

Executive summary

The global COVID-19 pandemic has had enormous impacts on societies around the world. In NSW, a public health response of an unprecedented scale and duration was mounted in January 2020. Given the magnitude of these events, it is critical we learn from what was done well and where there is room for improvement.

This report reflects specifically on the public health aspects of the NSW Health COVID-19 response. The 104 recommendations in this report reflect the major themes identified through a multi-method debrief process that engaged over 250 people across NSW Health and partners.

1 Context and purpose of the debrief

Context

Two structures were established by the NSW Ministry of Health to direct the health response to the pandemic. Both were set up using an Incident Control System, an emergency management structure designed to perform the functions of control, planning, operations and logistics.

- The Public Health Emergency Operations Centre (PHEOC) was set up in late January 2020 to ensure statewide coordination of the public health response. The initial remit of the PHEOC was to coordinate case finding, contact tracing, outbreak control, communications, and other preventive actions. In July 2020, the PHEOC became known as the Public Health Response Branch (PHRB) and later became the COVID Influenza Branch in 2022.
- The State Health Emergency Operations Centre (SHEOC) was set up in March 2020 to oversee the NSW Health system operational response to the COVID-19 pandemic. Its role was to manage and oversee clinical operations in hospitals and health facilities, support workforce, support vaccination and facilitate procurement during the pandemic.

These governance structures were designed to provide a coordinated COVID-19 response across all aspects of the health system. They were linked to the State Emergency Operations Centre, which brought together 20 critical NSW Government agencies to coordinate the whole-of-government response to COVID-19.

Purpose and scope

The purpose of the NSW COVID-19 Public Health Response Debrief (the debrief) was to examine the public health response since January 2020 to identify best practices and areas that require strengthening, and to provide implementable recommendations for a stronger and more integrated public health network now and into the future. The NSW whole-of-health COVID-19 debrief that has run concurrently addresses broader health system learnings while this debrief aims to provide a deep dive into key aspects of the public health response.

This debrief focused on public health network activities that supported the NSW Health COVID-19 response, including the activities of the COVID Influenza Branch (formerly PHRB) and public health units (PHUs) in local health districts (LHDs). Activities under review included contact tracing and case and contact interviews; public health surveillance and reporting; venue risk assessment; and communication to the public, and collaboration and communication with the broader health system, government and other agency partners in relation to the public health response. The debrief also examined the impact of COVID-19 on population health service delivery.

Though the scope of this debrief is comprehensive, it occurred in the context of other state and federal government review processes that examined different aspects of COVID-19 responses. To illustrate, Sydney Airport COVID-19 operations, hotel quarantine arrangements and interstate border measures are touched upon in the NSW whole-of-health debrief. Quarantine arrangements nationally have been examined in the *National Review of Quarantine* by Jane Halton.

The implementation and monitoring of the NSW COVID-19 vaccination program is addressed by the NSW whole-of-health debrief and the NSW Audit Office's review of the vaccine rollout. The vaccine rollout review did not address surveillance for vaccine-related adverse events, the support provided to the Therapeutic Goods Administration, or the rapid enabling of research to examine vaccine effectiveness in the Australian context, all of which are covered in this report.

The broader response to aged and disability care outbreaks and intersection with the Commonwealth is touched upon from a public health perspective, however the NSW whole-of-health debrief addresses this in more detail.

Cruise ships are an important setting given the high risk of transmission. Learnings in relation to cruise ships were addressed through the special commission of inquiry relating to the Ruby Princess. Subsequent whole-of-government and cross-jurisdictional work led to the establishment of the Eastern Seaboard protocol to support the recommencement of cruising.

2 Methods

The debrief process included multiple components designed to gather detailed information and a wide range of perspectives and experiences regarding the NSW public health response. These components include an after-action review involving over 100 people across the public health network and an examination of the impact of COVID-19 on population health service delivery across four policy areas (health protection, preventive health, oral health, and alcohol and other drugs). The debrief report was informed by key informant interviews (n=42), exploratory surveys (n=14), workshops with response teams (n=3), sense check consultations (n=25), case studies of best practice (n=36) and desktop reviews of research, reports and documents related to the COVID-19 response. More than 250 personnel were engaged through this debrief across stakeholder consultations and contributions of all kinds.

An Advisory Group with broad representation across NSW Health provided oversight, advice and strategic support for the debrief process. Membership included LHD Chief Executives, Directors of Public and Population Health, Ministry of Health senior executives and public health specialists.

There was also close liaison with the lead and team concurrently managing the whole-of-health COVID-19 debrief. That debrief and related report provides the broader context within which the public health response operated. Many common findings emerged across both debriefs.

3 Key learnings, achievements and recommendations

Cross-cutting themes

Cross-cutting themes emerged that were perceived to have a broad influence on the effectiveness of this public health response and how we respond to future pandemics and other public health threats. The cross-cutting themes below are inter-connected, have application across chapters in the report, and are not exhaustive of all cross-cutting issues.



Summary of key learnings and recommendations by chapter

3.1 Test-Trace-Isolate-Quarantine strategy for managing COVID-19 outbreaks in NSW

The Test-Trace-Isolate-Quarantine (TTIQ) strategy is used to break chains of transmission during a disease outbreak and involves isolating confirmed cases with the disease and identifying and quarantining their close contacts from the community. TTIQ is frequently activated after an individual presents with disease symptoms, at which point they will be tested for the pathogen. This TTIQ strategy, along with hygiene and physical distancing measures, make up the non-pharmaceutical interventions that are often used to suppress infectious diseases. NSW Health developed a world-leading TTIQ capability over the course of the pandemic. This capability evolved over time based on case numbers, vaccination uptake, and changing government policy settings.

Key learnings

The approach to testing evolved over the pandemic as testing capacity was scaled and new technologies, such as rapid antigen tests and rapid turnaround testing platforms, were introduced. The testing strategy must continue to respond to the changing context, noting easy and equitable access to testing is a cornerstone of an effective public health response.

The approach to case and contact interviews similarly evolved with the different challenges and contexts of the COVID-19 waves. Responding to frequent changes in policy settings required significant effort and flexibility. Changes, such as streamlining case and contact interviews, were essential to maintaining the efficiency and effectiveness of TTIQ in a high caseload environment. The ability to share case and contact workload across the public health network was a major strength of the NSW approach. Providing timely access to fit-for-purpose information technology systems was a critical enabler of case and contact management.

Contact tracing teams had to reach and engage with people with complex health or social needs and provide support and advice. This was challenging but critical to effective case and contact management.

Integration of processes for linking cases to virtual care and referral to hospital or healthcare interventions, such as monoclonal antibody therapy and antiviral therapy, were also important to achieving health outcomes.

Public health teams were also required to support critical industries – such as food producers and manufacturers – to maintain their operations through the provision of expert advice on risk mitigation.

Contact tracing teams needed to surge rapidly at various points in the pandemic. Planning for these surges, including workforce training and recruitment and the role of external providers, is critical.

Recommendations

Now

- 3.1.1** Maintain and regularly review plans for standing up and surging case and contact teams within the NSW public health network and Health Protection NSW (HPNSW) for use in future public health emergencies. This should delineate early phase essential priorities, next steps, and recommended structures and relevant functions, and include a central repository of case and contact management onboarding and training resources, and standardised tools developed during this response for adaptation to future conditions.
- 3.1.2** Utilise collaborative platforms in the post-COVID environment in line with proven use cases aligned with data governance and cyber security.
- 3.1.3** Sustain strong relationships between public health and pathology providers in BAU and strengthen these relationships during a public health response to enable ongoing adaptation of the COVID-19 testing strategy, or relevant future testing strategies.

Near future

- 3.1.4** Enhance staff training and development both centrally and locally across LHDs for public health emergency responses with a focus on building high-level capability in operational management, strategic planning, policy making and epidemiology.
- 3.1.5** Expand management and leadership training opportunities available to public health response staff to enhance succession planning and career opportunities.

3.2 Epidemiology, surveillance and reporting

A cornerstone of prevention and control measures during a pandemic is epidemiological surveillance and reporting. Surveillance is the ongoing systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event, to inform public health action. COVID-19 surveillance involves monitoring the spread of the disease to identify patterns of transmission –and for application of preventive and control measures –but can also extend to using data to better understand health system and community impacts.



Key learnings

NSW produced high-quality epidemiological analyses throughout the pandemic. This was possible because of a long-term and significant investment in information systems and epidemiological and statistical capability, and strong collaboration between the Centre for Epidemiology and Evidence and the PHRB.

The existing Notifiable Conditions Information Management System (NCIMS) was used to full capacity with the support of eHealth NSW. Investment in a new system, SIGNAL, has been secured and collaboration between eHealth NSW and Health Protection NSW (HPNSW) to finalise the scope and commence procurement is well advanced. This will allow the learnings from the pandemic response to be embedded in the functionality of the new system.

Maintaining an agreed single source of truth for case reporting and data quality is critical. Changing surveillance definitions over time had implications for mapping information and process flows and presented an additional challenge.

At this stage in the pandemic response, with a return to BAU governance arrangements, it is time to reflect on the ongoing relevance and utility of data fields in NCIMS.

Stakeholders had many different reporting needs, and this presented challenges as prioritisation had to occur. It is important to understand the information and data needs of stakeholders and tailor reports accordingly within a prioritisation framework.

Recruitment of additional staff with epidemiological, data analytic and visualisation skills was challenging, but bringing together people with a diverse range of skills was essential and led to ongoing innovation. In recognition of the importance of having a critical mass of skills to support epidemiological analysis and data insights, a strengthened team within HPNSW is being established. The workforce section provides additional insights in relation to workforce recruitment, training and development, and identifies epidemiology and surveillance as a key area for capability development.

Recommendations

Now

- 3.2.1** Significantly enhance data management, epidemiological and biostatistical capability in HPNSW and include a mechanism to flex this capacity using contingent workforce and academic partners in response to future pandemic surges.
- 3.2.2** Establish closer links between the epidemiological and surveillance team in HPNSW and other Ministry of Health data and analytics teams, including linking with the NSW Health Data Analytics Advisory Committee.
- 3.2.3** Implement targeted strategies to attract and retain data management, epidemiological and surveillance staff in HPNSW and LHDs, including offering greater tenure, professional development opportunities, involvement in communities of practice such as the Epidemiology Special Interest Group (EpiSig), and research.
- 3.2.4** Align processes for release and management of COVID-19 data with BAU data governance processes.
- 3.2.5** Review COVID-19 data fields collected through NCIMS to determine their ongoing relevance to pandemic response surveillance and reporting.
- 3.2.6** Maintain mathematical modelling capability for COVID-19 and other relevant infectious diseases as an important horizon scanning and pandemic planning tool.
- 3.2.7** Transition administration of NCIMS to eHealth NSW to reduce key person risk associated with the system's administration and to access additional capacity and capability available across the cluster.

Near future

- 3.2.8** Invest in enduring analytical infrastructure to ensure sustainable arrangements that meet the needs of HPNSW under non-pandemic conditions and to proactively respond to future outbreaks and pandemics.
- 3.2.9** Enhance the Centre for Health Record Linkage's computing, algorithm matching and clerical review capacity to support timely and high-quality record linkage services for COVID-19 research and surveillance projects.
- 3.2.10** Maintain the capability of the NCIMS platform and invest in the transition to the enhanced infectious diseases surveillance platform (SIGNAL).

4 Priority settings and populations

Due to increased risk of transmission of COVID-19, increased risk of severe outcomes following infection, or risk of critical service disruption, a number of settings and populations were recognised as key priorities requiring a more targeted and nuanced public health response. These included Aboriginal people, culturally and linguistically diverse (CALD) communities, education settings, residential aged care and disability care settings, and correctional settings.



4.1 Aboriginal people

Aboriginal and Torres Strait Islander people make up 4.2% of the total NSW population and 34.5% of the Aboriginal population of Australia. While NSW has a significant metropolitan Aboriginal population, a greater proportion of Aboriginal people reside in rural and remote communities. Aboriginal and Torres Strait Islander people are at higher risk of severe disease outcomes because of high levels of chronic disease. Targeted strategies to protect and support Aboriginal communities are a vital component of an effective public health response. These should be informed and led by Aboriginal people and communities.

Key learnings

It is important that Aboriginal people are represented in pandemic governance structures at all levels to ensure a culturally appropriate and effective response. The establishment of strong partnerships and consultation with the Aboriginal community controlled sector and the Aboriginal Health and Medical Research Council was essential. Local public health units also engaged with local Aboriginal Community Controlled Health Services and local communities to further tailor the local public health response.

Public health messaging was developed and delivered by Aboriginal people and was further localised when needed to address the local context.

Aboriginal people who had COVID-19 and their families benefited from cultural support services and this should be incorporated into BAU and future pandemic plans.

To ensure evidence is used to inform public health decision making, the collection of accurate information on Aboriginality should be strengthened across data collections.

Staff redeployments into the health service and public health responses, while necessary, drew resources away from other important Aboriginal services. Strategies to support the maintenance of high-priority programs during pandemics is essential.

Provision of culturally safe services and care mean that all staff (including broader health sector staff such as GP practice managers and receptionists, and pharmacists and pharmacy staff) should receive appropriate education and training in Aboriginal health and culturally safe practices.

Recommendations

Now

- 4.1.1** Enhance training of the public health response workforce in Aboriginal health and culturally appropriate policy and program development.
- 4.1.2** Explore processes to improve demographic data collection, including Aboriginality, in case management systems and other relevant data collections.
- 4.1.3** Investigate the utility of the Australian Immunisation Register linked to the Multi-Agency Data Integration Project (AIR-MADIP) as a tool to provide timely data on immunisation uptake by Aboriginality.

Near future

- 4.1.4** Continue consultation with Aboriginal communities to ensure communications are focused on priority messaging, are salient, and engage appropriate community champions who are recognised and accepted within the community.
- 4.1.5** Work in partnership with the Commonwealth, medical colleges and professional organisations to implement strategies to improve the cultural competence of staff working in primary care settings.
- 4.1.6** Ensure pandemic preparedness exercises include consideration of action in different settings (metro and rural) and with diverse populations, including Aboriginal and CALD populations.
- 4.1.7** Build on investment in the Aboriginal workforce made during the COVID-19 pandemic, and further strengthen Aboriginal public health workforce participation such that Aboriginal public health personnel are engaged to co-design relevant aspects of the public health response across the health system and are broadly embedded across organisational structures.

Future pandemics

- 4.1.8** NSW Health to lead a community of practice across NSW Government, Health and the community-controlled sector to engage Aboriginal people, develop communication materials, and share accurate and culturally appropriate information in a timely fashion.
- 4.1.9** Ensure Aboriginal people continue to be represented within pandemic governance structures both centrally and locally, so the needs of Aboriginal people are included in decision-making processes and policy development.
- 4.1.10** Consider how emergency management structures could further facilitate input from Aboriginal people in a pandemic response.

**4.2 Culturally and linguistically diverse communities**

NSW has a diverse and multicultural population with almost one-third of residents born overseas and a high proportion speaking a language other than English at home. Many CALD people experience higher levels of socioeconomic disadvantage, language barriers, low health literacy, and worse health outcomes. Given these challenges and cultural diversity across NSW, thorough engagement and communication with CALD communities was critical to effective public health action.

Key learnings

The NSW public health response built on existing health networks and relationships to engage with local CALD communities. Community leaders along with key partners such as Multicultural NSW and others were critical in working with the public health response to convey public health messages and develop tailored communication materials for local communities.

Communication needs vary between CALD communities and a 'one size fits all' approach should be avoided. For this among other reasons, communication materials should be developed with the input of cultural experts from CALD communities.

It was important to counteract misinformation and ensure communities had access to information from reputable sources. Respected community leaders were credible messengers in counteracting misinformation.

Specific strategies were undertaken to address low health literacy levels. Bespoke resources, such as audio files embedded in text messaging, were developed to meet community needs and assist in adoption of desired behaviours after receiving health information.

Online environments such as community forums provided opportunities – often at short notice – for engagement with local communities to hear concerns and relay public health information.

Using real-time data available through epidemiological and surveillance systems about CALD communities helped inform the public health response. However, more comprehensive data on cultural background and language spoken at home would have enhanced understanding of the effectiveness of strategies.

Some LHDs with considerable cultural diversity needed to manage large volumes of complex cases and contacts, necessitating development of targeted models of public health intervention and communications to support priority populations. These came with high workloads and impacts on staff.

Recommendations

Now

- 4.2.1** Draw on research and approaches used to develop communication strategies for CALD communities during the COVID-19 pandemic to address other existing and emerging health problems.
- 4.2.2** Explore processes to improve demographic data collection, including country of birth and language spoken at home, in case management systems.
- 4.2.3** Investigate the utility of the Australian Immunisation Register linked to the Multi-Agency Data Integration Project (AIR-MADIP) as a tool to provide timely data on immunisation uptake by socioeconomic and CALD status.

Near future

- 4.2.4** Maintain and strengthen relationships developed with CALD communities and partner agencies during the COVID-19 pandemic so these relationships can be drawn upon during current and future public health responses.
- 4.2.5** Invest in training and development of a multilingual public health workforce.
- 4.2.6** Invest in further strategies to improve health literacy among CALD communities, including health literacy training for CALD health and community workers.

Future pandemics

- 4.2.7** Build on the successful engagement with Multicultural NSW and the Multicultural Health Communication Service in future pandemics and seek their support in effective targeting, message development and engagement with CALD communities.
- 4.2.8** Engage with key CALD communities to understand information needs, barriers to accessing healthcare, changing communication preferences, and how to promote resilience during public health crises.
- 4.2.9** Ensure that CALD communities have accurate and timely access to public health information concurrently with the whole population.
- 4.2.10** Provide training for staff working in future responses so they understand the local context impacting CALD communities and provide tailored and culturally appropriate information and referral to necessary services.
- 4.2.11** Anticipate additional public health response workload and different workforce skill mix requirements in districts with large CALD populations (e.g. bilingual workers, social workers).



4.3 Education settings

School and early childhood services play a critical role in childhood and adolescent learning, and social and emotional growth. Ensuring ongoing engagement of children in learning was a key focus of work between NSW Health and the NSW Department of Education, given the risks of critical service disruption. Strategies were put in place to minimise transmission in schools and support learning. Throughout the pandemic, there was a focus on communicating the impact of COVID-19 on children. Paediatric research and surveillance were established to generate high-quality local evidence to complement international evidence.

Key learnings

Striking the right balance between student and staff safety and the least restrictive face-to-face learning approaches in educational settings is vital given the importance of such learning to childhood development. Strong engagement and regular communications across government and non-government sectors was a critical enabler in achieving this balance.

Another key enabler of effective policy making and swift operationalisation in a rapidly changing policy context was the existing stakeholder relationship between government departments. Sustained liaison between public health and educational sector leads across government and non-government sectors was crucial to the response. The NSW Department of Education supported liaison with Parents and Citizens groups and Principals Forums. This proved useful and should be embedded in policy approaches and future pandemic responses.

Strong internal linkages between the policy and operational arms of the public health response ensured joined up engagement in and advice to educational settings.

Recommendations

Now

- 4.3.1** Strengthen and expand the relationship between the Population and Public Health Division and the NSW Department of Education to enable ongoing collaboration between sectors for pandemic response and to link with broader public health issues.

Future pandemics

- 4.3.2** Initiate a process to define policy and operational roles and responsibilities between the NSW Department of Education, LHDs and central public health response teams.
- 4.3.3** Invest in partnerships with research groups to enable rapid engagement and implementation of research in schools and early childhood settings to understand drivers of transmission and disease severity to inform policy, risk assessment and public communications.
- 4.3.4** Retain education settings as a priority setting in future pandemics and continue to develop and adapt risk guidelines and public communications over the course of future responses in line with evidence.



4.4 Residential aged care and disability care settings

Increased risk of severe outcomes due to older age, presence of comorbidities and compromised immunity, and shared communal environments are just some of the challenges faced across residential aged and disability care settings.

While aged care is predominantly in the domain of the Commonwealth Government, NSW Health, including the public health network, worked together with the Commonwealth to ensure necessary support and care to residents in these high-risk settings, particularly in the context of outbreaks.

Key learnings

Multiple policy stakeholders came together in the rapidly changing context to develop clear and authoritative advice for COVID-19 policy and procedures. Relationships forged between public health teams, relevant clinical communities in aged and disability care settings, and NGOs were critical to effective public health action and should be sustained.

NSW Ministry of Health policy teams and local public health and clinical teams established effective ways to collaborate. Public health advice was then able to combine with understanding of the unique needs of people with disability in congregate settings – and of harder to reach individuals in supported independent living arrangements – to inform service provision and outbreak management.

The public health approach in aged and disability care settings adapted over time. Striking the right balance between risk reduction through restrictions and resident quality of life and autonomy is a key consideration in a nuanced public health approach in aged and disability care settings.

Substantial gaps in availability of resident demographic, risk factor and service data made risk assessment and outbreak management more challenging. Data sharing regarding public health risk and congregate settings for older people and those with disability should be enhanced in collaboration with the Commonwealth.

The disability care sector provides services to diverse groups of individuals in a wide range of settings. This means that more tailored risk assessments are required to balance the risks and benefits of public health restrictions in each specific setting. In addition, there is greater heterogeneity in disability residential arrangements, with generally smaller numbers of residents in these accommodation arrangements.

Providing tailored public health information accessible for people with a variety of disabilities warrants additional focus during a pandemic response and needs to be incorporated into BAU responses.

Recommendations

Now

- 4.4.1** Continue to invest in ongoing relationships between public health, clinical groups, other government agencies, and NGOs in aged and disability care settings to support effective clinical care, vaccination and outbreak management.
- 4.4.2** Investigate mechanisms in collaboration with the Commonwealth for enhanced data sharing between residential aged care and disability sectors and NSW Health to support the public health and health system response.

Future pandemics

- 4.4.3** Include consumer perspectives in emergency response policy for residential aged and disability care settings to ensure a nuanced balance of safety, risk and personal choice in the context of a communal setting.
- 4.4.4** Ensure residential aged care and disability continue to be priority settings with effective engagement between the Commonwealth, public health, health system and NGO service providers.
- 4.4.5** Recognise and plan for the heterogeneity of risk in disability settings in future responses. This requires tailored risk assessment and differs from the assessment and public health action in aged care settings.



4.5 Correctional settings

Correctional settings such as prisons, youth detention centres and forensic psychiatric facilities are high-risk environments for COVID-19 transmission among prisoners and staff, given the many challenges they pose for the prevention and control of infectious diseases. These settings also entailed high need for service continuity. A networked approach centred efforts around prevention, early detection, containment and outbreak management in both publicly and privately run correctional facilities in NSW. Public health advice and support also extended to managing COVID-19 contacts in the court system and advice on how to release prisoners safely back into the community. The prevention and control of COVID-19 in correctional settings was therefore an important component of the NSW public health response.

Key learnings

Correctional facilities were a complex environment during the response, given their congregate living arrangements, inherent restrictions on movement, and the chronic disease profile of prisoners. This required a high level of agility in policy and public health response. Personnel developed significant innovation in practices, such as reception of new prisoners, creating new inter-agency response structures and communication, and developing risk assessment matrices tailored to correctional settings.

Sustained relationships and effective communication between public health, the Justice Health and Forensic Mental Health Network, and Correctional Services NSW are critical to timely and constructive liaison on policy development, risk assessment and outbreak response in correctional settings.

Finding the right balance between the welfare needs of prisoners and staff was complex. Broader welfare concerns for prisoners emerged over time, as numerous outbreaks in correctional facilities and repeated quarantine periods led to some prisoners missing usual health programs. This may be technology-enabled both during a response and as part of BAU enhancements. The pandemic also had substantial impacts on the workforce (e.g. furloughing staff came with greater pressures on those remaining). Acceptable models of isolation/quarantine are a challenge that warrant ongoing consideration for COVID-19 and future pandemics.

There is now a greater focus on and investment in public health in correctional settings. Continued linkages between these settings and LHDs and PHUs will help integrate public health and ensure continuity of health interventions.

Recommendations

Now

- 4.5.1** Support finding the right balance between risk from COVID-19 and prisoner welfare and wellbeing, given that correctional settings continue to be a priority for a pandemic response and that isolation/quarantine approaches will need to be adapted in response to cases and variant characteristics.
- 4.5.2** Ensure systematic documentation of key learnings from the scale-up of COVID-19 public health operations in correctional settings by the Justice Health and Forensic Mental Health Network in collaboration with key stakeholders.
- 4.5.3** Maintain prevention and control of COVID-19 in correctional settings as a critical component of effective public health response, given that prisons are high-risk environments for COVID-19 transmission.

Future pandemics

- 4.5.4** Consider the broad suite of policies and processes for the prevention and control of respiratory diseases in future pandemic responses in correctional settings, including clinical isolation/quarantine, assessment of ventilation, surveillance testing, vaccination, infection control training, personal protective equipment for staff and prisoners, cleaning and disinfection processes, and case reporting systems to monitor respiratory pathogens.

5 Enablers

The public health response was underpinned by key enablers critical to the response: governance, workforce, integration with clinical partnerships, media and communications, information systems, and research.



5.1 Governance: structures and processes to oversee and enable the NSW public health response

Governance broadly refers to the 'structures and processes' in place to oversee and enable the pandemic response. Informed by emergency management plans, a nexus of expert and connected decision-making groups, lines of communication and reporting were activated during the response for coordinated activity. These included at state government level (through emergency management structures and their central and local implementation structures) and across LHDs. Governance arrangements played a critical role in how the NSW public health response was activated and managed.

Key learnings

The scale of the pandemic called for rapid adaptations to the public health response operating model –including people, processes, technology and structures –given the complexity and speed of change.

The emergency management structures provided a governance and operational framework for the initial phases of the public health response, but limitations appeared in the Incident Control System model for governing a response of this scale, complexity and duration.

Managing the high volume of information flows across NSW Health (SHEOC, PHRB, LHDs) and the NSW Government, as well as laterally with other state and national agencies, was challenging. Embedding systems across NSW Health governance structures for strategic issue identification, prioritisation and escalation, as well as comprehensive briefings at various stakeholder levels is important.

Strategic planning both within the response and for likely future scenarios is a critical capability that must run in tandem with a sustained ‘now’ focus on current problems. Embedding an enhanced strategic planning capability within future public health responses is merited, given the benefits identified in bringing together predictive case modelling, surge resource planning, future scenario planning, and risk assessment and mitigation.

Medical advisers within the PHRB or Ministry effectively led strategic initiatives, noting that clear roles, functions and reporting lines are critical.

Targeted recruitment of experienced operational managers, including those skilled in managing very large teams, is an enhancement warranting attention in future public health responses. Establishing clear line management and reporting for response managers is required.

Communicating strategic priorities or significant operational resets throughout the response was important for maintaining a common sense of purpose and operational planning.

Boosting capability at senior leadership levels is important. Having a flexible approach to drawing in and rotating suitably qualified senior staff to deputise in critical areas of the response will enhance strategic capability and reduce fatigue and key person risk during future pandemics. This capability should be built during BAU and is further discussed in the workforce section.

The Health Protection Leadership Team (HPLT) was a critical forum for strategy, information exchange, operational planning and implementation but it sometimes had to grapple with balancing local priorities and forging consistency in practice across the state. Standardisation of processes and tools and dissemination of these to the public health network is a critical enabler of effective public health response.

Clear, consistent and regular engagement by public health teams with LHD Chief Executives (CEs) was considered vital to giving CEs a better ‘line of sight’ and supporting their decision making and effective action in the complex ecosystem of the response.

After-action reviews provide a means to observe how well preparedness systems perform in real-world conditions after a response and can help identify and improve public health emergency preparedness and response. Intra/ after-action review processes were identified as an important quality improvement and reflective tool and should be expanded as part of routine public health practice.

Recommendations

Now

- 5.1.1** Review and update the NSW Public Health Incident Control System, minimum standards for public health preparedness and associated training to incorporate key learnings from the COVID-19 pandemic.
- 5.1.2** Review the organisational structure of HPNSW to effectively integrate emergency response functions into BAU and include consideration of reporting lines, operational metrics, surge capacity and governance, with the flexibility to respond to future public health emergencies.

- 5.1.3** Undertake ongoing development of Health Protection performance and standards that takes account of organisational requirements, leverages existing formal and informal metrics for identifying risk and optimising system performance, and complements concurrent efforts aimed at enhancing corporate governance and relationships with key partners, such as LHDs. This process should inform operations under both BAU and emergency conditions.
- 5.1.4** Build enhanced Executive-level strategic planning capability within HPNSW for response planning and coordination, and related organisational change.
- 5.1.5** Review the terms of reference of HPLT, given key lessons learned from the pandemic, and delineate roles and responsibilities, noting HPLT may serve different functions depending on the nature of issues being considered.
- 5.1.6** Maintain and build on relationships that have been built during the pandemic both centrally and locally, including with central agencies, clinical networks, primary health networks, the education sector, Multicultural NSW and NGOs.
- 5.1.7** Embed use of intra/after-action reviews as part of routine public health practice across the network as a mechanism for practice improvement, future pandemic and emergency processes planning, and/or as a vehicle for personnel debriefing on challenging events.
- 5.1.8** Develop an implementation plan arising from this debrief report in consultation with relevant implementation stakeholders.

Future pandemics

- 5.1.9** Consider mechanisms for timely and appropriate briefing of the broader public health network on major changes in the response strategy, including online town hall events throughout the pandemic.
- 5.1.10** Embed advisers or senior public health managers in SHEOC to assist decision making and translation of public health orders into operational planning and coordination, and to link back to public health.

5.2 Workforce capability and surge capacity

A capable, multidisciplinary public health workforce was essential to mounting an effective public health response. The NSW public health response also relied on personnel drawn from a range of professional backgrounds, including from government, universities, non-government partners, the Australian Defence Force, and the wider community. This brought in broader and essential skills such as policy writing, communications, community engagement, clinical operations, and inter-government relations.

The response called for operation 7 days per week over the course of the pandemic. An initial rapid scale-up of staffing, recruitment and workplace systems to support the public health response was required, with repeat efforts in 'surge' recruitment as the pandemic phases evolved in NSW. Thousands of personnel participated in the NSW public health response.

Key learnings

Significant and repeat surging of the public health workforce over successive waves of COVID-19, both centrally and locally, represented a substantial achievement for NSW Health.

A multidisciplinary and culturally diverse public health workforce was found to be critical to effective engagement across government and community. Existing public health training programs and associated alumni were important contributors to the surge workforce. Long-term relationships with academic partners and NGOs were also effectively leveraged for workforce surge and could be expanded for future pandemics.

The medical adviser workforce was an important enabler of flexible and effective public health response, especially in its intersection with clinical systems.

Centralised recruitment and mass onboarding facilitated the rapid surge in workforce, given staff working in the response were too time-poor to identify and select candidates. Rapid training on roles and responsibilities within different functional areas of the surge workforce was recognised as critical to an effective public health response.

Accurately determining workforce deployment across the response both centrally and locally was challenging, related to some limitations in integration of human resource management systems. The complexity of award structures made deployment and rostering of response staff challenging, both centrally and locally.

Repeated surge staffing, rapid and constant operational change over several years, and anxiety associated with feeling ‘we cannot fail’ resulted in a depleted and tired workforce. Reducing key person risk and ensuring sustainable working practices across central and local response structures, especially in leadership and highly specialised positions, is critical. All staff, including key position holders both centrally and locally, should have clearly appointed delegates or substitutes and structured downtime. Measures to support staff welfare and maintain sustainable work practices should be implemented early and become usual business practice throughout public health responses.

Integration of human resource and operational functions at Executive level within the organisational structure of the NSW public health response would have strengthened the response and related workforce planning and operations. The response would have benefited from additional operational and system management expertise.

Response contraction with the transition toward an endemic state of COVID-19 and return to BAU has been challenging, given the shift from the ‘high’ of the response, staff attrition, and the move to more strategic functions in many areas. However, the pandemic also developed a new generation of public health workforce, and talent retention and workforce development should be a priority.

Mathematical modelling for prediction of COVID-19 cases, alongside consideration of factors such as TTIQ capabilities and the prevailing context, are important for workforce planning. Workforce preparedness planning should consider a model for staged scale-up of response operations that identifies standing capacity in public health expertise and where to target ongoing training and development efforts beyond this existing capacity.

A whole-of-health system workforce approach is necessary to effectively respond to a pandemic. Normalising the expectations of health professionals and broader NSW Health staff for participation in future pandemic responses is important, as is participation in surge planning and maintaining capability to rapid upskill staff in emergency management.

Recommendations

Now

- 5.2.1** Continue to invest in a robust multidisciplinary and culturally diverse public health workforce both centrally and locally, including population health training programs, as this is critical for long-term sustainability of public health preparedness and response.
- 5.2.2** Maintain a strong medical adviser workforce in the Population and Public Health Division as an important enabler of effective public health response.
- 5.2.3** Develop a strategy to identify, retain and develop high value public health talent developed across the public health network during the pandemic.

Near future

- 5.2.4** Improve human resources data systems so they can produce accurate and timely reports of staff deployed in the public health and health system responses, including in LHDs.

- 5.2.5** Develop and/or collate a suite of training resources that cover key functions of the public health response that can be used to train new staff in any subsequent response surge.
- 5.2.6** Review existing industrial instruments used to employ public health response staff and determine the most efficient employment mechanisms that accommodate shift work for future pandemics, both centrally and within LHDs.

Future pandemics

- 5.2.7** Use mass onboarding agreements with key government, non-government and academic partners as an effective public health workforce surge tool in future pandemics.
- 5.2.8** Make greater use of non-clinical staff with operational management expertise in the central and local public health response.
- 5.2.9** Formally integrate a dedicated capability that includes human resources, finance, procurement, and strategic planning functions as a relationship manager into the organisational structure of the NSW public health response.
- 5.2.10** Proactively manage and monitor staff wellbeing using periodic surveys from the start of future pandemics to provide tailored and timely support services and training for frontline public health workers.
- 5.2.11** Implement public health response structures and support sustainable work practices both centrally and within LHDs, including for highly specialised and leadership positions.
- 5.2.12** Train and develop capabilities at a senior leadership level under BAU conditions. During a response, boost capability using a flexible approach to draw in and rotate suitably qualified senior staff. This will enhance strategic and other key capabilities, reduce fatigue, and minimise key person risk.
- 5.2.13** Ensure that future surge planning for case and contact teams includes consideration of skill mix (such as public health expertise, customer service skills, multilingual skills, management and communications), and consider potential sources for accessing personnel, triggers for surging, and methods for scaled escalation.
- 5.2.14** Maintain separate teams, where possible, early in a response for contact tracing/positive case interviews versus a call centre for public enquiries, to support better customer experience.

5.3 Integrating the public health response with clinical partnerships

A central challenge in responding to COVID-19 was the need to integrate public health actions with timely, high-quality clinical services across all areas of the response. Regular and meaningful engagement with health partners and clinical leaders was vital to informing and guiding the response, ensuring timely identification of issues, and facilitating a flexible and tailored response. Clinical partners, including GPs and pharmacists, were integral to the public health response for testing and treatment, vaccination, advice to patients, and in their roles as community leaders. Clinical engagement was also an important contributor in countering misinformation.

Key learnings

Public health leaders communicating with clinicians and peak bodies from the outset of the pandemic about evolving evidence on COVID-19 and its transmission was critical and continued throughout the pandemic. An example was working with the Royal Australian College of General Practitioners (RACGP) to support regular webinars for GPs that provided accurate and timely COVID-19 information.

Linking clinicians to the latest evidence about adverse events from COVID-19 vaccination facilitated evidence-based practice and effective clinical decision making. The enhanced surveillance system for monitoring adverse events related to vaccination also built clinical and public confidence in vaccine safety.

Drawing on clinical expertise to inform and develop the public health response was fundamental to success and took various forms, for example through expert panels and consultation with clinical networks and LHD clinical groups.

Two-way integration of public health advice and clinical responses at an individual patient and broader system level was also critical, for example through clinical councils and communities of practice. This integration also included engagement with and support for GPs, pharmacies and primary health networks.

Recommendations

Now

- 5.3.1** Continue to engage with and communicate information to clinical networks and peak bodies about COVID-19 as new variants emerge and when there are major shifts in strategic approaches and the evidence base.
- 5.3.2** Maintain strong working relationships with primary care, continue the RACGP webinar program for critical public health issues, and investigate expanding the webinar program to the pharmacy sector.

Future pandemics

- 5.3.3** Include enhanced surveillance of adverse events following immunisation in future public health responses, as this was an important tool to build clinician and public confidence in vaccination.
- 5.3.4** Continually disseminate trusted advice about infectious diseases, public health measures and associated implications for clinical practice to key clinical stakeholder groups as a vital part of the public health response.
- 5.3.5** Establish scalable systems and processes early to integrate public health and clinical responses to individual cases and, where relevant, for BAU conditions.

5.4 Media and communications

Empowering the public with the right information was critical for the response. Effective communication strategies can build public trust and confidence, and help the community understand the behaviours needed from individuals, communities and organisations to prevent the spread of disease during pandemics.



Effective communication was essential. There was a huge level of public and media interest in COVID-19, generating the need for comprehensive and agile media and communications responses. Media and communications were therefore central pillars and vital enablers of the public health response throughout the pandemic.

Key learnings

As critical elements of effective public health response, media and communications teams were proactively engaged early in the response and strong ongoing relationships with policy teams were formed. This collaboration was vital to ensuring that information and resources met the needs of the community, including those with lower health literacy or English as a second language. The review of key resources and guidelines by media and communications teams should be incorporated into approval processes before public release.

Media conferences were a critical communication vehicle with the public. They reached very wide audiences and enabled direct communication of important updates and the rationale for changes. They also provided the opportunity to appeal to the public with respect to critical health advice. Having a pool of media-trained spokespeople, including those with diversity of cultural backgrounds and language, can assist in the development of proactive media content centrally and locally. This also enables sharing of the workload in media and communications engagements. Real-time translation in multiple languages was also an effective communication strategy.

Effective communication with target audiences requires insights and data from multiple stakeholders, including public health teams, epidemiology and surveillance data teams, clinicians, consumer research and others. Local intelligence in 'on the ground' insights is critical to the development of effective communications strategy, as is co-design with cultural experts and delivery by trusted local leaders embedded within the community who help develop shared language and leverage reach with local communities. Messaging must have evidence built in and be inclusive of impacted communities. Technology innovations also supported messaging to hard-to-reach cohorts.

Integration with whole-of-government communications is also critical and is reliant on strong and trusted relationships across government and being able to leverage all available communication channels.

Media campaigns should reach the whole population, as well as targeted population segments. This requires multi-channel communications strategies and local community engagement. Multi-channel communications can hit different target audiences and leverage reach during a public health response.

A 'one size fits all' communications approach does not work in a multicultural society. Tailored messaging and drawing on multicultural expertise within communities take time but are necessary for appropriate translation of content and effective communication with the whole community.

Communications also needed to be informed by public sentiment as the pandemic evolved and community attitudes and context changed.

Misinformation and disinformation must be countered promptly and consistently, given the wide and rapid reach of social media.

Recommendations

Now

- 5.4.1** Continue to include media and communications teams in key COVID Influenza Branch/HPNSW public health policy and operational team meetings to improve situational awareness.
- 5.4.2** Continue joint planning between media and communications teams and public health teams to understand the policy and operational context and to support the development of proactive media and communications that meet strategic need.
- 5.4.3** Continue to use available communication and stakeholder engagement channels for promotion of public health messaging and proactively countering misinformation.
- 5.4.4** Public health response teams should continue to draw on and work closely with media and communications teams to ensure clarity of key resources and policy guidelines prior to public release.

Near future

- 5.4.5** Maintain a pool of diverse, multilingual media-trained NSW Health public health staff and physicians who can be public health response spokespeople and can also feature in proactive communication activities both centrally and locally.

Future pandemics

- 5.4.6** Expand BAU communications capabilities and, under pandemic conditions, augment with additional CALD and Aboriginal communications capability in a dedicated team.
- 5.4.7** Ensure communications campaigns are effective by using a combination of mass media, web based, social media and local community engagement, and including tailored strategies to reach CALD and Aboriginal populations.
- 5.4.8** Ensure communications campaigns are accompanied by community engagement strategies implemented in collaboration with LHDs and community organisations on the ground to achieve better reach to vulnerable communities.

5.5 Information systems and capacity

During the pandemic, information and technology systems played a critical role in managing data and other information to support decision making. This included systems for surveillance and case and contact management to collect and share information across the public health network, to inform policy action, and assist in two-way communication with affected community members. Before COVID-19, NSW Health had well-established information systems for surveillance and management of communicable diseases in NSW. These information and technology systems were continuously adapted. New systems were established to support the changing needs of the public health response in NSW. The pre-existing capacity of NSW Health to build and manage information systems was a strength of the public health response.

Key learnings



The diversity of information systems and processes across LHDs was sometimes a challenge when integrating a statewide system. Despite the challenges, NSW Health was able to leverage existing information systems and rapidly develop new platforms by bringing together the right combination of technical skills and subject matter expertise. This is preferably undertaken across the NSW Health cluster to support at-scale work.

Patient Flow Portal and NCIMS integration early in the pandemic was able to link data on positive cases with hospitalisations and ICU admissions data. This was a new and critical integration of public health surveillance and clinical information systems resulting in improved situational awareness of public health actions and understanding of pandemic impacts on the health system.

Implementing information systems – largely text message-based – that allowed rapid communication with large groups of people was key to supporting the public health response. These allowed response teams to reach out quickly and stay in contact with people impacted by COVID-19, reducing the chance of onward transmission.

Introducing a capability to text ‘sound files’ enabled contact with COVID-affected individuals with low literacy or who needed information in other languages.

Information systems require training and experience to use them effectively. Achieving this in a timely manner, particularly under surge and high workload conditions, was challenging.

Developing new ways of working between the Ministry of Health and relevant pillar agency partners was critical to rapid development and integration of information systems for common purpose.

Recommendations

Now

- 5.5.1** Review information technologies used during the pandemic and determine their utility for ongoing pandemic response and broader outbreak management in conjunction with eHealth NSW and as part of the new NCIMS Platform Continuous Improvement Design Working Group.
- 5.5.2** Strengthen surveillance and outbreak management platforms in NSW and continue investment in the development and implementation of the new SIGNAL system as a replacement for NCIMS.
- 5.5.3** Maintain and strengthen relationships with key technical and subject matter experts outside the Population and Public Health Division, including eHealth NSW and academic partners, in the refinement and development of new information technology systems.
- 5.5.4** Provide ongoing training and competency attainment in existing information systems as this is critical to ongoing pandemic and outbreak management across the public health network.

Near future

- 5.5.5** Strengthen clear governance structures for development and refinement of health protection data and information systems and ensure strong policy engagement with the program of work.
- 5.5.6** Review ongoing call centre requirements in light of existing statewide and Commonwealth Government call centre capabilities and identify an approach to surge and manage high volume inbound calls from the community while ensuring technical skills and key personnel to stand up the system.
- 5.5.7** Pilot Public Health Rapid, Emergency, Disease and Syndromic Surveillance (PHREDSS) sourcing rapid emergency department data from the Patient Flow Portal Operational Data Store to synthesise public health surveillance and clinical service utilisation data.
- 5.5.8** Continue to monitor the market for innovative approaches and tools to support core functions of HPNSW and take a user-centred design approach (e.g. alternative tools and mechanisms to communicate with people at-scale in a coordinated way).

Future pandemics

- 5.5.9** When developing information systems in future public health emergencies, note the importance of implementing co-design processes that consider operational requirements and capacity across the Ministry, pillar agencies and LHDs.


5.6 Research

The NSW Health COVID-19 Research Program was established in 2020 to contribute knowledge to the NSW COVID-19 response and to minimise the health and social impacts of the pandemic in NSW. Agile research infrastructure that facilitates rapid research production and knowledge dissemination is a powerful tool in the response to a public health emergency such as the COVID-19 pandemic.

Key learnings

The translation of COVID-19 research into NSW pandemic response decision making was a success by international standards. Reorientation of existing funding schemes collectively resulted in outstanding examples of research translation.

The NSW Health COVID-19 Research Program largely achieved its key objective of establishing a pathway to create knowledge and innovations that support the pandemic response.

 The Emergency Response Priority Research workstream enabled rapid generation of local evidence and its translation into operational and policy decisions, such as in wastewater surveillance, vaccine effectiveness and COVID-19 transmission in schools.

A key strength of the NSW approach was engagement of senior public health and health system representatives in identification of research priorities and the rapid deployment of research funding.

Leveraging existing relationships and investment within the health research sector meant research on policy priorities could be rapidly deployed. This was critical in maintaining research informing decision making during the public health response.

Embedding academic partners in the public health response was an important enabler of both research translation and workforce surge. Engaging clinical advisory groups bringing together public health, research sector and health system stakeholders was another important enabler of research engagement and translation.

Research translation achieved in the pandemic was built on a long-term investment in 'research ready' environments in population health in NSW. Research impact assessment is an important tool to determine policy and practice impacts and value for money.

Recommendations

Now

- 5.6.1** Continue to use clinical advisory groups as tools to engage policy makers and the research sector in identification of research priorities.
- 5.6.2** Identify key lessons learned about research translation from the pandemic and incorporate into BAU.

Near future

- 5.6.3** Develop a collection of COVID-19 public health research conducted across the public health network during the pandemic, including local research and projects funded through NSW Health funding schemes, and consider key implications of the research for practice.
- 5.6.4** Conduct an impact assessment and evaluation of the research competitively funded through the \$28m COVID-19 response and recovery investment at the completion of the funding period in June 2023.

Future pandemics

- 5.6.5** Leverage existing research infrastructure and partnerships and fund direct engagement of leading researchers to rapidly generate policy-relevant evidence and assess proposals through a rapid emergency response assessment panel.
- 5.6.6** Embed research staff into response epidemiology and surveillance functions to facilitate research translation and improve workforce capacity and surge.

6 How population health services adapted to COVID-19

The COVID-19 pandemic resulted in the disruption of many population-based programs and services. The population health workforce was widely deployed to the response, including in contact tracing and case management, assisting with testing activities, and taking up leadership roles, and was actively engaged in developing solutions to emerging problems on the ground. Impacts of COVID-19 on population health program and service delivery were examined across four policy areas (health protection, preventive health, oral health, and alcohol and other drugs).

Key learnings

Population health staff were a critical surge workforce for the NSW public health response, at times comprising the majority of many surge teams, particularly in the initial pandemic phases.

The population health workforce faced significant changes to their roles and practice throughout the pandemic, including those who continued to shoulder the burden of progressing BAU work. This impacted staff morale and wellbeing over time.

High levels of flexibility and collaboration among program partners ensured ongoing service delivery was possible.

Technology platforms – such as for communication and engagement between colleagues – were widely adopted. Further work is required to understand the potential interoperability and scalability of these technologies. Hybrid forms of online service delivery were also adopted and some adaptations have already undergone evaluation.

COVID-19 had variable impacts on population health service modifications, service disruptions and availability of screening and treatment services. It is important to minimise impacts on users of affected programs and efforts are now underway to address lags related to the impact of COVID-19.

A systematic process to capture local service adaptations and innovations and share these collaboratively across LHDs would be useful to inform future program and service design.

Recommendations

Now

- 6.1** Implement a process for sharing adaptations to population program/service delivery made during COVID-19 across the Ministry, LHDs and NGOs to inform future program and service design.
- 6.2** Population health policy areas should assess which adaptations to service delivery made in response to COVID-19 were effective and should form part of standard program and service delivery.

Future pandemics

- 6.3** Develop risk assessment and mitigation approaches to minimise impacts on population health programs and services during large scale pandemic responses.

7 Limitations

Efforts were made to engage with a broad representative group. However, a response of this scale included thousands of participants and their perspectives varied according to their role, location, seniority and length of involvement. Some personnel had left the response and were no longer available to participate in this debrief. Despite these limitations, there was remarkable concordance on the issues raised by stakeholders and the debrief stands as a sound reflection on this significant emergency response.