AMA

Public hospitals

Cycle of crisis

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FOREWORD: THE COVID-19 CONTEXT

The recent escalation of COVID-19 cases will deepen our existing public hospital crisis

On top of the current public hospital crisis outlined in this paper, Australia is now facing a COVID-19 crisis which will have a huge impact on public hospital capacity and ways of operating.

As this paper demonstrates, public hospitals are not starting from a position of strength, and do not have the capacity to scale up to meet the demands of a COVID-19 crisis or normal influenza season.

There are various models that can help us predict future demand on public hospitals, but prediction is challenging and depends on many moving parts.

What we do know is that more COVID-19 cases will impact on public hospital capacity in terms of available staff and available beds. We have a finite number of both. The only way to function within such a constrained system is to re-purpose resources by stopping doing other types of healthcare.

In additional to this, infection control measures are likely to further constrain the physical capacity of public hospitals and reduce the efficiency and availability of hospital staff. Despite this, it is absolutely essential to put measures in place to protect staff and prevent infection of non-COVID-19 patients. If we fail to do this, COVID-19 could be transmitted easily within overloaded hospitals (as seen in the English experience[i]). This would result in staff shortages, increased lengths of stay for already hospitalised patients, and quite possibly avoidable severe illness and deaths, including within vaccinated, vulnerable inpatients.

The escalation of COVID-19 cases is likely to mean that current problems are exaggerated such as ambulance ramping, access block and cancellation of 'elective surgery'. This means more waiting to receive critical hospital care, which will mean more avoidable deaths and deterioration from non-COVID conditions such as cancer and cardiovascular disease.

It also means more pressure on our strained healthcare workforce.

This means the need for reform to fix the underlying causes of the public hospital crisis is even greater than before the recent escalation of COVID-19.

Governments must ensure our public hospitals are ready and resourced to cope before opening up to a greater influx of COVID-19 cases

The AMA has analysed the impact on our public hospitals of easing public health safety measures (PHSMs), using a range of potential scenarios and available data. This analysis brings together insights from the Doherty modelling for Australia and the real-world experience of the United Kingdom (UK), and contextualises it in the likely timeframe and context within which Australia will 'open up'.

This is presented below as a range of potential outcomes, spanning three scenarios:

1. **Low scenario** (most optimistic): based on levels of hospitalisations, and viral behaviour assumed in the Doherty modelling for Australia. The opening up scenario of partial opening (medium PHSMs) at 70% vaccination (age 16+) and a bit more (low PHSMs) at 80% is used. This is the opening up scenario given in the Doherty modelling report provided to National Cabinet on 17 September 2021, in Table S1.5[ii], and at time of publication is the most likely opening up plan. A starting point is used of 2,000 cases a day with an opening up start date of 1 November 2021.
2. **Medium scenario:** based on levels of hospitalisations assumed in the Doherty modelling but with viral behaviour as experienced in the UK (using UK case rates). This is adjusted for the size and age distribution of the Australian population and, as far as possible, for Australian vaccine coverage. The same opening up scenario is used as in the low scenario.
3. **High scenario** (most pessimistic): based on levels of hospitalisations, and viral behaviour as experienced in the UK. This is adjusted for the size and age distribution of the Australian population but not for Australian vaccine coverage. The opening up scenario used is that of the UK from 1 June 2021.

As in the Doherty modelling, this analysis does not attempt to account for different scenarios in different States and Territories; it assumes that Australia is homogenous.

Where the UK real-world experience after opening up is depicted over a six month period, it is based on actual data from 1 June 2021 until 21 September 2021 (almost four months), and projected thereafter (the last two months).

Public hospital demand

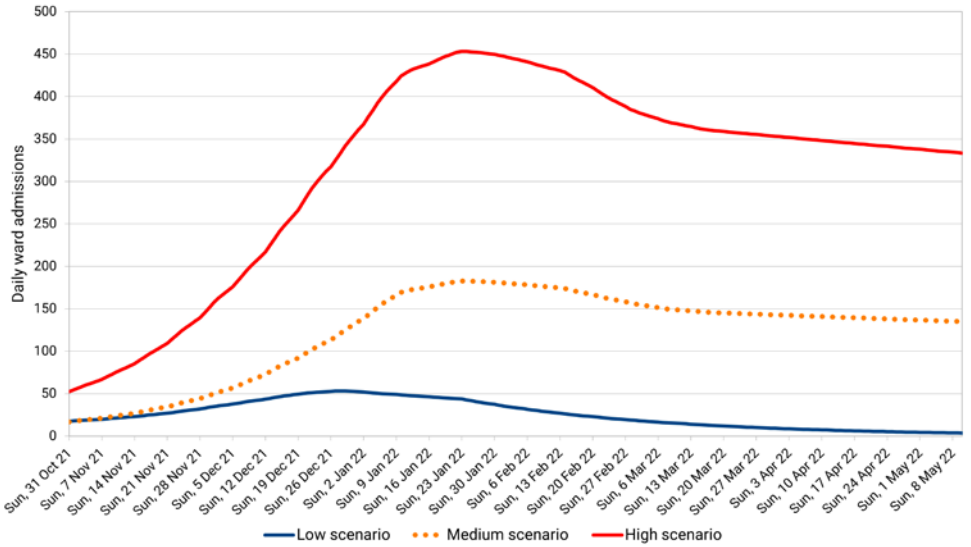
Providing results across the three scenarios gives a large range of potential outcomes, but all of them indicate that an increase in COVID-19 patients will significantly decrease public hospital capacity:

- demand on emergency departments (EDs) will increase by 18,900 (0.6%) - 124,000 (3.8%) admissions
- demand on Intensive Care Units (ICUs) will increase by 60,000 (6.9%) - 412,000 (47.5%) patient days[iii]
- average length of stay in hospital is likely to range from 7-12 days, or 15-21 days for a patient requiring ICU, where 12-15 of those days are in ICU compared with an average non-COVID-19 ICU stay of 3-4 days[iv]

These figures are annual. It is important to note that annual totals obscure sudden spikes in patient volume over a shorter period; government/hospital planning for a surge in COVID-19 patients would have to take this into account.

The impact on public hospital demand can also be visualised as follows:

Figure A: Australia-wide daily hospital ward (including ICU) admissions from COVID-19 patients after relaxing PHSMs under three scenarios, 31 October 2021 – 8 May 2022



This is a large range of potential outcomes, but with the upper end based on the UK real-world experience (adjusted for Australian population), governments must prepare hospitals for worst-case scenarios with contingency plans for essential care which is displaced by COVID-19 cases coming into hospitals.

Figure A shows that the assumptions in the Doherty modelling about the behaviour of the virus over time differ notably from the UK real-world experience of viral behaviour. While the number of COVID-19 cases peters out in the low scenario, in the medium scenario cases persist. Governments need to prepare for at least the medium scenario, where the additional pressure on public hospitals will not cease over time, but rather is a long-term drain on hospital capacity.

Living with COVID-19 inside the hospital

There will also be increased inefficiency costs of having to 'live with COVID-19' inside the hospital, including:

- healthcare staff capacity will decrease because 3.6-11.5 per cent or 13,000 - 42,500 staff will be furloughed by COVID-19 at the peak after opening up (steady level of staff absent on any day including doctors, nurses and ancillary staff)
- lost staff time in adhering to PPE protocols

Public hospital planning needs to take into account the potential for a 'peaks on peaks' phenomenon that could quickly get out of control. With a peak in COVID-19 cases from relaxing PHSMs, there would be more COVID-19 patients in hospitals. If infection control measures inside the hospital are not sufficient, there would be mixing with non-COVID-19 patients and staff, resulting in a peak in the number of people catching COVID-19 within the hospital. This would mean that, just at the point when you need them the most, there would be an additional peak in furloughed staff (in addition to an increase in staff cases from greater transmission of the virus in the community).

Opportunity cost of responding to COVID-19

When dealing with a surge in hospitalisations, inpatient beds and staff will be re-purposed to dealing with COVID-19 patients. ICU beds normally in use for post-operative care for major surgery such as cancer, will be blocked by COVID-19 patients as they remain in ICU for 12-15 days compared with 3-4 days for all other conditions.

Overall this means that 400 (0.6%) - 2,400 (3.7%) beds will be persistently in use by COVID-19 patients on an average day from six months after opening up, resulting in:

- even worse ambulance ramping as demand on EDs increases, also meaning longer waits for people needing ambulances
- 5-40 per cent less capacity to undertake 'elective surgeries'
- even more unmet demand for hospital care in the community

Further detail on how this analysis was undertaken is outlined in the Appendix.

Elective surgery is sometimes mistakenly thought of as optional or non-urgent. In fact it includes a range of surgeries at varying levels of urgency, some of which are very time-sensitive such as diagnostic procedures that could reveal cancer (e.g. a breast lump biopsy) or excision surgeries related to cancer (e.g. a prostatectomy). A coronary artery bypass graft would also be considered an elective surgery. The most common elective surgery in Australia in 2019-20 was a cystoscopy – diagnostic investigation of the bladder – which accounted for 9 per cent of all elective surgeries. This is in comparison to total knee and total hip replacements which were only 2 per cent and 1.5 per cent of all elective surgeries respectively.[v]

Governments must acknowledge the depth of the crisis in our public hospitals and invest now in system-wide reform

With the public hospital system already running at 100 per cent capacity, or close to, on a daily basis, an influx of demand from COVID-19 cases will tip the system over the edge. We need reform right now that is deeper than simply a COVID-19 funding boost.

Increased demand in our hospital wards translates to a significant opportunity cost. If governments do not resource the wider system and ensure contingency arrangements for non-COVID patients, we will see a secondary effect of avoidable mortality and morbidity from non-COVID conditions through significantly delayed care.

Foreword references

[i] Nuffield Trust (2020). Chart of the week: *The proportion of Covid-19 infections occurring within hospitals is growing as cases rise*. Retrieved 30/09/2021 from: https://www.nuffieldtrust.org.uk/resource/chart-of-the-week-the-share-of-covid-19-infections-occurring-within-hospital-is-growing-as-cases-rise

During the first wave in England, it was estimated that 20% of hospital cases were acquired in hospital – defined as cases diagnosed more than a week after admission.

[ii] National Plan to transition Australia's National COVID Response. *Doherty Modelling Interim Report to National Cabinet 17 September 2021* (PDF, Doherty Institute). Retrieved 21/09/2021 from: https://www.pmc.gov.au/national-plan-transition-australias-national-covid-response

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[v] Australian Institute of Health and Welfare (2021). *Elective surgery activity – Admissions by intended procedure*. Retrieved 09/09/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/intersection/activity/eswt

EXECUTIVE SUMMARY

Chronic underfunding of public hospitals has led to declining performance, putting lives at risk.

In the first half of 2021, we have heard stories of people dying waiting to be seen in public hospitals that are operating at breaking point, and ambulance ramping outside public hospitals because there aren't enough beds and staff to cope with demand.

There are both human and financial costs to our public hospitals operating in crisis mode. Access block and emergency department (ED) overcrowding appear to be getting worse, and this is associated with increased mortality, morbidity and length of hospital stay.

The AMA has been calling out the declining performance of public hospitals for several years. The *2020 AMA Public Hospital Report Card* showed that performance is stagnant or declining across all five areas covered in the Report Card. Patients are waiting longer for ED treatment and elective surgery, and the number of available hospital beds per 1,000 people aged ≥65 years – an important measure of public hospital capacity – has been in a trend of decline for decades.

2014-15 marked a turning point for the performance of public hospitals – after several years of year-on-year improvements across some measures, this trend was reversed around the time significant reforms were made to public hospital funding. These changes significantly stripped funding from public hospitals and abolished the National Health Performance Authority and performance-related funding.

The latest Addendum to National Health Reform Agreement 2020-25 (Addendum 2020-2025) is, by and large, a continuation of the same Commonwealth funding formula that has produced the long waiting times for public hospital services to date. More of the same will not help improve patients' timely access to public hospital treatments.

Without reform, public hospital performance will only get worse as demand increases. Australia's population is growing and ageing, and the burden of chronic and complex disease is increasing. ED presentations are also increasing, as is the urgency of treatment required when patients arrive at the ED. Meanwhile, public hospital finances are being squeezed, as cost growth (inflation) plus demand growth for public hospital services is expected to exceed government funding growth (AMA projection).

The AMA's vision is for a new funding approach to supplement the current focus on activity-based funding – one that includes funding for positive improvement, increased capacity, and reduced demand, and puts an end to the blame game.

While broader reform is needed in the long term, the AMA is calling for targeted reforms that are needed right now to stem the public hospital crisis. This includes the Commonwealth increasing its contribution to 50 per cent for activity (as per current COVID-19 specific partnership agreement), with States and Territories to use the 5 per cent of 'freed-up' funds on improvement. The Commonwealth and State and Territory governments have also saved a lot of money from insufficient indexation of their contribution to public hospitals under the current funding arrangement, and the Commonwealth government has saved money through the current 'cap' on funding growth. This should be addressed going forward. These savings should be reinvested as a first step, alongside introduction of new models of partnership funding between the Commonwealth and the States and Territories, and the re-introduction of select pay-for-performance targets.

Our public hospitals need funding to buy extra beds and staff them, and to focus on improving their performance. Funding is also needed for alternative out-of-hospital care, so that people whose needs can be better met in the community, can be treated outside hospital. This is what is needed now to steer public hospitals out of crisis mode.

Health and growth of the population

Australia's population is
growing and ageing

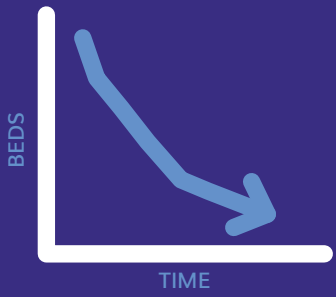
Burden of
chronic and complex disease
is inceasing

Public hospital capacity

Emergency department presentations
and their urgency are increasing

Median wait time for
elective surgery is increasing

Total beds per 1,000 people ≥65 years has been
in a trend of decline for decades



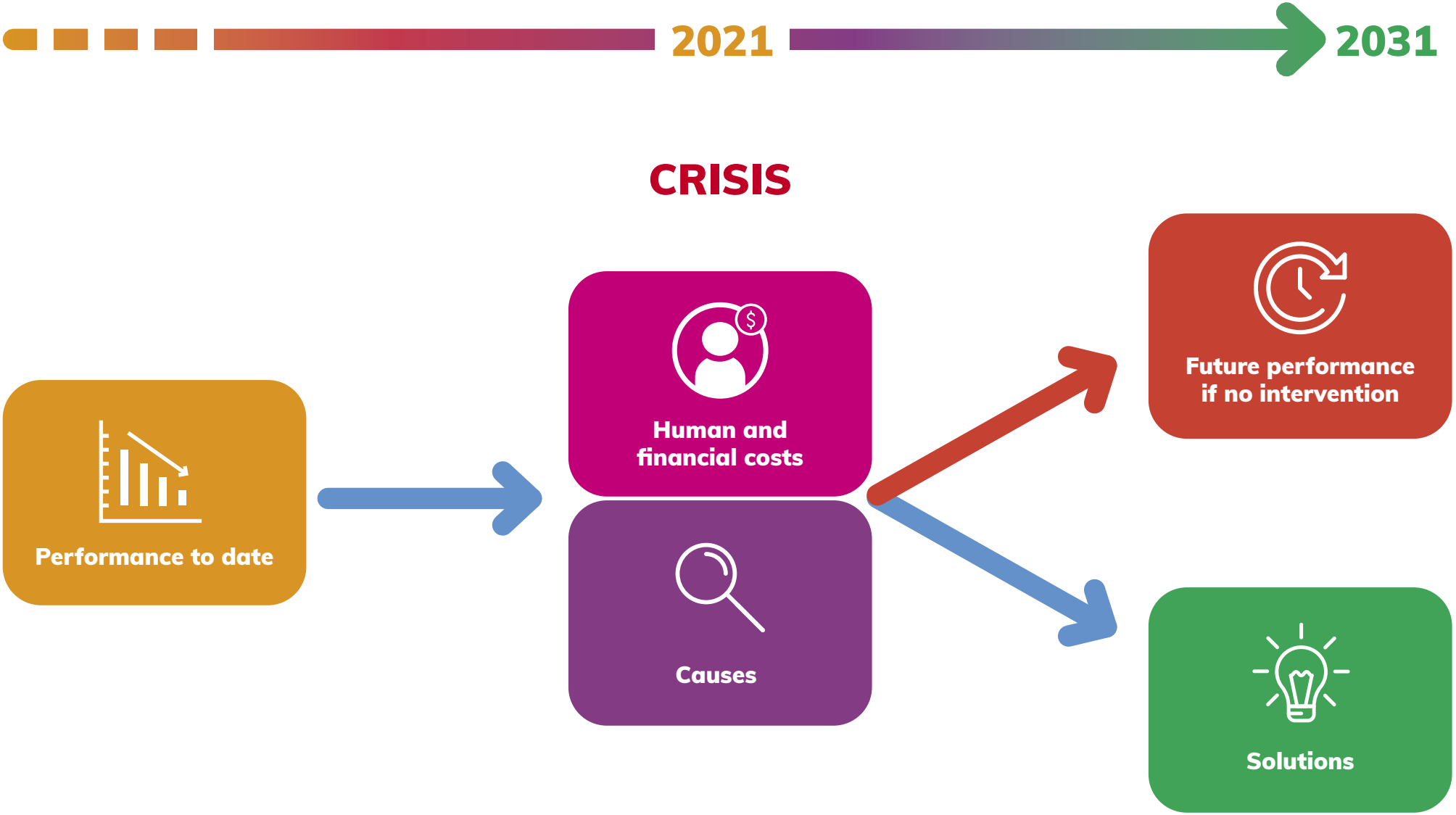
Public hospital finances

Cost growth
3.5%
Health inflation was 3.5% per year on average, 2013-2020

Demand growth
4.3%
AMA projects public demand for public hospital services will increase 4.3% per year to 2030-31

Funding growth per service
1.3%
Indexation of government funding for public hospital services was 1.3% per year on average, 2012/13-2021/22

Figure 1: Structural overview of paper and navigation aid



INTRODUCTION: OUR PUBLIC HOSPITALS ARE IN CRISIS

In the first half of 2021, we have heard stories of people dying waiting to be seen in public hospitals that are operating at breaking point, and ambulance ramping outside public hospitals because there aren't enough beds and staff to cope with demand.

There are both human and financial costs to our public hospitals operating in crisis mode. Access block and emergency department (ED) overcrowding appear to be getting worse, and this is associated with increased mortality, morbidity and length of hospital stay.[1]

What is access block?

Access block, as defined by the Australasian College of Emergency Medicine (ACEM), refers to "the situation where patients who have been admitted and need a hospital bed are delayed from leaving the ED for more than eight hours due to a lack of inpatient bed capacity".[2]

Access block is correlated with ≥90 per cent occupation of hospital inpatient beds.[3] The problem originates throughout the whole hospital but often manifests in crises in the ED, including over-crowding and ambulance ramping. Ambulance ramping is where patients who arrive by ambulance receive care from paramedics on ambulance stretchers while there is no safe physical space or ED staff available to handover to. This also prevents paramedics from responding to subsequent ambulance callouts while they wait with the patient.

The need to free up inpatient beds to allow patients from the ED to be admitted to the hospital for more specialist care (and leave the ED), can result in elective surgeries being cancelled, thereby causing an access issue elsewhere in the hospital and increasing waiting times.

The principal cause of access block in EDs and inpatient wards is lack of capacity, in terms of both numbers of beds and having the right staff, at the right time.

To what extent is it happening in Australian EDs?

ACEM gathers data twice a year on access block prevalence from select Australian EDs. A 2021 research study utilising this data concluded that, pre-COVID-19 (over the period 2017-2019), there was ongoing increase in demand in Australian EDs, with an even greater increase in occupancy (crowding). Between the June 2017 and 2019 surveys, average daily ED presentations increased by 11.4 per cent, and the number of people experiencing access block rose by 46.1 per cent. While demand and occupancy decreased during Australia's peak 2020 COVID-19 infection period, by September 2020 they were back to pre-pandemic levels (2018-19) in every jurisdiction apart from Victoria.[4]

In the first half of 2021, doctors have been reporting that the access crisis in public hospitals is the worst it has been in 30 years.[5] ACEM reports that, across 93 Australian EDs in September 2020, an average of 67 per cent of current patients waiting for inpatient admission were suffering access block.[6]

This has been happening in an environment where we did not have a large demand from COVID-19 cases and we have had a very quiet influenza season due to COVID public health measures and border restrictions. 2018 was a comparatively moderate flu season[7] and yet 10.5 per cent of available hospital beds (in FluCAN monitoring hospitals) were occupied by patients with confirmed influenza.[8]

Public hospitals do not have the capacity to scale up to meet the demands of a widespread COVID-19 outbreak or a typical flu season. Urgent intervention must happen now to prevent serious adverse outcomes for our population.

AMA member, Victoria

"I'm an Emergency Medicine Physician at a trauma hospital in Melbourne.

We have been experiencing a developing crisis in our public hospitals over decades, and are now at an unsustainable point. Steadily increasing demand on our healthcare system as a whole and insufficient numbers of staffed hospital beds are manifesting in access block and overcrowded, unsafe EDs, ambulance ramping and delayed ambulance response times. This impacts patient care and significantly increases patient morbidity and mortality, as well as increasing staff burnout, exposure to occupational violence, and stress.

In ED, significant time and resources spent caring for patients who are waiting to be transferred to an inpatient ward, divert staff from assessing new patients coming into the ED, including resuscitating and providing emergency care to acutely unwell patients and treating those with injuries and illnesses who can then go home.

We are now in a situation where we can't safely manage the combined clinical risks of increasing demand and access block. The impact on staff is profound. I can see stress and burnout across all areas of the system. I see staff moving out of the acute sector for their own wellbeing. Many have reduced their hours or left the health system. The demands of COVID-19 in terms of quarantine, testing and vaccination will be with us for years to come, and have stretched our nursing staff even further.

This requires a whole-of-hospital effort to fix. The solutions to ED overcrowding and demand/supply mismatch sit outside the walls of the ED. Emergency departments require targeted resources, but we need to cure the disease and not just address the symptoms associated with increasing demand and delays for patients across our whole system.

Currently, our system is failing many – patients, staff and our community. The solutions are firstly to recognise the extent and acuity of the crisis Australia-wide. Secondly, to increase resourcing and undertake funding reform to allow us to better identify the pressures across the system and specifically address them rather than 'bandaid' the areas where those pressures are manifesting in crisis. Thirdly, we need integration with primary care and collaboration between our state and federal governments to examine our health system as a whole, from beginning to end, not in a series of separate siloes for which different governments are responsible. Patients don't work like that – we can't keep working like that – and we cannot keep ignoring it. It's time to get better."

WHAT IS THE PERFORMANCE TO DATE OF PUBLIC HOSPITALS?

This section presents information from the *2020 AMA Public Hospital Report Card*, which draws on data from the Australian Institute of Health and Welfare (AIHW) from 2019 and earlier. Data from the *2021 AMA Public Hospital Report Card* has been deliberately excluded due to the distorting effects of the COVID-19 pandemic on public hospital operations and performance.[9]

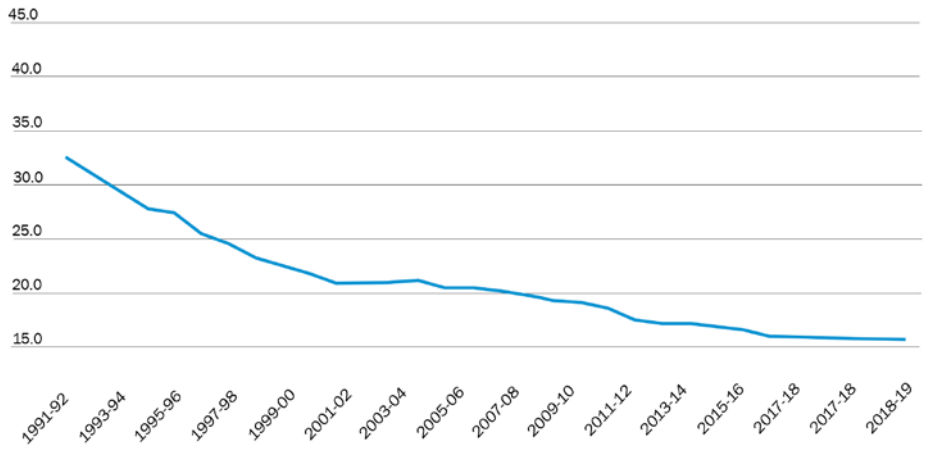
Public hospital capacity

One of the best measures of public hospital capacity is to compare the number of available beds to the size of the population.

The likelihood of requiring a hospital bed increases with age, and Australia is facing an ageing population.[10] This has put our health system under unprecedented demand. People aged 65 and over represent 16 per cent of the population but account for 50 per cent of total admitted bed days.[11] Not only are people 65 years or older more likely to be admitted to hospital, but the duration of their admission is 33 per cent longer compared to all other age cohorts.[12]

Therefore, the number of available hospital beds per 1,000 people aged 65 years or more is an important measure of public hospital capacity. Unfortunately, as you can see in Figure 2 below, this number has been in a trend of decline for decades. In 2018-19, the number of public hospital beds for every 1,000 people aged 65 years and older was 16.

Figure 2: Number of approved/available public hospital beds per 1,000 population aged 65 or over – all States and Territories[13]



This constrained capacity manifests in crises across the public hospital system, particularly in EDs where lack of beds in the appropriate ward means ED doctors cannot discharge people from the ED and optimise patient flow through the hospital. This impacts directly on ED waiting times and treatment times.

Emergency department waiting and treatment times

Pressure on public hospital EDs continues to increase. In 2018-19, there were 8,352,192 emergency presentations to Australian public hospital emergency departments – a 4.2 per cent increase on the previous year.[14]

Emergency patient acuity is also rising. In 2009-10, the proportion of patients assigned to the three most urgent triage categories (resuscitation, emergency and urgent) was around 43 per cent.[15] In 2018-19 over half (53%) of all emergency patients were assigned to the same three most urgent triage categories.[16] This suggests the urgency of treatment required by patients on arrival at the ED is rising.

Under the National Health Performance Framework, public hospital ED performance is measured against the following two indicators:

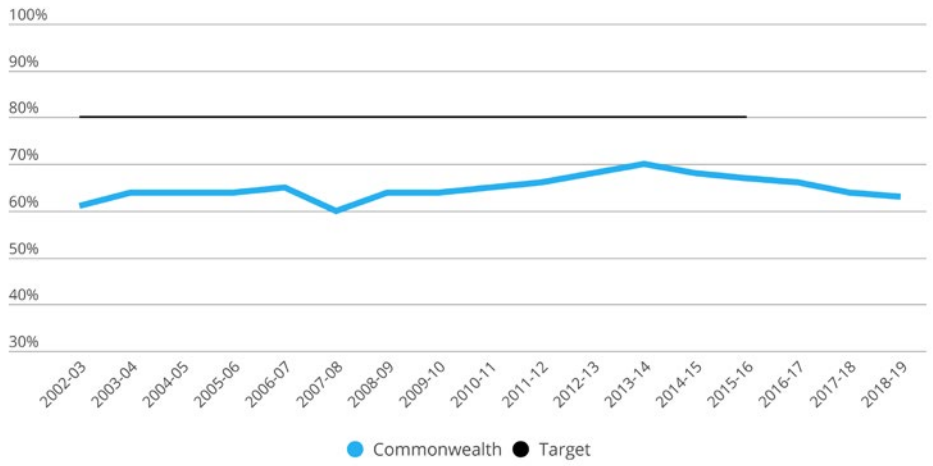
- Proportion of patients seen within the clinically recommended timeframes set by the Australasian Triage Scale; and
- Length of stay for ED care – proportion of patients staying for four hours or less.

Patients seen within clinically recommended timeframes

In 2018-19, across all triage categories, the proportion of emergency patients seen within the clinically recommended timeframe dropped to 71 per cent[17], down from 75 per cent in 2013-14[18], just five years earlier.

In 2018-19, nationally there were 3,161,155 people assessed to need category 3 (urgent) care, and only 63 per cent were seen within the recommended 30 minutes.[19] At a national level, performance against this measure peaked in 2013-14 when 70 per cent of category 3 (urgent) ED patients were seen within clinically recommended timeframes (see Figure 3). Since then, national performance has declined, with performance each year worse than the year before.

Figure 3: Percentage of category 3 (urgent) ED patients seen within recommended time – all States and Territories[20]



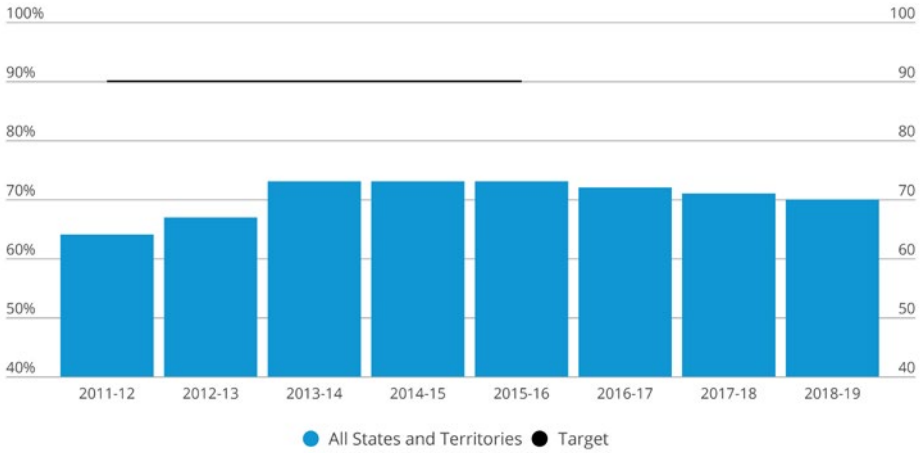
Note: National emergency admission targets were abolished with effect from 1 July 2015.

Patients leaving the emergency department within four hours

Patients are considered to have completed their visit to the ED when they physically leave (regardless of whether they were admitted to the hospital, were referred to another hospital, were discharged, or left the hospital at their own risk).

In 2018-19, the proportion of people (all triage categories) who completed their emergency presentation within four hours was 70 per cent. This is down from 71 per cent in 2017-18 and 73 per cent in 2015-16[21]. It is a trend of worsening performance on this indicator (see Figure 4).

Figure 4: Percentage of presentations to ED with a length of stay of four hours or less – all States and Territories[22]



Note: National Emergency Admission targets were abolished with effect from 1 July 2015

Patients least likely to leave ED within four hours are the sickest. In 2018-19, across all public hospital EDs, only 53 per cent of patients assigned to the triage category 'resuscitation', 57 per cent of 'emergency' patients and 61 per cent of 'urgent' patients left within four hours.[23] Of those who were subsequently admitted, fewer than half (46.7%) left the ED within four hours.[24]

Hospitals cannot operate at 100 per cent occupancy, as spare capacity is needed to meet seasonal and unplanned demand spikes. The delayed transition of patients from EDs to suitable ward beds strongly suggests inadequate public hospital bed numbers. Without sufficient bed numbers, patients cannot flow through the system. The delayed transition of high acuity patients out of the ED diverts emergency physicians away from patients still waiting for emergency treatment. The risks of delayed care include development of patient complications, poorer patient outcomes, longer length of stay, and higher costs for already tight public hospital budgets.

The other major consequence of this 'bed block' across the hospital is that it restricts the number of patients that can be admitted for elective surgery.

Elective surgery waiting and treatment times

Elective surgery is any form of surgery considered medically necessary, but which can be delayed for at least 24 hours. Nationally, in 2018-19, there were only 758,136 public hospital elective surgery admissions.[25] Between 2017-18 and 2018-19, growth in elective admissions per 1,000 population was negative (-0.4%).[26] Indeed, the average annual growth in elective surgeries per 1,000 population has been virtually stagnant since 2014-15, increasing by just 0.5 per cent on average each year.[27]

For elective surgery that is provided in public hospitals, the Australian Health Performance Framework includes the following two performance indicators that measure the provision of timely elective surgery:

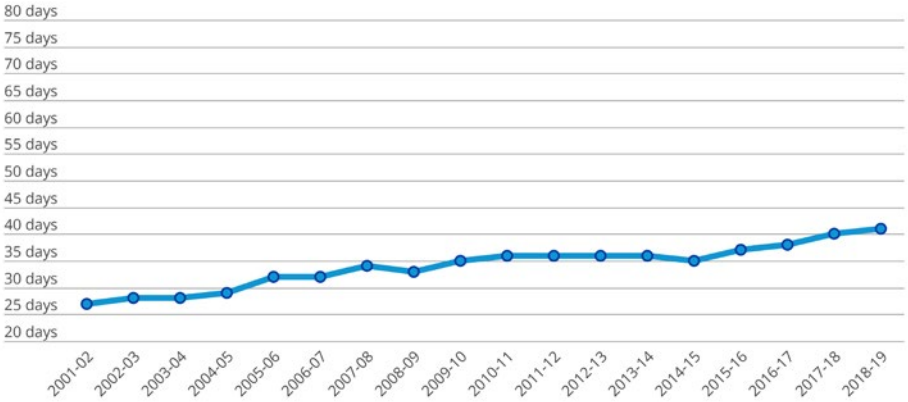
- The median waiting time; and
- The percentage of patients treated within the clinically recommended times.

Median waiting time for elective surgery

The median waiting time indicates the number of days within which 50 per cent of patients were admitted for their elective procedure (i.e. half of the patients had a shorter wait time than the median, and half had a longer waiting time).

As shown in Figure 5, the median waiting time has been increasing year on year since 2014-15.

Figure 5: Median waiting time for elective surgery (days) – all States and Territories[28]



Patients treated within clinically recommended times

There are three elective surgery clinical urgency categories:

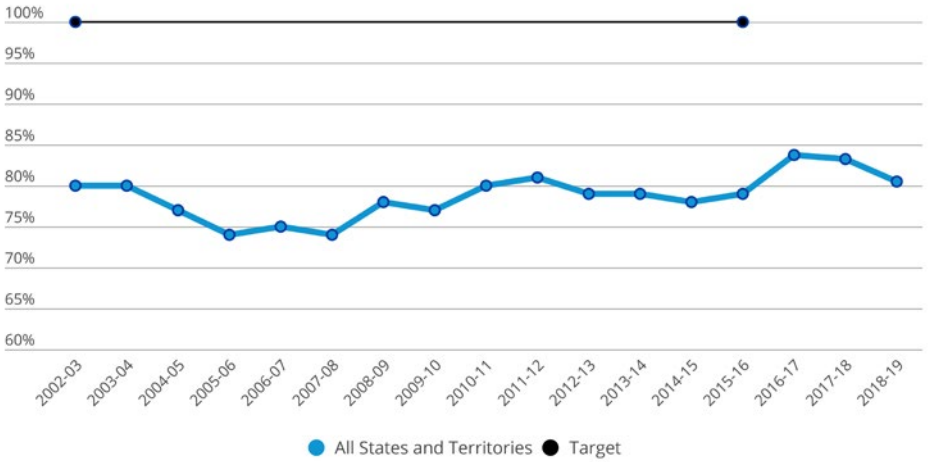
- Category 1 - clinically indicated within 30 days.
- Category 2 - clinically indicated within 90 days.
- Category 3 - clinically indicated within 365 days.

Nationally, in 2018-19, category 1 (most urgent) accounted for 27.8 per cent of total elective admissions, category 2 accounted for 38.2 per cent, and category 3 accounted for 34.0 per cent.[29]

Figure 6 shows that, in 2018-19, only 80.5 per cent of category 2 elective surgery patients were admitted within the clinically recommended 90-day period – nearly 3 percentage points (2.7) lower than the year before.[30]

Nationally, in 2018-19, there were 893,031 elective surgery patients added onto the public hospital elective waiting lists. Fewer were removed (886,418), and fewer still were admitted for their surgery (758,136).[31]

Figure 6: Percentage of category 2 elective surgery patients admitted within recommended time (90 days) – all States and Territories[32]



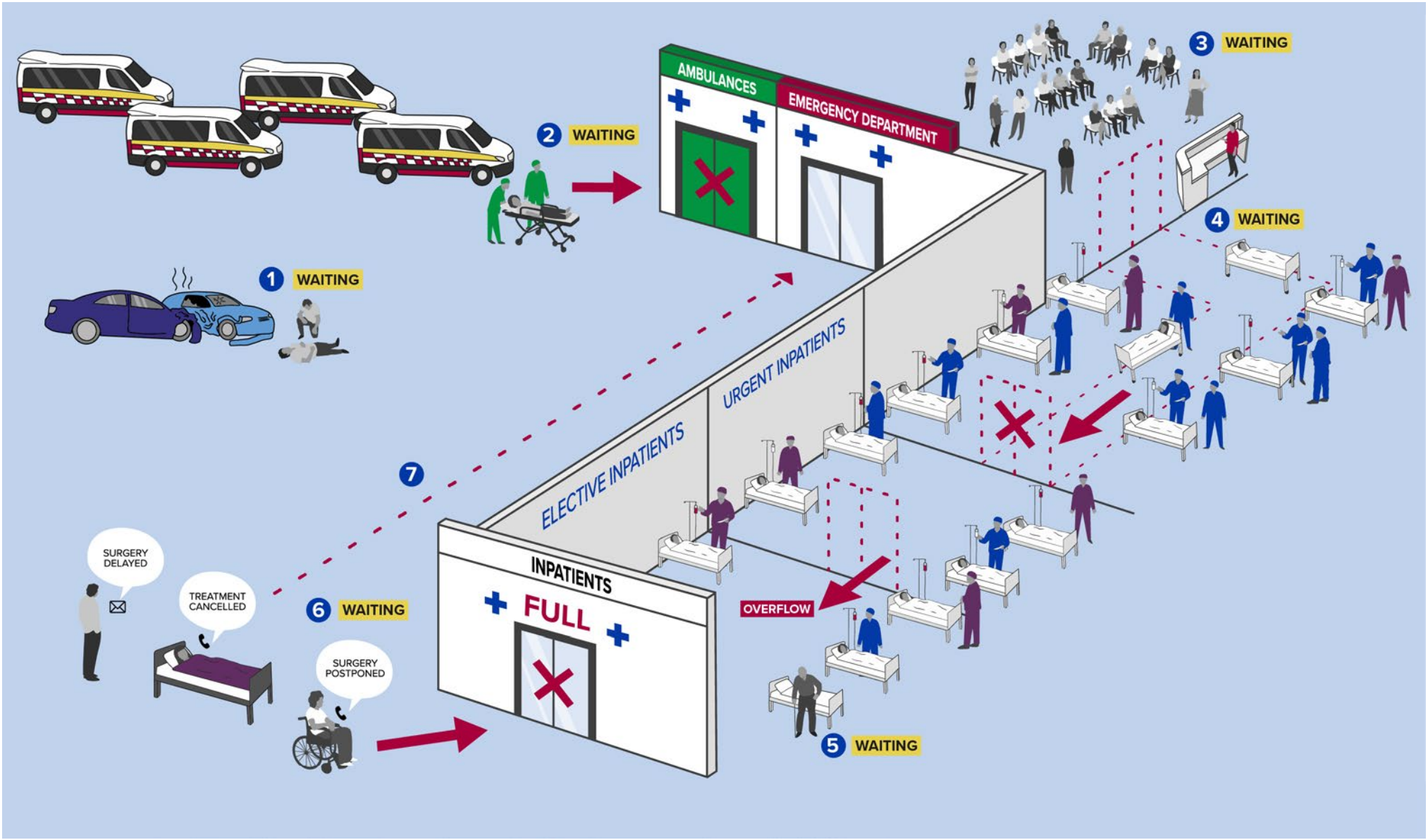
It is also important to note that these two performance indicators for elective surgery do not capture what is known as the 'hidden waiting list' – that is the waiting time from GP referral to the outpatient appointment. The patient is not placed on the elective surgery waiting list until the outpatient appointment, with some patients waiting years for an appointment. This means that the current elective surgery waiting lists do not accurately reflect current public demand for elective surgery.

Conclusion

Public hospitals are dynamic and complex systems; issues or blockages in one area can easily manifest in a crisis in another area. It is no surprise that performance is stagnant or declining across all three of these areas simultaneously. This indicates a systemic problem with the public hospital system (see Figure 7 on following page illustrating the dynamic hospital system).

This paper will explore the causes and propose solutions to reverse the decline in performance. Ultimately, the AMA argues that lack of funding is the root cause, and this paper recommends urgent reforms needed to the funding formula of public hospitals.

Figure 7: Overview of dynamic hospital system, showing points at which patients are waiting, and how blockages in one area impact on another.



1. More ambulances delayed at ED means people waiting longer for ambulances to arrive at the scene of a medical emergency.

2. **AMA Member, Tasmania:**

> "There are shifts where I have to attend to three Category 2 (emergency) patients, all still on their ambulance stretchers, unable to be offloaded due to a lack of space in the ED or elsewhere. It is not unusual to see 6, 8, 10 ambulances parked outside, all waiting to hand over their patients. The wider hospital does not have bed capacity. It is exhausting."

3. **AMA Member, Victoria:**

> "When I first began working in the ED just a few years ago, I would get nervous having 40 patients in the waiting room. Now, 40-50 waiting is the new normal. One time recently I had a record 67 patients in the ED waiting room. I had already stayed an hour overtime, and was trying to find a doctor to handover to. I walked out into the waiting room, and was accosted by a room full of patients who were in pain, frustrated, exhausted, scared. I could clearly see that they were suffering, and I was powerless to help. I love working in the ED, but I don't love that level of stress. Because of these trends I am extremely reluctant to join the training program and continue as an ED doctor."

4. **AMA Member, Queensland:**

> "There are often unacceptably long delays for patients who have been seen in the ED and need to be transferred to another part of the hospital as an inpatient. Recently I have seen innumerable examples of patients in critical condition waiting to access the Intensive Care Unit (ICU) but forced to stay in the ED for many hours because all the ICU beds are full. This causes delays in people receiving specialist care and proper monitoring, meaning in many cases the patient deteriorates while waiting. For example, a patient with septic shock deteriorated over multiple hours while waiting for an ICU bed, with higher and higher doses of medications needed to keep their blood pressure up, and ended up being put on a ventilator in ED and then needing dialysis in ICU after a seven hour wait in ED for an ICU bed."

5. **AMA Member, Tasmania:**

> "Exit block has become a big problem. Patients requiring transition to a nursing home or to appropriate disability accommodation, when previously they had lived at home, are staying much longer in an acute hospital setting than is medically necessary. This results in bed block, which then clogs up wards like orthopaedics, general medicine, rehab beds, the stroke unit... which leads to delays in patients being admitted from the ED and the associated inherent dangers in that."

6. **AMA member, Western Australia:**

> "We are constantly short of beds in the hospital, meaning we can't get patients in who are waiting for operations. 'Elective' but urgent surgeries get cancelled in favour of emergency patients coming through the ED. I've had patients who are prepared for surgery that day forced to wait all day only to get sent home, and this can occur multiple times, with repeated fasting. Inevitably the waiting list grows and grows. We have over 1,000 people on our waiting list, who are often suffering with chronic pain and deterioration of their condition. We are worried that if something doesn't change people will soon be waiting years for their operations. This is unacceptable."

7. **AMA member, South Australia:**

> "Delays in accessing surgery in hospitals (and before that, delays waiting for outpatient appointments to even get on the surgical waiting list), means many patients present to the ED either desperate to get care, or having become more unwell whilst waiting for appointments or operations."

WHAT ARE THE COSTS OF THE CURRENT PROBLEMS IN PUBLIC HOSPITALS?

There are both human and financial costs to our public hospitals operating at full capacity/in crisis mode.

What is the human impact?

Mortality

There is moderately strong evidence from Australia and internationally that delays in patients leaving the ED and being admitted to the hospital are associated with an increased number of deaths.[33]

There is also evidence from Australia that hospital overcrowding is associated with increased mortality. A 2006 study of EDs in Perth found that hospital and ED overcrowding is associated with increased mortality. It found a positive relationship between level of hospital occupancy and death by days 2, 7 and 30 following ED presentation. This equated to 2.3 excess deaths per 1,000 emergency admissions by day 30. Patients who experienced overcrowding conditions and subsequently died, stayed longer in the ED and had slightly longer physician waiting times.[34]

A later study (2012) found that when the four-hour target for being discharged from ED was introduced in WA in 2009-10[35], there was a reversal of overcrowding in three tertiary hospital EDs, which coincided with a significant fall in the mortality rate at two of those hospitals.[36]

Another (2018) Australian study of three acute hospitals in Melbourne found a greater risk of death for patients if they waited in the ED more than four hours, or if they waited more than four hours between bed request and transfer out of the ED.[37]

A recent (2020) study of acute hospitals in New Zealand found that the likelihood of the patient dying within seven days of presenting to the ED was higher if they arrived during a period of access block (where more than 10% of patients had an ED length of stay of ≥8 hours).[38]

In terms of elective surgery, given that it is not emergency treatment (it can be delayed for at least 24 hours), it is perhaps unsurprising that the relationship between waiting for surgery and mortality appears to have received little academic attention. What we do know is that AIHW data from 2018-19 shows that 9,004 people who were waiting for elective surgery in an Australian public hospital either died or were unable to be contacted.[39]

Morbidity/escalation of condition

Internationally, there is evidence that ED crowding results in higher risk of adverse outcomes/complications for cardiovascular patients, such as hypotension and cardiac arrest.[40] ED crowding is also associated with delays in treatment for patients with pneumonia or acute pain,[41] which could mean longer waits without proper pain management. With ED crowding there is also a higher likelihood that patients will be placed into inappropriate hallway spaces[42] or leave the ED without being seen.[43]

There is also international evidence that patients who experience delays in being admitted after ED treatment have worse outcomes than those admitted promptly.[44] An American study found that such delays were associated with re-admission rates for acute myocardial infarction, pneumonia, and central line-associated bloodstream infections.[45]

A Canadian study observed that patients who are delayed in being admitted generally "suffer prolonged periods on stretchers (not beds) in noisy environments where the lights never go out, and endure sleep-deprivation without privacy, dignity, or toilet facilities".[46] Being treated in the hallway of the hospital and waiting longer in the ED for an inpatient bed are also negatively associated with patient satisfaction with the ED and the hospitalisation in general.[47]

ACEM research has found that people presenting at the ED with mental health crises disproportionately experience unacceptably long lengths of stay while they wait for admission to specialist inpatient care. They are also more likely than other patients to leave the ED without completing treatment.[48]

When it comes to elective surgery, there is mixed evidence as to the impact of waiting on morbidity and quality of life.[49] It appears to be very condition-dependent, but certainly there is some evidence from developed countries that some patients will experience a deterioration of their condition and/or quality of life while waiting, which can involve visits to the ED.[50] And some patients have reported that it was a burden to live with unrelieved symptoms and poor health-related quality of life while waiting for surgery.[51]

Elective surgery is sometimes mistakenly thought of as optional or non-urgent. In fact it includes a range of surgeries at varying levels of urgency, some of which are very time-sensitive such as diagnostic procedures that could reveal cancer (e.g. a breast lump biopsy) or excision surgeries related to cancer (e.g. a prostatectomy). A coronary artery bypass graft would also be considered an elective surgery. The most common elective surgery in Australia in 2019-20 was a cystoscopy – diagnostic investigation of the bladder – which accounted for 9 per cent of all elective surgeries. This is in comparison to total knee and total hip replacements which were only 2 per cent and 1.5 per cent of all elective surgeries respectively.[52]

What is the financial impact?

International evidence indicates a strong positive correlation between time spent 'boarding' patients in the ED (i.e. while they are waiting for a bed elsewhere in the hospital) and the opportunity loss of treating other patients who are waiting. An American study looking at a range of hospitals found that the time lost to boarding patients in the ED amounted to an opportunity loss of treating 7 to 35 patients per day, or 5 to 13 per cent of the total ED volume. The authors estimated that this amounted to an opportunity cost of US$2.5-21 million per year, depending on each hospital's ED and boarding volume.[53]

A further American study perhaps unsurprisingly confirmed that longer boarding times were associated with increased costs, simply due to the additional time patients spent boarding in the hospital.[54]

There is also some Australian evidence that people who experienced access block in the ED had a longer inpatient length of stay once they were admitted. This effect, observed in the ACT, occurred across a range of disease types and severities.[55]

A larger study of three metropolitan hospitals in Melbourne found a strong positive correlation between ED length of stay and subsequent inpatient length of stay. It also found that ED length of stay predicts whether inpatient length of stay will exceed the state average for the relevant diagnosis. Compared with patients who stay in the ED for 4-8 hours, those who remain for 8-12 hours are approximately 20 per cent more likely to stay in hospital longer than the state average for the relevant diagnosis. If ED length of stay is greater than 12 hours it is 50 per cent more likely, and if ED length of stay is less than four hours it is 30 per cent *less* likely.[56]

These studies could indicate that access block in the ED contributes to an escalation of the patient's condition, which in turn could mean higher treatment costs incurred by the hospital. There would also be higher treatment costs involved by the patient simply staying longer. Indeed, strategies to reduce access block may reduce healthcare expenditure, while also decreasing patient morbidity.

ACEM reports that access block represents a large cost to EDs. Based on data from AIHW which shows that more than 522,500 ED patients experienced access block in 2018-19, ACEM estimates this cost the health system $583 million (range of $222-833 million).[57]

The cost of waiting for elective surgery is more complex, as there is a mix of costs to governments and costs to the individual. Costs to governments can include pharmaceuticals, planned and unplanned hospital care, tests, physiotherapy, and productivity costs (e.g. disability pension, sick leave and carers' leave). Costs to the individual can include out-of-pocket medical costs, transport, home help, home modifications, value of carers' time, and private healthcare (should the patient choose to leave the public waiting list[58]).[59] Again, it is likely to be condition dependent. For example, a United Kingdom study of people waiting for gall bladder surgery found that emergency admission while waiting was common and had significant cost implications.[60] In contrast, a Finnish study of people waiting for a total hip replacement found no cost difference in the weekly use of medication between patients who waited a short time and those who waited longer. However, *total* medication costs were higher in the group that waited longer simply because they waited longer.[61]

WHAT ARE THE CAUSES OF THE CURRENT PROBLEMS IN PUBLIC HOSPITALS?

As outlined above, public hospital performance is stagnant or declining across five key measures.

Our public hospitals are already struggling to cope with demand, but without reform, public hospital performance will only get worse as demand increases. Growth in the population aged 65 and over was 3.4 per cent on average, per year, in the five years to June 2020.[62] Without intervention, the rate of population growth for those over 65 is the minimum by which we can expect demand for public hospitals to increase.

This pure demographic driven growth does not allow for any increase in prevalence or severity of disease. Yet, the prevalence of risk factors for chronic disease is growing. For example, the proportion of overweight or obese adults has grown from 62.8 per cent in 2011-12, to 63.4 per cent in 2014-15,[63] and the latest National Health Survey estimates 67 per cent in 2017-18.[64]

With the combination of an ageing population and the trajectory of chronic disease, the AMA projects that underlying demand for public hospital services will increase by 4.3 per cent per year over the next decade to 2030-31, if no interventions are made.

The root cause of the current public hospital crisis is the funding formula used for public hospitals.

The funding formula for public hospitals

In 2011, the State, Territory and Commonwealth governments signed an agreement that shifted public hospital funding to an activity-based model which was widely adopted by hospitals from 2014-15. This is known as 'Activity-Based Funding' (ABF), and means hospitals are funded according to the amount and types of patients they treated in the previous year, adjusted for cost increases. Smaller regional hospitals with relatively low patient volume remain an exception and continue to be partially block funded.

Under ABF, the Commonwealth government contributes 45 per cent of the cost of public hospital services each year, while the States and Territories fund the remaining 55 per cent.

States and Territories also fund any hospital costs that exceed the cap imposed by the Commonwealth (explained below), and all non-admitted primary care services provided through local area health districts that are excluded from the latest Commonwealth-State funding agreement (the Addendum 2020-2025).

The amount that the Commonwealth government pays in public hospital funding is adjusted retrospectively based on actual hospital services provided in the previous year.

Erosion of the financial contribution to public hospitals

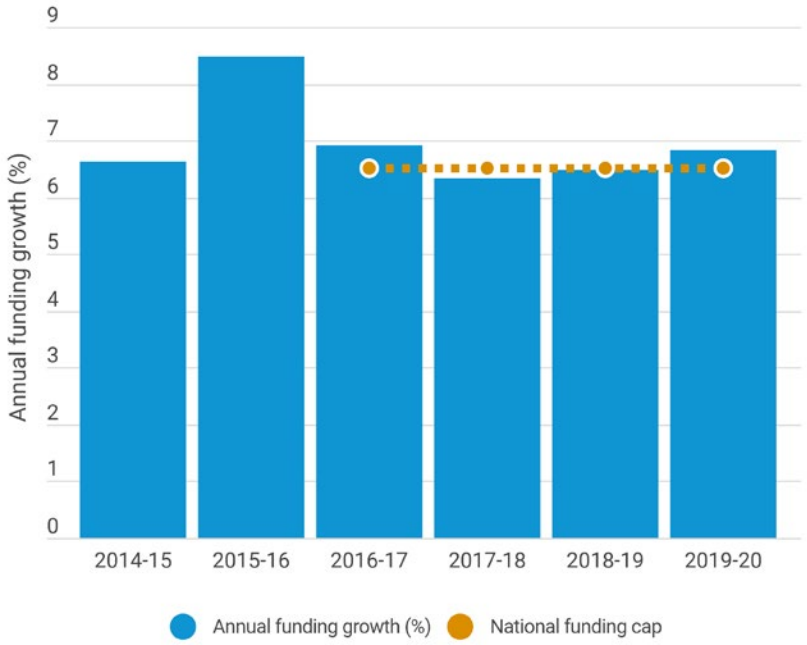
Annual growth cap

The Commonwealth government limits its contribution to public hospitals by capping annual funding growth at 6.5 per cent on the previous year (inclusive of health inflation). If the actual total cost of hospital activity exceeds 6.5 per cent growth on the previous year, the State and Territory governments have to pay the excess. While this cap on Commonwealth growth funding provides certainty for the Commonwealth, it shifts cost risk and budget pressure onto States and Territories.

Where States and Territories have public hospital services growth that is equal to or exceeds the 6.5 per cent Commonwealth cap, they have to either limit hospital services volume to 'live within' the Commonwealth funding cap, at the expense of meeting local demand for hospital services, or find more state revenue to pay for increased hospital activity. One of the few ways States and Territories can adjust hospital service volume is to limit the number of elective surgery admissions each year. Also, if States and Territories do not expand the number of beds, this by necessity caps the volume of patients that can be treated.

The growth in annual funding shown in Figure 8 shows the impact of the national cap on hospital funding (and by extension, hospital activity). It depicts the annualised growth in funding for hospital activity since 2013-14 (the year when most hospitals completed the transition to funding using ABF). 2016-17 is the first year the Commonwealth funding cap was in place. In all years since the introduction of the cap, growth is persistently close to 6.5 per cent.

Figure 8: Annual ABF growth at national level, 2013-14 to 2019-20[65]



In 2019-20 the Commonwealth government increased its funding growth above the national cap as an exceptional COVID-19-related measure. Much of this 'activity funding' was provided/used as direct assistance rather than using activity measures given the circumstances surrounding the pandemic. This additional funding was welcome in a difficult time, but it did not boost activity or capacity other than to assist with the difficulties surrounding COVID-19.[66]

Figure 8 shows annual growth at a national level. The cap is 'shared' between States and Territories, meaning that collectively they need to sit below 6.5 per cent growth in hospital services to avoid footing the bill for the excess. This likely provides more uncertainty and cost risk for the States and Territories as to what their final costs will be.

State and Territory governments receive regular updates from the National Health Funding Body throughout the financial year as to the level of ABF-eligible activity in their public hospitals, and those in other States and Territories. This provides an opportunity to regulate the activity of hospitals so that it sits within the 6.5 per cent growth cap.

National Efficient Price and indexation

The Independent Hospital Pricing Authority (IHPA) was introduced in 2011 to rationalise and unify the pricing framework for public hospitals across Australia. IHPA does this principally by determining the National Efficient Price and the National Efficient Cost for public hospital services. The National Efficient Price (actually a list of national efficient prices) determines how much the Commonwealth government will contribute to the cost of each type of public hospital service provided each year under the ABF framework. The National Efficient Cost determines how much the Commonwealth government will contribute in block funding, e.g. to small regional hospitals.

The National Efficient Price is based on the national average cost of an admitted episode of care in a financial year – known as a National Weighted Activity Unit (NWAU). The 'average' hospital service is worth one NWAU. More expensive or complex hospital services are worth multiple NWAUs (e.g. heart bypass surgery), while less expensive, simpler hospital services are worth a fraction of an NWAU (e.g. an emergency presentation with no subsequent admission).

The design of the National Efficient Price (use of an average cost) puts downward pressure on public hospital service costs. This is because hospitals that are providing a service (e.g. a heart bypass) at above the national average price will have to foot the bill for the portion that exceeds the average, whereas hospitals providing the same service at below the national average price will receive reimbursement that exceeds what it cost them to provide the service.

In response to this arrangement, public hospitals have achieved substantial efficiency gains and increased the speed of patient flow from admission to discharge. There is nothing wrong with public hospital efficiency gains, provided that hospitals are not incentivised to deliver the minimal care necessary to discharge a patient. It is also important to note that there are limits to the number and scope of efficiency gains that can be made. The bigger and easier changes to hospital processes have likely already been made, while later changes are likely to be more incremental. This means, as the years go on, it is harder and harder for hospitals to find further efficiency gains to help them manage budgetary pressures. And of course, some innovations (e.g. a new cancer intervention) that provide better outcomes for patients may increase the cost of care (e.g. through increased staff time required), while not necessarily providing an efficiency gain to the hospital.

These efficiency gains made through the National Efficient Price mechanism have been used to keep total budget growth in public hospitals below the 6.5 per cent cap. Wage growth is at its lowest level on record[67] and 'one-off' large efficiency savings (2.3 per cent per year since inception) cannot be relied upon forever. As the growth in wages lifts back to more typical levels and efficiencies become harder to find – say falling to 1 per cent per year – cost pressures/average cost per separation will rise.

In combination with ABF, it is easy to see how the current funding formula drives speed and volume over quality of care and patient outcomes. It is also easy to see how the current funding formula squeezes public hospital finances year-on-year. Indeed, since the National Efficient Price was introduced, the funding contribution to public hospitals has been eroded further. It is effectively indexed at the rate of the National Efficient Price. The first National Efficient Price (2012-13[68]) was $4,808. By 2021-22 it has reached $5,597.[69] This represents an indexation for an average hospital admission of 1.27 per cent per year (averaged over the period 2012/13 - 2021/22). This rate of indexation is less than nurses' salary growth averaged over the period 2012-13 to 2019-20 (3.1% per year)[70] and much lower than health inflation (i.e. how much hospitals pay for goods and services), which was 3.5 per cent per year averaged over the period June 2013 to June 2020.[71]

This has the effect of further squeezing public hospital finances, as the cost of providing hospital services exceeds the reimbursement paid for them. This funding formula has resulted in the Commonwealth government saving a lot of money. It also provides indirect benefit to State and Territory governments by providing a reasonable excuse to only match the Commonwealth funding on the 45-55 per cent proportional basis.

Performance and quality

Running a hospital well is about much more than just treating patients that come through the door as quickly as possible, yet this is the only aspect of public hospitals that the current funding formula rewards and remunerates. Hospitals are not sufficiently incentivised to focus on their performance or the quality of care provided, nor do they have the time or the money to do so. The current funding formula is also not well-designed to treat patients in a holistic way. This is most pronounced in the areas of chronic and complex disease. These problems are explored in more detail below.

Performance-related funding

In the 2014-15 Commonwealth Budget, significant changes were made that stripped funding from public hospitals and abolished the National Health Performance Authority and performance-related funding.[72] This marked a turning point for the performance of public hospitals – after several years of year-on-year improvements across some measures, this trend was reversed from around the time the reforms were made (see Figures 3, 4 and 5).[73]

ABF originally operated alongside performance-based funding, and was always designed to do so. Without this dual focus, current public hospital funding does not reward or pay hospitals to deliver high quality care or patient outcomes. The exception is the application of Commonwealth government funding penalties to incentivise State and Territory governments and public hospitals to minimise serious adverse patient outcomes.

ABF alone drives volume of individual treatment episodes, but not necessarily high-quality care or good patient outcomes. In fact, the current funding arrangement is an incentive to run hospitals at very high or full capacity which can impact negatively on patient outcomes.

Under the Addendum 2020-2025, Australian governments agreed to progress six long-term health reforms, including "paying for value and outcomes". The Addendum outlines the shortfalls of the current funding formula:

> "[...] current models for commissioning and funding health care are fragmented and do not reward providers for planning, coordination, and integration of care across a treatment journey. [...] Responding to the challenges the Australian health system will face in the future demands a financing system that is proactive, value-based and focused on individual and community needs. The current system does not afford the necessary funding flexibility and governance arrangements to address these challenges, provide best patient care and support contemporary models of care."[74]

Unfortunately, the Addendum 2020-2025 did not include sufficient additional funding to help State and Territory governments to progress these reforms. Therefore, it is unlikely that most jurisdictions will be able to make significant progress towards "paying for value and outcomes", without a specific injection of funds.

In particular, the investment in digital infrastructure needed to transition public hospitals to providing value-based healthcare is substantial. This is unlikely to be achievable by all States and Territories with the amount of funding currently available.[75]

Evaluation, improvement and expansion

The States and Territories are expected to fund the full cost of evaluation and improvement in public hospitals. But hospital staff do not have the time or money to evaluate current processes and identify and implement improvements, since they are funded purely on the basis of number and type of patients treated.

Public hospitals have huge potential to improve their processes to achieve better results with the same infrastructure and the same patient demand – they just need time and money to invest in evaluation and improvement. For example, access block in many cases could be avoided with a refinement of bed management, patient flow and discharge practices, alongside a review of staff mix and working hours.

However, in some cases, improvement of performance and easing of demand can only be achieved with an investment in capital infrastructure and additional human resource, such as more beds with more doctors and nurses to staff them. Sometimes this extra investment is simply unavoidable due to population growth, rising rates of chronic disease and an ageing population. While some of this demand can be better dealt with in the primary care space if funded through targeted initiatives, some additional beds will be required.

Most States and Territories cannot afford to fund either evaluation and improvement activities or capital infrastructure with current resources (a lack of effective revenue base), without compromising the day-to-day urgent business of public hospitals.

Exit block and alternative care destinations

One area ripe for improvement is the flow of people out of inpatient wards who are able to be discharged but have no safe destination. The most common reasons for this are that people's care needs have changed during their hospital admission, and they are now waiting for appropriate aged care (such as a place in a nursing home or a Home Care Package at the right level), or for disability care (often related to National Disability Insurance Scheme (NDIS) funding). This is known as 'exit block'.

The AIHW estimates that people waiting in hospital for a place in a nursing home occupied 7.2 patient days for every 1,000 patient days in hospital in 2018–2019 for major cities, or 222,000 patient days.[76] In a previous health economic paper, the AMA estimated this would increase to 232,000 patient days in 2020-21, at a total net annual cost of $197 million.[77]

There is significant scope for processes to be refined so that fewer beds are blocked for these reasons and patients can progress quicker to a more appropriate destination. In addition, different models of care need to be explored that would provide 'sub-acute' care to people who do not need to be in an acute hospital setting.

Furthermore, with nursing homes failing in many cases to provide an adequate level of clinical care for older people, nursing home residents are frequently taken to hospital. By adequately investing in aged care and improving clinical care in nursing homes, the Commonwealth government could remove some of the burden from the public hospital system while making substantial savings. In a previous health economic paper, the AMA estimated that $4.05 billion could be saved every year in potentially preventable hospitalisations from older people in the community and in nursing homes by investing in better primary care.[78]

There are, however, some aspects of the interface between hospitals and aged care that are currently operating well. Currently, aged care assessments for people with complex care needs are done by hospital-based aged care assessment teams (ACATs). There are 80 ACAT services throughout Australia linked to Local Hospital Networks, with 134 service outlets. ACATs are multidisciplinary teams that include nurses, allied health professionals and most importantly geriatricians, that provide comprehensive assessments to older people. ACATs know their communities well and know relevant health and aged care services they can refer patients to.

Under the current aged care reforms, there is a plan outlined by the Commonwealth Government to privatise aged care assessments.[79] An older person would still be in public hospital, but instead of the assessment being done by the hospital team that is already there, they would have to wait for an external team of assessors to come in and do it. Those assessors would need access to the patient, and potentially to clinical data that is currently readily available to the hospital team but not to external people. These things would have to be arranged by the hospital, thereby still taking up the time of public hospital staff. Meanwhile, the Commonwealth funding for them to do it would be withdrawn. This change would be to the detriment of the public hospitals and would likely result in long hospital stays for older people becoming even longer.

Public hospitals cannot afford to keep operating with the current level of exit block they experience, let alone with an increased level. The Commonwealth and State and Territory governments need to work together to refine the arrangements around transitions out of hospital care in order to free up beds in public hospitals.

AMA member, Tasmania

"I work in the ED of a rural hospital. The access block is a daily challenge for us. One of the reasons for this is the number of people in our medical beds waiting for nursing home beds or appropriate accommodation for patients with a disability (waiting for NDIS approval and work being done to their home to make it accessible). In addition to this, every day we see patients in our ED who are from our nursing homes, where they have been sent to the ED because there is no clear plan for management in the nursing home or no one skilled enough to deliver that care. The nursing home often only has one registered nurse on shift. Decades ago there were several nurses on shift. Then patients were less medically complicated. Now we have less skilled and trained staff for people who have far more medical conditions. It is bound to lead to more people being sent to the ED then being admitted to hospital beds for care.

The other issue is the older person in the community who is clearly becoming less and less able to manage at home. These people are not being identified early enough and the GPs are not able to have good conversations with them and their family about getting support early to manage, and a clear plan for a move into supported care or a nursing home. It is not the GPs' fault. These conversations take time and the GPs do not have the time. Sometimes people are stubborn and do not want to talk about these difficult issues of decline and loss of independence with ageing, which adds to the challenge. The result is that a crisis is reached and they come to the ED. We have no choice but to admit and then wait for a nursing home bed.

This lack of planning of the progression of decline and ageing takes away the choices of our older community members and they end up in the ED with no choice. This means our hospitals become clogged with people waiting to go to more appropriate accommodation which is not available. This has follow-on impacts through the whole hospital as beds and staff are unavailable. It means that people who need surgery to improve the quality of their lives, such as a joint replacement, wait years to get it. It means that those unfortunate people who spend too long in the ED waiting for an inpatient bed have a worse outcome, and those people coming into the ED with an acute medical condition when it is overcrowded with admissions, wait too long and also have a worse outcome."

Chronic and complex disease

Our public hospitals are in particularly high demand from older people (age 65+) and people with chronic and complex illness, including mental health issues. Often the needs of these people can be better met outside of hospital. If better funding models could be put in place for the management of chronic and complex disease, this would help to reduce demand on public hospitals.

It is now well recognised that activity-based funding is not a suitable mechanism for chronic and complex disease management. It is suited to single episodes of hospital care that can be dealt with largely in isolation; it is not suited to providing continuous, multidisciplinary care for ongoing medical conditions.

Both the Productivity Commission and IHPA have recently identified that ABF should be supplemented by different funding models for managing chronic disease.

As IHPA has identified, while "ABF remains the most appropriate funding model for one-off acute episodes of care usually in a hospital setting", there are specific areas of care that could potentially benefit from "funding and payment mechanisms that incentivise providers to focus on outcomes that matter to patients as opposed to volume of services or procedures performed".[80] IHPA has now undertaken preliminary analysis which has shown that around 30 per cent of the patients currently funded under ABF could potentially benefit from alternate funding approaches.[81]

The Productivity Commission in their 2021 report on *Innovations in care for chronic health conditions*, also identified limitations with ABF:

> "[...] activity-based funding mechanisms [...] reward service providers for the number of consumers they see, and the volume of treatment they provide. These funding mechanisms offer limited compensation for the management of chronic conditions, and provide insufficient incentives to engage in prevention, proactive outreach and quality improvement. [...] hospitals are paid for treatments they provide rather than being encouraged to keep people healthy and avoid the need for hospital visits."[82]

Funding models that are more appropriate for chronic and complex disease include those that provide a funding package for the management of a patient's holistic needs over a period of time. This can provide better 'wrap-around' care for the patient, while incentivising the fund manager to deliver good patient outcomes and find better ways to integrate healthcare across a range of providers and specialties.

These ideas are not new. In 2015, the Primary Health Care Advisory Group recommended to the Commonwealth government that, to achieve better outcomes for people with chronic and complex health conditions, "existing payment systems should be redesigned for eligible patients [...]. These should include the introduction of bundled payments, block payments and pooled funding [...] while preserving fee for service for episodic care."[83]

If better outcomes for people with chronic and complex disease can be achieved in the community through a mixture of primary and specialist care, this could significantly reduce the demand on public hospitals by avoiding people turning up with a clinical crisis once their condition has escalated.

CASE STUDY: Western Sydney Integrated Care Program

Time and location: This new model of care was trialled in Western Sydney in 2014-2017 (patient enrolment dates July 2015 – July 2017).

Model of care: Multidisciplinary team-based medical care was provided in the community for chronic diseases, as a collaboration between public hospitals and primary care.

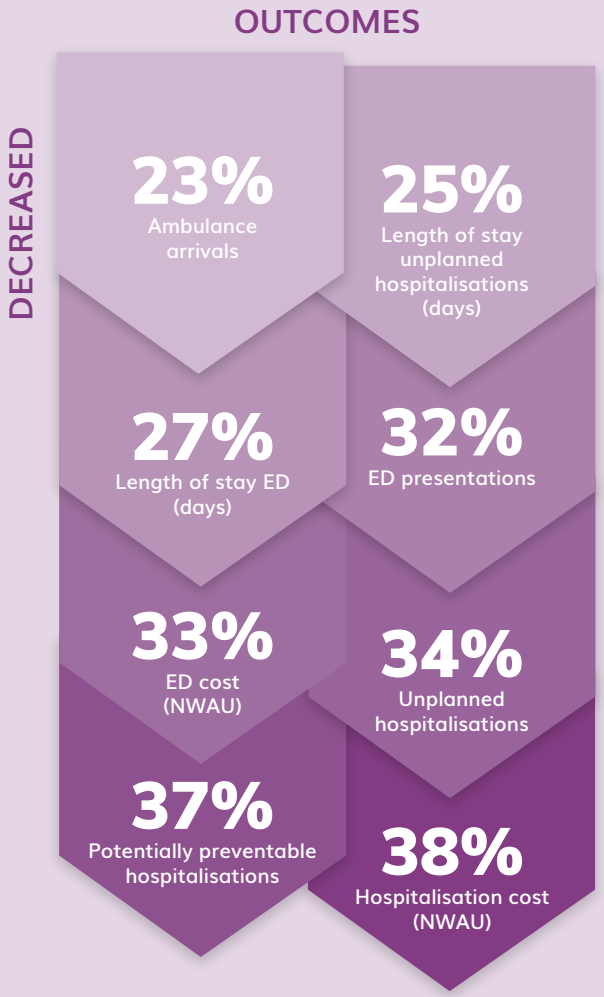
Eligibility: The program was open to patients with one or more of four chronic conditions — congestive cardiac failure, coronary artery disease, chronic obstructive pulmonary disease and diabetes.

Participation: Over the period, 1,510 patients were enrolled into the program via their participating GP or hospital. By July 2017, 60 general practices including 208 General Practitioners engaged in the program.

Outcomes: Results from the preliminary analysis show decreases in hospital admissions, ED presentations and hospital costs for the patient cohort.

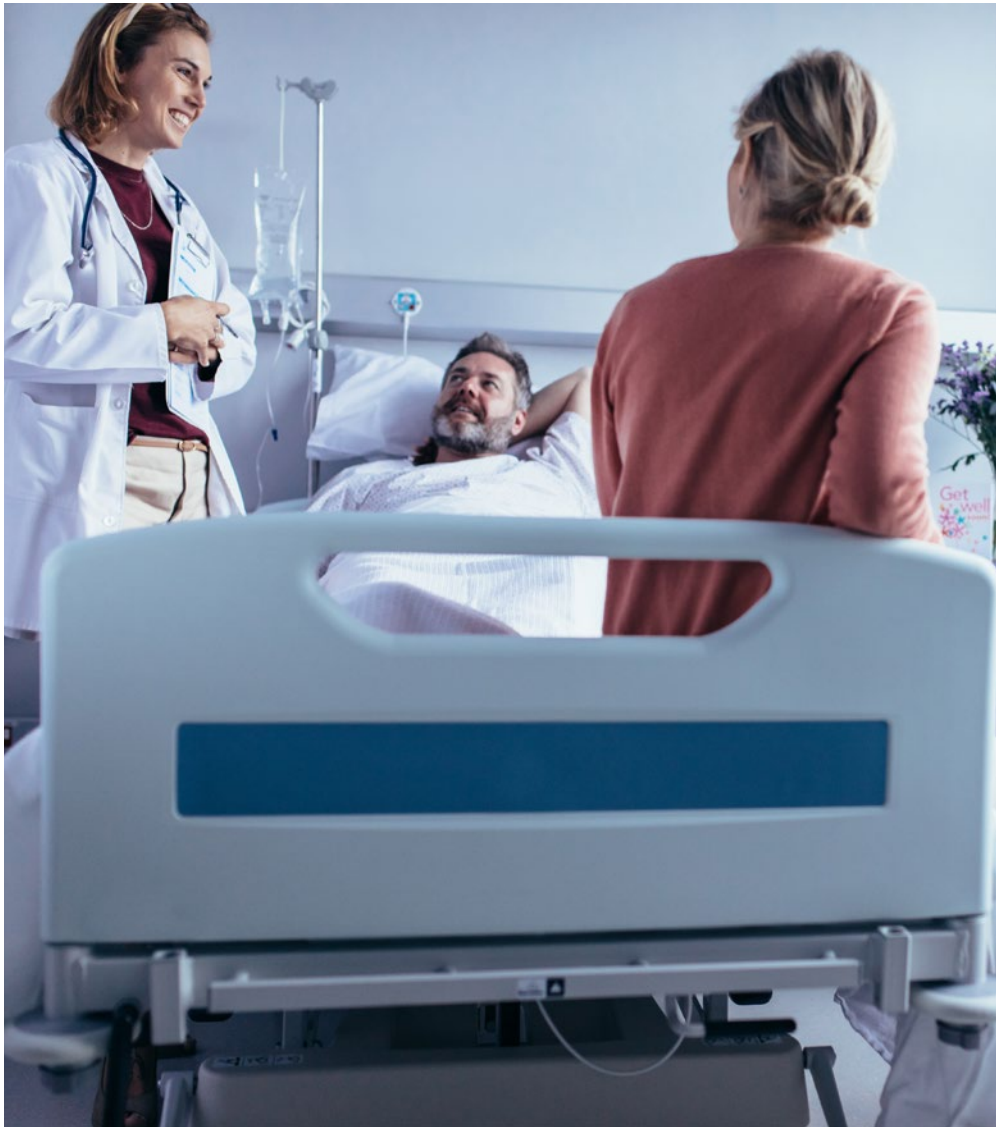
"Before the integrated care program, Mum was contstantly getting admitted into hospital. They would treat or fix one issue and then she'd come out of hospital and she had something else wrong ... But over the past six months I think she's been in hospital only twice. Her blood pressure and her sugar are on track ... and Mum's entire medical history was linked with both Blacktown and Westmead through the GP." - Carer

Source: Western Sydney Local Health District and Western Sydney Primary Health Network (2018). *The new frontier of health care: Western Sydney Integrated Care Demonstrator 2014-17.*



Source: Prelimminary analysis July 2015 - November 2017. Integrated & community health data 2017.

Source: Western Sydney Local Health District and Western Sydney Primary Health Network (2018). *The new frontier of health care: Western Sydney Integrated Care Demonstrator 2014-17.*[84]



Under the Addendum 2020-2025, Australian governments have agreed to prioritise prevention and wellbeing, to reduce the burden of long-term chronic conditions and improve people's quality of life. The Addendum also makes provision for States and Territories to trial innovative funding models.[85] IHPA has encouraged States and Territories to nominate alternative funding models to trial, and is allowing some flexibility in the hospital funding model to enable such trials to take place.[86] This is a positive step, but it must be recognised that significant resource and effort is required in a number of areas (most notably for data linkage) to enable innovative trials to succeed. Very little funding has been allocated in the Addendum to support this activity, which creates doubt about whether all jurisdictions will be able to afford the implementation costs of taking this step.[87]

Conclusion

The Addendum 2020-2025 is, by and large, a continuation of the same Commonwealth funding formula that has produced the long waiting times for public hospital services to date. 'More of the same' will not help improve patients' timely access to public hospital treatments. While ABF has achieved some positive outcomes, such as improved transparency and efficiency, it was never designed to operate in isolation, and reforms must now be made.

WHAT WILL PUBLIC HOSPITAL PERFORMANCE LOOK LIKE IN THE FUTURE UNDER A 'DO NOTHING' SCENARIO?

Bed numbers will continue to decline relative to the population

A key metric of public hospital capacity is their ability to cater for the number of older people (65+) in the community. People's likelihood of needing care increases as they age and when they do enter care they take longer to heal and are at greater risk of complications. People aged 65 and over represent 16 per cent of the population, but account for 50 per cent of total admitted bed days in hospital.[88]

The AMA has reported consistently on the decreasing capacity of public hospital beds relative to the population aged 65 and over (see Figure 2). As the population grows and ages, this capacity will decrease further if the rate of new beds being added remains stable. This will deepen the public hospital access crisis.

Figure 9 shows a continued decline in the number of beds per person aged 65 and over, projected out to 2030-31. Actual data is displayed to 2019-20, and projected data thereafter. The projection continues the current rate of additional beds and accounts for the ageing population. Without an increase in the rate of additional beds (currently 1% per year), the number of beds per 1,000 people aged 65 and over can be expected to fall from 14.9 in 2020-21 to 12.7 by 2030-31. An increase in public hospital bed capacity must be part of the solution to avoid deepening the public hospital access crisis.

In absolute numbers, there are estimated to be approximately 63,200 average available hospital beds in 2020-21, rising to 69,510 beds by 2030-31, if bed numbers increase at the current trend rate. By 2030-31, there will be approximately 7,150 fewer beds than needed for the population.

Figure 9: Actual and projected number of beds per 1,000 people aged 65+, 2009-10 to 2030-31[89]

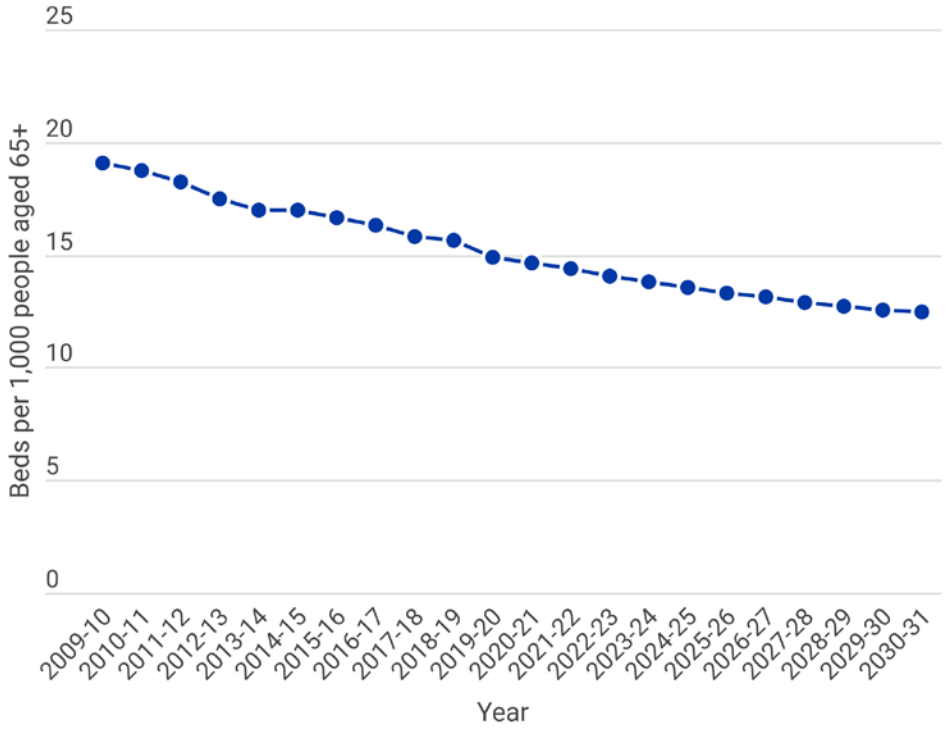
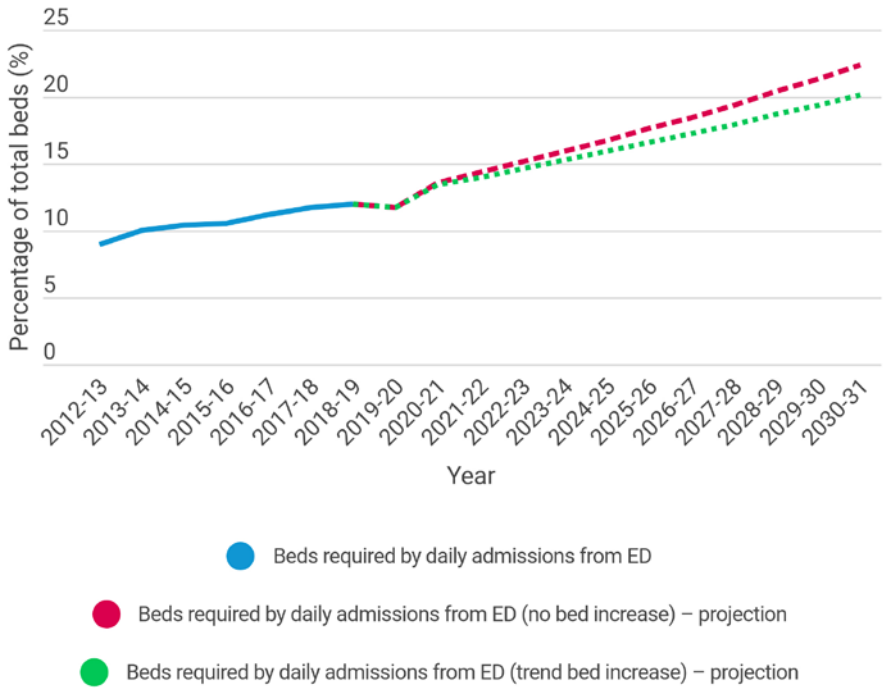


Figure 10 shows the impact of failing to increase bed capacity. Average daily admissions from the ED are already exceeding 10 per cent of total bed capacity. Due to the projected increase in admissions from ED, without an increase in the rate of new beds being added, this will reach 20 per cent by 2030-31.[90] The Figure shows actual percentage of beds to 2019-20, and projected percentage thereafter.

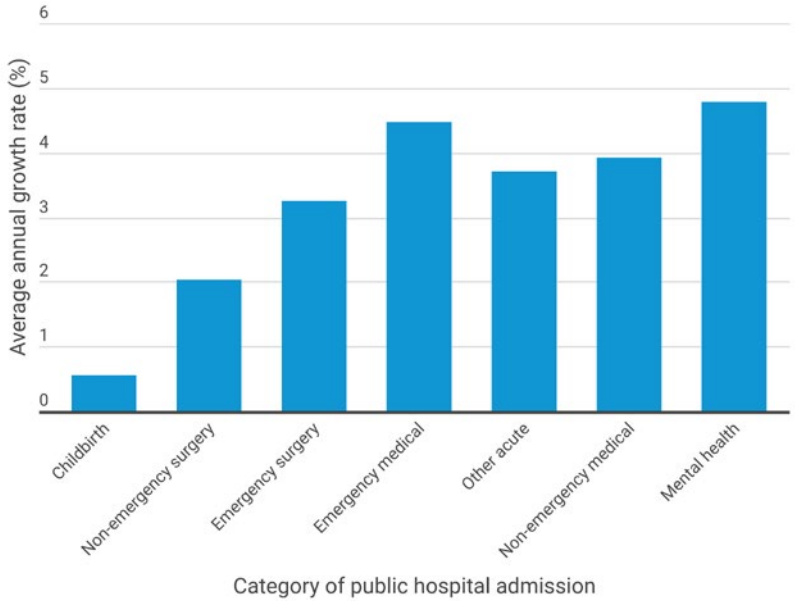
Figure 10: Actual and projected number of beds required by daily admissions from ED, showing projections under two scenarios – if no increase in beds and if bed numbers increase at current rate[91]



Growing hospital admissions and ED demand will put even more pressure on public hospitals

All types of hospital admissions except elective surgery and childbirth are growing strongly year on year. Figure 11 below shows the average annual growth rate of the major admission categories.

Figure 11: Average annual growth rate of public hospital admissions by category, 2013-14 to 2018-19[92]

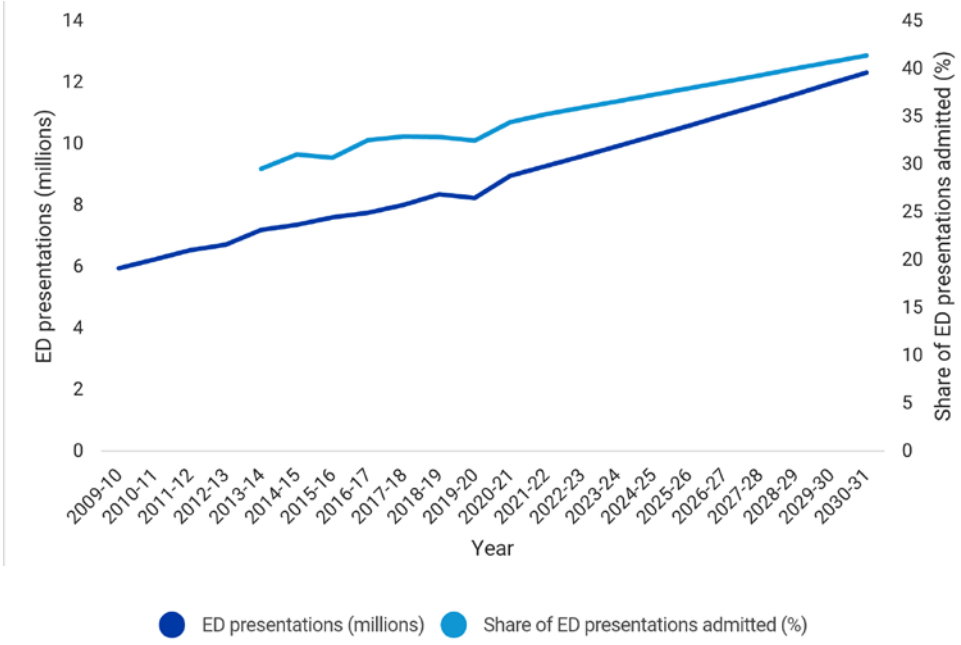


Even before the COVID-19 pandemic, mental health admissions were growing the fastest at 4.8 per cent per year, followed by emergency medical (4.5%), and non-emergency medical (3.98%). An example of non-emergency medical treatment is kidney dialysis. Chronic disease and the ageing of the population are likely causing the rise in medical admissions, and ageing of the population is also likely contributing to the rise in surgical admissions. These trends are likely to continue, squeezing the capacity of our public hospitals more each year if capacity and funding issues are not addressed.

Looking more closely at EDs, Figure 12 below shows the sustained growth in ED presentations back to 2009-10 (dark blue line). The light blue line shows that there is also sustained growth in the share of those presentations which were then admitted to hospital. The Figure displays actual growth to 2019-20[93], and trended age-specific growth rates thereafter.

The combined effect of strong growth across both measures begins to paint a disturbing picture. When growth is projected out to 2030-31, by continuing the trend of the age-specific rate of presentations and admissions[94], it shows admissions from ED will grow to over 5 million per year in 2030-31 from only 2 million in 2012-13.

Figure 12: Actual and projected growth in ED presentations and share of ED presentations admitted to hospital, 2009-10 to 2030-31



Again, the main drivers behind this are likely to be chronic disease and an ageing population. An older person is more likely to present to an ED and much more likely to require a subsequent admission. Of the 75-84 year-olds that present to the ED, 60 per cent require admission (either at the same hospital or transferred to another), compared with 21 per cent of 15-24 year-olds.[95] This means that the older group are approximately three times more likely to be admitted after presenting. As the population ages, this is driving up the total share of presentations to the ED that require admission.

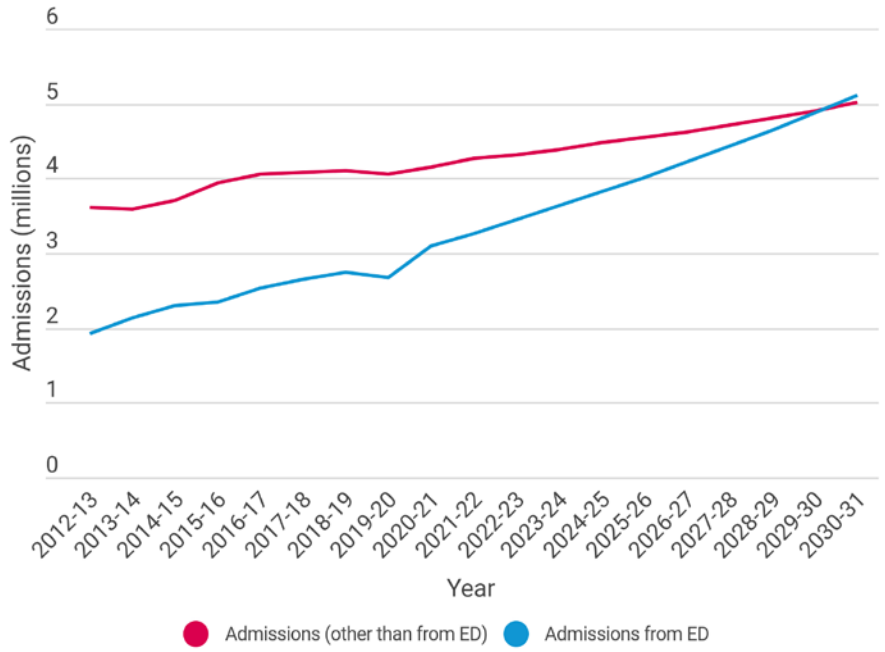
Given that the number of hospital beds relative to the population is declining, it is easy to see how, combined with rising demand for hospital services, this will only deepen the public hospital access crisis if no action is taken. More doctors and more nurses will also be required to address this demand, in addition to more beds.

Waiting lists for elective surgery will increase

When a stretched hospital needs to accommodate ever increasing admissions from ED, those beds, doctors and nurses become unavailable for any other form of admission.

Figure 13 below shows the current trends in hospital admissions from ED and other hospital admissions (not from ED). The Figure displays actual growth to 2019-20[96], and projected growth thereafter. You can see that other admissions are growing at a slower rate than admissions from ED. When growth is projected[97] out to 2030-31 based on trended age-specific admissions, it shows admissions from ED will overtake other admissions around 2030.

Figure 13: Actual and projected growth of hospital admissions from ED and other (non-ED) admissions, 2012-13 to 2030-31



The growth in hospital admissions from ED is particularly problematic in combination with the 6.5 per cent funding cap which constrains the volume of hospital services that can be provided. The resulting impact will be that other admissions will be increasingly deprioritised, leading to even longer waiting lists for elective surgery and non-emergency medical treatments.

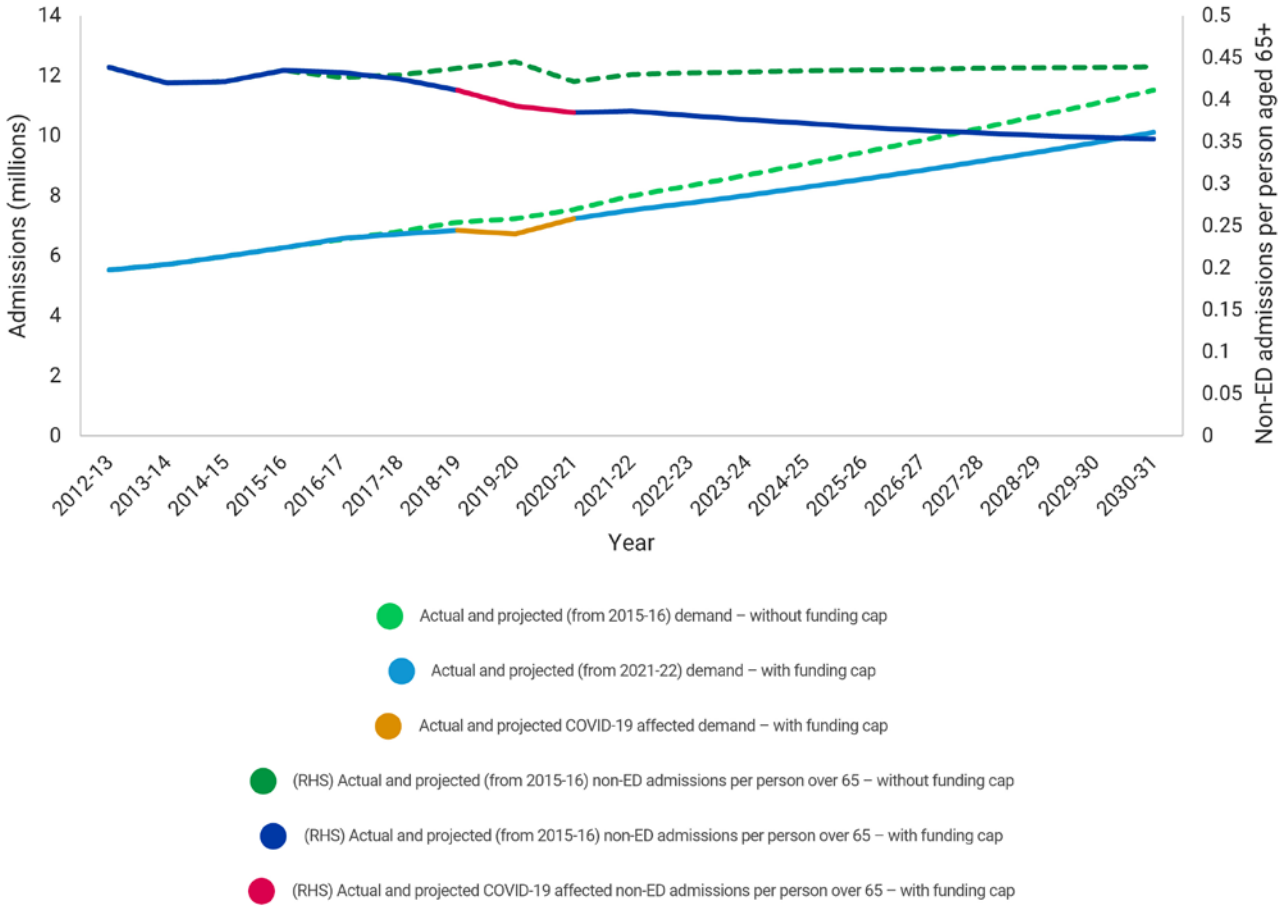
There will be significant unmet demand for non-emergency public hospital services

When faced with beds which are increasingly occupied by admissions from the ED, hospitals do their best to accommodate all other admissions. This capacity constraint combined with the 6.5 per cent funding cap will lead to fewer admissions than there otherwise would be. Looking ahead, the impact will likely be felt most acutely among older Australians, as this demographic group expands.

To understand the potential future impact of the funding cap, it is useful to project two scenarios – one with capped demand and one with 'uncapped demand' i.e. with the cap removed. Both are depicted in Figure 14 below. Demand in this case means for all public hospital services, emergency or otherwise.

The Figure shows that as demand continues under the projected uncapped scenario, the funding cap is not applied. In the second scenario, the funding cap is applied and demand is constrained (this was apportioned across age groups).

Figure 14: Actual and projected public hospital demand under two scenarios, capped and uncapped, 2012-13 to 2030-31



See endnote for explanation of how COVID-19 affected years were treated in the modelling.[98]

Uncapped demand has been projected based on the trend in actual demand from 2012-13 to 2015-16[99], using age-specific rates of admission. 2015-16 was used as the cut-off date because in 2016 reforms to the National Health Reform Agreement adjusted the Commonwealth share to 45 per cent with a 6.5 per cent annual funding cap. Therefore, 2015-16 is the last year of demand without the imposition of the national funding cap.

Capped demand has been projected from 2021-22 using the maximum funded budget under the Addendum 2020-2025 with the 6.5 per cent growth cap in place. Activity was then calculated as what can be afforded while fitting within this capped funding.

In both the uncapped and capped demand projections, the National Efficient Price was assumed to continue to accrue efficiency savings but at a slower pace than history, at 1 per cent per year. Using the long-term Australian Bureau of Statistics (ABS) Health Consumer Price Index rate of underlying cost growth for hospitals of 4 per cent, this implies a net annual cost growth of 3 per cent after efficiency savings are deducted. In turn, this implies that average cost growth across the entire public hospital system is approximately 3.2 per cent per year, once block funded hospitals are accounted for. This effectively caps underlying activity growth at approximately 3.3 per cent, once you allow for the fact that the National Efficient Price process only partly applies to block-funded hospitals.

In the projection it is assumed that emergency admissions continue to be met through the triage process. It is therefore worth examining what happens to the rate of non-emergency admissions.

As shown in Figure 14 (right Y axis/'RHS'), under the uncapped scenario, demand for non-emergency admissions continues to be met. In contrast, the capped scenario shows the decline in non-emergency admissions, as demand is not met. The impact on those aged 65 and over has been analysed because it is where future growth is strongest and it is an important measure of public hospital capacity.

Again, actual number of non-ED admissions is used, with 2015-16 as the last year of real data. The projected admissions, based on the same continuing trend from 2015-16, show the number of admissions for the 65 and over cohort continues at a steady rate of 0.44 admissions per person.

In the uncapped scenario, non-ED admissions merely hold at about the same rate as they were in 2012-13 and again in 2015-16.

In the capped scenario, accommodating the growth in demand for public hospital services (mostly driven by growth in ED admissions) means that the proportion of people able to be admitted without entering via the ED falls year-on-year. Demand is still in the community, but hospital activity is only meeting part of that demand. By 2030-31, admissions per person 65 and over fall to 0.35 from 0.44. This implies an unmet demand of 480,000 people over 65 in the community unable to access care when they need it, or a discrepancy as high as 20 per cent of demand emerges between the capped and uncapped scenarios for non-ED admissions.

For all admissions combined (left Y axis/'LHS'), by 2030-31 unmet demand rises to approximately 14 per cent of all hospital activity or around 1.4 million admissions. For comparison, this is larger than the current size of all elective surgery. This is a significant amount of unmet demand for hospital treatment that can be expected within ten years if no action is taken.

WHAT ARE THE SOLUTIONS TO THE CURRENT PROBLEMS IN PUBLIC HOSPITALS?

Urgent reform of public hospital funding is needed. The AMA's vision is for a new funding approach to supplement the current focus on activity-based funding – one that includes funding for positive improvement, increased capacity, and reduced demand, and puts an end to the blame game.

Solutions are presented in four categories: increase funding and remove funding cap; address demand; improve performance; and expand capacity.

Increase funding and remove funding cap

The Commonwealth contribution should increase to 50 per cent for activity (as per current COVID-19 specific partnership agreement), with States and Territories to use the 5 per cent of 'freed-up' funds on improvement.

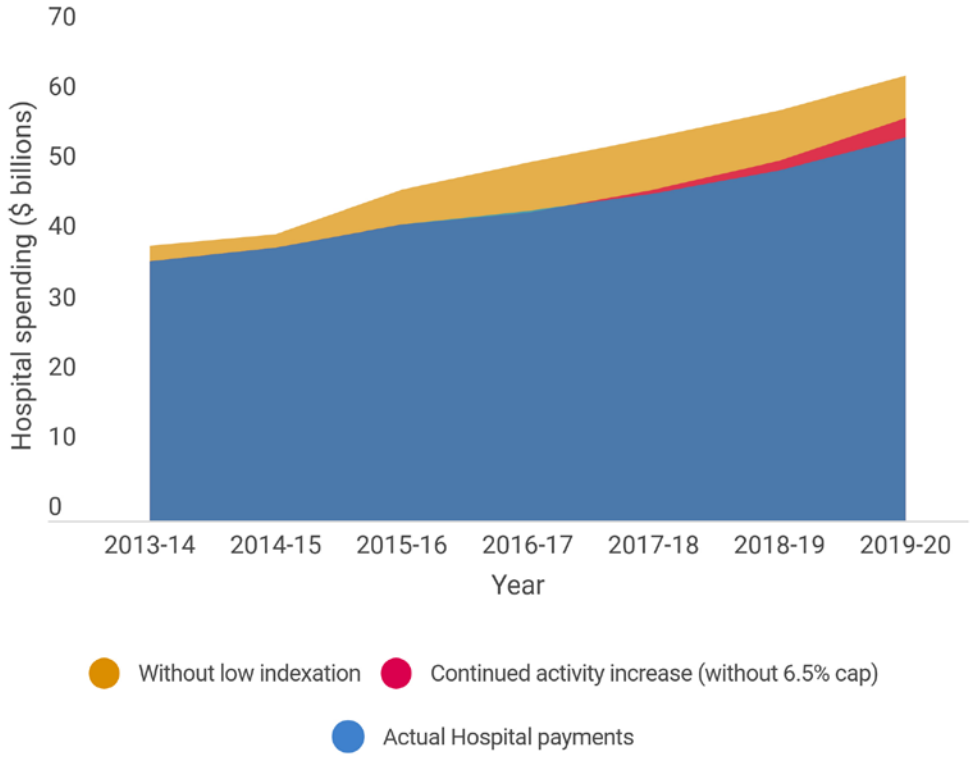
The annual growth cap on the Commonwealth's contribution should be removed, allowing funding to meet demand for hospital services.

The Commonwealth and State and Territory governments have saved a lot of money from insufficient indexation of their contribution to public hospitals through the use of the National Efficient Price. Where public hospitals are able to make efficiency savings that keep costs below Health Consumer Price Index, these savings should be reinvested into public hospitals by governments.

Indeed, through the implementation of the National Efficient Price and the funding cap, there have been significant savings achieved for governments. These savings are depicted in Figure 15 below. In the four years to 2019-20 alone, these savings amount to $32.4 billion[100] (the sum of the orange and pink areas since July 1 2016).

The blue area in Figure 15 represents the actual spend on public hospital services by Commonwealth and State and Territory governments (using the current funding formula outlined in the Addendum 2020-2025). The thin pink area represents the additional (counterfactual) cost if activity had been allowed to increase without the imposition of the 6.5 per cent national cap. The orange area at the top reflects what governments' hospital spend would have been if activity funding had been indexed to match the cost of health goods and services (Health Consumer Price Index).

Figure 15: Actual government payments for public hospitals versus hypothetical payments if low indexation and 6.5% cap were not in place

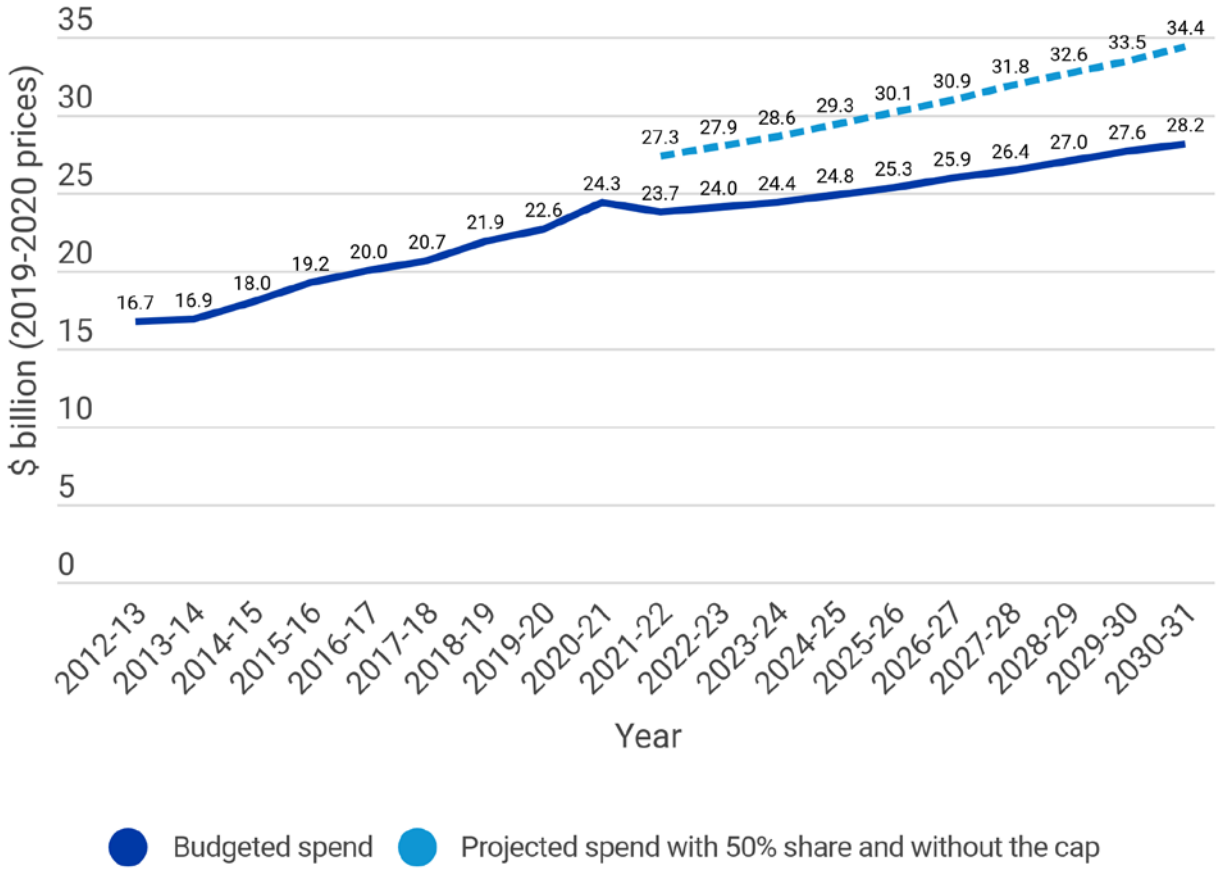


The orange area can be thought of as the amount 'saved' by Commonwealth and State and Territory governments by using the National Efficient Price as the indexation mechanism. The indexation mechanism drives the majority of savings. That process has squeezed efficiencies from the public hospital system each year since inception. The pink area can be thought of as the amount 'saved' by the Commonwealth government by imposing the 6.5 per cent funding growth cap. The implicit assumption is that, in absence of the national cap, State and Territory governments would have allowed greater activity within the public hospital system in order to meet demand.

The following projection in Figure 16 shows that the combination of the higher funding share (50%) and the removal of the 6.5 per cent funding cap would increase the future Commonwealth contribution by $3.6 billion in 2021-22, rising to a $6.2 billion increase in 2030-31 (in 2019-20 dollars).

The ABS Health Consumer Price Index series was used to inflate past years contributions, and the 10-year average ABS Health Consumer Price Index was used to deflate future amounts to bring all values to 2019-20 prices. Commonwealth budgeted contributions (solid line) match Budget forecasts[101] until 2024-25 ($29.9 billion in 2024-25 prices), then are projected with growth at the 6.5 per cent national cap.

Figure 16: Actual/projected Commonwealth spend budgeted for public hospital activity versus projected spend if contribution raised to 50% and 6.5% cap lifted



The projected activity (with 50% share and without the cap – dotted line) is measured by the trended age-specific activity up to 2015-16 prior to the introduction of the cap, projected out to 2030-31. This is estimated at 4.3 per cent annual growth as discussed earlier, which is primarily demographic driven growth.

Further funding above these measures will also be needed to address the current crisis, as outlined below.

Address demand

ABF should still be the funding model for the majority of people, but should be supplemented by alternative models of care better designed for holistic treatment of patients with chronic and complex disease, including mental illness. Some alternative models of care have been trialled, but time and money are needed to support and scale successful pilot projects to state-wide services, and enable further trials of innovative models of care.

The Commonwealth should partner with the State and Territory governments to provide additional up-front funding for this purpose – with the States and Territories funding from the hospital outpatient end, and the Commonwealth funding at a primary care level. Return on investment would be realised through reduced public hospital costs, over time. Improved patient outcomes would also be achieved through reduced admissions and re-admissions.

The Commonwealth and State and Territory governments should also work together and provide partnership funding to review and improve processes, and models of care, so that people who do not need acute hospital care are not in the hospital. This means looking at alternative destinations to the inpatient ward which might mean exploring out-of-hospital sub-acute care models. It also means improving administrative processes that contribute to exit block – principally relating to aged and disability care.

Expand capacity

State and Territory governments should use the 5 per cent of 'freed-up' funds to invest in evaluation and improvement activities to increase their capacity through improved processes.

Public hospitals should also be given additional funding to expand their capital infrastructure where needed. The Commonwealth government should fund this in partnership with the States and Territories, in the knowledge that it will improve both hospital efficiency and patient outcomes. This additional money could be allocated on a match funding basis, following proposals from the States and Territories. The obvious place to start would be to fund proposals that would result in improvements for EDs, given this is a priority area.

Improve performance

Select pay-for-performance targets should be reintroduced and monitored with the goal of *at least* reversing the decline in public hospital performance. This Commonwealth funding would be in addition to, and separate from, ABF funding and the new partnership funding to expand capacity and reduce demand proposed here.

Ultimately, to reverse the decline in performance in our public hospitals, we need action and funding across multiple domains; performance targets are only one part of the picture. Performance improvement will involve a range of reforms across capacity, process, systems, staffing, digital integration, avoidable admissions, and out-of-hospital care, all of which have been considered in this paper. The mix of these factors needed to turn the crisis around will vary between States and Territories, Local Hospital Networks, and even individual hospitals. That is why the AMA has proposed that specific project-based funding in the domains of 'expand capacity' and 'address demand' is initiated by the State/Territory and funded through a partnership model, rather than led by the Commonwealth.

A key priority for performance improvement must be our public hospital EDs. As highlighted throughout the paper, the current crisis does not originate in EDs but it does manifest there. Reforms across every domain are needed simultaneously to address this, including: the removal of the cap so that demand for hospital services can be met (in the ED and across the hospital); the 5 per cent freed up funds so that States and Territories can spend it on reviewing key processes such as inpatient discharge practices and availability of senior ED staff to make decisions; and the partnership funding to add more beds (in the ED and across the hospital) and trial/roll-out models of care that keep people out of hospital. One or two of these interventions in isolation will not address the crisis; they must work in concert.

Conclusion

The current crisis in public hospitals is not just a Federal or a State/Territory problem; it is a national problem. Significant effort will be required from both the Commonwealth and the State and Territory governments to turn things around. Under the plan presented here, the AMA calls on all governments to invest more in public hospitals. While the Commonwealth will need to increase its share by a greater amount due to the addition of new funding streams, and the limited capacity of most States and Territories to raise additional revenue, nothing that is proposed gives the States and Territories a free ride:

- The increase in Commonwealth contribution to 50 per cent for activity-based funding would require the States and Territories to reinvest the 5 per cent into public hospitals.
- The removal of the Commonwealth's annual growth cap would allow public hospitals to meet community demand, meaning an indirect increase in funding from all governments due to increased activity.
- Funding to address demand and expand capacity would be partnership funding, shared between the Commonwealth and States and Territories.
- Commonwealth funding for pay-for-performance targets would only be paid if States and Territories improved their public hospital performance.

The AMA stands ready to advocate on this issue and to provide advice and support to governments as needed to steer our public hospitals out of crisis.

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For background on the National Health Reform Agreement, see: Council on Federal Financial Relations. *National Health Reform*. Retrieved 02/07/2021 from: https://www.federalfinancialrelations.gov.au/content/national_health_reform.aspx

[75] Under Clause 20 of the Addendum 2020-2025, the Commonwealth has provided $100 million for a Health Innovation Fund for trials that support health prevention and the better use of health data. This funding is managed separately through a Project Agreement under the Intergovernmental Agreement on Federal Financial Relations. The one-off $100 million Commonwealth funding was a 2020-25 agreement sign-on incentive. When the one-off, pro rata $12.5 million per jurisdiction Commonwealth funding is spent, there is no new Commonwealth funding commitment to co-fund the digital infrastructure each jurisdiction will need to measure patient outcomes and the cost of the healthcare provided to each patient. In other words, value-based healthcare. This transition is required by the Addendum, but not funded by the Commonwealth.
The Addendum is available at: Council on Federal Financial Relations. *Addendum to the National Health Reform Agreement, 2020-2025*. Retrieved 02/07/2021 from: https://www.federalfinancialrelations.gov.au/content/npa/health/other/NHRA_2020-25_Addendum_consolidated.pdf

[76] Australian Institute of Health and Welfare (2020). *Admitted patient care 2018-19. Chapter 4: Why did people receive care?* Table 4.14. Retrieved 09/03/2021 from: https://www.aihw.gov.au/reportsdata/myhospitals/sectors/admitted-patients.

[77] Due to the source data, this figure could not be disaggregated between public and private hospitals; it is a combined figure.
Australian Medical Association (2021). *Putting health care back into aged care*. Retrieved 03/08/2021 from: https://www.ama.com.au/articles/report-putting-health-care-back-aged-care

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For background on the National Health Reform Agreement, see: Council on Federal Financial Relations. *National Health Reform*. Retrieved 02/07/2021 from: https://www.federalfinancialrelations.gov.au/content/national_health_reform.aspx
Under Clause 20 of the Addendum 2020-2025, the Commonwealth has provided $100 million for a Health Innovation Fund for trials that support health prevention and the better use of health data. This funding is managed separately through a Project Agreement under the Intergovernmental Agreement on Federal Financial Relations.

[86] Independent Hospital Pricing Authority (2021). *Consultation Paper on the Pricing Framework for Australian Public Hospital Services 2022-23*. Retrieved 11/08/2021 from: https://www.ihpa.gov.au/past-consultations/consultation-paper-pricing-framework-australian-public-hospital-services-2022-23

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For background on the National Health Reform Agreement, see: Council on Federal Financial Relations. *National Health Reform*. Retrieved 02/07/2021 from: https://www.federalfinancialrelations.gov.au/content/national_health_reform.aspx
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[88] Australian Institute of Health and Welfare (2020). *Admitted Patient Care 2018-19*. Retrieved 22/01/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/sectors/admitted-patients

[89] **For number of beds:** Average available hospital beds data from 2009-10 to 2019-20, trend projection 2020-21 to 2030-31. Australian Institute of Health and Welfare (2021). *Australian hospital statistics, Hospital Resources 2019-20*. Table 4.6: Average available beds (a) and beds per 1,000 population, public hospitals, states and territories, 2015–16 to 2019–20. Retrieved 10/09/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads; Australian Institute of Health and Welfare (2015). *Hospital resources 2013-14: Australian hospital statistics*. Data tables: Chapter 2: How many hospitals were there?; Table 2.6: Average available beds and beds per 1,000 population, public and private hospitals, 2009–10 to 2013–14. Retrieved 10/09/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2013-14-hospital-resources/data
For population: Australian Bureau of Statistics (2020). *2009-10 to 2019-20, ABS Estimated Resident Population*. Data tables Population - Australia, Population at 30 June, by sex and single year of age, Aust., from 1971 onwards. Population is based off last known estimate, June 30 2020, then grown thereafter by the growth rates implied by annual changes in the Populations Projections Australia data. The low series is used for the first 2 years to simulate low growth due to COVID-19, then the medium series is used for growth thereafter; Population, growth for the period 2020-21 to 2021-22: Australian Bureau of Statistics (2018). *Population Projections, Australia*. Table B9, Population projections, by age and sex, Australia - low series. Retrieved 10/09/2021 from: https://www.abs.gov.au/statistics/people/population/population-projections-australia/latest-release#data-download; Population, growth for the period 2022-23 to 2030-31: Australian Bureau of Statistics (2018). *Population Projections, Australia*. Table B9, Population projections, by age and sex, Australia - medium series. Retrieved 10/09/2021 from: https://www.abs.gov.au/statistics/people/population/population-projections-australia/latest-release#data-download

[90] Age-specific rates of presentation and subsequent admission to the ED are available from the Australian Institute of Health and Welfare (Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2018–19 (Admitted to this hospital and referred to another hospital for admission)). Presentations by age are provided by the Australian Institute of Health and Welfare back to 2009-10. The Age-specific proportion admitted to hospital is provided in the years 2017-18 to 2019-20. In other years prior to this, only the total admissions and the implied aggregate admissions are provided. Using the 2017-18 age-specific rates, the aggregate admissions and the age-specific population (using Australian Bureau of Statistics estimate for the resident population single year of age), the age-specific admission rates for years prior to 2017-18 are triangulated to match the aggregate admissions.

The age-specific series is then used as the basis for projecting out the trend in age-specific rates.
The underlying population to determine the number of people in each age cohort is estimated by using the Australian Bureau of Statistics Population Projections Australia. The Australian Bureau of Statistics projected population growth, Series C is used until 2022 and Series B from 2023 to reflect the slow population growth because of COVID-19 and a recovery starting mid-2022.
The number of available beds is provided by: Australian Institute of Health and Welfare (2020). *Australian Hospital Resources*. Table 4.6: Average available beds(a) and beds per 1,000 population, public hospitals, states and territories, 2015–16 to 2019–20. Retrieved 17/08/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads; until 2017-18, available from: Australian Institute of Health and Welfare (2019). *Hospital resources 2017-18: Australian hospital statistics*. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/hospital-resources-2017-18-ahs/contents/hospitals-and-average-available-beds
Available beds are projected using two mechanisms, no change, held constant at the last year of history. The second method is the linear trend in the growth of available beds from 2009-10 to 2019-20. Both series are projected to 2030-31.
The aggregate number of admissions is converted to a daily amount by dividing by 365. This daily number of admissions from ED is then compared to the number of available beds by way of ratio, daily admissions/ available beds. Then the line is charted for each year 2009-10 to 2030-31.
For more detailed references for each individual year of data please see the next endnote.

[91] **For hospital admissions from the ED:** Australian Institute of Health and Welfare (2010). *Australian hospital statistics 2009-10: emergency department care and elective surgery waiting times.* Table S5.2 (continued): Non-admitted patient emergency department emergency presentation statistics, by triage category and public hospital peer group(a), Australia, 2005–06 to 2009–10. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2009-10-emergency-department-elective-surgery/contents/table-of-contents; Australian Institute of Health and Welfare (2011). *Australian hospital statistics 2010-2011: emergency department care and elective surgery waiting times*. Table 2.13: Non-admitted patient emergency department presentations, by triage category and episode end status, public hospital emergency departments, 2010–11. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2010-11-emergency-department-elective-surger/contents/table-of-contents; Australian Institute of Health and Welfare (2012). *Australian hospital statistics 2011–12: emergency department care*. Table 2.12: Emergency department presentations, by age group and sex, public hospital emergency departments, states and territories, 2011–12. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2011-12-emergency-department-care/contents/table-of-contents; Australian Institute of Health and Welfare (2013). *Australian hospital statistics 2012-13: emergency department care.* Table 2.13: Emergency department presentations, by age group and sex, public hospital emergency departments, states and territories, 2012–13. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2012-13-emergency-department-care/contents/table-of-contents; Australian Institute of Health and Welfare (2014). *Australian hospital statistics 2013–14: emergency department care*. Table 2.4: Emergency department presentations, by age group and sex, public hospital emergency departments, states and territories, 2013–14. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2013-14-emergency-department-care/contents/table-of-contents; Australian Institute of Health and Welfare (2015). *Emergency department care 2014–15: Australian hospital statistics.* Table 3.1: Emergency department presentations by age group and sex, public hospital emergency departments, states and territories, 2014–15. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2014-15-emergency-department-care/contents/table-of-contents; Australian Institute of Health and Welfare (2016). *Emergency department care 2015–16: Australian hospital statistics.* Table 3.1: Emergency department presentations by age group and sex, states and territories, 2015–16, separate approximation for the ACT based on 2014-15 and national growth. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/emergency-department-care-ahs-2015-16/contents/table-of-contents; Australian Institute of Health and Welfare (2017). *Emergency department care 2016–17: Australian hospital statistics.* Table 3.1: Emergency department presentations by age group and sex, states and territories, 2016–17. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2016-17-emergency-department-care/contents/table-of-contents; Australian Institute of Health and Welfare (2018). *Emergency department care 2017–18: Australian hospital statistics.* Table 3.1: Emergency department presentations by age group and sex, states and territories, 2017–18; Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2017–18. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/emergency-department-care-2017-18/summary; Australian Institute of Health and Welfare (2020). *Emergency department care 2018–19 data tables.* Table 3.1: Emergency department presentations by age group and sex, states and territories, 2018–19; Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2018–19. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads; Australian Institute of Health and Welfare (2020). *Emergency department care 2019–20 data tables.* Table 3.1: Emergency department presentations by age group and sex, states and territories, 2019–20; Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2019–20. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/

myhospitals/content/data-downloads; Australian Institute of Health and Welfare (2014). *Australian hospital statistics 2013–14: emergency department care.* Table S2.1: Emergency department presentation statistics, by triage category and public hospital peer group(a), public hospital emergency departments, 2009–10 to 2013–14. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2013-14-emergency-department-care/contents/table-of-contents.
For number of beds: Australian Institute of Health and Welfare (2015). *Hospital resources 2013–14: Australian hospital statistics*. Table 2.6: Average available beds and beds per 1,000 population, public and private hospitals, 2009–10 to 2013–14. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/ahs-2013-14-hospital-resources/contents/table-of-contents; Australian Institute of Health and Welfare (2021). *Hospital resources 2019–20: Australian hospital statistics*. Table 4.6: Average available beds and beds per 1,000 population, public hospitals, 2013–14 to 2017–18. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports/hospitals/hospital-resources-2017-18-ahs/contents/at-a-glance; From 2018-19 MyHospitals portal has taken over reports. See: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads. The user must navigate through the list of data tables until they find the one of interest. In this case the available beds data is in the table listed as 'Hospital resources 2019-20 tables'.
For population: Australian Bureau of Statistics (2020). *National, state and territory population.* Previous catalogue number: 3101.0. Table 59 Estimated Resident Population, single year of age Australia. Retrieved 06/07/2021 from: https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/latest-release;
Australian Bureau of Statistics (2018). Population Projections, Australia. Table C9. Population projections, by age and sex, Australia - low series; Table B9. Population projections, by age and sex, Australia - medium series. Retrieved 06/07/2021 from: https://www.abs.gov.au/statistics/people/population/population-projections-australia/latest-release

[92] Australian Institute of Health and Welfare. *Australian hospital statistics 2018–19: Admitted patient care.* Table 5.1: Separations by broad category of service, public and private hospitals, 2014–15 to 2018–19. Retrieved 30/06/2021 from: https://www.aihw.gov.au/getmedia/107e9a30-40aa-45ec-926c-b3b09acb606b/admitted-patient-care-2018-19-chapter-5-tables.xls.aspx

[93] Australian Institute of Health and Welfare. *Emergency department care 2019-20: Australian hospital statistics supplementary data tables.* Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2019-20. Retrieved 30/06/2021 from: https://www.aihw.gov.au/getmedia/433caea4-03ff-4569-96ac-042f2844f29c/Emergency-department-care-2019-20.xlsx.aspx

[94] Age-specific rates of admission (share of all those presented that are admitted aged 15-24 = 21.2%, 25-34 = 24.9%, etc...) are provided from 2017-18 and approximated back to 2009-10 using aggregate totals. Age-specific rates of ED admissions are trended from 2010-11.

[95] Calculation: A total of 'Admitted to this hospital' and 'Referred to another hospital for admission", from: Australian Institute of Health and Welfare (2021). *Emergency department care.* Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2018–19. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/sectors/emergency-department-care
Percentage is measured as a share of the presentations in the same age cohort also presented in the same table from the Australian Institute of Health and Welfare.

[96] Using admissions from ED from: Australian Institute of Health and Welfare (2021). Table 4.15: Emergency department presentations by age group and episode end status, public hospital emergency departments, 2019–20. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads
All other admissions are calculated as the remaining admissions from total separations, from: Australian Institute of Health and Welfare (2021). *Admitted patient care 2019–20* 3: Who used these services? Table S3.1: Separations, by age group and sex, public hospitals, states and territories, 2019–20. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads.

[97] Aggregate activity is projected out to 2030-31 by using the maximum allowed activity that can be accommodated by the 6.5% national funding cap, and a projected cost growth ABS Health CPI of 4%, less projected IHPA savings of 1%. This total activity was then used to calculate the residual left over (non-ED admissions) after the age-specific ED admissions are taken as a high priority entry. The same age-specific trended admissions from ED are modelled as they were in Figure 10.

[98] The COVID-19 affected years (both 2019-20 and 2020-21) have been manually adjusted in the long-term trended growth scenarios to match funding and activity shocks caused by COVID-19. These are the only manual adjustments made to the trended series throughout the modelling. These manual adjustments are indicative and this report has chosen not to speculate on the hospital system performance during the COVID-19 pandemic but rather display the outcome as a separate colour in charts or exclude COVID-19 years from trend growth.
Note that the 2021-22 year is also affected indirectly by COVID-19 by a slower population growth during the pandemic with reduced migration. This slowdown in overall population growth causes the pause in deterioration of the number of non-ED admissions per person

over 65. This is a very conservative implicit assumption. In practice, there is likely to be an increase in activity from care delayed during COVID-19, through the ED which would push down the non-ED admissions for those 65 and over. The focus of this modelling is the long-term so it attempts to see beyond the short-term.

[99] Australian Institute of Health and Welfare (2021). *Admitted patient care 2019–20 3: Who used these services?* Table S3.1: Separations, by age group and sex, public hospitals, states and territories, 2019–20. Retrieved 06/07/2021 from: https://www.aihw.gov.au/reports-data/myhospitals/content/data-downloads.

[100] Like most of the health system, estimates are impacted by the COVID-19 effected year 2019-20. There was significant Commonwealth funding directed to hospitals outside the ABF mechanism. It is difficult to approximate the funding breakdown using the ABF process when funding was provided outside the process. It is worth noting the 2019-20 year approximation of the amount saved using the Independent Hospital Pricing Authority process is less than in 2018-19. This is driven by the significant direct funding contributed by the Commonwealth to respond to COVID-19.

[101] Australian Government Department of Health (2021). *Budget 2021–22: Health Portfolio Budget Statements*. Retrieved 06/07/2021 from: https://www.health.gov.au/resources/publications/budget-2021-22-portfolio-budget-statements

APPENDIX

COVID-19 ANALYSIS

This appendix contains further detail on how the COVID-19 analysis outlined in the foreword was undertaken.

Relaxation of public health safety measures (PHSMs)

The Commonwealth Government has sought to understand the impact of relaxing PHSMs by commissioning, and then releasing the Doherty modelling.[i]

In the opening up scenario used in this analysis, 'medium' PHSMs would remain in place between a 70% fully vaccinated (16+) and 80% fully vaccinated population, and 'low' PHSMs thereafter, to most accurately reflect current statements being made by State/Territory Premiers. In the Doherty modelling report provided to National Cabinet on 17 September 2021, this is the opening up scenario given in Table S1.5 in the appendix.[ii] There is some flexibility in how these measures might be implemented, but they are likely to include reduced capacity seating in indoor locations, reduced mass gatherings for large events/stadiums, and conditional social gatherings with QR code check-in.

Date of relaxation

The AMA analysis had to assume an indicative date for relaxation of PHSMs. Based on the situation at the time of the analysis, a date was chosen that placed partial re-opening for fully vaccinated people after the Australian total reaches 70% (16+) and then relaxing further restrictions once 80% of the population is fully vaccinated. At the time of the analysis, 1 November 2021 is a reasonable estimate for reaching this threshold. For the AMA analysis this is used as the start date of the 180-day comparison.

Case numbers at point of relaxation

The AMA analysis had to assume a specific number of daily cases at the point that PHSMs were relaxed. With the current PHSMs and current level of vaccination in the community, the effective reproduction rate (R-eff) has been close to 1. This is likely to remain the case until the chosen 1 November date for a staged re-opening. Based on average daily cases across Australia at the time of analysis of approximately 1,800 and a net R-eff close to 1[iii], a conservative estimate of 2,000 cases per day was chosen.

The UK as a comparator

It is important to juxtapose the Doherty modelling against real-world experience. The UK was chosen as a model given its similarities to Australia, including a diverse community and the types of vaccines used. The UK similarly has the majority of older people having received the AstraZeneca vaccine and younger people the Pfizer vaccine, and has partial Test, Trace, Isolation and Quarantine (TTIQ) measures mostly run by automated notification software on phones. This made the UK an excellent example of a potential 'upper range estimate' of case numbers and hospital experience, given the UK has implemented fewer PHSMs than is likely in Australia. This is the 'high scenario' depicted in the foreword.

A 'medium scenario' is also presented, which is partly based on the UK experience. This scenario utilises the Doherty modelling of the proportion of cases which result in symptomatic infections, hospitalisations, and ICU admissions. It combines this with the UK real-world case rate, adjusted for the Australian context.

As of 10 June 2021 the UK had given out approximately 70 million doses, or 105 per 100 people.[iv] The Australian vaccination program will have given out approximately 32 million doses by 1 November or 125 doses per 100 people.[v] The lived UK experience shows the net result of the actual transmission that results from the combination of viral load in their community, their vaccination coverage as well as the interactions between people of different age cohorts. It has the advantage of being lived experience compared with modelled results but it has a slight disadvantage of having different social interaction patterns, public health restrictions and vaccination coverage than Australia has when it begins to relax PHSMs.

Another important factor is the total amount of people previously exposed to the virus. In the UK, approximately 10% of the entire population has already had a confirmed

infection since the outbreak began[vi] , compared with only 0.4% of the Australian population.[vii] There is no perfect example which will show what Australia's future will look like living with COVID-19 though the UK has many parallels to make it an instructive point of comparison.

UK data sources

See 'medium' and 'high' scenario explanations below.

Treatment of children

The Doherty modelling is based on the population aged 16+ being eligible for vaccination. In contrast, the AMA analysis also accounts for children aged 12-15 being eligible for vaccination. This has been accounted for by lowering the number of cases and symptomatic infections for this cohort from the levels provided by the Doherty report. Hospitalisations and ICU admissions are also lowered in proportion for this cohort.

Assumptions in each scenario

Low scenario

The Doherty modelling (Table 4.6) provides numbers of symptomatic infections, hospitalisations and ICU admissions by broad age cohort (20 year bands) for an opening up scenario at 80% fully vaccinated (16+).[viii] The AMA analysis has been calibrated to match these case numbers, symptomatic infections, hospitalisations and ICU beds, all by age cohort.

The proportion of symptomatic infections is taken from Table S1.5 in the appendix of the Doherty modelling report provided to National Cabinet on 17 September 2021.[ix]

The R-eff was calibrated for each age cohort to match the updated projected paths in the Doherty modelling report provided to National Cabinet on 17 September 2021.[x] In the Doherty modelling, the R-eff remains above 1 in many of the cohorts with lower vaccination rates.

The Doherty modelling first provided in July 2021 was an important piece of research into the likely transmission of COVID-19 after the introduction of the Delta variant into the Australian community. The modelling relied on scientific information about the rate of transmission, the effectiveness of different vaccinations and the interactions between different age cohorts in Australian society. The net result is a likely transmission 'heatmap', *Figure S2.1: Age-based transmission matrix derived from Prem et al (2017)*.[xi] Modelling then layered this transmission matrix with different PHSMs to give a modelled transition for the virus both in aggregate numbers but also by different age cohorts.

This part of the model assumes that there is a low transmission rate in people aged 70+ after relaxation of PHSMs, due to low social mobility in this age group. This has a big impact on the results, and is an important factor in the Doherty modelling providing an optimistic outcome. This is why the Doherty modelling is used as the 'low scenario' in the AMA analysis. To provide a useful contrast, the medium scenario combines elements of the Doherty modelling with the transmission rates seen in the real-world experience of the UK. In the UK experience, the virus transmitted more freely in older people than in the Doherty model.

Medium scenario

From the UK Coronavirus dashboard, the 'heatmap' data was collected under the heading 'Cases by specimen date age demographics'.[xii] The data behind this graph provides a daily average number of cases per 100,000 people smoothed over the week. For older cohorts (aged 70+) there are 60-120 average cases per week, per 100,000 people. For the younger cohorts, it ranges from 300-700 per week, per 100,000 people. These average case rates across July to mid-August were adjusted for the Australian population to get a real-world example of a potential outcome. While the vaccination rates are specific to the UK and will have an impact on the confirmed case numbers, and specific factors are likely to differ between the UK and Australia, it provides a good benchmark for potential outcomes.

Using data from the Demographic Heatmap 'rolling rate' (see above) for the month of August, the rate of cases by age was approximated (all cases as it is not clear whether cases are all symptomatic or the extent to which asymptomatic cases are being captured). While the virus transmission and the resulting case numbers are dependent on the UK vaccination rates, in the AMA analysis, it is assumed that people will become symptomatic and be hospitalised at the same rate as the Doherty scenario of 80% vaccination with partial TTIQ. For each symptomatic infection, there is then a proportion that will be admitted to hospital and a proportion that will require ICU. These latter proportions are based upon the Doherty modelling.

High scenario

For the upper end of the range of possible outcomes, the UK rate of cases by age cohort was examined, as in the previous scenario (see above). For the high scenario, both the case rates and the rates of hospitalisation and ICU admission are taken from the UK real-world experience.

The actual data from the NHS is 'COVID-19 daily situation report COVID-19 admissions estimates in England'.[xiii] This data is focused on England rather than the entire UK due to the greater reliability of the English data.

Hospitalisations are much higher than in the Doherty modelling. Australia may not follow the UK path but it would be remiss not to consider the possibility.

Appendix references

[i] Doherty Institute (2021). *Doherty modelling report revised 10th August 2021*. Retrieved 30/09/2021 from: https://www.doherty.edu.au/our-work/institute-themes/viral-infectious-diseases/covid-19/covid-19-modelling/modelling

[ii] National Plan to transition Australia's National COVID Response. *Doherty Modelling Interim Report to National Cabinet 17 September 2021* (PDF, Doherty Institute). Retrieved 21/09/2021 from: https://www.pmc.gov.au/national-plan-transition-australias-national-covid-response

[iii] The R-eff is simultaneously higher than 1 in some areas and below 1 in other areas. For Australia as a whole the figure was close to 1. This measure is variable based on the development of outbreaks in different areas. R-eff was calculated based on average daily case numbers for Australia in the latest week and compared with the week prior. https://covidlive.com.au/report/daily-cases/aus. For comparison cases are also examined by LGA growth from prior week. For example new case numbers over time in the Cumberland LGA. https://covidlive.com.au/nsw/cumberland

[iv] Public Health England (2021). *Vaccine update: issue 322, June 2021, COVID-19 phase 2 special edition*. Retrieved 30/09/2021 from: https://www.gov.uk/government/publications/vaccine-update-issue-322-june-2021-covid-19-phase-2-special-edition/vaccine-update-issue-322-june-2021-covid-19-phase-2-special-edition

[v] Calculated based on Total Doses Administered and 1st and 2nd doses, based on 7-day average doses administered, retrieved 30/09/2021 from: https://covidlive.com.au/

[vi] 7.8 million confirmed cases as at 30/09/2021, 114,000 cases per million people, from: https://www.worldometers.info/coronavirus/country/uk/

[vii] 105,123 as at 30/09/2021, from: https://covidlive.com.au/

[viii] Doherty Institute (2021). *Doherty modelling report revised 10th August 2021*. Retrieved 30/09/2021 from: https://www.doherty.edu.au/our-work/institute-themes/viral-infectious-diseases/covid-19/covid-19-modelling/modelling

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[x] National Plan to transition Australia's National COVID Response. *Doherty Modelling Interim Report to National Cabinet 17 September 2021* (PDF, Doherty Institute). Retrieved 21/09/2021 from: https://www.pmc.gov.au/national-plan-transition-australias-national-covid-response

[xi] Doherty Institute (2021). *Doherty modelling report revised 10th August 2021*. Retrieved 30/09/2021 from: https://www.doherty.edu.au/our-work/institute-themes/viral-infectious-diseases/covid-19/covid-19-modelling/modelling

[xii] Gov.uk (2021). *Coronavirus (COVID-19) in the UK*. Accessed 30/09/2021 from: https://coronavirus.data.gov.uk/details/cases

[xiii] NHS England (2021). *Monthly COVID Publication September 2021*. COVID-19 hospital activity by age, ICU, ventilation, by hospital group. Retrieved 30/09/2021 from: https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-hospital-activity/. Direct link to download: https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2021/09/Covid-Publication-09-09-2021.xlsx

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