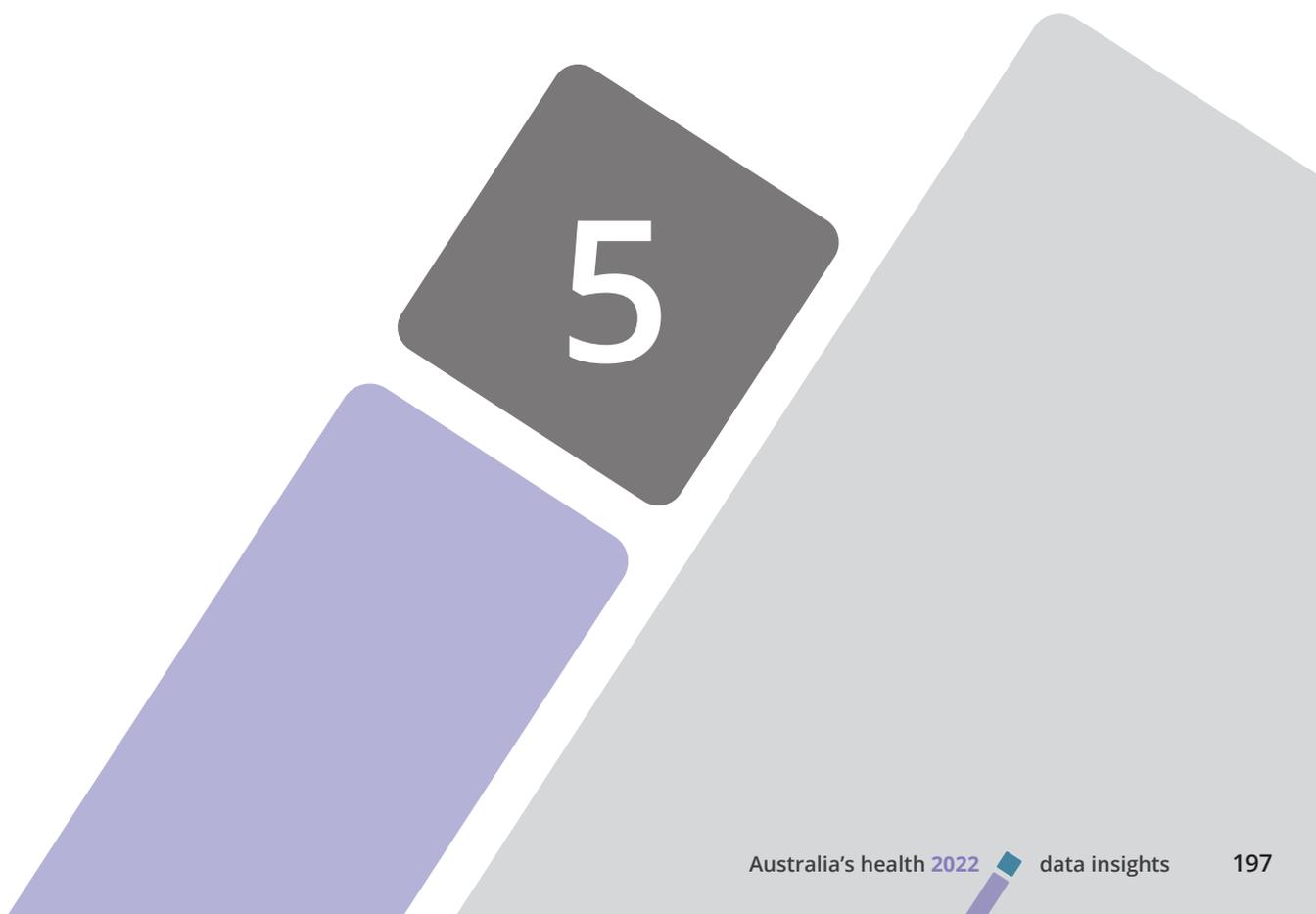


Australia's health care system: its evolution from the Spanish influenza to COVID-19



5

Australia's health care system: its evolution from the Spanish influenza to COVID-19

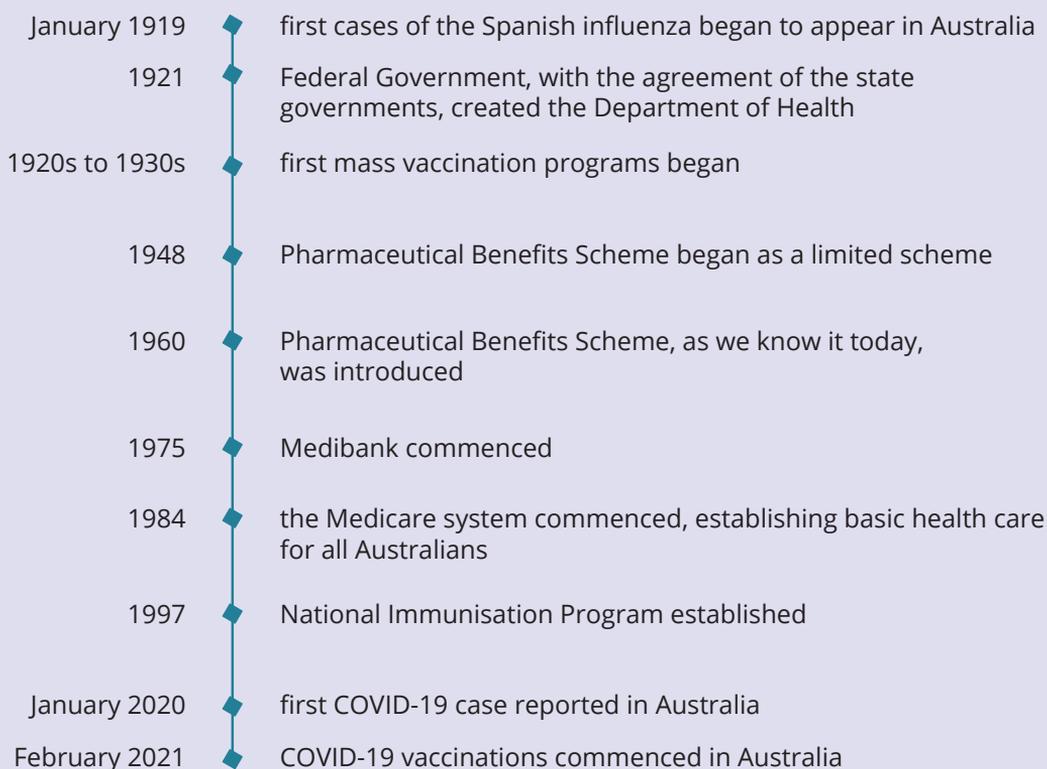
Key messages

The Coronavirus disease 2019 (COVID-19) pandemic has been one of the biggest public health challenges Australia has faced since the Spanish influenza around 100 years ago.

Some strategies adopted during the pandemic to prevent the spread of the disease – such as controlling population movement, quarantining and mask wearing – were also used during the Spanish influenza.

Despite these similarities, over the last 100 years, Australia's health system has changed in many ways in terms of its characteristics and how it is managed; it has also been changed by technical and pharmaceutical advances.

Key events in the health system between the Spanish influenza and COVID-19



Until the COVID-19 crisis, the Spanish influenza pandemic of around 1919 was one of the worst public health crises Australia had faced (Bongiorno 2020). An estimated 40% of the Australian population of 5 million people became ill and around 15,000 died during the Spanish influenza (Department of Health 2011; Gruszyn et al. 2012; NMA 2021).

These 2 pandemics, roughly 100 years apart, bookend substantial change in Australia's health system and in some ways, have helped to shape it. While the full impact of the COVID-19 pandemic is yet to be known or seen, this article summarises the major developments in the health system since the Spanish influenza. It covers changes in responsibilities for administering and funding the health system, public health measures, medicine policy and vaccinations, and the development of medical care and technologies such as critical care and intensive care units.

Federated responsibilities

After Federation, the delivery of health care was, at first, largely a state government or private responsibility. The Australian Constitution (1901) granted powers to the Federal Parliament only on quarantine matters (as far as public health matters were concerned) related to preventing diseases entering Australia (Biggs 2016; Hilless and Healy 2001; Sheehan 2020).

When the Spanish influenza first appeared in Australia, effective health treatments beyond basic nursing care were limited. Despite attempts to control movement across and within states, the disease spread across the country.

At that time, while some free treatments were provided in public and charitable hospitals, most health care was privately funded on a fee-for-service basis paid 'out of pocket' or by taking out insurance in funds known as friendly societies (Box 5.1) (Hilless and Healy 2001). In many cases, the hospitals treating the poor were staffed by honorary doctors working for no pay but who charged the wealthy for medical services provided in private rooms (RACGP 2008).

Given the local and fragmented nature of health care in Australia at the time, coordinating a response to the Spanish influenza pandemic was difficult. In 1921, this was recognised when the Federal Government, with the agreement of the states, created the Department of Health (Department of Health 2021a; Hilless and Healy 2001). Initially the department looked only after quarantine and 'reporting infectious diseases, public health research laboratories and occupational health' (Department of Health 2021a). Today, the Department of Health has been the primary funder of health care during the COVID-19 pandemic and the national coordinating and advisory body for the health response, including through the Office of Health Protection and the Chief Health Officer.

The roles of Australian governments have evolved through the pandemic. In the early stages, the National Cabinet, which was set up to consider such matters, reviewed restrictions on business and other measures to reduce infection, which were then largely implemented nationally. Later, state and territory governments played a stronger role in determining the restrictions that would apply in their jurisdiction. This development reflected the differing circumstances of jurisdictions in terms of their population characteristics and the timing and nature of COVID-19 outbreaks. Throughout the pandemic, state and territory governments have been mainly responsible for setting up testing and vaccination services, enforcing public health directions and managing the capacity of hospital services to care for critically ill patients. The Australian Government has been responsible for procuring and approving vaccination supplies and, in large part, making payments to individuals and businesses as part of an economic response to the pandemic.

Health insurance and funding

Private health insurance (PHI) schemes began in Australia with the friendly society movement (Box 5.1); many of today's health funds have their origins in these organisations (ABS 2012; Gale and Watson 2007). Voluntary PHI was the dominant form of health insurance until the public health insurance scheme was established (Duckett and Nemet 2019).

Box 5.1: Friendly societies

Friendly societies were mutual self-help organisations that covered the gap between people who qualified for free medical treatment and people who could afford to pay medical fees. Local groups banded together to form these societies. Members contributed fees on a regular basis; in turn, the society provided members and their families with general practitioner services and paid for their treatment and/or funeral benefits when required (Gale and Watson 2007; Hillless and Healy 2001; RACGP 2008).

In the decades following the Spanish influenza pandemic (during which World War II occurred), new health technologies and treatments, such as vaccines, emerged and debate continued on the role of the Australian Government in the health sector. The 1946 referendum on Social Services amended the Constitution to give the Australian Parliament new health responsibilities; specifically, to give it the power to make laws for the provision of pharmaceutical, sickness and hospital benefits, and to deliver and fund medical and dental services (AEC 2012; Goddard 2014; Senate Select Committee on Health 2016).

A few years later, the *1953 National Health Act* (Cth) came into effect. Among other functions, this act gave certain roles to the Australian Government in relation to the provision of health benefits and vaccines. This act, and the Medical Benefits Scheme (also set up in 1953), implemented arrangements whereby people who met a means test received free treatment in public wards by honorary specialists, while others paid for medical and hospital services (Gale and Watson 2007).

At this time, the Australian Government also introduced a subsidy – administered by non-profit voluntary health funds – for health services (Gale and Watson 2007). To keep premiums affordable, funds did not have to insure against pre-existing conditions, chronic illnesses or hospitalisations longer than a specific period (Gale and Watson 2007). In 1953, 83% of the population belonged to a private fund (Gale and Watson 2007). Of the remainder, many received benefits via pensions or as war veterans (RACGP 2008).

In 1975, Medibank was established, which provided Australians with access to hospital and certain medical services free of charge and without means tests; however, by 1978 it had been dismantled (Gale and Watson 2007). It was replaced in 1984 by the Medicare system. Today, Medicare supports the right to universal access for all Australians to a wide range of health and hospital services at low or no cost, as well as subsidising a large number of prescription medicines. These arrangements are administered through the Medicare Benefits Schedule (MBS) and the Pharmaceutical Benefits Scheme (PBS).

The establishment of a universal public health insurance scheme tended to draw people away from private funds, which lost a considerable number of members (Gale and Watson 2007); by the late 1990s, membership had fallen to around 31% (APRA 2021). As a result, various rebates and incentives were introduced to grow and maintain membership rates. Between 2000 to 2019, around 45% of the population, on average, in Australia had PHI (APRA 2021).

At this stage, it is not possible to determine what real impact the COVID-19 pandemic has had on PHI. Membership slightly increased in 2021, possibly attributable to COVID-19, even though access to medical services funded through PHI were curtailed due to pandemic restrictions. After falling steadily from 2015 through to 2020 (from 47% to 44%), PHI coverage was 45% in the December 2021 quarter (APRA 2021).

There are now around 34 PHI providers, although 80% of consumers are covered by the 5 largest PHIs (Commonwealth Ombudsman 2020).

Currently, the ratio of total health spending in Australia in the public and private sectors is around 70% to 30%, respectively. As well as managing the MBS and PBS programs, the Australian Government is responsible for system management, policy

and funding for general practitioners (GPs) and primary health care services, and for establishing Primary Health Networks. It contributes the most to overall health spending (around 43% of total spending in 2019–20).

The state and territory governments have primary responsibility for managing public hospitals as well as a variety of additional service delivery and regulatory roles; in 2019–20, they contributed 28% of total health spending in Australia (AIHW 2021c). Each state and territory also receives Australian Government payments that are tied to specific hospital activity levels and funding arrangements.

This complex sharing of roles and responsibilities influenced how Australia has responded to the COVID-19 pandemic, with a variety of measures requiring coordination across governments and sectors within the health system. For example, the COVID-19 vaccine program has largely been managed through cooperative arrangements; vaccines have been delivered through a range of channels, including dedicated clinics managed by state and territory governments, many general practices and selected pharmacies.

Public hospitals

Since Medicare was established, Australian and state and territory governments have funded and provided public hospital services under a series of agreements. The basic principles of these agreements have not changed, with the latest National Health Reform Agreement (NHRA) 2020–2025 (CFFR 2020) reaffirming the commitment of all governments to the Medicare principles, which underpin public hospital services (Box 5.2). The NHRA outlines the shared responsibility of the governments to work in partnership to improve health outcomes and to ensure the sustainability of the health care system. It has a particular focus on public hospital funding.

Box 5.2: Principles established by early funding arrangements

The first iteration of agreements, Medicare Agreements, were signed under the *Medicare Agreements Act 1992* (Cth) which contained the key principles of:

- choices of services, whereby people were to be given the choice to receive public hospital services free of charge as public patients
- universality of services, whereby access to public hospital service was based on clinical need
- equity in service provision, whereby states would ensure that the provision of public hospital services is equitable, regardless of geographic location (Senate Select Committee on Health 2016).

The NHRA recognises the states and territories as the managers of the public hospital system and public health services as well as of relationships with local hospital networks. Local hospital networks are independent authorities set up by the states and territories to manage public hospital services and funding (CFFR 2020).

The NHRA has formed an important part of the COVID-19 response, with its framework used to implement specific pandemic arrangements. In particular, the Australian Government provided additional funding and guarantees to state and territory governments to help ensure that their hospital systems had adequate capacity to manage the impact of COVID-19 (Morrison 2020). A range of other initiatives and further additional funding arrangements were also put in place, together with broader measures, such as restricting the volumes of elective surgery (AIHW 2021b).

Private hospitals

Private hospitals are largely owned and operated by private (non-government) organisations – either for-profit companies or not-for-profit organisations (AIHW 2016). Private for-profit and religious/charitable hospitals provide around 80% of available beds in private acute care and psychiatric hospitals (Senate Standing Committee on Community Affairs 2000).

From the time of the Spanish influenza until the late 1970s, many private for-profit hospitals were small institutions, often owned and operated directly by medical practitioners. From the 1990s, the private hospital sector grew considerably, with corporations entering the for-profit market (PC 1999; Senate Standing Committee on Community Affairs 2000). For instance, from 2006–07 to 2016–17, the number of private hospitals increased from 557 to 657, with their income increasing from around \$7.5 billion to \$15 billion (ABS 2018b).

The Australian Government now regulates private hospitals through various provisions of the *National Health Act 1953* (Cth) and the *Private Health Insurance Act 2007* (Cth). Private hospitals also need to be licensed by each state and territory government. The licensing requirements vary across jurisdictions (Department of Health 2012), but most jurisdictions incorporate controls on the number and geographical location of private hospital beds (PC 1999).

Private hospitals undertake most elective surgeries in Australia. In 2018–19, two-thirds (66%) of all elective admissions to hospital involving surgery were to private hospitals, with the number of hospitalisations of this type having grown at an average of 1.2% each year since 2014–15. The COVID-19 pandemic response has, at times, restricted health care activity, including the volume of elective surgery. This has reduced the activity of private hospital facilities and related medical specialist and allied health

services. For example, the number of hospitalisations in private hospitals for an elective admission for surgery fell by 5.7% between 2018–19 and 2019–20 after national restrictions on elective surgery were introduced in March 2020 (AIHW 2021a).

Recognising resources that might be available to help respond to the COVID-19 pandemic (including essential equipment and staff), the Australian and state and territory governments initiated a range of agreements with private hospitals to ensure a cooperative approach. These agreements, such as the National Partnership on COVID-19 Response (see <https://federalfinancialrelations.gov.au/agreements/covid-19-response>), enabled sharing of resources and continuing care to vulnerable populations who might have ordinarily received care in a public hospital. They also preserved the viability of private hospitals during this critical time, enabling them to continue their operations when the pandemic response ended.

Health protection and other public health measures

The health protection and other public health measures introduced to manage the Spanish influenza and COVID-19 were similar in many respects. Before it was known that the Spanish influenza had reached Australia, strict quarantine measures were introduced in an attempt to keep it out of the country; these were removed when the first case was confirmed in Melbourne in January 1919 (NMA 2021). States made their own arrangements to handle and contain disease outbreaks, including organising border controls. In Sydney strict measures were implemented to limit the spread of the disease, including closing schools and places of entertainment and mandating the use of masks (NMA 2021). Such measures did not prevent the spread of the disease but they did slow its movement (NMA 2021).

How health messages and communication are delivered has changed considerably since 1919. During the Spanish influenza, efforts were made to slow transmission through public health education initiatives, such as distributing information flyers (Stephens 2020). This contrasts with the way the COVID-19 pandemic has been managed: social media and daily briefings by politicians and health officials covering key announcements and presenting latest case numbers.

While the way in which health information is delivered has changed since the Spanish influenza outbreak, some public health measures and restrictions adopted for the COVID-19 pandemic were similar. For instance, the strict border controls; quarantine and contact tracing measures; and the closure of schools, non-essential retailers, places of entertainment and workplaces. During COVID-19, travel has been restricted and, where possible, people have worked or studied from home. At various stages, wearing of masks has been mandated in specific contexts, and social distancing and hand hygiene have been encouraged throughout (see 'Health promotion and health protection' at <https://www.aihw.gov.au/reports/australias-health/health-promotion>).

Telehealth

One way that these measures were supported was through the expansion of telehealth arrangements. Telehealth is the umbrella term for the electronic and telecommunication based expansion of health care services, which include telemedicine (telehealth clinical services) and electronic health record systems (Bursell et al. 2013). In the early 1990s, telemedicine was described as:

‘the linking of doctors, nurses, patients and specialists using telecommunications with additional facilities such as slow scan television and voice conferences. Computer-based systems can also provide access to diagnostic images and pathology reports as well as computer-based information retrieval systems’ (AIHW 1993:1).

The Australian Government funds telehealth services – real-time telephone and video consultations – through the MBS, while state and territory governments administer teleconsultations within the public hospital system (Taylor et al. 2021).

During COVID-19, an important measure to prevent disease transmission was the introduction of government subsidies for a wide range of medical professionals that expanded access to telehealth under Medicare for consultations that had not previously been eligible. In 2020, 23% of all Medicare services were telehealth service – primarily delivered by telephone (AIHW 2021b). Of Medicare subsidised services, consultations with GPs were most likely to be conducted via telehealth (25% of consultations in 2020) compared with specialist (17%) and allied health attendances (16%).

Medicine policy and vaccines

Contrasting with the rapid development of vaccines for COVID-19, little was known about viruses at the time of the Spanish influenza (Sheehan 2020). Despite this, multiple groups around the world, including some in Australia, worked to develop a vaccine. Millions of doses of vaccine were made and then distributed, without the clinical trials required today. The vaccines were what would now be called broad-spectrum vaccines; primarily, they reduced the number of secondary infections in people who already had influenza by ‘collecting gunk out of the lungs of people who had confirmed cases of pneumonic influenza’ (Lyons and Taylor 2020). The demand for vaccination was strong, with a quarter of the population of New South Wales lining up to get it voluntarily (Lyons and Taylor 2020).

One group working on the Spanish influenza vaccine was Commonwealth Serum Laboratories (CSL), set up by the Australian Government in 1916 to reduce Australia's dependence on overseas vaccines (NMA 2021; NSW Health Department 1997). As well as a vaccine for the Spanish influenza, CSL developed vaccines for typhoid, cholera, plague, smallpox and diphtheria antitoxin (Burgess 2003).

During the 1920s and 1930s, the first mass vaccination programs began, including school-based vaccination programs immunising against diphtheria (Burgess 2003; NCIRS 2021). The outbreak of World War II (in 1939), again stimulated vaccine development, as it was feared that a recurrence of an influenza pandemic might decimate the armed services (NSW Health Department 1997). The availability of these and other vaccinations (including against polio and tuberculosis), along with improvements in social conditions and the availability of treatment options, markedly reduced deaths from infectious diseases over the course of the 20th century. For more information, see Chapter 4 'Changing patterns of mortality in Australia since 1900'.

The successful Social Services referendum in 1946 (with consequential change in constitutional powers) led to the passing of the *Pharmaceutical Benefits Act 1947* (Cth) (Biggs 2003), with the first round of medicines to be subsidised directed towards antibiotics and vaccines for conditions such as diphtheria. The PBS, as it is known today, came into effect in 1960; it was established under the *National Health Act 1953* (Cth) (Department of Health 2021b; Goddard 2014; Grove 2016).

Although the PBS has historically been used to subsidise vaccines, few now remain on it. In recent years, new vaccines have been listed predominantly on the National Immunisation Program (NIP) Schedule. Under legislation, the Pharmaceutical Benefits Advisory Committee must consider both PBS and NIP listings.

The Australian Government retained responsibility for vaccination programs until 1988, when it was transferred to state and territory governments (NCIRS 2021). This resulted in variation across Australia in implementing the NIP. Each jurisdiction used different vaccine schedules, pricing varied, and some diseases (such as measles) were not well controlled (Ruff et al. 2012).

In 1993, the first national strategy for immunisation (1993 to 2001) was produced by a panel of experts on behalf of the National Health and Medical Research Council, which set out a common vaccination schedule and fixed pricing for all states and territories (NCIRS 2021). The strategy outlined clear responsibilities for immunisation through a childhood immunisation agreement between the Australian and state and territory governments. It also specified:

- better mechanisms for recording and reporting data
- better coordination between public and private sector providers
- recommendations for immunisation coverage (Department of Health 2019).

Australian and state and territory governments established the NIP in 1997 to reduce the number of cases of diseases preventable by vaccination by increasing immunisation coverage (Department of Health 2021d). The NIP is delivered and coordinated across these levels of government. It is underpinned by the National Immunisation Strategy (currently for 2019–2024) (Department of Health 2019), which outlines strategic priorities and regulation policy. A range of committees and other bodies play key roles in advising on and directing the strategy. Today, the NIP is viewed as a key success in Australia’s immunisation coverage. For more information, see Chapter 4 ‘Changing patterns of mortality in Australia since 1900’.

In the mid-2000s, Australian immunisation agreements enhanced coordination between the Australian Government and state and territory governments. This led to consistent funding for all vaccines of the NIP in return for agreed outcomes for immunisation coverage and vaccine wastage (Ruff et al. 2012).

As with all medicines today, several phases of clinical trials of COVID-19 vaccines were conducted before they were approved for use (Box 5.3). Their rapid development was made possible by:

- considerable international efforts and coordination
- the ability to undertake trials concurrently (rather than sequentially)
- the availability of newer technologies (Department of Health 2021c). One such technology was the availability of mRNA (Messenger RNA) vaccines that had been researched in recent decades for use in protecting against other diseases and can now be produced more efficiently than traditional methods of production (CDC 2022).

Box 5.3: Current process for authorising new medicines and medical services

The Medical Services Advisory Committee (MSAC) and the Pharmaceutical Benefits Advisory Committee (PBAC) are the bodies responsible for assessing and recommending new medicines and medical services for public funding in Australia. Both committees analyse the comparative safety, clinical effectiveness and cost-effectiveness of proposed medicines and medical services and technologies throughout their evaluation.

The committees have defined assessment procedures and use several subcommittees to assist them with their evaluation. The PBAC, for example, uses an Economics Subcommittee to assess clinical and economic evaluations of medicines submitted to it for listing; the subcommittee advises the PBAC on technical aspects of these evaluations.

Both committees analyse cost-effectiveness as part of their scope. For example, the MSAC uses a 5-year time horizon to evaluate cost-effectiveness, using metrics such as:

- the number of people likely to use the proposed medical service
- the number of times the proposed medical service is delivered
- the costs for each form of the proposed medical service, multiplied by the relevant unit costs.

Transformation of medical care and specialisation

In 1919, although hospitals may have had separate clinical departments, 'there was little evidence of any organised specialisation' (Storey 2014). This changed after World War I. The experiences and needs of patients after the war drove greater specialisation of medical practice and the development of postgraduate training opportunities. The first medical college, the Royal Australasian College of Surgeons, was established in 1927 (Storey 2014).

Critical and intensive care medicine have been particularly important areas of medical care in combating the COVID-19 pandemic:

- Critical care medicine (CCM) is a highly specialised medical field. It has developed rapidly over recent decades and plays an increasingly crucial role in providing hospital care (Thompson et al. 2017). CCM has the capability to reverse near-fatal states and to temporarily support failing vital functions, systems and organs, while the patient recovers from the underlying disease process (Villar et al. 2001).
- Intensive care is a separately recognised specialty in Australia, with specific postgraduate training and qualifications. ICUs are dedicated wards, usually staffed by specifically trained intensive care specialists (Hillman 2007), where patients can be continually observed and monitored, with life support (including ventilation) provided if needed.

The first respiratory unit using tank ventilators in Australia was established in the late 1950s, and the first unit using positive pressure mechanical ventilators (which 'deliver' breaths to the patient to make breathing easier) in 1961 (Blyth 1987). Use of positive pressure ventilators had become widespread after a polio epidemic in Denmark in 1952 when it was used to treat patients with acute respiratory failure – a milestone usually regarded as the 'birth' of intensive medicine. Before this, ventilation support relied on the 'iron lung', which was based on negative pressure ventilation – breathing was stimulated by applying negative air pressure to expand the chest, thereby expanding the lungs and allowing air to flow in.

During the 1970s, the scope of intensive care increased, and today ICUs now care for 'critically ill patients with a wide range of life-threatening respiratory, circulatory, neural and metabolic disorders caused by trauma, sepsis and meeting medical, surgical and paediatric diseases' (Blyth 1987). Intensive care physicians have, since the 1970s, been transforming medicine by integrating knowledge derived over generations with modern medical research and information technology (Villar et al. 2001).

CCM, particularly ventilation, is a vital aspect of the care of people suffering from advanced states of COVID-19 infection. Because of the specialised nature of both the staff and the facilities that constitute CCM, however, they are not widely available throughout Australia. At the start of the COVID-19 pandemic, there were around 200 ICUs with approximately 2,200 beds across the public and private hospitals, with most based in the major capital cities.

Australia's hospital system plays an important role in managing and treating COVID-19 patients, and in many ways the focus of Australia's response to the COVID-19 pandemic has been to ensure these facilities are not overwhelmed. This has entailed planning for surge responses and purchasing more ventilators. The focus of this strategy, however, has largely been on public health and social measures to limit the spread of the disease, and the temporary cancellation of many elective surgeries – some of which rely on ICUs as part of post-operative care arrangements.

From data submitted annually to the AIHW's National Hospital Morbidity Database it is possible to determine the number of people who were hospitalised with COVID-19 for the first part of 2020. Between January and June 2020:

- over 2,600 hospitalisations involved a COVID-19 diagnosis
- 8.6% of these hospitalisations involved a stay in an ICU
- the average length of stay for hospitalisations was 9 days, ranging from 1 day to 87 days (AIHW 2021a).

The number of hospitalisations and ICU stays since mid-2020 will have increased substantially. For updated information presented as daily counts, see Chapter 1 'The impact of a new disease: COVID-19 from 2020, 2021 and into 2022'.

Conclusion

Australia's health care system has evolved substantially from the time of the Spanish influenza pandemic of a century ago, to the system in place today. The response to the COVID-19 pandemic has, so far, been more effective than the response to the Spanish influenza epidemic in curtailing the spread of the disease, and in treating people infected by it. It is the hard work of a century that has created a health system that can cope with a major health crisis like COVID-19.

References

- ABS (Australian Bureau of Statistics) (2012) *Co-operatives in private health insurance in Australia*, ABS, accessed 5 May 2022, <https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/1301.0Main+Features2372012>.
- (2018) *Private hospitals, Australia*, ABS, accessed 29 January 2022, <https://www.abs.gov.au/statistics/health/health-services/private-hospitals-australia/2016-17>.
- AEC (Australian Electoral Commission) (2012) *Referendum dates and results*, AEC, accessed 24 January 2022, https://www.aec.gov.au/Elections/referendums/Referendum_Dates_and_Results.htm.
- AIHW (Australian Institute of Health and Welfare) (1993) *Telemedicine in Australia*, AIHW, accessed 1 January 2022, <https://www.aihw.gov.au/reports/hospitals/telemedicine-in-australia/contents/summary>.
- (2016) *Australia's health* [PDF 7.7 MB], 2016, AIHW, accessed 13 January 2022, <https://www.aihw.gov.au/reports/australias-health/australias-health-2016/contents/summary>.
- (2021a) *Admitted patient activity*, AIHW, accessed 12 January 2022, <https://www.aihw.gov.au/reports-data/myhospitals/intersection/activity/apc>.
- (2021b) *COVID-19: looking back on health in 2020*, AIHW, accessed 4 February 2022, <https://www.aihw.gov.au/reports-data/australias-health-performance/covid-19-and-looking-back-on-health-in-2020>.
- (2021c) *Health expenditure Australia 2019–20*, AIHW, accessed 20 January 2022, <https://www.aihw.gov.au/reports/health-welfare-expenditure/health-expenditure-australia-2019-20/contents/about>.
- APRA (Australian Prudential Regulation Authority) (2021) *Quarterly private health insurance membership trends*, December 2021, APRA, accessed 11 April 2022, <https://www.apra.gov.au/quarterly-private-health-insurance-statistics>.
- Biggs A (2003) *The Pharmaceutical Benefits Scheme – an overview*, Parliament of Australia, accessed 2 February 2022, https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/archive/pbs.
- Biggs A (2016) *Medicare: a quick guide*, Parliament of Australia, accessed 12 January 2022, https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1617/Quick_Guides/Medicare.
- Blyth P (1987) *Australian and New Zealand Intensive Care Society: Our history*, accessed 9 May 2022, <https://www.anzics.com.au/organisation-vision/>.

Bongiorno F (22 March 2020) 'How Australia's response to the Spanish flu of 1919 sounds warnings on dealing with coronavirus', *The Conversation*, accessed 22 February 2022, <https://theconversation.com/how-australias-response-to-the-spanish-flu-of-1919-sounds-warnings-on-dealing-with-coronavirus-134017>.

Bursell S, Jenkins A, Brazionis L and Rowley K (2013) 'Telehealth in Australia: an evolution in healthcare services', *Medical Journal of Australia*, 199(1):23–24.

Burgess M (2003) 'Tears often shed', *NSW Public Health Bulletin*, 14(1–2):5–8.

CDC (Centers for Disease Control and Prevention) (2022) *Understanding mRNA COVID-19 vaccines*, CDC, accessed 4 February 2022, <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/different-vaccines/mRNA.html>.

CFFR (Council on Federal Financial Relations) (2020) *Addendum to the National Health Reform Agreement: revised public hospital funding and health reform arrangements*, CFFR, accessed 18 January 2022, https://federalfinancialrelations.gov.au/sites/federalfinancialrelations.gov.au/files/2021-07/NHRA_2020-25_Addendum.pdf.

Commonwealth Ombudsman (2020) *State of the Health Funds Report*, Commonwealth Ombudsman, accessed 10 February 2022, <https://www.ombudsman.gov.au/publications/reports/state-of-the-health-funds/all-reports/docs/2020-state-of-the-health-funds-report>.

Department of Health (2011) *History of pandemics*, Department of Health, accessed 19 January 2022, <https://www1.health.gov.au/internet/main/publishing.nsf/Content/about-pandemic-history>.

— (2012) *Final report of the Private Hospital Data Collection Review*, Department of Health, accessed 21 November 2021, <https://www1.health.gov.au/internet/main/publishing.nsf/Content/PHDC-review>.

— (2019) *National immunisation strategy for Australia 2019 to 2024*, Department of Health, accessed 18 February 2022, <https://www.health.gov.au/resources/publications/national-immunisation-strategy-for-australia-2019-to-2024>.

— (2021a) *100 years of health*, Department of Health, accessed 5 March 2022, <https://www.health.gov.au/about-us/100-years-of-health>.

— (2021b) *Pharmaceutical Benefits Scheme (PBS)*, Department of Health, Australian Government, accessed 1 December 2021. <https://www1.health.gov.au/internet/main/publishing.nsf/Content/Pharmaceutical+Benefits+Scheme+%28PBS%29-1>.

— (2021c) *Is it true? Were COVID-19 vaccines developed too quickly to be safe?*, Department of Health, accessed 11 December 2021, <https://www.health.gov.au/initiatives-and-programs/covid-19-vaccines/is-it-true/is-it-true-were-covid-19-vaccines-developed-too-quickly-to-be-safe>.

- (2021d) *National Immunisation Program*, Department of Health, accessed 15 January 2022, <https://www.health.gov.au/initiatives-and-programs/national-immunisation-program>.
- Duckett S and Nemet K (2019) *The history and purposes of private health insurance*, Grattan Institute, Melbourne.
- Gale A and Watson D (2007) *Adventures in health risk: a history of Australian health insurance*, Institute of Actuaries of Australia, Sydney.
- Goddard S (2014) 'How the Pharmaceutical Benefits Scheme began', *The Medical Journal of Australia* 201(1):S23–S25.
- Grove A (2016) *The Pharmaceutical Benefits Scheme: a quick guide*, Parliament of Australia, accessed 7 March 2022, https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1516/Quick_Guides/PBS.
- Gruszyn S, Hetzel D and Glover J (2012) *Advocacy and action in public health: lessons from Australia over the twentieth century*, Australian National Preventive Health Agency, Canberra.
- Hauser C (3 August 2020) 'The mask slackers of 1918', *The New York Times*, accessed 31 March 2022, <https://www.nytimes.com/2020/08/03/us/mask-protests-1918.html>.
- Hilless M and Healy J (2001) *Health care systems in transition: Australia*, European Observatory on Health Care Systems, Copenhagen.
- Hillman K (2007) *Overview of intensive care in Australia*, ICU Management and Practice, accessed 5 February 2022, <https://healthmanagement.org/c/icu/issuearticle/overview-of-intensive-care-in-australia>.
- Lyons S and Taylor T (22 September 2020) 'A short history of vaccination campaigns in Australia and what we might expect with COVID-19', *ABC news*, accessed 22 December 2021, <https://www.abc.net.au/news/health/2020-09-22/vaccine-history-coronavirus-smallpox-spanish-flu/12673832>.
- Morrison, the Hon. S (20 May 2020) *Commonwealth and states sign \$131 billion five year hospitals agreement* [media release, jointly with the Minister for Health], Prime Minister of Australia, accessed 20 January 2022, <https://www.pm.gov.au/media/commonwealth-and-states-sign-131-billion-five-year-hospitals-agreement>.
- NCIRS (National Centre for Immunisation Research and Surveillance) (2021) *History of immunisation in Australia: immunisation policy and practice*, NCIRS, Sydney.
- NMA (National Museum of Australia) (2021) *Defining moments: influenza pandemic*, NMA, <https://www.nma.gov.au/defining-moments/resources/influenza-pandemic>.
- NSW Health Department (1997) *Public health bulletin: 100 years of vaccination*, NSW Health, Sydney.

- PC (Productivity Commission) (1999) *Private hospitals in Australia* [Commission Research Paper], AusInfo, Canberra.
- RACGP (The Royal Australian College of General Practitioners) (2008) *The history of general practice in Australia*, RACGP, accessed 3 March 2022, <https://www.racgp.org.au/the-racgp/history/history-of-general-practice>.
- Ruff T, Taylor K and Nolan T (2012) 'Australia's contribution to global immunisation', *Australian and New Zealand Journal of Public Health*, 36(5):564–571.
- Senate Select Committee on Health (2016) *Final report, hospital funding cuts: the perfect storm* [PDF 2,437 KB], Parliament of Australia, accessed 2 March 2022, https://www.aph.gov.au/Help/Federated_Search_Results?q=Final%20report,%20hospital%20funding%20cuts:%20the%20perfect%20storm.
- Senate Standing Committee on Community Affairs Parliament of Australia (2000) *Healing our hospitals: a report on public hospital funding* [PDF 989 KB], Parliament of Australia, accessed 10 December 2021, https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Community_Affairs/Completed_inquiries/1999-02/pubhosp/report/index.
- Sheehan M (12 March 2020) 'Were these the good old days?', *Living histories*, accessed 9 May 2022, <http://livinghistories.net.au/2020/03/12/were-these-the-good-old-days/>.
- Stephens E (2 April 2020) 'We've known about pandemic health messaging since 1918. So when it comes to coronavirus, what has Australia learnt?' *The Conversation*, accessed 28 March 2022, <https://theconversation.com/weve-known-about-pandemic-health-messaging-since-1918-so-when-it-comes-to-coronavirus-what-has-australia-learnt-134797>.
- Storey CE (2014) 'A brief history of the specialties from Federation to the present', *Medical Journal of Australia*, 201(1):S26–S28.
- Taylor A, Caffery L, Gesesew H, King, A and Bassal A (2021) 'How Australian healthcare services adapted to telehealth during the covert 19 pandemic: a survey of telehealth professionals', *Frontiers in public health*, accessed 9 May 2022, <https://www.frontiersin.org/articles/10.3389/fpubh.2021.648009/full>.
- Thompson K, Taylor C, Forde K and Hammond N (2017) 'The evolution of Australian intensive care and its related costs: a narrative review', *Australian Critical Care*, 31(5):325–330.
- Villar J, Mendez S and Slutsky A (2001) 'Critical care medicine in the 21st century: from CPR to PCR', *Critical Care*, 5:125.