The South Australian Department of Health and Wellbeing approach to emergency management during the COVID-19 pandemic

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Abstract

This paper summarises the strategic and operational approaches to emergency management taken by the South Australian Department of Health and Wellbeing (better known as SA Health) during the COVID-19 pandemic State of Emergency declaration between 22 March 2020 and 24 May 2022. It identifies several lessons that may be useful for future responses to similar types of emergencies. It is concluded that SA Health's response was highly effective, with all of the response's strategic objectives achieved; however, activities in some areas could nevertheless have been more efficient.

Introduction

COVID-19 was first detected in China in December 2019 (Graham and Baric 2020:734). The subsequent global pandemic is now in its fifth year, with the response including community lockdowns, social distancing, mandatory mask wearing, imposition of travel restrictions, and mandatory quarantine (Piret and Boivin 2021:10). These measures were widespread in Australia during the first two years of the pandemic, but have since ceased. In their place, Australia has transitioned to ongoing pandemic management as a part of routine business, and now takes a predominantly clinical as opposed to a public health approach. The third year of the COVID-19 pandemic was characterised by its progressive disappearance from media prominence, and by increased speculation as to when the disease would be declared endemic, formally ending its pandemic status (Klobucista 2022).

As Huremović (2019:22) observed about the 1918 Spanish Flu pandemic, 'societies deal with such rapidly spreading pandemics … at first with great interest, horror, and panic, and then, as soon as they start to subside, with dispassionate disinterest'. The COVID-19 pandemic is now well into the latter part of this process. Perhaps because of the rapidity with which the pandemic response rose and then fell from prominence, there has been limited exploration of potential lessons it may yield. In Australia, the COVID-19 pandemic was treated as a public health emergency for over two years at both the national and state levels (Evans 2022). In addition to its more prominent epidemiological aspects, several aspects of the response fit within the field of emergency management.

This paper seeks to fill a gap by identifying lessons from the state-level COVID-19 pandemic emergency response in South Australia (SA). First, it summarises SA's emergency management arrangements and how these were applied during the COVID-19 pandemic. Second, it summarises the pandemic's progression within SA and the Control Agency's emergency management strategies. The Control Agency was the SA Department of Health and Wellbeing, which along with its affiliated health networks and services is more often referred to as SA Health (SA Health 2022a). Third, this paper examines how these strategies were implemented operationally, and several lessons are identified. Lessons mostly relate to the application of the Australasian Interservice Incident Management System (AIIMS) (AFAC 2017), as this was used to organise State Control Centre – Health (SCC-H), which was established to coordinate SA Health's pandemic response operations. Overall, SA Health's COVID-19 pandemic emergency response was one of the most effective in the country; however, as the lessons identified show, its activities in some areas could have been more efficient.

Emergency management in South Australia

Emergency management in SA is governed by the *Emergency Management Act 2004* (SA) (hereinafter 'The Act') (Government of South Australia 2021). The Act establishes a State Emergency Management Committee and State Emergency Management Plan (SEMP), with the former responsible for preparing and updating the latter, as well as for providing strategic oversight of a range of emergency management functions. The Act appoints the Police Commissioner as the State Coordinator and South Australia Police (SAPOL) as the Coordinating Agency, with responsibility for interagency coordination and for facilitating Control Agency functions.

A Control Agency is appointed under The Act and has responsibilities for the management of a specific type of emergency. Control Agency responsibilities are detailed in the SEMP rather than in The Act (Government of South Australia 2022b:16–17). Of the 22 types of emergencies for which the SEMP specifies a Control Agency, this role is delegated to SAPOL 11 times; the SA Metropolitan Fire Service (SAMFS), SA Country Fire Service (SACFS) or SA State Emergency Service (SASES) twice each; and to one of five State Government departments for the remaining six types of emergencies. SA Health is the only department designated as the Control Agency for two types of emergencies: food or drinking water contamination, and human epidemics. Four other departments are each specified as the Control Agency for a single type of emergency (Government of South Australia 2022b:18).

When not the Control Agency, the other agencies mentioned in the SEMP have defined roles as Supporting Agencies. These roles may also be delegated by the State Coordinator to government departments not mentioned in the SEMP. An interagency list of nine functional support groups is also given, along with a lead agency for each group. Functional support groups focus on areas including logistics, communications, public information, emergency accommodation, engineering, and ambulance and Australian Defence Force (ADF) support (Government of South Australia 2022b:19–20). Additionally, SA is geographically divided into 11 'zones', with a Zone Emergency Support Team (ZEST) able to be activated by the Control Agency to respond to emergencies locally within the zone. A ZEST is coordinated by the Local Police Commander (Government of South Australia 2022b:9,20).

South Australia's COVID-19 pandemic State of Emergency arrangements

The first two cases of COVID-19 in SA were diagnosed on 1 February 2020 (ABC News 2020a). Amid growing case numbers originating in returning overseas travellers, a public health emergency was declared on 15 March (Keane 2020). This was followed on 22 March by Police Commissioner Grant Stevens declaring a state-wide State of Emergency under The Act (ABC News 2020c). The State of Emergency was extended several times, ultimately remaining in place for a record 793 days, until 24 May 2022 (Malinauskas, 2022).[1] The Chief Public Health Officer, Professor Nicola Spurrier, was appointed as State Controller – Health, and SA Health became the Control Agency (SA Health, 2020:15).

In accordance with SEMP requirements, the State Emergency Centre was stood up following the State of Emergency declaration to provide support to the Police Commissioner in his role as State Coordinator (ABC News 2020c). SA Health had stood up SCC-H on 2 February, prior to the State of Emergency declaration and as part of its response to detection of the state's first positive cases. Initially staffed by four people who held substantive appointments elsewhere in the department, SCC-H staffing rapidly expanded and other agency representatives were embedded within it following the declaration of the public health emergency (Parliament of Australia 2020:Table 8). These early measures ensured that SCC-H was already functioning when the State of Emergency was declared, at which time it commenced fulfilling the emergency response control and coordination roles of the Control Agency (Government of South Australia 2022b:21).

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1. For context, the second-longest declared State of Emergency in SA history lasted for 11 days, following flooding in the state's north (Nine News Staff, 2022).

Progress of the pandemic and SA Health's emergency response strategies

With hindsight, three distinct stages of SA's COVID-19 pandemic response can be identified. The nature of response strategies and the associated operational approaches, organisational structures, missions, main effort and key tasks varied considerably between these stages. It is therefore useful to address each stage separately.

Elimination stage

The first stage ran from the first case diagnosis on 1 February 2020 until 22 November 2021, which was the day before the state's borders were opened. This can be referred to as the elimination stage. The state's emergency response strategy implemented during this stage aimed to minimise risk to vulnerable community members, as little was known about COVID-19 during the early months of the pandemic and no vaccine was yet available (Spurrier 2020). To achieve this aim, the strategic objectives were to 'flatten the curve', prepare hospitals for an influx of COVID-19 positive admissions, and 'take the public on the journey' by keeping them informed of the approach and the reasons it was being taken. As this stage progressed, efforts to flatten the curve were so successful that the first of these objectives evolved into achieving zero COVID-19 cases within the state.

There were four community outbreaks within the state during this stage, with all being contained within days-to-weeks. These outbreaks were interspersed by lengthy periods when the only COVID-19 cases in the state were among the capped number of returning international or interstate travellers who were required to isolate in specialised medi-hotels for a 14-day period following arrival. The four outbreaks were the initial outbreak at the start of the pandemic (March to May 2020), the Thebarton Cluster (August 2020), the Parafield Cluster (November 2020) and the Modbury Cluster (July to August 2021) (InDaily Staff 2020; Richards 2020; ABC News 2020b; ABC News 2021). Of these, the initial outbreak was the most extensive, eventually including 438 positive cases (InDaily Staff 2020). The other three outbreaks were quickly and effectively contained, with each peaking at less than 50 active cases following short periods of strict lockdown implemented under The Act. Key indicators of the success of this approach are that, as at 22 November 2021, SA had the lowest total number of cases for any mainland Australian state and the lowest number of COVID-19-positive fatalities (COVID Live 2022).

Seeding and suppression stage

The second stage started when state borders were opened on 23 November 2021 and ran until the end of the State of Emergency declaration on 24 May 2022. This can be referred to as the seeding and suppression stage. During this stage, the state opened its borders to other states with active COVID-19 outbreaks and, shortly afterwards, to international arrivals. The intent at its outset was to introduce COVID-19 into the community in a manageable way (Spurrier 2021). Modelling conducted prior to the border opening was based on data pertaining to the Delta variant, an 80 percent community double vaccination rate, and the continuation of then-extant public health measures such as mandated mask wearing in public. This modelling showed a 27 percent chance of an 'outbreak', which was defined as over 100 cases per day for three or more days (Richardson 2021). It also predicted that case numbers would peak in mid-February 2022. Preparations for this stage, including the numbers of hospital beds expected to be required and the anticipated extent of the out-of-hospital response, were based on this modelling.

Four days after the state's borders opened, the World Health Organization recognised the newly-emergent Omicron variant as a 'variant of concern' (Nebehay and Winning 2021). This variant, which is much more infectious than Delta, was first detected in SA on 9 December 2021 (Lal 2021). Its presence rendered the Delta-based modelling outdated. In particular, its increased infectiousness caused greatly increased case numbers above those the modelling anticipated. This infectiousness necessitated expansions in both the hospital and out-of-hospital components of the response. New modelling occurred as soon as sufficient data on the Omicron variant became available, though this was not until a month after its detection (Spurrier 2022). The initial Omicron outbreak in SA peaked on 20 January 2022, about a month earlier than the Delta-based modelling had predicted, with 35,525 active cases including 290 people hospitalised (SA Health 2022b). After this, case numbers decreased until, by 22 February 2022, there were only 13,161 active cases (SA Health 2022c). Since that time, case numbers have oscillated, with a second peak in mid-April 2022 caused by the BA.2 sub-variant (Esterman 2022). This was the final significant wave of infections prior to the cessation of the State of Emergency.

Living with COVID-19 stage

The third stage commenced when the State of Emergency ended on 24 May 2022, and continues at the time of publication. This can be referred to as the living with COVID-19 stage. The response during this stage has occurred under the *South Australian Public Health Act*

2011 (SA), which was amended in May 2022 to enable an ongoing public health response without requiring continued use of the *Emergency Management Act 2004* (SA) (Malinauskas 2022). This stage has been defined by the integration of ongoing but reduced-scale response capabilities into SA Health's routine business practices. Part of this reduction included SCC-H ceasing operations in mid-June and disbanding on 30 June 2022. After this, some SCC-H functions ceased while others were transferred to different parts of SA Health. Although some of the ceased functions seem to have been temporarily reinstated at the peak of various waves of cases (see Harmsen, Boisvert and Opie 2022), such occurrences also seem to have decreased over time as response activities have become increasingly routinised.

Cases have continued to oscillate during this stage, and periodic peaks and troughs in case numbers are likely to continue indefinitely now that COVID-19 is within the community. It is also likely that this stage will continue until COVID-19 is declared to have transitioned to being endemic. Though speculation about the likelihood of this declaration is growing, it may still be several years away (Klobucista 2022). Regardless of timeframe, SA Health's COVID-19 response is already sufficiently integrated into routine business that this declaration is unlikely to have any noticeable operational impact.

Operational approach, effectiveness and lessons identified

The COVID-19 pandemic was the first time SA Health had been appointed as the Control Agency during a State of Emergency declaration. Though it had previously been a Supporting Agency, this required little organic emergency response capability. This meant that almost all of SA Health's capacity to conduct emergency response operations had to be built from scratch as the pandemic progressed. This included establishing and consolidating SCC-H, as well as several task-organised entities that became known as 'workstreams' by mid-2020.

From its establishment, SCC-H was organised in accordance with the AIIMS guidelines (AFAC 2017). This was due to the extensive assistance SA Health received from state and national-level emergency management agencies during the first year of the pandemic. Most notably these agencies were SACFS, SAMFS, SASES, SAPOL, and the ADF. The first three of these agencies use AIIMS, while the others instead use a similar staff structure in their own headquarters (ADF 2019:Annex 1B).[2] Embedded SACFS officers in particular assisted SA Health to implement AIIMS guidelines as it developed its own emergency response capabilities.

The AIIMS guidelines were adapted to meet the unique requirements of the first two stages of SA Health's pandemic response. Table 1 summarises these adaptions and lists the overarching functional areas within the SCC-H organisational structure. The greyed-out boxes within Table 1 indicate where the SCC-H and AIIMS structures deviated from each other. Furthermore, Table 1 does not list sub-structures nor constituent components within each SCC-H functional area. Both of these aspects are discussed separately below.

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2. There is a very strong case to be made that the organisational structure contained in AIIMS is derived from the ADF staff structure, which is much older, having its roots in the North Atlantic Treaty Organization Common Staff System. This has its own antecedents dating to the Napoleonic Wars (Zabecki 2008a:1–22; Zabecki 2008b:1–20).

Table 1: SCC-H adaptions to the AIIMS framework.

AIIMS structure (source: AFAC 2017:46)	SCC-H structure (elimination stage)	SCC-H structure (seeding and suppression stage)
Incident Control	Commander	Commander
Deputy Incident Control	Deputy Commander	Deputy Commander / Duty Commanders
Liaison	Liaison Officers	Liaison Officers
Safety		
Planning	Planning	Planning
Intelligence	Intelligence	Intelligence
Public Information	Public Information	Public Information
Operations	Operations	Operations and Logistics
Logistics	Logistics	
Investigation		
Finance	Finance and Business Support	Finance and Business Support
	SA COVID-19 Information Line	SA COVID-19 Information Line
	Exemptions	Clinical Support

As indicated by grey boxes in Table 1, SCC-H did not include separate functional areas for Safety or Investigation. Instead, safety considerations were factored into routine business across all functional areas, similarly to how the ADF integrates them into its operational planning and conduct (ADF 2019:Annex 1C). Due to the nature of the pandemic response, contact tracing occurred instead of more traditional forms of investigation. This was done within a workstream that was outside of SCC-H's structure. Additionally, when a breach of Emergency Declarations was suspected, investigation was undertaken by SAPOL.

Table 1 also shows two functional areas established within SCC-H to meet unique pandemic response requirements. The first was the SA COVID-19 Information Line, which provided a whole-of-state-government call centre service for members of the public seeking information about any aspect of the pandemic response. The second was a clinical capability. In the elimination stage, this capability was exemptions-focused, assessing applications for people seeking to enter the state or to exit quarantine on compassionate grounds. In the seeding and suppression stage, the opening of the state's borders resulted in a reduced number of exemptions requests and an increased need for clinicians to be embedded in Health Rapid Response Teams (HRRTs) (these are discussed below). As a result of this change in focus, processing of exemptions was rolled into an expanded Clinical Support functional area.

Within the other functional areas, precise roles sometimes varied from those specified within AIIMS. For example, during the seeding and suppression stage, SCC-H's Intelligence function developed an online booking system for close contacts of COVID-19-positive people. This enabled the orderly collection of rapid antigen test kits and reporting of test results. On the other hand, the Intelligence function had ongoing difficulties providing the analysis and forecasting required to enable intelligence-led operations. In terms of 'traditional' intelligence outputs, this functional area provided data collection, statistical reporting, and imagery support. This enabled historical and trend analysis but lacked a predictive element. Predictive analysis was instead achieved through mathematical modelling completed under contract by Adelaide University, the results of which were reported directly to the Chief Public Health Officer (Spurrier 2021). Modelling tended to be completed very close to predicted events, allowing insufficient time for preparedness activities to occur. A notable exception was modelling conducted in preparation for the state's border opening on 23 November 2021. This was completed several weeks before the scheduled event and enabled detailed planning and preparation to occur (Richardson 2021; Spurrier 2021).

Another example is the Finance functional area, which became Finance and Business Support through the addition of a dedicated human resources staff. This was important as SCC-H staff numbers needed to surge during high-tempo periods. Most staff were on short-term contracts with options to renew. This was a reasonable employment model in light of sustained uncertainty regarding how long SCC-H's emergency response capabilities would be required. Several SA Government human resources functions are centralised within Shared Services SA (Shared Services SA 2022). The need for interagency coordination to resolve almost all human resources matters often involved ongoing business-as-usual rates of responsiveness when the pace of dynamic emergency response operations required a much-faster-than-usual timeframe. SCC-H's organic human resources capability helped address this issue by facilitating consistent interagency coordination and by enabling rapid turnaround of the components of human resources processes that could be undertaken within SCC-H.

The roles of some functional areas closely aligned to those specified in AIIMS, but lessons can nevertheless be identified. For example, Public Information was excellent at distributing data including daily case numbers, and at informing the public about changes to Emergency Directions. However, the volume of work required to publish this data left no time for other public relations-type activities. As a result, Public Information published almost no human-interest stories about the pandemic response or responders. Public awareness of a wide range of commendable response activities was therefore limited to people directly affected. This contributed to a general feeling among SA Heath staff that their pandemic response activities were never fully understood nor recognised.

By the end of the elimination stage, SA Health had established nine workstreams outside of SCC-H to manage aspects of its pandemic response. These are summarised in Table 2. Some of these workstreams began as sub-functional capabilities within SCC-H, such as medi-hotel administration and testing site establishment. Both of these activities began within SCC-H's Operations function and were moved into their own workstreams once it was identified that the required scale needed to be much larger than initially anticipated. Other workstreams always existed separately from SCC-H, for example, the Acute Healthcare Readiness and Contact Tracing and Outbreak Investigations workstreams. All nine workstreams continued to exist during the seeding and suppression stage, though their roles changed to align with the changed strategic situation. At the end of this stage the workstreams were disestablished and, as occurred with SCC-H, their roles either ceased or were transferred to ongoing parts of SA Health to continue as a part of routine business operations.

The existence of these workstreams outside of and in addition to SCC-H helped to keep the Commander's span of control manageable (AFAC 2017:15–18). However, this came at the cost of unity of command (AFAC 2017:18–19),

intra-agency coordination, and efficiency. It also created some duplication as well as dual areas of responsibility and reporting. A key cause of these issues was that each of the workstreams was headed by a senior executive who was senior to Commander SCC-H. In other words, this aspect of the command structure was upside down. Instead of being empowered with the traditional scope of command authority, Commander SCC-H had to rely heavily on methods such as consensus building and negotiation. Furthermore, workstreams did not organise using the AIIMS structure. Rather, they were organised according to routine business practices, which complicated required coordination arrangements. In a future pandemic response, this situation should be rectified through the appointment of Commander SCC-H at a more senior level within SA Health.

While some of SCC-H's sub-functional level capabilities were broken out into their own workstreams, others remained within SCC-H. These were mostly within the Operations and Logistics functions. During the elimination stage, key sub-functional level capabilities included establishing quarantine areas ('red zones') in high-risk locations such as Adelaide Airport arrivals hall, and the safe transport of people needing to enter quarantine. During the four community outbreaks that occurred in this stage, SCC-H supported several high-risk facilities and communities. Support measures included providing personal protective equipment, conducting training on COVID-19 prevention measures and, rarely, deploying a single HRRT to an outbreak site for up to several days to establish forward incident control and provide localised SA Health support during outbreak management. Operations and Logistics functions were separate and their roles well-defined; however, neither function had dedicated staff to deploy during outbreaks. Instead, SCC-H could only conduct outbreak response operations by deploying operations room staff to an incident site, effectively

'robbing Peter to pay Paul'. This approach was feasible during the elimination stage because of the limited scale and duration of response operations.

The scope and scale of SCC-H operations dramatically increased during the seeding and suppression stage, when multiple HRRTs were deployed and sustained for weeks-to-months at high-risk locations across the state. To maintain this increased response effort, SCC-H established three new sub-functional areas with dedicated staff. Two of these were dedicated teams to support residential aged care facilities and remote Aboriginal communities. Each of these teams had a core of dedicated SCC-H staff, which was supplemented during HRRT deployments by other agency staff (primarily SAMFS and SASES), and by testers, contact tracers and clinicians from across SA Health. The third area was a Transfer Coordination Centre, which arranged safe movement of COVID-19 positive patients to or between medical facilities, and the operational movement of HRRT members. All three sub-functional capabilities were subordinate to a combined Operations and Logistics functional area. The combination of these two functions within the SCC-H operations room was due to staff shortages brought on by the need to transition from 15/7 to 24/7 operations. Although an unconventional and possibly unprecedented arrangement, the combination of these two function areas was workable due to cross-training of staff.

A final observation relates to command and control arrangements. Table 1 shows that SCC-H replaced Incident Control with a Commander, and Deputy Incident Control with Deputy and Duty Commanders. This is because SCC-H, while interagency, was formed within SA Health and its primary role was to coordinate the Control Agency's (SA Health's) response. Incident Controllers were appointed to manage interagency coordination at key locations when required, in accordance with the AIIMS principles (AFAC 2017:18–19). For example, in the elimination stage, Incident

Table 2: SA Health COVID-19 response workstreams.

Workstream	Role summary
Borders and Exemptions	Coordinated exemption requests processing.
Vaccine Rollout	Distributed vaccines to eligible community members.
Quarantine and Isolation	Administered medi-hotels to facilitate safe quarantining.
COVID-Safe Planning and Compliance	Coordinated monitoring of Emergency Directions implementation and compliance.
Contact Tracing and Outbreak Investigations	Identified, assessed and managed individual exposure information including contact tracing.
Testing and Surveillance	Ensured testing was available to identify positive cases.
Enablers	Provided human resources, procurement, and other supports to all workstreams.
Acute Healthcare Readiness	Ensured the hospital system was able to meet the demands of COVID outbreaks.
Coordination and Implementation Support	Coordinated expertise and data-sharing across workstreams.

Controllers were appointed to manage 'red zones' at Adelaide Airport and in medi-hotels during periods when passengers were transferred to quarantine. In both the elimination and seeding and suppression stages, HRRT commanders were appointed as Incident Controllers. Most of these personnel held substantive positions with SCC-H's Operations and Logistics functional areas or their sub-functional specialist teams; however, in a few remote locations, Incident Controllers were appointed from either SAPOL or a Local Health Network due to their extensive local knowledge. This arrangement had the additional benefit of relieving pressure on over-tasked SCC-H personnel and is an example of the benefits of interagency cooperation.

Conclusion

This paper examined the SA Health-led COVID-19 pandemic response during the State of Emergency declaration in place in SA from 22 March 2020 to 24 March 2022, summarising SA Health's emergency management strategies and operational approaches, and identifying several lessons. With hindsight, it is possible to identify three separate response stages, referred to herein as elimination, seeding and suppression, and living with COVID-19. The first two stages had their own strategic objectives, operational missions, main efforts and key tasks. The third stage has seen the pandemic response transition to being part of SA Health's routine business, with reduced-scale ongoing response functions occurring outside of an emergency management setting and after the cessation of the State of Emergency declaration.

Taking a holistic view, it can be concluded that SA Health's COVID-19 pandemic emergency response was one of the most effective in the country; however, its activities in some areas could nevertheless have been more efficient. This was especially the case regarding intra-agency command arrangements and coordination, which were affected by the concurrent existence of both SCC-H and workstreams that operated independently of it. Coordination was further complicated by the use of routine business-type organisational structures within the workstreams, which did not align with the AIIMS framework. While the application and adaption of the AIIMS framework within SCC-H was vital to its operational success, there was nevertheless room to improve within several functional areas, as highlighted by the lessons identified above.

These possible improvements are relatively minor when compared to the number of lessons that were identified and actioned during the period of the emergency response itself. Indeed, it must be borne in mind that SA Health started the pandemic with no prior experience of emergency management aside from that obtained through peripheral roles as a Supporting Agency. Every aspect of

its COVID-19 pandemic emergency response had to be built almost from scratch as the emergency progressed. That this occurred and that SA Health achieved one of the most effective responses in Australia, and arguably globally, is testament to the hard work and ingenuity of several hundred people from a range of agencies who were involved in the response.

Disclaimer

The views expressed in this article are exclusively the author's own and do not reflect those of any organisation with which he is or was previously affiliated.

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