NOTIFIABLE DISEASES SURVEILLANCE, 1917 TO 1991

(Robert Hall, AIDS/Communicable Diseases Branch, Department of Health, Housing, Local Government and Community Services, Canberra)

Notifiable diseases data are collected by States and Territories under their public health legislation. This legislation has required medical practitioners, and some other classes of people, to notify health authorities of certain notifiable and other diseases. These data have been collected on a national basis since 1917. For the years 1917 to 1922 national data were published in the Medical Journal of Australia. From 1924 until the Second World War the data were published in Health, the journal of the former Commonwealth Department of Health. After the war the Commonwealth Year Book published the data and this has continued to the present. Additionally, the Commonwealth Department of Health and its successors have published an annual compilation of notifiable diseases data in the Department’s Annual Report. These sources have been used to prepare an historical overview of notifiable diseases in Australia from 1917 to 1991.

A total of 157 different categories were used to collect notifiable diseases data during the period 1917 to 1991. Several of these are no longer recognised as independent nosological entities. For example ‘encephalitis lethargica’ and ‘coastal fever’ are not now used as diagnostic categories. Several of the categories represent stages in the evolution of diagnostic techniques to identify the same diseases. For example ‘homologous serum jaundice’ has evolved through ‘serum hepatitis’ to ‘hepatitis B’, and ‘low fever’ has evolved through ‘enteric fever’ to ‘typhoid’. Accordingly, data presented here have been recoded to modern categories (Table 1).

For some diseases, case definitions have changed markedly. ‘Arbovirus infection’ has included the categories ‘Ross River virus infection’ and ‘dengue’ (and still includes these categories in some States and Territories).

‘Dysentery’ included ‘bacillary dysentery’ and ‘amoebic dysentery’ until 1945. ‘Gonococcal infection’ as presented here includes both gonorrhoea and other forms of gonococcal infection.

Not all of these categories have been uniformly notifiable in all States and Territories. Tuberculosis, for example, was notifiable only in its pulmonary form in some years and in some States and Territories, and was notifiable only in the metropolitan, Blue Mountains and Hunter areas of New South Wales in the 1920s. Frequently, diseases were notifiable only in endemic or epidemic areas. For example, from the 1920s to the Second World War, dengue was notifiable only in Western Australia and the Northern Territory. Artefactual overestimates of the rate of notification of some diseases will follow from this. Furthermore, data on some diseases have been collected by States and Territories but have not been compiled nationally. Data presented here are only for those diseases for which national compilations have been published. The Australian Capital Territory was known as the Federal Capital Territory from 1928 to 1937 and the Northern Territory as North Australia from 1931 to 1933.

The results presented here are adjusted rates of notification per 100,000 population per year. Population data estimates are those of the Australian Bureau of Statistics for each State and Territory as at mid-year for the years 1917 to 1991. Rate adjustment was performed by defining the denominator populations at risk as the total populations of those States and Territories where the disease was notifiable. They are crude rates and are not age-standardised nor adjusted for sex.

In 1963, the period under surveillance was changed from the calendar to financial year, and data for 1963 are only available for the period January to June. The

---

Table 1. Reclassification of categories used for notifiable diseases

<table>
<thead>
<tr>
<th>Modern category</th>
<th>Previous categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brucellosis</td>
<td>Malta fever, undulant fever</td>
</tr>
<tr>
<td>Donovanosis</td>
<td>Granuloma, granuloma inguinale, granuloma pudendi</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>Infectious hepatitis, infective hepatitis</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Homologous serum jaundice, serum hepatitis</td>
</tr>
<tr>
<td>Legionellosis</td>
<td>Legionnaires’ disease</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>Weil’s disease</td>
</tr>
<tr>
<td>Measles</td>
<td>Morbilli</td>
</tr>
<tr>
<td>Perussis</td>
<td>Whooping cough</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>Acute anterior poliomyelitis</td>
</tr>
<tr>
<td>Rheumatic fever</td>
<td>Acute rheumatism</td>
</tr>
<tr>
<td>Scarlet fever</td>
<td>Scarlatina</td>
</tr>
<tr>
<td>Shigellosis</td>
<td>Bacillary dysentery</td>
</tr>
<tr>
<td>Typhoid</td>
<td>Low fever, continued fever, enteric fever, typhoid fever</td>
</tr>
</tbody>
</table>
numbers of notifications for 1963 have been doubled to calculate adjusted rates for the whole year. Denominator populations for the financial years are the mid-year population estimates for the year at the start of the financial year. In 1970 the reporting period reverted to the calendar year.

Data are missing for the years 1941, 1943 and 1952 and do not appear to have been published. Data for the Northern Territory for 1942 to 1946 were suppressed. Subject to the artefacts and uncertainties described above these results represent best estimates of Australian rates of notifiable diseases.

Over the 75 years 1917 to 1991 a total of 2,200,194 notifications was received by the routine disease notification system and compiled nationally. The peak number in any one year was 120,023 in 1919 with 89,941 notifications of influenza in that year. Recently there has been an increase in notifications (Figure 1).

Figure 1. Total notifications of notifiable diseases, Australia, 1917-1991

Vaccine preventable diseases

Diphtheria

Diphtheria has been notifiable in all States and Territories since the turn of the century and notifications have been nationally collated continuously since 1917. A peak incidence of reported diphtheria was reached in 1921 with 23,199 notifications for a notification rate of 425.5 per 100,000 population in that year. From 1936 there was a dramatic fall in the rate of notification to 0.006 per 100,000 in 1989 (Figure 2). Immunisation against diphtheria was introduced in the 1920s but was first only given to contacts of cases. In the early 1930s it was incorporated into school immunisation but widespread use occurred only from the 1940s. Diphtheria-tetanus-pertussis combined vaccine was introduced in 1953.

Measles

Measles became notifiable in South Australia in 1909, the Federal Capital Territory in 1929, North Australia in 1931 and Western Australia in 1940.Notifications were compiled nationally until 1948. Measles notifications were not reintroduced until the National Campaign Against Measles in the mid-1980s. During the period 1920 to 1949 there wide swings in the incidence of notified disease with a peak annual rate of 2,741.9 notifications per 100,000 in 1925 (14,804 notifications). This wide fluctuation in incidence is characteristic of measles in unimmunised populations. There was a dramatic decrease in the incidence of notified measles with 1.4 cases per 100,000 in 1989 and 8.0 per 100,000 in 1991. Measles vaccine was introduced in 1969 but it has taken many years to raise the immunisation level to even 80%.

Figure 3. Annual adjusted rate of notifications of measles, Australia, 1917-1991

Mumps

Mumps was notifiable in South Australia from 1932 to 1937. The rate of notified mumps rose to a peak of 396.5 per 100,000 in 1934.
Pertussis

Pertussis was first notifiable in South Australia in 1909 and in the Territories from the early 1930s. National compilation of pertussis notifications ceased in 1949 and did not recommence until 1979. There was a dramatic fall in notified incidence from a peak of 767.3 per 100,000 population in 1930 to 1.1 per 100,000 in 1988 (Figure 3). Cumpston noted a 3 or 4 year periodicity in pertussis mortality and this cyclic behaviour is also shown in the rate of notifications, where a period of 3-5 years is evident from peak to peak from 1917 to 1948 and again from 1979 to 1991. Pertussis immunisation was first used in the 1920s on an individual basis. Mass immunisation with pertussis vaccine did not start until the 1940s. Diphtheria-tetanus-pertussis vaccine was introduced in 1953. Current immunisation levels are still not adequate to abolish the cyclic behaviour of the disease and pertussis epidemics still occur with a 3-5 year periodicity, the last major episode being in 1989-90.

Rubella

Rubella was first notifiable in the ACT in 1942 and data were nationally collected until 1978. National collation was reintroduced in 1991. There was an epidemic in the ACT in 1943 with 93 cases to give an adjusted national rate of 653.9 per 100,000. In 1977 the national rate of 1.9 per 100,000 population was based on data from five States and Territories. Rubella vaccine was introduced in 1970 and has been given to girls usually at around the age of 12 years. The rubella control strategy was modified in 1989 with the adoption of combined measles-mumps-rubella (MMR) immunisation for all infants, and a second dose of MMR (for all children at age 10 to 16 years) was recommended in 1992.

Tetanus

Tetanus was first notifiable in Victoria in late 1921, in Western Australia from 1926 to 1931 and increasingly in States and Territories since the Second World War. The rate of notified tetanus reached a peak of 1.8 per 100,000 population in 1946. A steep decline in the rate of notified tetanus occurred between 1952 and the mid-1970s when the rate of notification levelled out at 0.03 to 0.1 per 100,000 population per year (Figure 6). Tetan...
nus immunisation commenced in the 1930s but was not widespread until combined diphtheria-tetanus-pertussis vaccine was introduced in 1953.

**Mycobacterioses**

**Leprosy**

Although leprosy had been notifiable in the colonies in the 1880s and 1890s, national compilation of leprosy notifications did not start until 1925. The peak incidence of notified leprosy was in 1944 at 1.5 cases per 100,000 population, and this declined steadily to 0.04 notifications per 100,000 in 1991 (Figure 7).

**Figure 7. Annual adjusted rate of notifications of leprosy, Australia, 1917-1991**

**Tuberculosis**

Tuberculosis became notifiable in all States just after the turn of century and data are available from 1917. However, in the period 1917 to 1922, only pulmonary tuberculosis was notifiable, and between 1917 and 1928 the disease was only notifiable in some parts of New South Wales (in Metropolitan, Blue Mountains and Hunter Sanitary Districts). This geographical restriction has been ignored in the calculation of notification rates. In addition to the national collation of notifiable diseases data there has been a separate tuberculosis surveillance system since 1948. The tuberculosis system has higher case ascertainment and higher rates, and data have been described by Cheah.

**Figure 8. Annual adjusted rate of notifications of tuberculosis, Australia, 1917-1991**

**Enteric infections**

**Campylobacteriosis**

Campylobacteriosis first became notifiable in South Australia in 1980. It has probably been markedly under-notified, but there was an increase in the rate of notifications from a low of 5.1 per 100,000 population in 1981 to 50.1 per 100,000 in 1991 (Figure 9).

**Figure 9. Annual adjusted rate of notifications of campylobacteriosis, Australia, 1917-1991**

**Cholera**

There was a total of 61 notified cases of cholera between 1917 and 1991. Forty-one of these cases occurred in 1972, when the rate of notifications was 0.3 per 100,000.

**Infantile diarrhoea**

Infantile diarrhoea was a notifiable disease between 1949 and 1978. Over that period the notification rate varied between 5.9 per 100,000 population of all ages in 1969-70, and 23.8 per 100,000 in 1975. Despite these fluctuations there was no apparent change in the underlying rate.

**Dysentery**

Dysentery was notifiable in several States and Territories and notification data were nationally compiled between 1917 and 1948. The category almost certainly captured several different modern nosological entities.
such as ‘amoebic dysentery’, ‘shigellosis’ and ‘typhoid’. Cumpston, writing in 1927, found it impossible, with the information now available, to form any precise opinion as to the nature of the condition known as dysentery. The notification rate fluctuated between 0.15 per 100,000 population in 1917 and 5.70 per 100,000 in 1947, with a peak of 4.5 per 100,000 also reported in 1932. Nationally compiled data for amoebic dysentery are available only for 1945, 1946, 1949 and 1950, during which period the annual notification rate averaged 1.1 per 100,000 population.

Paratyphoid

Paratyphoid notification data were compiled nationally under a separate category in 1920 and between 1949 and 1978. The notification rate peaked at 0.22 per 100,000 population in 1956, spiked in 1963 (42 cases notified in the first six months of that year), and then fell to 0.06 in 1978 (Figure 10).

Salmonellosis

Salmonellosis was first notifiable in Western Australia in 1949 and finally became notifiable in all States and Territories in 1976. There were 2.06 notifications per 100,000 population in 1949 and this increased 15-fold to 31.45 per 100,000 in 1991 (Figure 11).

Shigellosis

Shigellosis notifications were first nationally collated in 1945 under the category ‘bacillary dysentery’ and in 1979 as ‘shigella infections’. In 1991 the category ‘shigellosis’ was adopted. No clear trend is apparent over this period, and there have been major fluctuations in notified incidence, the highest rate being 11.8 per 100,000 population in 1972, the lowest 2.70 per 100,000 in 1984 (Figure 12).

Typhoid

The category ‘typhoid’ includes the categories ‘continued fever’, ‘enteric fever’ and ‘low fever’. Low and continued fevers were derived from the Nosological Index adopted by the colony of Victoria in 1863 and were notifiable in several States and nationally collated between 1917 and 1922. Cumpston regarded both of these as being mostly typhoid. The rate of notification of typhoid so categorised fell exponentially between 1917, when the notification rate was 55.5 per 100,000 population, and 1975 when it was 0.10 per 100,000. The notified incidence of typhoid rose fivefold between 1975 and 1991 to 0.51 notifications per 100,000 population in 1991 (Figure 13).
Sexually transmissible diseases

Gonococcal infection

The category 'gonococcal infection' includes gonorrhoea and other forms of gonococcal infections. The vast majority of these are gonorrhoea. Between 1916 and 1920, after a report of the Commonwealth Invalidity Committee, legislation was passed in five States requiring the notification of sexually transmissible diseases on an anonymous basis. Regular publication of nationally collated gonococcal infection notifications commenced in 1922 and ceased in 1929, recommencing in 1968-69. Some data are available for the period 1917 to 1921. The peak rate of notified gonococcal infection occurred in 1917 with 314.7 notifications per 100,000 in that year, falling to 183.2 per 100,000 in 1928. More recently, there was a peak, at 91.6 notifications per 100,000 population, in 1974. From 1982 there was a steep decrease in the notification rate from 84.4 per 100,000 in that year to 11.3 per 100,000 in 1990. Over that period the rate of decrease was between 14% and 40% per year. However, there was a reversal of this trend in 1991 with a 30% increase to 14.6 notifications per 100,000 (Figure 14).

Syphilis

Syphilis notifications are available for the periods between 1917 and 1929 and 1968-69 to 1991. The peak notification rate was in 1920 at 173.1 per 100,000. Since 1968 peak rates were in 1978 (23.1 notifications per 100,000 population) and 1983 (23.1 per 100,000). From 1986, there was a substantial decline of between 5% and 50% per year to 1990, when the incidence was 9.6 notifications per 100,000 population. In 1991 there was a 23% increase to 11.9 notifications per 100,000 (Figure 15).

Other sexually transmissible diseases

Data for other sexually transmissible diseases show no uniform pattern. Data are available for donovoniasis for the period 1917 to 1925 and for chancreoid, donovoniasis and non-specific urethritis from 1978. The incidence of notified chancreoid has fallen from 0.26 per 100,000 population in 1979 to 0 in 1991. Donovoniasis incidence has shown no trend, fluctuating between 0.74 and 2.1 notifications per 100,000 population per year in the period 1979 to 1991. The incidence of notified non-specific urethritis fell from a peak of 100.5 cases per 100,000 population in 1982 to 16.9 per 100,000 when national collation of notifications of this disease ceased in 1990.
Hepatitis A

Hepatitis A was first notifiable in four States and Territories in 1952. By 1961 the notified rate of this disease had reached 122.6 per 100,000 population. Between 1969-70 and 1990, there was a 21-fold decrease from 63.7 notifications per 100,000 to 3.1 per 100,000, followed by a fourfold rise in incidence in 1991 to 12.7 per 100,000 (Figure 16). Much of the incidence reported in 1991 was associated with homosexual men.

Figure 16. Annual adjusted rate of notifications of hepatitis A, Australia, 1917-1991

Hepatitis B

Hepatitis B first became notifiable (as 'homologous serum jaundice') in Victoria in 1952. There was a sharp increase from 0.66 notifications per 100,000 in 1971 to 21.1 per 100,000 in 1991 (Figure 17). However, these reports are likely to be mainly of prevalent cases and the true significance of this increase is not clear.

Figure 17. Annual adjusted rate of notifications of hepatitis B, Australia, 1917-1991

Hepatitis (not elsewhere classified)

'Hepatitis not otherwise specified' has recently comprised mostly hepatitis C in those States or Territories where hepatitis C was not notifiable as a separate category. There was no clear trend between 1979 (when data first became available) and 1991, apart from a sharp increase in 1990 due to the recognition of hepatitis C as a separate clinical and pathological entity.

Vector-borne diseases

Arbovirus infection (not elsewhere classified)

A category for 'arbovirus infection' was included in the reports from 1971 when the infection was notifiable in all States and Territories except Queensland. The category in some jurisdictions includes 'Ross River virus infection' and in some 'dengue'. In 1971 no notifications were received but in 1989 a peak of 16.7 notifications per 100,000 was reached (Figure 18).

Figure 18. Annual adjusted rate of notifications of arbovirus infection, Australia, 1917-1991

Dengue

Dengue has generally been notifiable in States or Territories with a higher prevalence of disease. Data are available for Western Australia for the periods 1919 to 1930 and 1947 to 1968-69, North Australia/Northern Territory 1932 to 1968-69 and several States 1952 to 1968-69. The category was reintroduced for national data collection from 1991. In 1939 the incidence of notified dengue reached a peak of 9,325.7 cases per 100,000 population (a figure based on 585 notifications from the Northern Territory, where the denominator population recorded at the time excluded aborigines).
Malaria

Malaria has been notifiable in most States and Territories, and the notifications have been nationally collated since 1917. Peak incidences of notified malaria were recorded in 1919, 1954 and 1946. In 1946, 5,496 notifications were received for a national malaria notification rate of 12.15 per 100,000 population (Figure 20). This major peak was recorded at the time as being due to cases in returned servicemen after the Second World War.

From 1952 there was a marked increase in the rate of notified malaria to 5.2 cases per 100,000 population in 1990 (Figure 21). It should be noted that case ascertainment of malaria in the routine surveillance of notifiable diseases is incomplete. The Australian Malaria Register reported 939 cases for 1991 compared with 790 cases in the National Notifiable Diseases Surveillance System.

Zoonoses

Anthrax

Anthrax was notifiable and data were nationally compiled between 1917 and 1990. It was notified at very low rates only, generally less than 0.08 notifications per 100,000 population per year.

Brucellosis

Brucellosis has been notifiable since 1937. The notification rate climbed steadily thereafter to reach a peak of 1.13 notifications per 100,000 in 1969-70. Since then the rate has declined, with a small peak of 0.27 per 100,000 in 1990 (Figure 22).
Leptospirosis

Leptospirosis notifications have been nationally compiled since 1934, but the disease was notifiable only in Queensland until 1952, when the notification rate was 4.0 per 100,000 population. The notified incidence fell until 1978, when the notification rate was 0.26 per 100,000. From 1978 there was an increase in the rate of notifications with 0.98 notifications per 100,000 reported in 1991 (Figure 23).

Figure 23. Annual adjusted rate of notifications of leptospirosis, Australia, 1917-1991

Other infections

Erysipelas

Erysipelas was notifiable from the turn of the century and data were nationally compiled from 1917 until 1948. The notification rate remained fairly constant with a background rate of between 15 and 20 per 100,000 population per year until the Second World War when the rate fell (Figure 25). The last recorded rate was 8.46 per 100,000 in 1948.

Figure 25. Annual adjusted rate of notifications of erysipelas, Australia, 1917-1991

Q fever

Q fever notification data have been collected since 1952. Peaks in the incidence of notifications occurred in 1958 (3.48 per 100,000 population) and 1965-66 (17.9 per 100,000). There was a 132% increase in the notification rate from 1983 (1.48 per 100,000) to 1991 (3.44 per 100,000) (Figure 24). A vaccine against Q fever was introduced in 1989.

Figure 24. Annual adjusted rate of notifications of Q fever, Australia, 1917-1991

Legionellosis

Legionellosis was first notifiable in 1979. There was a dramatic increase in the notification rate, with 0.64 cases per 100,000 population notified in 1991 (Figure 26).

Figure 26. Annual adjusted rate of notifications of legionellosis, Australia, 1917-1991
Meningitis, meningococcal infection

Meningitis was notifiable first in South Australia in 1902, and was notifiable in all States by 1915\(^5\). Notifications were collected under the category 'meningitis' from 1917 to 1948. The category 'meningococcal infection' was introduced in 1949 and retained until 1967-68, and reintroduced in 1979. The data presented here are from both sources, assuming meningitis before 1949 to have been due to Neisseria meningitidis. There was a marked peak of 33.1 notifications per 100,000 in 1942 (2,371 notifications were received from all States and Territories in that year), followed by a slow decline after the Second World War. From 1986 there was a fourfold increase in the rate of notifications from 0.33 per 100,000 population in that year to 1.73 per 100,000 in 1990 (Figure 27).

Puerperal fever

Figure 27. Annual adjusted rate of notifications of meningitis and meningococcal infection\(^1\), Australia, 1917-1991

Chorea

Chorea was separately notifiable from 1952 to 1967-68 and showed a decline, parallel to that for rheumatic fever, from 0.73 notifications per 100,000 in 1954 to 0.02 per 100,000 in 1967-68 (Figure 30).

Rheumatic fever

Rheumatic fever notifications were reported for the period 1952 to 1978. Over this period there was a 22-fold fall in the notified incidence from 6.38 per 100,000 population in 1955 to 0.27 per 100,000 in 1978 (Figure 29).
Scarlet fever

Scarlet fever notification data were collected from 1899 and are available for the period 1917 to 1978. Before the Second World War, the notification rate fluctuated between 100 and 200 per 100,000 population per year. From 1944 (when the notification rate was 222.5 per 100,000) there was an exponential fall in the rate of notifications to 1.24 per 100,000 in 1978.

Figure 31. Annual adjusted rate of notifications of scarlet fever, Australia, 1917-1991

Influenza

Influenza was made notifiable in all States during the epidemic in 1919. In that year, 89,941 notifications of influenza were received, the highest number for any notifiable disease in any year since 1917. The rate of notification was 1,733.2 per 100,000 population. A smaller epidemic was recorded in 1934 with 230.0 notifications per 100,000 population. Influenza was made notifiable again in South Australia in August 1957. A total of 1,199 notifications was received that year for an uncorrected (for the fact that notifications were received for 4 months only) notification rate of 137.2 per 100,000 population. In 1959, the rate was 126.3 per 100,000.

Data availability

Data presented in this article are available as an Excel spreadsheet file. The file contains numbers of notifications for each of the recorded categories by State and Territory and by year, Australian Bureau of Statistics mid-year population estimates by State and Territory and by year, national notification rates by recorded category by year and recording rules. A copy (either 3½ or 5¼ inch disk) may be obtained from:

AIDS/Communicable Diseases Branch
Department of Health, Housing, Local Government and Community Services
GPO Box 9848
CANBERRA CITY ACT 2601.

It is intended to make these data available on the CDI Bulletin Board in the near future.

Acknowledgement

I wish to thank Michelle Wood, Marlene Keir, Lenore Cupitt and Michelle Jozing for the large quantity of data entry.

References