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## Regular Research Article

# The dangers of performative scientism as the alternative to anti-scientific policymaking: A critical, preliminary assessment of South Africa's Covid-19 response and its consequences

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## ABSTRACT

At the onset of the Covid-19 pandemic South Africa was praised for decisive political leadership based on scientific advice and the strictness of the measures it imposed to limit domestic spread of the virus. This paper critically examines the South African response through two conceptual frameworks. The first frames an optimal policy response as a solution to an intertemporal welfare-optimisation problem. The need for governments to balance epidemiological considerations and public health measures with the negative consequences of non-pharmaceutical interventions to limit transmission is particularly acute in developing countries. The second considers the use of scientific evidence and expertise through the lens of scientism – undue deference to science. The South African government erred towards drastic action in the face of predictions by some scientific advisors of a catastrophe, but initially without a clear, public long-term plan. Its lockdown has caused serious economic and societal harm across a range of measures. But these costs have not been matched by proportional benefits in health system preparedness or, based on evidence three months into the epidemic, a definitive improvement in expected long-term epidemic outcomes. This failure, and the questionably confident basis for the original lockdown decision, has been obscured by the government's performative scientism – a public performance of deference to science – even in the absence of transparent decision-making. One consequence was a slower correction of strategy than merited by evidence of limited benefits and high costs of the lockdown. Another was an unwillingness to admit and explain errors after the fact. The latter, combined with the convincingness of the initial performance undermined the behavioural dimension of policy – leading to beliefs among citizens that confounded efforts by the state to adapt its policy stance through reopening schools, reducing the stringency of clinical guidelines and resuming various economic activities while nevertheless observing basic social distancing precautions.

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The South African government has been praised internationally for its rapid, “ruthlessly efficient” (Harding, 2020a) response to the Covid-19 pandemic, stated reliance on scientific advice (Xinhua, 2020) and the drastic measures it has imposed (Wadvalla, 2020; WHO, 2020b). Similar assertions have been made locally by academics and the national academy of science (Singh, 2020; ASSAf, 2020) and numerous media reports. This is in notable contrast to wealthier countries like the United States and United Kingdom, and other large developing countries such as Brazil and Tanzania, where governments appear to have acted tardily, failed to use relevant scientific expertise appropriately and in some instances had leaders who have made pseudoscientific claims. Many other governments have sought to emphasise their use of scientific evidence and advice in order to provide greater legitimacy to policy

responses. However, though well-intentioned, science-informed policymaking is unarguably superior from a procedural perspective to uncaring, pseudoscientific or science-disregarding decision-making, it does not guarantee better outcomes in a welfare economics sense. Overemphasis on extremely poor conduct risks overlooking serious flaws in more responsible policymaking approaches. That is particularly so when politicians and policy-makers engage in what we will call *performative scientism*, in which decision-makers seek credibility for their approach by performing excessive deference to what they believe to be ‘science’.

In that vein, we argue that the South African government's emphasis on an ostensibly scientific approach has been extreme and simultaneously shielded it from necessary scrutiny in a decidedly unscientific manner, so that most praise has been premature or misplaced. The paper focuses on the period up to the end of May 2020 and the corresponding evidence available. None of the

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substantive claims about the welfare benefits of the government's response have been substantiated by evidence-based analysis in the public domain. The government repeatedly used a crude graphical comparison with the UK to claim that South Africa was "on a unique trajectory" (Abdool Karim, 2020a, 2020b) and that its strict lockdown "has worked". One of its modellers was widely reported as stating that the lockdown had "saved 20,000 lives" (Evans, 2020) – a claim that appeared to corroborate the president's announcement a month earlier that an extension of the lockdown would mean "that tens of thousands of lives may be saved" (Republic of South Africa, 2020c). However, the methodology used to derive the claim was not made public and does not appear to be supported by subsequently published official projections predicting that between 48 million and 53 million South Africans of an estimated total population of 55 million would be infected with SARS-Cov-2 by 1 November 2020 (Silal et al., 2020). The claim also contrasts with a somewhat more muted insinuation of lives saved provided by the minister of health two weeks later, the basis for which was also not published:

*"Had we done nothing, estimates show that by this point, as many as 80,000 South Africans would have been infected, and nearly 2000 of our brothers and sisters would have lost their lives," the minister said, citing scientific models and estimates. (Xinhua, 2020)*

Given uncritical reporting and endorsement of such claims in the presence of calamitous anecdotes from northern Italy and Wuhan province in China, it is perhaps unsurprising that the government's response found significant societal support. However, to the extent that this support was associated with the performative scientism of the state and media, it would have been based on a misapprehension of, or incorrect assumptions about, the government's opaque strategy. Journalistic reporting suggests that the dominant impression of the media was that the government's strategy was one of containment or otherwise drastic reduction in the total number of infections. The government's lack of transparency is a notable failure in itself, but even the limited information in the public domain reflects important contradictions and failures in the approach taken. This is despite the fact that all available evidence points to genuine public interest motives behind the state's primary decisions.<sup>1</sup>

There is growing evidence that the lockdown caused significant suffering among the poor and the broader negative economic and social effects could, including through fiscal channels, last for a generation. As the government eased its lockdown via a 'risk-adjusted strategy' (Government of South Africa, 2020a; Republic of South Africa, 2020e) towards what appears to be a herd immunity strategy, the question arises as to whether the costs incurred from a six week strict lockdown were justified. And the failure to dispel public misapprehensions that led to initial approval could backfire, behaviourally and politically, as some South Africans resist measures to resume economic and social activity such as manufacturing and schooling while others abandon compliance with measures intended to ensure more manageable spread of the SARS-Cov-2 coronavirus.

## 1. Pandemic response as an intertemporal optimisation problem

The premise of this paper is that management of national epidemics is a form of temporal optimisation problem. In this section

<sup>1</sup> Detailed regulations promulgated to formalise restrictions at different stages of the government's lockdown may have been affected by rent-seeking efforts of vested interests, such as illicit tobacco traders, but this remains highly contested.

we provide a brief, non-formal overview of the structure of that problem that will serve as a basis for the detailed analysis of South Africa's response. Two main options have been identified for national efforts to respond to the Covid-19 pandemic: suppression/containment and mitigation (Ferguson et al., 2020). The former aims to limit the virus to a small portion of the population, while the latter focuses on slowing the spread through the population but not necessarily reducing the ultimate number of infections. In current terminology, the objective of mitigation is to 'flatten the curve' of a national epidemic in order to reduce the pressure on national health systems (public and private). In the absence of a widely accessible vaccine or treatment, the policy tools available are targeted public health interventions and non-pharmaceutical interventions (NPIs). In current parlance, NPIs include various forms of social distancing in which interpersonal contact is reduced in order to limit the probability of transmission and lockdowns in which the state imposes measures to reduce social and economic activity with the same basic objective. Targeted health interventions to identify, trace and isolate infected individuals are essential for containment but can also enhance the effectiveness of NPIs – especially in the early stages of a national epidemic.

At one end of the spectrum, social distancing could involve continuing day-to-day life almost as normal but with the wearing of some form of face mask. At the other end it would involve individuals maximally limiting any contact with, or proximity to, others outside of their homes. Similarly, lockdowns can vary from relatively mild regulations that prohibit large gatherings to curfews that require individuals, other than designated essential workers, to stay in their homes except when engaging in activities deemed necessary for basic well-being. The more extreme the social distancing and lockdown measures the greater the impact on society and the economy through non-disease channels. The relationship between epidemiological outcomes and broader societal consequences will vary depending on pre-existing social conditions and economic structure.

In this sense, for theoretically optimal policy making one would require a model that integrates epidemiological, health systems, economic and broader societal considerations. There have been some recent efforts along these lines (Alvarez, Argente, & Lippi, 2020; Gonzalez-Eiras & Niepelt, 2020), though these are still relatively simple in terms of the range of welfare-relevant factors considered and unlikely to be of much use to policymaking in the current pandemic. The widely stated notion that only epidemiological or public health expertise is relevant to policy decisions may be an inevitable response to inexperienced and pseudoscientific assertions about epidemiology, as well as a reflection of prior conceptions of scientific expertise (Suldozsky, Landrum, & Stroud, 2019), but is misplaced from the perspective of making societally optimal policy decisions. And while there may not be sufficient evidence to satisfy the standards of formal cost-benefit analysis (Appleby, 2020), policy decisions have to be made. In the case of Covid-19, there is currently little evidence that basic epidemiological outcomes are markedly worse in poor and developing countries relative to their wealthier counterparts; many of the factors (such as age) and co-morbidities (diabetes, heart disease, hypertension and so forth) that appear to be associated with worse health outcomes for individuals infected with SARS-Cov-2 are more prevalent in wealthier countries.<sup>2</sup>

The effectiveness of NPIs may be constrained in poorer countries, due to conditions of poverty such as overcrowding and poor sanitation infrastructure. Furthermore, in African (and other devel-

<sup>2</sup> There is evidence of worse outcomes for poorer communities within wealthier countries, such as African Americans in the United States (Yancy 2020).

oping) countries health systems are typically poorly resourced and fragile, limiting the scope for effective containment measures unless initiated very early. As a result, in many countries it is simply impossible to prevent hospital capacity from being rapidly exceeded even with mitigation measures (Nkengasong & Mankoula, 2020; Divala et al., 2020). On the economic and social dimension, however, the consequences of NPIs are likely to be more dire in relative terms; a large decline in household income, broadly defined, across a population would lead to large numbers of people falling into absolute poverty and complete destitution in poorer countries (Sumner et al., 2020) whereas in wealthier countries the absolute consequences would be far less severe. Such differences in non-epidemiological outcomes of NPIs are further exacerbated by the limited fiscal and other resources at the disposal of the governments of lower income countries to implement social and economic protection measures to offset such effects. It follows, then, that striking an appropriate balance between epidemiological and non-epidemiological outcomes is even more crucial for lower income countries. However, the earliest and most influential epidemiological studies of optimal policy responses to Covid-19, while suggesting entirely different responses, were concerned with developed countries and utilised model parameterisations that corresponded to detailed data from such countries (Flaxman et al., 2020; Lourenco et al., 2020).

The second critical dimension of an optimal policy response is temporal. The balance referred to above needs to reflect the way in which a national epidemic, or threat thereof, will evolve over time: “The aim of mitigation is to reduce the impact of an epidemic by flattening the curve, reducing peak incidence and overall deaths” (Ferguson et al., 2020, 7). Implementing drastic measures may be temporally optimal if it succeeds in containing a country’s epidemic (‘crushing the curve’). On the other hand, implementing such measures without achieving containment could incur significant costs with comparatively little health benefit – preventing or reducing a first wave but ultimately experiencing a second wave that is little different to what the first wave would have been with less extreme measures. In making the decision of how to spread resources and mitigation measures across time, country-specific factors such as climate and religious festivals may also be relevant.

One additional biomedical consideration in choosing between different mitigation measures is the prospect of a vaccine. Estimates for the development of an approved vaccine, even with hastened trials and approvals, have varied from six months to the possibility that no vaccine may be produced (Calina et al., 2020). This does not account for challenges in production and distribution that are likely to disproportionately delay the speed and scope of access for less wealthy countries (Lurie et al., 2020). Given that such countries also have less resources to sustain highly restrictive NPIs it follows that a strategy premised on strict lockdowns while waiting for a vaccine is not just sub-optimal but likely to be outside the feasible set of alternatives. And since vaccines typically only reduce probability of infection rather than eliminate it, the importance of behavioural factors means the net effect of a vaccine on infection rates and mortality would not be a simple function of biomedical efficacy (Talamàs & Vohra, 2020).

In relation to economic and social consequences, some have argued that ‘the virus harms the economy not lockdowns’. There are two main pillars to this claim. First, that countries adopting measures of different stringency appear to have similar economic outcomes based on current evidence and forecasts.<sup>3</sup> Second, that fears of infection will cause individuals to shun economic and social

activity anyway, regardless of the measures governments might put in place to enforce these. We disagree with the basic claim on the grounds that it is either false or tautological. As shown in Fig. 1, economic outcomes are partly a function of the actions of other countries and therefore comparisons will understate the differences in outcomes that are causally due to different approaches. From a strategic perspective, one could nevertheless argue that the negative economic consequences of the actions of country *N* on its own economy are less important if all other countries (*\_N*) have decided on drastic action.<sup>4</sup> While this is true and perhaps important for policy-making, it is a tautologous argument in general since it claims that economic consequences of drastic measures are negligible if almost all countries take drastic measures. An additional problem is a contradiction in the approach to individual beliefs about the risk of the virus. Proponents of the view that individual beliefs will lead to negative outcomes have also been among those at the forefront of arguing for interventions to manipulate beliefs to induce greater compliance with social distancing and other NPIs; if beliefs are malleable, then where evidence supports a mild mitigation approach it correspondingly makes sense for all but high-risk individuals to behave in accordance with the assumption that they will be infected, in which case economic activity may be minimally affected by the virus per se (see Fig 2).

A notable implication of the above, given the uncertainty about the SARS-Cov-2 virus and Covid-19 illness, is the possibility of a divergence between the merits of the policymaking process and welfare outcomes. The greatest such disjuncture would occur in a scenario where it is not actually possible to contain the virus, a significant proportion of the population had some level of pre-existing immunity, and the costs of stringent measures to contain transmission exceed the costs of uncontrolled spread. For this reason it is important to separate the basis for decisions from outcomes, a point which applies not just to policymakers but the rationality of positions taken by scientists and scientific advisors (Laudan, 1978). Many responses to Covid-19 appear reluctant to accept this separation, leading to conflation of milder mitigation policies with uncaring or reckless governments and schadenfreude at any negative outcomes experienced by such countries; Sweden is the leading example of such sentiments despite thorough analysis of its policy process painting a quite different picture (Angner & Arrhenius, 2020). Such nuances are important for our analysis of the South African case, which is based on the conceptual framework sketched above.

## 2. South Africa’s response and initial consequences

South Africa’s first confirmed case of Covid-19 was registered on the 5th of March 2020 – a citizen who had returned on the 1st of March from a visit to Italy. Until the 22nd of March, when the government stopped providing detailed information on case histories, the vast majority of confirmed cases had either travelled internationally or been in direct contact with someone who had (NICD, 2020b). In the early stages the government appeared to err on the side of protecting economic activity; on the 4th of March the health minister replied to questions from members of parliament (MPs) about the merits of a travel ban by noting that “the hospitality industry was extremely concerned that decisions may be taken by the Health Department which would adversely affect them” (PMG, 2020) and the department’s senior official emphasised challenges in banning flights from high risk countries. On the 15th of March the government announced that it would create a National Command Council (NCC) to oversee its Covid-19

<sup>3</sup> A popular example is Sweden – see for instance Andersen et al. (2020) for a substantive analysis which comes to this conclusion but fails to address the nuances we raise. Correia, Luck, and Verner (2020) make a similar argument based on experiences of cities in the United States during the 1918 flu pandemic.

<sup>4</sup> The relationships delineated in Fig. 1 apply to countries that are not large enough to individually influence the world economy in significant way.

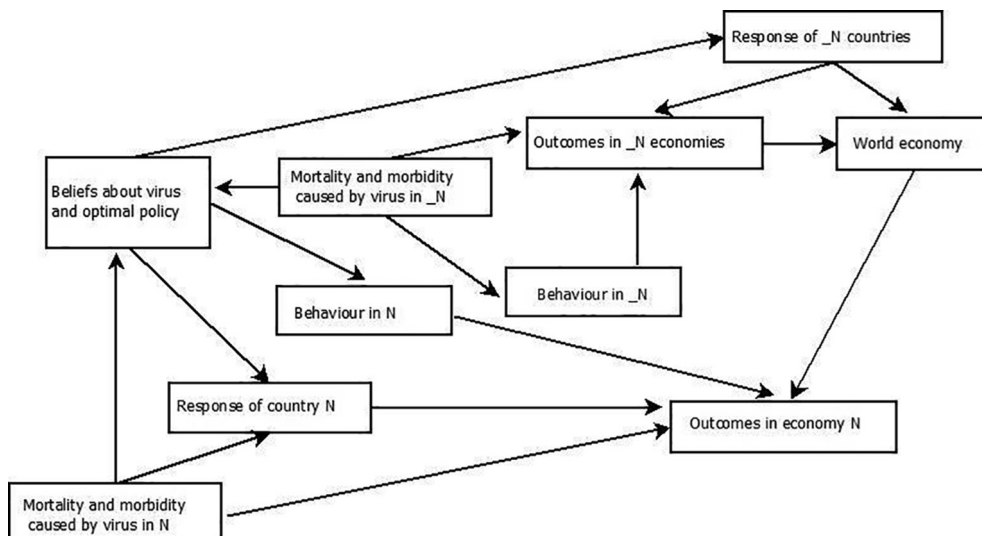


Fig. 1. Endogeneity of economic outcomes in response to country measures.

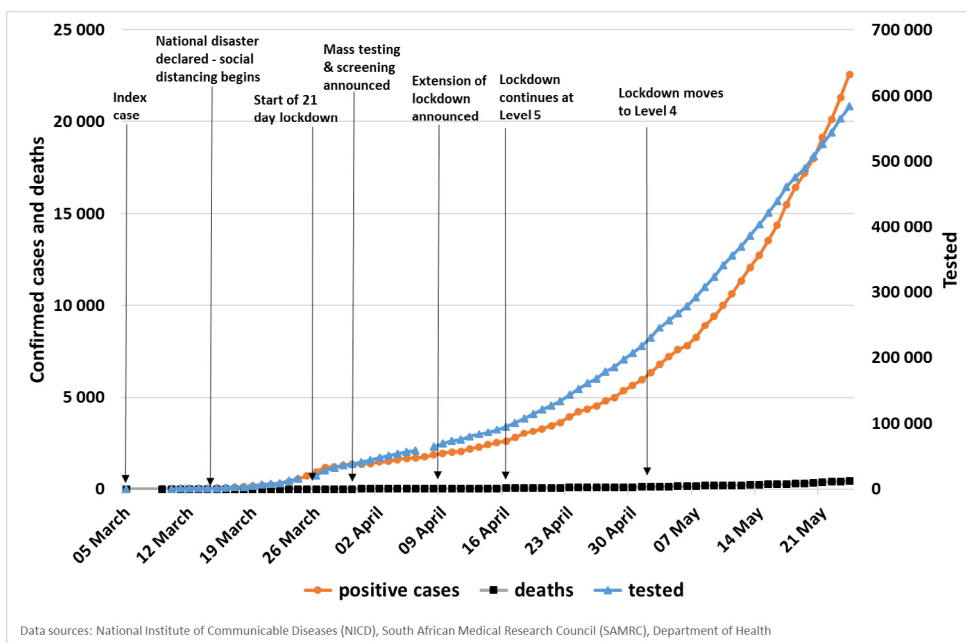


Fig. 2. shows how the South African epidemic progressed over the period discussed by this paper –the first three months – along with key decisions and events. Three issues in particular are worth noting: that the number of deaths remained low throughout; the lockdown did not contain spread; and, that the government began to ease lockdown regulations even as the number of infections escalated. (We have opted to use a linear rather than logarithmic scale since the latter is arguably not especially beneficial in the early stages of an epidemic and has other limitations (Romano et al. 2020).) Separate data on excess mortality from natural causes up until the end of May 2020 did not show a deviation from projections based on previous years (Bradshaw et al., 2020a). (Subsequent data shows excess mortality from natural causes from approximately mid-June to mid-August (Bradshaw et al., 2020c) – this is outside the period considered by the present paper but does not contradict the arguments presented.)

response and the president declared a national disaster in order to invoke the powers necessary to promulgate border closures, flight bans on nationals of designated high-risk countries and social distancing regulations (Republic of South Africa, 2020a).

It remains unclear how and why the government changed course so rapidly, as Cabinet minutes are classified by default and have not been made public in this instance. The proximity of the decision to the release of the influential ‘Imperial Report’ on 16 March (Ferguson et al., 2020) is suggestive. The government had also created a ministerial advisory committee (MAC) for the health minister. Although its membership and composition was initially kept secret, it later transpired that it contained 45 mem-

bers of whom the majority were medical scientists but included some government representatives. The manner in which the MAC’s advice fed into deliberations and decisions by the NCC has not been made clear, nor has the role of any non-medical experts in the policymaking process. The legal status of the NCC itself remains unclear and along with the Disaster Management Act is subject to a number of court challenges, which could render the decisions taken by that entity unconstitutional; such a ruling may not have much practical import but the possibility has some relevance to our interest in the state’s decision making process. Lack of clarity on the NCC’s status contributed to the failure of the national parliament to conduct oversight over the most important government

decisions relating to the pandemic, though it eventually did do so on subordinate matters such as school closures and military deployment.

The content of the initial announcement of a national disaster suggests that the government had already decided on a strict lockdown, given the statement that “[in addition to] dramatic decline in economic activity in our major trading partners, a sudden drop in international tourism and severe instability across all global markets...the measures we are required to take to contain the spread of the disease...will have a potentially severe impact [on economic outcomes]”. From such statements it is also clear that the government had some awareness of the trade-offs it was making, but what remains unclear is how economic, social and epidemiological considerations were weighed in the South African decision-making process or how that was achieved.

The president’s statement when announcing the initial 21 day lockdown is worth quoting at length:

*It is clear from the development of the disease in other countries and from our own modelling that immediate, swift and extraordinary action is required if we are to prevent a human catastrophe of enormous proportions in our country. Our fundamental task at this moment is to contain the spread of the disease. I am concerned that a rapid rise in infections will stretch our health services beyond what we can manage and many people will not be able to access the care they need. We must therefore do everything within our means to reduce the overall number of infections and to delay the spread of infection over a longer period – what is known as flattening the curve of infections.*

...

*Our analysis of the progress of the epidemic informs us that we need to urgently and dramatically escalate our response. The next few days are crucial. Without decisive action, the number of people infected will rapidly increase from a few hundred to tens of thousands, and within a few weeks to hundreds of thousands. This is extremely dangerous for a population like ours, with a large number of people with suppressed immunity because of HIV and TB, and high levels of poverty and malnutrition. We have learnt a great deal from the experiences of other countries. Those countries that have acted swiftly and dramatically have been far more effective in controlling the spread of the disease. As a consequence, the National Coronavirus Command Council has decided to enforce a nationwide lockdown for 21 days with effect from midnight on Thursday 26 March. This is a decisive measure to save millions of South Africans from infection and save the lives of hundreds of thousands of people. While this measure will have a considerable impact on people’s livelihoods, on the life of our society and on our economy, the human cost of delaying this action would be far, far greater.*

It is evident from the reference to the short time for action (‘the next few days are crucial’) and the purpose of doing so (‘save the lives of hundreds of thousands’) that the government was acting on advice suggesting a catastrophe. It has not released the modelling used at the time. One media report on the 19th of March, which has not subsequently been denied, claimed that government’s action followed presentation of modelling to the Cabinet that showed “a slow and inadequate response by government to the outbreak, could result in anywhere between 87 900 and 351 000 deaths” and these estimates were based on, respectively, population infection rates of 10% to 40% (Cowan, 2020a). The report noted that the projections were “based on studies of the virology and epidemiology of the virus in Wuhan”.

Only on the 14th of April did the government give a detailed indication of what its actual strategy might be, in a briefing by the chair of the health minister’s advisory committee where the

eight-stage strategy shown in Fig. 3<sup>5</sup> was presented (Abdool Karim, 2020a). The strategy’s most notable characteristic was that it was premised on an escalation in transmission as the most likely scenario, but no indication was given of what proportion of the population was expected to be infected. At the time it was unclear whether the strategy was a recommendation from scientific advisors or government policy. What is even less clear, including from subsequent publication (Abdool Karim, 2020b), is whether the strategy represented government’s initial intentions. In the next section we argue that the evidence shows contradictory remarks from different actors, but suggests not only that the government felt it had to attempt containment but also that it believed it could achieve this.

### 2.1. Preliminary epidemiological outcomes

A major advantage for South Africa in responding to the pandemic was its significant laboratory testing capacity, which is the most sophisticated and sizeable on the continent. Initially, only individuals who had travelled to high risk countries or been in contact with infected or high risk individuals were encouraged to get tested and almost all of these tests were conducted at private facilities. Government guidelines stipulated that individuals who tested positive would need to self-isolate or be quarantined and all contacts of that individual should be traced and tested if they met certain criteria (NICD, 2020a). In order to facilitate contact tracing, government utilised an existing provision in legislation to introduce regulations allowing it to obtain data from mobile phones. In particular, that the head of the department of health could, “direct an electronic communications service provider to provide him or her with information regarding the location or movements of any person known, or reasonably suspected, to have contracted COVID-19 or any person known, or reasonably suspected, to have come into contact with such a person” (Department of Justice, 2020).

With the initiation of community testing and screening the number of tests conducted increased dramatically and by the end of May the public and private sectors were responsible for an approximately equal share of the 680,175 tests done, of which 24% were from community screening and 76% from passive case finding (NICD, 2020f). The government stated that its objective was to reach a testing rate of 15,000 per day in April and 36,000 per day by the end of that month (Mabuza, 2020), but in fact it only achieved a high of 11,630 by the end of April and had not consistently exceeded 20,000 tests per day by the end of May.

All-cause mortality initially declined in absolute terms and relative to simple official forecasts, apparently due to a reduction in unnatural deaths prevented by the strict lockdown (Bradshaw, Laubscher, Dorrington, Groenewald, & Moultrie, 2020b). These include motor vehicle accidents and violent crime, the prospects of which are likely to have been affected by banning of alcohol sales and limits on movement. Natural deaths remained within the 95% confidence interval of official forecasts, which was seen as providing tentative evidence to support the view that Covid-19 was not yet significantly more widespread than indicated by testing. This also means that using the second-best measure of excess mortality to proxy for Covid-19 deaths yields the conclusion that the virus had not, by the end of May, resulted in a net increase in South African mortality rates.

An official estimate of the reproductive number (‘R’) up to the 5th of May was only released on the 27th of May and suggested, as shown in Fig. 4, that government measures reduced R from 2.07 (1.5 to 2.5) to 1.5 (NICD, 2020e). While the confidence intervals for these estimates narrow over time as case numbers

<sup>5</sup> I am grateful to Neil Murray for providing his collated data on Covid-19 in South Africa for a first version of this paper.

# Stages of SA's COVID-19 response

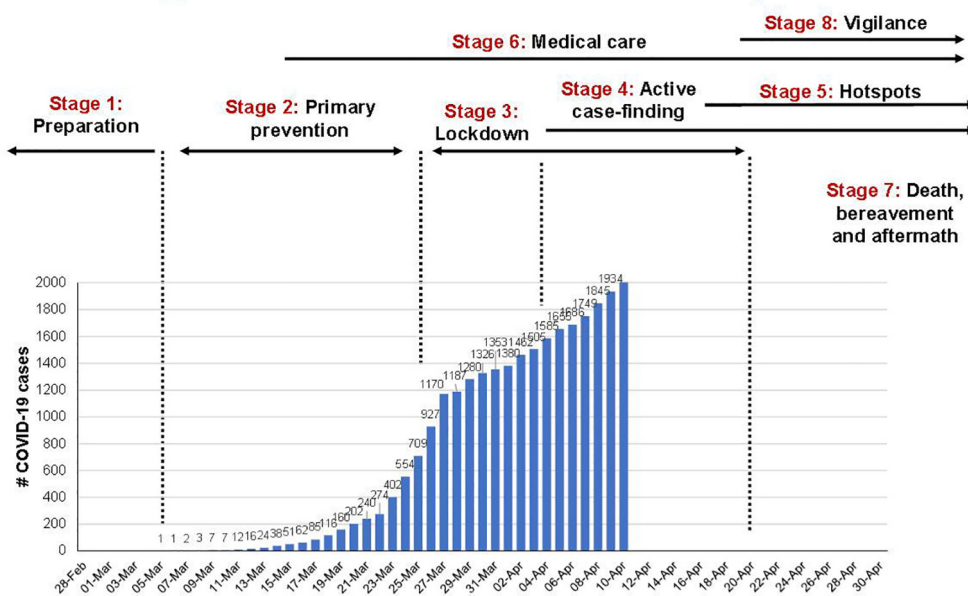


Fig. 3. Strategy description by chair of ministerial advisory committee (14 April 2020).

increase, they may nevertheless be biased by changes in selection effects relating to testing and screening. The most striking observation is that the largest decline appears to be associated with flight restrictions, border closures and school closures, not the strict lockdown itself.<sup>6</sup> That R was never reduced below 1 indicates the failure of any attempt at containment.

## 2.2. Health system preparedness

The broader South African healthcare system is also relatively advanced by developing country standards but, like other parts of society, is characterised by sharp inequities between the costly but relatively high quality private system and the mostly free but heavily oversubscribed and under-resourced public system. There is also significant variation within the public system, depending on institution type and geographical location. A clear intention throughout the first months of the epidemic was to increase total system capacity to handle Covid-19 admissions. Four areas of focus were: ICU beds, ventilators, general hospital beds, and personal protective equipment (PPE). The government appears to have managed to secure sufficient supplies of PPEs through procurement and donations, though it has not provided detailed updates.

The effort to produce ventilators partly followed from an emphasis in early media reporting on the Italian experience which emphasised ventilator requirements and shortage. In April the government stated that it expected to need 7,000 ventilators at the peak of the epidemic relative to an estimated stock of 3,216, of which 2,105 were in the private sector (Department of Health, 2020a). In the context of a generally positive response to the government's efforts, local ventilator production initiatives were also the subject of much media and public enthusiasm as an illustration of the ability of different stakeholders – including the state arms manufacturer and a kitchen appliance manufacturing firm – to work together in the national interest (Schutz, 2020a). In April it was announced that the United States had donated 1,000 ventilators although it is unclear when and if those were delivered. By the end of May, it was unclear what progress has been made with

local production and the chair of the MAC's public health sub-committees stated in his individual capacity that "investment in ventilators was a huge waste" (Harding, 2020b) – a notable change in emphasis from the previous reference to 'ruthless efficiency'.

The government also expected that 25,000–70,000 general hospital beds and 4000–14,000 ICU beds would be needed at the epidemic's peak. A month later, however, the government's modelling collaboration produced estimates of peak ICU bed requirements of 20,000 to 40,000 and hospital bed requirements of 55,000 to 110,000 – where these reflected optimistic and pessimistic scenarios. While no final indication was issued of what the government expected to be able to provide, the presentation of the models suggested a limit of 90,000 general beds and 4000 ICU beds (Sila et al. 2020).

## 2.3. Economic relief and social protection measures

While South Africa's lockdown was faster and more stringent than most other countries, its corresponding economic relief and social protection measures were initially far less. The package of measures proposed at the outset involved little additional spending and rather sought to reposition the Unemployment Insurance Fund, which had more than a R100billion in reserves, to support workers, along with various forms of tax relief. Though the president had claimed that "we are supporting the vulnerable" (Republic of South Africa, 2020b), the government's initial social protection measures were paltry and largely relied on donations to a Solidarity Fund which itself was more oriented toward procuring personal protective equipment (PPE). It took significant pressure from civil society coalitions to persuade the state that large-scale social protection measures were necessary and a decision to implement these – in the form of an increase in the child support grant and creation of a new 'Covid-19 social relief of distress grant' – was only announced on the 21st of April.

In late April the Treasury announced its final proposals which amounted to R500billion or approximately 10% of GDP (National Treasury, 2020). Of this, R95billion would be new expenditure financed by borrowing from international financial institutions, R130billion would be reprioritised expenditure (including an addi-

<sup>6</sup> This impression is strengthened by considering the incubation period of the virus.

tional R20billion to healthcare) and R200billion would consist of credit guarantees issued to commercial banks. Of the increased expenditure, R50billion was allocated to social protection. However, bureaucratic delays meant that by the end of May (10 weeks into the lockdown) 6.3million valid applications had been received but only 100,000 recipients were expected to be paid by the end of the month.

#### 2.4. Easing the lockdown: A 'risk-adjusted strategy'

As with other aspects of the government's response, the process by which the economic and social protection package was developed remains unclear. It is notable, in particular, that when the government announced a strategy for gradual easing of the lockdown key details were announced by the Department of Health rather than the Treasury. In keeping with the international narrative discussed in the preceding section, the department's senior official stated that "[it is] important to emphasise that, in terms of economic activity, the pandemic—and not the public health measures—will depress the economy' (Pillay, 2020). And the government specifically referenced Correia, Luck, and Verner (2020) in defending its prior approach (Republic of South Africa, 2020d). It nevertheless proposed (Republic of South Africa, 2020d) a relaxation of the lockdown using three criteria for determining which economic sectors could resume activity:

1. Risk of transmission (including the ease of implementing mitigation measures)
2. Expected impact on the sector of continued lockdown (including prior vulnerability)
3. Value of the sector to the economy (e.g. contribution to GDP, multiplier effects, export earnings)

In applying these, though, the health minister stated that sectors should be subject to an "ordinal ranking of priority" (Government of South Africa, 2020b). This is significant from a welfare-optimisation since decision criteria based on ordinal rankings are almost always sub-optimal.

The broad characteristics and intentions of each level of the lockdown are shown in Figs 5 and 6, where the initial lockdown was defined ex post as Level 5.

At the end of May, shortly before the country was due to move to Level 3 of the lockdown, the president held a briefing with newspaper editors in which he stated that while its scientific advisors had recently recommended an immediate move to Level 1, the country did not yet meet World Health Organisation guidelines (WHO, 2020a) for doing so. Those guidelines propose six criteria for "managing a controlled and deliberate transition from a scenario of community transmission to a sustainable, steady state of low-level or no transmission", none of which South Africa seemed likely to meet until its epidemic had run its course. An obvious concern is that the guidelines, which were published on the 14th of April, fail to consider any factors other than epidemiological ones – notably the consequences of ongoing lockdown measures.

#### 2.5. Public response

None of the polls and surveys conducted in South Africa during the critical months of March and April are entirely satisfactory in

<sup>7</sup> One initiative to collect data using mobile phones from a subset of an existing nationally representative panel, the Coronavirus Rapid Mobile Survey (CRAM), only began in May 2020. Other polls conducted by the country's Human Sciences Research Council solicited responses in a non-systematic way and weighted these to match national demographics, making it impossible to responsibly interpret the findings about sentiment, compliance with regulations and other matters that would be of interest for our analysis. The conclusions of such studies may, nevertheless, have affected the government's response, the stance of the media and public perceptions.

terms of their claims to national representativeness, but they provide some systematic indication of public sentiment.<sup>7</sup> One internet-based poll found that more than 80% of respondents across a range of characteristics expressed support for the strict lockdown (IPSOS, 2020a) despite belief that it would have a significantly negative economic impact on them and others (IPSOS, 2020b). An indication that this may not have been in keeping with epidemiological evidence is reflected in the fact that more than 50% of respondents believed infection with SARS-Cov-2 would 'very seriously' or 'extremely seriously' affect their health, when in fact South Africa's rates of hospital admissions and deaths up to that point, and subsequently, have been lower than or equal to international averages.<sup>8</sup> Such was the initial positive reaction that some began to tout the health minister's performance as leading to a future presidential position (Cohen and Vecchiato, 2020).

The broader public response was mirrored in the responses of particular societal stakeholders. Non-governmental organisations (NGOs), trade unions, political parties and organised business largely welcomed the government's initial approach (Manyathela, 2020). Among the reasons cited were the risk of large numbers of deaths and contrast with apparently anti-scientific or reckless approaches by governments and leaders in other countries. Subsequent dissent concerned two specific issues: NGOs raised concerns about unintended consequences and inadequate social protection for poor and vulnerable groups. The private sector complained about specific lockdown regulations being unwarrantedly harmful to their interests and the economy at large, with bans on tobacco and alcohol sales being a particular target of criticism from various quarters. Both sets of issues were given significant media attention and dominated objections to the strict lockdown itself – although the main opposition party, having supported the initial lockdown, later argued against the extension of those measures based on economic harms (Steenhuisen, 2020). Given the acceptance of the necessity of a lockdown, there was little pressure during this crucial period for the state to release its modelling or the substantive basis for its decisions.

### 3. An opaque, ineffective strategy shielded by performative scientism

The government's public presentation of its approach repeatedly and heavily emphasised its use of science and scientists. But as Samoff argued in this journal in relation to the scientism of the early 1990s, "policy makers who are largely guided by research focused on the issue to be decided do not necessarily make better decisions" (Samoff, 1996, 617). Debates about scientism have recently been resurrected in philosophy (Boudry & Pigliucci, 2017) and here we use the term in line with Haack's description of it as an "inappropriately deferential attitude to science" (Haack, 2012). She suggests 'six signs of scientism' and there are three in particular that are evident in the South African response to Covid-19: using words like 'science' as generic praise (and therefore invoking credibility), looking to sciences for answers outside their scope, and (implicitly or explicitly) denigrating other forms of inquiry (Haack, 2012, 77–78).

#### 3.1. Rhetorical scientism

The government made a particular point throughout its response of emphasising its reliance on 'science' and 'scientists', and this was immediately reflected in media coverage. The following statement by the President encapsulates the general tenor:

<sup>8</sup> And as shown in Fig. 1, such beliefs are important for economic outcomes under different government approaches.



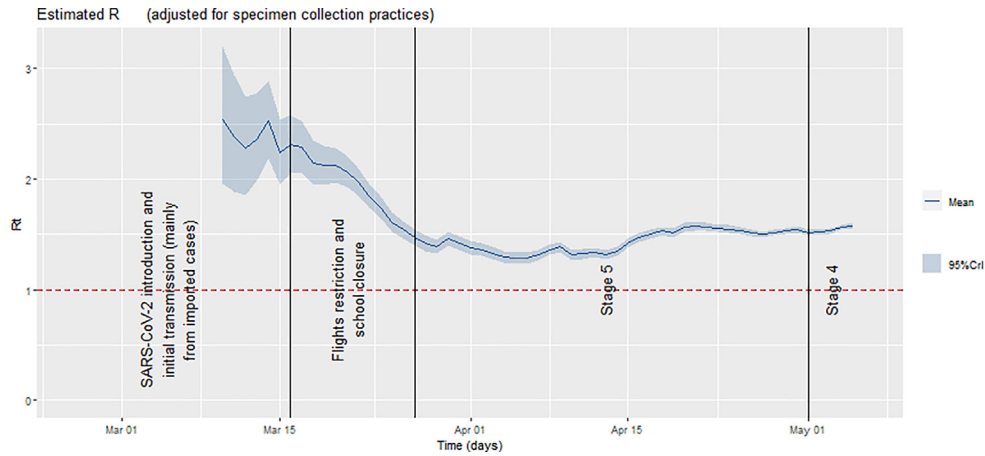


Fig. 4. Official estimates of South Africa's reproductive number (R). Source: National Institute of Communicable Diseases (NICD, 2020e).

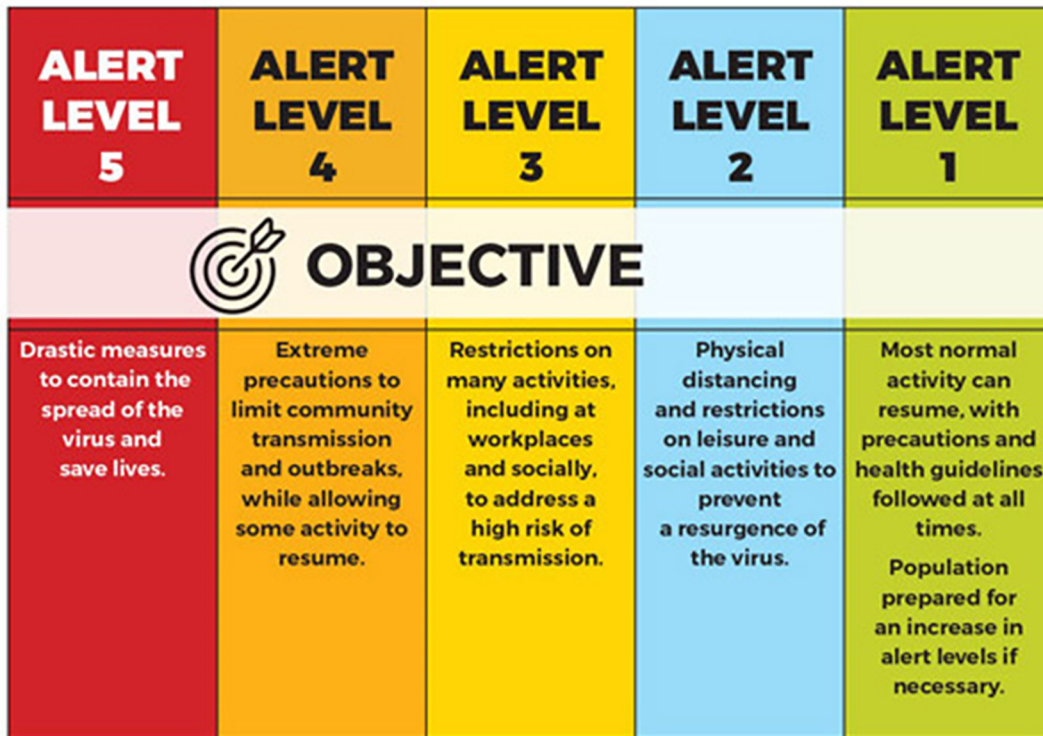


Fig. 5. Risk-adjusted strategy: infographic for the general public.

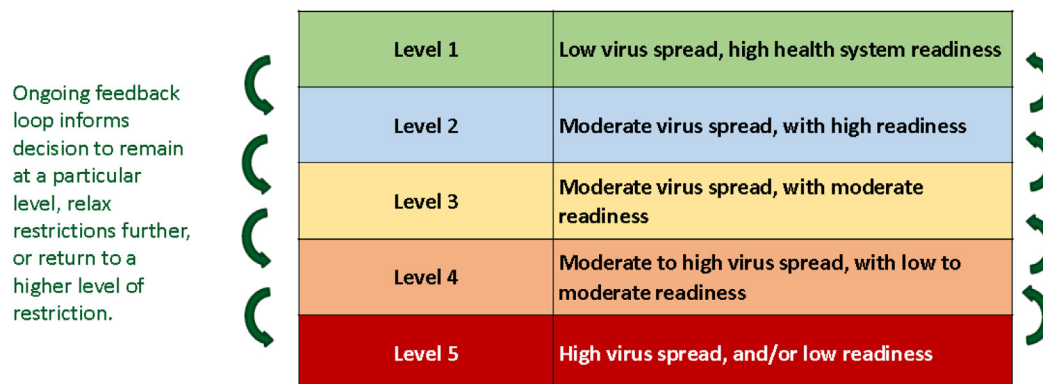


Fig. 6. Risk-adjusted strategy: infographic presented to Parliament (Republic of South Africa, 2020d).

when they look at us, [international bodies such as the World Health Organisation] truly see a shining example of how countries should have responded to the challenge of COVID-19. Also, the important thing is that we have relied on science. We haven't been flying by the seat of my pants and thumb sucking everything. The fact that [the health minister] enlisted top-class scientists and doctors as we saw, led by Prof Karim, has positioned us very well because we haven't been sending out confusing messages. (Government of South Africa, 2020b)

The headlines and adjectives used by the press were no less effusive with repeated references to 'top experts', 'world-class scientists', 'scientific advice' and 'mathematical modeling'. This dimension of scientism was reinforced by numerous positive contrasts by journalists and academics with South Africa's earlier era of HIV/AIDS denialism (Malan, 2020) in which the governing party resisted the consensus among medical scientists, thereby delaying the provision of anti-retrovirals to prevent mother-to-child transmission and for treatment, contributing to conspiracy theories and at times peddling pseudoscience (Makgoba, 2000; Mark, 2007).

Rhetorical scientism manifested also in the use of specific terminology related to epidemiological strategies, most notably the notion of 'flattening the curve'. That this was essentially rhetorical is reflected in the fact that the government never stated its specific objectives: the extent to which it hoped to reduce the peak number of infections, whether it also intended to reduce the area under the curve, over what period this was expected to take place, and so forth. It also contributed to a false rhetorical binary with 'herd immunity' which was deemed, incorrectly, to refer to entirely unmitigated spread through a population.<sup>9</sup> The consequence being that the same health journalist could state about the South African case in late March that, "We can't stop this virus from spreading" (Malan, 2020) then in late April state that "a COVID-19 strategy based on herd immunity is bad" (Suárez, 2020).

### 3.2. Did South Africa 'flatten the curve'?

What were the consequences of scientism? We suggest that it concealed inconsistencies in, and failures of, the government's approach by facilitating acceptance of unsubstantiated claims. The minister of health, president, chair of the MAC, and various other advisors claimed that 'the lockdown worked'. As we have seen, some went further and made the more specific claim that 'the lockdown saved lives'. These assertions were reported largely uncritically by the media, but do they hold up to scrutiny?

In the abstract, the notion of flattening a curve could be subject to differing interpretations. In particular, it could mean reducing the total number of infections (reducing the area under the curve), or reducing the maximum number of infections at any given time (reducing the peak but not the area). As we have already seen, the government's intentions at the outset were far from clear and appeared to change unannounced. On the 20th of March the health minister stated that he expected "60–70% of the population" to ultimately be infected with Covid-19. That is perhaps consistent with the catastrophic mortality forecasts that initially triggered the government's response but raises the question as to what the long-term plan was if not containment. The medical scientist leading the government's testing indicated later that she was surprised (Cowan, 2020b) at new research showing a high proportion of asymptomatic cases – evidently under the belief that the National Institute of Communicable Diseases was capturing the vast major-

<sup>9</sup> This appears to have resulted from media coverage, internationally and locally, of the UK's approach, which conflated the initial policy decision to 'rapidly achieve herd immunity' with the notion of herd immunity itself.

ity of positive cases through symptom-based testing (either patient-initiated or as an outcome of community screening).

The projections and counterfactuals released by government's modellers two months after the lockdown was begun suggested a peak flattened from 12 million to 10 million (pessimistic) or 8 million (optimistic) and delayed from early June to mid-July or mid-August (NICD, 2020c). But those were based on assumptions about efficacy of the lockdown that have not been empirically corroborated. The more damning point is that the leading epidemiological model supporting a strict lockdown strategy (Ferguson et al., 2020) envisaged 'flattening the curve' as attempting to keep ICU bed demand below the number of beds available. While the government declined to provide detailed information on the number and availability of such beds nationally (Mashishi, 2020), reports suggested that the number of such beds in the public sector had only increased from 2,512 to 2,719 between March and June (Cowan & Evans, 2020).<sup>10</sup> Since the government's own projections subsequently showed that such demand was expected to vastly exceed the supply, and that the supply had not markedly increased during the lockdown, it follows that South Africa did not flatten the curve for any reason related to its response.

Linked to this are the claims about reductions in mortality mentioned in our introduction. The epidemiological modelling consortium noted that, "The effect, in particular on mortality, of not being able to meet ICU and ventilator demand is not taken into account in the model, nor are the effects of any rationing of these resources." (NICD, 2020c). This is remarkable because it implies that the more sophisticated models on which the government based its decisions after instating the lockdown cannot reflect the actual benefit of flattening the curve in the sense of Ferguson et al. (2020). To do so would require the use of parameters representing differences in mortality rates for patients with different severity of illness under different treatment scenarios (home treatment, hospital admission and ICU admission). The government does not appear to have published any assumptions or estimates of these key parameters and there is no indication that such parameters have informed policy decisions.

### 3.3. The scope of medical science

The available evidence suggests that government relied almost solely on medical scientists to determine its initial response to the epidemic and it did so on the basis of deference to their expertise. That is a sub-optimal approach within the framework we outlined in section 1. It also constitutes a form of scientism on two dimensions: it seeks answers from medical scientists – particularly epidemiologists – that are outside the scope of their expertise and, in doing so, implicitly disparages other sources of knowledge especially in the social sciences. This is reflected in the apparently unsophisticated approach to a spectrum of possible strategic options.

Besides the critique above of claimed successes, the counterfactual scenario used to make such claims was one in which the state took no measures at all, which is inappropriate or at least overly simplistic. Even at the outset few local critics of the lockdown argued against *any* measures to slow the spread of the virus but rather endorsed less extreme measures (Broadbent & Smart, 2020; Muller, 2020) such as those the government instituted immediately after invoking powers under the National Disaster Act. Similarly, later critics – including the chair of the health minister's advisory sub-committee on public health – argued for "a unified health and economic strategy that allows for some eco-

<sup>10</sup> One widely-cited set of estimates suggested a total of 2260 critical care beds in the public sector and 3780 in the private sector (van den Heever, 2020).

conomic activity while inhibiting the uncontrolled spread of the virus". Thus the relevant counterfactual to the stringent lockdown was not wholesale inaction but various forms of less drastic, and therefore less socially and economically costly, action. In fact, the estimates of R shown in Fig. 4 provide preliminary support to the view that fewer restrictions could have been almost as effective but incurred much lower costs.

A second point that appears to have been entirely neglected by all parties is that the government could have maintained its initial measures for longer and thereby retained the option of a stringent lockdown at a later stage. In fact, our reading of Ferguson et al. (2020) is that such an approach is precisely what those authors suggest where containment is not possible. They note that:

*Introducing such interventions too early risks allowing transmission to return once they are lifted (if insufficient herd immunity has developed); it is therefore necessary to balance the timing of introduction with the scale of disruption imposed and the likely period over which the interventions can be maintained. In this scenario, interventions can limit transmission to the extent that little herd immunity is acquired – leading to the possibility that a second wave of infection is seen once interventions are lifted (Ferguson et al. 2020, 7–8)*

The available evidence suggests that the latter scenario may accurately characterise the South African approach. So while the imposition of a stringent lockdown was praised for 'strong and decisive leadership', and was well-intentioned, it may have been excessive. This sheds an unflattering light on the president's initial stance that : "there can be no half measures" (Republic of South Africa, 2020a). Ultimately, the folly of the government's approach was evidenced in it being forced into easing its lockdown because of the economic and social costs incurred.

### 3.4. Sacrificing of nuance

Other nuanced strategic considerations were arguably also a casualty of the narrow epidemiology-focused approach that emerged from the government's scientism. The first example is related to the matter of critical care beds. While the original Imperial model emphasised the danger of overwhelming the healthcare system, that is somewhat endogenous: it depends on criteria used for admission, approach to treatment, use of ventilators and palliative care. For example, Germany's relatively low mortality rate has been attributed in part to its efforts to limit hospital admissions through home-based care and monitoring. Such strategies appear even more important for developing countries with very limited hospital and critical care capacity. While the South African government has sought to expand its available quarantine facilities and referred to the construction of 'field hospitals for triage' (Abdool Karim, 2020a) there was little evidence of using clinical guidelines as a key part of managing the consequences of different epidemiological scenarios.

A second nuance never seriously or widely discussed in the public domain was the government's approach to testing and screening. As noted, the early approach focused on highly probable cases of Covid-19 based on travel histories and clear symptoms. This inevitably introduced a strong selection effect into the initial testing, as reflected in the almost wholesale use of private facilities. Similarly, when testing was then expanded to community level the purpose was never made clear. The use of pre-screening for relevant symptoms meant that the initiative failed to provide useful local data on the proportion of asymptomatic cases. And in the push to increase test numbers the state overestimated its bureaucratic dynamism and neglected the importance of turnaround times for the efficacy of its containment-like self-isolation, quaran-

ting and contact tracing strategy (Department of Health, 2020b). An epidemiologist on the MAC noted in April that, "Testing at scale by the end of May, which I think is what [the government's] target is, pretty much becomes a meaningless exercise" (Schutz, 2020b). This contradicts the earlier claims by the chair of the MAC about the uniqueness of SA's active case finding and its use of 28,000 community healthcare workers (Abdool Karim, 2020a), which were widely and positively reported in the press.

A final nuance concerns the link between the timing of the epidemic peak, co-morbidities and seasonal flu. One argument for the government's response over-and-above the dire projections it received was the prevalence of particular risk factors in the general population such as HIV/AIDS and tuberculosis (TB). For instance, some findings suggest that HIV-infected individuals with severe acute respiratory infection associated with influenza had significantly higher mortality rates (Cohen et al., 2015; Tempia et al., 2014), while others link HIV and other widespread diseases such as TB to mortality during the H1N1 pandemic in 2009 (Phaswana-Mafuya et al., 2020).

Yet the latter authors note that it was also the case that, while these diseases were associated with higher mortality within the population, "population-level morbidity and mortality related to [H1N1] was notably much lower in [South Africa] compared with countries in the Northern Hemisphere generally". Given the possible impact of the South African winter (that occurs mid-year), respiratory virus transmission, and significant easing of lockdown restrictions, it appears entirely possible ex ante that delaying the peak into winter months could lead to worse mortality outcomes. This is evidenced by efforts to exhort the government to increase uptake of the seasonal influenza vaccine to "reduce the likelihood of a 'double hit' of SARS-Cov-2 and seasonal flu" (Preiser, Mendelson, & Taljaard, 2020). Also notable is those authors' hope that, "Reducing morbidity and mortality through better influenza vaccination uptake might be one good thing to come out of this new public health threat" – reflecting either the ineffectiveness of the health system, or lack of urgency of the state, in avoiding similar causes of mortality prior to the current pandemic.<sup>11</sup>

Linked to this is emerging evidence that the lockdown undermined broader public health efforts to detect and treat TB:

*The COVID-19 level 5 restrictions has [sic] resulted in a ~ 48% average weekly decrease in TB Xpert testing volumes...the number of TB positive declined by 33%. . .These unintended consequences will have a negative impact of [sic] efforts to control TB which remains the leading infectious disease cause of death in South Africa currently (NICD, 2020d)*

Given the tentative lessons from South Africa's experience of the H1N1 pandemic (Phaswana-Mafuya et al., 2020), it is conceivable that a crude attempt to reduce transmission in the entire population that decreases TB detection and treatment could increase mortality relative to the counterfactual of interventions targeted at high risk individuals.

### 3.5. Scientism undermines good science

Excessive deference to the views or advice of scientists at a given point in time can contribute to an environment that is hostile to practices that are often considered to be characteristic of good science. Two such practices were undermined in the South African case: openness/transparency in scientific advice and associated policy decisions; and, independence of opinion. Despite initial positive statements by the state about 'open science', we have already

<sup>11</sup> That also has bearing on our consideration of the massive trade-offs made to potentially reduce Covid-19 mortality relative to the comparatively small cost of greater distribution of influenza vaccines.

noted that the government withheld publication of its models and projections until early May and still did not release the initial projections it acted upon. In addition, there has been a reluctance to make important data publicly available (Marivate & Combrink, 2020) and this was reflected in international open Covid-19 datasets where South African data was amongst the sparsest available within those countries that have comparable data collection capacity (Xu et al., 2020).

The façade of consensus created by the state's scientism cracked when Glenda Gray, the chair of one of its subcommittees and chair of the Medical Research Council (SAMRC), criticised the lockdown regulations as 'unscientific' and raised concern about perceived increases in the prevalence of malnutrition. Both the health minister and his senior official responded with sharp criticisms of their own and the latter requested an investigation by the SAMRC. That organisation apologised for its chair's actions and promised to institute an investigation – a decision it withdrew after a petition supported by hundreds of academics defending Gray's right to academic freedom and freedom of expression. Ironically, however, a number of these academics had themselves been responsible for contributing to scientism (ASSAf, 2020) both rhetorically and by making unsubstantiated claims about the efficacy of the government's interventions.

### 3.6. Behavioural consequences

The government's lack of transparency on key issues combined with its performance of scientism appears to have had an effect on public perceptions that benefitted government in the short run, but may undermine its efforts (and possibly popularity) in the medium- and long-run. As noted in section 2, the government's actions had high approval but that was premised on a belief in the catastrophic allusions made by the president in his declaration of a national disaster. The government's subsequent messaging sought to encourage compliance with the lockdown regulations, thereby amplifying the original perception.

Yet in attempting to pivot its strategy, having exhausted its very limited economic and fiscal buffers, the government was then faced with the challenge of getting individuals to act in ways that it discouraged with dire warnings previously. The difficulty in doing so manifested earliest in opposition by parents and teacher unions to even a relatively cautious reopening of schools. And the closure of medical facilities in response to detection of a single Covid-19 infection left the state frustrated at what it perceived to be overreaction by healthcare workers. The overall result being the incongruous conclusion that despite the government inducing fear in the population, "Experts say the fear factor about coronavirus needs to be addressed" (Harding, 2020b).

Another example is the furious societal reaction to the announcement that the regulations for Level 3 of the national lockdown (Government of South Africa, 2020c; Republic of South Africa, 2020e) in effect from 1 June 2020 would allow faith-based services to resume with a limit of 50 people at any given time, provided all congregants wear masks and social distancing regulations are observed. That understandably caused consternation, given national and international evidence that religious congregation has been the source of 'super-spreader' events where one, or a small number of people, infects many others. The result was that commentators, journalists and even the coordinator of the government's epidemiological modelling effort expressed dismay that the decision reflects an approach which is "utterly irrational". Yet the reopening of places of worship and schools could also be part of a deliberate effort to partially hasten the spread of the virus through the population, in-line with a 'herd immunity' strategy.

These examples point to the danger of using scientism to engender public support, since it potentially compromises the crit-

ical link between policy, behavioural response and pandemic outcomes (Rasul, 2020).

### 3.7. Slow, inadequate and inefficient social protection

From the perspective of evidence-based policymaking a particularly unusual aspect of the situation, as in other countries, is that it was possible to anticipate the negative economic and social consequences of the strict lockdown with more confidence than the epidemiological outcomes. The reason is that strict lockdowns simply shut down much formal economic activity – subject of course to country-specific compliance and enforcement. In South Africa, compliance and enforcement appeared high for formal sector activities, which constitute a much higher proportion of economic activity than in comparator countries. Prospective economic analysis using tools such as social accounting matrices are often, rightly, criticised for strong assumptions about static economic structure over time and in the face of new interventions to estimate direct and indirect effects. Yet such methods are likely to be well-suited to predicting at least the formal sector and aggregate consequences of crude interventions of this kind in the South African case. Using such methods Arndt et al. (2020) estimate the largest negative effects of the lockdown on sectors that were almost entirely shut down, such as alcoholic beverages and tobacco (greater than 60%) the sale of which was prohibited. Whereas sectors like pharmaceuticals, health services, communication and agriculture, which were declared an essential service, were expected to experience a mild decline of less than 10%. The lockdown itself was expected to reduce government's annual tax revenue by 27%, rising to 32.5% when macroeconomic factors were included. Given that public finances were already under significant pressure after years of failing to stabilise growth in the debt-to-GDP ratio, revenue losses alone will have fiscal consequences for years to come.

In relation to households, the first-round effects would have a larger, absolute and relative, impact on wealthier deciles – partly because lower deciles were dependent on government grants which would remain constant. However, as in other countries, lower-skilled workers were expected to be worst affected. Analogous mechanical calculations by other authors using nationally-representative household survey data showed that the extreme poverty rate among vulnerable households could be expected to triple without government intervention (Bassier et al., 2020) due in particular to the impact on households with informal workers. Yet despite this the government failed to even conceive of the need for enhanced social protection for poor and vulnerable households, focusing its attention almost entirely on protecting the formal economy. This suggests that the state's scientism affected policy-making not only in relation to lockdown decisions but also in the low weight placed on non-medical and non-epidemiological considerations.

## 4. Conclusion

As with all countries, South Africa faced many challenges in deciding on an appropriate response to the Covid-19 pandemic. Unlike some others, the government acted in a manner which suggests a primary concern with public health and a desire to act on the best available evidence. Despite that, it failed to adequately appreciate the economic and social consequences of its actions when making critical decisions and acted far too slowly in initiating the provision of social protection to support its lockdown. In reacting hastily to imitate an international trend in instituting lockdowns, the state appeared to have given little consideration to country-specific characteristics that may have suggested a dif-

ferent approach. In all notable respects, the measures taken to combat the spread of SARS-Cov-2 have inequality, vulnerability and poverty, while substantially weakening public finances and therefore future prospects of tackling what were already enormous challenges. These effects on the country's development will be felt for at least a few years but could extend to an entire generation. That alone calls into question the government's response, however narrowly well-intentioned.

Placing such consequences alongside the apparent failure of such efforts to have a large impact on the preparedness of the healthcare system and the long-term trajectory of the epidemic presents a damning picture of the government response. At the end of May, the WHO classified South Africa's 'country preparedness capacity' as only at Level 3 preparedness – along with many other African countries (including Tanzania) and below Brazil (WHO, 2020c). The available evidence on the government's decision-making process suggests that in its determination to be seen to do the right thing, the state fell into the trap of performative scientism. That led to a decision-making process that was secretive and based on advice that exuded incredible certitude (Manski, 2013), manifesting in an initially paternalistic stance that was hostile to, or dismissive of, dissenting views. The result was excessive reliance on, and confidence in, catastrophic projections that informed the original lockdown decision. Government's recognition of its resultant overreaction began to filter through in its risk-adjusted strategy but it arguably moved too slowly in changing course, likely due to some combination of political and bureaucratic incentives along with difficulty in navigating which expertise to rely on. South Africa's comparatively robust media and civil society institutions failed to serve as corrective mechanisms at key moments as they were also caught up in the performative process. Few other countries appeared to have suffered from such a sharp disjuncture between rhetoric of scientism and the reality of a deeply flawed policymaking process that produced sub-optimal decisions with incorrect premises and societally damaging outcomes.

There had been some correction at the time of writing, as reflected in the citations of data and analysis released by state agencies and advisors. The president's stance at the end of May suggests, however, that the corollary of government's scientism was a view that scientists be the ones ultimately accountable for the policy trajectory:

*"The scientists are the ones who continue to lead our effort in all of this. They have advised us that we needed to impose a lockdown, which we did. They said it will help flatten the curve of the infections, and with that we will have sufficient time to prepare ourselves, to prepare our healthcare system, to prepare our tools to be able to deal with the spike that is to follow. They also said once we went through Level 5 and Level 4, they also said the lockdown has served its purpose" . . . Ramaphosa emphasised that the government's response was wholly guided by scientific opinion (Hunter 2020)*

There are two evident problems with this. First, the extant evidence suggests a lack of consensus among government's scientific advisors on various key issues and the manner in which the NCC came to decisions based on epidemiological, public health, economics and broader advice remains unknown. Indeed, it was precisely the lack of transparency about that process which led to stringent public criticism by members of the MAC and subsequent harsh response from the government. In that light, the claim that a homogenous scientific consensus determined action is misleading. Second, outsourcing policy decisions in this fashion would be inconsistent with the obligations of democratically elected political leaders, whose constitutional rule requires them to balance a

range of considerations that medical scientists are poorly equipped to adjudicate. Doing so would not just be inconsistent with a democratic mandate but also fail to identify a temporally optimal strategy. Yet the media was guilty of participating in the same logic, as illustrated by one editor's naïve statement that:

*It is the science that gives the political decisions credibility. With the scientists providing the road map, it will be up to the politicians to make sure the country follows it. (Du Toit 2020)*

A better approach would have required a level-headed assessment of the limitations of the evidence available, recognition of the full scale of the negative consequences of a strict lockdown, substantive understanding of the intertemporal dimensions of the policy problem, and much greater procedural transparency especially as regards the evidence relied on. For example, high initial mortality rates from northern Italy were evidently upwardly biased by the elderly population, prioritisation of testing for the severely ill, and corresponding inability to assess the proportion of asymptomatic individuals. Furthermore, even if strict lockdowns were effective elsewhere in reducing the rate of transmission, various aspects of South African society suggested that might not be the case locally and the country had less resources to sustain such an approach than Western nations. Finally, the highly selective detection of early cases through private facilities focused on wealthy individuals returning from overseas trips was not capable of detecting community transmission, which therefore could have been well under way before the strict lockdown was implemented. The alternative approach that emerges from such considerations would have been a more gradual escalation of non-pharmaceutical interventions, rather than panicked implementation of an extremely strict lockdown without adequate social support or convincing long-term rationale.

In many policy situations, in South Africa or elsewhere, political constraints may explain sub-optimal policy. In this instance, however, the opposite has arguably been the case: the almost unfettered trust from citizens and all major sectors of society placed in the government's initial, critical decisions enabled sub-optimal decisions. Such unconditional support shielded decision-making at the most crucial stage from scrutiny that could have exposed flaws and concerns much earlier. Furthermore, constraints in terms of bureaucratic or state capacity – such as under-resourcing, corruption, wasteful spending and inefficiency – were well-known and therefore should have informed decisions *ex ante* rather than being cited *ex post* as reasons for poor outcomes or unintended consequences.

The three broader lessons pertain to issues that have been elaborated on by various authors prior to the pandemic as being given inadequate attention even under relatively normal policymaking conditions. The first is the importance of treating expressions of 'incredible certitude' (Manski, 2013, 2020) with scepticism rather than acclaim, placing value on epistemic humility (Angner, 2020) and developing the capacity of public institutions to make policy decisions that better-reflect limited knowledge. The second is adequately recognising the challenges of external validity: to extrapolating evidence from one context to another (Rothwell, 2005; Muller, 2015) not least when it may be confounded by endogeneity of various kinds. These two dimensions counteract tendencies towards scientism – performative or otherwise. The third is the importance of making policy for the context one has, rather than those one might wish to have, in a way that proactively considers unintended consequences (Merton, 1936).

The drastic nature of the decisions taken in the unforgiving context of a global pandemic are such that even a two-month period of misguided policymaking will leave a negative legacy for many years to come. Detailed examination of individual countries'

responses and the associated outcomes is crucial for separating rhetoric from what actually took place while learning from failures and successes. Having previously learned the lesson of the dangers of pseudoscience during a past era of HIV/AIDS denialism, South Africa's response to Covid-19 may be a salutary lesson that the opposite extreme also has significant dangers – especially where scientific evidence is inconclusive and scientists themselves are unaccustomed to giving policy advice in novel, high-stakes situations. Rarely has there been a more dramatic illustration of the importance for development outcomes of nuanced understandings of evidence and expertise for public policy.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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