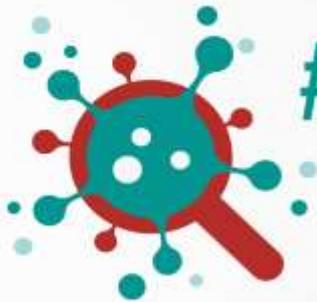# RESEARCHERS BOOTCAMP

#OPENUPYOURTHINKING
READY, SET, *THINK!*

Education Researchers Respond to The COVID-19 Pandemic

Research Report

Theme 4:

COVID-19 lockdowns: can they help to govern the pandemic in Africa?

Project Lead: Andrew Paterson
May 2020

JET EDUCATION SERVICES

NATIONAL EDUCATION COLLABORATION TRUST

Abstract

The aim of analysis in this report is to develop a framework that helps to understand how governments have been responding to the COVID-19 attack on human societies. In the wake of the attack, government responses have become referred to as 'lockdown' strategies.

A means of describing the intention of these lockdown strategies is through identifying what functions governments have been obliged to mobilise to meet the needs emerging from the COVID-19 attack on the health of citizens. The severity of the COVID-19 attack on health and government responses have impacted on almost all facets of the daily lives of citizens: in particular work, education, recreation and freedom of association.

The lockdown strategy is primarily intended to protect families, individuals, communities and people residing in various institutions – hospitals, prisons, armed forces and homes for the elderly – from COVID-19 infection. Furthermore, the requirement of a severe lockdown requires all people to 'shelter in place'. Consequently, the predictability of 'normal' life and the taken-for-granted uninterrupted operation of social institutions cannot be sustained. The cumulative effect of lockdown conditions adopted by governments all over the world has been to severely disrupt nearly all forms of economic and social exchange.

Nevertheless, people and governments have had to work within and make sense of the new parameters. This report is the outcome of efforts to understand the impact of lockdowns on the functioning of societies and economies and education systems with reference to the African context.

Contents

Introduction

Starting in January 2020, COVID-19 threatened China, devastated parts of Europe and North America and has spread to establish its presence in more than 200 countries worldwide. While COVID -19 has secured a hold on every continent, the deepening of its presence has been slowest on the African continent. There is opportunity to consider how the pattern of response to the impact of COVID-19 in developing countries in Africa differs to that in Europe, North America and South East Asia .

This study aimed to examine the evolving strategies and practices of governments as they respond to COVID-19; the resulting report presents a comparative analysis of a set of countries that have reacted in different ways to the pandemic (see Appendix A). The analysis was not a simple task: the impacts of and government's responses to COVID-19 are multidimensional and fast moving and information through electronic media is plentiful and of mixed quality.

Governments are the primary instruments according to which decisions are supposed to be made in the interests of the wider society, and thus governments have to intervene as the primary interface between societies and other economies and threats of war, pandemics and climate change. Across the globe countries differ tremendously in their approach to COVID-19 based on the stage of the pandemic in the country, available resources, cultural context, socio-economic features, political environment, and perceived risk factors.

Our point of departure was to conduct a limited number of African and non-African case studies of how particular countries and their governments have responded to COVID-19. These case studies provided the platform for the analysis. Comprehensive description and analysis of all facets of the COVID-19 pandemic on a set of case study countries would be too ambitious. The analysis thus concentrated on a few themes that emerged out of the case studies. In particular, the strategy of school closures and the impact on learning are highlighted.

The report goes on to develop a framework of government actions that have been carried out in response to COVID-19. This framework is interrogated as a means of supporting a structured approach to understanding government responses to COVID-19. The discussion concentrates on the functions and resources that governments can mobilise to defend the health, institutions, economy and social stability in their countries. Difficulties in assessing the impact of government strategies are interrogated.

This report has two parts. The first offers a meta-analysis of the key strategies that governments across the globe are adopting to deal with COVID-19. We characterise these strategies based on:

- 'Lockdowns' (China, India, Nigeria, South Africa);
- 'Tracking and tracing' of infected people to close down transmissions (South Korea); and
- Mixed approaches (Italy and United States).

In the course of this analysis the relative advantages and disadvantages of the different approaches are highlighted, taking into account that these tactics are driven as much by technical or scientific reasons as by

political considerations. (Other marginal policy responses include 'denialism' such as espoused by Brazil's president but not by his country's state governors. This group will not be discussed in this report).

In the second part, emerging from the case studies, the report considers challenges that governments may encounter as they select and implement their responses to COVID-19 and that may prove relevant to dealing with COVID-19 in African and developing countries. The report aims to steer clear of the assumption that developing countries have no choice but to try to emulate high income countries.

Methodology

The case study countries selected for this study were: China, India, Italy, Nigeria, South Africa, South Korea and the United States. The selection takes in three developing countries where the COVID-19 pandemic was at a relatively early stage, three high income countries which responded to COVID-19 in different ways, and China. The research was conducted during the South African COVID-19 lockdown period between 31 March and 30 April, followed by report writing. The case studies were not selected based on an a priori assumption that the countries must have or already offered useful or valuable lessons to share from the progress of their battles with COVID-19. The findings drawn from the case studies are presented as a thematic synthesis.

Progress of COVID-19 pandemic in the case study countries

Figure 1 provides a summary of confirmed COVID-19 cases in the case study countries on May 7th. (It should be noted that these statistics do not represent the true number of confirmed cases because of limits inherent in testing only part of a population). The trend-lines are drawn from the 100th confirmed case so that change in confirmed infections can be more easily compared. The lines for China and South Korea are flat, showing negligible increases in their cases. In the case of Italy – and to a lesser extent the United States – the curved lines reveal that new infections were slowing down. On the day for which data was captured, the South African and Nigerian lines reveal consistent increases in infections.

The figure illustrates how different countries were at different phases of the first wave of COVID-19 infections. If, for example, in comparative terms, Nigeria's COVID-19 experience was two months behind China, what advance knowledge could be of assistance in Nigeria's case, and what could Nigeria do with hard-won information drawn from countries struck by COVID-19 at an earlier stage?
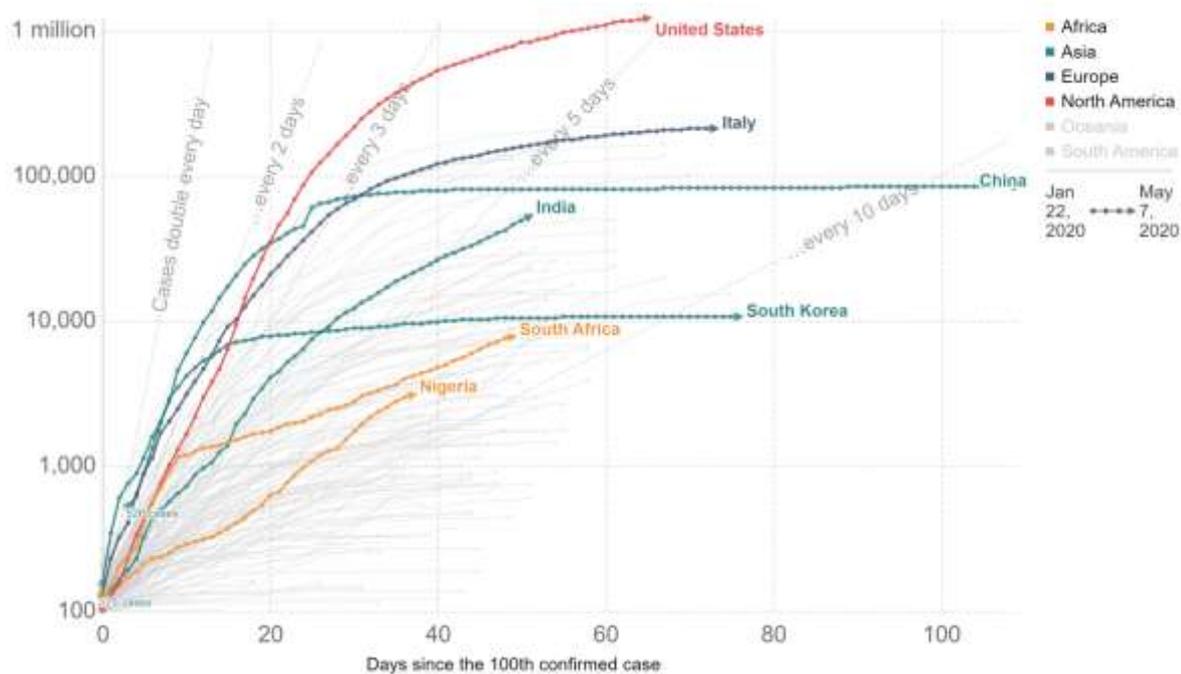
Figure 1: Total confirmed COVID-19 cases (7 May 2020) (Oxford University,BSG,2020a)

The argument has been made widely that the more countries learn from the earlier experience of other countries, the better prepared they will be to withstand the onslaught of COVID-19. The analysis will uncover three caveats. Even with fore-knowledge in hand: countries must have sufficient financial and other resources in hand (countries caught in the middle of the global pandemic struggle to source supplies and support); political considerations impact option selection; and context matters, where local social and economic contexts impact uniquely on how a pandemic behaves.

Part 1: Governing COVID-19: Models of governance

The appearance of COVID-19 in the People's Republic of China at first presented as a public health emergency but soon the realisation set in that COVID-19 was threatening the social, economic and political structure of the country in many dimensions. Based on observation of China's responses alone, it became obvious that if COVID-19 spread internationally, governments would have to mobilise many of their functions in order to meet the challenges brought about by the COVID-19 epidemic-pandemic.

The world witnessed as China mounted an extremely wide-ranging offensive against COVID-19 on many fronts. In practice, the Communist Party as the ruling party exercises complete control over governance in China: this enabled the party leadership to make any decisions deemed necessary to combat COVID-19. Many such decisions would not have been possible in democracies with greater checks and balances and delays in legal processes adjudicating admissibility of actions. The Chinese lockdown materialised as a multi-layered and highly controlled social and economic environment. Actions taken in China were heavily criticised as authoritarian by politicians in western democracies. Our analysis of China's strategy has benefited from such critiques which have brought to light government and party controls over public and private information, association, movement and media and the securitisation of public spaces. In spite of

these reservations, it is still worth enquiring to what extent the China lockdown influenced subsequent lockdowns in the period that followed.

Government Counter COVID Intervention Framework

Using China's response as a reference point, we arrived at a descriptive framework of government functions that could be used to counter COVID-19. Through systematically identifying the government functions brought into play in China and building a framework around these, we developed a template against which to compare how different governments have responded. The framework offers a structured approach to identifying which functions a government might feel obliged to activate under COVID-19 pressure.

In addition, this framework is useful for unpacking and identifying the policy tools that might be introduced into a lockdown. This is in itself an important contribution in the light of discussions about lockdown which assume a binary choice between 'lockdown' on one hand and 'no lockdown' on the other, ignoring the possible gradations or options of lockdown – for instance to employ armed forces or not. The framework offers a point of departure for discussing the strategic balance taken in different countries and how these involve trade-off decisions in balancing public health protection, public trust in the evidence used and tolerance of infringements of various rights – to subsistence, to work, to freedom of movement, to access government services.

The framework is presented below and uses generic references (and not official Chinese nomenclature) for government department functions that were brought into action in defending against COVID-19:

Table 1: Government Counter COVID Intervention Framework

	Function	Actions
Health of the population		
1.	Pharmacological interventions by Health Departments	Treating symptoms and opportunistic infections such as pneumonia; requiring medical personnel and facilities including beds, medicine, respirators, intensive care and personal protective equipment (PPE)
2.	Health: non- pharmacological interventions	a. Large scale testing b. Contact tracing c. Management and administration of centralised quarantine d. Door to door screening for symptoms (largescale/targeted) e. Community education on personal protection and prevention
Management of movement of people		
3.	Immigration, emigration, travel	Control over international movement
4.	Domestic and home affairs	Control over internal movement; partitioning of the country
5.	Transport and infrastructure systems	Control over urban and rural commuting and local mobility
Jurisdiction over urban and rural recreation and free association		
6.	State/province, city, municipal government	City quarantining; control of public and religious gatherings, restriction of restaurants, entertainment, etc.

Management of and closure of education institutions	
7. Education, including ECD, school and post school	a. Control over gathering and movement of education related populations b. Education of students on personal protection and prevention c. Implementation of online learning
Closing down and deactivating businesses and trading	
8. Industrial planning and production planning	Control over public and private business activities
Financial support to affected populations and businesses	
9. Finance/Treasury	Funding of emergency pandemic interventions; support for people affected by lockdown strategy
State security and control over the society	
10. Media control/ control of information	Counteracting fake news, dissent, xenophobia
11. Surveillance	National surveillance using data and artificial intelligence (AI) to track population
12. Policing	Crime prevention
13. Military	Public order enforcement
14. State information systems	Using individual information to track people
15. Legal system	Utilising the framework of laws that permits government actions, links between party political activity and state control

Source: Paterson (2020)

Oxford COVID-19 Government Response Tracker

Another example of an initiative to track government responses to COVID-19 has been developed by the Blavatnik School of Government, University of Oxford. The Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et.al,2020) is used as a model for gathering empirical data on the extent to which governments have brought into action responses identified in Table2 below. The version in the table below reflects updates made to the original version by the creators to improve its utility.

Table 2: Oxford COVID-19 Government Response Tracker

Closures and Containment
1. School closing
2. Workplace closing
3. Cancel public events
4. Restrictions on gathering size
5. Close public transport
6. 'Shelter-in-place' and home confinement orders

7.	Restrictions on internal movement
8.	Restrictions on international travel
Economic response	
1.	Income support
2.	Debt/contract relief for households
3.	Fiscal measures
4.	Giving international support
Public health/health system	
1.	Public information campaign
2.	Testing policy
3.	Contact tracing
4.	Emergency investment in healthcare
5.	Investment in Covid-19 vaccines
Miscellaneous	
1.	Other responses

Source: University of Oxford (2020b), 12 May 2020
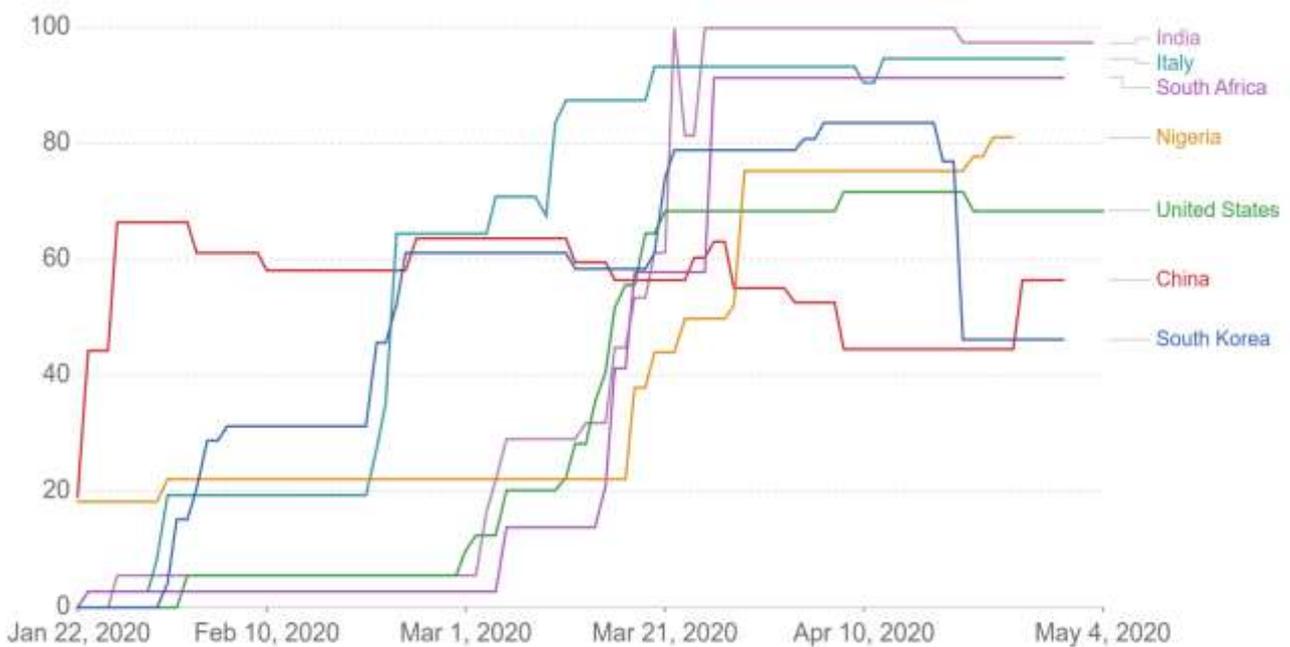
Government Response Stringency Index

Data on each of the above responses is captured and fed into the Government Response Stringency Index (https://covidtracker.bsg.ox.ac.uk/)which usefully plots changes in the rigour, strictness or severity of government responses over time. The index uses data from nine of the above response indicators which are then rendered as a value out of 100. The index is meant to generate a value based on the number of responses and strictness of government policy. This index is represented in the visualisation below (Figure 2), giving a picture of the relative stringency among our case study countries.

From the timeline we can see:

- In **China** (red line), substantial lockdown measures were practically immediately put in place. Notice however, that according to the index, China's stringency is not as high as might be expected. This may be due to the criteria used and weighting of responses.
- For **Italy** (turquoise line), lockdown was not a premeditated choice as in China. Italy initially put in place mild lockdown restrictions before transitioning to higher levels of lockdown relatively late following high numbers of fatalities.
- **South Korea** (dark blue line) increased its lockdown stringency at the same time as Italy but was in a position to reduce severity when its tactics of testing and tracing together with moderate restrictions brought infections down.

- **India** (light purple line) and **South Africa** (dark purple line) quickly established comprehensive lockdowns. The government of India gave citizens barely four hours' notice before activating lockdown.
- **Nigeria** (orange line), together with India and South Africa and the United States, increased their response stringency almost simultaneously, indicating how the COVID-19 wave of infections prompted governments to respond.
- Looking at the **United States** (green line) reveals how late that country responded to COVID-19 and also how the federal government was not prepared to impose lockdown at a national level, with states having to make their own tactical decisions

Source: https://covid-policy-tracker/legacy_data_20200425/OxCGRT_20200425 LEGACY.csv

Figure 2: COVID-19: Government Response Stringency Index, Jan 22 to May 4, 2020

The Government Response Stringency Index for China is much lower than might have been expected based on our observations of the comprehensive lockdown implemented in China. An important difference between the Government Response Stringency Index and our Government Counter COVID Intervention Framework is that the latter identifies a broader set of interventions including options for implementing more repressive means that were not included in the former index. We argue that some means of indicating actions of government that are inclined to regulate social conditions domestically should be included in assessing overall government stringency or control; these actions include: limiting access to information (such as statistics on COVID-19); subduing critique or dissent; restricting legitimate participation in decision making processes; condoning excessive force by police/army and practising denialism.

The Government Response Stringency Index seems to focus on identifying the intention to implement response measures but does not speak to the quality of implementation or impact of the measures. What

each country calls 'lockdown' includes a different combination of interventions. Perhaps cautiously, the authors of the Response Stringency Index avoid assessing or quantifying the effectiveness of implementation or impact of each government's measures as it would be difficult to compute the overall effectiveness of a combination of measures instituted at a particular time.

From the output of the Government Response Stringency Index, it is clear that country strategies to combat COVID-19 can vary over time, in intensity and in the selection of interventions. The core aim of government response strategies is 'flattening the curve', which refers to limiting the number of infected people requiring medical attention or hospitalisation, and spreading the volume of infections at any point in time over a longer time expanse. Actions to 'flatten the curve' can imply any interventions, be they medical or non-pharmaceutical. The latter, involving governing people's activities, is the key means of governing COVID-19, given that the virus' mobility is primarily dependent on human behaviour.

What would be feasible metrics for assessing how effective a lockdown is? Answering this question could help countries and cities to obtain better outcomes from their lockdowns. Cost benefit analysis of the interventions identified in the frameworks above and their relative contribution could perhaps assist government. Yet such work would not be practically feasible given the frightening rate at which COVID-19 replicates in new countries and populations – unless in retrospect. At best, governments have access to modelling studies, the details and numbers of which of many governments prefer not to share.

Lockdown – politics of strategy choice

Without viable empirical evidence, the benefits and pitfalls of lockdown as a temporary defence or delaying tactic against COVID-19 rates of infection are loudly debated. We must then consider why lockdowns in some form are so widely adopted in a majority of countries across the globe?

The World Health Organization (WHO) has observed that governments and populations are invariably unprepared for the onslaught of COVID-19, hence the need to buy time (WHO, 2020). This fact is often underestimated: short time horizons severely limit options available in the presence of a pandemic. This is why so few governments had any viable options or alternative strategies other than lockdown. Most had no other choice, though this reality is quickly glossed over. Globally, lockdown is the de facto default path. According to the United Nations Economic Commission for Africa (UNECA), at least 42 African countries put in place either partial or full lockdowns (UNECA,2020).

Governments are mindful that their lockdown decisions are sending a signal to regional neighbours as well as to economic and investment partners. Nonetheless, lockdown is fundamentally a domestic policy concern. What governments are learning first hand is that lockdowns are technically and scientifically complex and highly expensive events. Far less has been spoken about the realpolitik of making lockdown decisions. Taking a particular lockdown path involves decisions as to what interventions to include in the lockdown, *and* later how to exit lockdown, which inevitably have political dimensions, particularly related to public buy-in and consent.

COVID-19 brings severe trauma and drastically increases risk to the stability of institutions in the economy, in the society and in governance. From a political perspective, the incumbent party in government and

opposition parties can view lockdown as a means to an end. However, the battle against COVID-19 is fast moving. A lockdown offers temporary respite and cannot be viewed as an end in itself. The lockdown path presents opportunities for a sitting government to influence lockdown in ways that secure preferential outcomes for sustaining its own control over political power.

For a government in power that is risk averse or needs to secure and stabilise its political advantage, lockdown may be seen to offer a modicum of political space and perhaps a period of enhanced control in which to manoeuvre. In the short term, governments can make quick gains in support. Taking a lockdown route can convey that a government is showing its resolve and, at least initially, can generate confidence and a sense of clarity of purpose among the citizenry. Lockdown also has concomitant political implications. It offers a rationale - and legal grounds - to mobilise security forces, which alternative tactics do not permit. In a situation of such complexity, unknowns and risk, it is unsurprising that governments have taken the lockdown option.

As time passes under lockdown, political opposition and economic, rights-based and other lobbies inevitably begin pressurising government to release or ease lockdown. Low-income households and communities and industries and business owners making huge sacrifices will be highly stressed. Yet the countervailing threat of COVID-19 infections will advance. The impending move out of lockdown must be decided. Recovery plan provisioning and targeting must be in place. While uncertainty drives calls for better information to justify a pronouncement, government is aware that the only path out of lockdown is through trial-and-error. The transition out of lockdown is both politically and economically risky

Taking the plunge, government announces its intention to lift lockdown, aware that cases of confirmed infections are rising. But it cannot do otherwise as intelligence clearly demonstrates the urgent need to open up economic sectors to staunch enterprise losses and enable workers to earn wages. Confidence in government's decisions declines. Facing turbulent conditions, government may opt to retain emergency powers in its back pocket.

Similar changes confront a large cohort of governments worldwide, including those of South Africa, Nigeria and India. Italy was one of a group of European countries that for a short time avoided implementing lockdown measures but could not avoid taking stringent action when faced by very high infection rates in the north of the country. The United States is an extreme case since it is mired in a patchwork and highly permeable lockdown, disparities in state-level buy-in, poor coordination with high hopes pinned on immense testing plans for the whole population, and rising levels of discord in the society.

In every country where lockdown is the default option, testing is undertaken as complementary to, but not as a substitute for, lockdown. It is argued that if testing and tracing can be expanded strategically to identify infection outbreaks and medical services are promptly mobilised, the outbreak hotspots can be contained to forestall fatality levels. And if testing and tracing can keep up with the spread of infection, results would more accurately reflect the spread of infections. With more testing done, the information generated becomes less biased and supports a more accurate estimation of the prevalence of COVID-19. Countries differ drastically in their ability to test and to use data that informs proactive strategies. Doubts and questions about COVID-19 test data feed controversies at national level, from over the validity of

scientific contributions to the trustworthiness of government policy decisions. The discussion is picked up again further into this report.

Alternative to lockdown: 'testing and tracing' and trust

In a small group of countries that includes South Korea, primary emphasis is given to testing for the presence of the COVID-19 through viral and antibody tests. A positive test result and prognosis then triggers allocation of infected persons to quarantine or to hospitalisation. The same result also triggers tracing of people with whom the infected person has had contact, who in turn are also tested and treated accordingly. Testing has to be quick – 12 to 24 hour turnaround on test results – to quickly trace people and prevent geometric progression in asymptomatic transmissions. The aim is to disrupt the ability of the virus to reproduce. With a hypothetical 100% success rate in tracing contacts back to the original individual – or 'index' case – it is possible to break the chain of transmission, and the virus is then said to have been 'suppressed'.

This approach assumes the presence of technology in the society (ubiquitous mobile phones and personal data), surveillance data (identity and movement monitoring by government), consent in society (for the state to source their personal data), medical technical ability to test and manufacture tests, adequate capacity of hospital and quarantine accommodation, and highly efficient tracing capacity.

A key point of interest is how a cohort of countries like South Korea (also Taiwan) became confident enough to adopt strategies that emphasise testing and tracing for COVID-19 infection in the population. What underlies this approach is a common understanding that it is based on shared trust that government and citizens will dependably play their roles. Our observation is that the politics of testing and tracing in South Korea has to be based on substantial levels of trust between citizens and the government, which is necessarily linked to trust in government institutions mandated to implement the testing and tracing approach. The strategy would also depend on general confidence that government would make reasonable strategy judgements based on empirical evidence of the pandemic. In this environment, shared trust between citizens and government and levels of social cohesion in the society can play a role. Reference has also been made to cultural tendencies towards compliance or of willingness to collaborate in common purpose such as in South Korea.

We do not seek to stereotype the testing and tracing countries as a particular regional phenomenon and include countries like Sweden, which has managed to hold a balance in its response to COVID-19, in this category. There is acceptance of the movement of infections across the population, while social distancing disciplines are maintained in place, backed by strong health care capacity and protection for older people. An estimated 25–40 per cent of Stockholm had contracted COVID-19 by March/April 2020 which is understood as a gradual process towards securing incrementally higher levels of immunity and remaining vigilant without losing control. This strategy would not be advisable or suited for developing country contexts with low health-care access and comorbidities (UNECA, 2020) possibly including malaria, poor nutrition and other identified risk factors.

As lockdown has progressed a searching question insistently asked in many high income countries is whether lockdown tactics have already catalysed greater domestic social and economic damage than the

COVID-19 virus could. The immediate economic costs in unemployment, loss of business turnover and social costs of foregone wages and hunger are reckoned daily, country by country. Some commentators have bluntly averred that from an economic and social protection viewpoint, the lockdown path is and will remain the poorest decision that governments could take. However, this has not been a free choice by any means. Our analysis emphasises that lockdown has been a 'default' or a forced choice for many governments finding themselves lacking preparation to follow alternative ways of dealing with COVID-19.

Similarly, critics have contrasted the long-term consequences and merits of 'lockdown' and 'testing and tracing'. Both groups will suffer consequences. The former is associated with the distress of whole business sectors being eliminated, small and medium business closures, rising barriers to entry, stubborn unemployment, disruption of industrial value chains, and decline in international trade. However, the 'testing and tracing' countries will not escape the combined after-effects of COVID-19 and the lockdown policy. The 'testing and tracing' approach is likely to bring the associated benefit of shielding the domestic economy. But countries like South Korea will nevertheless share the pain of deterioration in partner country economies and in the global economy.

A chronological perspective on 'lockdown' and 'testing and tracing' responses

Due to the preoccupation of debates with the economic consequences of lockdown versus the testing and tracing type of response to COVID-19, we propose a time-based comparison between lockdown and the testing and tracing approach.

Based on our observations, we describe the process of lockdown and testing and tracing that countries are passing through in Figure 3 below.

Using a chronology, we argue that the lockdown approach is likely to place very high levels of stress on politicians, government, economy and the society. Lockdowns have in many instances been pronounced with little consultation or by decree, sometimes invoking emergency powers. A lockdown timeline is punctuated by transitions from one stage to another, involving requirements on society to change behaviour. There is dislocation of families, for instance, when schools and workplaces are in different modes of operation. Adaptation out of the safety of lockdown for some generates familial and individual tensions. For others it brings some relief from financial hardship and food shortages. For workers returning to employment, the safety of the workplace and compliance of the employer becomes a primary source of fear and tension.

In contrast, the testing and tracing approach offers continuity, stability and social cohesion and much less exposure to stress than in the experience of lockdowns. It is usually based on a deliberative process and emerges from political contexts where there seem to be developed relations of trust between citizens and government.
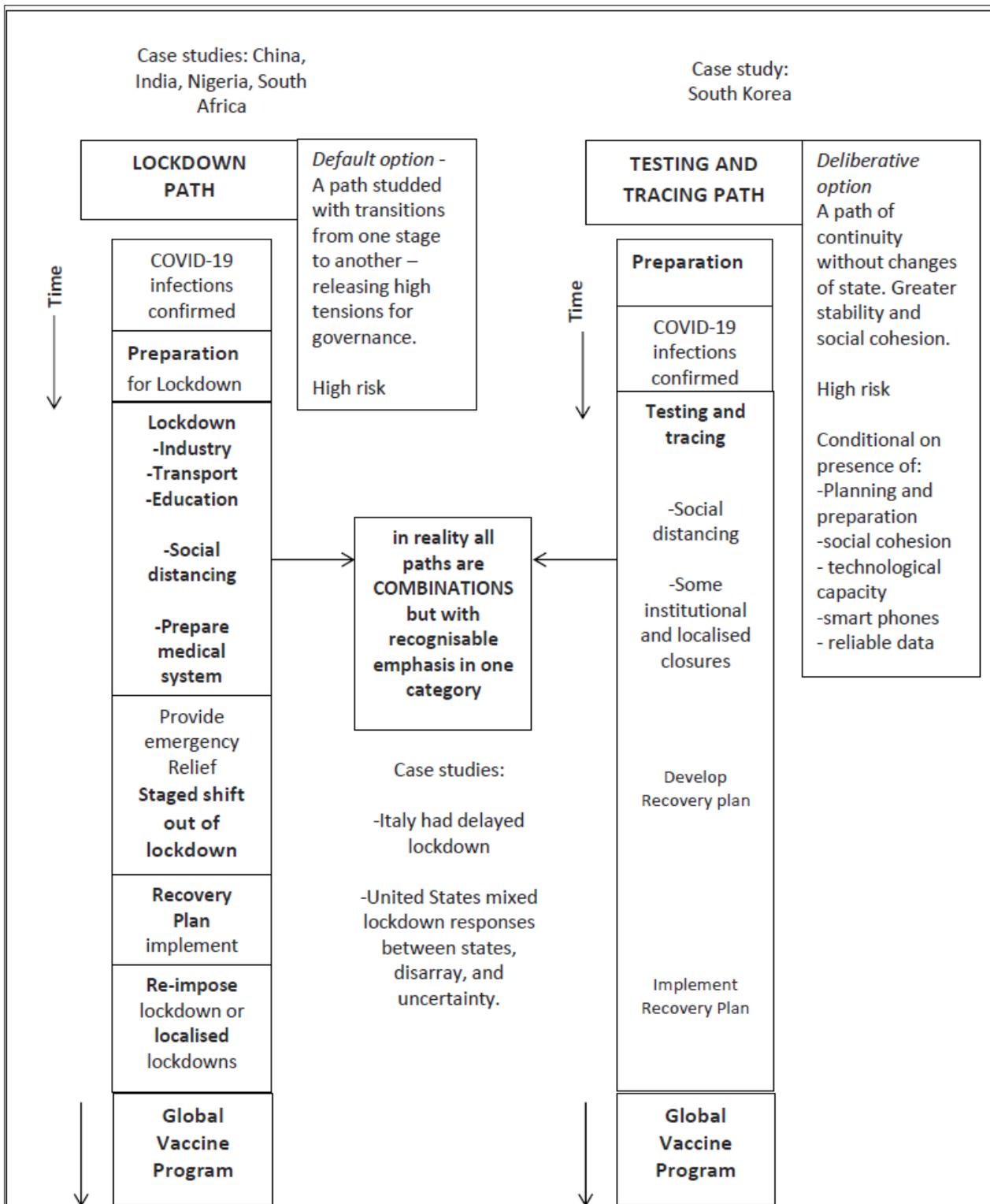
Figure 3: Country choices for defending against COVID-19 (lockdown path, testing and tracing path, mixed path)

A critical issue will be to assess levels of risk in each approach. It appears that both are probably equally as risky. Neither of these measures can guarantee complete freedom from outbreaks. South Korea has been forced to retain high levels of alert and close down areas where hotspots emerge. Only a vaccine seems to offer a lasting solution. That is why this analysis assumes that a key point of closure will be with the discovery of a vaccination.

Opening schools after lockdown: the politics of evidence, service delivery and trust

During the COVID-19 outbreak, very large numbers of schools across national school systems have been closed as a standard feature of country lockdown strategies, affecting hundreds of millions of school-age children and learners. Many countries are planning lockdown exit strategies that entail lifting social distancing restrictions, including reopening schools, and options are being evaluated. Since it is clear that there is no prospect of a quick resolution to the COVID-19 crisis, assessing the costs and benefits of school closures is a crucial long term question, with children's futures in the balance.

Reopening schools after lockdown has become a feature of contention in almost every case study country's education system. What emerges in public debates is a complex relationship between different knowledge domains of science, policy and politics and how these are constructed by stakeholders such as government officials, school-based teachers and principals, medical scientists, teacher unions, and parent communities.

Costs and benefits

There are strong arguments against school closures for economic reasons. School closures are strongly criticised by employers, who can't operate their businesses if they lose access to their workforce. If caregivers or parents are obliged to stay at home to care for children, they lose income, which can worsen poverty and hunger. Economic estimates are that school closures at an aggregate level impact negatively on national productivity (Ridenhour et al., 2011).

Closure of schools is strongly discouraged for educational reasons. Shorter closures impact on schooling through learning loss, but longer periods of school closure can impair learning development. Recouping missing curriculum elements requires extra effort from learner s and teachers, while some learners may not return to school. In middle- and low-income countries, gains in expanded access achieved at great effort could recede.

School closures also disrupt school-based learner feeding programmes which can strain household food self-sufficiency. In these circumstances, vulnerable rural households may require child members to work on the family farm. In fragile states, the retrogressive effects of school closure 'can leave children at risk of child labour, early marriage, sexual exploitation, and even recruitment into militias.' (Minardi, Hares & Crawfurd, 2020).

It is well known that in addition to closing schools, government lockdown measures also include closing workplaces, closing public transport, cancelling public events and restricting the size of private events. The

assumption justifying school closures is that schools do in some way contribute to increased infections through bringing learners into close contact for extended periods of time every day of the school year.

Since closing schools can be so destructive to education, which is the primary source of national stocks of knowledge, skills, and innovative capabilities needed to meet developmental goals and generate economic and social value, it is useful to know the relative contribution of school closures to controlling infections in the society. School closures are implemented concurrent with other interventions, so it is difficult to establish how much school closures themselves contribute to suppressing spread of the virus. The outbreak of COVID-19 is so new to medical science that there are no drugs available specifically for treatment of COVID-19 infection. Nor is there a vaccine. So according to Lodge, Schatz and Drake (2020:1), national campaigns to counter COVID-19 must rely on the above social distancing interventions plus large scale individual behaviour change such as washing hands, wearing masks and other non-medical means to limit human-to-human transmission and contain the virus.

The medical and epidemiological evidence

The onset of COVID-19 has stimulated substantial research on the impact of school closures and on COVID-19 infections in children that may impact policy discussions - if not decisions. Medical and epidemiological evidence in hand about COVID-19 among school-age children is not clear-cut. The central questions are: Are children of school-going age at risk of being infected by COVID-19? Are children who become infected at risk of severe complications and fatality from COVID-19 infection? Do children who are infected pose a risk of infecting others at school, at home or in public? Clear-cut answers to these questions are needed to confirm whether infection rates in homes and schools are more or less likely to escalate when schools open. An alternative point of departure would be to assess the contribution of school closures in limiting infections through modelling techniques.

A rapid systematic review of recent research on the effectiveness of school closures in restricting the spread of COVID-19 has brought into question the effectiveness of school closures in limiting infections. The authors, Viner et al. (2020: 397) draw attention to data from research on the severe acute respiratory syndrome (SARS) outbreak in mainland China, Hong Kong, and Singapore which suggests that 'school closures did not contribute to the control of the epidemic.'

Further, a modelling study by Ferguson, Laydon, Nedjati-Gilani, et al. (2020:15) for the United Kingdom finds that 'school closure is predicted to be insufficient to mitigate (never mind supress) an epidemic in isolation; this contrasts with the situation in seasonal influenza epidemics, where children are the key drivers of transmission due to adults having higher immunity levels.' More specifically, modelling shows combined school and university closures to generate only between 2% and 4% reduction in deaths (Ferguson et al., : 9. Nonetheless, this lone finding does confirm assumptions that school closures may contribute in a limited way to holding back infections.

COVID-19 was initially presumed to be highly contagious to all people, so the trade-off decision between sacrificing children's education and increased likelihood of infections, illness and fatalities was hard to contemplate. However, recent findings (cited by Paulus and Bijker,2020) reported in the albeit lean literature on children's role in spreading COVID-19 suggest that children are less likely than adults to get

infected, less likely to get seriously ill if infected and less likely to infect adults. Further confirmation of these studies would make it easier to let early childhood development and early grade learners go back to school with assurance of a minimal risk of an outbreak of infection. However, medical evidence does not provide unequivocal clarity. For example, a recent study in preprint compared COVID-19 viral loads in patients across different age categories and found no significant difference between any pair of age categories, including children (Jones et al., 2020). Based on the results, the authors 'caution against an unlimited re-opening of schools and kindergartens in the present situation. Children may be as infectious as adults.'

However, Jones et al. (2020) argue that the work cited by Viner et al. (2020) above may have been biased by circumstances of lockdown and the preoccupation of much epidemiological work until now on adults. They say that the 'The timing of this work may have influenced the results because school and kindergarten closures were in place under lockdown in many countries before observational trials could begin (Jones et al., 2020). More recently, eminent scholars McConway and Spiegelhalter have heavily criticised Jones et al. (2020) for incorrectly analysing their own data and inadvertently drawing a false conclusion and have called for the Jones et al. paper to be withdrawn. These recent exchanges demonstrate the need for policy makers to be cautious about drawing findings from research into policy too soon.

Public trust

It may take longer for the contentious issue of children's safety to be resolved from a scientific perspective. There are numerous contributions to the medical and epidemiological research literature that bring new perspectives on the matter. This needs to continue until the contributions by researchers working on different facets of the same problem begin to bring clarity on what needs to be investigated. Meanwhile, uncertainties regarding children becoming infected and transmitting infection stand – which does nothing to ease the burden of policy makers who must make a determination on school opening under enormous pressure from parents and children themselves.

At the same time, it is quite apparent that parental misgivings and fears about allowing their children to return to school after lockdown are not necessarily allayed by the reassurances of education ministry officials regarding low probability of illness and even smaller probability of fatalities among children. The dilemma for parents is partly captured in the phrase: 'The numbers are low until it's your child' (Janes & Elmer, 2020), which highlights the gut feel of a parent that it is 'better to be safe than sorry'.

In the end, parent's decisions to send their children to school or not are not only shaped by their own understandings of medical research, by the education officials' representation of the medical evidence or by fear for the safety of their children; parents are influenced strongly by the level of trust they have formed with their child's school's teachers and principal as well as their trust in the provincial and national education departments. In South Africa, a substantial number of historically disadvantaged schools, especially in rural areas, do not have access to basic sanitation and potable water on the premises for learners to practice essential hygiene such as washing hands with soap. Parents are doubtful that proper social distancing can be practiced currently in overcrowded classrooms in urban and rural schools. The national Department of Basic Education has galvanised a campaign to provide temporary facilities and to

make good the gaps. Personal protective equipment for learners and teachers are being delivered to all schools.

This scenario has highlighted how the COVID-19 pandemic has exposed longstanding deficits in the basic servicing of numbers of schools and wide disparities between schools sited in rich and poor communities, affecting their preparedness to operate under COVID-19 conditions. How school communities can be supported to respond to the health threat of COVID-19 while at the same time sustaining school operations will be a strategic issue in developing countries.

Part 2: Exploratory analysis of challenges for African governments responding to or counteracting COVID-19

In this second part of our report, we refer back to the two frameworks introduced in the first part: the Government Counter COVID-19 Intervention Framework and the Oxford COVID-19 Government Response Tracker which identify a number of functions or responses that governments may activate in confronting COVID-19. We select a limited number of government functions for discussion and look at the two. The aim is to draw insights from the experience of the six case studies that anticipate likely challenges for African governments in their efforts to control COVID-19.

This discussion does not take for granted that the COVID-19 experience and lockdowns will follow events elsewhere as unique social and environmental conditions on the continent are likely to influence the behaviour of the virus. This report will aim to highlight key themes identified in the country case studies as relevant to improving our understanding of the constraints and opportunities that governments are likely to find in countering the impact of COVID-19 in implementing the lockdown and/or testing and tracing approaches. It is important to consider, even at this early stage of the COVID-19 advance on the continent, the conditions under which African governments must operate in defending the health of citizens, economies and societies and how they will influence the path of the pandemic on the continent.

Lockdown challenges

Double jeopardy for African countries fighting COVID-19

Through the period January to April, during which time China and then Italy, Spain, the United Kingdom, France and Germany, were defending against peak infections and fatalities due to COVID-19, other countries on the globe witnessed with bated breath. Few observers anticipated the extent of economic disruption in other parts of the world that would ensue from lockdowns by China and by prominent members of the European Union.

The global interconnectedness of markets and producers has increased interdependence of national economies. African countries are highly vulnerable to aftereffects of economic disruption in trade partner countries in Europe and Asia, and are now simultaneously experiencing the full impact of the virus locally.

The effects are taking place in two ways: the decline in bilateral and multilateral trade due to shutdowns in production at the producer side in Europe/Asia is impacting employment levels in Africa; and delays and

©JET EDUCATION SERVICES

dislocation of logistics and transport systems interfere with the supply of food and other essential goods locally. Worsening underemployment in formal and especially informal labour markets in Africa and food insecurity are coinciding with national lockdowns on the continent.

Under lockdown conditions – and thereafter – high proportions of acutely food-insecure people will be in need of assistance in the Horn f of Africa, Southern Africa and parts of West Africa (e.g. Nigeria). Parts of the continent are dependent on food that is externally sourced, such as rice from Asia, but producer countries are limiting exports to ensure domestic food availability. Many farmers, as small producers, are unable to travel to sell their produce, and regional travel transport restrictions are disrupting staple food value chains as well as livestock movement. This drives increases in local food prices. Nigeria is implementing an identity card which allows for the movement of agricultural workers and transporters to try to open up supply (George, 2020; Kumar, 2020).

Informal employment accounts for 85.8 per cent of all employment across all African economies (ILO, 2020a). The ILO reported that in the second half of April 2020, African informal sector workers numbering 164 million and 101 million people were working under either 'total lockdown' or 'partial lockdown', respectively (ILO, 2020b). Informal sector worker earnings are expected to decline, limiting household resources and food security. Future job losses could lead to 'reverse migration' of unemployed urban dwellers to rural areas and the further spread of COVID-19. (Food and Agriculture Organisation, 2020, International Labour Organisation (2020b).

These conditions are highlighted because they impact severely on people's ability to sustain household subsistence in urban and rural areas. As a consequence, citizens are more likely to disregard lockdowns and curfews to feed their families, which weakens the effectiveness of lockdowns. Moreover, these conditions place additional demands on governments to supply emergency food and health resources, and diverting funds to cover these urgent immediate costs can diminish recovery plan investment. Similar disadvantageous trade dependency relationships between countries will reproduce double-jeopardy pressures, especially for resource-based economies elsewhere on the globe. These circumstances have to be factored into an assessment of African and developing country moves to govern COVID-19.

Complexities of social distancing resistance and control

The case studies confirm that impediments to lockdown have to be taken into account, including living conditions of the population, that will weaken the impact of any lockdown. For example, 90 million Indian families live in one-room homes. In South Africa, large informal settlements with high densities and dwellings offering limited protection from the elements (in particular heat from the sun) as well as lack of access to clean water are serious impediments. There are also cultural practices and traditions that counter the concept of isolating households.

Our case study countries in Africa and India show that climate change and global warming restricts access to water. In dry or drought conditions, water must be used sparingly, so more frequent hand washing to prevent COVID-19 infection competes with other usage priorities.

©JET EDUCATION SERVICES

In many water scarce regions, access points to water are scarce because of limited water supply networks. Boreholes and taps must be shared communally, and people assemble to queue at them for water on a regular basis, making social distancing extremely difficult. Mukwazhi (2020) describes a scene in neighbouring Zimbabwe:

> *There's been little change in attitudes, even with the threat of the virus hanging over every line. If anything, the people pack tighter, more afraid of missing out on food. A cough here at the front of the queue. A sneeze there at the back. Heads snap to see who it came from. Sometimes people demand the guilty party leave the queue. They never do. The expressions on faces are a mix of concern and determination, with eyes narrowed, that this day's queuing won't be in vain. The faces are clearly visible because hardly anyone wears masks. In the ongoing quest for overpriced bread and milk, who has money for masks?*

Through deliberate controls imposed on freedom of movement, the lockdowns enforced great hardships in the lives of many citizens of the case study countries who depend on daily work to subsist. The extremity of these circumstances is captured in this statement:

> *Most Nigerians are not economically empowered to cope outside the proceeds from their daily economic engagements. They have no savings or reserves they can draw from to run their affairs if they comply with the directives. People are therefore forced, by such circumstances, to defy the order in search of their 'daily bread'. Acting otherwise will be a self-sentence to hunger, begging, frustration and perhaps crime.* (The Guardian Editorial Board, 2020).

Incidents of police and military officers using violence to enforce lockdown could be traced in case study countries including India, South Africa and the United States. Olewe usefully observes that these actions are 'at the sharp end of a debate over the balance between personal freedoms and human rights on the one hand, and the need to protect society as a whole from coronavirus on the other'(Olewe,2020).

These tensions feed into the relationship between citizens and state agencies, highlighting how important it is for government to limit erosion of civic trust in public institutions.

Impacts on learning opportunities

Imposition of school closures during lockdown has disrupted learning and curriculum coverage across all affected grades and education systems. Education departments are under pressure to plan and implement learning opportunities as alternatives to school-based in-person teaching and learning. There are wide disparities between countries in access to and utilisation of broadcast television or radio media and online learning. COVID-19 schooling closures tend to work to the disadvantage of poor households that cannot afford access to the internet.

For example, nearly nine out of ten United States households with school-aged children have home access to a high-speed internet service – even so, low-income families are disadvantaged (Reilly,2020). In South Africa, one out of ten homes has a computer and internet access. Only in the wealthiest 5 per cent of schools do almost all learners have access to a computer linked to the internet. In the majority of schools,

teachers and learners have limited access to or familiarity with personal computers, which inexorably increases disparities in learning – even more so under lockdown.

To its credit, the South African National Broadcasting Corporation (SABC) broadcast COVID-19 learner support programmes on television and radio, but this was limited to three grade levels, each for two hours per day. (Spaull, 2020: 7-8) Some schools gave printed materials to children before lockdown or made pdf workbooks available for parents to download. Teachers and parents created support groups on WhatsApp or via email. Based on their qualitative study, Taylor et al. (2020) suggest that the majority of public schools are probably not providing educational resources and advice to homes. Spaull is more forthright, contending: 'If one is realistic, for the poorest 80% of learners in South Africa there is virtually no curricular learning that is taking place during lockdown.' (Spaull, 2020: 7-8). The South African experience strongly suggests that all countries should maximise their use of radio and television for education purposes.

In India, the most common electronic device is a mobile phone. States have taken advantage of this by increasing materials and learning applications available mainly to smart phones. However, there are difficulties. Approximately 78 per cent of India's 1.3 billion population possess mobile phones – though in rural areas this is closer to 57 per cent. But in the family, these phones are commonly owned by the father and may not be available for children to use for learning. In larger families, siblings compete to use the phone. In addition, there are limits to the educational utility of phones for activities like reading (Bhatt, 2020). There is abundant evidence that lockdown conditions restrict learning chances for the majority of children, seriously jeopardising their progression into the following grade. Also, in each case study country without exception, unequal access to technology tends to exacerbate disparities.

Testing and tracing challenges

In the case study countries, only China and South Korea have been able to mobilise testing and tracing to the degree of accuracy, reliability, efficiency and high responsiveness that has enabled them to suppress infections by cutting off the ability of COVID-19 to reproduce.

The ability of a country to test and trace is critically important in generating information from which infections and the reproduction rate can be estimated. However, this capacity varies very sharply between countries. To put the achievements of the other case study countries into perspective, a comparison of tests completed per 1 000 people on 16 May 2020 shows: United States, 32; South Africa, 7.4 India, 1.5; and Nigeria, 0.2. (Our World in Data, 2020).[1] Of countries in the African region with populations greater than two million, on 16 May South Africa has comfortably the highest testing rate at over 15 000 per million people, followed by Botswana at over 10 000 and Morocco at over 7 000 per million people, which indicates that large-scale testing is not commonly practiced by African countries (Worldometer, 2020)[2]. The Africa Centre for Disease Control (Africa CDC) has reported that by early March 2020, 43 African countries had laboratories that could do COVID-19 testing (Africa CDC, 2020).

---

[1]. https://ourworldindata.org/grapher/daily-tests-per-thousand-people-smoothed-7-day
[2] https://www.worldometers.info/coronavirus/

©JET EDUCATION SERVICES

While the capacity to test is being ramped up, African countries could draw on and extend capacity of community health workers to conduct door-to-door screening of the population as has been implemented in South Africa, where screening of over three million people in this manner was completed by early May 2020. Screening helps to identify people who are self-reporting symptoms, and only these people will be tested. This saves on the use of tests, but excludes the possibility of identifying asymptomatic people who can share COVID-19 unknowingly.

Limited availability of COVID-19 test supply is a fundamental challenge because without this capacity it will be difficult for many African countries to confidently formulate plans and to allocate resources to combat COVID-19 infections. Such information is critically important to 'anticipate the country-specific demographic pattern of the national epidemic' (De Waal, 2020). This also means that the impact of lockdown and of social distancing cannot be measured. Nor, at a smaller scale, can practices in communities that effectively limit infections be identified unless tests are specially sourced for this purpose.

The ability to test and trace is arguably one of the most important government functions that impacts on accountability and ability to save lives. Yet it is paradoxically a function that can be very difficult to master in complex human social systems. In India, obtaining statistical data on deaths registered as COVID-19 related is very difficult because 80 per cent of deaths happen at home and only 22 per cent are medically certified (Biswas, 2020). This is because in that country, shortly after death most bodies are cremated in open-cast fires according to traditional burial rituals. This demonstrates how obtaining accurate data about COVID-19 infections cannot rely on testing alone, but also requires an understanding of the ways in which the true levels of infection may be obscured by various social practices that also include fear of discrimination.

How Governments in Africa are countering COVID-19

The first part of this report involved an attempt to make sense of how governments have responded to or countered COVID-19. To this end, two frameworks, the Government Counter COVID Intervention Framework and the Oxford COVID-19 Government Response Tracker that have been developed to identify what kinds of activities governments may undertake to deal with the threat of COVID-19 were introduced. The frameworks, which can be updated with time, arguably provided a sufficiently broad breakdown of the range of actions that could be used to create a profile of activities followed by a country for the purpose of comparison. The aim was then to identify any common patterns of response across countries that have so far engaged substantially with COVID-19. The Oxford COVID-19 Government Response Tracker shows how governments have differed in how they have implemented their lockdown measures over time and in their combinations of measures.

The majority of governments in Arica have adopted a lockdown approach which is driven through mobilising government departments to conduct activities. In this mode, government designs and implements its lockdown, which may be associated with variable levels of enforcement. A smaller number of African governments have undertaken what has been termed a testing and tracing approach, which is much less invasive and depends on shared assumptions and a high trust relationship between citizens and government regarding behaviour and respective responsibilities in dealing with the threat of COVID-19.

This characterisation of the lockdown and the testing and tracing approaches is not binary. All countries in lockdown do use testing and tracing functions and, on the other hand, countries committed primarily to testing and tracing will also implement lockdown measures. Our review of the approaches, in conjunction with the case studies, reveals that only certain countries had done sufficient prior planning and had the technical and skills capacity to make their approach work.

The next step was to hypothetically explore each approach in a time perspective in order to find out what impacts, including costs and benefit, each approach could have on the society. And also important was to consider what types of society might be better positioned to adopt the testing and tracing approach. Our hypothetical analysis indicated that for some – though not all – cases, the lockdown approach is the default. Relatively few governments and societies were sufficiently well positioned to take the testing and tracing road.

This analysis was pursued in order to find sound footing for further analysis of the case studies. In conducting the case studies, the researchers gathered their data and conducted their analysis according to the themes set out in the Government Counter COVID Intervention Framework, which is the more comprehensive of the two frameworks discussed.

The aim was then to draw observations from the case studies that could improve understanding of how successful each government has so far been in implementing lockdown by comparing across the case study countries for each lockdown activity or function. We hoped in this way to identify challenges that governments experienced per lockdown activity. These challenges are raised where deemed relevant to a developing country context. The reason for taking this line of investigation was based on a commitment to exploring the future of lockdown in African countries, since these countries, as observed earlier in this report, have encountered COVID-19 at a later stage than many Asian, European and North American countries.

Even so, it was hoped optimistically that this analysis could generate more value. For instance, a recent article by De Waal (2020) argues that a non-negotiable task for a government in preparation for the appearance of COVID-19 infections in the population should be to 'examine the conditions required for the standard 'lockdown' policy to succeed'. The analysis in this report suggests that such levels of specificity may be difficult to achieve. Much analysis and modelling of the likely COVID-19 impact on the African continent is quite abstract, in the sense that it does not necessarily speak to government decision makers on the ground. For example, the WHO developed a model based on 47 countries to estimate fatalities on the continent if no containment measures were taken. According to the model, the estimated number of fatalities could range between a high of 1 000 000 and a low of under 200 000. The challenge for doing more specific modelling work may well be lack of usable data. By mid May 2020, 42African countries had already implemented forms of lockdown measures to curb the advance of COVID-19. (UNECA, 2020) Hopefully these decisions were made on the basis of sound data.

Explanations put forward for why COVID-19 appears to be spreading more slowly across Africa are really quite speculative. They include:

- This could be due to poor surveillance that does not detect true rates of infection.

- Less developed transport networks permit less local and regional movement of people.
- Since the majority of the African population is under twenty years old, comprising age groups that suffer less severity when infected, fatalities will be lower.
- A small proportion of just 3.5% of Africa's population of 1.2 billion are aged 65 years and over. (Leeson, 2018: 107)

These factors are admissible as part of the explanation. But they are based on broad features of the landscape and do not refer to how human behaviour moves COVID-19. There are further challenges. What would the answer be to the following question: What could be the assumptions for modelling counter measures such as lockdown by African countries? We don't know yet.

This would be difficult to address since lockdown strategies will differ country by country in many dimensions. More information is needed to reflect the specificity of African social and economic conditions. We take, for instance, information on rural areas in Africa. In the huge output of reportage, debate, and empirical data about lockdown, limited reference is made to rurality and how COVID-19 behaves in rural human settlement conditions. This is a major gap since Africa, as the least urbanised continent, in 2018 had 60 per cent of its people living in rural areas as compared with 50 per cent, 34 per cent and 66 per cent in Nigeria, South Africa and India respectively. In the United States, Republic of Korea and Italy, rural populations are at 18 per cent, 19 per cent and 30 per cent (World Bank, 2020). There is clearly an urban bias in how the world has followed COVID-19, perhaps because it has been experienced in mainly urban societies. This contributes to a perceived lack of in-depth and closer understanding of responses to COVID-19 in Africa.

Outbreaks of COVID-19 seem to originate in urban areas but propagate less quickly in rural areas as there is relatively less opportunity for multiple contacts in quick succession with different individuals in sparsely distributed settlements. Africa's majority rural population may therefore have a natural built in 'epidemiological buffer' (UNECA, 2020) analogous to 'social distancing and isolation' practised in high income countries.

But like urban areas, rural areas can differ substantially in their socio-spatial and economic arrangements including schooling access. An epidemic is likely to have a different transmission trajectory according to settlement type, of which there are many configurations: an inner city neighbourhood; a middle-class suburb; a densely populated township; a peri-urban informal settlement; a remote small village; an area dotted with isolated homesteads; a refugee camp; or a nomadic community.

In rural and urban conditions it is especially important to understand the texture of community life and intermingling with COVID-19. De Waal (2020) argues convincingly 'Given that transmission patterns are determined by social factors that are local and intimate, which epidemiologists cannot learn in real time but which community members know, this requires joint learning between experts and affected communities.' This assertion calls for greater involvement of communities in how COVID-19 is to be countered.

Perhaps Dr Matshidiso Moeti, WHO's regional director for Africa had these conditions in mind when she warned:

> *While COVID-19 likely won't spread as exponentially in Africa as it has elsewhere in the world, it likely will smoulder in transmission hotspots …COVID-19 could become a fixture in our lives for the next several years unless a proactive approach is taken by many governments in the region.'* (cited in Meldrum, 2020)

Research is needed to test the assumption embedded in Dr Moeti's hypothesis.

References

Africa Centre for Disease Control (2020) Africa CDC leads continental response to COVID-19 outbreak in Africa: Statement by the Director of Africa CDC. Retrieved from: https://africacdc.org/news-item/africa-cdc-leads-continental-response-to-covid-19-outbreak-in-africa-statement-by-the-director-of-africa-cdc/

Bhatt N. (2020) Coronavirus lockdown: How e-classes reveal India's digital divide. *Al Jazeera*, 11 May 2020. Retrieved from: https://www.aljazeera.com/news/2020/04/coronavirus-lockdown-classes-reveal-india-digital-divide-200428075114733.html

Biswas S. (2020) India CoronaVirus: The 'Mystery' of Low Covid-19 Death Rates. *British Broadcasting Corporation* April 28. Retrieved from https://www.bbc.com/news/world-asia-india-52435463

De Waal A. (2020) COVID-19 in Africa: 'Know your epidemic, act on its politics.' March 31st, 2020. Retrieved from: https://blogs.lse.ac.uk/crp/2020/03/31/covid-19-in-africa-know-your-epidemic-act-on-its-politics/

Department of Basic Education, South Africa. (2020) Basic Education condemns vandalism of 397 schools since Coronavirus COVID-19 lockdown. 17 Apr 2020. Retrieved from: https://www.gov.za/speeches/basic-education-condemns-vandalism-397-schools-coronavirus-covid-19-lockdown-17-apr-2020

Ferguson NM, Laydon D, Nedjati-Gilani G et al. (2020) Report 9: impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. London: Imperial College, 2020. 16 March 2020. Retrieved from: https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-9-impact-of-npis-on-covid-19/

Food and Agriculture Organisation. (2020) Impact of COVID-19 on informal workers. 07 April 2020. Retrieved from: https://www.tralac.org/documents/resources/covid-19/3234-impact-of-covid-19-on-informal-workers-fao-7-april-2020/file.html

George L. (2020) COVID-19 is exacerbating food shortages in Africa. *Reuters World Economic Forum*, 27 April 2020. Retrieved from: https://www.weforum.org/agenda/2020/04/africa-coronavirus-covid19-imports-exports-food-supply-chains

Hale T, Webster S, Petherick A, Phillips P, & Kira,B. (2020) Oxford COVID-19 Government Response Tracker, Blavatnik School of Government. Retrieved from: https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker

International Labour Organisation (2020a) *ILO Monitor: COVID-19 and the world of work*. Third edition. Updated estimates and analysis. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_743146.pdf

International Labour Organisation. (2020b) *The impact of the COVID-19 on the informal economy in Africa and the related policy responses*. ILO Brief. https://www.ilo.org/wcmsp5/groups/public/---africa/---ro-abidjan/documents/briefingnote/wcms_741864.pdf

Janes C. & Elmer V. (2020) The numbers are low until it's your child': The coronavirus can be deadly for children too. *Washington Post*. Retrieved from: .https://www.washingtonpost.com/health/the-numbers-are-low-until-its-your-child-the-coronavirus-can-be-deadly-for-children-too/2020/04/21/0f5ab28a-83e9-11ea-ae26-989cfce1c7c7_story.html

Jones TC, Mühlemann B, Veith T, Biele G, Zuchowski M, Hoffmann J, Stein A, Edelmann S, CormanVM, Drosten, C. (2020) An analysis of SARS-CoV-2 viral load by patient age.*medRxiv* ; doi: https://doi.org/10.1101/2020.06.08.20125484

Kumar V. (2020) COVID-19 will magnify food shortage in Africa. *DownToEarth*, 05 May 2020. Retrieved from: https://www.downtoearth.org.in/blog/africa/covid-19-will-magnify-food-shortage-in-africa-70895

Leeson GW. (2018). The growth, ageing and urbanisation of our world. *Population Ageing,* 11: 107–115. https://doi.org/10.1007/s12062-018-9225-7

Lodge EK, Schatz AM & Drake JM. (2020) Protective population behaviour change in outbreaks of emerging infectious disease. *bioRxiv,* 2020 Retrieved from: https://www.biorxiv.org/content/biorxiv/early/2020/01/28/2020.01.27.921536.full.pdf

McConway K. & Spiegelhalter D. (2020) Is SARS-CoV-2 viral load lower in young children than adults? Jones et al provide evidence that it is (in spite of their claims to the contrary). *Medium*
Retrieved from: https://medium.com/@d_spiegel/is-sars-cov-2-viral-load-lower-in-young-children-than-adults-8b4116d28353

Meldrum A. (2020) Virus could 'smolder' in Africa, cause many deaths, says WHO. *AP News*, May 8, 2020. Retrieved from: https://apnews.com/ce631e42de10cb0d31bab134014c4e70

Minardi AL, Hares L & Crawfurd L. (2020). Containing the epidemic: Should schools close for coronavirus? *Center for Global Development*, February 28, 2020. Retrieved from: https://www.cgdev.org/blog/containing-epidemic-should-schools-close-coronavirus

Mukwazhi T. (2020) Virus diary: Staving off the virus while our water runs out. *AP News*, 5 May 2020. Retrieved from: https://apnews.com/bb11704ee824dc6d8b1996ea3a577824

Our World in Data. (2020). Coronavirus Pandemic Data Explorer. Retrieved from: https://ourworldindata.org/coronavirus-data-explorer?yScale=log&zoomToSelection=true&deathsMetric=true&dailyFreq=true&aligned=true&smoothing=7&country=USA~GBR~CAN~BRA~AUS~IND~DEU~FRA~MEX~CHL~ZAF~DZA~COL

Paterson A. (2020) China's lockdown strategy. Unpublished manuscript.

Paulus S & Bijker E. (2020) Coronavirus: is it safe for children to return to school? *The Conversation*, May 28, 2020. Retrieved from: https://theconversation.com/coronavirus-is-it-safe-for-children-to-return-to-school-139228

Petesch C. (2020) African nations seek their own solutions in virus crisis. *AP News*, 11 May 2020. Retrieved from: https://apnews.com/66e8d6229ce8cfa535c3db2e821e7753

Reilly K. (2020) As schools close amid coronavirus concerns, the digital divide leaves some students behind. *Time.com,* March 11, 2020. Retrieved from: https://time.com/5803355/school-closures-coronavirus-internet-access/

Ridenhour, B.J., Braun, A., Teyrasse, T. & Goldsman, D. (2011). Controlling the spread of disease in schools. PLoS ONE 6(12): e29640. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3248433/

Spaull N. (2020) Who should go back to school first? Children under 10 are least susceptible to COVID-19, they should go back first. Policy Brief 8 May 2020. Stellenbosch: RESEP. Retrieved from: http://resep.sun.ac.za/wp-content/uploads/2020/05/spaull-2020-schooling-policy-brief-10-may-2020.pdf

Taylor N. et al. (2020) Education at home: Research report. Education Researchers Respond to the COVID-19 Pandemic. Johannesburg: JET Education Services. Retrieved from: https://www.jet.org.za/resources/theme-1-overview-report-final.pdf/view

The Guardian Editorial Board. (2020) Editorial: Still on defiance of lockdown order. *The Guardian*, 26 April 2020. Retrieved from: https://guardian.ng/opinion/still-on-defiance-of-lockdown-order/

UNECA. (2020) ECA proposes COVID-19 exit strategies to bring African economies back on track. *UNECA,* May 10 2020. Retrieved from: https://www.uneca.org/stories/eca-proposes-covid-19-exit-strategies-bring-african-economies-back-track

University of Oxford, Blavatnik School of Government (BSG). (2020a) Oxford COVID-19 Government Response Tracker Retrieved from: https://covid-policy-tracker/legacy_data_20200425/OxCGRT_20200425 LEGACY.csv

University of Oxford, Blavatnik School of Government (BSG). (2020b) Oxford COVID-19 Government Response Tracker: What's changed? *BSG,* 28 April 2020. Retrieved from: https://www.bsg.ox.ac.uk/sites/default/files/OxCGRT.%20What%27s%20changed%2024%20April%202020.pdf

Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, Mytton O, Bonell C, & Booy R. (2020) School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *The Lancet Child & Adolescent Health*. 4(5)397-404. Retrieved from: https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(20)30095-X/fulltext

WHO. (2020) US$675 million needed for new coronavirus preparedness and response global plan: Urgent support needed to protect vulnerable countries from outbreak. Retrieved from: https://www.who.int/news-room/detail/05-02-2020-us-675-million-needed-for-new-coronavirus-preparedness-and-response-global-plan

Wordlometer. (2020) COVID-19 Coronavirus pandemic. Retreived from:
https://www.worldometers.info/coronavirus/

World Bank (2020) Data: Urban population (% of total population) *World Bank,* 19 May 2020. Retrieved from: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=ZG

Appendix A: National government lockdown or other responses to COVID-19

National government lockdown or other responses to COVID-19			
Country	**Begin**	**End**	**Affected areas**
China	23 January	8 April Wuhan City (2 months, 2 weeks and 2 days 25 March Hubei Province	Wuhan and 14 other cities in prefectures in Hubei province. By 12 February . a total of 207 cities (including 26 provincial capitals and sub-provincial cities) have announced the implementation of closed management. Some on 'wartime'
Italy	9 March	3 May	National
India	25 March	18 May	National
Nigeria	30 March	12 April	Targeted: Abuja City, Lagos City, Ogun State
South Africa	26 March	30 April Stage 4 lockdown from 01 May	National
South Korea	No lockdown	No lockdown	Targeted interventions: -Ban on mass gatherings in affected cities. -Military unit in Daegu in isolation. -On 4 February denial of entry to foreigners traveling from Hubei Province.
United States	Begun between 19 March and 24March	Some still under lockdown Some open(ed) between 13 April and 30 May	Decentralised and/or own initiative: State, City, County

Source: https://en.wikipedia.org/wiki/National_responses_to_the_COVID-19_pandemic

Appendix B: Research team

Project lead:	Andrew Paterson
Co-lead:	Raymond Matlala
Peer reviewer:	Melanie Ehren
Researchers:	Cebisa Ncube
	Glodia Kgobe
	Japhta Mametja
	Jason Muyumba
	Jenna Barnes
	Marlize Kantor
	Monge Richer Nkuna
	Philip Gasseler
	Rachel Neville
	Shadrack Mlambo
	Thabang Rainett Teffo
	Tusani Ndlela