

# The Australian health system response to COVID-19 from a resilient health care perspective: what have we learned?

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## Key points

- Australia's response to the COVID-19 pandemic can be framed using a resilient health care perspective. Systems that are resilient are able to monitor, anticipate, respond and learn
- Although the prevalence of COVID-19 has varied across states, Australia is one of the few industrialised nations to respond relatively effectively to the challenges presented by the pandemic
- The Australian experience provides lessons that may be relevant internationally for responding to COVID-19 and future pandemics

## Abstract

As of late 2020, Australia's response to the coronavirus disease 2019 (COVID-19) pandemic has been relatively successful in comparison with responses in Northern Europe and the US – but what have we learned? In this perspective, we used a resilient health care approach to frame the health system response in three key Australian states (New South Wales, Victoria and Queensland) with large and diverse population groups. We assessed their response in terms of four resilience capacities: how did Australian health authorities *monitor* public health to enable anomalies to be detected; how did they *anticipate* the emerging COVID-19 crisis; how did they *respond* to the pandemic; and what did they *learn* from this experience? Increased system agility and new ways of working, including contact tracing, telehealth and resource-sharing, are now available to underpin Australia's response to future challenges or other unexpected events.

## Introduction

The protective measures that we put in place in our public health system – such as standardisation of clinical processes, adverse event reporting and analysis, a large number of directives in the form of policies, and regulation and accreditation of facilities and practitioners – are patently inadequate for coping with unexpected events such as COVID-19.<sup>1</sup> Many are intended to create barriers to guard against errors, but error-prevention devices can also reduce flexibility of practice, and make routine procedures more onerous or time consuming.<sup>2</sup> In a public health crisis such as that experienced in 2020, we need new ways of working that are responsive to rapidly changing conditions and the demand for flexible or newly configured services.<sup>3</sup>

Resilient health care (RHC) is a fresh approach to such problems, and is grounded in the literature on healthcare safety.<sup>4</sup> It recognises the limitations of traditional 'find, fix and forget' approaches to dealing with safety breaches in complex adaptive systems such as public health.<sup>2</sup> Resilience can be defined

as “the ability of the healthcare system (a clinic, a ward, a hospital, a country) to adjust its functioning prior to, during, or following events (changes, disturbances, and opportunities), and thereby sustain required operations under both expected and unexpected conditions”.<sup>5</sup>

From an RHC perspective, humans – with their inherent variability, and propensity to get things mostly right – are not seen as a liability but an asset. Human responsiveness, and the continual adjustments people make to their daily work to meet emerging conditions, contributes to success. The need to adapt to meet emerging requirements has been very relevant for managing COVID-19, where conditions have been unpredictable, complex, time critical and rapidly changing. In comparison with much of the international community, Australia initially responded well to the COVID-19 challenge; as of 8 July 2020, there were only 8886 total cases, with less than half (44%) locally acquired, and only 106 deaths.<sup>6</sup> Since then, a second wave in Melbourne, Victoria, contributed to an Australian total of 27 777 cases and 907 deaths, as of 18 November 2020.<sup>7</sup> How did our healthcare system respond? What have we learned that can be applied to future crises?

The COVID-19 experience has varied significantly across Australia over the past 10 months, so we address these questions using examples from three of Australia’s largest states that have a mixed demographic which is spread out across metropolitan, rural and remote locations: New South Wales (NSW), Victoria and Queensland. Each of these states responded differently to the crisis and experienced different outcomes. NSW and Victoria have each weathered significant social, health and economic setbacks, whereas Queensland has yet to be challenged as significantly.

As of 21 November 2020, NSW had experienced 4349 cases and 55 deaths.<sup>8</sup> The state suffered a boosted first wave of the pandemic between early March and mid-April, which peaked at about 200 new cases per day. The additional cases were attributed to the cruise ship, the Ruby Princess, which docked in Sydney on 19 March 2020 with 2700 passengers, 100 of whom reported feeling unwell. All passengers were allowed to disembark, and were free to travel, contributing to 900 positive cases and 28 deaths.<sup>9</sup> As of 20 October, Victoria had experienced 20 319 cases and 817 deaths.<sup>10</sup> The state weathered a small first wave, but suffered a larger second wave of infections from late June to early October, triggered by poor infection control stemming from lax quarantine arrangements for those Australians returning from overseas.<sup>11</sup> The wave peaked in early August with 700 new cases per day. As of 22 November, Queensland had experienced 1193 cases and 6 deaths<sup>12</sup>, and has fared well in comparison with NSW and Victoria.

In framing Australia’s response to COVID-19, we can use the Resilience Analysis Grid (RAG).<sup>13</sup> The RAG model was developed by Erik Hollnagel in 2006, and is the seminal model used in technical industries

to conceptualise and operationalise organisational resilience. The RAG measures four interrelated capacities of organisations for coping with unexpected or challenging events: how organisations *monitor* their operations to enable anomalies to be detected; how they *anticipate* an emerging crisis or adverse event, how they *respond* to a crisis, and how they *learn* from experiencing a crisis.<sup>14</sup>

## How health systems monitored the situation

Under state public health acts, Australian health authorities routinely monitor for infectious diseases, such as measles or HIV, which require mandatory reporting by healthcare professionals when detected in the community. The first Australian case of COVID-19 was identified on 25 January 2020, but authorities were aware of the virus from late December, due to monitoring provided by the World Health Organization (WHO). However, the virus was not declared a notifiable disease in NSW until 21 January 2020, when NSW Health staff began assisting Australian Government biosecurity staff at Sydney Airport in monitoring the health of travellers returning from Wuhan, China. WHO declared COVID-19 to be a pandemic on 11 March 2020.

## How health systems anticipated the emerging crisis

It is fair to say that Australia has adequate monitoring capability, however it is equally important that adequate distribution channels exist for dissemination of that information within a timeframe that enables a rapid response. Communication in healthcare has always been problematic.<sup>15,16</sup> Information transfer between government health departments, Local Health Districts (LHDs) and hospitals tends to be ‘top-down’, with limited scope for ‘horizontal’ or ‘bottom-up’ information transfer. Government departments tend to be siloed and it is common for one department to have critical information and not realise that another department which needs that information does not also have access.<sup>17</sup>

Adding further complexity, political leaders frequently make decisions based on news report cycles and a desire to create positive public impressions. For example, over a period of 4 days in early January, the Federal Minister for Health provided and reserved almost 3.5 million P2 face masks from the National Medical Stockpile for use by frontline workers and high-risk members of the public in bushfire-affected communities of Australia, while acknowledging they were held in the Stockpile for use for pandemics.<sup>18,19</sup>

In a resilient system, early notification will trigger anticipation of what response is needed to avert or cope with a crisis which will provide time to put plans into place. Australia squandered some of the advantages of an effective infectious disease monitoring system and was slow to anticipate the need to close borders. It was also slow to prepare the health system, and did not anticipate the importance of consistency in public messaging (both between state and Federal governments, and over time to the general public) to engage the population in preventive actions.<sup>20</sup>

## How health systems responded to the crisis

Like other countries, Australia does not have an agile healthcare system: individual hospitals and LHDs have some degree of autonomy, but control is ultimately centralised, with state and Federal government bureaucracies responsible for much of the organisational decision making that is critical for responding rapidly to COVID-19. While the importance of resilience is beginning to be recognised<sup>21</sup>, drives for efficiency over the past decade have resulted in a process of 'leaning'<sup>22</sup> many parts of the system by removing 'waste', thereby inadvertently removing the extra capacities that support more resilient performance when needed.<sup>23</sup> In addition, there are competing pressures between state and Federal governments, and between private and public health systems, resulting in misunderstandings in communication and coordination.

It was clear early on in the pandemic, both from advice from epidemiology experts and evidence emerging from countries hardest hit by the virus, such as Italy, that the speed of response would be critical. However, a rapid response relied on early detection of the virus and the supply of serology testing kits was limited. From the beginning, there was a recognition of the need to 'flatten the curve' (i.e. manage disease spread and avoid disease increase) due to limited intensive care unit beds in hospitals across Australia, and the limited supply of ventilators, masks and personal protective equipment (PPE).

Nevertheless, governments were slow to act. The first 'lockdown', initiated by the Federal Government, started on the evening of 22 March 2020, with non-essential services such as clubs and restaurants closed. Federal governments in Australia, as with other parts of the industrial world, generally tend to prioritise economic stability, with the view that wellbeing follows prosperity, so the changes needed to respond to the pandemic were antithetical and unpalatable. It was not until the end of March that more severe restrictions were put in place, including the 'two-person rule' whereby no more than two people could gather together (unless they were members of the same household) and lockdown rules were introduced banning people from being outside their

homes unless travelling to work, purchasing groceries, exercising, or obtaining medical treatment. By 6 April 2020, some beaches in Australia had been closed. In response to slow government action, various community-based groups were established to support the vulnerable, including the elderly, the immuno-compromised and those in enforced quarantine. Schools and universities then closed, and education departments struggled to develop processes for remote education and online learning.

Within industry, manufacturers switched their lines of production to produce face masks, visors, hand sanitiser and PPE. Federal and state governments moved to a more transparent decision-making model for COVID-19-related actions, relying on expert medical advice and providing daily media conferences that included reports from respective Chief Medical Officers. A carrot and stick approach was used to encourage community compliance with social-distancing directives – assistance was provided for businesses, people without jobs, those renting and the homeless, while fines were introduced for breaking the lockdown rules. New skills and ways of working were required within the health system: these included contact tracing, telehealth, and leveraging resources from the private hospital and health sector.

In response to COVID-19, the Australian Therapeutic Goods Administration (TGA) instituted procedures for rapid assessment on a range of medical devices used in the treatment of the disease. These included ventilators, point-of-care testing kits and PPE. This inadvertently encouraged manufacturers from sectors not normally related to healthcare – such as mining companies – to begin making medical devices, and resulted in heightened risks associated with provision of devices by manufacturers unfamiliar with the safety requirements of healthcare. The TGA was, however, able to respond to device issues as they arose, and instituted an expedited recall pathway for this purpose (initiated in less than 24 hours).<sup>24</sup>

In a dynamic system, it is not possible to 'set and forget' when implementing strategies.<sup>22</sup> Rather, a continual (and sometimes iterative and uneven) cycle of monitor, anticipate, respond and learn is required. Implementation of such a cycle may have enabled earlier anticipation of the risk of disembarking passengers from the Ruby Princess cruise ship in NSW, and could have resulted in more thorough quarantine checks for returning Australian travellers in Victoria, as well as earlier detection of the inherent problems with the commercial provision of quarantine services in Victoria. We have seen more recently how a daily cycle of monitor numbers, anticipate implications, respond (with information, amending restrictions) and learn has enabled Victoria to bring their second wave of infections under control.

## What health systems learned from the crisis

So, what have we learned so far in Australia? We may not be able to judge this fully until the crisis has passed, but a couple of things stand out. In terms of curbing transmission of infection, we learned the importance of strict quarantine and closing our borders at a national and state level. We also learned the usefulness of lockdown at a community level, and the need for social distancing at a personal level.<sup>20</sup> In Australia, as an island continent, we are fortunate to have the ability to control borders, to have a sparsely distributed population that facilitates social distancing, and to have the economic security that lends itself to the application of welfare benefits to those most in need, that also enable a large percentage of the population to stay at home. The importance of coordinating both action and messaging between Federal and State Governments was recognised, and processes improved.

We are starting to become more agile and quicker to act: a hotspot in North West Tasmania in April 2020 showed how resources (including those from the Federal Government and Australian Defence Force) could be marshalled and redirected to address the challenge of new outbreaks.<sup>26</sup> This event informed the Victorian State Government's action on the second wave of COVID-19 in Melbourne, in July 2020 which, despite a delay in responding, saw it successfully apply lessons learned from Australia and New Zealand to eventually curb the outbreak.<sup>27</sup> We have also learned the importance of listening to the experts: nationally, and within each state, politicians were accompanied in their daily press briefings by Chief Medical Officers, who informed the public on the current situation and what to do to reduce the spread of the virus.<sup>20</sup>

Finally, we have learned the value of adapting care processes in response to emerging needs. New models of care have been introduced in elective surgery, in telehealth, through remote monitoring and by bringing the hospital into the home (including remote consultation and assessment). Protocols and new facilities have been implemented to help prioritise and balance the care of people with COVID-19, and those with other, comorbid health conditions, and the private healthcare system has been recruited to provide additional resources (financial and personnel) where necessary.

These are not new lessons: similar findings were gleaned from our response to the influenza A pandemic (H1N1) in Australia in 2009.<sup>28</sup> Going forward, we need to retain what we have learned, not just from what did and did not work in Australia, but from the international experience of COVID-19. We should be careful to foster the additional resilience we have gained, which may well be needed in the future. As one of the few industrial

countries responding effectively to COVID-19, it will also be important to share lessons learned from the Australian experience globally.

## Limitations

We have attempted to apply a tool designed for assessing the resilience of organisations to behaviour of health systems at state and national levels. This has its limitations, but we believe it is a useful tool for framing the discussion around resilience. Although the RAG is a useful tool for understanding the contributors to system resilience, it provides a point in time assessment. A dynamic system might appear very resilient in one phase (e.g. in responding acutely) but as the impact of the pandemic continues to be felt, further issues may emerge that alter the resilient profile (e.g. the extent to which there is political solidarity across jurisdictions and political parties). For this reason, the tool is usually employed to answer a specific question, or longitudinally to understand better how the system changes over time.

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## Competing interests

None declared.

## Author contributions

RCW, FR and JB conceptualised the perspective. RCW led the paper, FR and JB provided review and critical intellectual content. All authors approved the final version for submission.

## References

1. Braithwaite J, Wears RL, Hollnagel E. Resilient health care: turning patient safety on its head. *Int J Qual Health Care*. 2015;27(5):418–20.
2. Braithwaite J, Clay-Williams R, Nugus P, Plumb J. Health care as a complex adaptive system. In: Hollnagel E, Braithwaite J, Wears R, editors. *Resilient health care*. Surrey, UK: Ashgate Publishing Limited; 2013.
3. Nemeth C, Wears R, Woods D, Hollnagel E, Cook R. Minding the gaps: creating resilience in health care. In: *Advances in patient safety: new directions and alternative approaches*, Vol 3: performance and tools. Rockville, MD: Agency for Healthcare Research and Quality (US); 2008.

4. Ilaifel M, Lim RH, Ryan K, Crowley C. Resilient health care: a systematic review of conceptualisations, study methods and factors that develop resilience. *BMC Health Serv Res.* 2020;20:1–21.
5. Hollnagel E, Braithwaite J, Wears R. Resilient health care. Surrey, UK: Ashgate Publishing Limited; 2013. p. xxv.
6. Australian Government Department of Health. Coronavirus (COVID-19) current situation and case numbers. Canberra: Australian Government; 2020 [cited 2020 Jul 9]. Available from: [www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers](http://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers)
7. Australian Government Department of Health. Coronavirus (COVID-19) at a glance – 18 November 2020. Canberra: Department of Health; 2020 [cited 2020 Nov 19]. Available from: [www.health.gov.au/resources/publications/coronavirus-covid-19-at-a-glance-18-november-2020](http://www.health.gov.au/resources/publications/coronavirus-covid-19-at-a-glance-18-november-2020)
8. NSW Government. Find the facts about COVID-19. Sydney: NSW Government; Oct 2020 [cited 2020 Nov 21]. Available from: [www.nsw.gov.au/covid-19/find-facts-about-covid-19](http://www.nsw.gov.au/covid-19/find-facts-about-covid-19)
9. BBC News. Coronavirus: 'Serious mistakes' made over Ruby Princess outbreak. London: BBC News; 17 Aug 2020 [cited 2020 Nov 13]. Available from: [www.bbc.com/news/world-australia-53776285](http://www.bbc.com/news/world-australia-53776285)
10. Victoria State Government. Victorian coronavirus (COVID-19) data. Melbourne: Victoria State Government; Oct 2020 [cited 2020 Oct 20]. Available from: [www.dhhs.vic.gov.au/victorian-coronavirus-covid-19-data](http://www.dhhs.vic.gov.au/victorian-coronavirus-covid-19-data)
11. Schneiders B. How hotel quarantine let COVID-19 out of the bag in Victoria. Melbourne: The Age; 3 Jul 2020 [cited 2020 Nov 13]. Available from: [www.theage.com.au/national/victoria/how-hotel-quarantine-let-covid-19-out-of-the-bag-in-victoria-20200703-p558og.html](http://www.theage.com.au/national/victoria/how-hotel-quarantine-let-covid-19-out-of-the-bag-in-victoria-20200703-p558og.html)
12. Queensland Government. Queensland COVID-19 statistics. Brisbane: Queensland Government; 2020 [cited 2020 Nov 23]. Available from: [www.qld.gov.au/health/conditions/health-alerts/coronavirus-covid-19/current-status/statistics](http://www.qld.gov.au/health/conditions/health-alerts/coronavirus-covid-19/current-status/statistics)
13. Hollnagel E. The four cornerstones of resilience engineering. In: Nemeth CP, Hollnagel E, Dekker S, editors. Resilience engineering perspectives: preparation and restoration. Surrey, UK: Ashgate Publishing Limited; 2009. pp. 117–33.
14. Hollnagel E. Epilogue: RAG - the Resilience Analysis Grid. In: Hollnagel E, Paries J, Woods D, Wreathall J, editors. Resilience engineering in practice: a guidebook. Surrey, UK: Ashgate Publishing Limited; 2011.
15. Karam M, Brault I, Van Durme T, Macq J. Comparing interprofessional and interorganizational collaboration in healthcare: a systematic review of the qualitative research. *Int J Nurs Stud.* 2018;79:70–83.
16. Taylor N, Clay-Williams R, Hogden E, Braithwaite J, Groene O. High performing hospitals: a qualitative systematic review of associated factors and practical strategies for improvement. *BMC Health Serv Res.* 2015;15(1):244.
17. Johnson I, Hansen A, Bi P. The challenges of implementing an integrated One Health surveillance system in Australia. *Zoonoses Public Health.* 2018;65(1):e229–36.
18. Minister for Health the Hon Greg Hunt MP. 453,000 P2 face masks to help in bushfire communities. Canberra: Ministers, Australian Department of Health; 4 Jan 2020 [cited 2020 Nov 10]. Available from: [www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/453000-p2-face-masks-to-help-in-bushfire-communities](http://www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/453000-p2-face-masks-to-help-in-bushfire-communities)
19. Minister for Health the Hon Greg Hunt MP. Number of P2 masks provided for bushfires almost 3.5 million. Canberra: Australian Department of Health; 10 January 2020 [cited 2020 Nov 10]. Available from: [www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/number-of-p2-masks-provided-for-bushfires-almost-35-million](http://www.health.gov.au/ministers/the-hon-greg-hunt-mp/media/number-of-p2-masks-provided-for-bushfires-almost-35-million)
20. Duckett S, Stobart A. 4 ways Australia's coronavirus response was a triumph, and 4 ways it fell short. Melbourne: The Conversation; 4 June 2020 [cited 2020 Nov 11]. Available from: [theconversation.com/4-ways-australias-coronavirus-response-was-a-triumph-and-4-ways-it-fell-short-139845](http://theconversation.com/4-ways-australias-coronavirus-response-was-a-triumph-and-4-ways-it-fell-short-139845)
21. FitzGerald GJ, Capon A, Aitken P. Resilient health systems: preparing for climate disasters and other emergencies. *Med J Aust.* 2019;210:304–5.
22. Al-Balushi S, Sohal AS, Singh PJ, Al Hairi A, Al Farsi YM, Al Abri R. Readiness factors for lean implementation in healthcare settings – a literature review. *J Health Organ Manag.* 2014;28(2):135–53.
23. Saurin TA, editor. Classification and assessment of slack: implications for resilience. Lisbon: The Resilience Engineering Association Symposium; 2015 [cited 2020 Nov 11]. Available from: [www.resilience-engineering-association.org/download/resources/symposium/symposium\\_2015/Saurin\\_T.-Classification-and-assessment-of-slack-Paper.pdf](http://www.resilience-engineering-association.org/download/resources/symposium/symposium_2015/Saurin_T.-Classification-and-assessment-of-slack-Paper.pdf)
24. Therapeutic Goods Administration. Expedited recall system for faulty or unauthorised COVID-19 devices. Canberra: Australian Government Department of Health; 3 Aug 2020 [cited 2020 Nov 13]. Available from: [www.tga.gov.au/behind-news/expedited-recall-system-faulty-or-unauthorised-covid-19-devices](http://www.tga.gov.au/behind-news/expedited-recall-system-faulty-or-unauthorised-covid-19-devices)
25. Hollnagel E, Wears R, Braithwaite J. From Safety-I to Safety-II: a white paper. The Resilient Health Care Net: University of Southern Denmark, University of Florida, Macquarie University; 2015 [cited 2020 Nov 11]. Available from: [www.researchgate.net/publication/282441875\\_From\\_Safety-I\\_to\\_Safety-II\\_A\\_White\\_Paper](http://www.researchgate.net/publication/282441875_From_Safety-I_to_Safety-II_A_White_Paper)

26. ABC News. Tasmania calls in ADF medics as coronavirus tally hits 150. Tasmania: ABC News; 13 Apr 2020 [cited 2020 Jul 9]. Available from: [www.abc.net.au/news/2020-04-13/up-to-5000-tasmanians-in-isolation-over-north-west-coronavirus/12143936](http://www.abc.net.au/news/2020-04-13/up-to-5000-tasmanians-in-isolation-over-north-west-coronavirus/12143936)
27. Davey, M. Coronavirus Victoria: 73 new COVID-19 cases reported as 36 Melbourne suburbs return to lockdown. Melbourne: The Guardian; 1 Jul 2020. [cited 2020 Jul 9] Available from: [www.theguardian.com/world/2020/jul/01/coronavirus-victoria-73-new-covid-19-cases-reported-as-36-melbourne-suburbs-return-to-lockdown](http://www.theguardian.com/world/2020/jul/01/coronavirus-victoria-73-new-covid-19-cases-reported-as-36-melbourne-suburbs-return-to-lockdown)
28. Weeramanthri TS, Robertson AG, Dowse GK, Effler PV, Leclercq MG, Burtenshaw JD, et al. Response to pandemic (H1N1) 2009 influenza in Australia—lessons from a state health department perspective. *Aust Health Rev.* 2010;34(4):477–86.

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