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**MINISTERIAL ADVISORY COMMITTEE ON COVID-19  
MITIGATING COVID-19 IN SOUTH AFRICA: GOING FORWARD  
POSITION PAPER  
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**Introduction**

The World Health Organization declared COVID-19 a pandemic in March 2020 and governments instituted various responses in the form of extraordinary emergency measures and lockdowns in a bid to contain the pandemic.

Over the past two years much has changed about the pandemic. More is now known about the evolution of the virus and the effectiveness of the containment measures, and vaccines and new therapeutics have been game-changers. In addition, seroprevalence studies indicate that a high proportion<sup>1,2</sup> of the South African population has been infected. There is thus a need to review protocols adopted thus far and to shift to managing COVID-19 as an endemic disease.

This paper was developed by the Technical Working Group on Mitigating COVID-19 Going Forward, and endorsed by the Ministerial Advisory Committee (MAC) on COVID-19, and makes proposals on the following:

- (a) When the State of Disaster can be lifted and what should replace the regulations issued in terms of the Disaster Management Act.
- (b) What indicators should be used to alert the country and health system to further COVID-19 outbreaks, and the need to re-issue a state of disaster or other enhanced responses.
- (c) How the management of COVID-19 in the health sector can be integrated into existing programmes.

**The Changing COVID-19 Landscape in South Africa**

At the time of submission of this position paper, South Africa had experienced four full waves of SARS-CoV-2 transmission. The second, third, and fourth waves were driven by the emergence of Beta, Delta, and Omicron variants, respectively. Each of these variants has been successively more transmissible than the previous,<sup>3,4</sup> and thus able to spread despite high levels of population immunity from prior waves and, more recently, vaccination. The Omicron variant not only appears to be more transmissible than previous variants but also demonstrates immune evasion, with higher levels of reinfections and vaccine breakthrough infections than seen with earlier variants.<sup>5,6</sup>

The response to COVID-19 waves has also changed over time. Strict lockdowns were implemented during the first wave in an attempt to contain spread of the virus, with people confined to their place of residence except to perform essential services or obtain essential goods and services, including medical care. However, these dramatic measures were insufficient to prevent community transmission and had serious socio-economic consequences.<sup>7</sup> Responses to subsequent waves were focused on mitigation measures – intended to prevent overwhelming the health system – rather than containment. The country remained on Alert Level 1 (the lowest alert level) throughout the fourth wave. Nevertheless, certain policies more appropriately directed toward containment efforts,<sup>8</sup> including contact tracing and border testing for incoming travellers, have remained in place throughout the pandemic to date.

During the peaks of the first three waves, health services, especially hospital services came under extreme pressure.<sup>9</sup> There were insufficient ICU and high care beds in particular, and in a few instances shortages of oxygen. Health workers (many of whom were infected and some demised) were under extreme pressure.<sup>10</sup> Furthermore, there was a shortage of trained and qualified ICU staff.<sup>11</sup> There is also significant evidence that during the responses to the COVID-19 pandemic (especially lockdowns related to Levels 4-5), routine health services were severely disrupted.<sup>12</sup> However, this impact varied by health district, depending on the number of infections that were experienced as well as the redeployment of staff, which in some instances resulted in primary healthcare clinics being shut.

The fourth wave has highlighted several key features of the changing COVID-19 landscape in South Africa. The most important of these is the substantial population-level immunity that has been built up through a combination of prior infection and vaccination. The PHIRST-C community cohort study found that by the end of August 2021, 62% of individuals had experienced at least 1 SARS-CoV-2 infection (57% at the rural site and 68% at the urban site).<sup>1</sup> A survey conducted in Gauteng at the start of the fourth wave found an overall seroprevalence of 73%.<sup>2</sup> The large numbers of infections during the fourth wave, and evidence of high levels of community prevalence in some settings, suggests that the overall attack rate for previous SARS-CoV-2 infection in South Africa is extremely high. Furthermore, as of mid-January 2022, approximately 40% of the adult population has been fully vaccinated and booster doses are widely available. Vaccine coverage is higher among high-risk age groups (60% in individuals age 60 and above).

Since the start of the fourth wave, substantial evidence has accumulated that, despite Omicron's ability to infect those with some form of immunity, this immunity is strongly protective against severe disease outcomes including hospitalisation and death.<sup>13,14,15</sup> Mounting evidence, primarily from outside the South African context, also suggests that Omicron may be inherently less severe than prior variants; however, this effect is relatively small and the variant causes substantial levels of severe disease and deaths in unvaccinated individuals without a prior infection. Both hospitalisations and excess deaths were substantially lower in the fourth wave compared to the previous three waves.<sup>16,17</sup>

Beyond the fourth wave, it is necessary to consider health policy changes to the management of COVID-19. At this point in time, it is clear that the virus will not be eliminated from South Africa. Although it is impossible to know the future trajectory of the virus or precisely predict the emergence of new variants, surges of SARS-CoV-2 transmission are likely to put substantially less pressure on the health system moving forward. Over the next few years, we are likely to reach an endemic state similar to influenza and seasonal endemic human

coronaviruses, which continue to result in seasonal illness and death at levels that are tolerated without requiring lockdowns, masks, and social distancing. New medicines and vaccines for the prevention and treatment of COVID-19 will become available as new evidence emerges.

While the economic cost of restrictions such as curfews and limited gatherings were warranted given the public health crisis caused by the pandemic, the economic damage and large-scale job losses suffered since March 2020 (when lockdowns were first imposed) cannot be ignored in 2022, with an official unemployment rate of 34.9% and an expanded unemployment rate now above 44%. South Africa's fiscal position has also deteriorated dramatically relative to pre-COVID projections, with the debt-to-GDP ratio of 70% and debt-servicing costs expected to consume more than 15% of the national budget by financial year 2023/24.<sup>18</sup>

As COVID-19 continues to pose a health risk into 2022 and beyond, there is a need to consider responses that are integrated into the health system, that are not detrimental to other health needs, and which aim to minimise the extraordinary costs to the macroeconomy.

### **Rationale for Moving from Containment To Mitigation**

At the start of the COVID-19 pandemic, in the absence of vaccines, effective drugs or widespread immune protection from prior infection, countries (including South Africa) implemented policy responses reliant on non-pharmaceutical measures (NPIs) later named public health and social measures (PHSM), to address the pandemic. Epidemiologically, these policy responses can be considered as either “containment” or “mitigation” strategies.<sup>19</sup> Differences in the rationale, objectives and policy implications of these strategies are outlined in Box 1 below.

However, as has been the case in South Africa, containment and mitigation strategies are often implemented concurrently. This results in confusion around their purpose and applicability at different epidemic stages. Containment strategies, which are not sustainable and only effective at the start of an outbreak when the number of infected people is small, have been inappropriately retained despite substantial socio-economic harm.<sup>20</sup> In addition, containment strategies such as testing to attempt to identify all cases for the purpose of case and contact tracing, have diverted health resources away from non-COVID-19 services and contributed to a substantial non-COVID-19 disease burden, which has worsened through successive COVID-19 waves. Of note, key WHO principles for implementing PHSM aimed at reducing SARS-CoV-2 transmission include:<sup>21</sup>

- Adoption of measures with the highest level of acceptability and feasibility and proven effectiveness – and which minimize the negative consequences on health and wellbeing of all members of society and the economy
- Decisions to apply PHSMs must be weighed against the wider impact of the measures on health and well-being

Furthermore, there is increasing realization that the premises/assumptions on which containment efforts are based do not hold:

- Substantial transmission of SARS-CoV-2 occurs from asymptomatic or pre-symptomatic cases<sup>22</sup>
- Inability of testing in South Africa to rapidly identify the vast majority of cases with a diagnosed fraction of under 10% of cases (calculated from seroprevalence studies and excess deaths)
- Inability to rapidly identify and quarantine all contacts of a case

- Emergence of variants with increased transmissibility
- Socio-economic circumstances that render quarantine, isolation, and effective social distancing unfeasible

The threat of a COVID-19 surge resulting in overwhelmed health services has been substantially reduced by widespread access to vaccines which are effective at preventing severe disease and death, high seroprevalence from prior infection which affords similar protection, growing experience of rapidly increasing health service capacity during previous COVID-19 waves and the emergence of new therapeutic options.

In this context, we propose a deliberate shift to an evidence-based mitigation approach<sup>23</sup> as COVID-19 moves towards endemicity. It is envisaged that this shift will reduce socio-economic harms and shift resources currently used for ineffective containment measures to those that will provide the greatest mitigation benefit, including reducing the burden of disease that has resulted from neglected non-COVID-19 services, especially mental illness.

Box 1: Rationale, objectives and policy implications of containment and mitigation strategies for COVID-19

**CONTAINMENT**

**Assumptions:**

- Disease not yet widely spread through population
- Cases (& contacts) easily detected, ‘sealed off’ from uninfected population very rapidly ( $\leq 24$  hours after infectiousness starts), and doing this prevents transmission
- Population able and willing to social distance, and this is sustainable and affordable to society

**Policy objectives:**

- STOP transmission in the general population

**Policy implications:**

- Large-scale testing
- Case and contact tracing
- Quarantine and isolation
- Strict and sustained public health and social measures to prevent transmission e.g. limited gathering size, work from home

**MITIGATION**

**Assumptions:**

- Disease widely spread through population
- Cases and contacts not easily or timeously detected
- Sustained social distancing measures not possible in many settings, not sustainable or affordable

**Policy objectives:**

- Protect the vulnerable
- Reduce transmission at a cost that is affordable and sustainable to society

**Policy implications:**

- Vaccination
- Case management of vulnerable
- Indoor mask-wearing and ‘seek fresh air’
- Titrate hospital capacity
- Measures to reduce non-COVID-19 health service burden (curfews, alcohol sales restrictions) may be needed only if health service platform capacity is threatened

## **Recommended changes to existing public health and social measures (PHSM)**

The following table sets out a number of proposed changes to existing interventions in the light of the new approach that emphasizes mitigation rather than containment.

Proposed Intervention	Rationale
<b>Stop contact tracing and quarantine, including testing of close contacts</b>	<ul style="list-style-type: none"> <li>• See separate advisories on contact tracing, quarantining and reducing duration of isolation</li> </ul>
<b>Stop temperature, symptom screening and reporting of temperature and symptom screening</b>	<ul style="list-style-type: none"> <li>• Department of Labour regulations require employers to screen employees for symptoms and signs of COVID-19 when they report for work.<sup>24</sup> Temperature screening using low quality thermometers to measure skin temperature is of limited value as environmental factors influence readings and skin temperature is a poor proxy for core body temperature.<sup>23</sup></li> <li>• A high proportion of cases are asymptomatic (84% in a local study) and are able to transmit SARS-CoV-2.<sup>24</sup></li> <li>• Fever and symptoms do not differentiate between COVID-19 and other illnesses.</li> <li>• The human resource cost of assigning a staff member to measure temperatures, conduct symptom screening and fulfil reporting requirements is not immaterial.</li> </ul>
<b>Stop all decontamination and fogging of premises</b>	<ul style="list-style-type: none"> <li>• The updated Department of Health guidance on cleaning and decontamination of workplaces in the context of COVID-19 (August 2021) states that there is no need to “deep-clean” or implement any other form of cleaning in areas unoccupied for more than 3 days”.<sup>25</sup></li> <li>• However, the guidance note also indicates that if an identified COVID-19 case “spent a considerable amount of time in the workplace, touched, and handled many objects ....then more comprehensive manual surface cleaning would be warranted”.</li> <li>• The guidance note could be misinterpreted as suggesting that closing premises for 3 days could be justified or that decontamination and/or fogging is warranted.</li> <li>• A systematic review concluded that the lack of positive viral cultures suggests that the risk of transmission of SARS-CoV-2 through fomites is low.<sup>26</sup></li> <li>• The expenditure by provincial departments of health on surface decontamination and fogging has been enormous and is not justified.</li> </ul>
<b>Stop mandating the provision of hand sanitiser, and rather promote frequent hand-washing rather than mandating the use and provision of hand sanitisers promote the use of hand sanitiser where access to hand washing in facilities is poor.</b>	<ul style="list-style-type: none"> <li>• Department of Labour regulations require employers to provide hand sanitiser for use by employees and members of the public.<sup>24</sup> The US CDC recommends that people regularly wash their hands with soap and water as it is more effective than hand sanitisers at removing certain kinds of germs, like <i>Cryptosporidium</i>, norovirus, and <i>Clostridium difficile</i>.</li> <li>• The efficacy of hand sanitisation in reducing transmission of SARS-CoV-2 is unclear. A pre-COVID-19 systematic review of hand hygiene interventions to reduce community transmission of influenza and acute respiratory tract infection concluded that the impact of hand hygiene interventions were variable but likely to be beneficial in some contexts.<sup>27</sup></li> </ul>
<b>Remove SARS-CoV-2 test requirements for cross-border travellers</b>	<ul style="list-style-type: none"> <li>• There is a MAC on COVID-19 Advisory on travel, including cross border travel from neighbouring states.</li> <li>• Travellers with SARS-CoV-2 entering South Africa are unlikely to significantly alter the epidemic trajectory unless it results in introduction of a new variant.</li> <li>• However, as the recent international spread of Omicron has clearly shown, travel restrictions and pre-travel testing do not contain spread of variants, possibly delaying the spread by a few days if at all.</li> </ul>

	<ul style="list-style-type: none"> <li>• Requiring SARS-CoV-2 tests in order to travel likely reduces non-essential travel and damages the hospitality industry which is highly dependent on tourists</li> </ul>
<p><b>Stop the imposition of outdoor mask mandates, but promote wearing of masks outdoors when in larger gatherings, if people are at risk of severe disease or when people have respiratory symptoms.</b></p>	<ul style="list-style-type: none"> <li>• The risk of SARS-CoV-2 transmission is far higher indoors than outdoors with outdoor settings likely contributing less than 1% of infections.<sup>28</sup></li> <li>• US CDC guidance indicates that “in general you do not need to wear masks outdoors”,<sup>29</sup> but provides messaging consistent with a harm reduction approach, recommending that individuals should consider wearing a mask when in large outdoor gatherings or if they are at high risk for severe COVID-19 disease or if people have respiratory symptoms. Nonetheless, more research and guidance on wearing of masks indoors is needed.</li> </ul>

## Integration of COVID-19 into existing health services

As South Africa exits the fourth wave, and noting the impact of COVID-19 and responses to the pandemic on routine health services, there is a growing need to rethink how the national responses to COVID-19 can be mainstreamed/integrated into routine health services while learning lessons from previous responses to COVID-19.

**COVID-19 vaccination** should cease to be provided only as a vertical programme. Mass vaccination has reached an inflection point where there will be very limited additional vaccinations secured through this route. Vaccination will continue within specific groups, especially vulnerable individuals, and certain sectors (for example tourism and other recovering economic sectors). Within the health sector, vaccination should be integrated into primary health care services as this will optimise resource utilisation. Some provinces, for example KwaZulu-Natal and Western Cape, have already integrated COVID-19 vaccination into primary health care clinics – lessons from these provinces should be scaled to other provinces. This includes integration of vaccination programmes into chronic care services, antenatal services and HIV programmes, as well as other primary healthcare services.

COVID-19 has highlighted the need for good **infection control** practices. The use of masks by the general population has become routine. The provision of N95 masks for use by healthcare workers should be sustained in health facilities to support infection prevention and control. Isolation and quarantine are likely to be required in future epidemics, and all provinces should continue to maintain epidemic preparedness that include isolation and quarantine facilities that can easily be mobilised when required.

Significant investments have been made by provinces and partners in strengthening oxygen supply and management. This investment should also be used to strengthen access to oxygen in paediatric wards and ensure that the electronic dashboards are utilised by all facilities.

**Monitoring and surveillance** improved because of COVID-19 and these improvements should be extended to include other critical diseases. COVID-19 should be reported in the context of other diseases such as influenza and TB which are also airborne. The regular reporting of COVID-19 cases and deaths should be extended to these other programmes. The Western Cape already has a public-facing dashboard that reports on tuberculosis. This integration will ensure that all diseases receive adequate attention. Monitoring and surveillance needs to be improved, properly resourced, and located within an effective national public health institute. Consideration should be given to integrating sentinel surveillance for COVID-19 into

existing systems for respiratory conditions. Progress towards the implementation of the National Public Health Institute of South Africa (NAPHISA) Act should be prioritised.

The DATCOV systems showed how data from the public and private hospitals can be integrated and lessons from the deployment of DATCOV should be used to strengthen data collection from both sectors. Additionally, the EVDS that registered people for COVID-19 vaccination can be used for other vaccination programmes. To manage admissions, bed bureaus were used by some provinces – this can be strengthened for use especially for emergency admissions for example.

Current investments in wastewater surveillance should be strengthened as these serve as an early warning system. Genomic surveillance should also be supported for detection of new variants and their characteristics.

Self-testing for COVID-19 has been enabled in a number of countries. If COVID-19 evolved as expected, it will become a disease associated with low levels of transmission, possibly with seasonal increases, but with low mortality due to high levels of immunity and vaccination. At this point, which may be reached within six to twelve months, the need for routine testing for SARS-CoV-2 in symptomatic mild COVID-19 cases will need to be reviewed. COVID-19 may then be diagnosed early and treated with antivirals. Self-testing may be important in enabling early diagnosis and differentiation from other acute respiratory illnesses.

### **Legislative considerations**

The current imposition of a range of PHSM relies on the Disaster Management Act (Act 57 of 2002). Disasters may be declared at local, provincial or national levels (as per section 23 of the Act). A national state of disaster is time-limited (initially for three months) but can be extended on a monthly basis. In the case of national disasters, which are primarily the responsibility of the national executive, the responsible Minister is enabled to issue regulations, broadly aimed at preventing escalation of the disaster, alleviating, containing and minimising its effects. However, the powers assigned to the Minister may only be exercised in order to assist and protect the public, provide relief, protect property, prevent or combat disruption, or otherwise deal with the “destructive and other effects of the disaster.” Importantly, the responsible Minister (at this time, the Minister of Co-operative Governance and Traditional Affairs) may suspend the operation of any regulations, either nationally or in specific provinces, metropolitan areas or districts, and may also reintroduce their operation as needed.

A more challenging question concerns the ability of the Minister of Health to intervene, when the state of disaster is no longer in place, in order to enable an appropriate response to an ongoing threat from SARS-CoV-2. The Minister of Health would need to rely on the National Health Act (Act 61 of 2003), which requires that “within the limits of available resources”, the Minister “endeavour to protect, promote, improve and maintain the health of the population”. Limited powers are provided in terms of treating a patient without consent, which can be done if “failure to treat the user, or group of people which includes the user, will result in a serious risk to public health”. Whether the Minister of Health can restrict the rights of the general public, in anticipation of their being at risk of exposure to disease, needs to be considered in terms of the Constitution. Section 36 of the Constitution (Act 108 of 1996) states that rights may only be limited “to the extent that the limitation is reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom”. The following issues need to be taken into account: the nature of the right being limited, the importance of the purpose of the limitation, the nature and extent of the limitation, and the relation between the



limitation and its purpose. Critically, the limitation must represent a less restrictive means to achieve the stated purpose.

COVID-19 has been declared a category 1 notifiable medical condition, requiring reporting within 24 hours.<sup>30</sup> The National Health Act enables the Minister of Health to make regulations regarding “notifiable medical conditions”. No additional detail is provided in the Act, but existing regulations deal with the management of suspected and confirmed cases, and measures to enable “control of the spread of notifiable medical conditions”.<sup>31</sup> The current regulations are narrowly focused on cases and contacts, rather than on the general population.

It remains unclear, and untested in a court of law, whether the Minister of Health could rely on the National Health Act to impose such restrictions as are currently in force in terms of the Disaster Management Act. This includes the imposition of curfews, restrictions on gatherings (such as limits on capacity, or absolute limits), mandatory wearing of face masks in public and mandatory screening. Restrictions on travel, or the sale and transport of alcoholic beverages, would likely require collaborative action with other Ministries, relying on other legislation. Other interventions, such as workplace vaccine mandates, have relied on other legislation, such as the Occupational Health and Safety Act (Act 85 of 1993).

The International Health Regulation Act (Act 28 of 1974) predates the current International Health Regulations (2005). There are limited Regulations issued in terms of the 1974 Act, most recently in 2003. The World Health Assembly Special Session held in November 2021 committed to the development of a Pandemic Treaty, as well as the strengthening of the IHR (2005).

### **Summary Recommendations**

Based on the above considerations, the following summary recommendations are offered:

#### **1. Public Health and Social Measures (PHSM)**

It is recommended that the following PHSM be stopped:

- Contact tracing, quarantine and testing of close contacts.
- Temperature and symptom screening.
- Decontamination and fogging of premises.
- Mandatory provision of hand sanitiser
- Mandatory wearing of masks outdoors.

The following practices are to be promoted:

- Hand washing and sanitising where soap and water are not available.
- Wearing of masks in outdoor areas, especially in crowded areas, if people are at risk of severe disease or when people have respiratory symptoms.
- Evidence-based programmes to engage with vaccine hesitancy

The use of masks indoors needs further research and guidance. Indoor mask mandates should not be imposed indefinitely and criteria for the removal of indoor mask mandates should be clearly defined.

#### **2. Integration of COVID-19 into existing health services**

The following steps are recommended to integrate COVID-19 into other health services:

- Integration of COVID-19 vaccination into primary health care services.

- Risk-based use of N95 masks by health care workers.
- Epidemic preparedness plans to include easy mobilisation of isolation and quarantine facilities.
- Optimal supply of oxygen to be achieved, including for paediatrics.
- COVID-19 monitoring, surveillance and reporting to be integrated with TB and influenza reporting. Common dashboards to be made available to HCWs and the public.
- Strengthen DATCOV and utilise for general referral purposes.
- Continue with wastewater surveillance and genomic sequencing.
- Inclusion of COVID-19 into existing sentinel surveillance for respiratory conditions.
- Progress towards the implementation of the National Public Health Institute of South Africa (NAPHISA) Act should be prioritised.

### **3. Disaster Regulations**

The Department of Health is currently revising existing regulations issued in terms of the National Health Act. However, any attempt to rely on the existing National Health Act to issue regulations that potentially restrict the rights of the population may be vulnerable to challenge in the courts. The flexibility currently exists to not only extend the declaration of a national state of disaster as needed, but also to limit the application of regulations issued in terms of the Disaster Management Act as needed.

In the medium-term, consideration should be given to strengthening the capacity of the Minister of Health, either through amendment to the International Health Regulation Act or the National Health Act, to more precisely enable the development of effective regulations to deal with emerging epidemic and pandemic threats. These amendments will be informed by global progress in relation to the Pandemic Treaty and/or the strengthening of the IHR (2005).

## References

1. <https://www.medrxiv.org/content/10.1101/2021.07.20.21260855v2.full.pdf>
2. Madhi et al. South African Population Immunity and Severe Covid-19 with Omicron Variant. <https://www.medrxiv.org/content/10.1101/2021.12.20.21268096v1>
3. Campbell et al. Increased transmissibility and global spread of SARS-CoV-2 variants of concern as at June 2021. *Euro Surveill.* 2021;26(24):pii=2100509. <https://doi.org/10.2807/1560-7917.ES.2021.26.24.2100509>
4. Pearson et al. Bounding the levels of transmissibility & immune evasion of the Omicron variant in South Africa. <https://www.medrxiv.org/content/10.1101/2021.12.19.21268038v1>
5. Pulliam et al. Increased risk of SARS-CoV-2 reinfection associated with emergence of the Omicron variant in South Africa. <https://www.medrxiv.org/content/10.1101/2021.11.11.21266068v2>
6. Enhancing response to Omicron (COVID-19 variant B.1.1.529): Technical brief and priority actions for Member States World Health Organization HQ: Headquarters, Geneva, Switzerland Update #5: 7 January 2022 (updated from previous version, published 23 December 2021)
7. Spaul et al. Synthesis report: National Income Dynamics Study Coronavirus Rapid Mobile Survey Wave 5. <https://cramsurvey.org/reports/>
8. Ministerial Advisory Committee on COVID-19 (2021). Preparing for a Potential Third Wave. <https://sacoronavirus.co.za/2021/03/31/preparing-for-a-potential-third-wave>
9. Jassat et al (2021) Difference in mortality among individuals admitted to hospital with COVID-19 during the first and second waves in South Africa: a cohort study. *Lancet Global Health.* July [https://doi.org/10.1016/S2214-109X\(21\)00289-8dy](https://doi.org/10.1016/S2214-109X(21)00289-8dy)
10. Moodley K (2021) COVID-19: ‘A pandemic of the unvaccinated’? – compassion fatigue among healthcare professionals in South Africa. *S Afr Med J* 2021;111(11):1040-1041. <https://doi.org/10.7196/SAMJ.2021>
11. Smit et al (2020). Supplemental oxygen therapy in COVID-19. *SA Heart* <https://journals.co.za/doi/pdf/10.10520/ejc-saheart-v17-n3-a12>
12. Pillay et al (2021). Impact of COVID-19 on routine primary healthcare services in South Africa *South African Medical Journal* 2021;111(8):714-719. DOI:10.7196/SAMJ.2021.v111i8.15786
13. Davies et al. Outcomes of laboratory-confirmed SARS-CoV-2 infection in the Omicron-driven fourth wave compared with previous waves in the Western Cape Province, South Africa. <https://www.medrxiv.org/content/10.1101/2022.01.12.22269148v1>
14. Hussey et al. Assessing the clinical severity of the Omicron variant in the Western Cape Province, South Africa, using the diagnostic PCR proxy marker of RdRp target delay to distinguish between Omicron and Delta infections – a survival analysis. <https://www.medrxiv.org/content/10.1101/2022.01.13.22269211v1>
15. Wolters et al. Early assessment of the clinical severity of the SARS-CoV-2 Omicron variant in South Africa. <https://www.medrxiv.org/content/10.1101/2021.12.21.21268116v1>
16. SAMRC. Report on weekly deaths in South Africa. <https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>
17. National Institute for Communicable Diseases. Covid-19 Hospital Surveillance. <https://www.nicd.ac.za/wp-content/uploads/2022/01/NICD-COVID-19-Weekly-Sentinel-Hospital-Surveillance-update-Week-2-2022.pdf>
18. South African Reserve Bank, Quarterly Bulletin, December 2021. <https://www.resbank.co.za/content/dam/sarb/publications/quarterly-bulletins/quarterly-bulletin-publications/2021/ke-december-boss/01Full%20Quarterly%20Bulletin.pdf>
19. OECD Policy Response to COVID-19. (<https://www.oecd.org/coronavirus/policy-responses/flattening-the-covid-19-peak-containment-and-mitigation-policies-e96a4226/>)
20. Spaul et al. Synthesis report: National Income Dynamics Study Coronavirus Rapid Mobile Survey Wave 5. <https://cramsurvey.org/reports/>
21. <https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance>

22. Cohen et al. SARS-CoV-2 incidence, transmission and reinfection in a rural and an urban setting: results of the PHIRST-C cohort study, South Africa, 2020-2021. <https://www.medrxiv.org/content/10.1101/2021.07.20.21260855v2>
23. Halperin et al. Revisiting COVID-19 policies: 10 evidence-based recommendations for where to go from here. *BMC Public Health* **21**, 2084 (2021). <https://doi.org/10.1186/s12889-021-12082-z>
24. Department of Labour (11 Jun 2021). Disaster Management Act: Consolidated Direction on occupational health and safety measures in certain workplaces. [https://www.gov.za/sites/default/files/gcis\\_document/202106/44700reg11292gon499.pdf](https://www.gov.za/sites/default/files/gcis_document/202106/44700reg11292gon499.pdf)
25. Department of Health. Statement on cleaning and decontamination of workplaces in the context of COVID-19. <https://www.nioh.ac.za/wp-content/uploads/2021/08/V2-Statement-on-cleaning-and-decontamination-of-workplaces-in-the-context-of-COVID-19-12-Aug-2021-FINAL.pdf>
26. Onakpoya, Igho J et al. “SARS-CoV-2 and the role of fomite transmission: a systematic review.” *F1000Research* vol. 10 233. 24 Mar 2021, doi:10.12688/f1000research.51590.3 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8176266/>
27. Warren-Gash et al. Hand hygiene to reduce community transmission of influenza and acute respiratory tract infection: a systematic review. *Influenza Other Respir Viruses*. 2013 Sep;7(5):738-49. doi: 10.1111/irv.12015. Epub 2012 Oct 8. PMID: 23043518; PMCID: PMC5781206.
28. Razani et al. Clarification Regarding “Outdoor Transmission of SARS-CoV-2 and Other Respiratory Viruses: A Systematic Review”, *The Journal of Infectious Diseases*, Volume 224, Issue 5, 1 September 2021, Pages 925–926, <https://doi.org/10.1093/infdis/jiab298>
29. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html>
30. NICD. Coronavirus Disease 2019 (COVID-19). [https://www.nicd.ac.za/wp-content/uploads/2021/10/CORONAVIRUS-DISEASE-2019-COVID-19\\_NMC-case-definitions-category-1\\_August2021\\_final.pdf](https://www.nicd.ac.za/wp-content/uploads/2021/10/CORONAVIRUS-DISEASE-2019-COVID-19_NMC-case-definitions-category-1_August2021_final.pdf); also see <https://www.nicd.ac.za/nmc-overview/nmc-covid-19-documents/>
31. Minister of Health. Regulations relating to the surveillance and the control of notifiable medical conditions. Government Notice No. 1434, Government Gazette No. 41330, 15 December 2017. [https://www.nicd.ac.za/wp-content/uploads/2017/12/41330\\_15-12\\_Health-compressed.pdf](https://www.nicd.ac.za/wp-content/uploads/2017/12/41330_15-12_Health-compressed.pdf)