

# Reflections on the health system response to COVID-19 in the Western Cape Province

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Building organisational fitness and resilience through everyday challenges is critical for emergency preparedness and for health system strengthening.

In the Western Cape Province, as elsewhere in the country, the COVID-19 crisis has required an intense multi-pronged response by the provincial Government. With the aim of encouraging wider reflection, this chapter presents our experiences, focusing specifically on surveillance and planning, the outbreak and health platform response including corporate support services, and leadership and governance.

During the inter-wave periods, the Department of Health convened a series of facilitated conversations with staff to consider our responses and identify lessons that can inform our future strategy.

The Western Cape COVID-19 response showed that government can be adroit and responsive to shocks. We drew on the pre-existing health system foundations of trusting relationships, collaboration and networking. The responses were also underpinned by decisive and distributed leadership and stewardship – mobilising a range of actors within, across and outside government

around a common purpose; using routine information and evidence in continuously adapting to emergent conditions; and decentralised approaches that enabled local responsiveness. Responsive corporate support services (infrastructure provision, oxygen supply and staffing support) have been critical. Developing agile inter-disciplinary and cross-functional mechanisms for rapid decision-making, such as huddles, were instrumental. We also specifically sought to: address staff safety in all sectors; use digital technologies to do business differently; and develop a culture of learning and constant improvement. Areas for future improvement include strengthening community connectedness, managing 'policy overload' on frontline managers, and empowering middle management in their mediating role between frontline staff, the community and senior management.

It is critical to strengthen the health system to manage both everyday challenges and extraordinary adverse events like COVID-19. Organisational muscle and resilience are built through collaborative relationships, flexibility and agility, and the ability to learn, improve and adapt.

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## Introduction

Coronavirus 2019 (COVID-19) placed tremendous strain on the South African health system in 2020/21. We have experienced two distinct waves provincially and nationally and in July 2021, were in the throes of a third wave. As of 28 July 2021, there were 2 408 525 cases / 70 908 deaths in SA<sup>a</sup>, and more than 387 922 COVID-19 cases / 14 800 deaths in the Western Cape Province.<sup>b</sup>

It is important that we reflect on this experience both to improve our response to possible future waves, and to deepen resilience in strengthening the health system. Pre-COVID-19 assessments of our epidemic preparedness suggested that, as a country, we had some important measures in place (e.g. laboratory and surveillance systems), and there were also areas of weakness (e.g. infection control programmes).<sup>1,2</sup> But what has the reality been? We present the Western Cape (WC) experience, knowing that other provinces have had to manage similar immense challenges. Our objective is to encourage engagement within and across provinces so that we can learn from each other.

The lessons from the vaccination roll-out programme to date are not included.

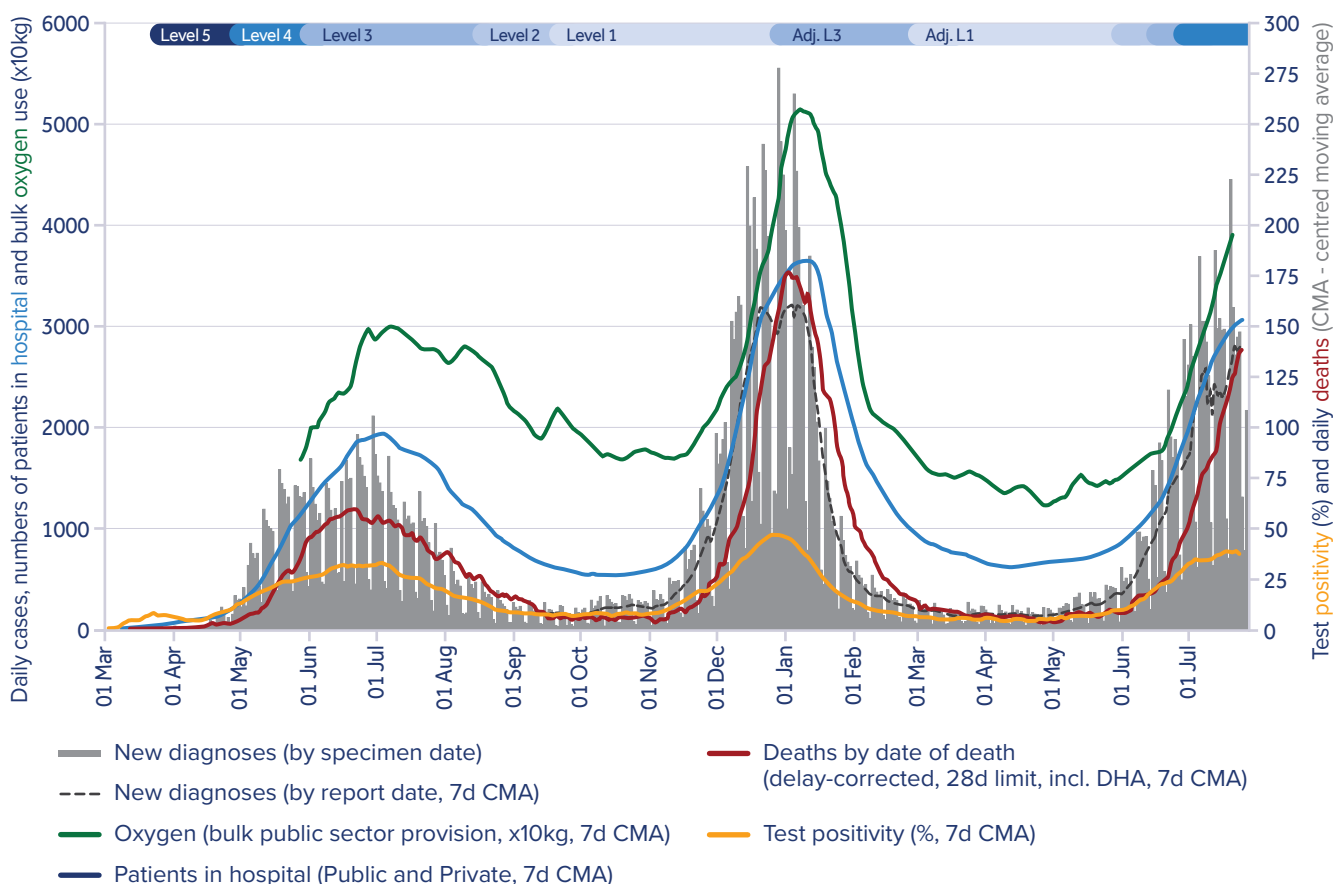
## Methodology

In August 2020, after the first COVID-19 wave, the WC Department of Health (WC-DoH) initiated a series of reflective conversations through existing structures, involving senior managers, clinicians, public health specialists/registrars, and service and corporate managers from all levels of care and our partners, to consider and learn from our experiences. Additional reflective conversations with more than 50 senior and middle managers, focused specifically on leadership and governance experiences, were facilitated by academic partners. These conversations have continued in 2021. Such structured reflection is a form of knowledge mobilisation acknowledged as important in institutionalising system learning.<sup>3</sup> This chapter is a product of the collective wisdom generated through such reflection.

## Timelines

The first COVID-19 wave in the WC was centred around the first week of July 2020; the second, around the last week of December 2020, and the third commenced in mid-June 2021 (Figure 1). The second wave was steeper, higher and shorter than the first.

Figure 1: Western Cape COVID-19 cases, March 2020 to 28 July 2021<sup>b</sup>



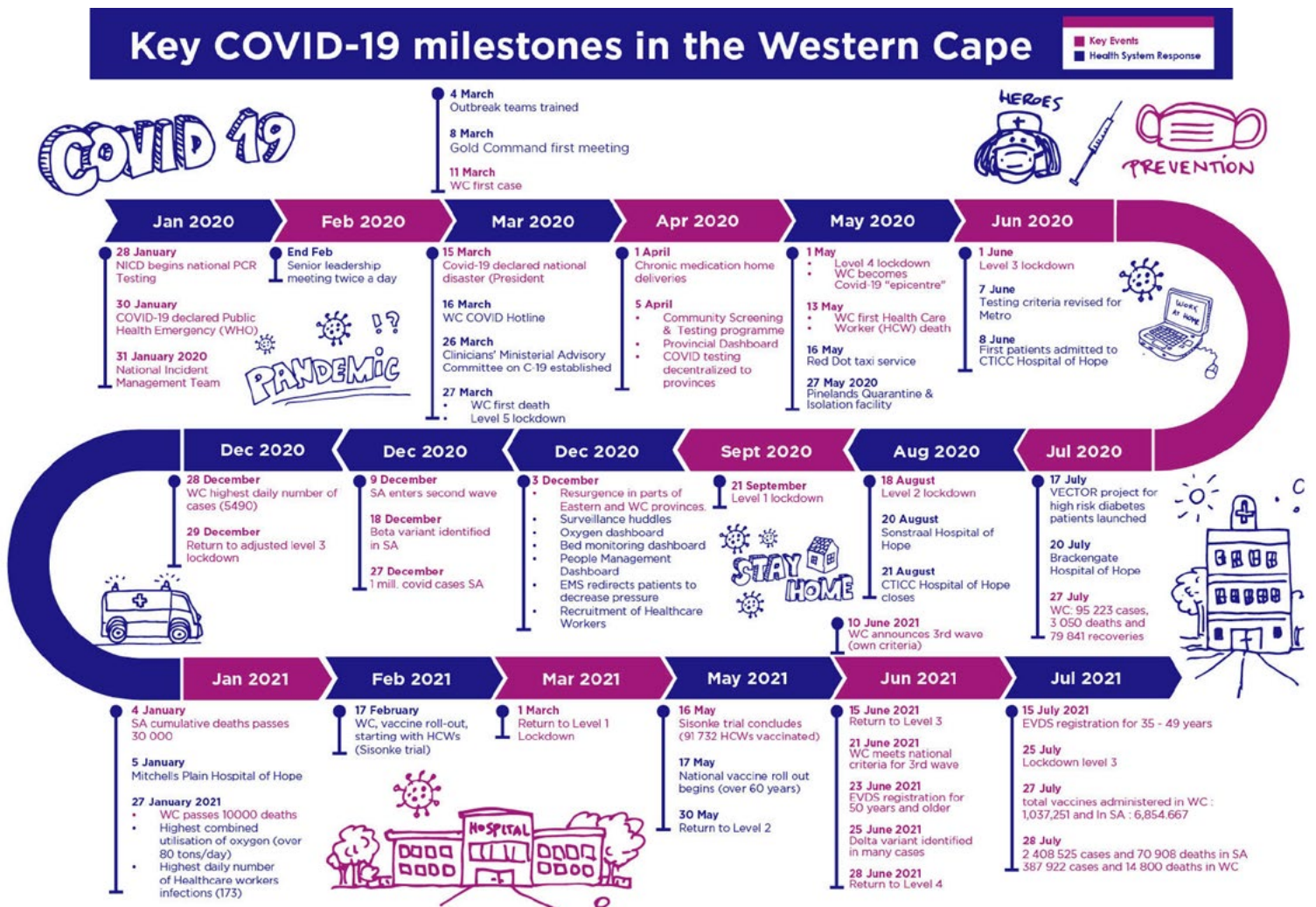
a [www.sacoronavirus.co.za](http://www.sacoronavirus.co.za)

b <https://coronavirus.westerncape.gov.za/covid-19-dashboard>

Key events and activities in the national and WC health system response are highlighted in Figure 2. In the WC,

efforts have focused on surveillance and planning, health service response, and leadership and governance.

Figure 2: Key events and activities in the National and Western Cape health system response, January 2020 to July 2021



## Health system response

### Surveillance and planning

#### Surveillance

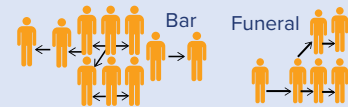
“Know your epidemic, know your response” – this well-known mantra, placing evidence at the heart of addressing

the HIV epidemic,<sup>4</sup> is perhaps even more important for an emerging infectious disease such as COVID-19, given the rapid evolution in understanding of its epidemiology.

## Box 1: Multi-dimensional complementary surveillance activities used by WC-DoH

**Seroprevalence surveys** conducted, using residual specimens from sentinel populations attending services for non-COVID-19 reasons (e.g. children, and people living with HIV and/or diabetes) in July and October–December 2020 (post-wave 1) and February 2021 (post-wave 2) to assess vulnerability of different population groups and regions to future COVID-19 waves

**Case-based surveillance** to identify cases and contacts in order to contain clusters



**Daily tracking of cases, admissions, deaths, proportion positive** at sub-district level with trends by age and gender, presented in daily reports and in interactive internal and public dashboards

**Surveillance ‘huddles’** to identify clusters and possible super-spreader events with feedback to JOCs and Communications. Huddles are short (<30 minutes), focused meetings aimed at problem-solving and sharing key information.



**Wastewater** samples from treatment plants are tested weekly for SARS-CoV-2 by the South African Medical Research Council in collaboration with district municipalities in Cape Town, Theewaterskloof and Breede Valley, to provide early warning or confirmation of community transmission not dependent on numbers of people testing for COVID-19. We also investigated the utility of wastewater testing to identify transmission in closed settings such as long-term care facilities and university campuses.

**Genome sequencing** of SARS-CoV-2 PCR tests in collaboration with the Network of Genomics Surveillance South Africa to identify new variants with transmission / severity / vaccine implications and to assess whether cluster outbreaks are due to genetically similar viruses

Since early 2020, WC-DoH has used multi-dimensional surveillance tools (Box 1), adapting and strengthening existing systems, and innovating to build long-term surveillance capacity.<sup>5</sup> The WC Provincial Health Data Centre (PHDC), which consolidates the comprehensive person-level health data from various provincial clinical and patient administrative health information systems, has been the major COVID-19 reporting and outbreak response tool.<sup>6,7</sup> Since the second wave, surveillance ‘huddles’ have purposefully brought district outbreak response teams together with the central epidemiology and surveillance team and provincial communications office staff to share information across districts. Strong pre-existing partnerships between WC-DoH and other stakeholders enabled many surveillance activities – including for wastewater surveillance – with local municipalities and the South African Medical Research Council<sup>8</sup>, and with the National Health Laboratory Service and academic virologists for molecular surveillance.

Critically, these activities allowed for data on cases, admissions, deaths and proportion positive to be triangulated across sources. The validated data were then used to guide the implementation of targeted control measures and for health service planning. Data

were shared publicly, such as through the WC Provincial COVID-19 Dashboard and the Premier’s weekly Digi-conferences<sup>c</sup>, to build trust in the provincial response to the epidemic.

Surveillance activities enabled rapid assessment of emerging epidemiological patterns (such as identification of the Beta and, in late May 2021, Delta variants<sup>9</sup>) and timeous recognition of the onset of the second wave. However, it was more difficult to achieve an agile response to these patterns. During the second wave, the identification of the Beta COVID-19 variant proved, instead, to be the final impetus for the decision to switch from a containment paradigm (emphasising case and contact tracing, with isolation and quarantine as the key interventions) to a mitigation approach (entailing service re-configuration to limit morbidity and mortality, and public health and social measures to reduce transmission and competing demands on the health system). This experience highlighted the need to establish pre-identified triggers for changing approaches using surveillance data, such as the level of increases in cases, admissions and deaths, as well as the importance of multiple complementary surveillance tools. Such catalysts have supported the WC-DoH in its management of the third wave.

c <http://bit.ly/3tEBhni>

## Planning

A nationally led process supported the initial implementation of broad public health measures to prevent COVID-19 transmission and clinical and operational approaches to testing and outbreak response country-wide. However, the responsibility for managing outbreak activities and for preparing health services to deal with the anticipated clinical load of COVID-19 largely fell to provincial governments.

Decisions with significant impacts on service delivery and budgets had to be taken around the de-escalation of routine services, re-configuration of existing services, creation of additional service capacity, and purchasing of capacity from the private sector. To support decision-making, the WC-DoH developed, and fine-tuned over time, provisioning models that estimated the bed, staff, mortuary, and other needs to meet the anticipated COVID-19 cases and deaths. For example, decisions about establishing and providing beds for emergency intermediate care were based on these estimates.

Developing such scenarios is subject to substantial uncertainty, but estimates were needed to support early decision-making and allow adequate time to put plans into operation. Initially, we worked from consensus estimates and later, from outputs of nationally led modelling exercises. The initial modelling was based on the conservative scenario of a cumulative mortality of 1 000 COVID-19 deaths per million population (moderately higher than the then-highest global mortality rates of 600–700 deaths per million) – and equivalent to roughly 7 000 deaths in the WC Province. The provisioning estimate was also initially calibrated to an anticipated peak bed requirement in August 2020.

As deaths increased rapidly during April to May 2020, it seemed possible that peak requirements could exceed initial estimates and further provisioning was briefly contemplated. However, revised modelling based on a slowing in the growth of admissions and deaths provided reassurance about the adequacy of our estimates. In addition, the possibility of some level of population immunity initially suggested that a second wave was unlikely to be as extensive as the first wave. However, resurgences in the Eastern Cape and then the Garden Route in the Western Cape showed that the timing of the duration to peak was much shorter than in the first wave. The peak service requirements also far exceeded those of the first wave, probably due to unanticipated viral evolution. Overall, then, the health services had far less time to prepare for the second wave, resulting in challenges to service availability and resourcing.

As the first wave subsided, it appeared that the total COVID-19 burden, as reflected by excess mortality, might eventually be around 70% of that for which we had provisioned. The largest field hospital had utilised only 40% of its capacity at the peak, as the epidemic trajectory had been much flatter in the WC than anticipated due to

the early onset of strict lockdown conditions. However, by the end of the second wave, cumulative excess mortality exceeded 2 000/million (double the original provisioning scenario) and included a period during which services had been severely stretched.

As the third wave emerged in May to June 2021, a more adaptive approach was taken. A less severe surge than the second wave was anticipated, but we also allowed for requirements as severe as the second wave should there be new variants of higher transmissibility, or other unanticipated drivers of case numbers or severity of illness. When another variant was confirmed, the Province was able to calibrate expectations based on the experience in Gauteng – which had entered the third wave ahead of the WC with similar population attack rates, confirming a worst-case scenario for the WC of similar magnitude to the previous wave. This estimate was validated by nationally led modelling incorporating the transmission characteristics of the new variant and data from seroprevalence studies.

## Health service response

### Outbreak response

The first COVID-19 case in the WC was reported on 11 March 2020. At this point, and throughout the first two waves, the national policy directive was to attempt to contain the outbreak through case identification and isolation, and contact identification and quarantine. More specifically, the National Institute for Communicable Diseases (NICD) guidelines required health services personnel to visit – in person – each case and contact, and to provide each contact with a thermometer and a symptom checklist. Any contact who developed symptoms was to be tested and sometimes, samples were collected at contacts' homes.

However, this 'purist' approach could not be sustained operationally, given the sheer force of numbers and the limited resources available to undertake both adequate testing with timeous turnaround times, and case and contact tracing. As the case numbers increased rapidly in April to May 2020, three main changes were made to WC containment practices:

- In the Metro district, only those deemed to be high-risk were tested during peak periods (although the directive to test everyone remained in place for rural districts).
- Only the most at-risk positive cases were selected for regular, but not daily, telephonic follow-up – and other cases were given initial advice and told to make contact if any concerning symptoms developed.
- Attempts to trace the contacts of identified cases were largely dropped during peak periods, and patients were themselves asked to notify their contacts, or selected contacts were notified and asked to liaise with other contacts.

Two other containment activities that may have impacted on individuals but were of limited population impact were:

- Community screening and testing (CST) – which started in Cape Town in April 2020, based on international examples where mass testing was used to support containment efforts. Unfortunately, CST coincided with shortages in laboratory testing kits and reagents, both limiting the potential mitigation effects of this approach and leading to a crisis in the testing strategy. This experience indicates that experiences from other countries should be applied only after paying careful attention to context.
- Government-sponsored quarantine and isolation (Q&I) facilities – were made available from May 2020, but there was extremely poor uptake of these facilities by those testing positive throughout both waves. On reflection, much effort is required to convince someone to leave their own home and family for 10 days – especially within a climate of distrust for authority.

The following are other important features of the WC containment experience that are worthy of review in preparing for future epidemics:

- A provincial call centre was established during the first wave and played an important role in supporting the case and contact tracing.
- The role of volunteerism was critical to contact tracing, as many came forward and worked voluntarily or worked well beyond their usual scope of work and hours – although this was not sustainable over time.
- The difficulty of co-ordinating with the highly disparate ‘private sector’ meant that it was unclear if and which cases were being contacted by private providers, and so WC-DoH health teams contacted all private-sector cases, which added to their workloads.
- There was an inability to develop unified information systems and workflow processes that could report on the number of cases and contacts reached across and within urban and rural districts, and across the public and private health sectors.

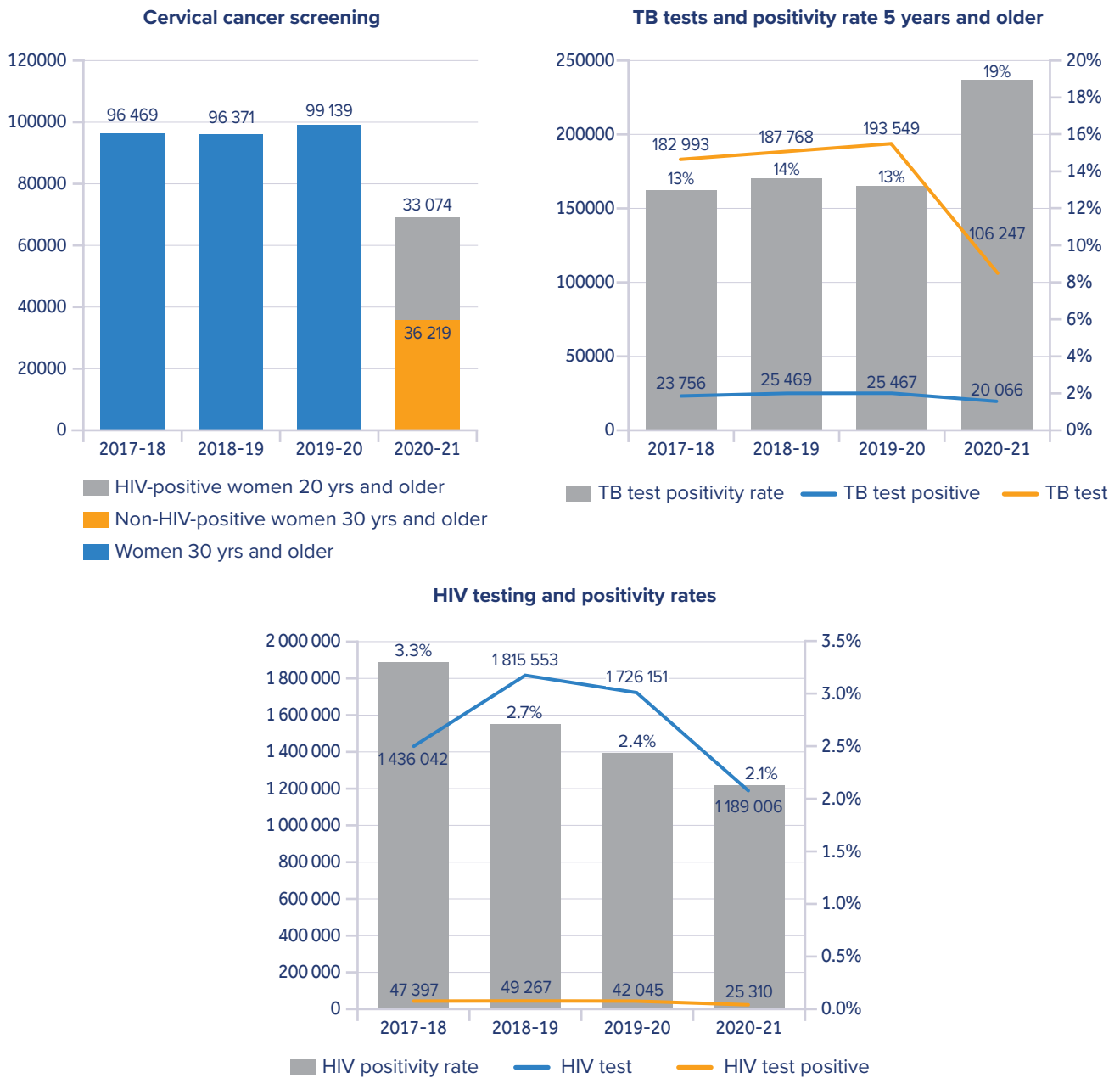
Finally, it is notable that mitigation and prevention responses have lagged behind the growing understanding of the operational realities of containment and of the mode of COVID-19 transmission. Health services had to continue with a limited containment strategy despite evidence of community transmission, rather than fully focusing on population-level interventions. Indeed, in May 2021, many businesses and organisations still insisted on ‘temperature screening’, providing a false sense of security, rather than focusing on masking, physical distancing, ventilation and air changes. With further extensive lockdowns being unlikely and ‘behaviour-change fatigue’ setting in, the need for ongoing communication around safe behaviours must be continually addressed.

### Service delivery platform response

Given the anticipated health service demands, WC preparations from March to April 2020 focused on speedily de-escalating and adapting routine services. This entailed: deferring chronic disease visits, rehabilitation visits, oral health services and elective operations; treating patients with tuberculosis (TB) at home; providing home delivery of medication for repeat prescriptions; conducting telehealth consultations; disallowing escorts except when essential; providing patients with specific appointment times; and dissuading patients with minor ailments from attending facilities.

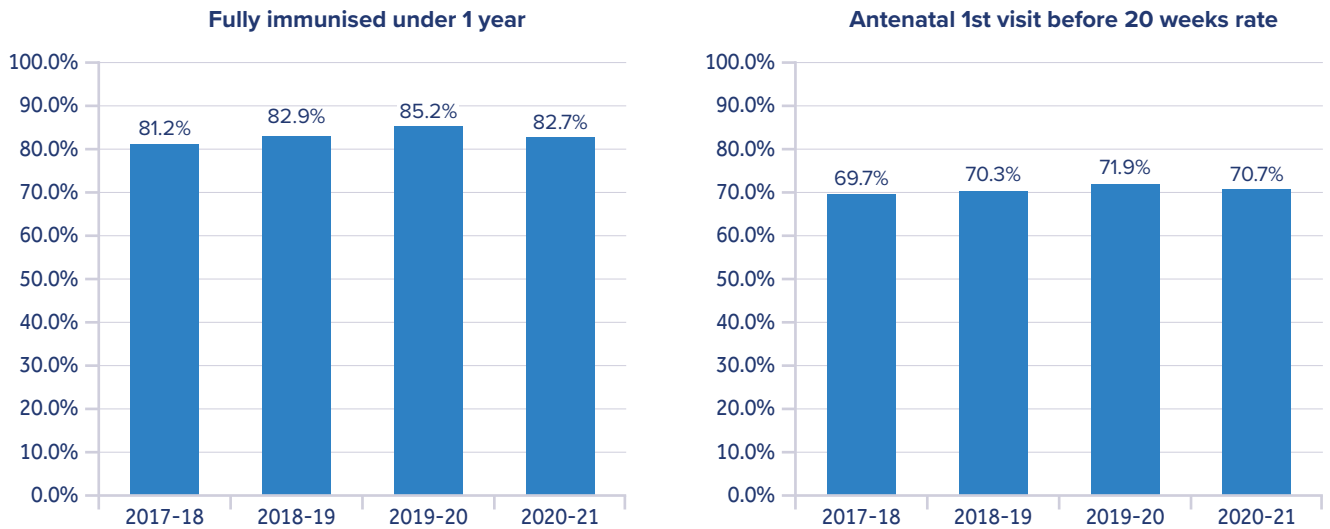
Among the consequences of de-escalation were lengthened waiting lists for elective surgery and an initial reduction in some preventive services for conditions such as TB, HIV and cervical cancer screening, but with subsequent partial recovery (Figure 3). Other preventive services such as vaccination and antenatal visits were not significantly affected (Figure 4). Day-case surgery such as cataract operations were markedly reduced, although with hindsight these could have continued. Home delivery of medication took off rapidly but was challenging, as incorrect addresses resulted in significant numbers of failed deliveries. The inter-wave VECTOR project, entailing telephonic follow-up of high-risk diabetic COVID-19 patients to ensure early admission to hospital if required, was successful in reducing mortality. It is unclear as to how patients with minor ailments have coped.

Figure 3: Reduction in cervical cancer screening, TB and HIV tests done, 2017/18–2020/21



Source: WCDoH – routine data from 4<sup>th</sup> Quarter M&E 2020/21

Figure 4: Trends for fully immunised children and antenatal visits, 2017/18–2020/21

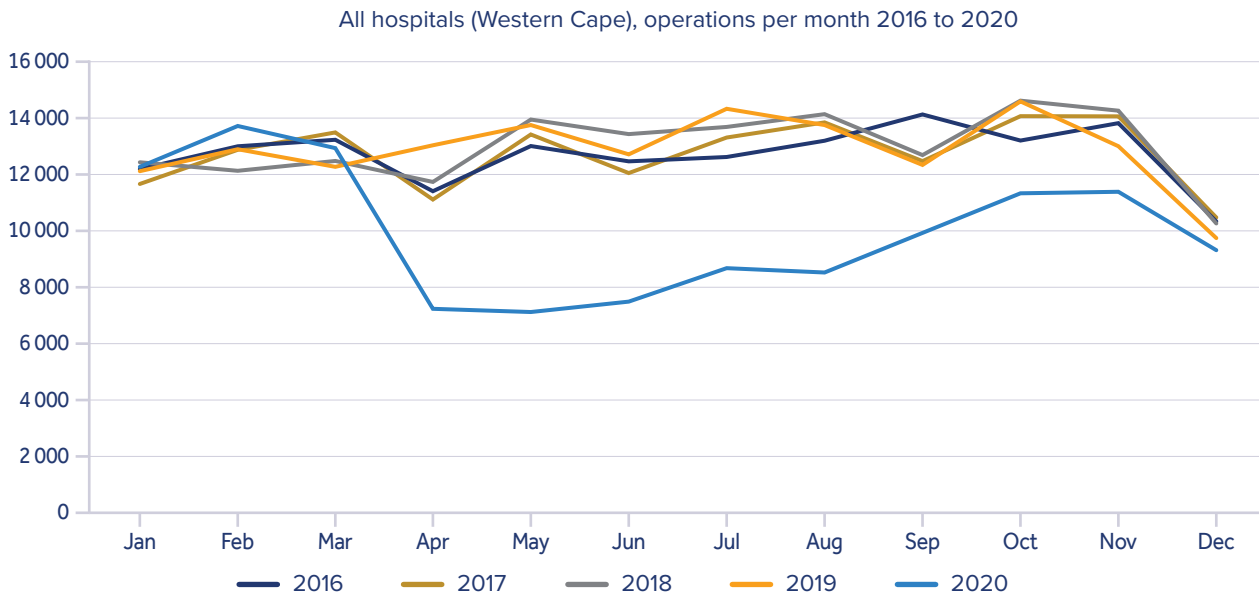


Source: WC-DoH – routine data from 4<sup>th</sup> Quarter M&E 2020/21

The re-escalation of services during the August–October 2020 period, and subsequent de-escalation of services during the second wave (November 2020–January 2021) were more carefully adjusted and managed, allowing for a

better balance of COVID-19 and non-COVID-19 services to be delivered. Figure 5 outlines the escalation and de-escalation trends of operations during and between these waves.

Figure 5: Operations performed, 2016 to 2020



Source: WC-DoH Provincial routine data – Operations 2016–2020

Key mechanisms for managing the COVID-19 demand on beds were the Provincial Bed Status Dashboard (Figure 6)

and clinician/operational managers' huddle, meeting daily during the peak.



Figure 6: Extract from Provincial Bed Status Dashboard of acute hospitals in Cape Town Metro on 5 January 2021

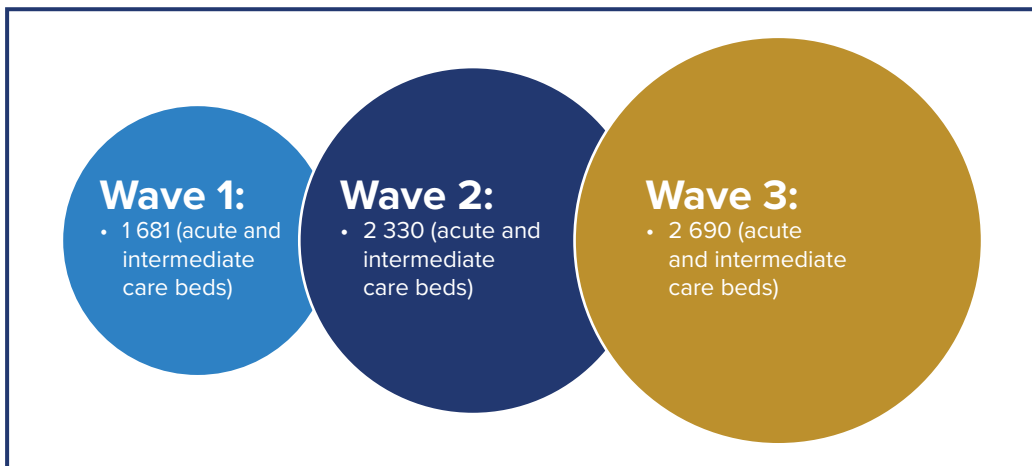
Drainage Area	Hospital	Operational beds	Filled beds	BUR %	% COVID-19 patients	BUR % for COVID-19 beds (General Wards)
Cape Town	Tygerberg Hospital	1 407	1 337	95%	11%	74%
	Groote Schuur Hospital	1 066	965	91%	24%	89%
	Wesfleur Hospital	45	37	82%	46%	126%
	False Bay Hospital	58	49	84%	27%	75%
	Victoria Hospital	173	202	117%	47%	180%
	New Somerset Hospital	334	304	91%	31%	95%
	Mitchells Plain District Hospital	365	455	125%	29%	121%
	Khayelitsha Hospital	340	424	125%	17%	70%
	Karl Bremer Hospital	305	292	96%	37%	115%
	Helderberg Hospital	178	221	124%	26%	109%
	Eerste River Hospital	150	178	119%	34%	133%
	Brackengate Intermediate Care	330	309	94%	98%	92%
	LGH Ward 99	30	25	83%	100%	83%
	Lentegeur Hospital: Fresia Ward	60	29	48%	100%	48%
	Mitchells Plain Intermediate Hospital	60	45	75%	100%	113%
	<b>Total Cape Town drainage area</b>	<b>4 901</b>	<b>4 872</b>	<b>99%</b>	<b>29%</b>	<b>96%</b>
<b>Sub-total WC-DoH</b>	<b>7 537</b>	<b>6 717</b>	<b>89%</b>	<b>33%</b>	<b>92%</b>	

Source: WC-DoH –Provincial Daily Bed Status Dashboard – 2021

At hospital level, preparations for the first wave included activating additional in-house hospital beds for acute care. The Cape Town International Convention Centre (CTICC) and a warehouse in Brackengate were converted into ‘intermediate care’ hospitals. However, COVID-19 admissions in the first wave were lower than anticipated and the extra bed capacity, except for critical care, was underutilised. Critical care beds were then protected by protocols clarifying which patients could access these beds, and formal agreements with the private sector secured access to additional beds should the need arise – although these were minimally utilised in the second wave. However, other preparations for the second wave were inadequate

due to its greater intensity. The decommissioning of temporary intermediate care beds during the inter-wave period – given the high cost of maintaining them – resulted in inadequate capacity being available for the start of the second wave. Although additional beds were rapidly commissioned again, these arrived only at the peak of the wave. These beds were then maintained at skeleton staffing level during the inter-wave period, to allow for rapid and progressive expansion during the current third wave. A mass fatality facility was similarly managed. The additional acute and intermediate care beds commissioned over the three waves are shown in Figure 7.

Figure 7: Additional acute and intermediate care beds commissioned over the three waves in the WC-DoH



Source: WC-DoH Digicon presentation – 29 July 2021

Many other adaptations have been implemented within the health service delivery platform since early 2020. To support staff to travel to hospitals during lockdown curfew periods, and patients to travel to Q&I facilities, the Department of Transport and Public Works (DTPW) contracted the minibus taxi industry to provide safe transport (via the Red Dot taxi service). Private-sector ambulances were contracted for emergency patient transportation during peak demand times. Improved therapies of steroids, anticoagulants and High-Flow Nasal Oxygen (HFNO) proved successful, and were rapidly scaled up. Flexibility in referral pathways is now being implemented to ensure that the COVID-19 case load is more purposefully spread across available hospital capacity in the third wave. Despite wider service de-escalation, the critical vaccination campaign has been protected and progressively expanded during the third wave, even during its peak.

These service platform adaptations were all implemented rapidly, while learning lessons from previous waves. This experience is in stark contrast to the previous culture in which changes were cautiously and gradually introduced, following extensive consultation. It has been particularly important to cut the lead times for service delivery preparation and adaptation and to link them to COVID-19 prevalence levels.

### WC-DoH corporate support services

The COVID-19 experience has re-emphasised the criticality of support services in enabling patient care and service delivery at the frontline. Lessons from three areas are briefly described as follows.

#### Infrastructure

The infrastructure team demonstrated a singular focus, seamless collaboration with the health services and our

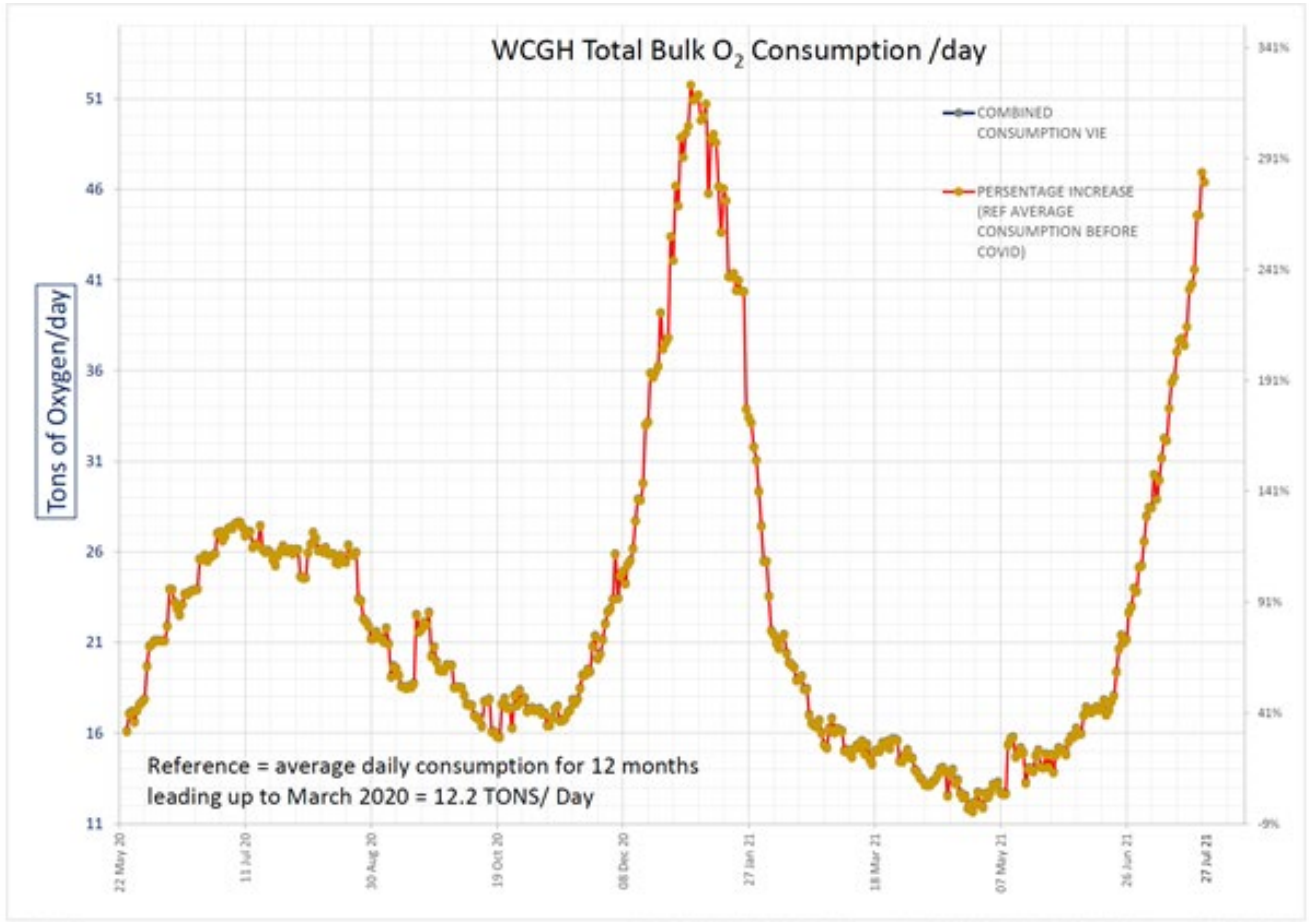
partners (DTPW), as well as efficient project management. The team set up tents as virus testing units at 19 facilities in one month (April 2020), and prefabricated containers were established as triage and testing units at 63 PHC facilities from May to September 2020. Approximately 1 500 additional intermediate care beds were commissioned in re-purposed venues. This included 862 intermediate care beds within the CTICC within a six-week period, 200 intermediate beds at Mitchells Plain Hospital precinct at the height of the second wave on 5 January 2021, and facilities in rural areas. Pre-COVID-19 maintenance and capital projects had to be de-escalated to prioritise these activities.

#### Oxygen supply

As the pandemic unfolded locally, we learnt the importance of strengthening our oxygen supply systems, especially given the clinical outcome improvements demonstrated by HFNO therapy. The number of HFNO and ventilator points increased from 266 in the first wave to 378 in the second wave, and to 434 in preparation for the third wave. We also developed a real-time data dashboard showing facility-level oxygen utilisation levels, storage capacity and reserve capacity, to support decision-making. A regular 'oxygen huddle' of clinicians, engineers, managers and, eventually, the primary vendor (Afrox Oxygen Limited), also optimised communication, collaboration and action.

At the height of the second wave, increased consumption led to serious concerns about the risk of running out of oxygen (Figure 8). To salvage the situation, senior WC-DoH managers intervened with Afrox to redirect supplies and tankers to the WC from the Eastern Cape and Gauteng. Afrox has now increased their oxygen generating capacity from 50 Tons per day to 70 Tons per day, and their storage for cylinder filling capacity from 26.5 Tons to 62.5 Tons.

Figure 8: Oxygen consumption trends from May 2020 to July 2021



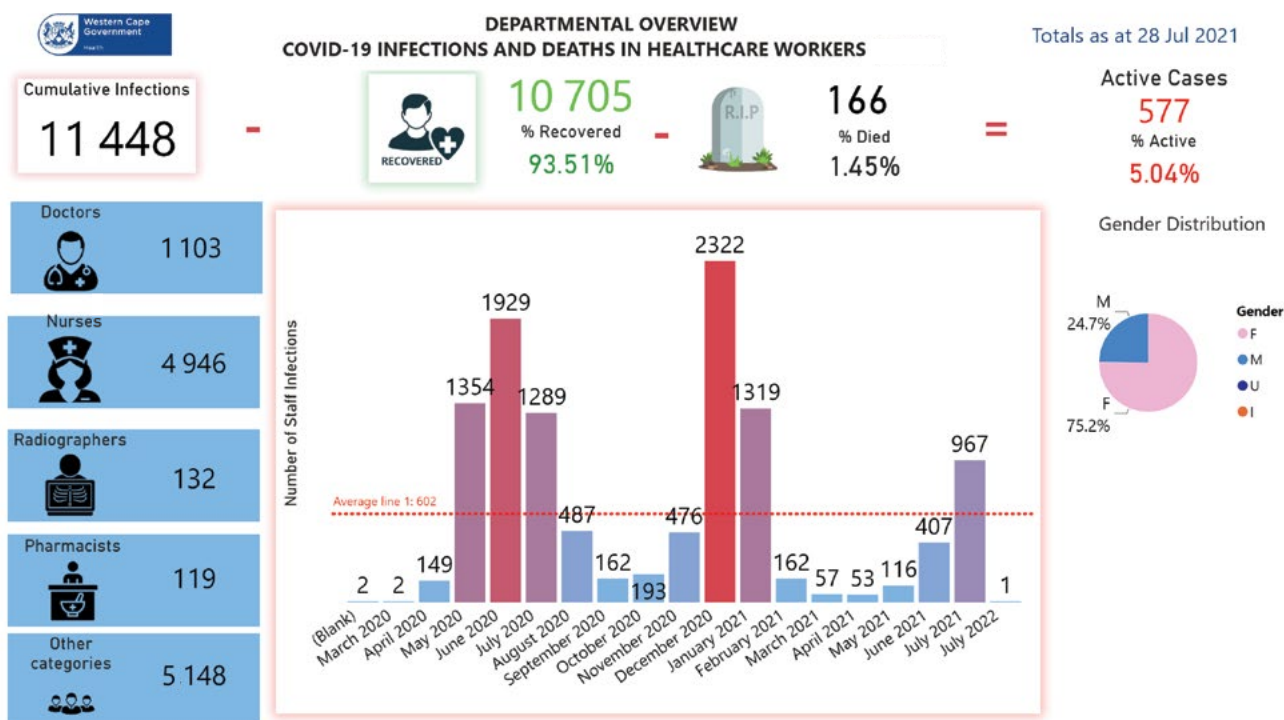
Source: WC-DoH – 2021

### Staff safety

Having been historically neglected, the Occupational Health and Safety (OHS) of staff became a key priority for the Western Cape Government issue. As at 28 July 2021,

11 488 HCWs had been infected and 166 had tragically died from COVID-19. The highest number of deaths occurred during December 2020 at the height of the second wave (see Figure 9).

Figure 9: Healthcare worker COVID-19 infections and deaths, March 2020 to July 2021



Source: WC-DoH Healthcare Worker Dashboard – 2021

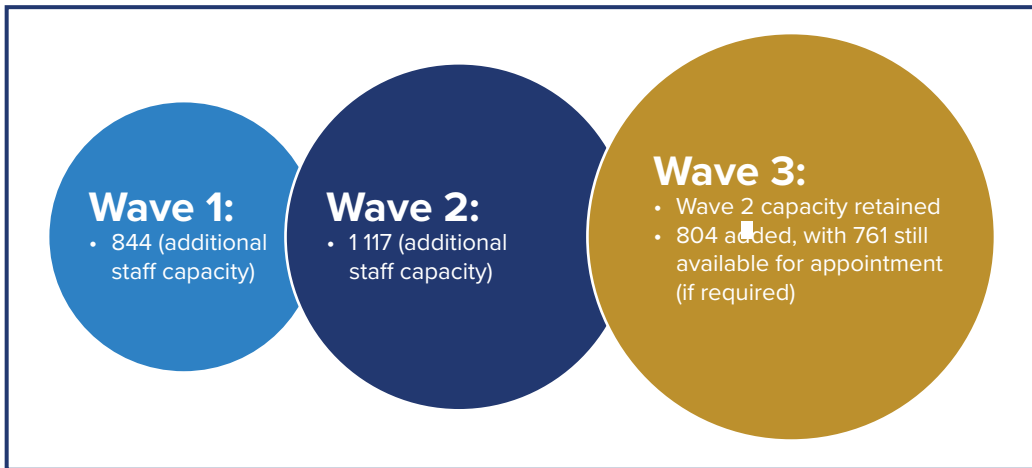
The system response comprised several initiatives. The initial rapid proliferation of policy circulars to guide action had the paradoxical effect of overwhelming frontline staff with mixed and confusing messages. Policies on infection prevention control (IPC) and appropriate personal protective equipment (PPE) usage were rapidly developed and implemented before the first wave, with proactive PPE rationing via usage protocols when supplies were limited. Occupational Health specialists/registrars from the public, private and academic sectors were organised as a collaborative and allocated to various districts and facilities to provide advice and support. At a provincial level, regular engagements were facilitated between senior management and organised labour, where information was freely shared. In addition, a strategic OHS committee comprising senior WC-DoH managers was established to provide oversight of a technical committee including the OHS specialists, service and corporate representatives, and organised labour. These governance arrangements proved important in overcoming pre-existing silos and developing a cross-functional, coherent and collaborative response to staff safety.

We learnt quite early in the pandemic that the anxiety and emotional turmoil borne by our staff was significant, so we strengthened the programme for counselling and employee assistance and support. A staff safety and wellbeing learning collaborative was set up with our partners to share experiences and encourage local improvement responses.<sup>10</sup> A series of more than 40 staff sessions was facilitated in 2021 to allow staff to share their grief and be vulnerable, to support collective healing in a safe space. Staff were also encouraged to take leave after an exhausting year of relentless pressure. Additional staff were recruited on short-term contracts to provide additional capacity during the second wave, with many being retained for the third wave and to support the vaccine roll-out programme (see Figure 10). The vaccination programme and the prioritisation of staff wellbeing is itself providing hope to staff. By the end of July 2021, approximately 68% of WC-DoH healthcare workers had been vaccinated, including 80% of doctors and 70% of nurses.<sup>d</sup> There had been approximately 769 breakthrough infections.<sup>e</sup>

<sup>d</sup> WC-DoH staff update – 30 July 2021

<sup>e</sup> Provincial Health Data Centre, 31 July 2021

Figure 10: Additional staff employed over the three COVID-19 waves



Source: WC-DoH Digicon presentation – 29 July 2021

It remains important, however, to strengthen local capacity and enhance OHS prioritisation at facility level. An Occupational Health information system and a service delivery model with improved decentralised capacity is being developed.

### Leadership and governance

The WC COVID-19 health system responses have been continuously adapted over time given the changing demands of the epidemic and lessons of implementation. This system-level capacity to adapt in response to crises is called ‘adaptive governance’, “the ability to deal with complex societal issues involving many stakeholders, diverging interests and uncertainty about the actions to be taken”.<sup>11</sup> Reflections shared by managers across the WC Department of Health and other stakeholders point to several critical dimensions of this capacity in the WC-DoH.

The Department’s senior management team was experienced as playing a decisive, guiding role. Frequent engagement among the team (twice daily during the peaks of the first and second waves) allowed critical, speedy decision-making. Various forms of evidence were critical for this process, including formal data and the collective intelligence of the various groups brought together in huddles across the system (involving clinicians, corporate and service managers, public and occupational health specialists, behaviour change experts, other academics and national colleagues). At the same time, virtual meetings literally brought the senior leadership team into the offices and homes of staff across the province, ensuring that information was shared directly with them. Open and respectful personal communication practices further enabled trusting relationships among staff and groups such as labour organisations, other sectors and the private health sector. Regular media briefings and transparent public communication ensured that information and data were openly shared.

National–provincial relationships were, of course, important in managing COVID-19 responses, and have deepened over time. Having a designated representative from the Inter-Ministerial Taskforce (IMT) allocated to the province early in the epidemic, who regularly attended provincial governance meetings, helped to build the relationship and strengthen two-way communication. Some tensions surfaced in 2020 around the differences between national strategies and operational realities relating to containment and Q&I. However, WC experiences later supported national policy developments around resurgence planning for the second and third waves, and public and social health measures such as restrictions on gatherings and access to alcohol.

Ultimately, implementing the array of COVID-19 health system responses has rested on leadership and action at the frontline – by many different teams, facilities and services, across sectors and geographic areas. Personal leadership practices, such as active listening and having difficult conversations, were important in enabling teamwork. ‘Emergency’ conditions enhanced the decentralisation of authority and flattened hierarchies in ways that supported teamwork, and strengthening a shared sense of purpose. Local decision-making was also enabled by the greater frequency of virtual and in-person communication (even if burdensome for some), and by practices such as the more frequent, shorter, focused and informal huddle engagements.

These dimensions of adaptive governance capacity were, in turn, founded on the previous trajectory of provincial health system development.<sup>12</sup> Four critical factors provided the platform for COVID-19 responses: the spread of values-based leadership system-wide; the recognition that each person, facility, programme and function is part of a wider whole with a shared purpose; the strengthening of internal public health expertise to support strategic decision-making; and stable and sound resource management practices.

Nonetheless, there have been governance challenges. The hierarchies and power dynamics that pervade health systems continued to constrain local-level decision-making and teamwork. Understandable staff anxieties about COVID-19 exacerbated the challenge of managing people and relationships. Tensions within teams and between people were deepened in some instances, including in relationships with organised labour at facility level. Governance challenges also limited the wide engagement with community groups that is recognised as being important in epidemic responses. Although clinic committee structures offered a channel of engagement in some settings, it was difficult to connect with the wider range of more informal groups offering important health and social support within communities. This may reflect the constraints imposed by rigid and hierarchical bureaucratic processes or the lack of spaces for such engagement beyond legislated, formal structures.

## Conclusions

The WC-DoH has felt itself better prepared for each additional epidemic wave, despite the unanticipated pace and scale of the second and third waves due to the dominance of the Beta and Delta variants. Our pre-COVID-19 commitments to deepening and distributing values-based leadership, to reflection, to learning and improvement, and to building resilience into our organisational narrative provided a strong platform for rapid, effective COVID-19 responses. We have built on this platform by: nurturing emerging and mid-level managers as boundary spanners and system innovators; being data-led and evidence-informed; ensuring open, two-way communication; and empowering the frontline.

It is more than likely that the future will pose similar major, if not catastrophic, challenges, even if their substance and form is different. It is therefore vital that we continue to strengthen our processes, practices and relationships as a coherent health system, and deepen our systemic resolve and resilience. The palpable bias towards action and responsiveness exhibited during COVID-19 must be embedded into the DNA of the WC health system.

Our experiences also confirm wider judgements about epidemic preparedness.<sup>13</sup> It requires more than the hardware of, for example, surveillance and laboratory systems. Health system software such as governance and leadership processes that support trusting relationships are critical components that must also be strengthened. Epidemic preparedness guidelines should encompass both hardware and software dimensions.

## Recommendations

### Leadership and governance:

- Developing and maintaining a sense of shared and collective purpose has catalysed action across the system before and during the crisis.
- Overcoming conventional hierarchical and bureaucratic ways of functioning and behaving is important to provide stewardship, act responsively and quickly, and galvanise partners from other sectors and civil society in collective action.
- The public sharing of information and open, frequent communication across the system is essential for building trust and confidence. Public messaging and its ongoing adjustment to emerging risks, nuanced with expert advice including behaviour change expertise, has been a central element of the WC health system response.
- Distributed and decisive, values-based leadership and governance capacities, at both strategic and frontline levels, constitute a critical investment to enable responsiveness to dynamically changing conditions and demands. Being decisive, even in the midst of uncertainty and with limited information, is essential.
- Strengthening relationships across levels of care and between functions inside the WC-DoH as well as with external partners from other sectors, spheres of government, organised labour and civil society, has supported crisis responses.
- Investing in a learning culture and reflective practice at all levels of the system was an important precursor to continuous improvement, both during and between the COVID-19 waves.
- Developing agile inter-disciplinary and cross-functional mechanisms such as huddles, collaboratives and advisory committees to consider appropriate responses to emergent conditions secured greater health system resilience.
- Local managers struggled with the quantity and pace at which regulations and policies were issued both nationally and provincially, at times leading to mixed messages, varying interpretations, and confusion. The provincial level should address this in creative ways.
- Keeping up with the quantity, quality and pace of global and local research evidence and experience proved challenging. We relied on the collective antennae of our managers, technical experts within the Department and university partners to make meaning of this evidence.
- Community engagement by the provincial government and WC-DoH was sub-optimal and this represents a pre-existing fault-line that was exposed during the crisis. Nonetheless, the opportunity of social mobilisation for vaccines is being used to energise civil society involvement in health. Meaningful and effective community engagement will require a very different way of being and doing by WC-DoH officials.

## Health system responses:

- Strengthening system-level capabilities, processes and practices pre-COVID-19 served the provincial health system well during crisis times.
- Investing in coherent and interoperable information systems, improving data access via dashboards, and the use of data for decision-making, were critical enablers of effective system responses.
- Strengthening surveillance systems to monitor local variations in disease risks and epidemiological patterns was an important enabler of differentiated health system responsiveness across geographical areas.
- It is important to have clearly identifiable triggers that catalyse a shift from containment to mitigation strategies and provoke the de-escalation of other services and activation of additional bed capacity.
- Occupational health and staff well-being and safety must remain an important policy priority at all times, with strengthened policies, processes and practices at all levels. The mental health of staff is as important as their physical health.

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