i>	biotype g	2
<i>Shigella</i> species	-	1

Source: *Human Annual report 1997*, National Enteric Pathogens Surveillance Scheme

### 2.3.7 Typhoid and paratyphoid

Infections caused by *Salmonella* Typhi (typhoid) or *Salmonella* Paratyphi (paratyphoid) A, B or C are known as the enteric fevers. Typhoid is always the result of the consumption of food or water contaminated with human faeces. Carriage of *Salmonella* Typhi may be prolonged. Untreated enteric fevers cause significant mortality.

All infections in the ACT were acquired from overseas, or contact with a person who has travelled overseas. The rates of typhoid and paratyphoid in Australia are low. The average rate over the period 1993-97 in Australia was 0.4 cases per 100,000 population.

Surveillance case definition:

Isolation of *Salmonella* Typhi from any clinical specimen.

or

Isolation of *Salmonella* Paratyphi serotype A, B or C from any clinical specimen.

There were 7 cases of typhoid fever (2 males and 5 females) notified in the ACT between 1993-97. All cases occurred in the 15-39 year age group.

### 2.3.8 Yersiniosis

Yersiniosis caused by the bacterium *Yersinia enterocolitica* is an important cause of gastroenteritis particularly in young children. Involvement of intestinal lymph nodes is common, and the condition can be difficult to distinguish from appendicitis. Only those strains of bacteria that possess essential virulence factors can cause intestinal disease. Diagnosing the disease relies on laboratory diagnosis.

As routine examination of faecal specimens for *Yersinia* species may not occur the diseases may be under reported.

Surveillance case definition:

- a) Isolation of *Yersinia enterocolitica* or *Yersinia pseudotuberculosis* from the patients' faeces or blood.
- or**
- b) Detection of circulating antigen by ELISA or agglutination test.
- or**
- c) Positive yersinia serology in the presence of clinically compatible illness.

Only cases of foodborne yersiniosis or gastroenteritis in an institution are notified in the ACT. There have been three cases (all adults) notified in the ACT during the period 1993-97.

The majority of notifications for this disease in Australia are received from South Australia and Queensland and occur in the 0-4 year age group. There appeared to be an increase in notifications in Australia during the summer months. Notifications of yersiniosis have shown a gradual decrease since 1992.

### 2.3.9 Giardiasis

*Giardia intestinalis*, the causative agent of giardiasis, is one of the most common intestinal protozoan pathogens in Australia. It is an important cause of intestinal disease in children and adults. Outbreaks of disease are common within childcare centres through person to person contact. Outbreaks may also occur as a result of the consumption of contaminated water.

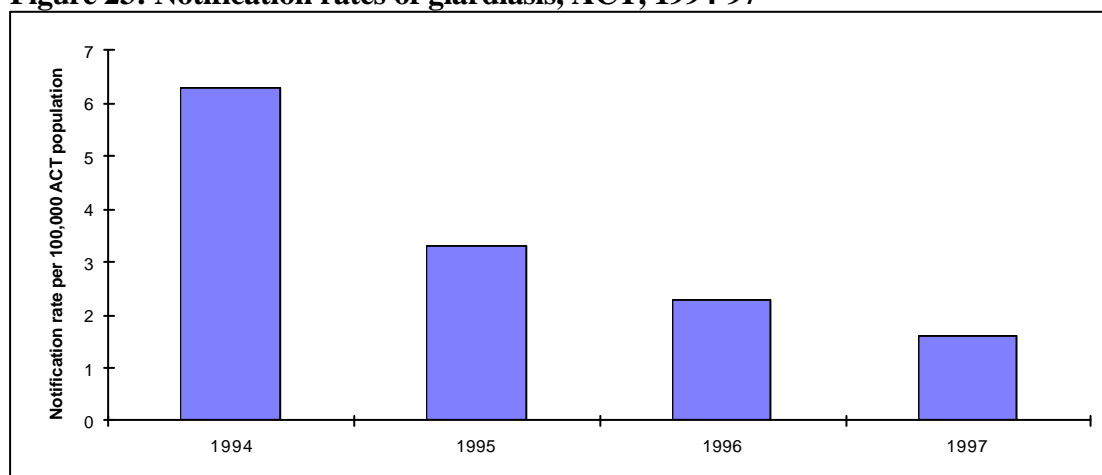
Giardiasis is not a nationally notifiable disease, but cases are occasionally reported to the Communicable Disease Control Program in the ACT by laboratories, in an effort to implement control procedures in childcare and daycare centres. This disease is under reported.

Surveillance case definition:

Giardiasis is diagnosed by the identification of the parasite *Giardia intestinalis* in the faeces of individuals.

There were 41 cases notified over the period 1994-97. The male to female ratio was 1.5:1. No seasonal trend was apparent. 50 percent of cases notified were from children 0-4 years. The rate of notifications in the ACT has decreased since 1994. It is difficult to establish whether this is due to a drop in the incidence of the disease or a drop in the voluntary notification of the disease.

**Figure 23: Notification rates of giardiasis, ACT, 1994-97**



Source: Notifiable disease data, ACT, 1993-98



### 2.3.10 Cryptosporidiosis

Cryptosporidiosis is an infection caused by the parasite *Cryptosporidium parvum*. The parasite causes profuse watery diarrhoea and abdominal cramps. This disease can be prolonged and life threatening in severely immunocompromised persons eg HIV infected patients. *Cryptosporidium* species are transmitted by the ingestion of oocysts excreted in the faeces of animals or humans. Cryptosporidial infection can be transmitted from person to person, from animal to person or through ingestion of faecally contaminated food and water. Person to person transmission is common especially amongst young children, hence the parasite's significance in the child care setting.

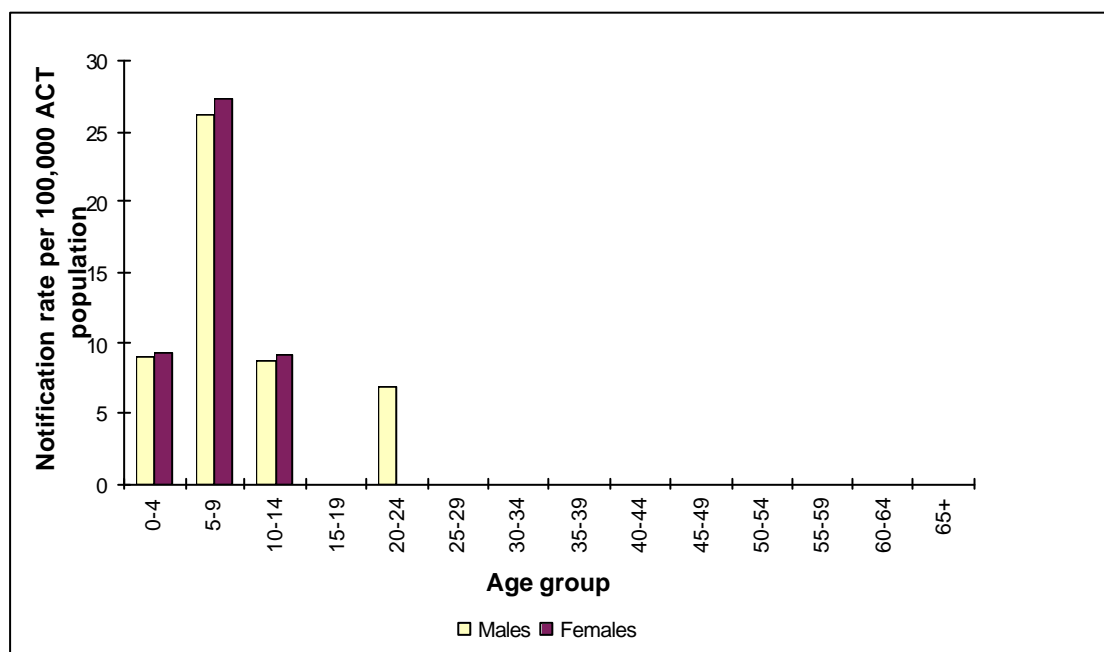
Well documented outbreaks of cryptosporidiosis attributed to drinking contaminated water or using contaminated swimming pools have occurred.

Currently there is no effective treatment for cryptosporidiosis. The oocysts of *Cryptosporidium* species are also highly resistant to chlorine and other disinfectants. Cryptosporidiosis was made a notifiable disease in the ACT in February 1998 during a swimming pool associated outbreak.

Surveillance case definition:

Cryptosporidiosis is diagnosed by the presence of *Cryptosporidium* oocysts in the faeces of an individual.

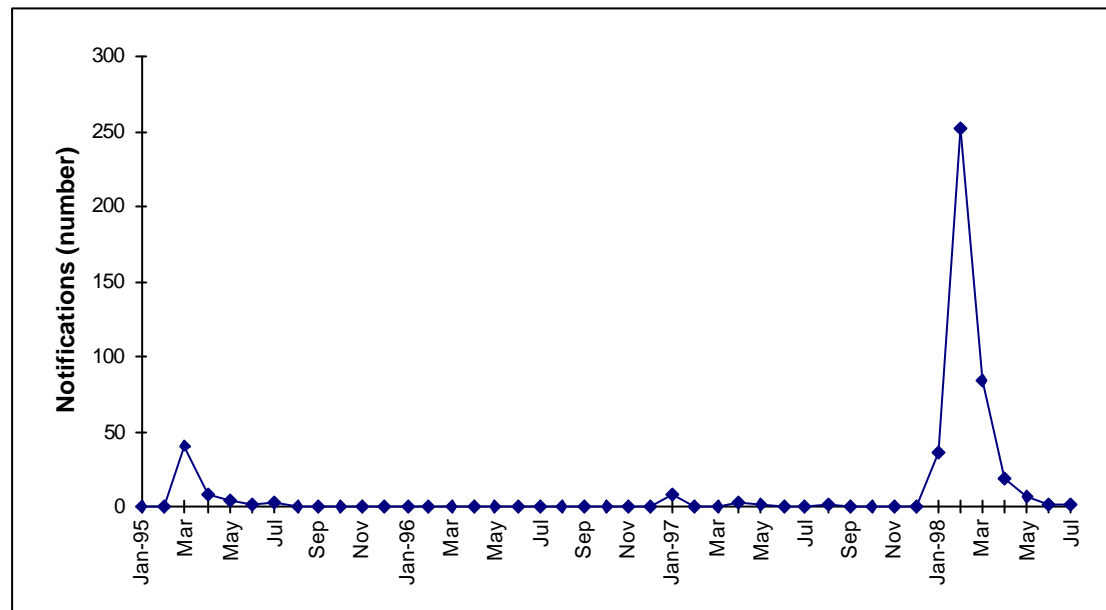
**Figure 24: Notification rates of cryptosporidiosis by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1993-97

There were 97 cases notified in 1997 in the ACT. The male to female ratio was 1.3:1. Most cases occurred in the younger age groups, in particular the 5-9 year age group.

**Figure 25: Notifications of cryptosporidiosis by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1993-98

Cryptosporidiosis tends to occur in the warmer, wetter months. Outbreaks have occurred in January through to April in 1995 and 1998. The large peak in 1998 was associated with an outbreak of cryptosporidiosis in ACT swimming pools. **The management of the outbreak has attracted commendation from other states and international agencies.**

### 2.3.11 Enterohaemorrhagic *Escherichia coli* (EHEC) infections

EHEC strains of bacteria produce a shiga-like toxin (ST). EHEC infections present with diarrhoea, often bloody, and progress in a small proportion of cases to ST mediated haemolytic uraemic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP). These syndromes are characterised by anaemia and kidney failure. EHEC has been associated with contaminated foodstuffs. An outbreak in 1995 occurred in Australia due to contaminated mettwurst.<sup>12</sup>

Surveillance case definition:

EHEC is diagnosed by the isolation of EHEC from the faeces of a symptomatic individual.

EHEC is not a notifiable disease in the ACT but sporadic cases should be reported routinely as food poisoning, and investigated.

There was one ACT case reported to the National Salmonella Surveillance Scheme, during the period 1993-98.

### 2.3.12 Food poisoning

Foodborne disease usually manifests as gastrointestinal symptoms. Food poisoning is not a notifiable disease at the national level but is notifiable in the ACT. Cases of food poisoning are investigated to determine whether any public health action is required, in the absence of a laboratory diagnosis.

Surveillance case definition:

A disease of an infectious or toxic nature caused by, or thought to be caused by, the consumption of food or water.

There were 10 ACT cases of food poisoning notified in 1997. This represents a rate of 3.2 notifications per 100,000 population. The numbers of cases of food poisoning are undoubtedly under reported. The rate of food poisoning over the 1994-97 period remained fairly constant.

### 2.3.13 Legionellosis

Legionellosis usually presents as a clinical pneumonia. The bacterium *Legionella pneumophila* is most commonly associated with the disease but other species of *Legionellae* can be implicated. Air-borne transmission is thought to be the main mode of transmission.

Environmental sources of *Legionella* species include water and soil. Hot water systems, airconditioning cooling towers, evaporative condensers, humidifiers, spas, disturbance of soil and potting mix have all been associated with outbreaks of infection.

Surveillance case definition:

- a) A clinically compatible illness (fever, cough or pneumonia)  
**and** at least one of the following:
- Isolation of *Legionella* species from lung tissues, respiratory secretions, pleural fluid, blood or other tissues.
- or**
- Demonstration of *Legionella* species antigens in lung tissue, respiratory secretions or pleural fluid.
- or**
- A fourfold or greater rise in (IFA) titre against *Legionella* species, to at least 128, between acute and convalescent phase sera.
- or**
- A stable high *Legionella* titre (at least 512) in convalescent phase serum.

The ACT notified 6 cases of legionellosis in the period 1991-97. Notification rates of legionellosis are low in the ACT and Australia. There have been no reported outbreaks of legionellosis in the ACT. The ACT Health Protection Service actively monitors contamination of air conditioning cooling towers.

## 2.4 Vaccine preventable diseases

Vaccination against measles, mumps, rubella, poliomyelitis, *Haemophilus influenzae* type b, tetanus and diphtheria are part of the routine immunisation schedule for children. Some Meningococcal infection, depending on the serotype, can also be prevented by vaccination, but this is only recommended in outbreak situations.<sup>13</sup>

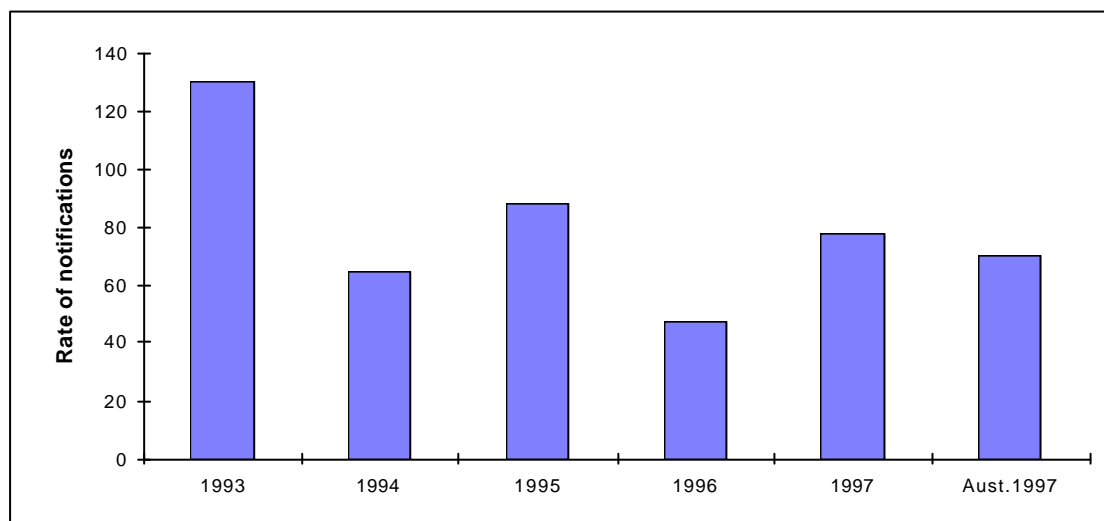
The National Childhood Immunisation Committee has implemented a number of initiatives in line with the 1993 NHMRC National Childhood Immunisation Strategy. In February 1997 a major initiative "*Immunise Australia: The Seven Point Plan*" was launched, with the aim of raising the level of immunisation in Australia.

In October 1997 the ACT Immunisation Program complemented the Commonwealth's strategy by launching the program "Simply Protecting Our Tots" or SPOT. This is a five point plan and includes:

- Mobile immunisation clinic
- Free vaccine delivery service to GP surgeries
- Access initiatives
- Information, communication and awareness
- Phone information /inquiry line<sup>14</sup>

The rate of all vaccine preventable diseases in the ACT can be seen in Figure 26. Overall rates decreased in the ACT between 1993-97. However the ACT rates of vaccine preventable diseases in 1997 (78.1 per 100,000 population) were slightly higher than the Australian rate (70.8). The extent to which this is due to better case ascertainment in the ACT is difficult to establish.

**Figure 26: Rate of vaccine preventable disease notifications ACT 1993-97 & Aust.1997**



Source: Notifiable disease data, ACT, 1993-98

### 2.4.1 Diphtheria

Diphtheria is produced by a toxin producing strain of the bacterium *Corynebacterium diphtheriae*. The toxin producing organism can cause a severe upper respiratory infection often characterised by an adherent membrane of the tonsil(s), pharynx and/or nose. This strain can also cause skin lesions. There have been a number of cases of invasive nontoxicogenic *Corynebacterium diphtheriae* infections in Australia.

Surveillance case definition:

- Isolation of toxigenic *Corynebacterium diphtheriae*  
**and** one of the following:
- Pharyngitis and/or laryngitis (with or without a membrane)
- or**
- Toxic (cardiac or neurological) symptoms.

There were no cases of diphtheria reported in the ACT or Australia in 1997. The last notification of diphtheria in Australia was in 1993.

The absence of diphtheria is the result of a widespread immunisation campaign. However the possibility of the resurgence of diphtheria must be acknowledged and consideration must be given to the adult population where many adults will now be susceptible, even if previously immunised, due to lack of natural boosting. The epidemic of diphtheria in the former Soviet Union, which began in 1990, was attributable to falling immunisation levels and social disruption.

#### 2.4.2 *Haemophilus influenzae* type b (hib) infection

*Haemophilus influenzae* type b is an encapsulated bacterium causing invasive disease including meningitis, epiglottitis, septicaemia, cellulitis and septic arthritis. The disease mainly affects children under 5 years, after which time natural immunity usually prevents the development of disease. Vaccines have been available in Australia since 1993 and the fall in *Haemophilus influenzae* type b is directly attributable to the vaccination campaign, which included a “catch up” program.

Surveillance case definition:

An invasive clinically compatible illness (meningitis, epiglottitis, cellulitis, septic arthritis, osteomyelitis, pneumonia, pericarditis or septicaemia)

and

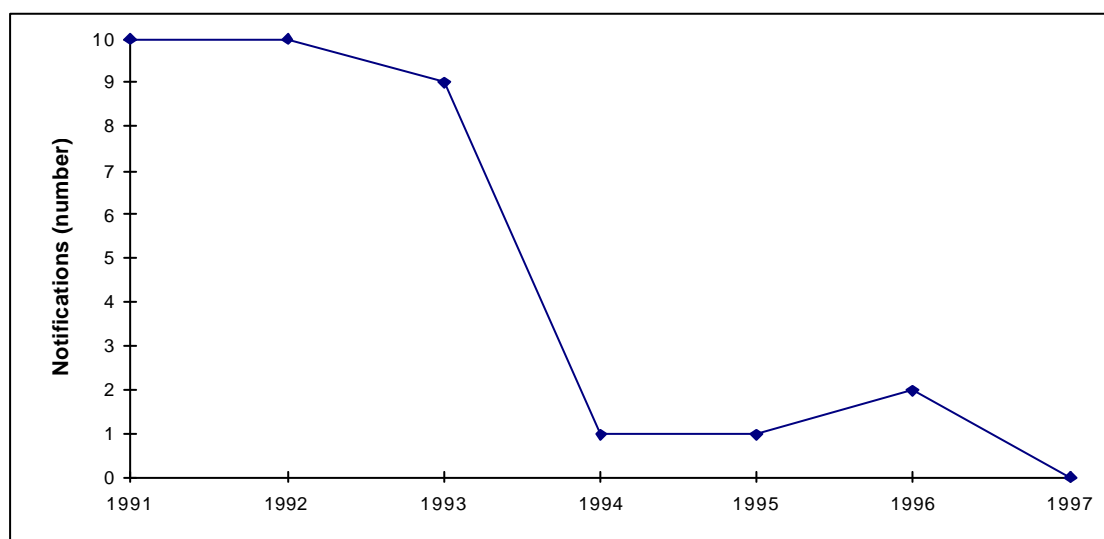
- the isolation of *Haemophilus influenzae* type b antigen (in a clinical case).

or

- detection of gram negative bacteria where the organism fails to grow in a clinical case.

In Australia the notification rate for this disease in children under 5 years has dropped from 33.6 per 100,000 in 1992 to 2.2 in 1996. The rate of invasive *Haemophilus influenzae* type b disease in the ACT in 1997 was 0.3 per 100,000 population. Four cases of Hib (1 male and 3 female) were notified between 1994 and 1997 in the ACT. All of these cases were in children between 1 and 4 years of age. One child was not immunised and three children were only partially immunised.

**Figure 27: Notifications of invasive *Haemophilus influenzae* type b disease, ACT, 1991-97**



Source: Notifiable disease data, ACT, 1993-98

### 2.4.3 Measles

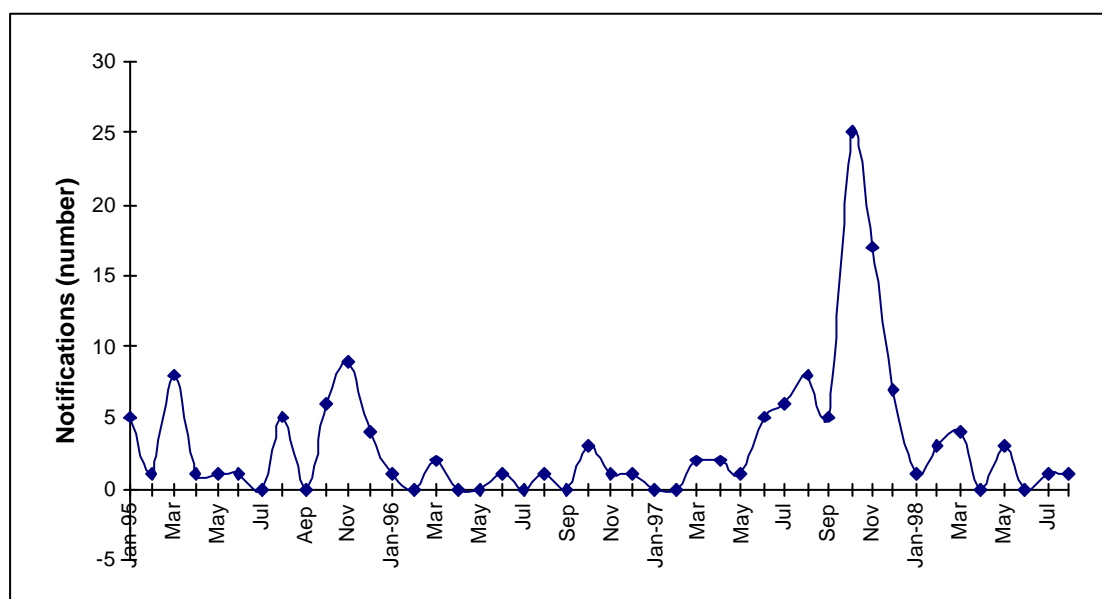
Measles is an acute infection caused by the rubeola virus. Measles is a highly contagious disease which can have severe complications of bronchopneumonia, otitis media, encephalitis and as a late complication subacute sclerosing panencephalitis (SSPE). The measles vaccine is part of the childhood immunisation schedule at 12 months of age until 1994. A second dose at year 6 was introduced in 1994 and in 1998 this second dose was moved to 4-5 years of age. The decision was taken as part of the National Measles Control Campaign which aims to prevent a significant epidemic anticipated in the next year or two. The ACT is actively involved in the implementation of the campaign.

#### Surveillance case definition:

- a) An illness characterised by all the following features:  
A generalised maculopapular rash lasting 3 or more days **and**  
a fever (at least 38 degrees centigrade if measured) **and**
- cough or coryza or conjunctivitis or Koplik spots
- or**
- b) Demonstration of measles specific IgM antibody.
- or**
- c) A fourfold or greater change in measles antibody titre between acute and convalescent phase sera obtained at least 2 weeks apart, with the tests preferably conducted at the same laboratory.
- or**
- d) Isolation of measles virus from a clinical specimen.
- or**
- e) A clinically compatible case epidemiologically related to another case.

Notifications of measles in the ACT showed a peak in 1993 (60.9 notifications per 100,000 population) and then a decline to 3.3 in 1996, followed by a sharp increase in rate to 25.2 in 1997. Measles shows seasonal trends in the ACT with peaks occurring in spring. 1993 and 1994 were epidemic years in Australia for measles.

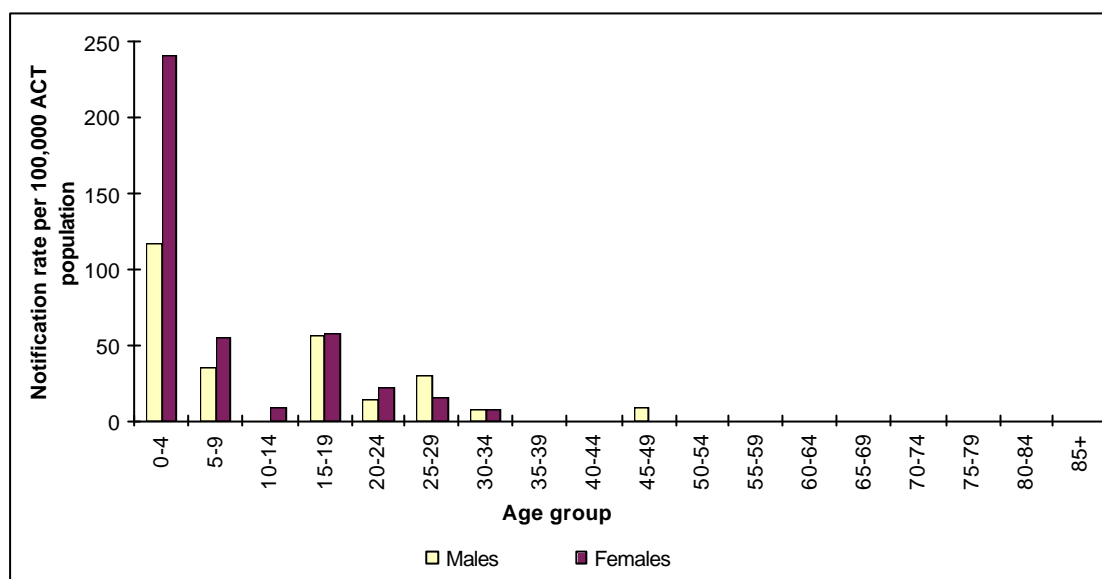
**Figure 28: Notifications of measles by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1993-98

The male to female ratio of measles was 1:1.4 in 1997. The majority of cases occurred in the 0-4 age group.

**Figure 29: Notification rate of measles by age and sex, ACT, 1997**



Note: Caution should be exercised interpreting data in children under 12 months as measles can be difficult to diagnose in this age group.

Source: Notifiable disease data, ACT, 1997

#### 2.4.4 Meningococcal infection

Meningococcal disease is caused by the bacterium *Neisseria meningitidis*. The bacterium can cause fulminant meningitis, pneumonia or overwhelming sepsis. Mortality is 100 percent if left untreated. *Neisseria meningitidis* is subdivided into serogroups A,B,C,Y,W and X and can be further subtyped. Serogroup identification undertaken by the Australian Meningococcal Surveillance Programme showed that the overall pattern of disease in Australia in 1996 was one of sporadic disease with occasional localised clusters.

The public health response to meningococcal disease relies heavily on the identification of the serogroup of the strain of meningococcus, not only to assist outbreak investigation, but also to gauge the response to vaccines (vaccines are available for serogroups A and C but not B). Overall in Australia, serogroup B and C isolates together accounted for 92 percent of isolates of invasive disease in Australia. Serogroup B strains were the main cause of sporadic meningococcal disease in Australia in 1996 and serogroup C was responsible for both sporadic and disease clusters. No serogroup A meningococci were isolated in 1996<sup>15</sup>. Expanded serotyping which is now available by reference centres throughout Australia allows more detailed analysis of case clusters and apparent clusters.

Surveillance case definition:

- Isolation of *Neisseria meningitidis* from a normally sterile site
- or
- Detection of meningococcal antigen in joints, blood or CSF
- or
- Detection of gram negative intracellular diplococci in blood or CSF.

The rate of meningococcal infection in the ACT in 1997 was 2.9 notifications per 100,000 population which was similar to the Australian rate of 2.6. Rates of meningococcal disease have only slightly increased over the 1991-97 period in Australia and the ACT.

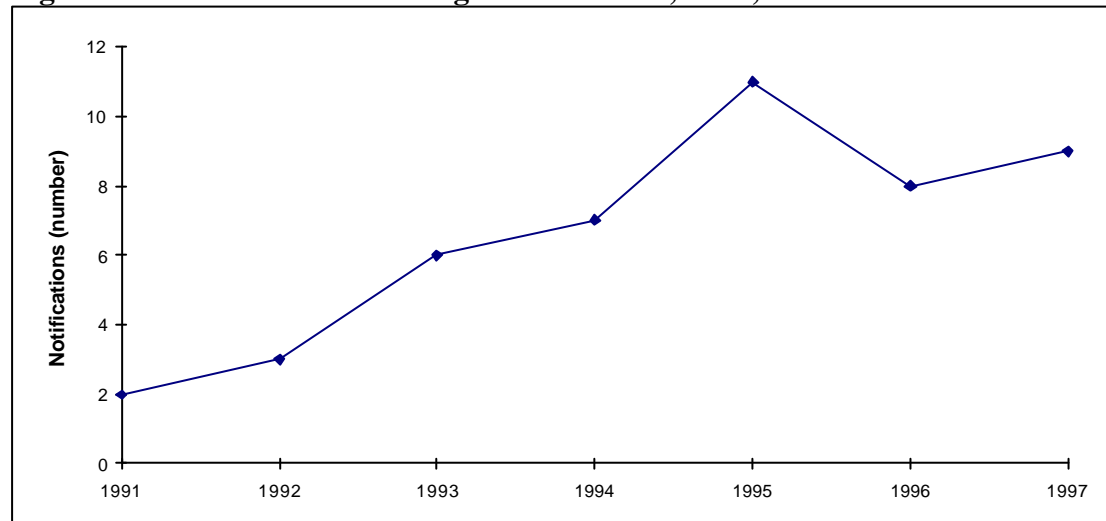
**Table 4: Meningococcal serogroups by age and site, ACT, 1997**

Serogroup	Site	Age (years)	Number of cases
serogroup B	Cerebrospinal fluid	less than 1	2
serogroup B	Cerebrospinal fluid	1	1
serogroup B	Cerebrospinal fluid	48	1
serogroup B	Cerebrospinal fluid	52	1
serogroup C	Cerebrospinal fluid	2	1
serogroup Y	Blood culture	48	1
untyped	Throat swab	19	1
untyped	Sputum	23	1
<b>TOTAL</b>			<b>9</b>

Source: National Neisseria Network database, 1997

In the ACT, serogroup B has predominated every year since 1994.

**Figure 30: Notifications of meningococcal disease, ACT, 1991-97**

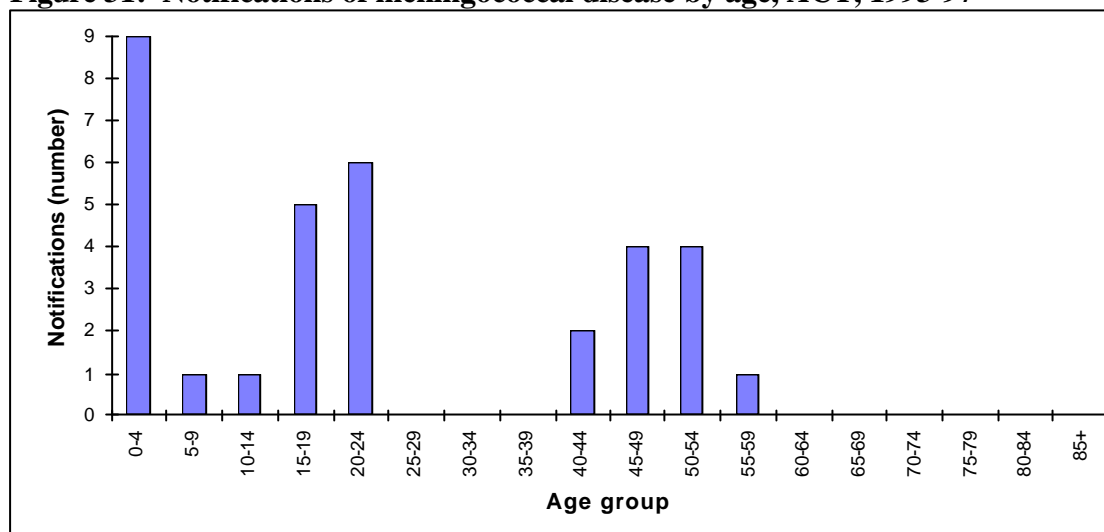


Source: Notifiable disease data, ACT, 1991-97

The male to female ratio over the 1993-97 period was 1.1:1. Twenty seven percent of notifications in the ACT between 1993-97 were in the 0-4 age group, 33 percent in youth 15-24 years and a further 24 percent occurred in the 45-54 age group.



**Figure 31: Notifications of meningococcal disease by age, ACT, 1993-97**



Source: Notifiable disease data, ACT, 1991-97

Meningococcal disease demonstrates marked seasonality, with peaks occurring in winter months around July. This was not demonstrated in the ACT data, probably due to the low number of cases.

The Australian Meningococcal Surveillance Programme is a collaborative laboratory based programme for the surveillance of *Neisseria meningitidis*. Antibiotic susceptibility testing was performed on isolates of *Neisseria meningitidis* collected over 3 years (1994-1996) in Australia.

No strains demonstrated resistance to penicillin. All strains were susceptible to the third generation cephalosporins, chloramphenicol and ciprofloxacin. However results showed that the percentage of strains showing reduced susceptibility to penicillin rose from 52 percent in 1994 to 74 percent in 1996. This finding does not mean that therapeutic failure will occur, but the increase in the number and proportion of strains in this category is an epidemiological marker of the slow progression towards resistance<sup>16</sup>.

#### 2.4.5 Mumps

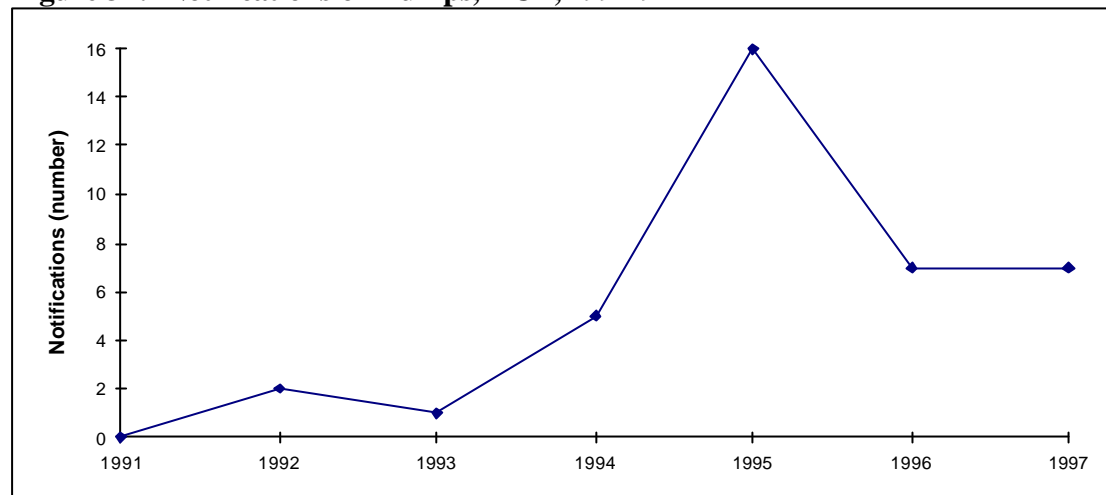
Mumps is an acute viral infection characterised by swelling and tenderness of one or more salivary glands, usually the parotid. Orchitis occurs in 20-30 percent of postpubertal males with mumps infection. The central nervous system can be involved, usually as an aseptic meningitis.

Surveillance case definition:

- a) Isolation of mumps virus from a clinical specimen
- or**
- b) Significant rise in mumps antibody level by any standard serological assay, except following immunisation
- or**
- c) A clinically compatible illness (unilateral or bilateral swelling of the parotid or other salivary glands lasting 3 days or more without other apparent cause).

The rate of notifications of mumps in 1997 was 2.3 notifications per 100,000 ACT population. This was higher than the Australian rate of 1.0 for 1997.

**Figure 32: Notifications of mumps, ACT, 1991-97**



Source: Notifiable disease data, ACT, 1991-97

The male to female ratio for mumps over the 1993-97 period was 1.4:1. Most notifications (58%) occurred in children under 14 years of age, the male to female ratio in this age group over the period 1993-97 was 1.9:1.

#### **2.4.6 Pertussis (whooping cough)**

Pertussis is a highly infectious bacterial disease affecting the respiratory tract. The disease is characterised by a whoop like noise sufferers make between coughs, vomiting is common. The disease has a sudden onset and can last for 3 months. The disease is caused by the bacterium *Bordetella pertussis*.

Children under one year, and particularly those under six months of age, are at greatest risk of death from pertussis. Although pertussis is a vaccine preventable disease, it has been epidemic in Australia since 1993 and has claimed the lives of 4 children under the age of 3 months since October 1996. Whilst these children were too young to be adequately immunised in accordance with the recommended schedule, their risk of exposure would have been diminished if there was less pertussis in the community. Pertussis vaccination is part of the routine immunisation schedule. In an attempt to reduce transmission in school age children a booster (fifth dose) of pertussis at 4-5 years was introduced into the recommended childhood vaccination schedule in 1994.

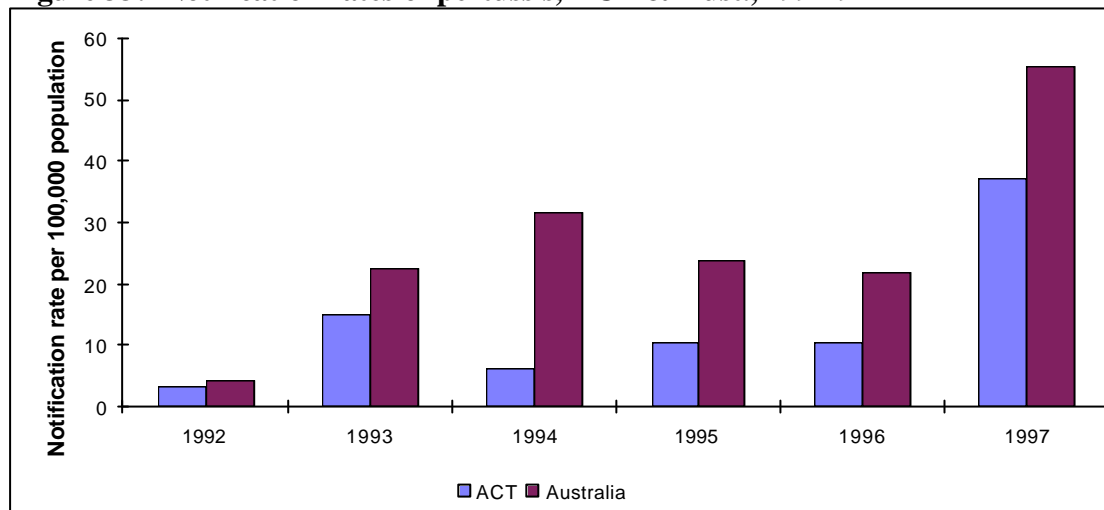
Peaks in pertussis incidence have been reported to occur every 3 to 4 years in Australia and overseas. National notifiable disease data show sustained activity at a national level in Australia over the last 4 years with a peak of 30.5 per 100,000 population in 1994<sup>17</sup>.

Surveillance case definition:

- |  |
|--|
| <p>a) Isolation of <i>Bordetella pertussis</i> from a clinical specimen.<br/><b>or</b><br/>b) Elevated <i>Bordetella pertussis</i> specific IgA in serum or <i>B.pertussis</i> antigen in a nasopharyngeal specimen using immunofluorescence with a history of clinically compatible illness.<br/><b>or</b><br/>c) An illness lasting 2 weeks or more with one of the following:<br/>paroxysms of coughing or<br/>inspiratory “whoop” without other apparent causes, or<br/>post-tussive vomiting.<br/><b>or</b><br/>d) An illness characterised by a cough lasting at least 2 weeks in a patient who is epidemiologically related to a laboratory confirmed case.</p> |
|--|

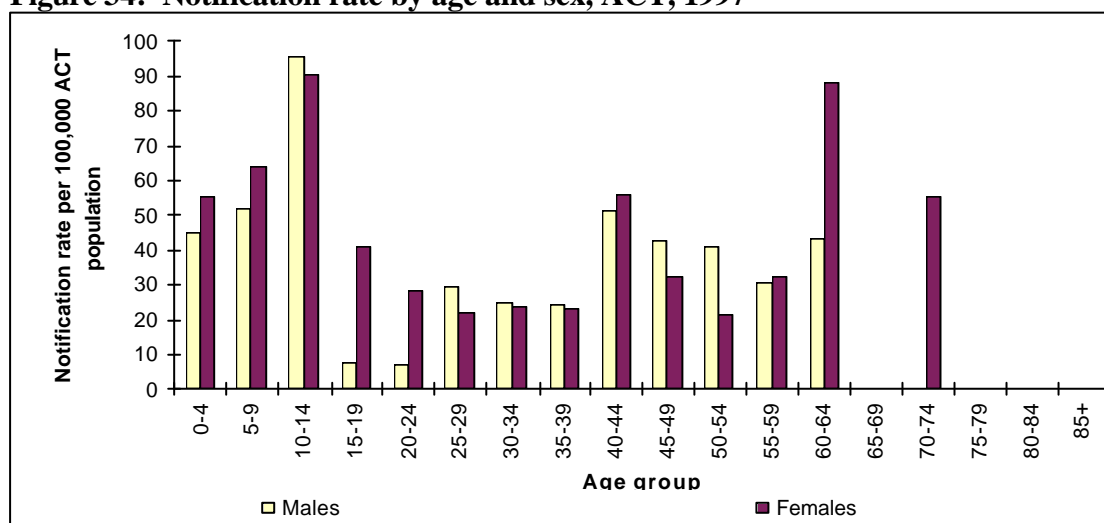
The rate of pertussis notifications in the ACT for 1997 was 37.1 per 100,000 population, which was the highest rate recorded in the ACT since 1991. The Australian rate for 1997 was 55.3 which was the highest recorded in Australia since 1991.

**Figure 33: Notification rates of pertussis, ACT & Aust., 1992-97**



Source: Notifiable disease data, ACT & Aust., 1992-97

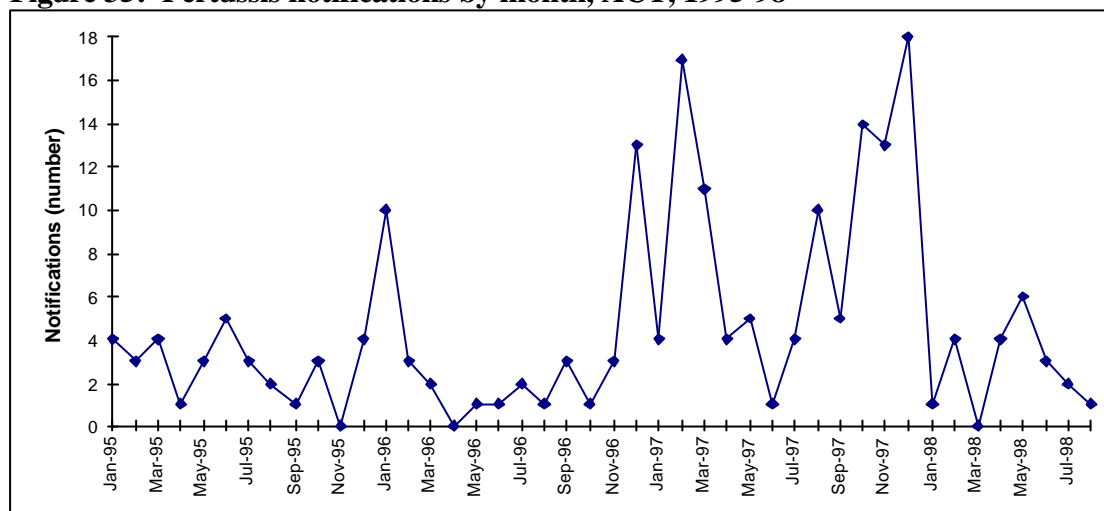
**Figure 34: Notification rate by age and sex, ACT, 1997**



Source: Notifiable disease data, ACT, 1991-97

The male to female ratio for pertussis in the ACT was 1:1.2. Age specific notification rates for 1997 were highest for children under 14 years.

**Figure 35: Pertussis notifications by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1995-98

In the ACT, pertussis appears to peak in the warmer months (Figure 35).

### 2.4.7 Poliomyelitis

Poliomyelitis (polio) is the result of an infection with the poliovirus. Widespread immunisation has virtually eliminated the disease from Australia, and the disease is likely to be eradicated world wide by the end of the decade. Due to the very sensitive case definition, some cases of flaccid paralysis not caused by the poliovirus have been notified. The last case of poliomyelitis in Australia due to the wild type virus was recorded in 1978. The last case in the ACT was recorded in 1962. Vaccine associated cases in Australia were reported in 1986 and 1995<sup>18</sup>.

Surveillance case definition:

Acute onset of a flaccid paralysis of one or more limbs with decreased or absent tendon reflexes in the affected limbs without other apparent cause, and without sensory or cognitive loss.

### 2.4.8 Rubella

Rubella (German measles) is caused by infection with the rubella virus. Rubella is generally a mild, self-limiting infection. In contrast, congenital infection, where the foetus is infected transplacentally in the first trimester of pregnancy can be a severe disease leading to foetal death, premature delivery and an array of congenital defects.

Surveillance case definition:

**Rubella**

a) A generalised maculopapular rash and a fever, AND one or more of

- arthralgia/arthritis
- lymphadenopathy
- conjunctivitis

and an epidemiological link to a confirmed case.

or

b) Demonstration of rubella specific IgM antibody, except following immunisation.

or

c) A fourfold or greater change in rubella antibody titre between acute and convalescent phase sera obtained at least 2 weeks apart.

or

d) Isolation of rubella virus from a clinical specimen.

**Congenital rubella syndrome**

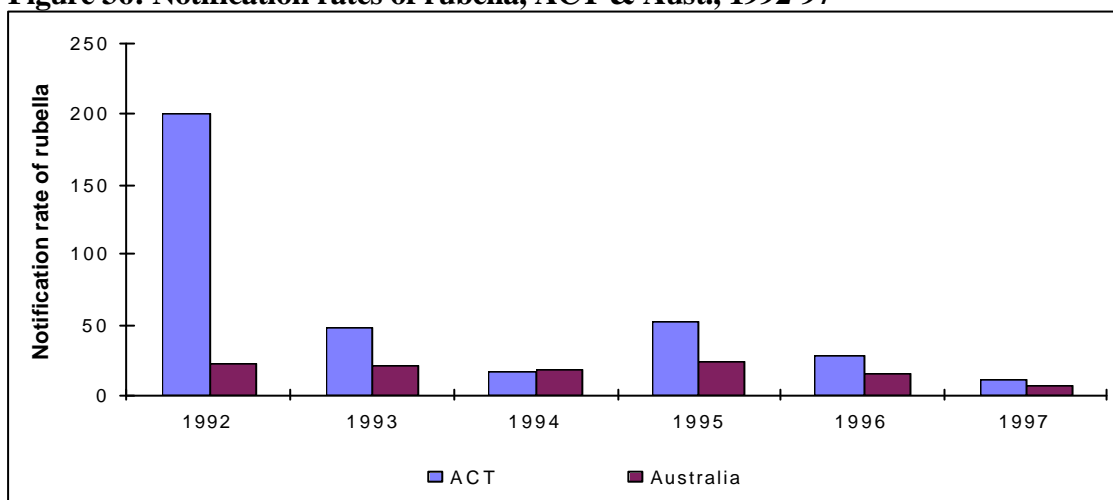
A live or stillborn infant with clinically compatible defects (cataracts, congenital glaucoma, congenital heart disease, hearing defects, microcephaly, pigmentary retinopathy, mental retardation, purpura, hepato-splenomegaly, meningoencephalitis, radiolucent bone disease)

and at least one of the following:

- Isolation of rubella virus from a clinical specimen from the infant,
- demonstration of rubella specific IgM antibody in the infant's serum,
- persistence of rubella specific IgG antibody of titre higher than expected from passive transfer of maternal antibody,
- laboratory confirmed maternal rubella infection in the first trimester of pregnancy.

The ACT notification rate for rubella in 1997 was 10.3 per 100,000 population which is higher than the Australian rate (7.6). Of the 32 cases reported in 1997 none were reported as congenital rubella.

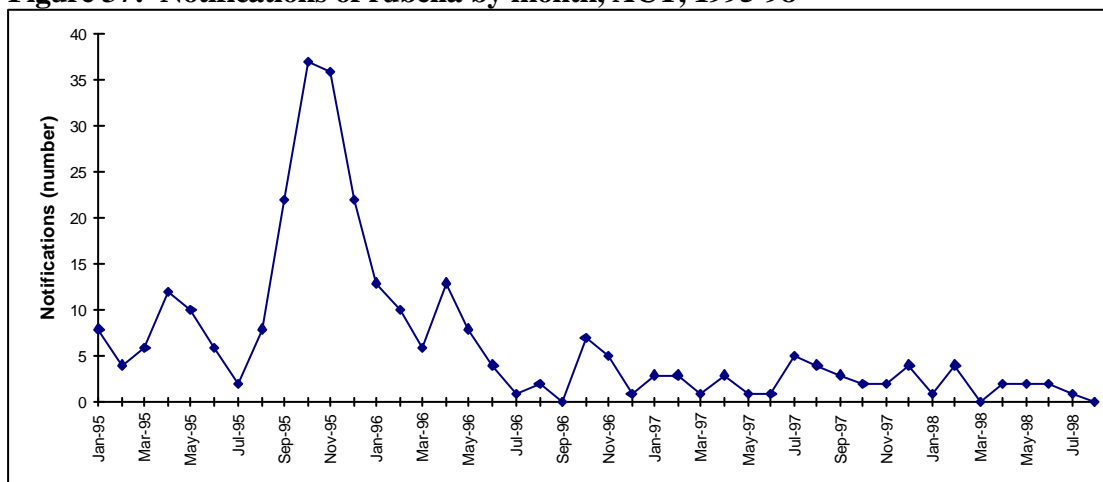
**Figure 36: Notification rates of rubella, ACT & Aust., 1992-97**



Source: Notifiable disease data, ACT & Aust, 1992-97

The ACT rate for rubella notifications has been higher than the Australian rate since 1992 other than 1994. The ACT recorded a high rate of rubella in 1992 following an outbreak which was predominantly in primary school children and adolescent males.

**Figure 37: Notifications of rubella by month, ACT, 1995-98**



Source: Notifiable disease data, ACT, 1995-98

Australia wide notifications of rubella follow a seasonal pattern, with annual springtime peaks. This pattern was not obvious in the ACT, possibly due to the small numbers of notifications.

The male to female ratio was 1:1.5 in the ACT during 1997. This is different from 1993-96 where there were more notifications for males than females. The peak incidence of disease was in the 0-4 year age group which were responsible for 41 percent of total rubella notifications in 1997. Fifteen percent of total notifications were in the under 1 age group.

#### **2.4.9 Tetanus**

Tetanus is produced by the action of a potent neurotoxin produced by the bacterium *Clostridium tetani*. The disease is characterised by acute onset of hypertonia and/or painful muscular contractions and generalised muscle spasms.

There were no notifications of tetanus in the ACT between 1991-97. There were a total of 8 notifications in Australia in 1997.

Surveillance case definition:

A clinically compatible illness without other apparent cause, with or without a history of injury, and with or without laboratory evidence of the organism or its toxin.
--

### **2.5 Vectorborne diseases**

Vectorborne diseases are those diseases which are transmitted from one host to another by a vector, usually an arthropod. Mosquitos are common vectors for disease in Australia. The nationally notifiable vectorborne diseases include several arboviruses and malaria.

Australia has been certified malaria free since 1981. The majority of cases reported were imported, occurring in travellers returning from endemic areas. Most Australian cases are acquired in Papua New Guinea. Surveillance is necessary to ensure that malaria is not re-introduced.<sup>19</sup>

#### **2.5.1 Ross River virus**

Ross River virus causes a syndrome known as epidemic polyarthritis. It is the most common arboviral disease in Australia. Sporadic cases occur widely, particularly in coastal areas of Australia. Epidemic activity is commonly associated with heavy rainfall events, flooding or high tides inundating coastal wetland and salt marshes. The majority of cases of Ross River virus are recorded in Queensland.

Surveillance case definition:

- a) Demonstration of a four-fold or greater change in serum antibody titres between acute and convalescent phase serum specimens obtained at least 2 weeks apart and preferably conducted at the same laboratory
- or**
- b) Demonstration of specific IgM antibodies in CSF or acute phase serum
- or**
- c) Isolation of virus from blood, CSF or tissue specimens.

The highest notification rate in Australia was recorded in 1996 (42.7 per 100,000 population). The ACT notifications over the period 1993-97 are the lowest of all states and territories, a result of its geographical location. The highest rate for the ACT of 2.9 per 100,000 ( 9 notifications) was recorded in 1997.

The male to female ratio was 1:1.8 for the period 1993-97. No particular age distribution was evident.

### 2.5.2 Barmah Forest virus

This virus causes a syndrome similar to epidemic polyarthritis. It may lead to chronic illness in some patients. Barmah Forest virus, although first isolated in 1974, was not linked to human disease until 1988. There has been an increase in detection of the disease in Australia over the past 5-7 years, partly due to the greater awareness of the virus and the ability to detect it by routine laboratory procedures.

Surveillance case definition:

- a) Demonstration of a four-fold or greater change in serum antibody titres between acute and convalescent phase serum specimens obtained at least 2 weeks apart and preferably conducted at the same laboratory.
- or**
- b) Demonstration of specific IgM antibodies in CSF or acute phase serum.
- or**
- c) Isolation of virus from blood, CSF or tissue specimens.

There have been seven cases of Barmah Forest Virus notified since 1995 in the ACT. These infections are unlikely to have been acquired in the ACT. Six of these cases were notified between May 1995 and March 1996. Rates in the ACT are very low compared to the Australian rates. The male to female ratio was 1:2.5 over the period 1993-97.

### 2.5.3 Dengue

Dengue is not endemic in Australia. Epidemics reported have been a result of importations by viraemic tourists or returning residents. The potential for local transmission is confined to an area in Queensland corresponding to the geographic range of its mosquito vector.<sup>20</sup>

Surveillance case definition:

Demonstration of a four-fold or greater change in serum antibody titres between acute and convalescent phase serum specimens obtained at least 2 weeks apart and preferably conducted at the same laboratory.

or

Demonstration of specific IgM antibodies in CSF or acute phase serum.

or

Isolation of virus from blood, CSF or tissue specimens.

The ACT had 2 notified cases of dengue since 1991. Both cases were male, one 28 years and one 54 years of age. These infections were probably acquired overseas.

### 2.5.4 Malaria

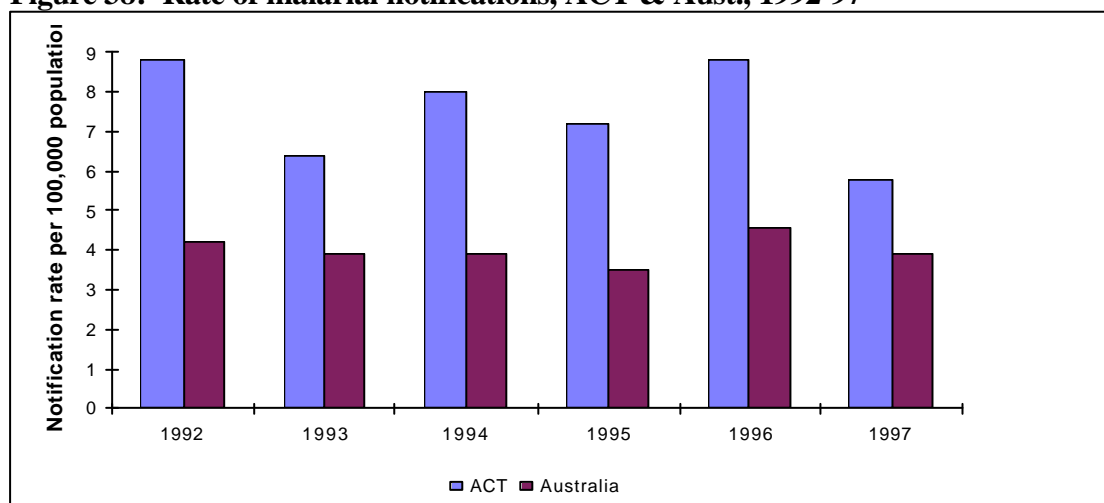
Malaria is a severe febrile illness resulting from infection with one or more of the four *Plasmodium* species of parasite. It is transmitted by the female anopheline mosquito. The four *Plasmodium* species that infect humans vary in their geographical location and the severity of disease that they cause. Untreated *Plasmodium falciparum* is often fatal. *Plasmodium vivax* is the predominant species notified in Australia. Peak incidence of the disease in Australia occur in the months of January and February.

Surveillance case definition:

Demonstration of malaria parasites (*Plasmodium* species) in a blood film.

The notification rate of malaria in the ACT in 1997 was 5.5 per 100,000 population. This is a drop from the previous year where the ACT notification rate was 8.8 (27 cases). The rate in 1996 for malarial notifications in the ACT was the third highest after Queensland and the Northern Territory. All of these cases were due to returned overseas travellers. Notifications for 1997 showed *Plasmodium vivax* (53%) as the predominant species in the ACT, followed by *Plasmodium falciparum* (35%).

**Figure 38: Rate of malarial notifications, ACT & Aust., 1992-97**

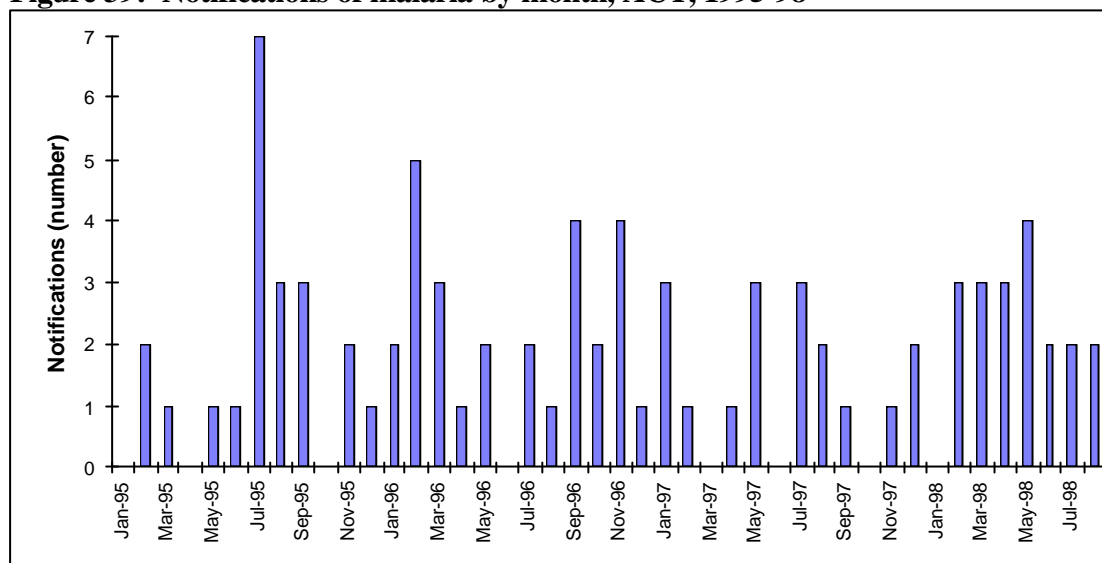


Source: Notifiable disease data, ACT & Aust., 1992-97

The male to female ratio over the period 1993-97 was 3.3:1. Figure 39 shows that malarial notifications showed no evidence of seasonality in the ACT.



**Figure 39: Notifications of malaria by month, ACT, 1995-98**



Source: Notifiable disease data, ACT & Aust., 1995-98

## 2.6 Zoonoses

Zoonotic diseases are defined as “a group of infectious diseases transmissible under natural conditions from vertebrate animals to humans”<sup>21</sup>. Most diseases in this category are occupationally acquired diseases. Of concern in Australia are the new emerging zoonotic diseases, equine morbillivirus and bat lyssavirus.

### 2.6.1 Brucellosis

Brucellosis is caused by infection with the *Brucella* species of bacteria. Reservoirs of *Brucella* species include cattle, pigs, sheep, goats and dogs. The mode of transmission is by contact with tissues, blood, urine, aborted foetuses and placentas of infected animals. A fluctuating fever is characteristic in many cases of the disease.

Rates for brucellosis in Australia are low, with most cases occurring in Queensland.

Surveillance case definition:

- a) Isolation of *Brucella* species from a clinical specimen.
- or**
- b) A fourfold or greater change in *Brucella* agglutination titres or complement fixation titres between acute and convalescent phase serum samples at least 2 weeks apart with the tests preferably conducted at the same laboratory.
- or**
- c) Demonstration of *Brucella* antigen in a clinical specimen.

The ACT recorded no cases of brucellosis between 1991 and 1997. Two cases of brucellosis occurred during 1998, both in males 61 years and 30 years of age, the infections were acquired overseas.

## 2.6.2 Hydatid disease

This disease is caused by the tapeworm *Echinococcus granulosus*, which is passed to humans from infected dogs. Dogs are infected through the consumption of infected animal flesh particularly sheep. Eggs of the tapeworm are transmitted by the faecal oral route, either by direct contact or by contaminated food and water. Hydatid cysts can grow in the liver, lungs, kidney, spleen, bone and central nervous system. Low rates of hydatid disease were observed throughout Australia.

Surveillance case definition:

- a) Positive serological test for infection with *Echinococcus granulosus* in a patient with clinical, radiological or sonographic evidence of hydatid disease.
- or**
- b) Identification of *Echinococcus granulosus* in cyst fluid or sputum.
- or**
- c) Immunoelectrophoresis demonstrating arc 5 or three or more other arcs.

The ACT had a rate of 1.3 per 100,000 in 1996 which was the highest of all states and territories, however this only represented 4 cases of the disease which leads to a high degree of error in the rates. Only 6 cases have been recorded since 1991.

## 2.6.3 Leptospirosis

Leptospirosis is caused by infection with the bacterium *Leptospira interrogans*. Infection can be subclinical, mild flu-like febrile illness or severe systemic disease (Weil's disease) with renal and hepatic failure, myocarditis, vasculitis and death. Transmission is via contact with the urine of infected animals, either directly or indirectly. Reservoirs of the bacteria include cattle, pigs, rats, and dogs. In Australia, infections are usually due to *Leptospira interrogans* serovar hardjo (cattle, sheep) or serovar pomona (pigs). Persons working in contact with animals are at the highest risk of contracting the disease.

Surveillance case definition:

- a) Isolation of *Leptospira* species from clinical specimens.
- or**
- b) A fourfold or greater change in leptospira agglutination titre between acute and convalescent phase sera obtained at least 2 weeks apart and preferably conducted at the same laboratory.
- or**
- c) Demonstration of leptospiral antigen in a clinical specimen.
- or**
- d) A single raised leptospira agglutination titre with a clinically compatible illness.

In Australia the rate of notifications for leptospirosis was 1.2 per 100,000 population and occurrence of the disease was primarily in the rural communities of Queensland, NSW and Victoria.

One case of leptospirosis was notified in the ACT between 1991-97. This may reflect low levels of testing in the ACT or low incidence of the disease.

#### 2.6.4 Ornithosis/psittacosis

This is a pneumonic disease caused by the bacterium *Chlamydia psittaci*. It is transmitted to humans from infected birds or the bird's surroundings. Infection occurs when dried bird faeces or secretions are inhaled.

Surveillance case definition:

- a) Serology using paired acute/convalescent phase sera.
- b) Culture of organism from sputum, blood or biopsy material or in the case of infants, posterior nasopharynx or throat.

The Australian rate of notifications has remained low, with rates usually below 1 per 100,000 population. Small peaks in notifications occurred in 1991 and 1995 in Australia.

Seven cases of psittacosis occurred between 1991-1997 in the ACT. Four of these cases occurred in 1991.

#### 2.6.5 Q fever

Q fever is an acute febrile illness caused by the rickettsia *Coxiella burnetii*. Reservoirs for this organism include cattle, goats, cats, sheep and some wild animals. Transmission is usually by inhalation of aerosols contaminated with tissue, fluid and excrement of infected animals. This frequently occurs in or near abattoirs or establishments handling animal by-products. Abattoir workers are at high risk of contracting Q fever due to occupational exposure.

Notifications in Australia are mainly from NSW and Queensland. In Australia the disease is essentially an occupational disease with highest rates recorded in the male 20-44 year group. Vaccinations are available for occupationally exposed persons.

Surveillance case definition:

- a) A fourfold or greater change in serum (CF) antibody titre to phase II antigen of *Coxiella burnetii*.
- or**
- b) A fourfold or greater change in enzyme linked immunosorbent assay (ELISA) of antibody titre to Phase I or II antigens of *Coxiella burnetii*.
- or**
- c) An IgM fluorescent antibody titre of at least 1:160 during the convalescent phase of the illness (ie 10 days or more after onset).
- or**
- d) In chronic infections (eg endocarditis), elevated (CF) IgG or IgA titres to *Coxiella burnetii* phase I antigen.
- or**
- e) Isolation of *Coxiella burnetii* from a clinical specimen.

The ACT notified 4 cases of Q fever between 1991-98. Two of the cases were notified in 1998.

### 2.7 Quarantinable diseases

Cholera, plague, rabies, yellow fever and viral haemorrhagic fevers (Ebola, Marburg, Lassa fever, Crimean-Congo haemorrhagic fever viruses) are considered to be of human quarantine importance.

These diseases are all formally notified to the National Centre for Disease Control by all states and territories as they occur.

### 2.7.1 Cholera

Cholera is caused by certain enterotoxin producing strains of the bacteria *Vibrio cholerae*. The disease is characterised by vomiting and diarrhoea which can be severe. *Vibrio cholerae* serotype O1 is endemic in rivers of eastern Australia and occasionally causes sporadic cases of diarrhoea.

Case definition:

- a) An illness characterised by diarrhoea and/or vomiting.  
**and**  
b) Isolation of toxigenic *Vibrio cholerae* serogroup O1 or O139 from a clinical specimen.

There was one case of cholera notified in the ACT between 1991-97. The infection was acquired overseas.

## 2.8 Mycobacterial diseases

Mycobacterial diseases are caused by a group of bacteria characterised by their slow growth in the laboratory and their resistance to usual antimicrobial therapy. Mycobacterial infections are a major public health concern in both developing and developed countries. Tuberculosis remains an unconquered disease globally, despite TB control programs. Disease due to non-tuberculous strains of mycobacteria has been recognised primarily in immunocompromised patients and particularly those infected with HIV. Leprosy (Hansen's disease) is present in Australia, and has been notified from all states and territories other than Tasmania.

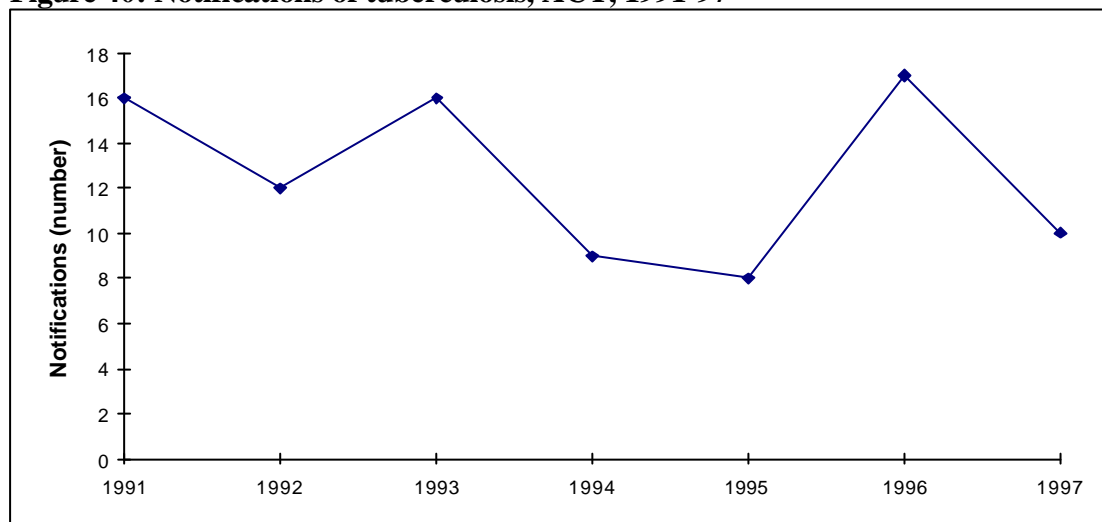
### 2.8.1 Tuberculosis

Tuberculosis is a chronic bacterial infection usually transmitted from person to person by airborne particles. It affects the pulmonary system, but extrapulmonary tuberculosis can occur especially in immunocompromised patients. The infectious agents of tuberculosis are the *Mycobacterium tuberculosis* group of bacteria which include *Mycobacterium tuberculosis*, *Mycobacterium bovis* and *Mycobacterium africanum*. Rates of tuberculous disease have remained low and stable in Australia since the mid 1980s. The rate of Australian born persons with tuberculosis has declined over the past 10 years, and this has been balanced with an increase in the rate of overseas born persons. There are some groups which appear to be disproportionately affected. These include indigenous persons and several migrant groups. Of the 10 new cases of Tuberculosis reported in 1997, 6 persons were born in Asia, 3 were born in Australia, one in Europe. Australia has one of the lowest rates of tuberculosis in the world.

Surveillance case definition:

- a) Isolation of *Mycobacterium tuberculosis*, *Mycobacterium bovis* or *Mycobacterium africanum* from a clinical specimen.
- or
- b) Demonstration of acid-fast bacilli in a clinical specimen or in a histopathological lesion when a culture is not available, in a person with signs or symptoms compatible with tuberculosis.
- or
- c) Evidence of resolution of disease where treatment with two or more anti tuberculosis medications have been prescribed and follow up has been instigated.

**Figure 40: Notifications of tuberculosis, ACT, 1991-97**



Source: Notifiable disease data, ACT, 1991-97

In 1997, the site of infection was most frequently pulmonary (4 cases), followed by the lymph system (2 cases).

The rate of tuberculosis notifications in the ACT for 1997 was 3.2 per 100,000 population. This was lower than the Australian rate of 5.1 for that year. Equal numbers of men and women were affected. One notification was received regarding a child in the 0-4 year age group.

The recent increase of drug resistant strains of tuberculosis in the USA is of some concern. Drug susceptibility testing in Australia shows no notable changes in the prevalence of drug resistant strains in the Australian population. About one in 15 patients was infected with a strain that was resistant to either isoniazid, rifampicin or to a combination of both.

## 2.8.2 Leprosy (Hansen's disease)

Leprosy is a chronic bacterial disease of the skin, peripheral nerves and airways. It is caused by the bacteria *Mycobacteria leprae*.

Surveillance case definition:

- a) Enlarged dermal nerves with associated sensory loss
- or
- b) Demonstration of acid -fast bacilli in a skin, smear or biopsy specimen
- or
- c) A histological picture compatible with leprosy in a specimen.

Leprosy is present in Australia at low rates of approximately 1 case per 100,000 population. The ACT, South Australia and Tasmania recorded the lowest incidence of disease between 1991-1997. The ACT recorded one case of leprosy in the interval 1991-97. The case was notified in 1992.

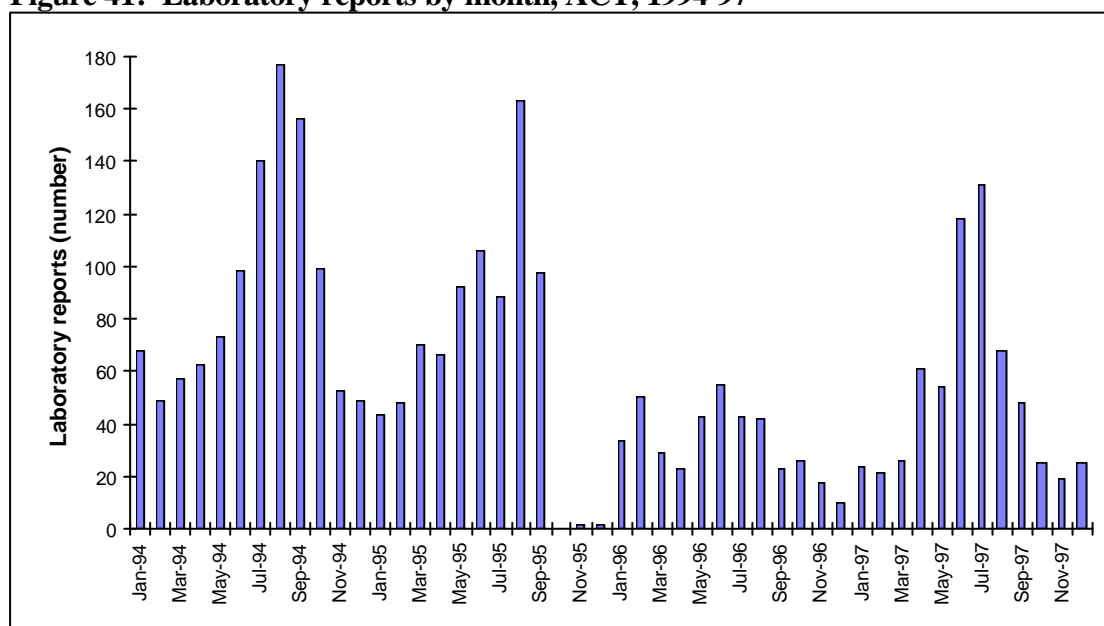


### 3.0 Laboratory surveillance (Virology and Serology reporting Scheme)

The data in the LabVISE scheme is subject to a number of biases including the number and location of participating laboratories which varies from time to time. Changes in diagnostic practices and interpretation of results can bias the data. Laboratories may opt not to report to the scheme depending on available resources. The scheme is a sentinel scheme, hence incidence can not be determined. The information from this scheme is useful for observation of general trends<sup>22</sup>. Data reported to this scheme is often not reported elsewhere. In this publication, data from this scheme will be used where the disease is **not notifiable** to the NNDS. Only selected organisms reported to this scheme will be reported. Organisms reported to this scheme have been identified by laboratory procedures from clinical specimens.

ACT Pathology located at the Canberra Hospital reports to this scheme. The data used in this chapter relates to data supplied by ACT Pathology and is preliminary data only and as such should be interpreted with caution.

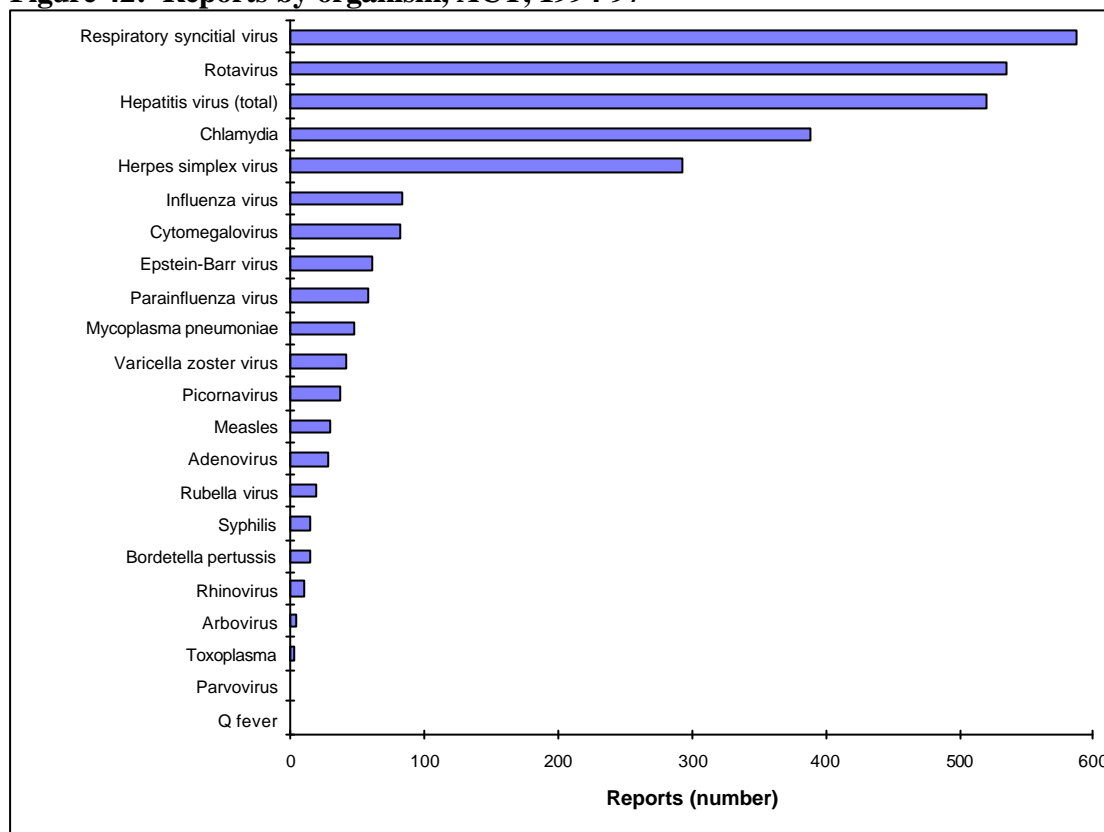
**Figure 41: Laboratory reports by month, ACT, 1994-97**



Source: LabVISE database, TCH

Laboratory reporting shows seasonal variation with a peak in the winter months. 1996 had a smaller number of reports compared to other years.

**Figure 42: Reports by organism, ACT, 1994-97**



Source: LabVISE database, TCH

Respiratory syncytial virus and rotavirus infections were the most common organisms reported.

### 3.1 Adenoviruses

Common disorders caused by the adenoviruses include respiratory tract infection, conjunctivitis, hemorrhagic cystitis and gastroenteritis. Adenoviruses are more common in children but can also occur in adults.

There were 28 laboratory reports of adenovirus between 1994-97 of which 6 were typed. Adenovirus type 3 was the most frequently reported adenovirus in the ACT and Australia. Nasopharyngeal isolates yielded 54 percent of all adenoviruses, followed by faeces (32 %) and eye (14 %).

The male to female ratio was 1.8:1. Sixty one percent of infections occurred in the 0-4 year age group and 29 percent in the 5-9 year age group. Only one percent of adenovirus infections occurred in adults.

### 3.2 Herpesviruses

The human herpesviruses are ubiquitous and many individuals become infected at an early age. Latent infection, with subsequent recurrent disease, is a trademark of the herpesviruses.



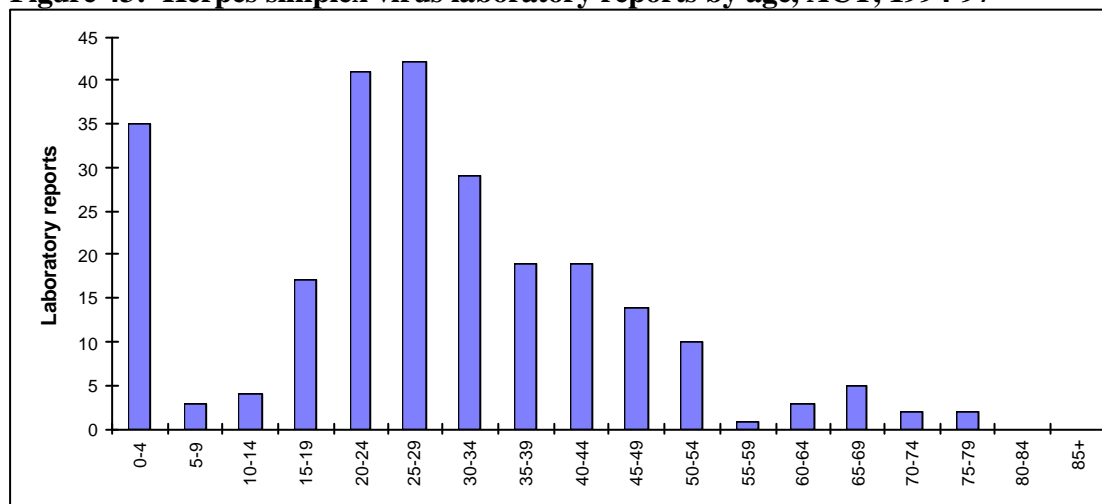
Herpes simplex (HSV) and varicella zoster (VZV) viruses are neurotropic whereas Epstein-Barr (EBV), cytomegalovirus (CMV) and human herpesvirus 6 (HH6) are lymphotropic herpesviruses. The tropism refers to the cell type in which these viruses establish latent infection.

### 3.2.1 Herpes Simplex Virus (HSV)

Primary HSV-1 infection is frequently asymptomatic but may present as gingivostomatitis and pharyngitis most commonly in children under 5 years of age. Primary HSV-2 infection is most common in young adolescents and young adults and usually presents as a genital infection. Meningitis and encephalitis are serious infections due to this virus. Cervical excretion of HSV-2 may occur during pregnancy and lead to vertical transmission during vaginal delivery, or by an ascending in utero infection.

265 reports of herpes simplex virus were received between 1994-97 in the ACT. 94 percent of reports were not typed. The source of most specimens was the genital tract (60%) followed by skin (20%) and nasopharyngeal (10%). Diagnoses may have been for new infections or recurrences. Male to female ratio was 1.3:1. The most common site of isolation of herpes simplex virus in the 0-4 year age group was nasopharyngeal (52%) followed by skin (32%) and genital (7%). The most common site of isolation of herpes simplex virus in the 20-34 year age group was genital (80%) followed by skin (10%). Risk factors included immunocompromised (9 reports), pregnancy (7 reports), HIV (7 reports).

**Figure 43: Herpes simplex virus laboratory reports by age, ACT, 1994-97**

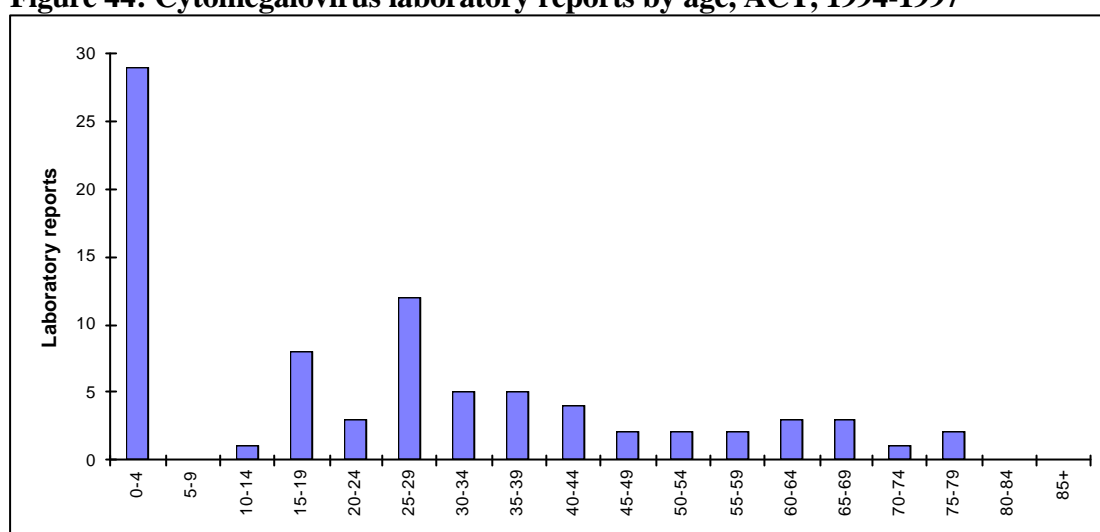


Source: LabVISE database, DHFS

### 3.2.2 Cytomegalovirus (CMV)

CMV is a common human pathogen. Infection is widespread and often not apparent. It causes a number of disease syndromes in adults and paediatric patients. It is a prominent pathogen in immunocompromised patients. CMV infects lymphocytes and leucocytes and is spread throughout the body in these cells. The major means of CMV transmission are by the congenital, oral, sexual routes and by blood transfusion or tissue transplantation. In adults, symptoms resemble those of infectious mononucleosis.

**Figure 44: Cytomegalovirus laboratory reports by age, ACT, 1994-1997**



Source: LabVISE database, DHFS

Cytomegalovirus was reported in 82 patients between 1994-97 in the ACT. The male to female ratio was 1.3:1. The virus was most commonly diagnosed from infants less than 1 year of age.

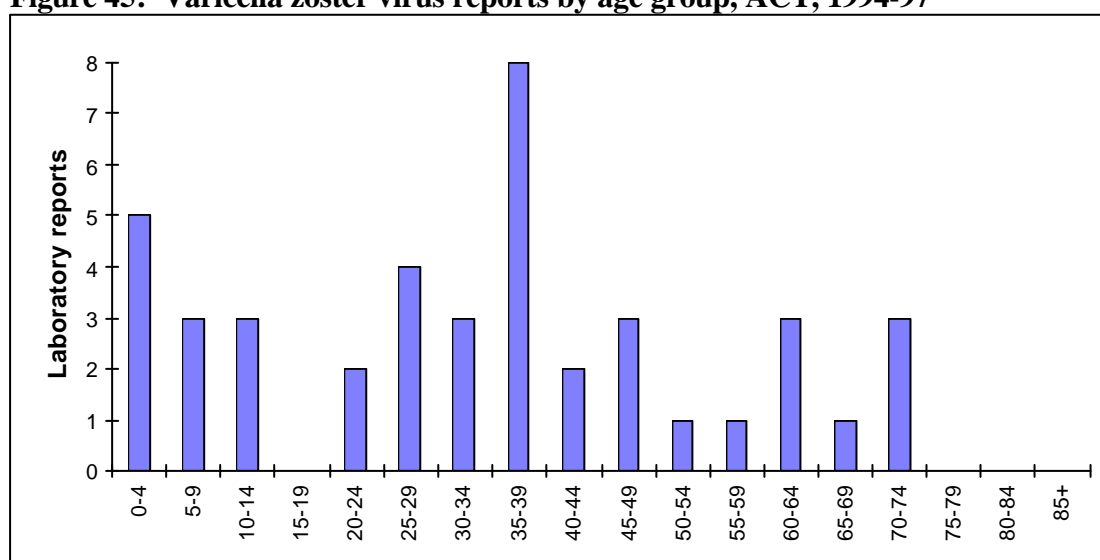
Risk factors were reported for 9 patients and these included transplant (4 reports), HIV (3 reports), hospitalisation (1 report) and overseas travel (1 report).

Specimen types used to identify the virus were urine (24%), serum (11%), nasopharyngeal specimens (10%) and others (3%).

### 3.2.3 Varicella zoster virus (VZV)

Varicella (chickenpox) is the primary infection caused by varicella zoster virus. It is usually a disease of childhood and is usually symptomatic, characterised by fever and maculopapular rash. Herpes zoster or shingles occurs sporadically in those persons who have already experienced varicella infection and represents a recurrence of the disease.

**Figure 45: Varicella zoster virus reports by age group, ACT, 1994-97**



Source: LabVISE database, DHFS

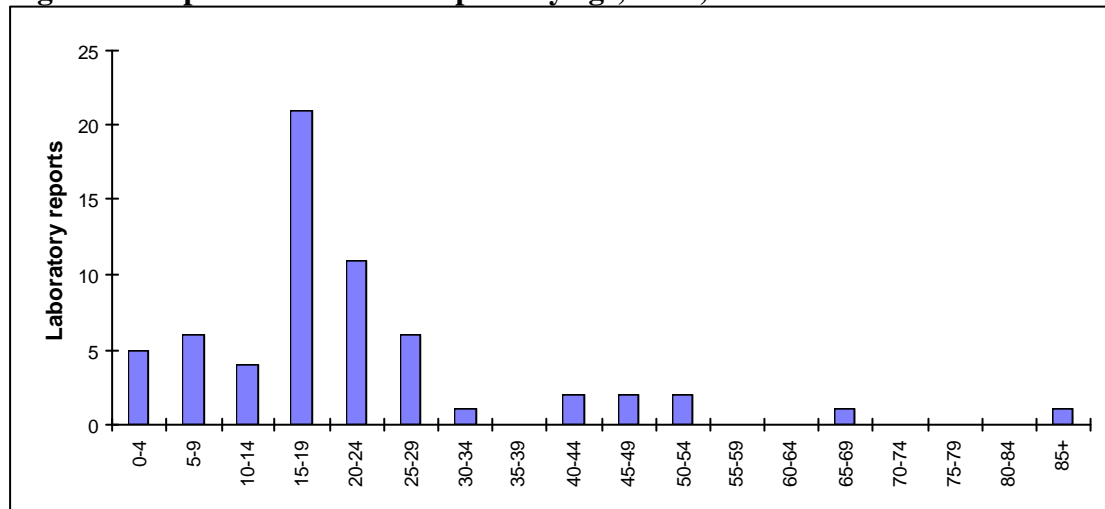
Varicella zoster virus was reported from 42 patients between 1994-97 in the ACT. The male to female ratio was 1:2 for that period. The most common specimen source was skin, and diagnosis was mainly by culture techniques. Varicella zoster was isolated from a cerebrospinal fluid specimen from a 43 year old male with meningitis.

Due to the recurrent nature of this disease and the limitations of current laboratory procedures a distinction cannot be made between reports that may be due to chickenpox and those due to shingles.

### 3.2.4 Epstein -Barr virus (EBV)

Epstein-Barr virus induces a broad spectrum of disease in humans. Classic or typical infectious mononucleosis is an acute illness caused by this virus and characterised by sore throat, fever and lymphadenopathy.

**Figure 46: Epstein -Barr virus reports by age, ACT,1994-97**



Source: LabVISE database, DHFS

There were 62 reports of Epstein-Barr virus in the period 1994-97 in the ACT. Fifty percent of reports were made in 1997. The male to female ratio was 1:1. The majority of reports received were for the 15-24 year age group. There were two reported cases in patients over 65 years of age. No risk factors were reported. All diagnoses were by serological methods.

### 3.3 Parvovirus

*Parvovirus* B19 is the cause of erythema infectiosum (fifth disease) and is also responsible for episodes of aplastic crisis in patients with chronic haemolytic anaemias. Most infections with this virus occur before 40 years of age with a peak occurrence in children 4-15 years.

There was one report of parvovirus from a 15 year old male. Identification was by serological methods.

### 3.4 Picorna Virus Family

This is one of the largest virus families and includes the genus enterovirus and rhinovirus. Hepatitis A virus and poliovirus are classified in this group.

#### 3.4.1 Enterovirus

Enteroviruses commonly infect humans, and the consequences of infection are either asymptomatic virus shedding or a broad spectrum of acute diseases, including undifferentiated febrile illness, aseptic meningitis, encephalitis, paralysis, a sepsis-like picture in neonates, myopericarditis, pleurodynia, conjunctivitis, exanthems, pharyngitis and pneumonia. Clinical illness is most frequently seen in infants and young children. Outbreaks of certain types are seen each year. The viruses are highly transmissible and are spread for the most part by the faecal oral route. Enteroviral eruptions may occur. Hand, foot and mouth disease is a vesicular exanthem usually caused by coxsackievirus A16. Enteroviruses include poliovirus, coxsackievirus, echoviruses and hepatitis A virus.

Activity of echovirus and coxsackievirus types vary from year to year (Table 5). 1993 showed high activity of coxsackievirus type A9.

**Table 5: Picornavirus laboratory reports by year, ACT, 1993-97**

	1993	1994	1995	1996	1997
Coxsackievirus type A9	17	0	0	4	0
Coxsackievirus type A16	0	0	0	0	4
Coxsackievirus type B3	0	2	4	0	2
Coxsackievirus type B5	6	0	1	0	0
Coxsackievirus type B2	0	1	1	0	0
Coxsackievirus type B4	0	1	0	0	1
Echovirus type 3	0	1	0	0	0
Echovirus type 5	0	0	0	1	2
Echovirus type 6	0	3	1	0	0
Echovirus type 7	1	0	0	0	0
Echovirus type 9	1	0	0	0	0
Echovirus type 11	6	0	0	0	1
Echovirus type 22	0	0	0	0	1
Echovirus type 30	1	2	2	0	0
Total	32	10	9	5	11

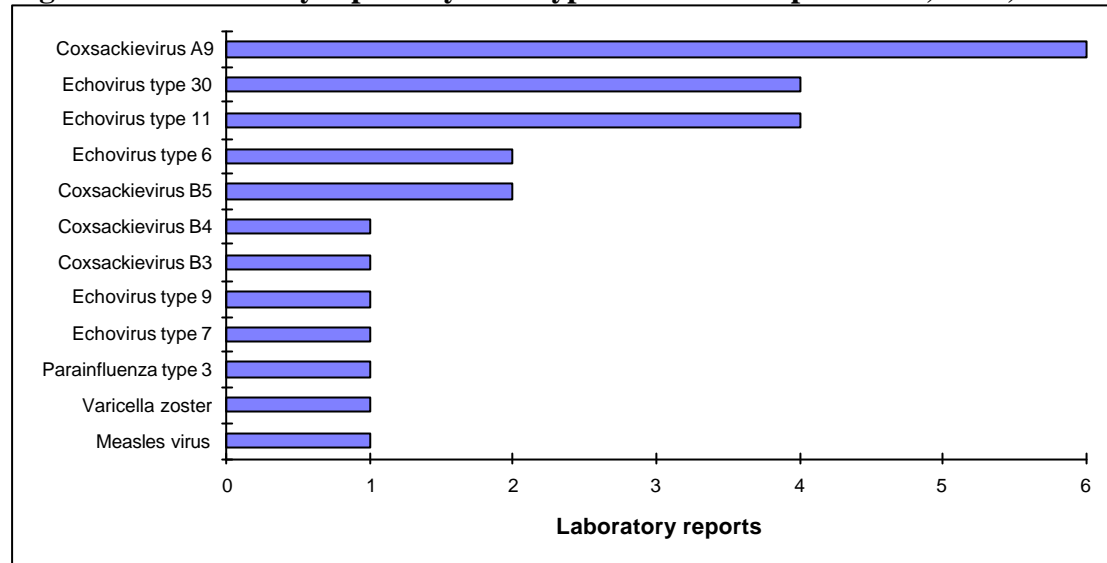
Source: LabVISE database, DHFS

Twenty one reports of coxsackievirus A9 were reported in the ACT between 1993-97. This represents the highest activity of any enterovirus. Seventeen of these reports were recorded in 1993, the majority in July. This highest annual figure for this virus since 1988 was recorded in Australia during 1993.

The male to female ratio was 1.4:1. Six reports (35%) were from infants 0-1 years of age. All isolates were diagnosed by viral isolation, six isolates from cerebrospinal fluid, nasopharyngeal specimens (9 reports) and faeces (2 reports).

Echoviruses and coxsackieviruses are the most commonly isolated virus from cerebrospinal fluid. Between 1993-95 there were 25 laboratory reports of viruses isolated from cerebrospinal fluid, 22 of these reports were echovirus or coxsackievirus.

**Figure 47: Laboratory reports by virus type from cerebrospinal fluid, ACT, 1993-97**



Source: LabVISE database, DHFS

### 3.4.2 Rhinovirus (all types)

Rhinoviruses are the most common cause of the common cold and upper respiratory infection. These viruses are transmitted by aerosols and direct contact. Most cases of rhinovirus would be clinically diagnosed hence not reported to the LabVISE system.

There were 11 cases of rhinovirus reported between 1994-97 in the ACT. Viruses were isolated by viral culture techniques. The virus was most commonly isolated from the 0-9 year age group. Most reports were during winter months.

## 3.5 Ortho/paramyxoviruses

### 3.5.1 Influenza

Influenza A virus and influenza B virus are the causative organisms of influenza. Influenza infection occurs annually during the winter months. Surveillance of influenza is important to detect emergence of new strains that need to be incorporated into the new vaccine. Influenza is a continually emerging disease and remains a major threat to public health worldwide. The ongoing antigenic variation of the influenza viruses results in outbreaks of respiratory diseases throughout the world. Influenza outbreaks can lead to high rates of morbidity and excess mortality.

An effective national surveillance system is an essential component of a program for the control of influenza. Components of surveillance in Australia are:

- Laboratory diagnosis and reporting of influenza particularly viral isolation which is the gold standard for influenza diagnosis and antigenic characterisation for vaccine production. This information is routinely reported the LabVISE system. Unfortunately a laboratory diagnosis is sought in a small proportion of cases, so comprehensive data is not available.

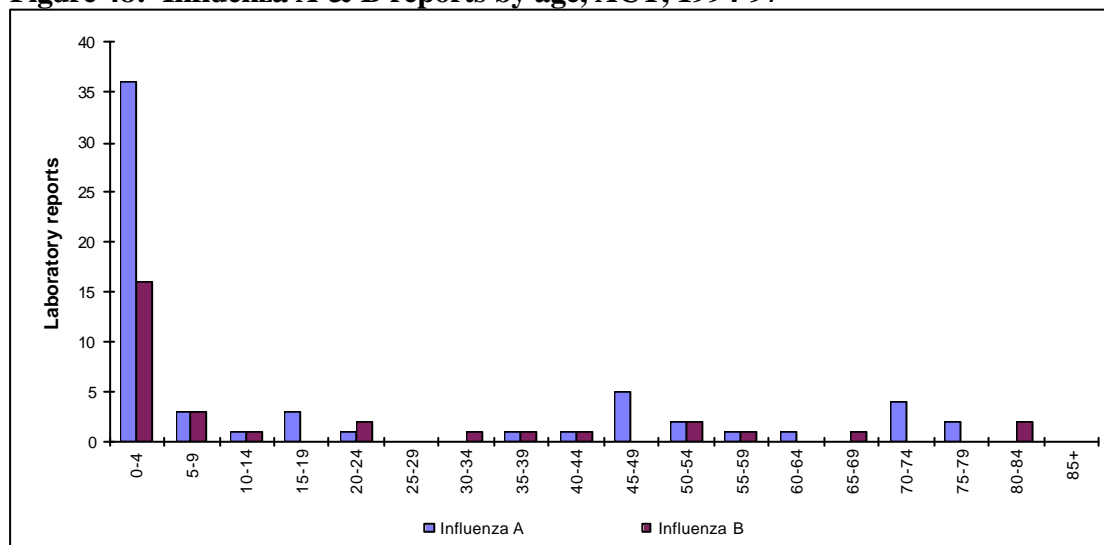
- Surveillance for quantitation of influenza activity includes consultation rates from sentinel general practitioners (ASPREN) and absenteeism data from a national employer, Australian Post. Although this type of data lacks specificity it is useful as a surrogate marker of influenza activity.<sup>23</sup>

Case definition of Australian Sentinel Practice Research Network (ASPREN):

- a) Viral culture or serological evidence of influenza virus infection.  
or  
b) Influenza epidemic, plus four of the criteria in (c),  
or  
c) six of the following:
- sudden onset (within 12 hours)
  - cough
  - rigors or chills
  - fever
  - prostration and weakness
  - myalgia, widespread aches and pains
  - no significant respiratory physical signs other than redness of nasal mucous membranes and throat
  - influenza in close contacts

There were 84 laboratory reports of influenza virus between 1994-97 in the ACT. These consisted of 58 reports of influenza A virus and 26 reports of influenza B virus. The male to female ratio was 1:1.4. Most cases of influenza A and B occurred in the 0-4 year age group.

**Figure 48: Influenza A & B reports by age, ACT, 1994-97**



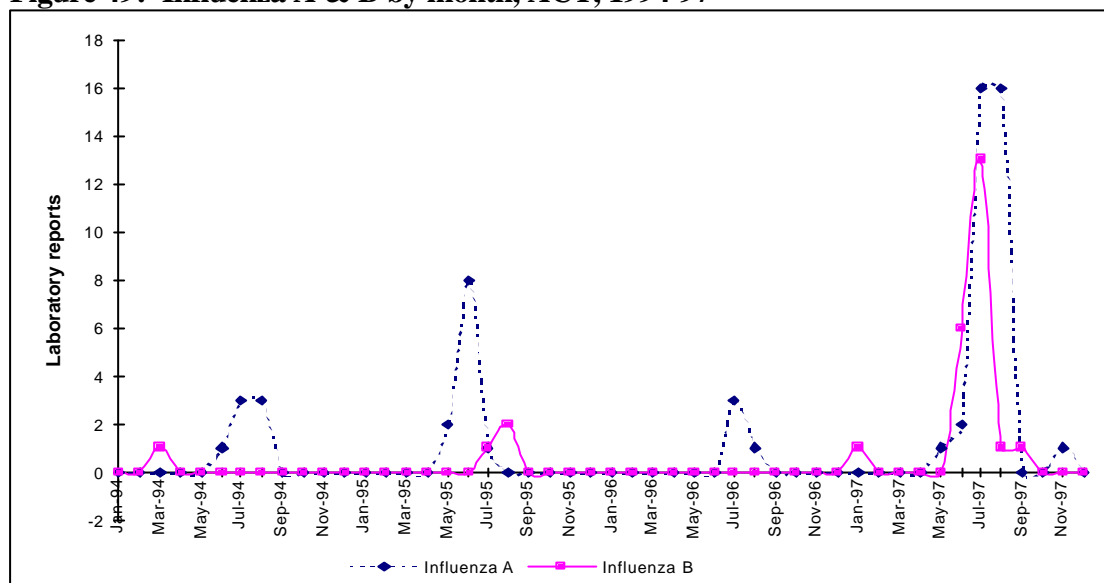
Source: LabVISE database, DHFS

Influenza activity peaks in the winter months. 1997 was a year of high influenza activity in Australia. Influenza B peaked before influenza A.

In Australia two sequential epidemics of influenza were documented in 1997. Following sporadic influenza B activity in the preceeding summer, there was an early outbreak of influenza B. This was followed by a second outbreak due to influenza A (H3N2).

It is interesting to note that outbreaks of influenza B have been recorded in alternate years, the most recent epidemic year being 1995. Although numbers for the ACT are small the Australian trends for influenza A and B were mirrored.

**Figure 49: Influenza A & B by month, ACT, 1994-97**



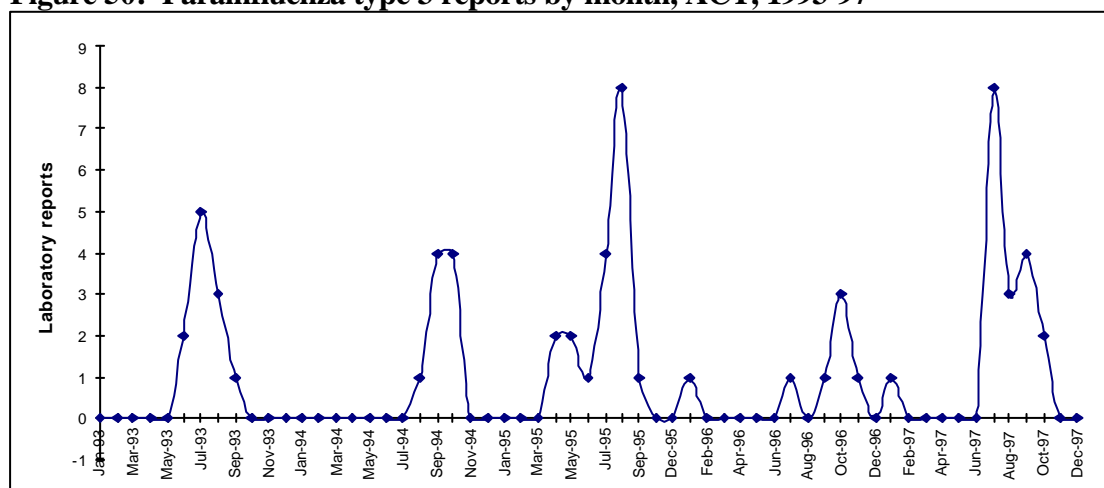
Source: LabVISE database, DHFS

### 3.5.2 Parainfluenza

Parainfluenza causes both upper and lower respiratory infection, primarily in children. Parainfluenza types 1, 2 and 3 are second only to respiratory syncytial virus as important causes of severe lower respiratory infection in infants and young children. They are especially associated with laryngotracheobronchitis (croup). Infections with parainfluenza viruses type 1 and 2 (the major cause of croup) tend to occur in autumn, whereas parainfluenza virus type 3 infections occur throughout the year. Whilst parainfluenza type 1 and 2 cause epidemics of disease, usually in alternating years, parainfluenza type 3 causes epidemics each year.

There were 58 reports of parainfluenza between 1994-97 in the ACT. The male to female ratio was 1:1.1. 92 percent of all parainfluenza virus occurred in the 0-4 years age group. A total of 5 parainfluenza type 1 reports were recorded, most cases occurred during Autumn 1994 (4 reports). One report of of parainfluenza type 2 occurred in Autumn 1995. Thirty seven reports of parainfluenza type 3 were recorded between 1994-97.

**Figure 50: Parainfluenza type 3 reports by month, ACT, 1993-97**

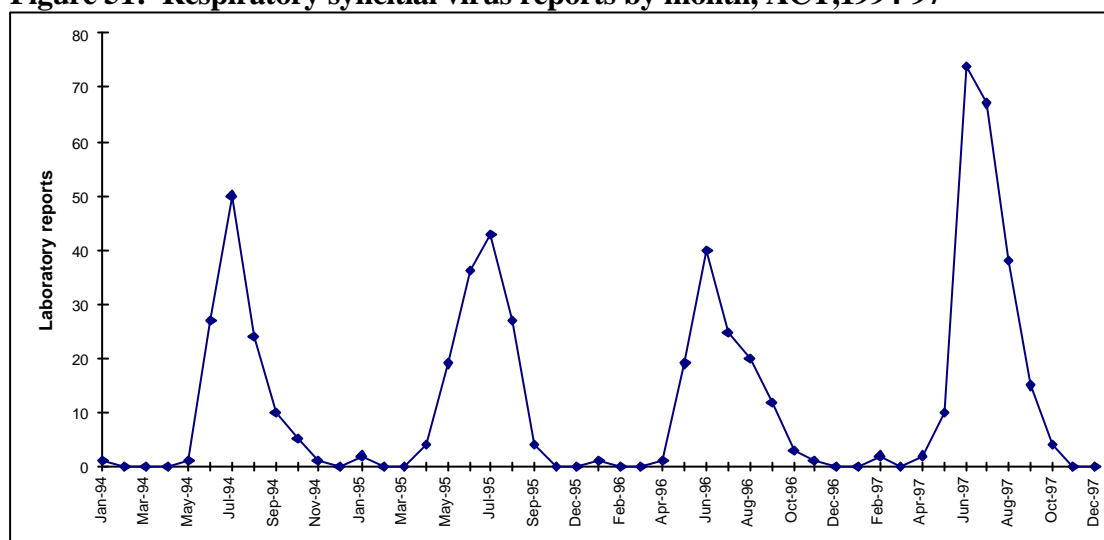


Source: LabVISE database, DHFS

### 3.5.3 Respiratory syncytial virus (RSV)

Respiratory syncytial virus (RSV) is the most frequent cause of fatal acute respiratory infection in infants and young children. The infection is localised to the respiratory tract and can cause illness from common cold to pneumonia. Infections almost always occur in winter. In the ACT, 585 cases of respiratory syncytial virus were reported between 1994-97. 582 reports were in the 0-4 age group. The male to female ratio was 1:1.5. More reports of the virus were received in 1997 than in previous years 1994-96. Activity of the virus peaks in July each year in the ACT.

**Figure 51: Respiratory syncytial virus reports by month, ACT,1994-97**



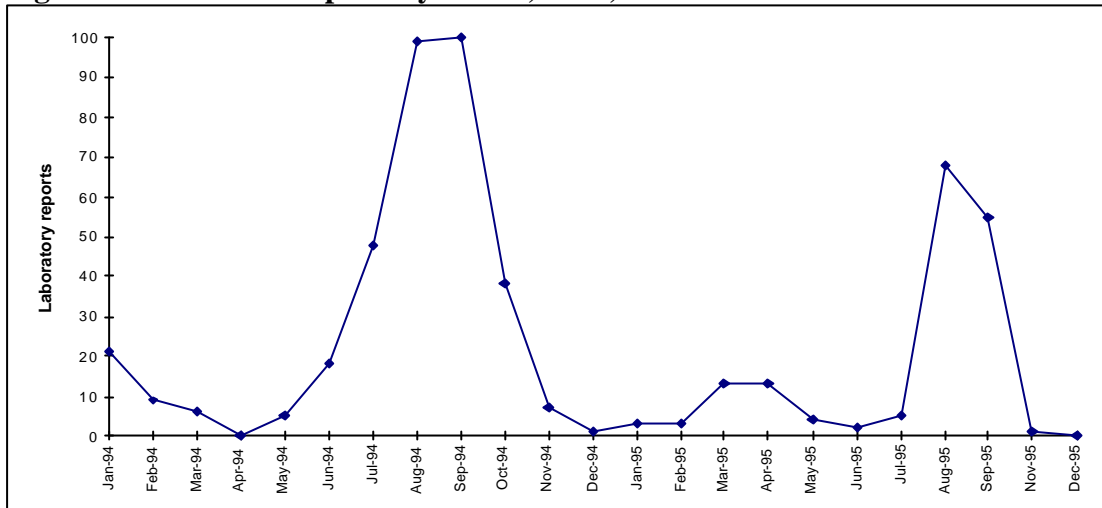
Source: LabVISE database, DHFS

### 3.6 Rotavirus

The rotaviruses are a large group of gastroenteritis causing viruses. They are a common agent of infantile diarrhoea. Children are infected at an early age. The virus is transmitted by the faecal-oral route. Rotavirus survives well on inanimate objects and this contributes to the spread of the virus. The virus has a short incubation period of approximately 48 hours. Outbreaks occur in preschool and day care centres and among hospitalised infants.



**Figure 52: Rotavirus reports by month, ACT, 1994-96**



Source: LabVISE database, DHFS

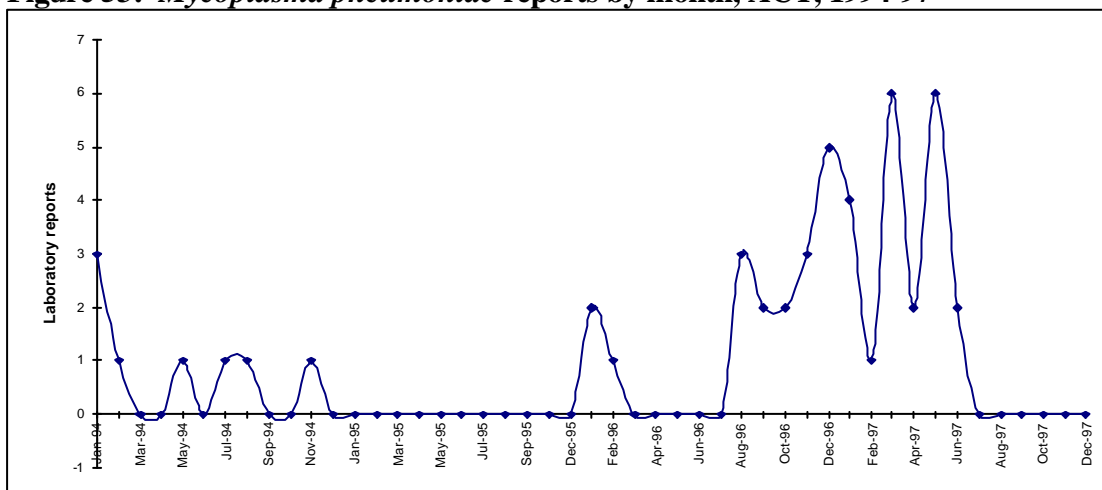
Rotavirus reports show marked seasonality with most reports occurring in the winter months and peaks seen in August. Most infections (91%) were reported in the 0-4 year age group. The male to female ratio was 1.2:1. Reports of rotovirus infection were received in older children and adults, however it is less likely that a laboratory diagnosis would be sought in these patients.

### 3.7 *Mycoplasma pneumoniae*

*Mycoplasma pneumoniae* are the smallest free living bacteria which do not possess a cell wall. This makes them resistant to antimicrobials that attack the cell wall (eg penicillins). Diseases associated are pneumonia, tracheobronchitis and pharyngitis. Pneumonia caused by this organism has been referred to as “primary atypical pneumonia”. Serious disease is principally seen in older children.

There were 47 reports of mycoplasma infection recorded between 1994-97. More males than females were affected (ratio of 1.8:1). Seventy seven percent of these reports were recorded in the later part of 1996 and first half of 1997. Mycoplasma activity tends to peak every 4 years. The last year of increased activity was in 1993.

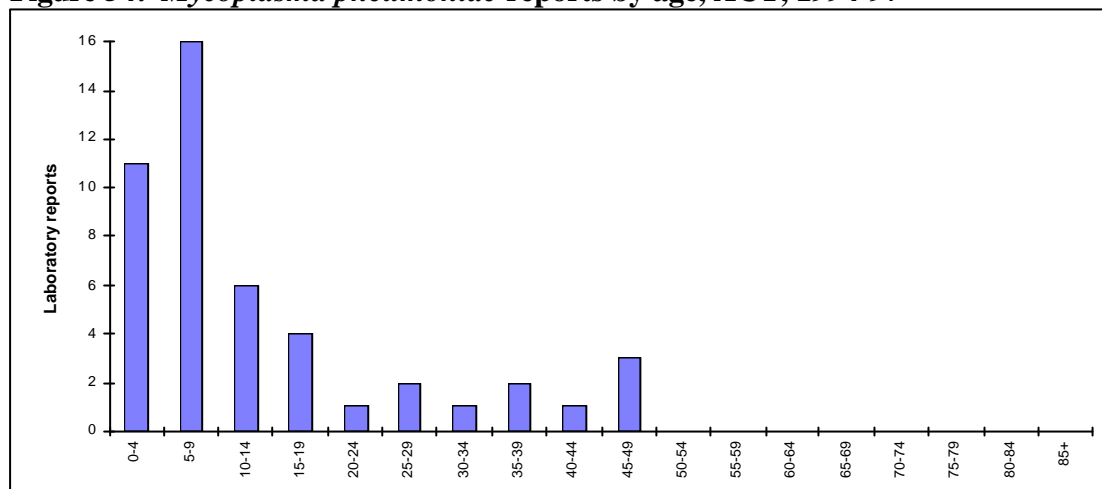
**Figure 53: *Mycoplasma pneumoniae* reports by month, ACT, 1994-97**



Source: LabVISE database, DHFS

Reports of mycoplasmal disease were highest in children in particular, the 5-9 year age group. There were no reports in older adults.

**Figure 54: *Mycoplasma pneumoniae* reports by age, ACT, 1994-97**



Source: LabVISE database, DHFS

### 3.8 Toxoplasmosis

Toxoplasmosis is a parasite which infects humans causing symptoms which resemble infectious mononucleosis in the immunocompetent patient. Humans become infected from two sources, ingestion of improperly cooked meat from animals harbouring the parasite or the ingestion of parasites from cat fecal contamination. Transplacental infection from an infected mother can occur. Acute infection poses the greatest hazard to the infant in utero or the immunocompromised patient.

Two reports were reported in the ACT over the period 1994-97. No risk factors were identified. Both reports were females in the 20-34 year age group.



## Appendix 1: Methodology

### Rates

Rates per 100,000 are calculated as follows:

Rate =  $N/P \cdot 100,000$  (where N = number of events and P = population at risk of experiencing the event).



## Appendix 2: Infectious and notifiable diseases, ACT

### **Infectious and Notifiable Diseases under ACT Public Health Regulations\***

#### **Infectious diseases**

Botulism  
Campylobacteriosis  
Chlamydial disease (not elsewhere classified)  
Cholera  
Cryptosporidiosis  
Diphtheria  
*Haemophilus influenzae* type b infection  
Hepatitis A  
Hepatitis B  
Hepatitis C  
Hepatitis (viral, not elsewhere classified)  
Legionellosis  
Leprosy  
Measles  
Meningococcal infection  
Mumps  
Pertussis  
Plague  
Poliomyelitis  
Rabies  
Rubella  
Salmonellosis (not elsewhere classified)  
Shingellosis  
Tuberculosis  
Typhoid and paratyphoid  
Viral haemorrhagic fever  
Yersiniosis

#### **Notifiable Diseases**

Anthrax  
Arbovirus infection (not elsewhere classified)  
Brucellosis  
Dengue  
HIV (Category 1, 2 or 3)  
HIV (Category 4 - Acquired Immune Deficiency Syndrome)  
Hydatid infection  
Leptospirosis  
Listeriosis  
Malaria  
Psittacosis and other forms of Ornithosis  
Q fever  
Ross River virus Infection  
Tetanus  
Yellow Fever

#### **Sexually Transmitted Diseases**

Chancroid  
Chlamydia  
Donovanosis  
Gonorrhoea  
Lymphogranuloma venereum  
Syphilis

## Glossary

**Antibody** see immunoglobulin

**Antigen** any substance which when injected into animal tissues will stimulate the production of antibodies. In the context of this report, antigens are components of viruses, bacteria, fungi or parasites which are bound by specific antibodies.

**B lymphocyte** type of lymphocyte involved in humoral immunity, the secretion of antibodies.

**Chancres** the primary lesions of Syphilis, occurring at the site of entry of the infection.

**Conjunctivitis (inclusion)** conjunctivitis (inflammation of the conjunctiva) primarily affecting newborn infants, caused by a strain of *Chlamydia tracomatis*.

**Complement fixation** a method of testing for the presence of antibodies in a person's serum in which the antibody/antigen complex binds (fixes) the cytotoxic serum chemical complement and prevents destruction of red blood cells used as a test indicator.

**Coryza** acute inflammation of the mucous membrane of the nasal cavities.

**Encephalitis** inflammation of the brain.

**Enzyme immunoassay** a method of testing for the presence of a specific antigen or antibody which uses, respectively, the correspondingly specific antibody or antigen bound to an enzyme. After the specimen has been allowed to react with the enzyme-bound antigen or antibody, excess free antibody or antigen is washed off and specific antigen-antibody complexes are detected by adding an appropriate chemical which the enzyme breaks down to produce a colour change.

**Erythema** abnormal redness of the skin due to a local congestion of blood, as in inflammation.

**Glaucoma** a disease of the eye, characterised by increased pressure within the eyeball with progressive loss of vision.

**Haemolytic anemia** anemia caused by increased hemolysis of erythrocytes (red blood cells), resulting in a shortening of their life span that the bone marrow (where red blood cells are produced) is unable to compensate for.

**Haemolytic uraemic syndrome (HUS)** syndrome characterised by anaemia and kidney failure, which is frequently chronic, and occasionally intracerebral injury, often caused by infection with shiga toxin (ST) producing bacteria.

**Hypertonia** abnormally increased tonicity (tone) of the skeletal muscles or the walls of arteries.

**Immunoglobulins** proteins, also called antibodies, found in human serum which normally function as part of the immune system by binding foreign antigens. Human immunoglobulin includes 4 classes: IgM (produced especially early in infection), IgG (produced later during infection and on re-infection), IgA (specifically produced for protection against infection at mucous membranes) and IgE (frequently produced in infections with parasites).

**Incidence** (of a disease) the number of new cases of the disease occurring during a certain time period.

**Jaundice** a condition due to the presence of increased amounts of bile pigments in the blood, characterised by yellowness of the skin and the whites of the eyes.

**Lymphadenopathy** a chronic swelling of the lymph nodes.

**Mononucleosis** excess of mononuclear leukocytes in the blood.

**Myocarditis** inflammation of the myocardium, the muscular substance of the heart.

**Orchitis** inflammation of the testicle.

**Otitis media** inflammation of the middle ear.

**Parasite** a plant or animal that lives upon or within another living organism at whose expense it gains some advantage.

**Pathogen** a disease-producing organism, including viruses, bacteria, fungi and parasites.

**PCR** polymerase chain reaction.

**Perinatal** relating to the period shortly before and after birth.

**Prevalence** the total number of cases of a disease in a given population at a certain time.

**Protozoa** the phylum of unicellular animals.

**Pseudo membrane** false membrane.

**Septicaemia** the invasion and persistence of pathogenic bacteria in the bloodstream.

**Serology** a method of diagnosing an infection by demonstrating the presence of, and/or an increasing amount over time of, antibodies in a person's serum which bind to a specific pathogen. An increase in this amount over time is conventionally demonstrated by showing antibody activity in more diluted serum collected 2 weeks after and initial *acute* specimen.

**Serotyping** a method of subtyping microbial species in outbreaks by detecting subtype specific antigens on these bacteria using antibodies of known affinity from laboratory animal sera.

**Shiga toxin (ST)** protein produced by various bacteria, including *Shigella dysenteriae* 1 and enterohaemorrhagic *Escherichia coli* (EHEC), infection with which may result in bloody diarrhoea.

**Statistical local area (SLA)** spatial divisions defined by the Australian Bureau of Statistics (ABS).

**Subacute sclerosing panencephalitis** diffuse inflammation of the brain, mainly in children, which is linked to slow infection with measles virus.

**Thrombotic thrombocytopenic purpura (TTP)** syndrome characterised by anaemia and kidney failure (frequently chronic) and occasionally intracerebral and pancreatic injury, often caused by infection with shiga toxin (ST) producing bacteria.

**Titre** in this context a dilution of serum. In serology the patient serum is diluted serially twofold (ie 1 in 2, 1 in 4, 1 in 8 etc.) and antibody is said to be present or absent at a titre, for example, of 1 in 2. A fourfold rise in titre, ie antibody activity persisting in convalescent serum at dilutions more than two-fold higher than in the acute serum, is usually considered diagnostic of recent infection.

**Toxin** component of a pathogen that produces damage to human or other animal tissue, often employed as the starting material for immunising agents: see toxoid.

**Toxoid** an altered toxin which, without inducing tissue damage, produces an antibody response in a human or animal which protects against the effects of the unaltered toxin.

**Tuberculin** see purified protein derivative (PPD).

**Vector** an insect or other organism transmitting pathogens.

**Viraemic** having a virus present in the bloodstream.



## References

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- <sup>21</sup> *Surveillance case definitions*, NHMRC, 1994
- <sup>22</sup> *Communicable Diseases Surveillance*, CDI, Vol.21:No1, 1997
- <sup>23</sup> *National Influenza Surveillance*, 1997, Vol.22No.5, CDI

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## Health Series Publications

The Epidemiology Unit of the Department of Health and Community Care has developed an on-going health series of publications to inform health professionals, policy developers and the community on health status in the Territory. Information contained therein will assist in the development of appropriate policy and service delivery models, the evaluation of programs, and an understanding of how the ACT compares with Australia as a whole with regard health status.

- Number 1: *ACT's Health: A report on the health status of ACT residents*  
Carol Gilbert, Ursula White, October 1995
- Number 2: *The Epidemiology of Injury in the ACT*  
Carol Gilbert, Chris Gordon, February 1996
- Number 3: *Cancer in the Australian Capital Territory 1983-1992*  
Norma Briscoe, April 1996
- Number 4: *The Epidemiology of Asthma in the ACT*  
Carol Gilbert, April 1996
- Number 5: *The Epidemiology of Diabetes Mellitus in the ACT*  
Carol Gilbert, Chris Gordon, July 1996
- Number 6: *Developing a Strategic Plan for Cancer Services in the ACT*  
Kate Burns, June 1996 (Out of print)
- Number 7: *The First Year of The Care Continuum and Health Outcomes Project*  
Bruce Shadbolt, June 1996
- Number 8: *The Epidemiology of Cardiovascular Disease in the ACT*  
Carol Gilbert, Ursula White, January 1997
- Number 9: *Health Related Quality of Life in the ACT: 1994-95*  
Darren Gannon, Chris Gordon, Brian Egloff, Bruce Shadbolt, February 1997
- Number 10: *Disability and Ageing in the ACT: An Epidemiological Review*  
Carol Gilbert, April 1997
- Number 11: *Mental Health in the ACT*  
Ursula White, Carol Gilbert, May 1997
- Number 12: *Aboriginal and Torres Strait Islander Health in the ACT*  
Norma Briscoe, Josie McConnell, Michelle Petersen, July 1997
- Number 13: *Health Indicators in the ACT: Measures of health status and health services in the ACT*  
Carol Kee (Gilbert), George Johansen, Ursula White, Josie McConnell, January 1998
- Number 14: *Health status of the ACT by statistical sub-divisions*  
April 1998
- Number 15: *Results from the 1996 ACT Secondary School Students' Survey*  
Hai Phung, George Bodilsen, Allison Webb, Norma Briscoe, June 1998
- Number 16: *Childhood Immunisation & Preventable Diseases in the ACT 1993-97*  
Hai Phung, Michelle Petersen, June 1998
- Number 17: *Health Related Quality of Life in the ACT 1994-97*  
Hai Phung, Ursula White, Brian Egloff, June 1998
- Number 18: *Maternal and Perinatal Status in the ACT*  
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Carol Kee, Michelle Petersen, Kate Rockpool, October 1998
- Number 20: *Young People in the ACT*  
Linda Halliday, Josie McConnell, October 1998
- Number 21: *Communicable Diseases in the ACT*  
Linda Halliday, Michelle Petersen, November 1998

