LIFE AND DEATH

Waverley cemetery, Sydney. Photograph by Kevin Diletti, 1983.

THE LIFE EXPECTANCY of girls born in the 1980s is 77.9 years, for boys 70.8 years. Excluding Aborigines, Australians are among the healthiest people in the world, having benefited from improvements in nutrition, shelter, working conditions, medicine and hygiene over the last 150 years. This chapter reviews selected aspects of the changing incidence of disease and the provision of basic hospital services. It examines outbreaks of disease that at times have provoked near-panic: smallpox, bubonic plague, pneumonic influenza and poliomyelitis. Today, along with the great killer diseases of former times (such as gastroenteritis, scarlet fever, diphtheria and tuberculosis), they cause but a tiny proportion of deaths. These days degenerative diseases and cancers have replaced them as major causes of mortality.

New causes of death now claim victims among young adults, not least motor vehicle accidents. Australia's record in traffic trauma, which accounts for about 3500 deaths each year, is among the worst in the world.

Colonial mortality rates

FOR THOSE WHO set out in the early fleets, the chances of a long and healthy life were limited. Not only did they face death from the diseases which easily claimed victims at the end of the eighteenth century, they also faced the hardships of life in a harsh and often brutal colony, which was threatened for many years by starvation.

Although mortality and survival rates differed from fleet to fleet, all fleets shared the diseases associated with poor hygiene and malnutrition; dysentery and scurvy were commonplace. Most of the first fleeters managed to survive these diseases; eighteen months after leaving England, 90 per cent were still alive. In contrast, the experience of those on the second fleet can only be described as terrible. About 25 per cent of those who embarked died on the voyage to New South Wales. Typhus and typhoid, scurvy and dysentery took a heavy toll. Within a year of their arrival, half of those who had left England were dead.
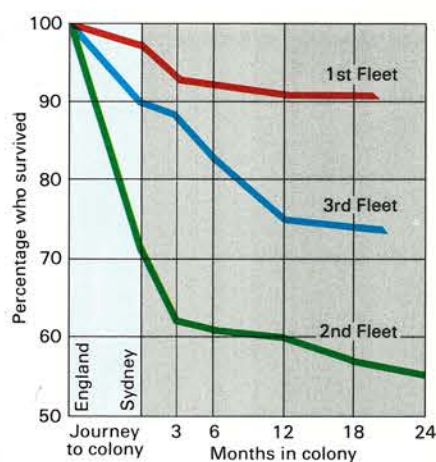
Smallpox and quarantine
Smallpox was first detected among Europeans in Australia in 1788. It affected not only the new settlers but, more significantly, the Aborigines. The disease had spread rapidly among eastern Australian Aborigines by the end of the 1830s.
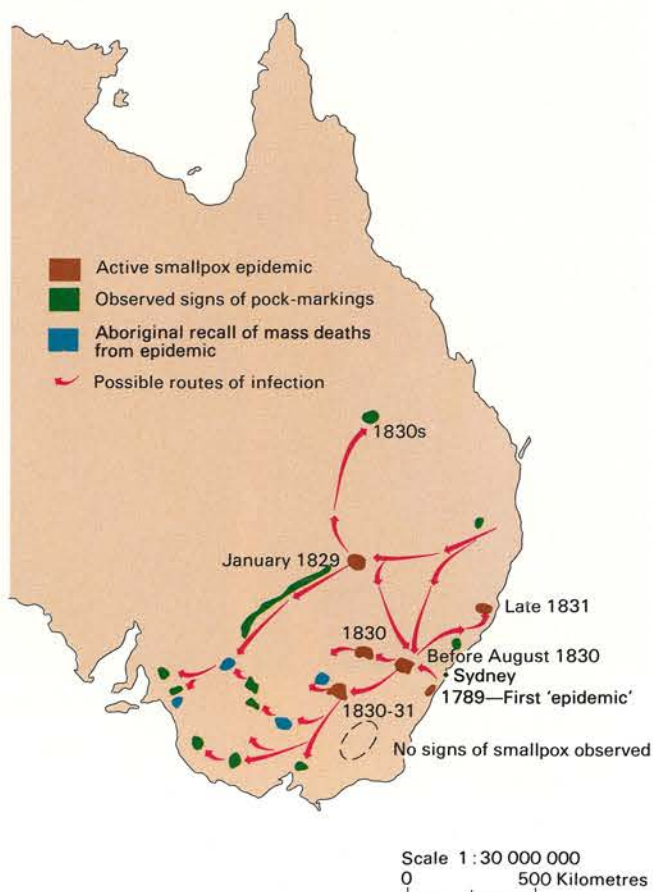
To prevent infection from incoming passengers, ships were quarantined by port health officials if disease was detected. One of the first vessels quarantined because its crew was infected with smallpox was the transport ship *Bussorah Merchant*, quarantined in Neutral Bay, Sydney, in September 1828. In 1832, the first quarantine act was passed to standardise quarantine procedures. During the next 28 years, nineteen ships, mostly from the British Isles and Europe, were placed in quarantine because they carried smallpox on arrival at Sydney. In addition, seven

ships were quarantined at Melbourne and two at Fremantle before 1860. Between 1860 and 1880 more vessels were quarantined at Melbourne than at Sydney, Melbourne being the busier port. One-third of these had sailed from Asian and Indian ports.

For effective quarantine, port health officers needed to know the passengers' port of origin, the length of their journey and the incubation period of particular diseases. Isochronic charts were drawn and used to assess the risk of a vessel carrying disease. For example, a victim infected by the plague at Rangoon would show symptoms by the time the vessel arrived at Thursday Island, the plague having a maximum incubation period of seven days; a passenger infected with smallpox (which has a maximum incubation period of eighteen days) could possibly arrive and land before symptoms became apparent.

Inoculation and quarantine measures assumed increasing importance for the colonies in the second half of the nineteenth century. During the 1890s quarantine was a topic of intercolonial debate, but it was not until 1908 that a federal quarantine act was passed. Thirteen years later, a federal department of health was established to oversee its operation.

Survival of first, second and third fleeters
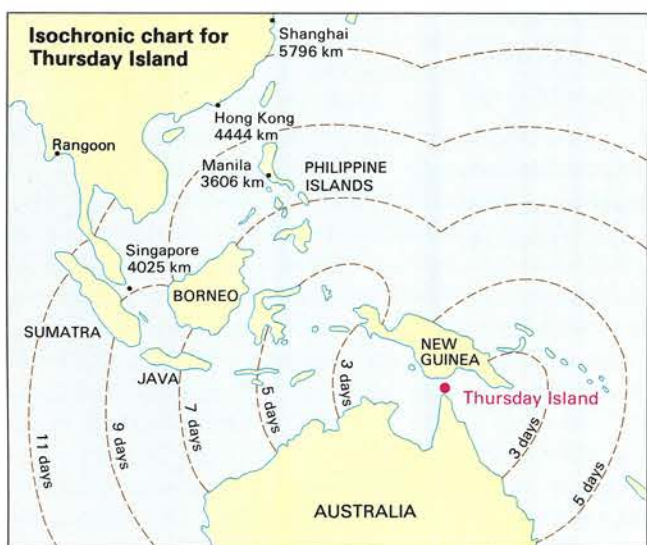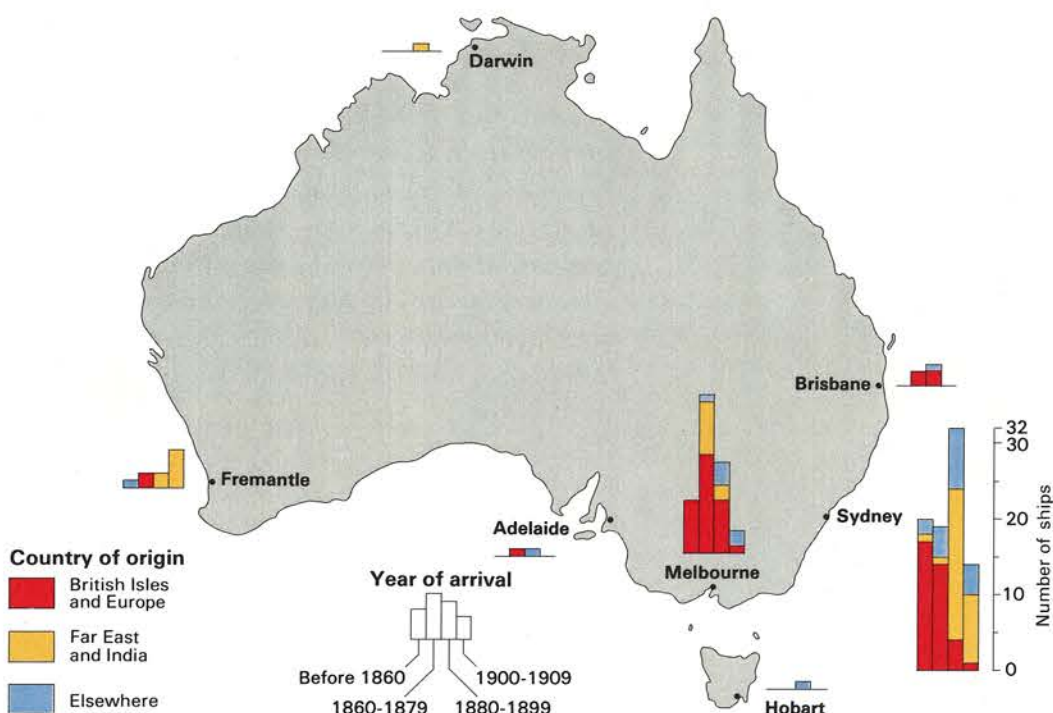

Death rates at Sydney Cove 1788-1791
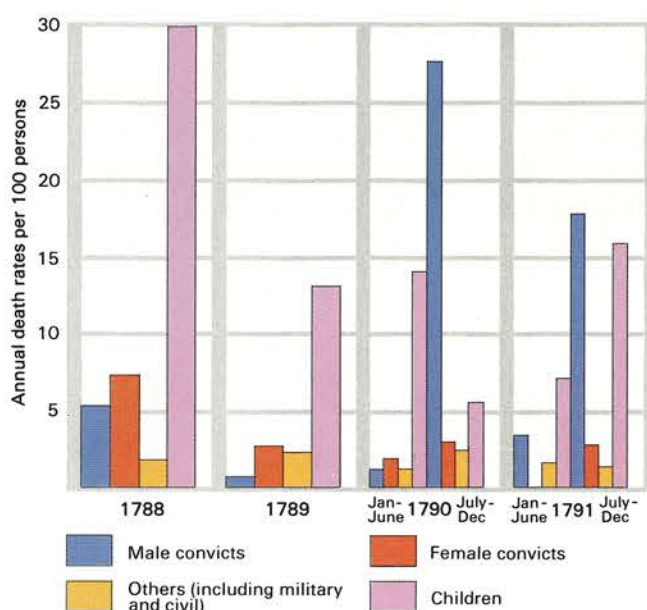
In the graph to the left, mortality rates are calculated as the annual number of deaths per 100 living persons in each category. The 1788 and 1789 figures are calculated for the respective years, the 1790 and 1791 figures for six-month periods.

Male convicts
Female convicts
Others (including military and civil)
Children

Smallpox in Aborigines 1789-1830s

Active smallpox epidemic
Observed signs of pock-markings
Aboriginal recall of mass deaths from epidemic
Possible routes of infection

Scale 1 : 30 000 000
0   500 Kilometres

Ships quarantined for smallpox

Country of origin
British Isles and Europe
Far East and India
Elsewhere

Year of arrival
Before 1860   1900-1909
1860-1879   1880-1899

Isochronic chart for Thursday Island

Isochrones c1900 based on steamer travel at 435 km per day

According to today's expectations, few people enjoyed good health or long life in Europe in the early nineteenth century. Life expectancy in the mid-nineteenth century was only about forty-five years. Nearly half the children born died before the age of twelve. Diarrhoea and dysentery, typhoid, smallpox, measles, pneumonia and scarlet fever all claimed lives. Health care was limited.

Because of its isolation and its scattered population, Australia remained relatively free of the common infectious diseases until the 1830s, when substantial numbers of people began to migrate to Australia. The incidence of disease, and death rates, rose steadily. Individual diseases could, in any one year, push the death rate up. In Sydney, for example, scarlet fever, measles and influenza frequently pushed the death rate above 30 per 1000 between the 1850s and the mid-1870s. By comparison in the 1970s it averaged about 8 per 1000.

As medical and hospital care improved and public health measures such as clean water and sewerage systems were developed, there was an overall downward trend in the mortality rate from infectious disease. Yet these measures could not prevent occasional epidemics of specific diseases. Smallpox outbreaks in New South Wales, in Sydney in particular, pushed the mortality rate to nearly 25 per 1000 in the early 1880s. The graph shows other epidemics that pushed up death rates. Childhood diseases were endemic, at least until the 1920s. Diphtheria caused many deaths in the late nineteenth century. In all colonies, but particularly in Queensland, diarrhoea among infants and children was a major problem, especially during the summer months.

Overall, mortality rates in Australia declined after 1870. Health acts controlling water purity, food handling and waste disposal were passed by all colonies by 1900. More children reached adulthood, and general life expectancy rose to 58.6 years for white males and 64.3 years for white females.

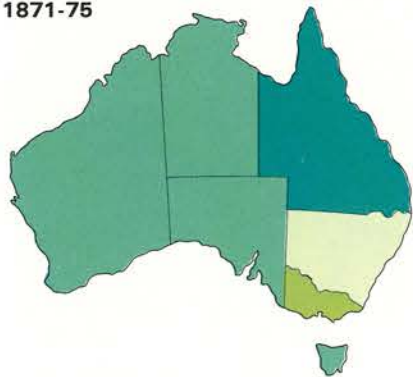## Crude death rates in Sydney and suburbs 1856-1900
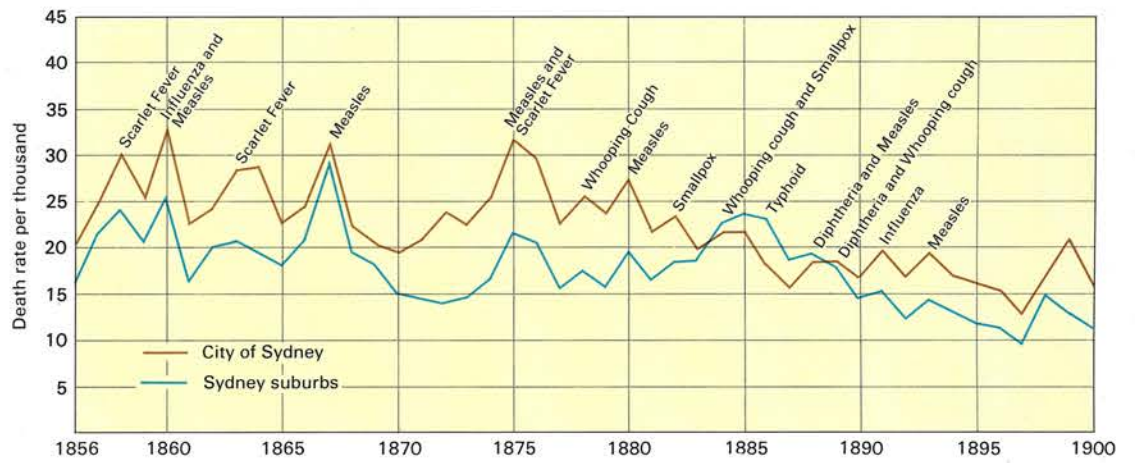
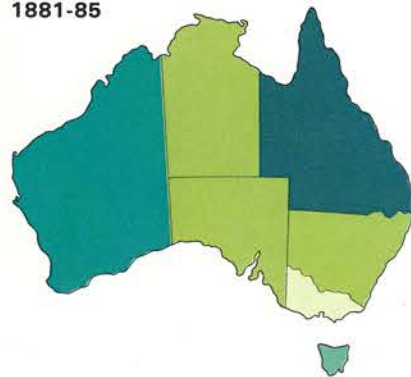## Death rates from specific diseases NSW 1875-1900
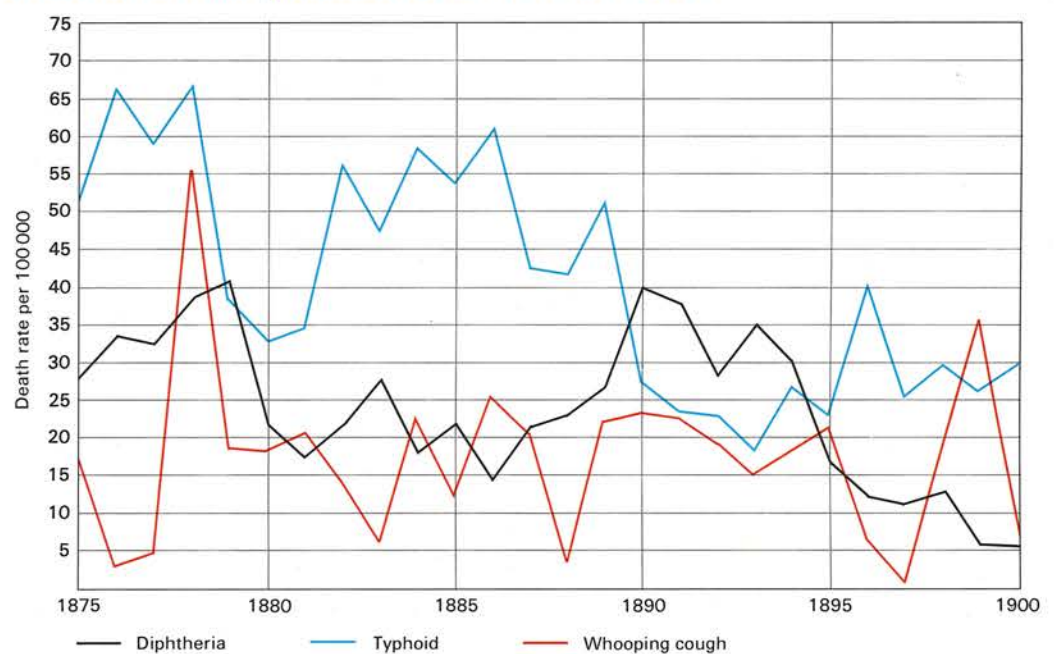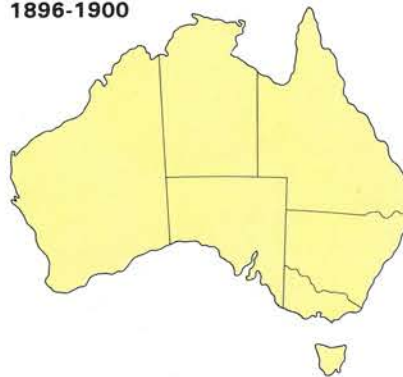

Annual death rates 1871-1900

1871-75   **1881-85**   **1896-1900**

Annual death rate per thousand

| 11.0-13.0 | 14.0-14.5 | 14.6-15.5 | 15.6-16.0 | 17.0-18.0 | 19.0-19.5 |

*The registration of deaths became compulsory in Tasmania in 1839 and by 1856 all colonies had a system for recording deaths. These records and the censuses taken from the 1870s onwards provide a reliable record of the level and pattern of mortality. The dramatic decrease in mortality rates in Australia during the last quarter of the nineteenth century is clearly shown in this series of maps.*

Infant mortality rates 1871-1900
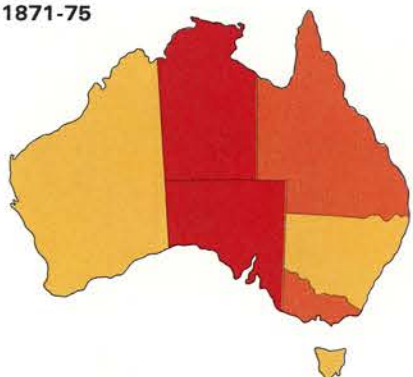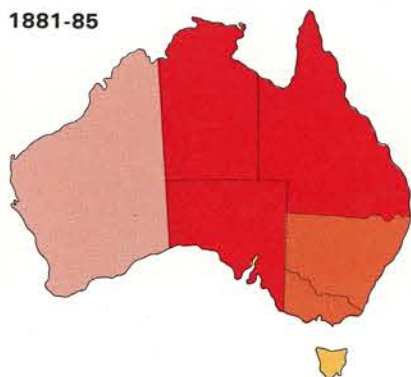
1871-75   **1881-85**   **1896-1900**
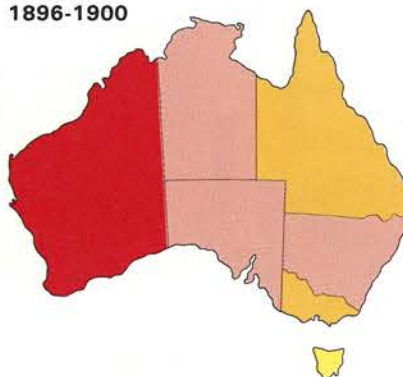
Annual deaths per 1000 live births

| 95-100 | 101-110 | 111-120 | 121-130 | 131-140 | 155-160 |

The death rate of infants is a sensitive indicator of the health of a population. Adequate information for Australia is available from the 1870s. Up to 1900, the infant mortality rate (the number of infant deaths during the first year for each 1000 live births) fluctuated between a maximum of 140 and a minimum of 105, except in Tasmania, where by 1900 it had dropped below one hundred. By 1930, the average for the Australian white population had fallen to 50 and by the 1980s to 11 per 1000 live births.

The plague

THE THREAT of bubonic plague caused panic along the eastern seaboard of Australia during the the the early 1900s, but attempts to eradicate the disease brought great benefits. In particular, the worst slums in Sydney and Brisbane were removed in the drive to rid these cities of the breeding grounds of the rats and fleas that transmitted the disease to humans.

The epidemic of plague at the start of the twentieth century was part of the last major occurrence of the disease. An outbreak of plague in south China in 1893 marked the start of the epidemic. While this outbreak was relatively small, the consequences were momentous, for the disease was carried far and wide by ocean-going vessels. By 1894 Hong Kong had been infected and Japan and the Philippines suffered the disease in 1897. By 1899 plague had been reported in Noumea. From south China, the plague also spread westwards and had reached India by 1896 and Egypt by 1900. Shortly afterwards, port cities in Europe were infected with rats carrying the disease.

Outbreaks and deaths from plague 1900–09

As the plague was a disease spread by fleas on rodents, including shipboard rats, it was inevitable that an Australian port would become infected. On 15 January 1900, the first case was reported in Adelaide. Within a week, a case had been notified in Sydney and during the next ten years outbreaks of plague occurred each year in Australia, the most severe being in 1900, 1902 and 1905.

Over 1200 cases of bubonic plague occurred in this country. The worst-infected states were New South Wales and Queensland, with 614 and 499 cases respectively. However, plague was not reported from Tasmania, and despite its early infection Adelaide reported only seven cases. Similarly, after ten cases in 1900 Melbourne reported only two further cases during the decade. In the west, Fremantle and Perth, which had more direct contact with India, suffered 80 cases during the period.

Four hundred and sixty-seven plague victims died. Queensland recorded most deaths with 218, and each of the state's major ports was at some time the centre of a plague scare. In New South Wales, Sydney bore the brunt of the epidemic. The city recorded 191 deaths from plague in the years from 1900 to 1909. The epidemic also caused concern at Newcastle in 1902 and again in 1905, when a degree of panic struck a number of small northern river ports. Lismore, Ballina, Woodburn and Ulmarra were also infected and fourteen victims died as a result of the bubonic plague. Minor outbreaks of plague occurred during the 1920s but generally quarantine measures kept Australia free of the disease. The discovery of antibiotics in the 1940s provided a cure for the plague for the first time.

Advertisement in the Medical column of the Bulletin, June 30, 1900.
ANU ARCHIVES OF BUSINESS AND LABOUR

1900 — Charters Towers, Cairns, Townsville, Rockhampton, Brisbane, Sydney, Melbourne, Adelaide, Fremantle

1901 — Brisbane, Fremantle, Perth, Sydney

1902 — Townsville, Gladstone, Bundaberg, Brisbane, Newcastle, Sydney, Melbourne, Fremantle

1903 — Cairns, Townsville, Rockhampton, Bundaberg, Brisbane, Fremantle, Perth, Sydney

1904 — Cairns, Maryborough, Brisbane, Fremantle, Perth, Sydney

1905 — Cairns, Townsville, Bundaberg, Maryborough, Childers, Brisbane, Northern Rivers, Newcastle, Sydney

1906 — Cairns, Rockhampton, Brisbane, Geraldton, Fremantle, Perth, Sydney

1907 — Port Douglas, Townsville, Brisbane, Kempsey, Sydney

1908 — Cairns, Brisbane, Sydney

1909 — Mackay, Adelaide, Sydney

Death from plague 1900-1909

- ● Greater than 50
- ● 20-49
- ● 10-19
- ● 5-9
- · 1-4
- ○ Infected but no deaths

The plague in Sydney

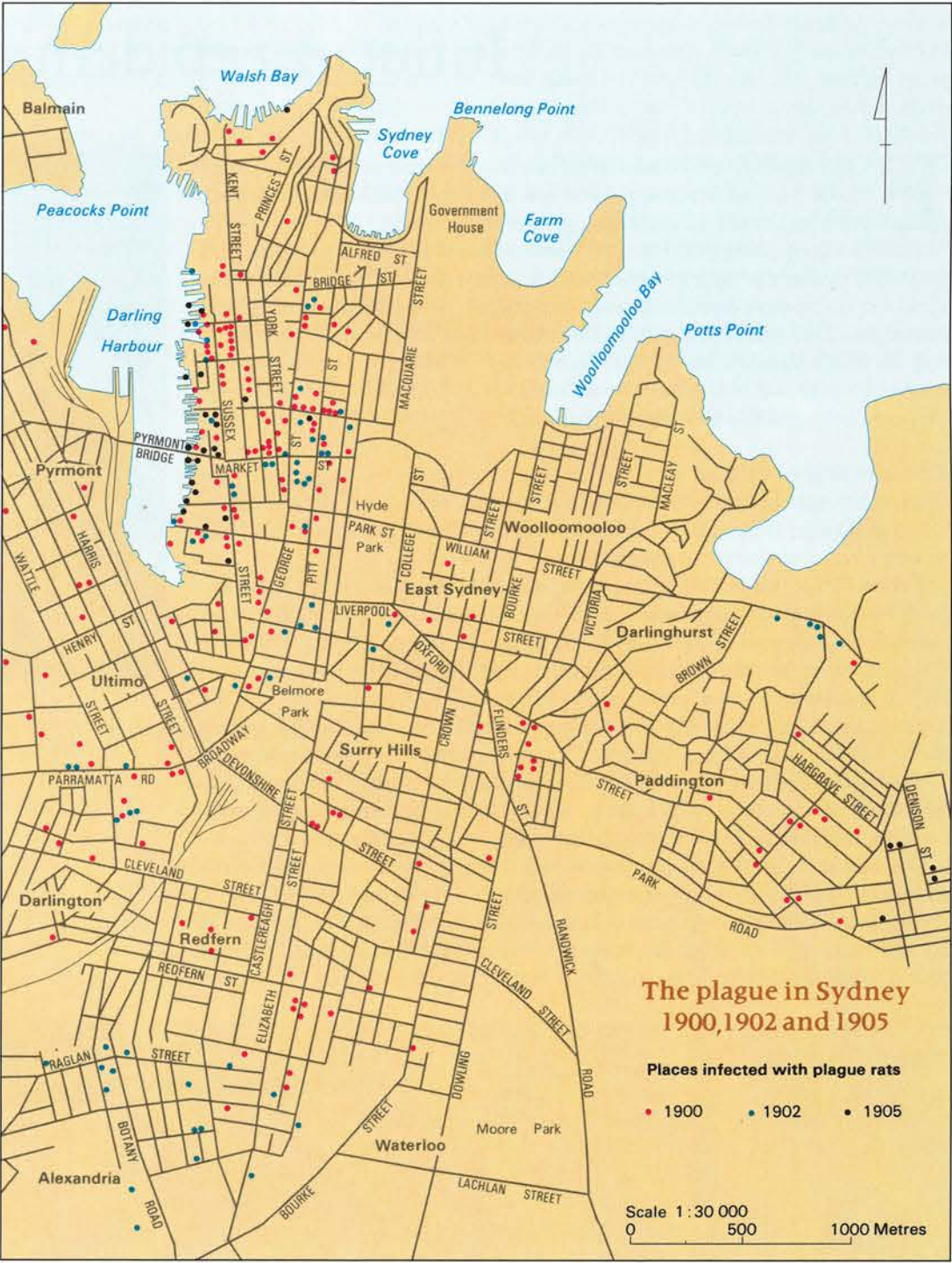> Plague is present in Sydney. It has been introduced by diseased rats and there is a great danger of its spreading still further.

With stark directness the presence of bubonic plague was confirmed by this public announcement for the citizens of Sydney. It had, however, been nearly two months since the first case had been reported and public health warnings issued, when deaths from plague occurred at the end of February 1900. The disease could no longer be ignored. Public apathy turned to panic and drastic action was called for.

The plague outbreak of 1900 was the city's worst. From 1 April to 12 May, 57 people died of the plague and before the end of the year the plague claimed 103 victims. More than 80 per cent of those who died were male. Many were workers on the docks, wharves and in the warehouses of the inner city. The great majority of cases were reported in the area bounded by Darling Harbour in the west, Walsh Bay and the Rocks in the north, Pitt Street in the east and Belmore Park in the south. Other infected areas in 1900 included parts of Paddington in the Flinders Street area, Surry Hills, Redfern and Ultimo. These were areas of substandard housing with an appalling lack of sanitation. Shared water closets, cesspits and open drains were common and were potential breeding grounds for vermin.

1.

2.

3.

The plague in Sydney
1900, 1902 and 1905

Places infected with plague rats

● 1900 ● 1902 ● 1905

Scale 1 : 30 000
0 500 1000 Metres

4.

From 23 March to 17 July 1900, cleansing operations were carried out in plague-infested areas of Sydney. These photographs, taken at the time, show some of the squalid, overcrowded housing and business premises which provided ideal conditions for the spread of the plague. Under the control of George McCredie and his staff, local residents in quarantined areas worked on the cleansing and limewashing of buildings, the removal and burning of garbage and, where necessary, the demolition of slums. 1. Members of the fire brigade cleansing the streets. 2. Sussex Street. During the cleansing operations in Sydney, 50 000 tonnes of garbage were removed and either burned or dumped at sea. 3. Workmen completing the cleansing of 11 Margaret Street. 4. Harris's Joinery Works at 365 Kent Street.
MITCHELL LIBRARY

Sydney outbreak 1900

Died
Recovered
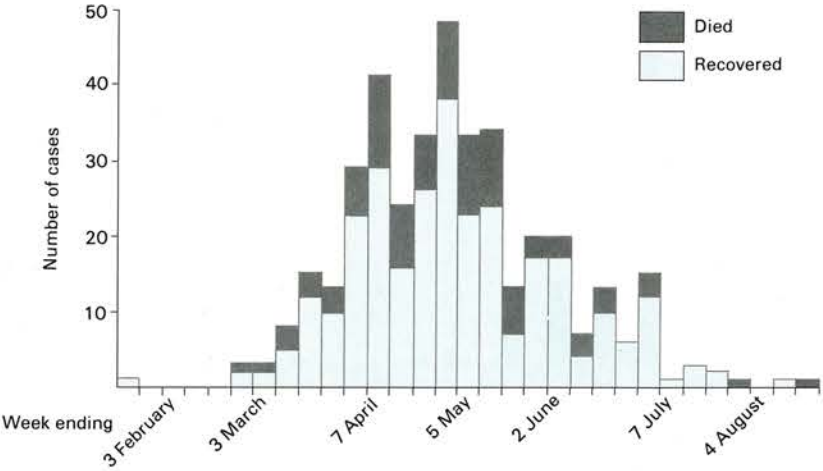
Influenza epidemic 1919

EARLY IN 1918, outbreaks of influenza occurred in military camps in the United States of America. By April, influenza had been reported among American soldiers in France.

In 1918 Europe was in turmoil. Thousands of troops and a vast civilian population were living in wretched circumstances. Conditions were ideal for the spread of infection. In June the first deaths from influenza occurred in England and soon after Australian troops stationed there fell ill. With the return of troops to their home countries a world epidemic followed. Before it subsided, it killed 20 million people. Diggers brought the influenza virus back to Australia.

The blessing of distance

During the spread of the 1918–19 influenza epidemic, Australia's isolation was a blessing. It gave the commonwealth and state governments time to carry out preventative measures.
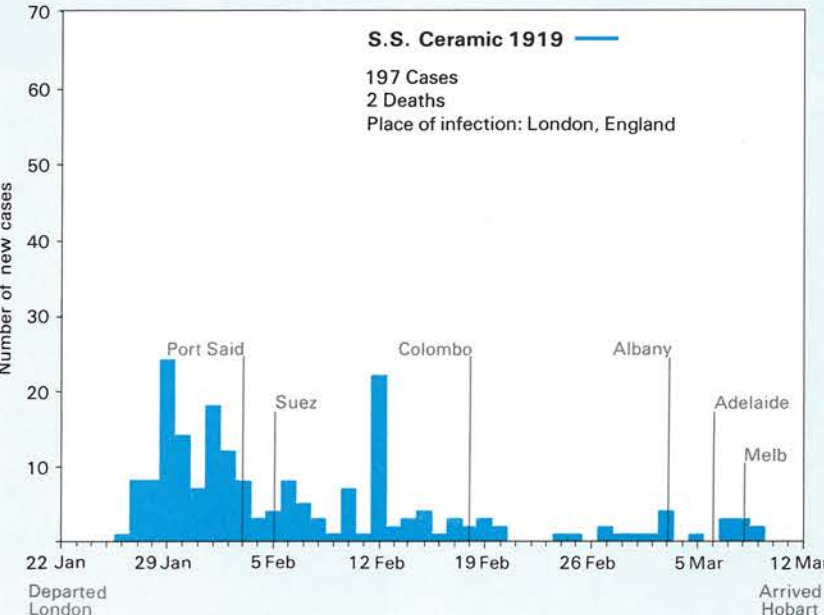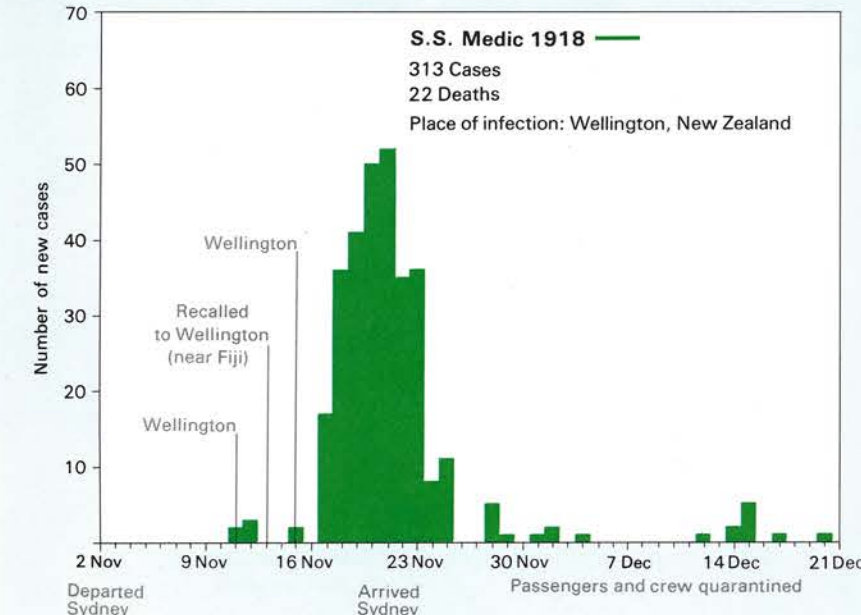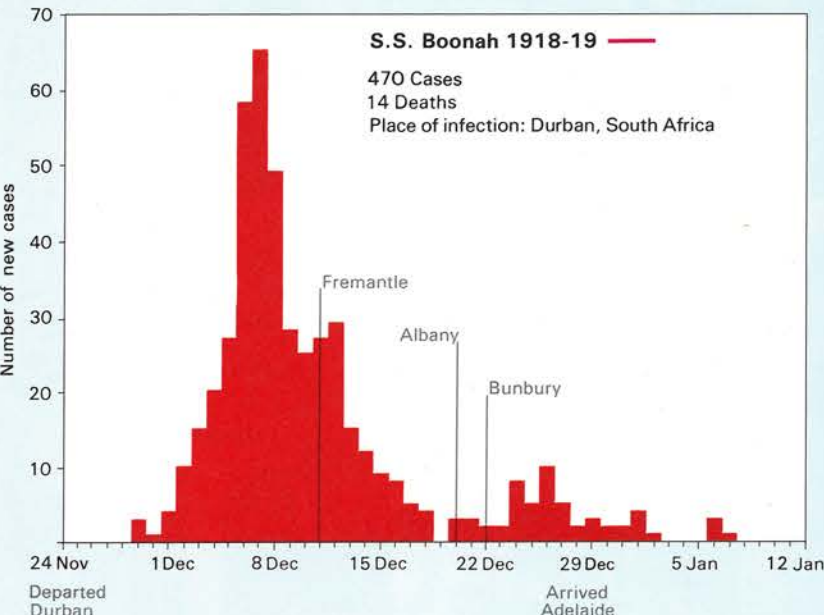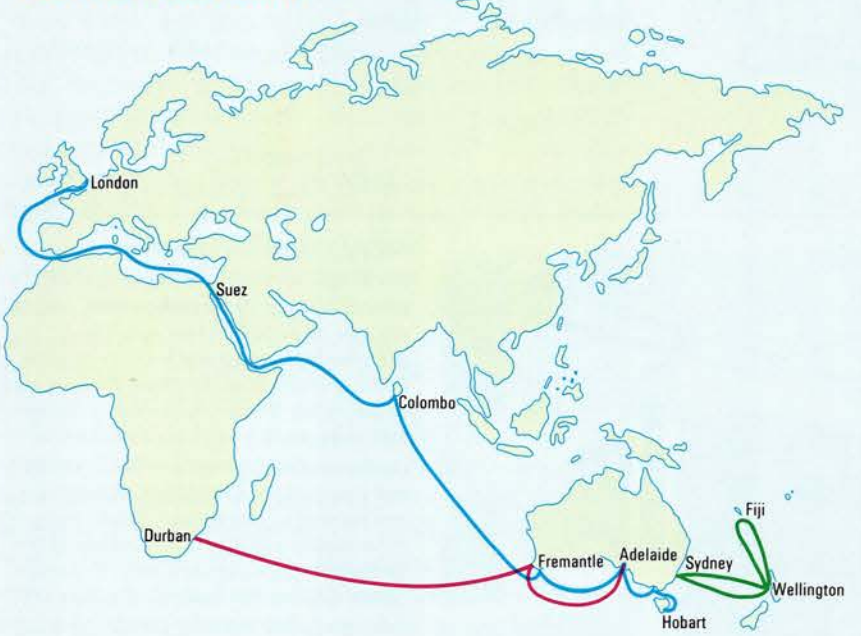
From 17 October 1918 ships infected with influenza arriving from overseas were quarantined. Shortly afterwards, quarantine was extended to all vessels arriving from England, South Africa and New Zealand, whether they were infected or not. In the following months, 58 528 passengers and crew were subjected to medical checks by quarantine officers and 228 ships were quarantined. Among these were the SS *Medic,* SS *Boonah* and the SS *Ceramic.* The SS *Medic* left Sydney on 2 November 1918 with troops for Europe, only to be recalled on Armistice Day. It called at Wellington, where some passengers and crew became infected. The *Medic* then sailed for Sydney. En route influenza broke out and the ship was quarantined. Before it was declared free of infection, 22 deaths had occurred. The SS *Boonah* and the SS *Ceramic* brought infection from South Africa and England respectively. The 16 people who died on these ships were among the 500 influenza fatalities that occurred on vessels quarantined because of the virus.

Influenza was brought to Australia by troops returning from Europe at the end of World War I. It quickly became an epidemic. In an attempt to control the spread of the virus, governments banned mass spectator sports, including football and horse races, and insisted that masks be worn in public to minimise the risk of infection. This photograph shows women at work making masks during the 1919 epidemic.
MOLLY DOUGLAS

Arrival of infection

S.S. Boonah 1918-19 ——

470 Cases
14 Deaths
Place of infection: Durban, South Africa

S.S. Medic 1918 ——

313 Cases
22 Deaths
Place of infection: Wellington, New Zealand

S.S. Ceramic 1919 ——

197 Cases
2 Deaths
Place of infection: London, England

Despite the quarantine net around the country, the influenza virus inevitably came to Australia. To limit the spread of the disease, the commonwealth and state governments approved interstate quarantine measures.

It was agreed in principle that as soon as a state became infected it would close its land borders with any adjacent state that was free of infection. In practice, the plan did not work and bitter arguments followed. New South Wales, for example, accused Victoria of not declaring itself infected as soon as it was known that the disease had become established in that state, thus permitting the spread of the virus. For the victims of the influenza virus, the wrangling among the states and with the commonwealth was of little importance.

Death from influenza in Australia 1919

During 1919, some 12 000 Australians died from influenza. From its first foothold in Victoria in January, the disease spread quickly to New South Wales. Fifty-five per cent of all recorded deaths from influenza in Australia occurred in that state. One-fifth of all deaths were recorded in Sydney alone. Two months later a third state, South Australia, was declared infected. By mid-May Queensland was stricken. In turn, Western Australia and Tasmania became infected.

Metropolitan areas were hit hardest, particularly in New South Wales, Victoria and South Australia. Melbourne recorded 68 per cent of Victoria's deaths from the epidemic, considerably more than the city's proportion of the state's population. Sydney and Adelaide each accounted for more than half of the deaths in their states.

The epidemic of 1919 brought to a temporary halt a declining death rate in Australia. During that year, the number of deaths was 27 per cent higher than expected, an increase of some 14 000 deaths of which 12 000 were attributed directly to the influenza epidemic.
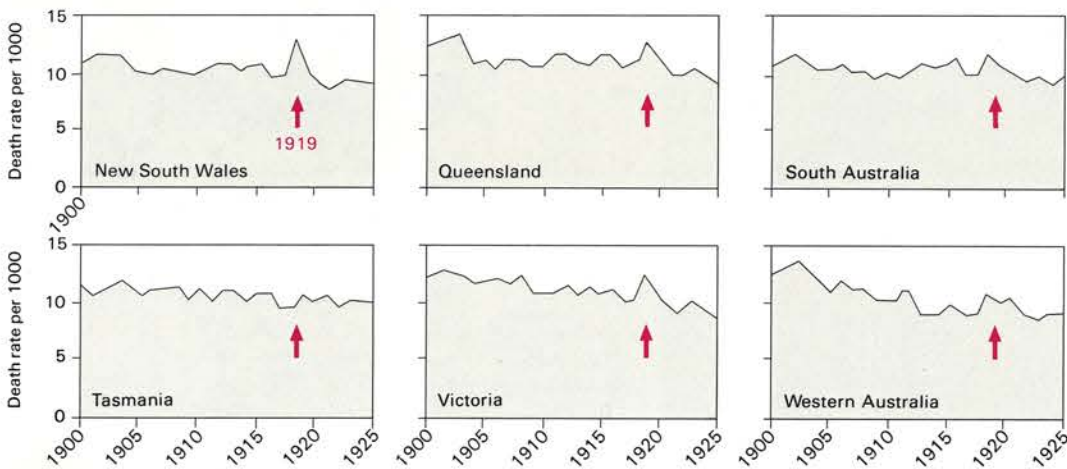
Deaths from influenza 1919

Number of ships, passengers and crew quarantined in Australia from 17 October 1918 to 30 April 1919

	No. of ships	Passengers-Crew
Infected	79	2795
Uninfected	149	55 733
Total	228	58 528
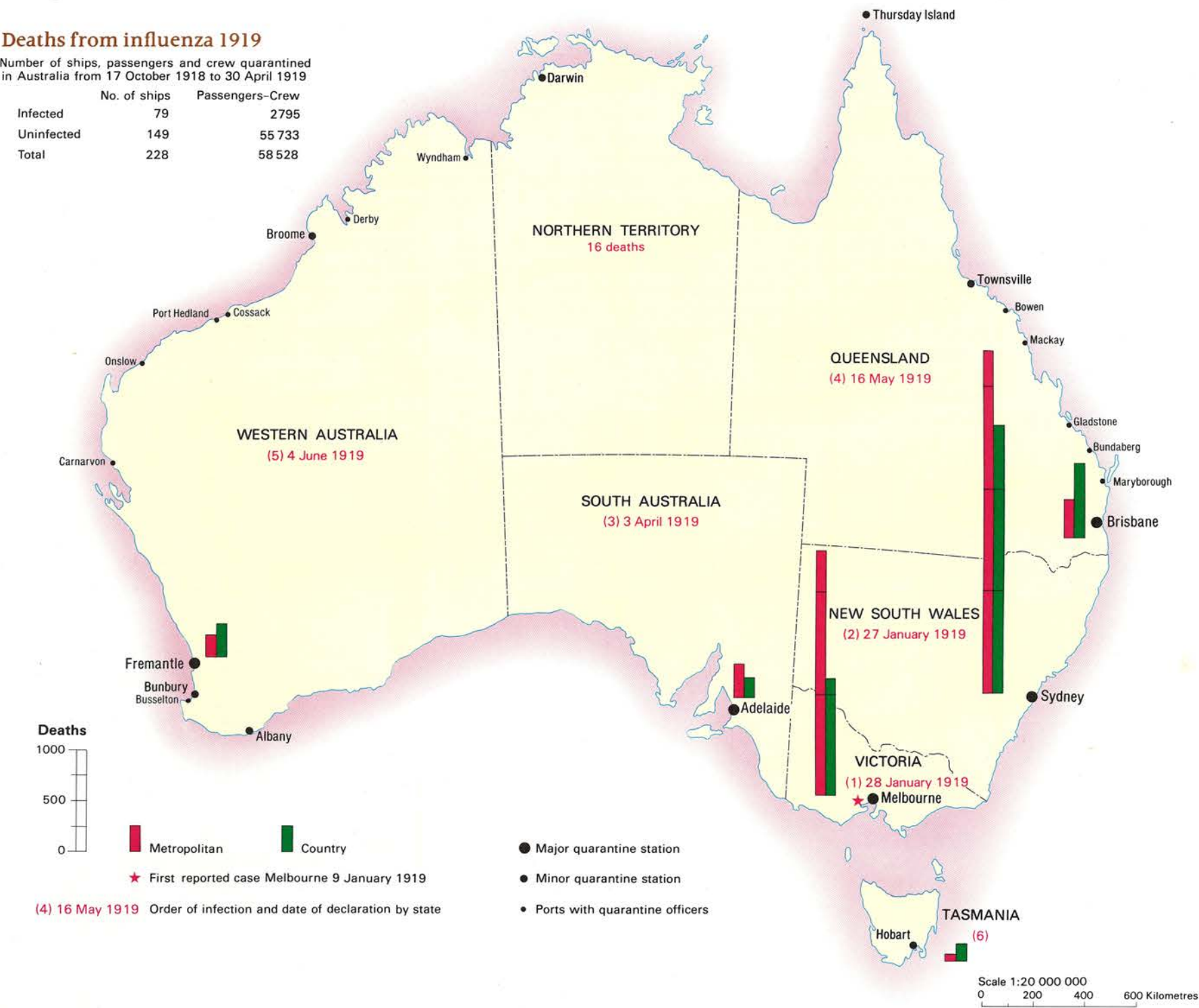
Death rates 1900-1925

Influenza in New South Wales, 1919

THE FIRST INFLUENZA DEATH in New South Wales occurred in Sydney on 24 January 1919. The victim, a man, had travelled by train from Melbourne three days earlier. His death was the first of over 6000 attributed to influenza during 1919. In the first week of February, more cases were reported in Sydney; a week later, cases occurred in widely separated areas. Deniliquin and Albury in the south were infected on 8 February and two days later influenza was reported in Lismore to the north. In the third week of February, 40 people suffering from influenza were hospitalised in Sydney, and Corowa and Wagga Wagga in southern New South Wales buried their first flu victims. Doctors in the far north coast town of Murwillumbah also treated their first patients of the epidemic.

The disease spread slowly during March. Newcastle recorded its first influenza death, a ship's passenger from Melbourne. Nurses, doctors and patients at the hospital where the victim had died contracted the disease. Within a fortnight, influenza was rampant in the city. Shortly afterwards, the virus broke out in Muswellbrook and the scene was set for the infection of the Hunter valley. On the central and southern tablelands the epidemic was reported at Orange and Goulburn.

In April the disease spread rapidly along the major rail routes; by the end of the month almost every large country town had suffered influenza deaths. Tamworth, Glen Innes, Gunnedah and Moree in the north and Cowra, Cootamundra and Griffith in the south became infected. The mining settlements of the lower Hunter were hit hard and people died from the epidemic in the coastal towns of Taree, Port Macquarie, Kempsey, Coffs Harbour and Grafton. In Sydney, the epidemic continued. In the middle weeks of April more than 1000 influenza sufferers were hospitalised each week.
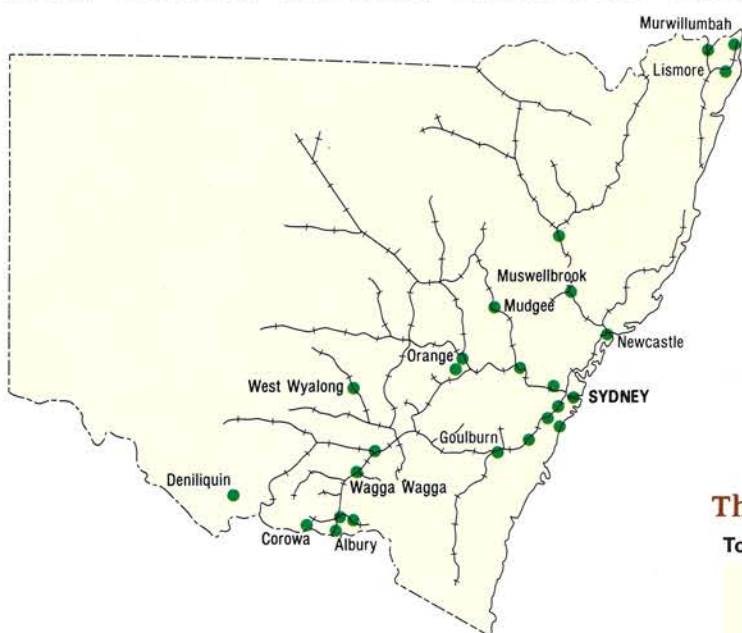
The epidemic peaks

April saw the epidemic's first peak. The number of influenza deaths then fell steadily and by the end of May fewer than ten were recorded each day. With the onset of winter, the epidemic returned savagely. During the last three weeks of June, the number of influenza cases admitted to hospital in Sydney again exceeded 1000 per week. In the country, 50 more towns became infected during the month. Influenza was widespread in New England and few settlements escaped the spectre of death. In the far west, the miners of Broken Hill suffered badly. The south coast, which had escaped the first wave of the epidemic, became infected. By mid winter, the virus was rife throughout the state. Thirty-five per cent of the population caught the flu. Deaths peaked on 26 June when 142 people died.

After June the epidemic waned. The last towns to be infected were isolated communities. Wentworth, Balranald and Trundle did not suffer until July and Dorrigo until September.
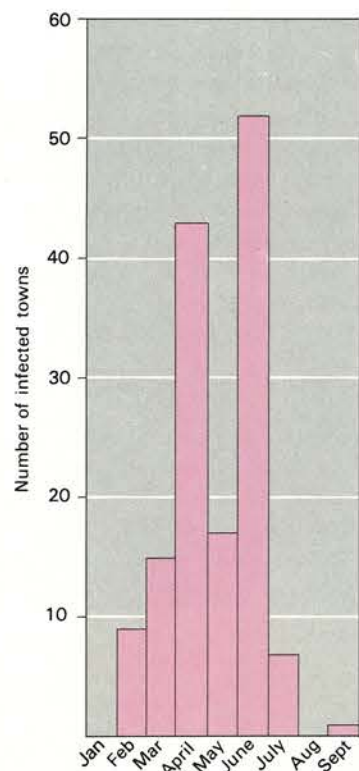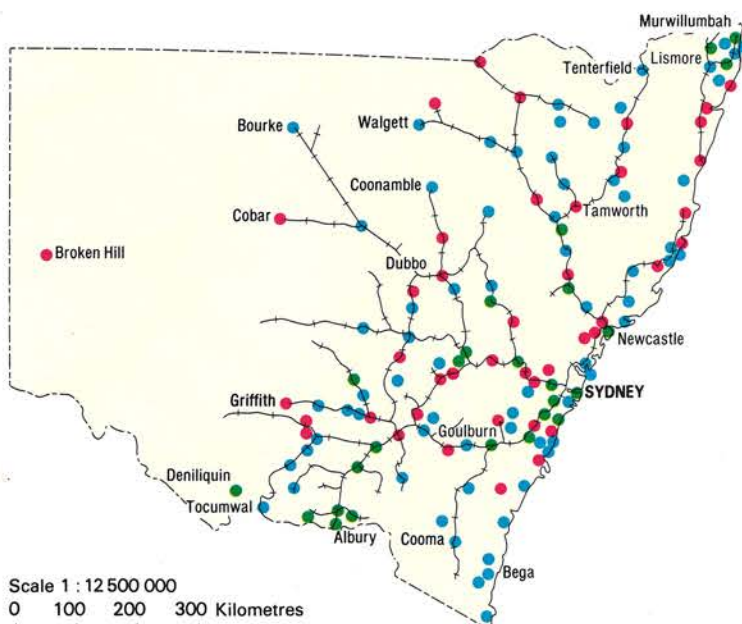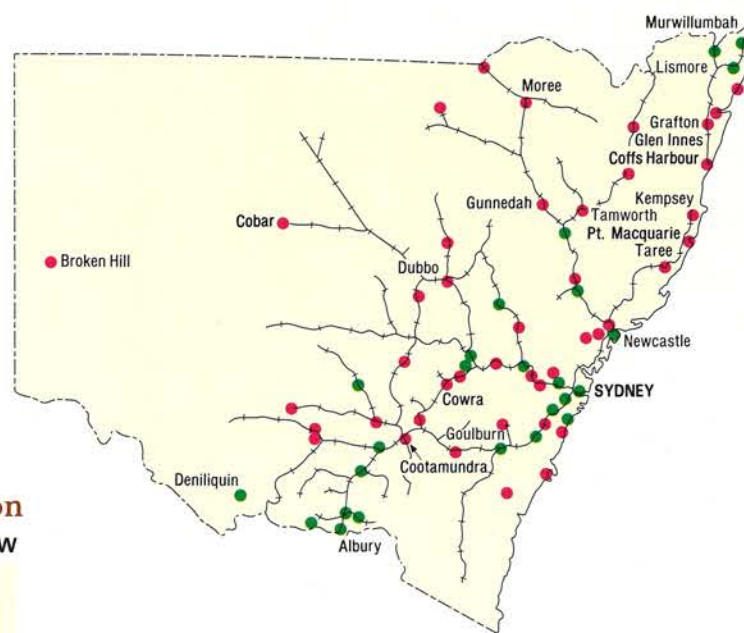

Declaration of infected country towns

The spread of infection

Towns declared infected NSW

- 🟢 by March
- 🔴 in April
- 🔵 May-June
- 🟤 July-September

Scale 1 : 12 500 000

0   100   200   300 Kilometres

Pattern of deaths

Few areas in New South Wales escaped the epidemic, but by far the greatest number of deaths occurred in the Sydney metropolitan area, where over 3600 people died.

Within the capital itself, the pattern of influenza mortality was uneven. It ranged from 9.7 per 1000 residents in Homebush to less than 1 per 1000 residents in Vaucluse. The inner city suffered most, with poverty and poorer housing conditions contributing to higher death rates. The City, Glebe, Balmain, Redfern, Paddington and Waterloo suffered death rates greater than 5 per 1000 residents. In contrast, the more affluent suburbs on the north shore had mortality rates of fewer than 3 per 1000.

Outside the metropolitan area, Newcastle and adjoining mining settlements also suffered high mortality rates. More than 300 deaths occurred and the death rate from influenza was 5.4 per 1000. Many deaths were also recorded in the pit villages of the Maitland coalfield, where 40 per cent of the population was estimated to suffer from the virus. The southern and central tablelands and the north-western plains were also infected. Some individual towns suffered badly. Lithgow, for example, recorded 141 deaths during the epidemic and the town's death rate from influenza neared 10 per 1000.

A striking characteristic of the epidemic was the high mortality among males between 25 and 45 years of age. From an average mortality rate of 0.04 per 1000 between 1914 and 1918, it jumped to 8 per 1000 in 1919. In comparison, the female death rate for the same age group was 5 per 1000; perhaps because women were frequently housebound with domestic duties, their lack of mobility reduced their risk of infection.
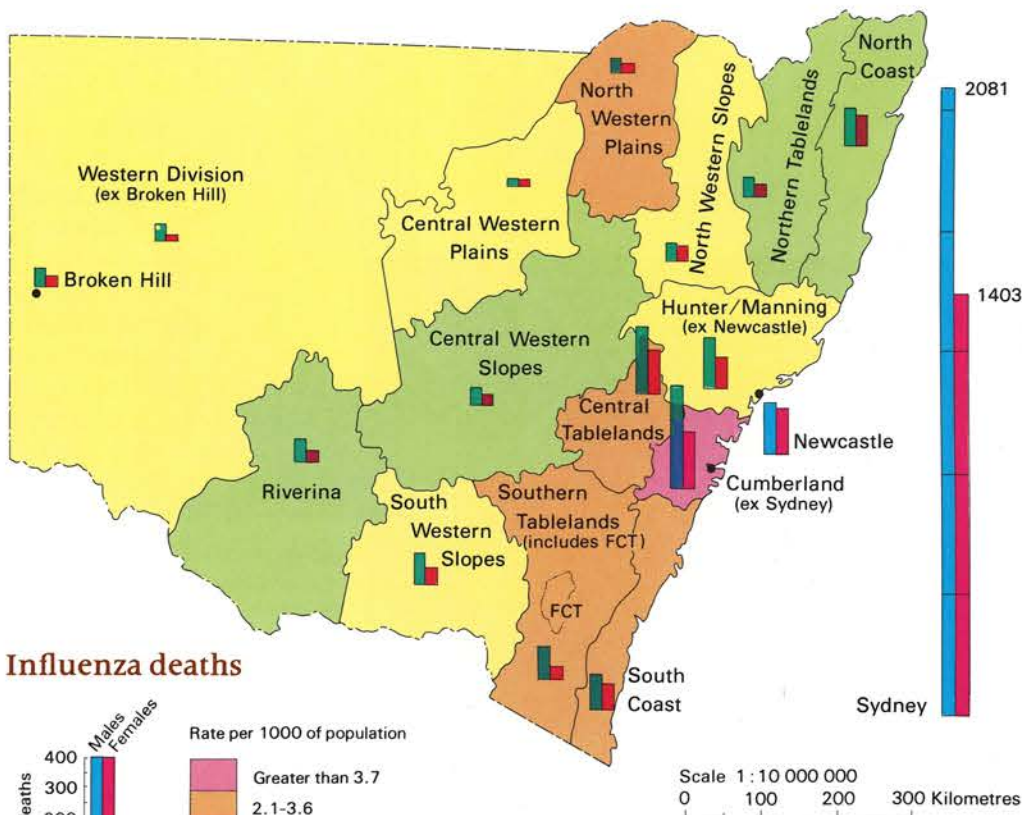
By the time the epidemic waned, the state had suffered the worst influenza epidemic in its history. Between 1875 and 1919, 7287 people had died from the illness. The total number of deaths in 1919 was 6387, only 900 fewer than the previous 44 years. The total number of influenza deaths during 1919 was also the highest for any disease in a single year ever recorded in New South Wales. The epidemic had wrought havoc in the workforce, closed schools, caused the suspension of sporting meetings, restricted religious gatherings and prohibited movement between city and country. It was a social disaster of considerable magnitude, highlighting inadequacies in health care and medical knowledge. It also fostered commonwealth interest in health and quarantine issues.

'Two jobs nobly done. The influenza epidemic in N.S.Wales has been got so thoroughly under control that for the last three days of the week only two deaths have been reported from the hospitals'.

Australia, in the form of the 'little boy from Manly', thanks the nation's tired nurses for their care of the returning war veterans and the victims of influenza. Cartoon by Norman Lindsay, Bulletin, 7 August 1919.
ARCHIVES OF BUSINESS AND LABOUR

Influenza deaths

Rate per 1000 of population
- Greater than 3.7
- 2.1-3.6
- 1.8-2.0
- 1.1- 1.7

No. of deaths — Males / Females

2081
1403
Newcastle
Sydney

Scale 1 : 10 000 000
0   100   200   300 Kilometres
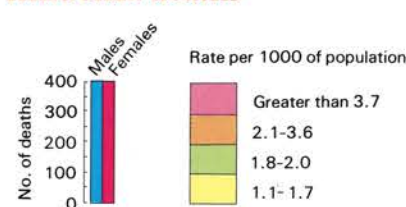
Admissions to Sydney hospitals
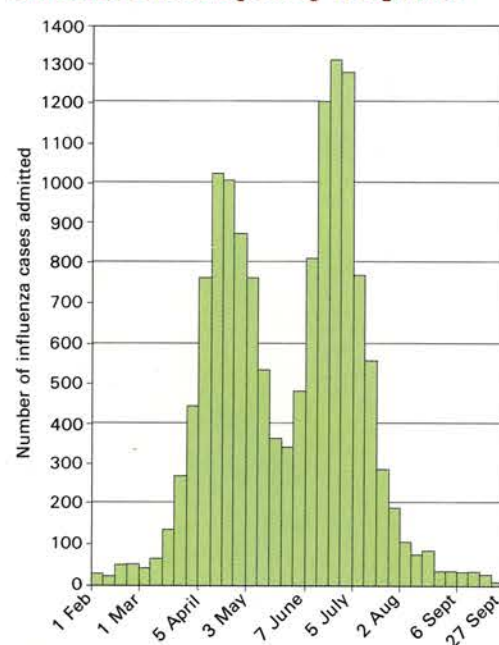
Influenza deaths by age group

Males
Females

Rate per 1000 of population
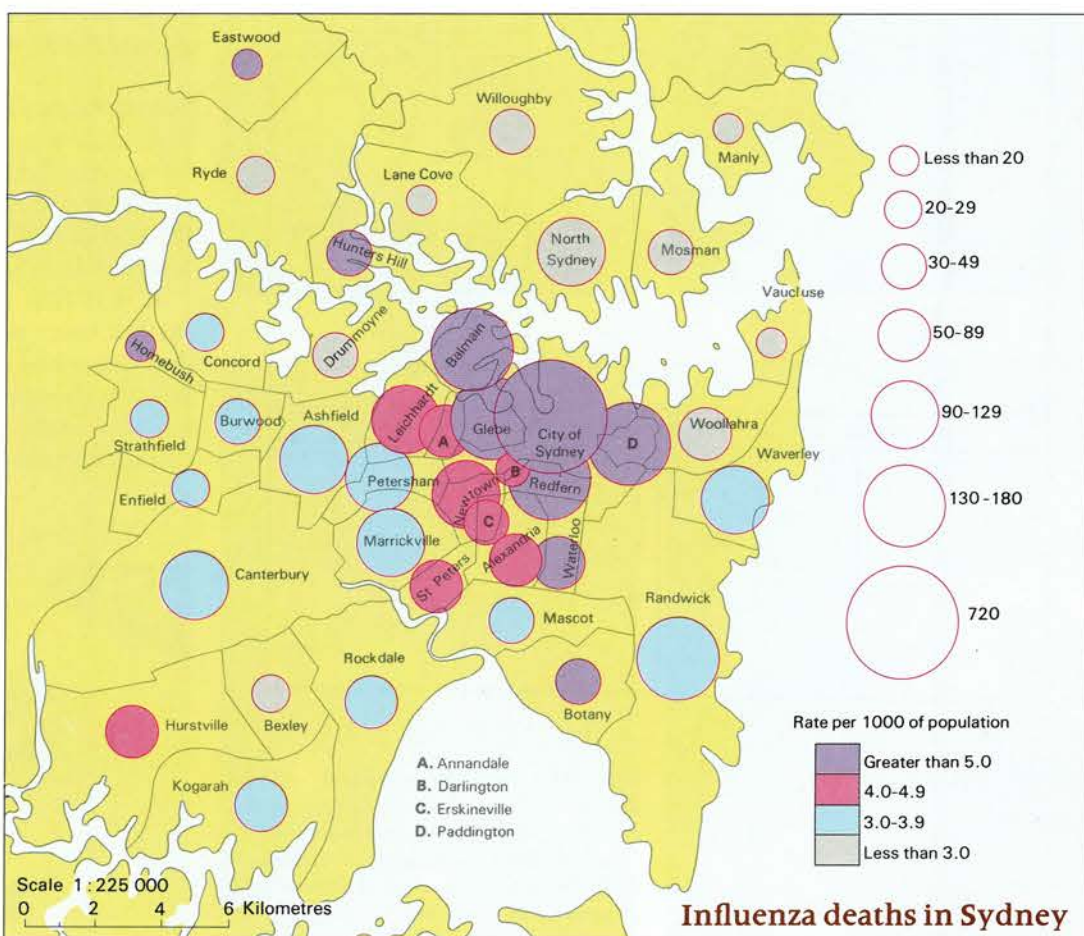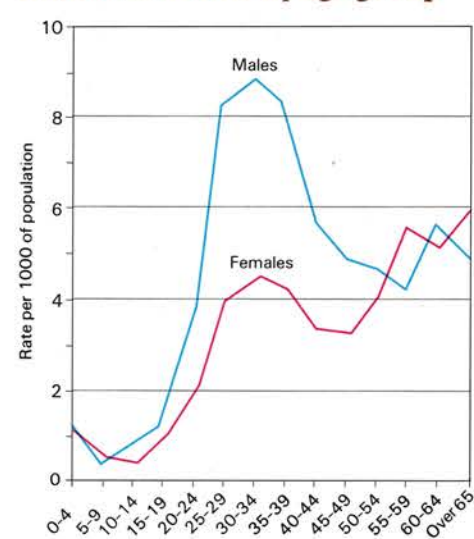
Influenza deaths in Sydney

Less than 20
20-29
30-49
50-89
90-129
130-180
720

Rate per 1000 of population
- Greater than 5.0
- 4.0-4.9
- 3.0-3.9
- Less than 3.0

A. Annandale
B. Darlington
C. Erskineville
D. Paddington

Scale 1 : 225 000
0   2   4   6 Kilometres

Polio

Incidence of polio in Australia 1933-1967

DISTRIBUTION OF METROPOLITAN POLIOMYELITIS IN ADELAIDE 1947 - 1948.

TIME ORDER OF METROPOLITAN POLIOMYELITIS CASES
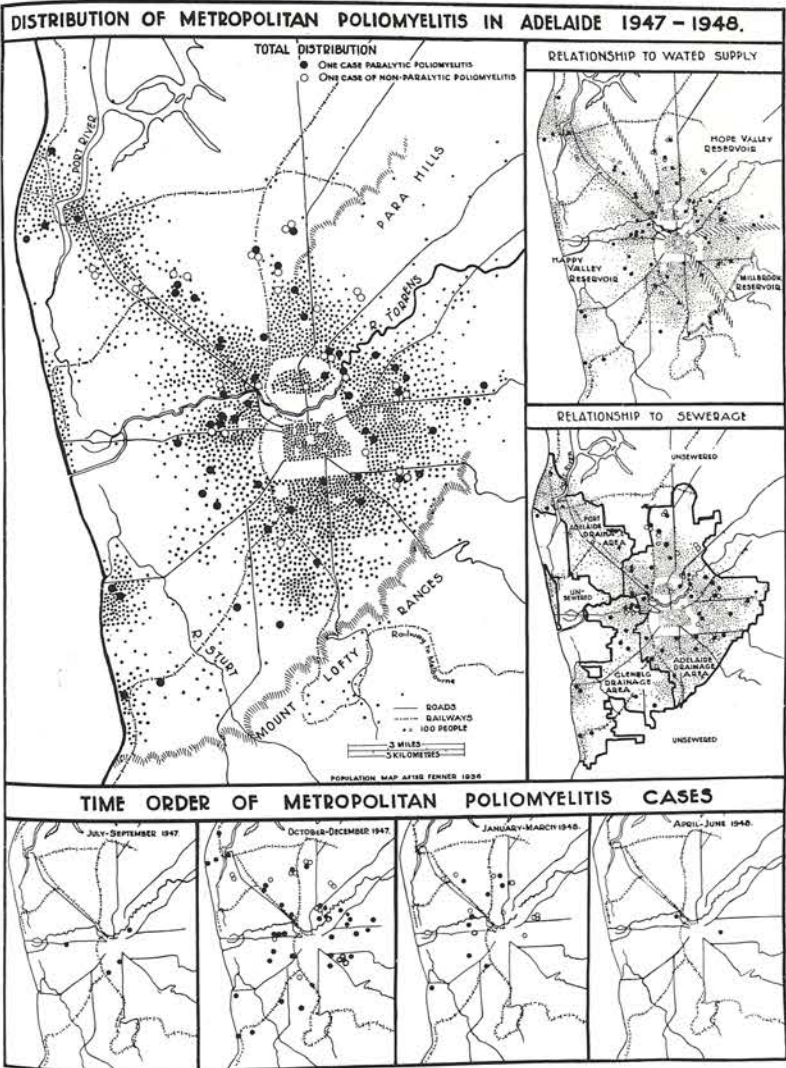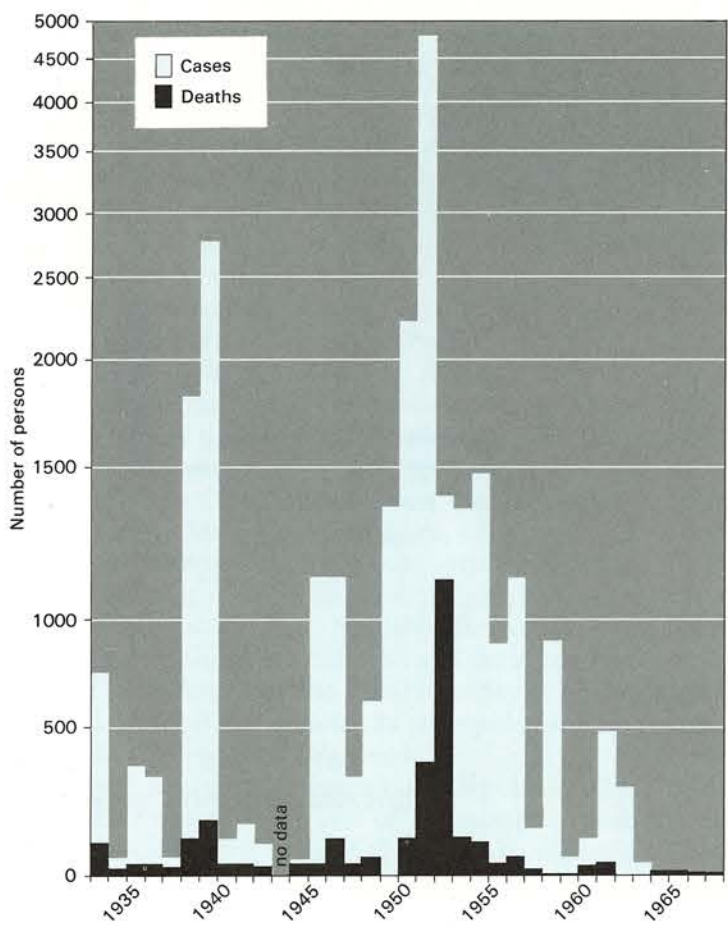
Right. Polio, one of the most feared childhood diseases, could cripple or kill. The production of an anti-polio vaccine, developed by an American doctor, Salk, began in Australia in 1955. In the following years children all over Australia were vaccinated. O. Ziegler, This is Australia, 1956.

POLIOMYELITIS occurs mainly in children and appears to increase in severity with social progress. Its terrible impact only came to notice in this century and coincided with the improvement of conditions in which people lived. Under earlier unsanitary conditions the population was probably widely exposed to the virus. Most children contracted the disease early when it showed as a mild, indeterminate fever lasting two or three days. Few suffered permanent ill effects and those who were infected built up immunity. The virus can be spread by contact with the excreta of infected persons, ingested by the mouth and transmitted to the alimentary tract. It can be also be conveyed by droplet. As conditions improved, exposure and acquired immunity diminished.

The critical period began in Australia in the early 1900s and major outbreaks of poliomyelitis occurred in New South Wales and Queensland in 1904. Victoria suffered its first polio epidemic in 1908 and in subsequent years all states experienced the trauma of this crippling disease. In all states, cases of polio had to be reported to the relevant state health authority.

During the 1930s the number of cases showed a steady increase and at the end of the decade more than 2500 people, mainly children, had suffered from polio. Few years in the 1940s were without the tragedy of young children crippled or killed by polio. No state was free from the disease and the 1950s started as the 1930s had ended, with more than 2000 cases reported. In 1951 major outbreaks in New South Wales, Queensland and South Australia saw 4755 cases reported; more than 300 people died.

Cures and remedies for polio and its victims were actively sought from the early 1900s. In the late 1930s and 1940s the work of Sister Elizabeth Kenny in caring for polio victims received Australian and worldwide recognition. She wrapped the patient in woollen clothes which had been soaked in hot water and then wrung out. She re-educated the muscles by passive exercise and the use of calipers. Not until the early 1950s were vaccines for immunisation developed. The first immunisation, using dead poliomyelitis virus, took place in 1952 when Dr Jonas Salk immunised 55 000 children near Pittsburgh, USA. These tests proved the effectiveness of the vaccine.

With the experience of successful anti-polio campaigns in North America the production of Salk vaccine began in Australia in 1955. By July 1956 vaccine had been distributed to all states and before the end of the year 1.3 million Australians, mainly children under fourteen, had received the first of three anti-polio injections. In 1964 Tasmania was the first state to use the orally taken live Sabin vaccine and rows of children waiting to be immunised by eating a sugar lump impregnated with the vaccine became a familiar sight. The number of recorded cases of polio throughout Australia fell dramatically as an ever-increasing proportion of children were vaccinated and the population in general queued for its sugar lump.

South Australia: epidemic of 1948
The epidemic of polio in South Australia during the summer of 1947–48 was the first major outbreak for nearly a decade. It was an experience that was repeated each summer during the next five years. Before the end of 1952, more than 3500 people fell victim to poliomyelitis in South Australia.

It was first notified in Adelaide at the end of June 1947 and three further cases were reported in the city before late September. By this date cases had also occurred outside Adelaide. During the next three months the epidemic reached its peak and spread throughout Adelaide and the state. The pattern of the 1947–48 epidemic was repeated throughout the early 1950s in South Australia and elsewhere in Australia.

Epidemics in Western Australia

In 1948 and 1954 Western Australia suffered two serious outbreaks. In 1948, 311 cases were notified, 90 per cent of them being paralytic polio. In the epidemic of 1954, 436 people fell victim to the disease.

The two epidemics followed different paths through the state. In 1948 the epidemic developed in Perth north of the Swan River, quickly spreading through the northern part of the city. Not until the epidemic was at its peak did major outbreaks occur south of the Swan River. Parts of Fremantle and Gosnells were infected. Outside the metropolitan area Kalgoorlie, the goldfields and the southwest suffered most.

In contrast, the outbreak in 1954 was concentrated in the southern suburbs of Perth and in Fremantle; only late in the epidemic did the disease spread through the northern suburbs. The fewer cases and slower spread through the northern suburbs suggest that a substantial immunity might have been built up by people in those areas most heavily infected during the 1948 epidemic. Beyond Perth, those areas worst affected in 1948 avoided the worst of the 1954 epidemic. In contrast, the Midland district suffered 29 cases in 1954 in comparison with the 18 cases notified in 1948.

For children born in the decades between the 1930s and the 1960s, poliomyelitis was a serious threat. Few parents were unaware of the dangers of this crippling and life-threatening disease, and few objected to the vaccination program started by the federal government in the mid-1950s. By the 1970s poliomyelitis had almost disappeared. Prevention had paid off handsomely. However, poliomyelitis remains a disease that can reappear in affluent societies. Indifference to immunisation could once again place the population at risk.
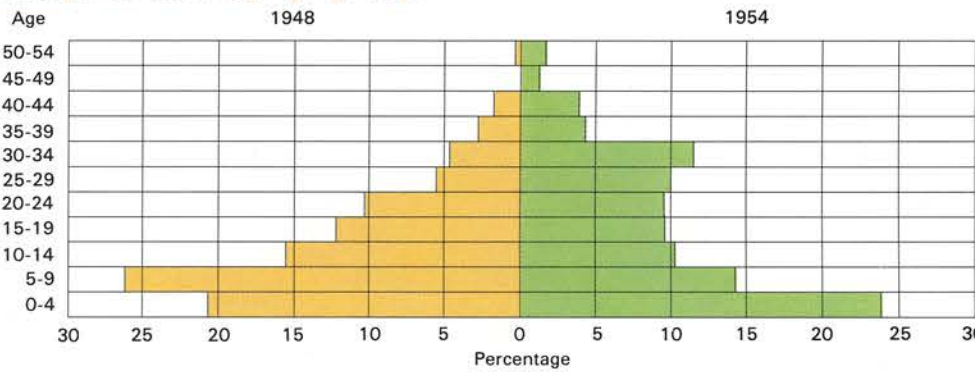

Sister Elizabeth Kenny (left) demonstrates her method of treatment in her book, Infantile paralysis and cerebral diplegia, *published in 1937.*
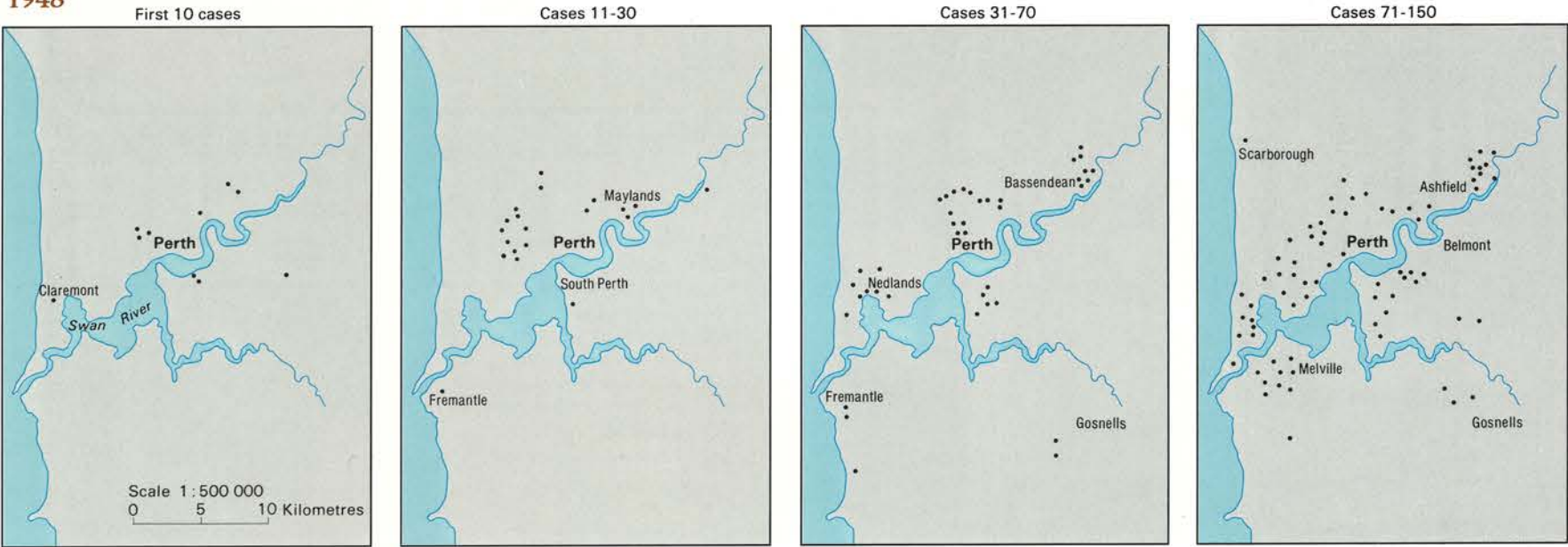NATIONAL LIBRARY

Polio cases Western Australia

Polio cases
• 1948
• 1954
☐ Excluding Perth

Scale 1 : 10 000 000
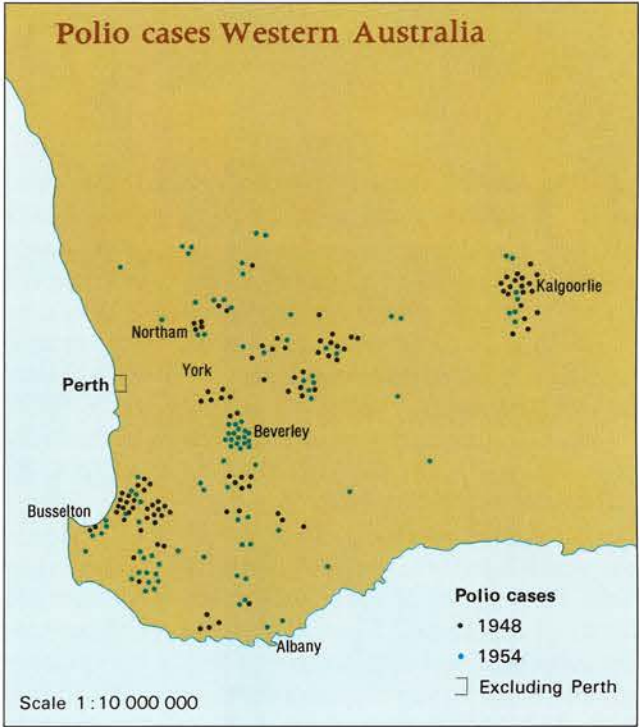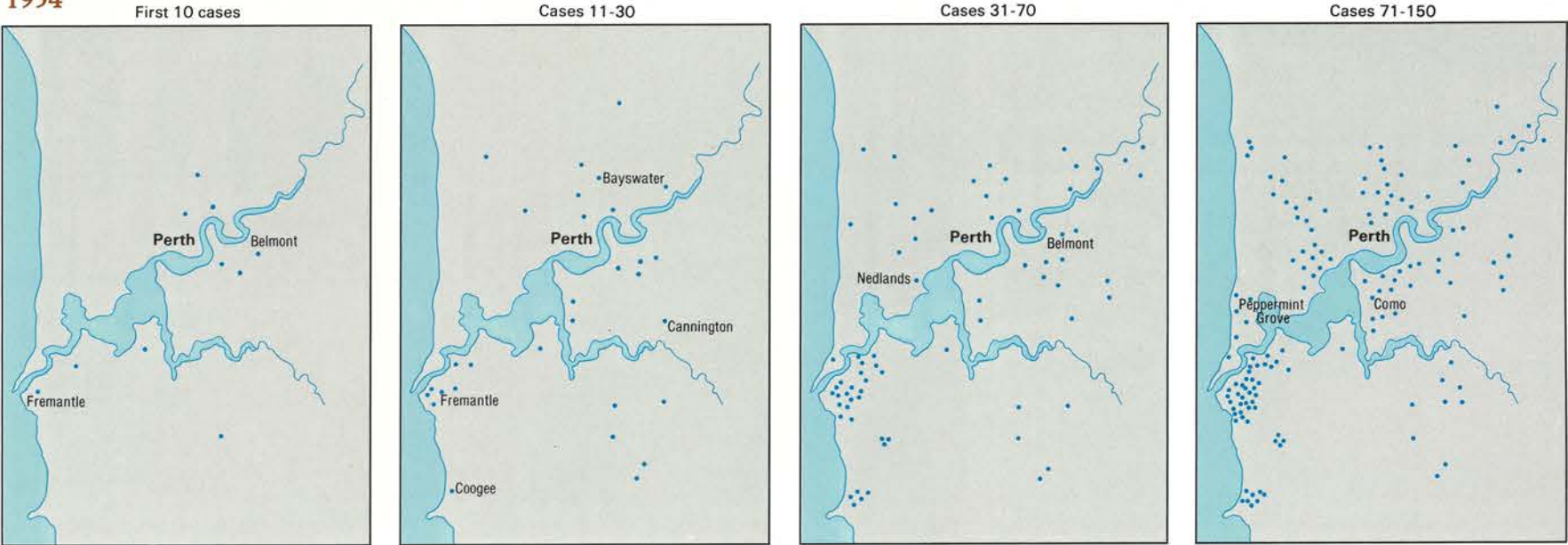
Percentage of cases by age groups

## Spread of infection in Perth
1948

### 1954

Death on the roads

DEATHS AND INJURIES caused by road accidents are an increasing public health problem Australia-wide. Unlike many other health problems that have been cured or eradicated by drugs or by an immunisation program, there appears to be no ready way of reducing road fatalities. Road deaths continue to claim victims at an insatiable rate.

The number and rate of road deaths in Australia rose steadily from the late 1930s to the 1970s. By 1970, more than 10 people per day were dying as a result of road accidents. In some parts of Australia the death rate from road accidents had reached more than 4 per 10 000 of the population and no state had a rate of less than 2.5 per 10 000. The 1970s saw the introduction and application of many compulsory measures designed to reduce the road toll. These included the wearing of seatbelts, the wearing of safety helmets for motor cyclists, radar speed traps and random breath tests for alcohol. The number of road deaths in 1980 was less than in 1970 and the accident rate per 10 000 registered motor vehicles had declined. By 1980 four states had a road fatality rate of less than 5 per 10 000 vehicles.

From the three examples of Western Australia, Victoria and Queensland, a pattern of road fatalities can be detected. It is clear that in relation to their overall population, non-metropolitan areas in these states contribute more road fatalities than do the metropolitan areas. This is particularly noticeable in Queensland. The evidence is somewhat sketchy, but it appears that the majority of fatalities involve drivers who come from outside the region.
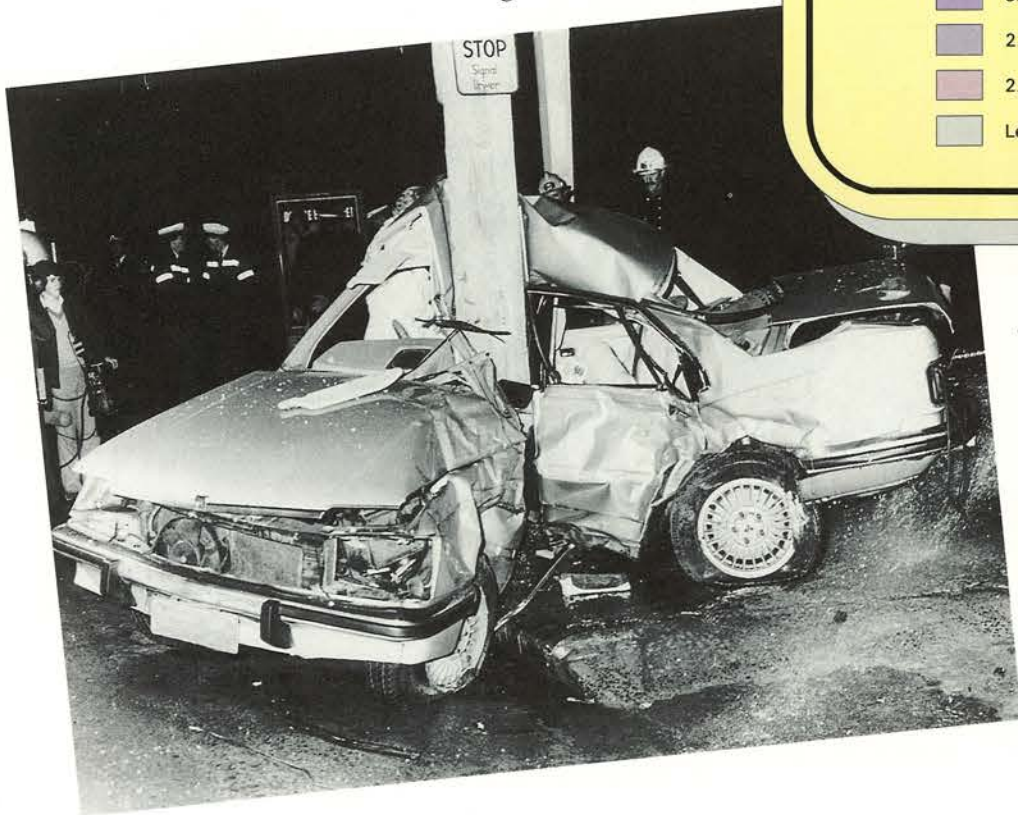
More males are killed than females, and males who are the most likely to die are those aged between 17 and 29 years. In Victoria, Western Australia and Queensland this group of the population suffered the largest number of road deaths in 1982. Most road deaths occur on Fridays, Saturdays and Sundays, and on these days most accidents resulting in death occur between 4 pm and midnight. The most dangerous time to be on the roads is between 4 pm and 6 pm.

Persons killed per 10 000 population

Greater than 4.0
3.5-3.9
3.0-3.4
2.5-2.9
2.0-2.4
Less than 2.0
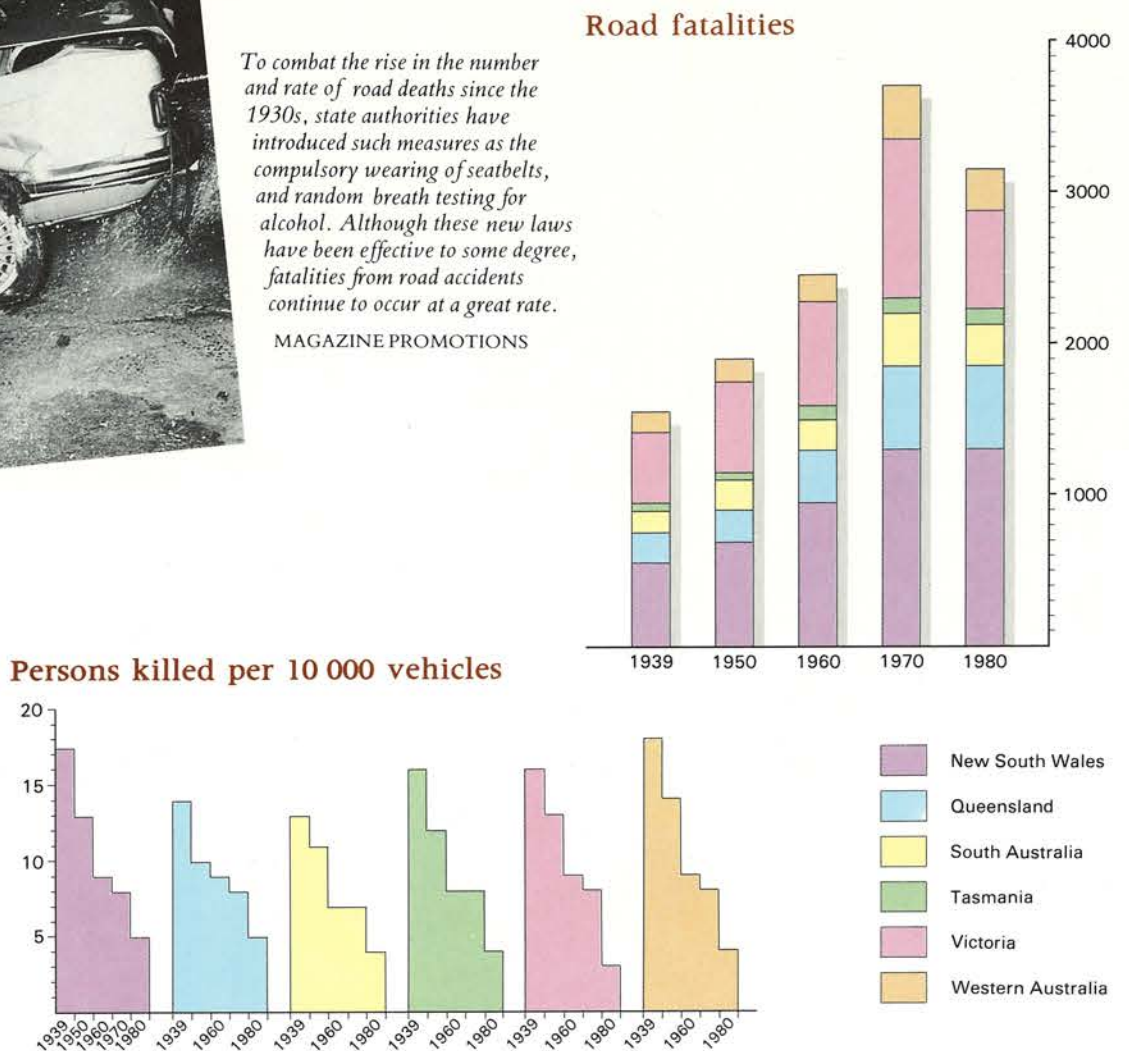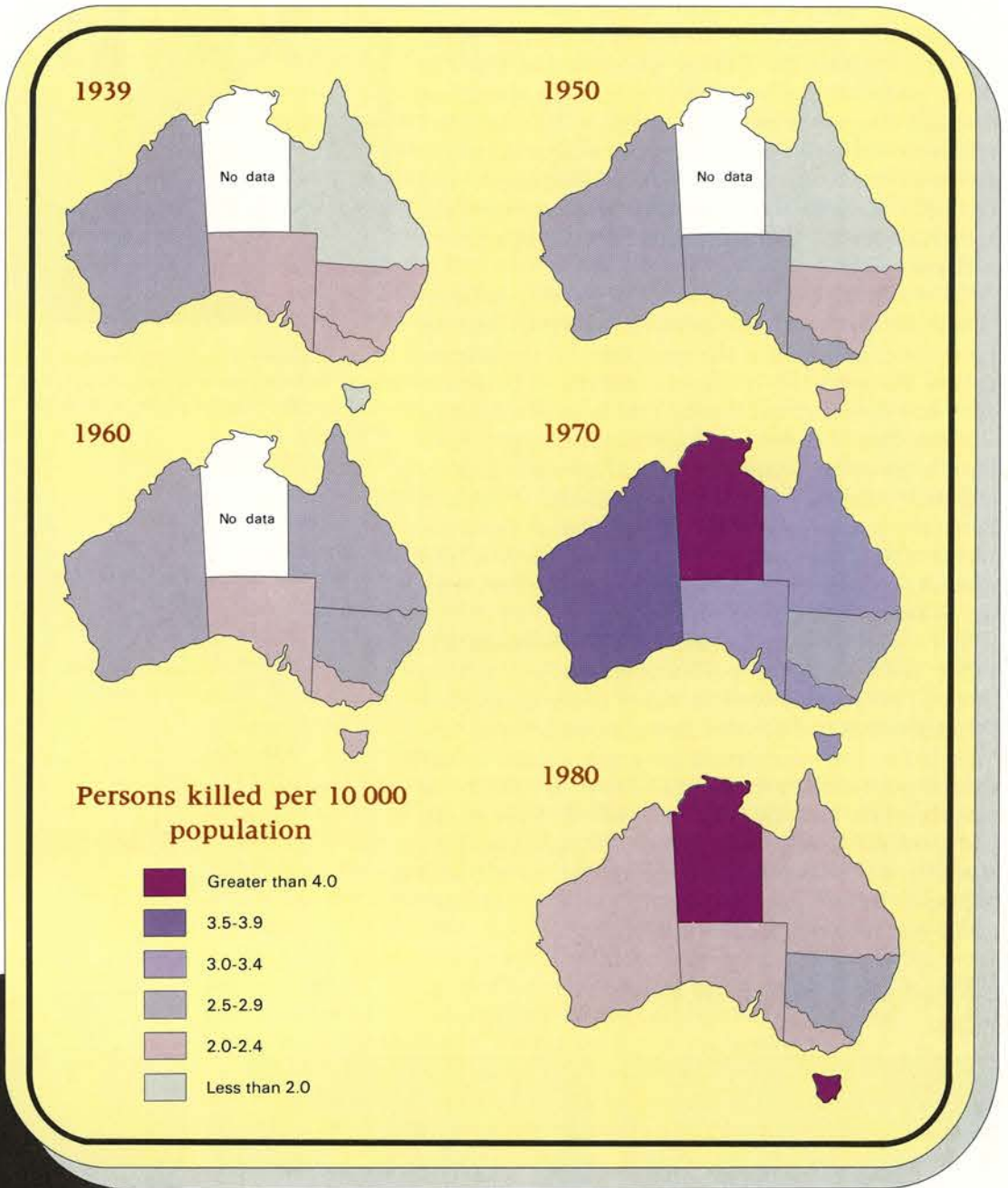
To combat the rise in the number and rate of road deaths since the 1930s, state authorities have introduced such measures as the compulsory wearing of seatbelts, and random breath testing for alcohol. Although these new laws have been effective to some degree, fatalities from road accidents continue to occur at a great rate.

MAGAZINE PROMOTIONS

Road fatalities

Persons killed per 10 000 vehicles

New South Wales
Queensland
South Australia
Tasmania
Victoria
Western Australia

Queensland

**Road deaths by statistical divisions
1982**

609 deaths

Brisbane
Provincial cities
Other

Map values: 50, 22, 46, 44, 5, 57, 56, 6, 61, 120, 142

Road deaths by age and sex

Male | Female

Over 60
50-59
40-49
30-39
21-29
17-20
5-16
0-4

Age

150 100 50 0 50 100 150
Number of deaths

Road deaths by time of day

Midnight
10.00 pm
8.00 pm
6.00 pm
4.00 pm
2.00 pm
12.00 noon
2.00 am
4.00 am
6.00 am
8.00 am
10.00 am
5 10 15 20

Road deaths by days of the week

25
20
15
10
5

Percentage

Mon Tues Wed Thur Fri Sat Sun

Victoria

709 deaths

Other | Melbourne

Map values: 23, 14, 46, 58, 32, 24, 357, 11, 27, 35, 47, 35

Road deaths by age and sex

Male | Female

Over 60
50-59
40-49
30-39
21-29
17-20
5-16
0-4

150 100 50 0 50 100 150

Road deaths by time of day

Midnight
10.00 pm
8.00 pm
6.00 pm
4.00 pm
2.00 pm
12.00 noon
2.00 am
4.00 am
6.00 am
8.00 am
10.00 am
5 10 15 20

25
20
15
10
5

Mon Tues Wed Thur Fri Sat Sun

Western Australia

236 deaths

Other | Perth

Provincial cities

Map values: 13, 15, 3, 17, 21, 101, 32, 22, 12

Road deaths by age and sex

Male | Female

Over 60
50-59
40-49
30-39
21-29
17-20
5-16
0-4

150 100 50 0 50 100 150

Midnight
10.00 pm
8.00 pm
6.00 pm
4.00 pm
2.00 pm
12.00 noon
2.00 am
4.00 am
6.00 am
8.00 am
10.00 am
5 10 15 20

25
20
15
10
5

Mon Tues Wed Thur Fri Sat Sun

Health care

Public hospitals in 1861 and 1901

▲ Opened by 1861 and closed by 1901

✚ Opened by 1861 and still open in 1901

✖ Opened between 1861 and 1901

Scale 1 : 20 000 000
0   250   500 Kilometres

H EALTH CARE has always been as much a
financial as a medical problem. Few Austra-
lians have ever been able to finance their
own health care. For most people during the
nineteenth century, being sick and unable to pay for
care went hand in hand. Help came from charitable
societies, insurance societies and, most importantly,
from the government.

Sydney was served by a hospital as early as 29
January 1788 when surgeon White opened a tent
hospital. This was replaced by a building that could
accommodate eighty patients. Van Diemen's Land,
Moreton Bay and other outstations established similar
hospital care. Surgeons, buildings and medication
were all provided by the government. Poor free
settlers also received medical treatment from these
government-run hospitals. By 1826 the Sydney
hospital had a publicly supported dispensary for the
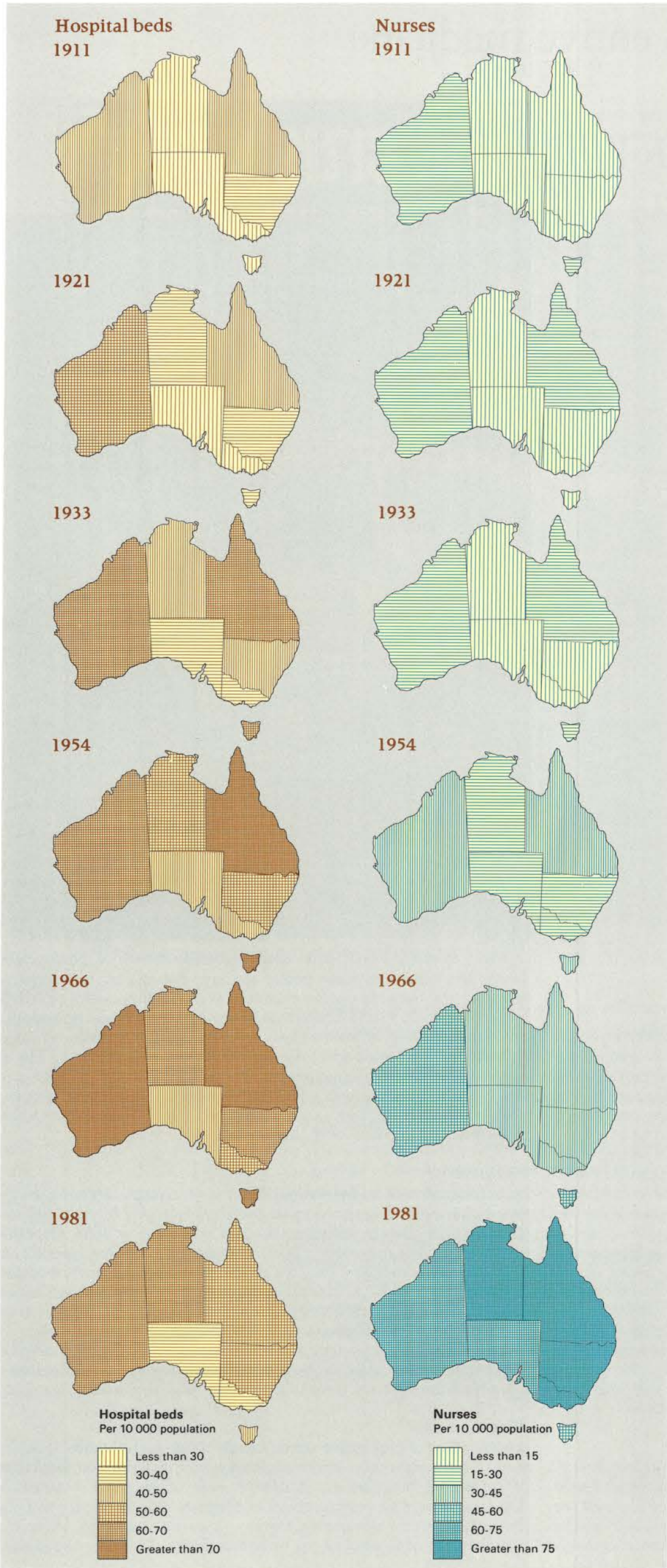outpatient care of free settlers.

As settlement expanded, the need for centres to
care for the sick, aged and poor in country districts
grew. Local charities were often hard pressed and
government assistance was needed. Medical care for
the mass of the population became institutionalised
in newly opened hospitals. By 1861 all colonies had
systems of public hospitals. Victoria and New
South Wales already had nineteen hospitals. During
the next 40 years, more than 220 public hospitals
were opened throughout Australia, though in South

Australia only one public hospital had been opened
before 1901.

The growth of hospitals during the second half of
the nineteenth century reflects changes both in their
usage and in the value placed on them. By the early
twentieth century, more people were using hospitals,
an increase that did not just reflect the demands of a
larger and older population. It indicated that by the
1900s hospitals were no longer seen as places in
which to treat the poor or as hospices for the dying;
they were places that could offer cures and relief for
illness. This changed attitude to hospitals increased
the demand for them and hospitals became community
services. Admissions rose steadily.

*The original North Shore Hospital, built
on Willoughby Road, Crows Nest in New
South Wales. The foundation stone was laid
by Sir Henry Parkes on 18 June 1887.*
ROYAL NORTH SHORE HOSPITAL

Hospital beds

1911

1921

1933

1954

1966

1981

Hospital beds
Per 10 000 population

- Less than 30
- 30-40
- 40-50
- 50-60
- 60-70
- Greater than 70

Nurses

1911

1921

1933

1954

1966

1981

Nurses
Per 10 000 population

- Less than 15
- 15-30
- 30-45
- 45-60
- 60-75
- Greater than 75

Expansion of services

By 1911 there was a well-established demand for hospitals but the numbers of beds and nurses were limited. Only in Western Australia and Queensland were there more than 40 hospital beds per 10 000 of the population and, apart from Western Australia, all states were poorly supplied with nurses.

The need for beds was more quickly met than that for nurses. By 1933 Western Australia, Tasmania and Queensland had from 60 to 70 hospital beds for each 10 000 of their population. South Australia and Victoria remained relatively poorly supplied. From 1911 to 1921 only Queensland managed to improve the overall supply of nurses in relation to its total population and by 1921 the ratio in this state was the same as that of Western Australia. The ratio of nurses to population was less than 15 per 10 000 in the remaining states. From 1921 to 1933 these ratios remained constant, except in Tasmania.

From 1933 to 1954 the provision of hospital beds and nurses improved substantially in all states, an improvement that continued through the 1960s. By 1966 both Queensland and Western Australia provided more than 70 beds for each 10 000 of their population, and even in South Australia, the least well-supplied state, there were between 40 and 50 per 10 000 population. Additional beds were provided both in city and country hospitals. The ratio of nurses to population also greatly improved.

Rationalisation

After the 1960s, hospital services were rationalised. Some country hospitals closed; many reduced the number of wards and beds. Many factors encouraged rationalisation and the establishment of regional hospitals to serve larger areas. It was now possible to transfer seriously ill patients in the country to city hospitals for specialist care. Better treatment reduced the time people stayed in hospital. Declining populations in country districts meant that many areas were oversupplied with hospital beds. For example, in New South Wales in 1981, the far west of the state had 114 beds per 10 000 of the population and the beds had an occupancy rate of less than 60 per cent. In contrast, the western suburbs of Sydney had only 29 hospital beds per 10 000 and the beds had an occupancy rate of nearly 80 per cent.

The decline in the overall number of hospital beds following rationalisation has been partly offset by a rise in the number of nurses per 10 000 of the population. Since 1971 the number has risen and no state has less than 45 nurses per 10 000 people.

Hospital beds and nurses

Number per 10 000 population

Hospital beds

Nurses

1901 1911 1921 1933 1947 1954 1961 1966 1971 1981
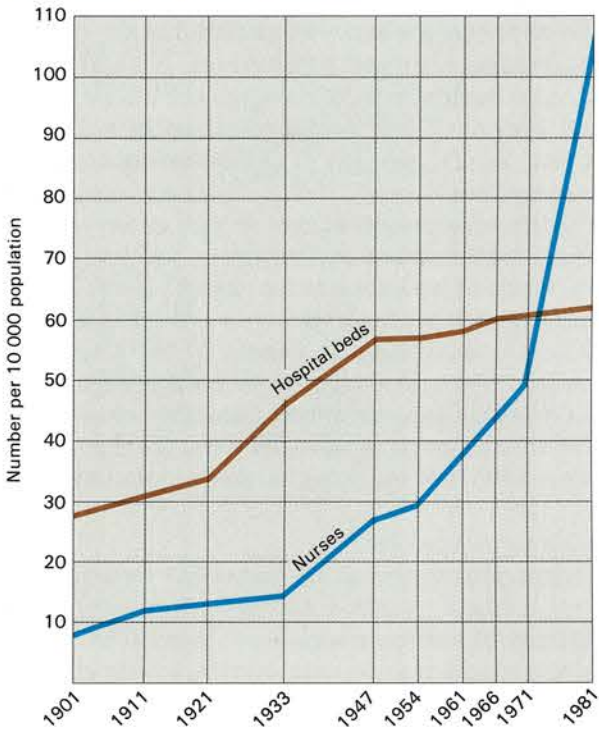
Preventive medicine

PATTERNS OF SERIOUS disease have changed dramatically in Australia during this century. In 1920 most deaths in young children were caused by gastroenteritis, diphtheria, pneumonia and measles. Nowadays these diseases have been replaced among the very young by accidents, the consequences of birth defects and cancers. The place of tuberculosis as a leading cause of death among adults until middle age has been taken by traffic accidents, by far the greatest risk to life for Australians under forty. At older ages the picture is dominated by heart disease, cancers and strokes.

In many ways, disease and accident prevention has become more difficult. With the major epidemic diseases of former times, it was a matter of breaking the chain of infection by isolating infected persons, inducing individual resistance by immunisation and eliminating environmental conditions which encouraged epidemics. Many preventive principles have been institutionalised in the monitoring and regulatory responsibilities of government agencies. Yet environmental determinants of health, such as impacts from pollutants, radiation and chemicals are still prominent. Infectious agents remain significant and include new viral onslaughts, of which AIDS (Acquired Immunodeficiency Syndrome) is the prime example.

Funds committed to preventive medicine in Australia were estimated to be less than 0.5 per cent of total health expenditures ($10.8 billion) in 1981–1982. In general, commonwealth government grants influence the direction of major preventive activities. State and territory governments conduct a range of activities, including health promotional programs and traditional services aimed at vulnerable groups. Voluntary organisations and the medical care sector are concerned mainly with preventive strategies for specific diseases or disabilities.

Health programs
Health programs aim to induce behaviour which will help prevent a number of diseases or disabilities rather than merely one class of disorder. At the individual level, preventive 'packages' are designed for family doctors to administer to patients. Two clinics in Australia, Sydney's Medicheck Referral Clinic and Melbourne's Shepherd Foundation, offer health screening to detect early signs of disease.

Addressed to the larger population, government-sponsored health campaigns aim to reduce unhealthy behaviour; example is the 'Life — be in it' program conducted by the Victorian Department of Youth, Sport and Recreation.

Heart disease and strokes are still major targets for prevention in Australia. Aims currently pursued are the detection and control of high blood pressure, reduction of stress and of dietary salt and fat, cessation or avoidance of cigarette smoking, regular physical exercise and avoidance of alcohol abuse.

Cancer prevention
Australians have the highest known incidence of skin cancers, especially melanomas. Exposure to sunlight is a causal factor, so campaigns have been introduced to reduce excessive sunbathing or other activities which leave individuals unprotected against the sun. Cigarette smoking is a causal factor in cancer of the lung, the mouth, larynx, oesophagus and bladder, and is also incriminated in the causation of heart disease, chronic bronchitis and emphysema. Several preventive strategies are directed specifically at encouraging the public to avoid the habit. Educational programs encourage cessation of smoking, and are aimed at school children, women of child-bearing age and women taking oral contraceptives.

Preventive measures against dietary causes of cancer include promotion of diets high in fibre and vitamins and low in fat. Excessive alcohol consumption also increases the risk of cancer, and some food processing involving pickling, salt curing or smoking is under suspicion.

There is increasing awareness of the cancer-inducing potential of radiation. Medical x-rays are by far the largest source of exposure, so should be kept to a minimum. Identified causes of cancer in the working environment, such as asbestos particles that can cause mesothelioma, are the subject of much protective regulation and legislation.

Accident prevention
Accident prevention is an Australian priority; accidents involving a motor vehicle account for 80 per cent of all accidental deaths. Emphasis has been on legislative provisions: mandatory seat-belt use, laws enforcing the wearing of motorcycle crash helmets and random roadside breath testing in some areas. Major campaigns have encouraged road safety among children and discouraged the use of alcohol or

The crushproof box for smokers
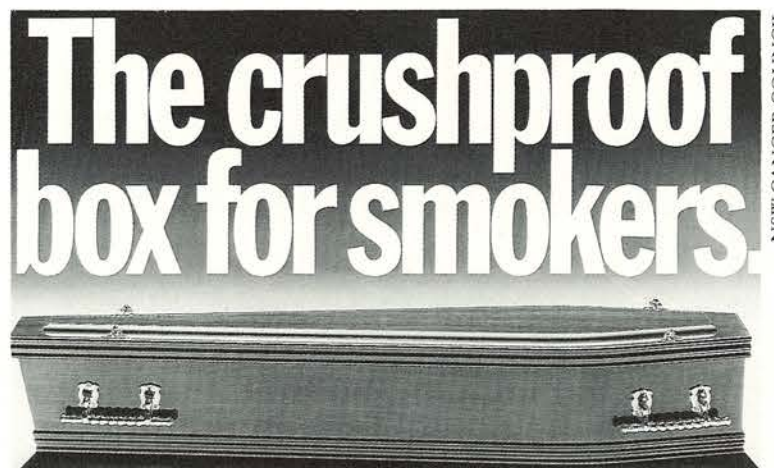
drugs before driving.

Educational measures against other types of accidents range from the provision of home safety information to confidence-building programs for adolescents (among whom there is an appreciable risk of suicide or attempted suicide). Increasing attention is being given to technological safeguards (for example, against flammable clothing or potentially dangerous toys) and to preventive legislation. Twenty-four-hour crisis counselling ('Lifeline') and poison information centres are important in preventing self-inflicted or accidental trauma.

Alcohol and drugs
Increasing awareness of the personal and social costs of alcohol and drug misuse in Australia has generated renewed attempts at prevention, such as advocacy for such measures as lowering the prescribed blood alcohol level for drink-driving offences, further restrictions on the advertising of alcohol and stricter regulation of the prescription of narcotic and psychotropic medications. Specific target groups and usage patterns require specially designed educational campaigns. For instance, among Australian teenagers the predominant pattern of chemical abuse is with alcohol, analgesic drugs, solvents and cannabis; among Aborigines the problem is confined mainly to alcohol and petrol-sniffing.

Infectious diseases
The control of infectious diseases in Australia lies mainly in the preventive area. Immunisation programs aim to reduce and eventually eliminate some infections which still cause illness and, occasionally, permanent disability or death. These include diphtheria, mumps, rubella and measles.

AIDS is one instance of a 'new' epidemic disease of viral origin which has caused extreme public anxiety. Because no treatment is available yet, the only option currently available for control of AIDS is to minimise the spread of infection by preventive methods. In Australia the disease is largely confined to several high-risk groups — male homosexuals, persons receiving regular blood transfusions or blood products and users of intravenous non-prescription drugs. The preventive approach consists of identifying persons in these groups, detecting, and educating in preventive practices, those infected and those who have contact with them.

Pollution
Prevention of environmental pollution is receiving increasing attention in Australia. Prevention of air pollution is largely directed against the burning of fuels by industry, transport and domestic users. Harmful effects are mostly respiratory. There may also be harm from specific air contaminants, especially lead, which in high concentrations is thought to result in neurological damage to children. Water contamination can spread infectious diseases, and poisoning can result from toxic levels of chemicals, metals and salts.

Preventive solutions are being constructed gradually, and involve legislation supported by public education. But high costs inhibit many desirable improvements, especially for water treatment in rural Australia.

Antenatal care
Another area of preventive activities surrounds reproduction. Family planning is a preventive health measure which assists in the reduction of unwanted pregnancies. Antenatal care of pregnant women is designed to prevent complications of pregnancy or maternal practices that may harm the developing foetus — cigarette smoking, excessive consumption of alcohol or use of certain drugs. A rapidly expanding strategy is the antenatal detection of genetic disorders in a foetus.