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# Covid-19: Sailing a ship while building it

The widespread commitment to responding to the epidemic provides me with great hope that our country may not experience the level of devastation seen elsewhere

By **SALIM ABDOOL KARIM**

● The first person with confirmed Covid-19 in SA was a traveller who had returned from Italy and was diagnosed on March 5. When 402 cases had been identified after 18 days, the government announced a national lockdown, which was implemented four days later when the epidemic had a doubling time of two days and there were 1,170 identified cases (Figure 1A). During 35 days of strict lockdown, the doubling time slowed to 15 days, and there were a total of 5,647 cases (with 103 deaths) by April 30.

Since May 1, when the process of easing the lockdown started, the epidemic's doubling time was at 12 days. On May 27, SA had a cumulative total of 25,937 cases, of which 11,934 were still active cases, from 634,996 tests. By that date there had been 552 deaths. About one in 50 patients confirmed with Covid-19 have died, a case fatality rate of 2.1%.

SA's national Covid-19 response has comprised eight overlapping stages. The first stage was focused on preparing for Covid-19, including establishing testing capacity. Stage 2 started when there were 51 cases, 10 days after the first South African patient was diagnosed. The government declared a national state of disaster, banning international travel, closing schools, restricting gatherings, and promoting social distancing and hand hygiene. A high-level advisory committee with 51 clinicians, virologists, epidemiologists, mathematical modellers, public health practitioners and other experts was established to provide evidence-based advice to the minister of health.

Stage 3 consisted of the national lockdown, which is now being eased slowly. While it slowed viral spread, the lockdown has caused substantial economic hardship, especially among poor and vulnerable people, with both government financial support and community charitable efforts under way to ameliorate this problem. The contraction of the economy during this period is concerning as it could have important long-term consequences. Restrictions on movement and concerns about the risk of contracting Covid-19 in health-care facilities has brought major reductions in the use of health services, thereby compromising continuity of care for people with HIV, tuberculosis (TB) and chronic noncommunicable diseases.

During stage 4 of the national Covid-19 response, which was initiated 33 days after the first case, the government deployed more than 28,000 community health workers to the highest-risk communities to undertake active house-to-house case finding. SA's community contact-tracing teams, established for TB control, have been used for Covid-19 contact tracing and monitoring of compliance with quarantine. With the highest HIV burden in the world, the country has a network of providers, including tens of thousands of trained community health workers experienced in conducting door-to-door visits in socially vulnerable communities.

This community-based response has been used to screen over 12-million (just over one in five) people for Covid-19. A cellphone application is widely used to administer a symptom checklist, and data for each household are uploaded along with phone location co-ordinates to a central database to map screening coverage. People with Covid-19 symptoms are referred to mobile testing stations or nearby health facilities and are advised to self-quarantine thereafter.

Stage 5, which is currently being implemented, involves identification of hotspots and implementation of prevention measures in areas with localised outbreaks. Local outbreaks in supermarkets and grocery stores, possibly with some super-spreading events, have led to several hotspots in the Western Cape, where the epidemic is now most advanced.

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Stage 6 is focused on providing medical care, including constructing field hospitals – some in convention centres. Locally appropriate clinical guidelines have been made available and are being updated regularly. Preparations for the surge in cases are under way.

Stage 7 involves preparing for deaths, burials, and the mental health challenges associated with bereavement.

The final stage, stage 8, focuses on staying vigilant by engaging in case-finding activities and monitoring population immunity levels using serosurveys in preparation for subsequent epidemic waves.

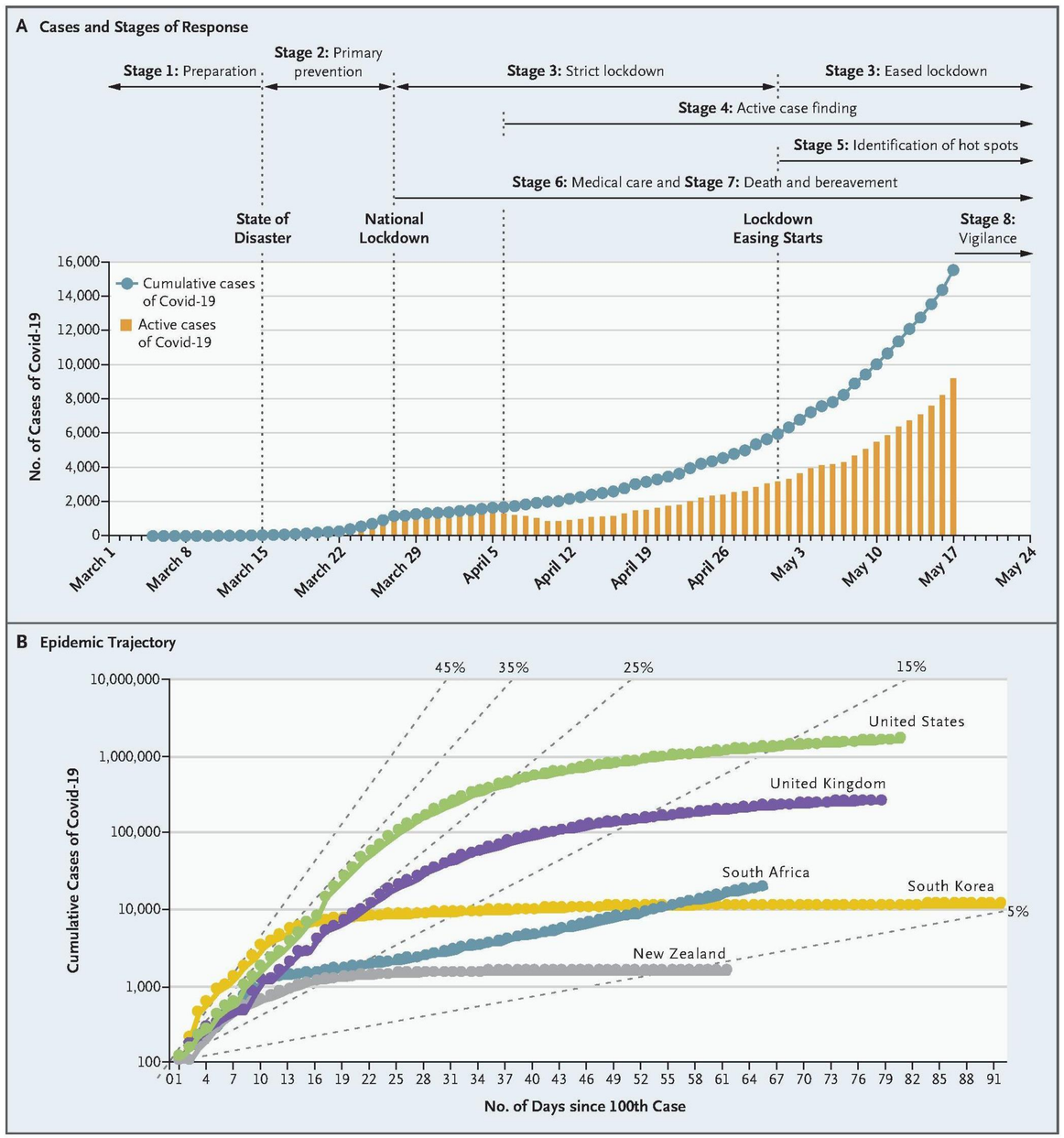
Several challenges may hinder SA's efforts to limit its epidemic. The country has scaled up testing and is trying to scale it up even further than the current cumulative rate of 9.6 tests per 1,000 people. Initially, restrictive criteria made it difficult for people to get tested in public clinics and hospitals, with private sector providers conducting about 80% of tests. The criteria were changed after about one month, and most testing now occurs in the public sector. Securing sufficient testing supplies and personal protective equipment for health-care personnel is proving to be a major challenge as there is a worldwide shortage of these supplies. Insufficient availability of test kits has led to delays in results and prioritisation of hospitalised patients, health-care workers and outbreaks.

Among people living in informal settlements, where population density is high, implementing preventive interventions such as hand washing and social distancing is difficult. There are about 7.9-million people living with HIV and about a quarter of a million incident cases of TB in SA. Covid-19 could add severe strain to the already overburdened health-care system, particularly if people with HIV or TB are at higher risk of developing severe Covid-19 illness. The potential for a double challenge looms as SA prepares to enter its annual flu season.

A major challenge is the speed at which the epidemic is evolving, putting enormous pressure on the response to adapt rapidly, especially in the face of limited information as well as constrained capacity and resources. It is extremely difficult to keep creating new, while dismantling previous, Covid-19 programmes and interventions in rapid succession. It is an almost impossible task to convert the multitude of new policy decisions demanded by the Covid-19 response into carefully laid-out detailed plans and then proceeding to converting them into fully fledged programmes to keep pace with the rapidly changing epidemic. Despite the ever-present infection risks, burnout and fatigue, the selfless dedication and commitment to implementing the ever-changing Covid-19 response on the ground that I witness each day is truly humbling.

SA's early interventions have delayed the Covid-19 peak (Figure 1B) and the persistently low community transmission levels achieved in most parts of the country have started the process of "flattening the curve".

As SA braces for an expected surge of cases over the coming weeks, initially in the Western Cape with the other provinces following later, I can best describe the national Covid-19 response as "sailing a ship while building it".




**Professor Salim Abdool Karim heads the committee of scientists advising the government on its response to the Covid-19 pandemic.** Picture: Sandile Ndlovu

**Figure 1: Covid-19 in SA. Panel A shows the number of cumulative and active cases and the stages of SA's Covid-19 response. Panel B shows SA's Covid-19 epidemic trajectory and the trajectory in selected other countries. Diagonal dotted lines indicate hypothetical trajectories for daily increases in cases of 5%, 15%, 25%, 35% or 45%.** The data for Panel B are from Tulio de Oliveira, Maria Schuld, and the University of KwaZulu-Natal CoV Big Data Consortium.

* Prof Abdool Karim is chair of SA's ministerial advisory committee for Covid-19. This is an edited version of an article published in the New England Journal of Medicine on Friday.