



health

Department:
Health
REPUBLIC OF SOUTH AFRICA



Date:	16 May 2021		
To:	Minister ZL Mkhize, Honorable Minister of Health	From:	Ministerial Advisory Committee (MAC) on COVID-19

CRITERIA/TRIGGERS FOR NEW COVID-19 RESTRICTIONS

Problem Statement

There has been concern that reaction time for previous COVID-19 waves may have been too slow. The MAC on COVID-19 was thus requested by the National Department of Health to provide guidance on what the red flags or triggers would be to enable the institution of timeous appropriate restrictions.

The intention is to enable swift action so as to limit the peak of each wave and ensure that healthcare resources are not overwhelmed thereby avoiding preventable death (patients that would survive if they are afforded healthcare services).

Furthermore; recommendations are sought that take the aggravating factors of novel variants and socio-behavioural factors, as well as mitigating factors of vaccine penetration and sero-prevalence in the local population, into account.

Evidence review and Analysis

OVERVIEW

When considering triggers for restrictions related to rising COVID-19 infections for a third or subsequent wave, the intention is clearly related to ensuring that **preventable death does not occur**. In other words, patients that present with moderate to severe disease and that would benefit from clinic/ hospital care (usually with oxygen, medication and supportive therapies) are always in a position to access such care. Global experience in developed (UK, USA) and developing (India, Brazil) countries is evidence that in an unrestricted environment the likelihood of our healthcare system being overwhelmed is high.¹

The identification and implementation of a “trigger based” approach to restrictions is not an exact science. We are living with a novel virus and spread that is only partly informed by prior experience – of the behaviour of similar viruses in the past and then of our current waves and pandemic.

The importance of the public taking collective responsibility for its own safety with the promotion of non-pharmaceutical interventions (NPIs) is the cornerstone of success to controlling infection rates and protecting our national healthcare resources.

As the pandemic evolves, we are likely to have increasing seroprevalence and vaccine penetration. Over time, these two are likely to decrease the burden of moderate and severe disease on our health system. As this decrease is experienced, triggers and restrictions will be able to be more flexible and lenient over time. Unique country experience means triggers and restrictions will need to be evaluated on an ongoing basis and modified as seroprevalence and vaccine penetration increases.

There will always need to be a balance between lives and livelihoods. The final position at any point of time will therefore need to ensure that the health system can accommodate moderate and severe disease and then ensure that livelihoods are protected.

Variants are a particularly concerning entity as they introduce further uncertainty with respect to triggers for restrictive intervention. Prior experience and prospective models are not able to predict how variants will influence future experience. We do know that high prevalence of disease and importation of variants (international travel predominantly) are likely to result in new variants. ²

The intention of an early warning system (triggers) and responses is founded on 3 principles:

1. Transparent communication and planning enabling public understanding and trust.
2. Staged, incremental, dynamic interventions to prevent rapidity of increase (flattening the curve) of infections that may ultimately overwhelm the healthcare system.
3. Reinforcement of community and other adopted interventions to strengthen monitoring and response.

RESURGENCE METRIC ANALYSIS

The SACMC recently presented a set of guidelines to use resurgence metrics displayed on the SACMC Epidemic Explorer to detect the start of a new wave. The dashboard, released in November 2020 and available at <https://masha-app.shinyapps.io/SACMCEpidemicExplorer> is intended for use by district, provincial, and national level decision-makers and health planners.

- The SACMC Epidemic Explorer dashboard presents metrics that should be used in concert to monitor for increasing case trends:
 - case thresholds,
 - percentage change
 - and other metrics, defined in detail in the appendix.
- In addition to the metrics above, the test positivity rate is crucial in quantifying case trends in relation to the number of tests conducted and should be considered in combination with case trends as a leading indicator of possible resurgence.

As has been demonstrated in the first two waves:

- an increase in cases typically translates into an increase in hospitalizations after approximately 10-14 days.

The metrics can be used to inform decisions:

- at the provincial and district level about when to move from epidemic containment to mitigation - and when to mobilise extra resources,

- but no single metric is a perfect indicator of when to act.

In particular, it is worth noting that all indicators can be influenced by abnormal decreases in trends as a result of weekends and holiday periods. This is primarily due to a decrease in testing over these periods. A combination of metrics such as case thresholds, percentage change and test positivity rate should be used to detect a resurgence.

The following occurrences (alone or simultaneously) provide a strong warning that a new wave might be beginning:

- A **sustained increase** that lasts for a week or longer.
- Moderate or large increases in weekly incidence (**percent change** metric >10%) when case numbers are already high (**case threshold** metric > 30 new cases per week per 100,000 population)
- **Test positivity rate** > 10%

The following occurrence is also of concern but not necessarily a strong indicator of a new wave beginning:

- Large increases in weekly incidence (**percent change** metric >20%) when case numbers are moderate to high (**case threshold** metric between 10-30 new cases per week per 100,000 population)
- **Test positivity rate between** 5% and 10%

The case metrics and districts of concern are displayed on the SACMC Epidemic Explorer and updated three times a week. The test positivity data are produced by the NICD and presented to the IMT weekly.

PUBLIC AND PRIMARY HEALTH CARE

The voracity of the second COVID-19 wave in South Africa caught pandemic response teams unaware as laboratory capacity became overwhelmed resulting in sub-optimal turnaround times for results. Predictors for the third wave from a community, primary healthcare and district hospital approach should include data from sub-districts to best inform triggers and restriction planning and include the following:

- Community based surveillance utilizing data from community health workers and primary healthcare clinics. Week test positivity rates are currently reported to the IMT.
- Probable cases as defined by the WHO must be captured and reported to district offices.
- The COVID APP used to screen for probable cases.

LABORATORY SERVICES AND TESTING

- Laboratory testing capacity is approximately 72000 tests/day nationally based on testing done during week 1 of 2021, the peak of the second wave. This is split at 30 000 (NHLS has capacity for 50 000 test/day if needed) tests/day in the public sector and 42000 tests/day in the private sector. If testing is maintained within capacity, turnaround time (TAT) is <24 hours for urgent cases (those requiring hospitalisation) and <48 hours for non-urgent cases. An increase in infections is associated with increased pressure on laboratories for the following reasons:
 - Increase in test requests;
 - Pressure on reagent and consumable supply which is unpredictable and may reduce testing capacity;
 - Staff absenteeism (due to illness or quarantine).
- During high demand periods, consideration should be given to reducing pressure on PCR testing by utilising SARS-CoV-2 antigen testing based on guidelines already provided by the DOH).³

CLINICAL ENVIRONMENT

5 dynamic factors influence the current spread and burden on our healthcare system:

1. Seroprevalence and Immunity
2. Vaccination Rate and Impact on Disease Pattern
3. Variants of Concern
4. Bed Occupancy and accompanying Resources (HR, Oxygen Supply and Medical Equipment)
5. Socio-behavioural Factors and Impact on ER and Critical Care Bed Availability – Trauma Epidemic

1. Seroprevalence and Immunity

The number of infected and recovered patients in South Africa is not known with certainty. Owing to testing capacity constraints in the first wave, our system has prioritized testing for in-hospital and higher risk patients. The early and rapid transition from containment to treatment in South Africa has resulted in testing being an inaccurate reflection of seroprevalence. Globally there is a poor understanding of how prior infection and recovery may protect or decrease the severity of disease with a subsequent infection. There are a number of patients who have been reinfected with either similar or worse disease expression than the first infection.^{4,5,6} In general it is understood that patients who have been infected have some level of “protection” against the development of severe disease with a repeat infection.⁷

2. Vaccination Rate and impact on Disease Pattern

In territories with high vaccination penetration of the population, the numbers of severe infections and death have decreased dramatically.^{8,9} This experience highlights the importance of rapid implementation of our national vaccination programme. Ethical issues relating to access and prioritisation must be dealt with rapidly and not result in a limitation on the absolute number of individuals vaccinated per day. The absolute number and rapidity of population vaccinated is what is important to decrease the patient burden on the healthcare system and a move toward “herd immunity”.

A smooth, swift and uninterrupted national vaccination rollout is extremely likely to result in a decrease in severe disease in vaccinated susceptible individuals, which in turn will take the edge off the burden of disease away from Health Care facilities.^{8,9}

3. Novel Variants

To date there is evidence that variants (B1.1.135, B1.1.7, B1.167.2) have not necessarily increased the severity of disease but rather the R_0 or ability of the virus to spread more rapidly (infectivity).¹⁰ That stated, most variants have been associated with populations that have engaged in mass gatherings (superspreading events), limited social distancing and not practiced non-pharmaceutical interventions (NPIs) over a period of time.¹¹ Once a large pool of infectious population has been established, a wave of infections sustains ongoing infection in communities and supports the ability of the virus to mutate and develop a new “variant”.²

There is now evidence that variants first sequenced in the UK and India have been identified in South Africa. The NICD has recently confirmed community spread of B1.1.7 (UK Variant) in South Africa. Variants introduce complexity with respect to modelling, triggers and interventions. As such reaction to new variants globally should be prioritized.

4. Bed Availability and Occupancy for COVID-19 Patients

Data from our two previous waves indicate that facility occupancy increases exponentially once a wave “commences” reaching capacity within 72 to 96 hours (NICD DATCOV data). Preparation and “wave experience” has clarified requirements with respect to Medical Equipment, Human Resources and facility requirements including oxygen. Deficits remain with

respect to Human Resources and equipment. Cohorting of facilities and dynamic addition of COVID beds are now in place throughout the health sector.

5. Socio-behavioural Factors and Impact on ER and Critical Care Bed Availability

South Africa's trauma epidemic, influenced by alcohol consumption¹² utilizes healthcare resources ill afforded during pandemic surges inclusive of emergency response and transport, emergency rooms, operating theatres, general ward, high care and critical care services.

Triggers discussion

Triggers for consideration of increased vigilance and/ or interventions as outlined in the Recommendations below, for the purpose of this advisory, are divided into early and intermediate (or enhanced early warning) triggers:

Early Warning (Testing)	Intermediate/ Enhanced Early Warning
<ul style="list-style-type: none"> • Absolute Number of Infections 	<ul style="list-style-type: none"> • Admission Rates
<ul style="list-style-type: none"> • Positivity (pickup) rate 	<ul style="list-style-type: none"> • Relative number COVID beds available
<ul style="list-style-type: none"> • Testing Capacity (TAT) 	<ul style="list-style-type: none"> • Relative number COVID beds by acuity
	<ul style="list-style-type: none"> • Oxygen Supply/ Demand/ Capacity

Early Warning variables:

With a local testing strategy that has adapted over time due to the transition from a containment to treatment phase of the pandemic, variable limitation in testing capacity and increasing knowledge and community health worker management of mild disease:

The result is still that the **absolute number** of positive tests or active infection at any given time do not accurately reflect the absolute burden of mild, moderate and severe disease. This metric is still useful but may prove less so with vaccination and increased seroprevalence.

The current testing default in most areas of the country is that patients are tested for the following reasons:

1. Planned healthcare procedure – most facilities require a negative test to protect patients and health workers from infection as well as protect patients from complications if they happen to be positive.¹³
2. Contact tracing – while aspirational and legislated, many of the public no longer come forward for testing but rather symptom monitor and self-isolate for the required number of days.
3. Travel mandates require negative tests prior to travel across borders.
4. Testing for illness that is due to suspected COVID-19 is generally directed by the treating healthcare provider.

Positivity rate represents the number of positive tests done in a period as a proportion of total tests performed over the same period. At this stage of our pandemic positivity rates remain relevant and closely correlate with likely sustained increases and trends toward health system burden.

Testing capacity has been a vital indicator of burden of disease in geographical areas and directly affects the ability of a health system to deliver COVID and non COVID services. Without the ability to have rapid turnaround of testing, treatment of admitted patients is less directed (and therefore less effective), and ability to deliver non COVID interventions (e.g. surgery) is hampered. Delayed time to result (testing capacity strained or overwhelmed), with current

testing national capacity taken into account, would generally be as a result of increased burden of disease. As such, this constitutes a viable trigger to inform intervention.

Intermediate/ Enhanced Early Warnings Variables:

Admission rates with respect to COVID care and capacity allocated to COVID care are currently well monitored through submission of data to the NICD DATCOV database. Data submission by the private healthcare sector and the Western Cape Department of Health public sector hospitals has been good for the majority of the pandemic with recent instruction to all provinces to ensure local facilities and provinces submit their data.

With increased vaccination and seroprevalence, monitoring of admission data and cross reference to testing data (early warning) will be more important to ensure actions and interventions are neither too early nor too late.

Admission rates are a real reflection of burden of moderate and severe disease. Once these start climbing (although not an early warning), the likelihood of increased admissions progressing to an overwhelmed national healthcare system (public and private) is more likely. These data only currently allow for between 3 and 5 days forewarning of an overburdened system considering prior wave experience.

COVID Bed Number Availability is a variable number through the public and private system. These bed numbers are generally broken down into Patient Under Investigation (PUI) Beds reserved for patients admitted (symptomatic or not) to any facility until their test results become available, COVID positive general ward beds (for symptomatic or asymptomatic patients), High care beds and Critical care ICU beds. Actual number of beds available is rarely equivalent to total number of beds available in a facility. Availability is dependent on human resource availability (**most often the limiting factor**), oxygen, equipment and drug availability and physical bed availability. These numbers are updated daily by facilities who submit to the NICD DATCOV database.

Stratifying care by **acuity** within the beds occupied is vital to inform the interventions required.

Oxygen Capacity for the national system is easily monitored by identifying acuity of care requirements, facility oxygen deliveries, oxygen manufacture and demand by the few oxygen suppliers nationally. This is a relatively easy surrogate marker (information supplied by the Hospital Readiness Team) for burden of disease that may be correlated by district or province or identify disparities in reporting that may be inaccurate.

Recommendations

TRIGGERS

An attempt to provide a simplified trigger metric has been adopted in the interest of being able to easily assess and respond.

The following are recommended triggers for the National Department of Health or Government to respond to in an attempt to limit the peak of pandemic waves:

Surveillance Metrics (NDOH Data): These metrics likely to provide 14 to 21 day advance warning of significant increased numbers potential overwhelmed resources or a “wave” without intervention.

- An increase in the number of **probable cases** (sustained increase of a week or longer showing an increase of $\geq 20\%$).

- A sustained increase of confirmed cases that lasts for a week or longer. Moderate or large increases in weekly incidence of (percent change metric >10%) when case numbers already high (case threshold metric > 30 new cases per week per 100,000 population).^{14,15}
- Facility-based test positivity > 20% (facilities with highest test positivity are presented to IMT weekly).
- Test positivity rate between 5% and 10%.

Testing (Data from NHLS and Private Laboratories): These metrics likely to provide 7 to 14 day advance warning of significant increased numbers and potential overwhelmed resources or a “wave” without intervention.

- Sentinel SARS-CoV-2 molecular laboratories should be identified regionally in the public and private sector.
 - These laboratories should preferably be those processing the largest portion of tests in that area.
 - They should alert when a positivity rate of $\geq 5\%$ has been observed daily for a 7-day period. This variable has positively correlated with sustained increases after this week preceding prior waves.
 - They should also alert when the positivity rate exceeds 10%.
 - This will provide an immediate, real-time alert that cases are increasing in an area that is more representative than the daily total number of positives, which is influenced by the number of samples processed on any given day. This will provide an immediate alert rather than waiting for the consolidated weekly reports and will draw attention to an area that requires closer evaluation.
- A comparison of a 7-day moving average and 40-day moving average (MA) of confirmed infections. Where the 7-day MA moves above the 40-day MA by more than 10% for at least 14 consecutive days we see this as a fairly strong early signal of a possible next wave.
- When testing capacity approaches 80% of capacity in the public and/ or private laboratories, clear plans to resuscitate and accelerate surge testing laboratories must be in place as well as consideration of intervention.
- Testing Turnaround time (TAT) is >24 hours for urgent cases (those requiring hospitalisation) and >48 hours for non-urgent cases for 2 consecutive days when in conjunction with increased new cases as well as a positivity rate > 5%.

Clinical (Data from NICD DATCOV database): These metrics likely to provide 2 to 7 day advance warning of significant increased numbers and potential overwhelmed resources or a “wave” without intervention.

- A sustained increase of probable/confirmed cases needing hospital admission. The threshold metric should be $\geq 50\%$ of all available COVID19 beds in facilities in a district/ province.
- Bed occupancy of higher acuity (high care and intensive care) >50% of available COVID19 beds.
- >30% increase in admission of patients Aged 0 to 12 years in one week.
- Oxygen supply/ usage > 4 times usual demand.

INTERVENTIONS

Immediate interventions to enhance detection of triggers:

- All public and private facilities should be monitored to ensure compliance with the requirement or agreement to submit daily data regarding daily beds available and the number occupied to inform a percentage of beds occupied/ available.
- National department of Health and government should analyse data that informs what restrictions have been most successful to date.
- NICD DATCOV Data interrogation to attempt to better identify possible inflection points that may give earlier warnings of healthcare facility burden increases (towards being overwhelmed).

First Interventions when early triggers passed (14 to 21 days):

It is advisable to approach increasing prevalence on a provincial basis. District interventions are difficult to enforce while national interventions are economically and potentially unnecessarily burdensome (economic and civil) with differing incidence of disease.

- strong public messaging about increasing cases and the need for stricter NPI adherence.
- Publish ceilings of second triggers with restriction expectations should these be breached. This transparency enables the public to take responsibility for altering behaviour aligned with required NPIs.
- increased testing capacity and turn-around times, isolation of positive cases, contact tracking and tracing to prevent further community spread.
- Notification of mobilization of resources needed to support a substantial surge (refer to the MAC advisory on Preparing for a Potential Third Wave¹⁶ for further details).
- increasing the rate of vaccination of health care workers and the general population, if possible.
- targeted sequencing of virus from areas driving increases in case incidence.
- Consider restrictions as decided by the NCCC detailed hereunder as “Restrictions for Consideration.”

Second Interventions when second triggers passed (14 days):

It is advisable to approach increasing prevalence on a provincial basis. District interventions are difficult to enforce while national interventions are economically and civilly unnecessarily burdensome with differing incidence of disease.

- strong public messaging about increasing cases and the need for stricter NPI adherence.
- Publish ceilings of third triggers with restriction expectations should these be breached. This transparency enables the public to take responsibility for altering behaviour aligned with required NPIs.
- Consider limiting testing not absolutely necessary – exclude leisure travel, discretionary elective procedures, non-prescribed testing (e.g. worried well).
- mobilization of resources needed to support a substantial surge within 7 to 14 days (refer to the MAC advisory on Preparing for a Potential Third Wave¹⁶ for further details).
- increasing the rate of vaccination of health care workers and the general population, if possible.
- targeted sequencing of virus from areas driving increases in case incidence.
- Consider increasing restrictions as decided by the NCCC detailed hereunder as “Restrictions for Consideration.”

Third Interventions when third triggers passed (2 to 7days):

It is advisable to approach increasing prevalence on a provincial basis. District interventions are difficult to enforce while national interventions are economically and civilly unnecessarily burdensome with differing incidence of disease.

- strong public messaging about increasing cases and the need for stricter NPI adherence.
- Publish potential increase of lockdown restriction expectations should systems indeed be overwhelmed. This transparency enables the public to take responsibility for altering behaviour aligned with required NPIs.
- Limit testing not absolutely necessary – exclude leisure travel, discretionary elective procedures, non-prescribed testing (e.g. worried well).
- Active mobilization of resources needed to support a substantial surge within 2 days (refer to the MAC advisory on Preparing for a Potential Third Wave¹⁶ for further details).
- increasing the rate of vaccination of health care workers and the general population, if possible.
- targeted sequencing of virus from areas driving increases in case incidence.
- Consider further increasing restrictions as decided by the NCCC detailed hereunder as “Restrictions for Consideration.”

The DoH Resurgence Plan¹⁷: Plan of action to mitigate a COVID-19 resurgence in South Africa, is a practical guide outlining the steps that should be followed to respond to a COVID-19 resurgence as measured by a set of indicators with key indicators displayed in the SACMC Epidemic Explorer. Ten intervention areas were identified to aid in the resurgence alert and response phases: Governance and leadership, Medical supplies, Port and Environmental Health, Epidemiology and response, Facility readiness & case management, Risk communication and community engagement, Occupational health and safety, Infection Prevention and Control and Human resources for health. This work plan is a living document and continues to be workshopped in provinces and districts around the country

Restrictions for Consideration

When considering that COVID19 spread is dependent on aerosol and droplet spread, and clear evidence of the impact social interaction has in increasing disease spread¹⁶, recommendation of two specific restrictions is made. It is suggested that these restrictions do not necessarily have to be limited to specific levels of lockdown and should be dynamically increased or decreased with monitoring of first, second and third Trigger levels.

- **Gatherings**

It is advisable that gathering size be curtailed incrementally and decisively when each trigger level is passed. As of today's date (14th May 2021) multiple provinces have passed trigger level 2.

- **Curfew**

The consequence of curfews, while offending civil liberties, are particularly important to consider in our country where alcohol abuse and the trauma epidemic have a massive effect on healthcare system burden. Curfews effectively limit the time available to consume alcohol in large groups (thereby limiting larger gatherings and decreased adherence to NPIs) as well as the time available to congregate socially in larger numbers. Curfews decrease time on roads with a resultant decrease probability of motor vehicle and pedestrian vehicle accidents and injury.

While curfew does impact the country economically, the impact is less severe than lockdowns and enables the economy to continue during non-curfew hours with vital sectors enabled through issuance of certificates to operate.

As a result, it is recommended that incremental curfews be decided upon by the NCCC and instituted incrementally with increasing trigger levels. As of today multiple provinces have passed trigger level 2.

- **Quarantine, self-isolation and travel ban – International Travel**

While politically controversial, the impact of importing SARS CoV-2 variants into South Africa cannot be overstated. Variants have generally been more infectious than the “parent” viral strain. Recommendation for consideration of travel bans to be implemented in 2 week intervals (may be renewed) with identification of infectious strains from other countries. When appropriate bans are lifted, subsequent mandatory 10-day quarantine (at the traveler’s cost) and negative test prior to introduction into the local population should be mandatory.

Thank you for consideration of this request.

Kind regards,



PROF MARIAN JACOBS

CO-CHAIRPERSONS: MINISTERIAL ADVISORY COMMITTEE ON COVID-19

DATE: 16 May 2021



PROF KOLEKA MLISANA

CC:

- » **Dr S Buthelezi (Director-General)**
- » **Dr T Pillay (Deputy Director-General)**
- » **Incident Management Team**

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