

Recommendations on lockdowns

Summary:

South Africa, despite having one of the earliest and harshest lockdowns for a protracted period of time never achieved suppression/reversal and never attained a $R < 1$. It achieved mitigation by slowing the epidemic spread in an attempt to reduce peak health care demand. Several independent groups have confirmed this:

1. NICD modelling:

Interventions introduced from Mid-March 2020, such as flight restrictions, school and university closure followed by the national level 5 lockdown substantially reduced the national R , likely contributing to slowing the progression of the epidemic. During stage 4 lockdown, there was a slight initial increase in R with the R returning to around 1.5 indicating ongoing transmission. In the Western Cape Province, the daily R remained at around 1.5 during the initial stage 5 lockdown. Towards the second half of the stage 5 lockdown and the current stage 4 lockdown, R increased above 1.5, returning to around 1.5 in recent weeks. In other provinces where estimation was possible (Gauteng, KwaZulu-Natal and Eastern Cape provinces), the R during the stage 4 lockdown was been between 1 and 1.5 reflecting ongoing steady progression or raising of the epidemic.

2. Imperial College: RSA estimates

	Imperial College R_t
3 May - 9 May	1.7
10 May - 16 May	1.48
17 May - 23 May	1.26
24 May - 30 May	1.67
31 May - 6 June	1.31
7 June - 13 June	1.48
14 June - 20 June	1.34
21 June - 27 June	1.09
28 June - 4 July	1.17

The average $R(t)$ for level 4 was 1.5 while the average to date for level 3 is 1.3, based on this methodology. It is interesting that, according to Imperial College, the lifting of lockdown measures did not lead, so far, to an increase in the $R(t)$ – and there is no clear difference observed between levels 4 and 3 – or at least not in the expected direction

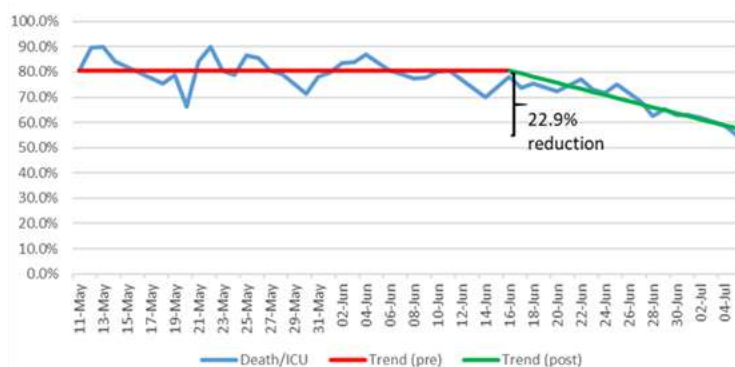
3. Youyang Gu

Youyang Gu, publishes daily projection for many countries (<https://covid19-projections.com/south-africa>) based on a machine learning techniques imposed on top of a classic infectious disease model to make COVID-19 infections and deaths projections. This model has been quoted widely in the international media. Their R(t)s are as follows:

- Initial R0: 2.21
- Post mitigation R: 1.11
- Current R: 1.09.

The lack of suppression can be attributed multiple factors that include: 1) the lack of an integrated ecosystem approach to the COVID outbreak from initiating community screening to tracking COVID -19 disease outcomes; 2) the inability to scale-up community testing; 3) with concomitant long turn-around times; and 4) inadequate contact tracing that could lead to the timeous isolation of cases and close contacts. Contact tracing was never achieved at scales required to contain the epidemic despite having one of the largest testing programmes in Africa.

The lockdown was also intended to give the health service the required time to adequately prepare and cope with the outbreak. There may be medical benefits gained in this period, garnered by the experience in the use of HFNO and the increased use of dexamethazone. In the private sector a 23% reduction in the death rate has been achieved over time and this experience may assist us as we move into more severe stages of the epidemic.



IMPACT OF LOCKDOWN ON NON COVID-19 HEALTH CONDITIONS

The lock-down has affected the HIV and TB programmes and cryptococcal screening program in South Africa and has led to a decline in immunisation rates of children.

IMPACT OF LOCKDOWN ON THE ECONOMY

The lockdown has had a significant impact on the economy. Findings show that the lockdown measures are likely to have a larger impact on annual GDP and employment in 2020 than previously estimated.

- If lockdown level 3 remains in place in 2020Q3 and 2020Q4, annual GDP and employment is estimated to contract by 16.8% and 12.3%, respectively.

- b. If the economy moves to lockdown level 2 in 2020Q3 and lockdown level 1 in 2020Q4, then annual GDP is estimated to decline by 10.9% and employment by 7.8% in 2020.
- c. Annual GDP in 2020 is estimated to decline by 8.2% and employment by 6% if the economy moves to lockdown level 1 in 2020Q3 and remains at that level in 2020Q4.
- d. We have not updated the analysis for a return to lockdown levels 4 or 5 in 2020Q3 or 2020Q4, however the results would likely be worse than the scenarios presented.

The fiscal and monetary policy package can reduce the contraction in annual GDP by around 2.4% depending on how effectively these measures support aggregate demand and growth.

The scenarios suggest a revenue shortfall of between R259 billion and R544 billion.

South Africa’s lockdown relative to other countries

Relative to many other countries, South Africa went into strict lockdown much earlier in the epidemic. At the point of going into lockdown, South Africa’s incremental reported infections per day was 3.7 per million. By contrast, the following table sets out the same number, i.e. incremental reported infections per million on the day of lockdown. It is clear that European countries that were heavily affected by COVID were often much further along the trajectory of the epidemic before going into lockdown:

	Incremental infections / million at the point of strict lockdown
France	16.81
Germany	13.65
Italy	9.28
Spain	3.91
UK	6.38

The reported infection rates are clearly influenced by testing capacity at the time, and hence, for instance, the Spanish and UK infection rates are probably understated in the above table.

By contrast, in the early stages of the epidemic, South Africa had adequate testing capacity and the “pick-up rate” was less than 3%, where pick-up rate is defined as the percentage of patients testing positive out of all the tests requested. As a rule of thumb, countries with pick-up rates of less than 3% (which can only be achieved if a lot of people get tested), have tended to do much better in the epidemic. Unfortunately, the current pick-up rate in South Africa is more than 22%, which falls short of this requirement – but most countries in the world have struggled to achieve the ideal of less than 3%.

South Africa went into lockdown before there was widespread community transmission of COVID-19. As a result, level 5 lockdown slowed the spread of the epidemic significantly, and bought South Africa a lot of time to prepare for the eventual increase in the epidemic.

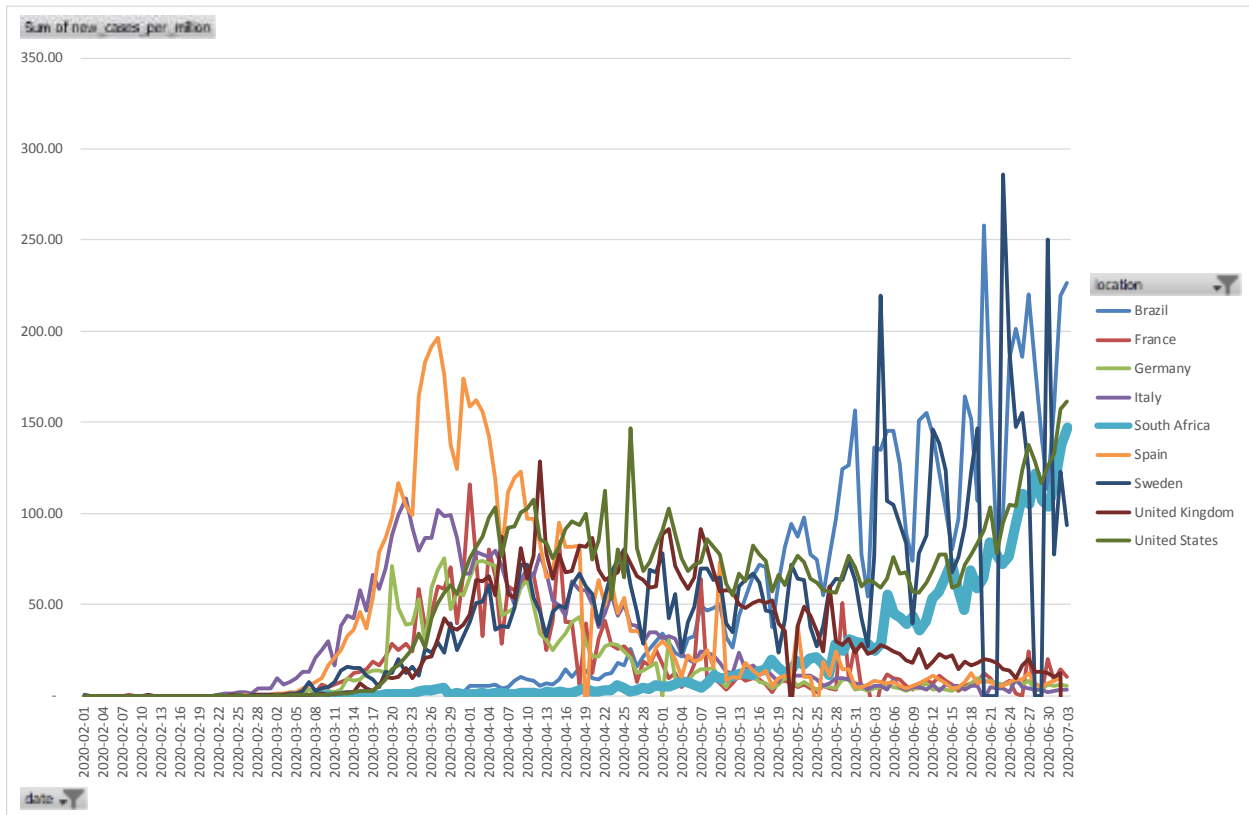
The following graph, shows that many developed countries have, through lockdown, managed to reduce infections – see, for instance, the experience of Spain, Italy, the UK, Germany and France. In all of these, despite a relatively late lockdown, through enforcement, population acceptance, and, also, the fact that

it is to a far greater extent possible for people in developed countries to self-isolate, work from home, have essentials delivered to home, and limit contact with others, lockdowns have been effective.

There are a few exceptions though, shown in the graph below:

- 1) The United States. Here, the politicization of simple measures such as wearing masks, the general political division and lack of leadership, as well as the premature lifting of lockdown measures in many states, has had devastating consequences.
- 2) Sweden, who aimed for herd immunity, and never went into total lockdown. Nevertheless, Sweden still gave guidance to its population, recommending that vulnerable people stay at home, encouraged working from home, and encouraging social distancing – and as a result, whilst the outcomes for Sweden are worse than many other developed countries that went into lockdown, generally, it appears to have kept new infections fairly stable. In recent weeks, however, there is a lot of volatility in Sweden’s reported infections, and it is hard to interpret their experience.
- 3) Brazil, which is not a developed country. Due to a politically divisive strategy on COVID, it faces not only the consequences of poor leadership and a reluctance to implement lockdown membership, but also the effects of being a developing country with high income inequality and overcrowding. It is generally believed that Brazil’s numbers are significantly understated, but despite that it is clear that the epidemic is still rapidly and alarmingly increasing in Brazil.

Incremental infections per day



Some developed countries, not shown on the above graph, due to scale, either went into lockdown earlier, before their was significant community transmission, and, most importantly, enforced it strictly with extensive testing programmes and contact tracing. The best examples of these are South Korea, New Zealand and Australia. These countries managed to contain the epidemic, and whilst it is now clear from recent events in Melbourne, for instance, that COVID-19 is not yet eradicated, it is also evident that Australia still finds it possible to enforce strict, short, local lockdowns and bring the epidemic under control due to the fact that it does not have general community transmission.

The question is how to interpret South Africa's experience relative to other countries. It can probably be summarized as follows:

- South Africa had the benefit from strong political leadership from the word go. The country went into lockdown early, and general compliance was high. It is fair to say that South Africa benefited significantly from going into lockdown before there was widespread community transmission of the virus.
- Nevertheless, as the epidemic spread into more crowded areas, even during level 5 lockdown, there was already an increase in incremental infections (see further analysis below)
- Hence, the increase in infections observed recently can generally be attributed to the difficulty of containing the epidemic in crowded low income spaces.

At the time of writing, South Africa's incremental infections is now 147 per million. This is significantly higher than the level at which lockdown was implemented *in any other country in the world*. There is now widespread and rapidly increasing community transmission of the virus in South Africa. There is no evidence that an attempt to implement a large lockdown at this level of community transmission is effective. It has not been attempted anywhere in the world, and there is no evidence that it would be successful. In addition to this, examples such as the USA and Brazil show how important it is for general population acceptance of lockdowns for it to work. No country has (yet) attempted (yet) a strict second large scale lockdown. It is highly questionable whether this will be accepted by the population, and whether, in the almost inevitable rebellion against it, the outcomes don't deteriorate significantly, given the potential of protests, and unwillingness to comply with social distancing and mask wearing.

We comment in more detail on local or cyclical lockdowns below, but at this point, a strict national lockdown does not appear to be feasible in South Africa.

Information on the impact of the initial lockdown

The overall goal of a lockdown is reduce reproduction/keep reproduction below 1 by either: 1) mitigation (slowing the epidemic spread) and reducing the peak health care demand (isolation of suspected cases and households; social distancing; protecting the elderly and people at highest risk of serious illness); or 2) suppression, or lockdown aiming to reverse epidemic growth reducing case numbers to low levels by social distancing the entire population indefinitely and closing schools and universities.

South Africa, despite having one of the earliest and harshest lockdowns for a protracted period of time never achieved suppression/reversal and never attained a $R < 1$. This can be attributed multiple factors that include: the lack of an integrated ecosystem approach to the COVID outbreak from initiating community screening to tracking COVID -19 disease outcomes; the inability to scale-up community testing, with concomitant long turn-around times and inadequate contact tracing that could lead to the timeous isolation of cases and close contacts. Contact tracing was never achieved at scales required to contain the epidemic despite having one of the largest testing programmes in Africa.

In addition, the lockdown was also intended to give the health service the required time to adequately prepare and cope with the outbreak. However, the lock-down has affected the HIV and TB programmes and cryptococcal screening program in South Africa and has led to a decline in immunisation rates of children as well as having had a significant impact on the economy.

IMPACT OF LOCKDOWN ON THE COVID-19 EPIDEMIC

Interventions introduced from Mid-March 2020, such as flight restrictions, school and university closure followed by the national level 5 lockdown substantially reduced the national R, likely contributing to slowing the progression of the epidemic. During stage 4 lockdown, there was a slight initial increase in R with the R returning to around 1.5 indicating ongoing transmission. In the Western Cape Province, the daily R remained at around 1.5 during the initial stage 5 lockdown. Towards the second half of the stage 5 lockdown and the current stage 4 lockdown, R increased above 1.5, returning to around 1.5 in recent weeks. In other provinces where estimation was possible (Gauteng, KwaZulu-Natal and Eastern Cape provinces), the R during the stage 4 lockdown was been between 1 and 1.5 reflecting ongoing steady progression or raising of the epidemic.

Testing in the public sector only started scaling up towards the end of April 2020 and overall testing in both the private and public sector increased from 8892 tests/day on the 26th April to 34 758/day on the 3rd of July 2020 (2.9% of the population).

The Compound Daily Growth Rate (CDGR) was reduced over a period of a month from 47.2% on the 1st March 2020 to 4.5% on the 5th April 2020 and has remained between 4-7% over the last 12 weeks, with a current national of 5.1%. The CDGR in Gauteng is 8.2%; in E Cape it is 5.6%, WC 2.1%. KZN 8.8% and NW 7% signaling the surge in other provinces. The Case Fatality Rate remains stable at around 1.9%, with some provincial variations (WC~3%), and other provices decreasing indicating a probable volatility in reporting deaths.

In summary, the protracted lockdown slowed down transmission, attenuated the peak, but did not manage to suppress the epidemic. The current testing capability of the country is unlikely to support a system of testing that will lead to epidemic control. South Africa does not have the public health capacity to implement a vigorous strategy that can 1) take testing to scale, 2) improve TAT in order to trace contacts and 3) isolate cases and contacts in time required to contain the epidemic.

EFFECTS ON HIV, TB and the EPI programme

In SA, testing for TB decreased by 50%, from a weekly average of 49,109 tests in the seven weeks pre-lockdown, to an average of 24,620 during the five-week Level-5 lock-down period and remained at this rate through Level-4 lock-down. Concurrently the weekly average of microbiological confirmed TB cases declined by 33% from a weekly average of 3,707 to 2,465 between the pre-lockdown and Level-5 lock-down period and remained as such during Level-4 lock-down. This significant reduction in TB diagnosis is likely to result in delay of initiation of TB treatment and threatens to reverse gains made in reducing incidence of TB in SA, and lends itself to exacerbating *Mycobacterium tuberculosis* transmission to others. The disruption of TB services, represents but a single example of the unintended consequences of an unmeasured approach such as total lock-down to mitigate the consequences of COVID-19 pandemic.

South Africa has the largest HIV treatment programme in the world, with steady progress to the UNAIDS 90-90-90 targets including a 40% reduction in new HIV infections in 2019 compared to 2010(10). During the Level-5 lock-down, there has been a 22% and 33% reduction in the average weekly HIV-1 viral load (done annually in people living with HIV to monitor HIV antiretroviral treatment) and CD4+ (done mainly when initiating antiretroviral treatment) testing done by NHLS compared to the pre-lockdown periods. This suggests possible treatment interruptions, and missed appointments due to patient fear of SARS-CoV-2 infection and violating travel restrictions in the context of widespread security force excesses. During Level-4 lockdown, weekly averages of HIV-1 viral load and CD4+ testing were only 5% and 15% lower compared to pre-lockdown averages, respectively.

As it pertains to vaccinations, overall immunization rates have declined by approximately 25%

Table 1: Vaccination coverage April 2020 as compared to April 2019

Province	BCG dose	DTaP-IPV-Hib-1st dose	DTaP-IPV-Hib-3rd dose	DTaP-IPV-Hib-4th dose	Immunised fully under 1 year	Measles 1st dose	Measles 2nd dose	PCV 3rd dose under 1 year	RV 2nd dose under 1 year
EC	-9.1%	-7.4%	-15.9%	-21.7%	-16.9%	-15.4%	-14.7%	-19.5%	-12.7%
FS	18.3%	-8.5%	-16.1%	-12.2%	-20.7%	-10.6%	-12%	-21.2%	-18.4%
GP	+8%	-18.2%	-21.6%	-33.7%	-28.9%	-29.6%	-31.9%	-27.7%	-20.8%
KZ	37.9%	-15.3%	-23.1%	-35.8%	-27.6%	-31.1%	-33.9%	-27.9%	-24.2%
LP	30.7%	-34.7%	-29.2%	-45%	-34.7%	-23.6%	-29.5%	-43.7%	-34.4%
MP	-1.5%	-13%	-22.3%	-29.4%	-25.9%	-24%	-27.4%	-30.1%	-20.8%
NC	-8.1%	-25.2%	-30.1%	-26.4%	-40.8%	-32.5%	-28.6%	-39.7%	-37.4%
NW	43.4%	-12.4%	-39.6%	-32%	-26%	-33%	-38.2%	-20.5%	-32.4%
WC	-7.3%	-28.9%	-34.5%	-43.6%	-12.4%	-34.2%	-41.7%	-36.2%	-34.5%
Total	15.8%	-18.5%	-24.5%	-33.5%	-25.6%	-27.1%	-30.2%	-29.3%	-24.6%

Impact on the economy

Findings show that the lockdown measures are likely to have a larger impact on annual GDP and employment in 2020 than previously estimated.

- a. If lockdown level 3 remains in place in 2020Q3 and 2020Q4, annual GDP and employment is estimated to contract by 16.8% and 12.3%, respectively.
- b. If the economy moves to lockdown level 2 in 2020Q3 and lockdown level 1 in 2020Q4, then annual GDP is estimated to decline by 10.9% and employment by 7.8% in 2020.
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What happened to the reproduction rate in various stages of lockdown?

We show some independent data on $R(t)$ s in SA and elsewhere in this section:

Imperial College

Imperial College publish a weekly estimate of $R(t)$ for different countries. The estimates for South Africa are shown below.

	Imperial College R_t
3 May - 9 May	1.7
10 May - 16 May	1.48
17 May - 23 May	1.26
24 May - 30 May	1.67
31 May - 6 June	1.31
7 June - 13 June	1.48
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The average $R(t)$ for level 4 was 1.5 while the average to date for level 3 is 1.3, based on this methodology. It is interesting that, according to Imperial College, the lifting of lockdown measures did not lead, so far, to an increase in the $R(t)$ – and there is no clear difference observed between levels 4 and 3 – or at least not in the expected direction

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- Initial R_0 : 2.21
- Post mitigation R : 1.11
- Current R : 1.09.

Interestingly, the mitigation point is derived from the data, and shows as 27 March 2020. This is very close to the actual level 5 lock-down date of 26 March, and indicates how the initial level 5 lockdown, before there was widespread community transmission, certainly had an impact.

The table below estimates the R_0 , the $R(t)$ post intervention, the date of intervention as well as the current $R(t)$ from the data.

- What is clear is that strict interventions before widespread community transmission certainly have had a significant impact
- Even so, $R(t)$ s do not seem to have increased dramatically even after lifting some of the restrictions

(source https://github.com/youyanggu/covid19_projections/blob/master/r_values/2020-07-04_r_values_global.csv)

Country	initial_r_0	post_mitigation_r	inflection_date	current_r	cur_date
Algeria	2.51	0.77	14/03/2020	1.08	04/07/2020
Argentina	1.27	1.11	17/03/2020	1.1	04/07/2020
Australia	1.44	0.75	23/03/2020	0.99	04/07/2020
Austria	1.84	0.72	15/03/2020	1.04	04/07/2020
Bangladesh	1.63	1.07	28/03/2020	1.07	04/07/2020
Belarus	1.32	1.01	06/04/2020	1.01	04/07/2020
Belgium	2.59	0.82	18/03/2020	0.92	04/07/2020
Bolivia	1.42	1.13	05/04/2020	1.09	04/07/2020
Brazil	1.49	1.04	20/04/2020	1	04/07/2020
Bulgaria	1.53	1.03	11/03/2020	1.08	04/07/2020
Canada	1.94	0.89	29/03/2020	0.97	04/07/2020
Chile	1.4	0.97	17/05/2020	0.91	04/07/2020
China	2.98	0.66	20/01/2020	0.76	04/07/2020
Colombia	2.15	1.15	20/03/2020	1.11	04/07/2020
Croatia	1.47	0.78	20/03/2020	1.11	04/07/2020
Cuba	1.25	0.67	08/04/2020	0.88	04/07/2020
Cyprus	1.37	0.48	12/03/2020	0.95	04/07/2020
Czechia	2.2	0.6	14/03/2020	1.04	04/07/2020

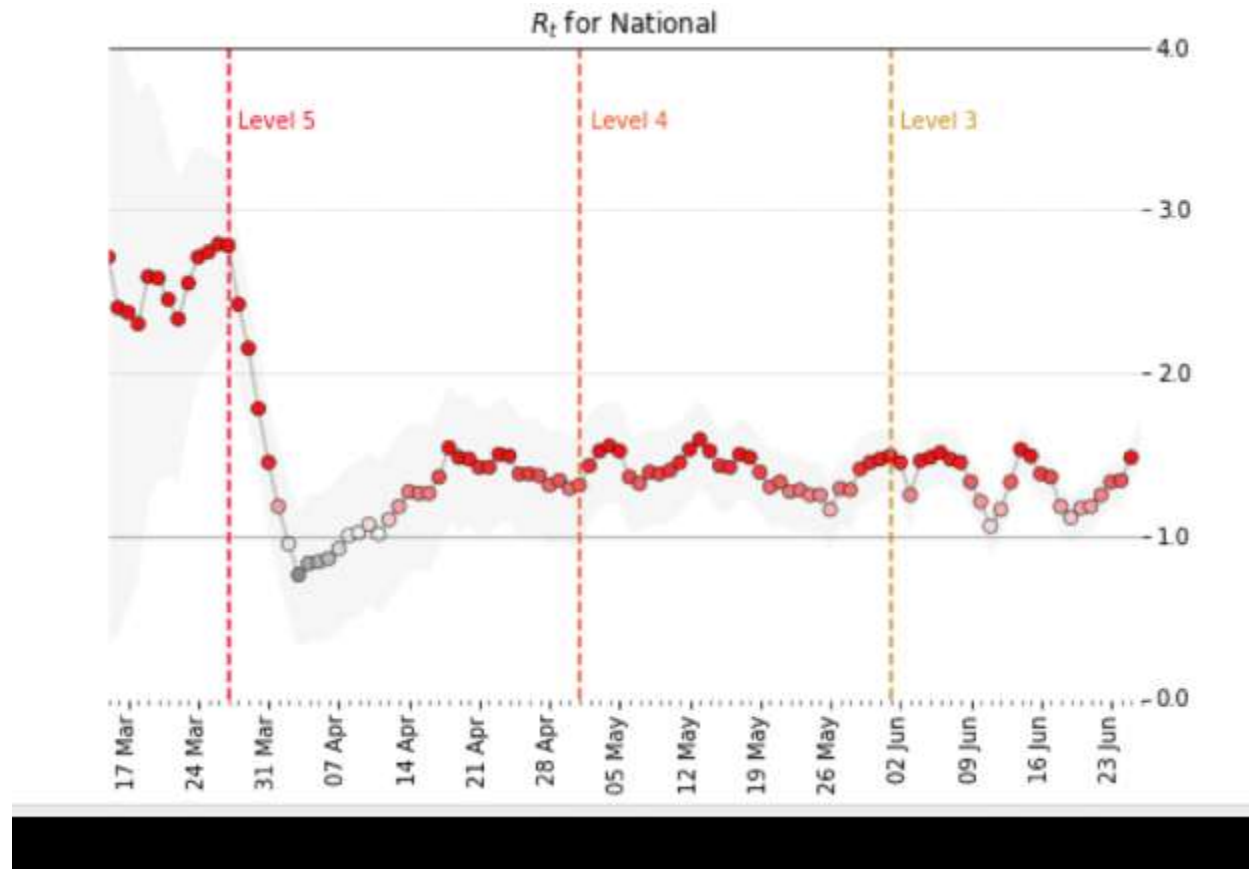
Denmark	2.17	0.75	11/03/2020	0.96	04/07/2020
Dominican Republic	2.52	0.87	15/03/2020	1.12	04/07/2020
Ecuador	1.6	0.89	12/04/2020	0.98	04/07/2020
Egypt	1.66	1.09	20/03/2020	1.09	04/07/2020
Estonia	2.26	0.43	11/03/2020	0.78	04/07/2020
Finland	1.78	0.73	28/03/2020	0.94	04/07/2020
France	1.69	0.81	18/03/2020	0.93	04/07/2020
Germany	2.22	0.8	18/03/2020	1.01	04/07/2020
Greece	1.6	0.7	08/03/2020	0.93	04/07/2020
Honduras	1.27	1.03	06/04/2020	1.1	04/07/2020
Hungary	1.88	0.85	25/03/2020	1.04	04/07/2020
Iceland	1.41	0.47	21/03/2020	0.86	04/07/2020
India	1.36	1.11	20/04/2020	1.1	04/07/2020
Indonesia	1.61	1.02	15/03/2020	1.07	04/07/2020
Iran	2.45	0.88	25/02/2020	1	04/07/2020
Ireland	1.69	0.74	31/03/2020	0.91	04/07/2020
Israel	2.63	0.8	18/03/2020	1.02	04/07/2020
Italy	2.54	0.91	02/03/2020	0.95	04/07/2020
Japan	1.31	0.81	31/03/2020	1.01	04/07/2020
Kuwait	1.75	0.89	18/04/2020	0.89	04/07/2020
Latvia	1.33	0.54	30/03/2020	0.91	04/07/2020
Lithuania	1.78	0.8	12/03/2020	1.03	04/07/2020
Luxembourg	1.89	0.67	18/03/2020	0.87	04/07/2020
Malaysia	2.09	0.59	07/03/2020	1.05	04/07/2020
Malta	1.67	0.7	20/03/2020	0.99	04/07/2020
Mexico	2.17	1.09	01/04/2020	1.02	04/07/2020
Moldova	1.47	1.04	17/03/2020	1.03	04/07/2020
Morocco	2.19	0.73	14/03/2020	0.95	04/07/2020
Netherlands	2.48	0.85	11/03/2020	0.97	04/07/2020
Nigeria	1.49	0.96	13/04/2020	1.04	04/07/2020
Norway	1.73	0.64	17/03/2020	0.85	04/07/2020
Pakistan	1.66	1.05	09/04/2020	1.01	04/07/2020
Panama	1.4	1	19/03/2020	1.1	04/07/2020
Peru	2	1.05	03/04/2020	1.01	04/07/2020
Philippines	1.13	0.95	15/03/2020	1.08	04/07/2020
Poland	1.59	0.97	20/03/2020	1.08	04/07/2020
Portugal	2.18	0.83	11/03/2020	1.03	04/07/2020
Romania	1.7	0.93	15/03/2020	1.11	04/07/2020
Russia	1.61	0.96	20/04/2020	0.99	04/07/2020
Saudi Arabia	2.28	1.07	22/03/2020	1.07	04/07/2020

Serbia	1.49	0.83	24/03/2020	1.08	04/07/2020
Slovakia	1.77	0.6	28/03/2020	0.96	04/07/2020
Slovenia	1.76	0.7	20/03/2020	0.92	04/07/2020
South Africa	2.21	1.11	27/03/2020	1.09	04/07/2020
South Korea	2.09	0.86	22/02/2020	0.99	04/07/2020
Spain	3.25	0.85	06/03/2020	0.95	04/07/2020
Sweden	1.97	0.94	19/03/2020	0.9	04/07/2020
Switzerland	2.14	0.76	13/03/2020	0.95	04/07/2020
Turkey	2.5	0.75	21/03/2020	1.03	04/07/2020
Ukraine	1.56	1.04	23/03/2020	1.04	04/07/2020
United Arab Emirates	1.69	0.8	05/04/2020	1.01	04/07/2020

Kevin Systrom

Kevin Systrom, the founder of Instagram, published code to calculate $R(t)$. It's a modified version of a solution created by Bettencourt & Ribeiro 2008, to estimate real-time using a Bayesian approach (<https://github.com/k-sys/covid-19/blob/master/Realtime%20R0.ipynb>).

Using this approach, the following $R(t)$ s are derived.



From the above, we can make the following comments:

- There was no widespread community transmission, and the pandemic had for all practical purposes not really started in South Africa at the time the level 5 lock-down was introduced. High reported $R(t)$ s before that point is as a result of imported cases, not community transmission.
- The pandemic then started spreading locally at a slow pace reaching a steady level around middle April only.
- The average $R(t)$ s then increased *before level 5 lockdown was lifted*. For the last two weeks of April, the $R(t)$ hovered around 1.5. Since then, the $R(t)$ has also remained at a similar level, *irrespective of the level of lock-down*. It is thus not clear that the lifting of strict lock-down measures has had a significant negative impact on the spread of the virus.

Local or cyclical lockdowns

In addition to the above, there are two critical questions about local or cyclical lockdowns:

- 1) Is there widespread community transmission of the epidemic?
- 2) Is it practically possible to police and enforce the “borders” of the local lockdown, or the cycles of the cyclical lockdown.

From the above analysis, it is clear that the effect of a local lockdown would be limited where there is widespread community transmission around the outbreak area. It is also problematic to attempt to enforce it, and somewhat pointless if the borders of the lockdown area cannot be closed (unlike national borders).

The UK is currently attempted to implement a local lockdown in Leicester. The decision to do so was based on compelling evidence, as show in this report by Public Health England (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897128/COVID-19_activity_Leicester_Final-report_010720_v3.pdf). At that point, local infections were more than 900 per million, so significantly higher than even South Africa’s current incremental infections per million.

However, it is too early to know whether this local lockdown has worked – the data has not yet emerged. At this point, we can only consider media reports and there are several indicating that: it requires a huge policing effort (<https://www.bbc.com/news/uk-england-leicestershire-53276261>), residents are not necessarily compliant (<https://www.telegraph.co.uk/news/2020/07/06/leicester-residents-accused-sneaking-nearby-pubs-locals-identify/>) and also that the Government response is widely criticized (<https://www.ft.com/content/32916989-fecd-4cd8-a7d0-e0fa29f9b2c6>), and that residents find it confusing (<https://news.sky.com/story/coronavirus-leicester-lockdown-risks-creating-uncertainty-and-disorder-scientists-warn-12019610>).

As far as cyclical lockdowns are concerned, similar questions about enforcement and compliance are relevant. As far as we know it has not been tried anywhere in the world.

In the absence of widespread community transmission, local breakouts can perhaps be enforced, with population support, as appears to be the case in Melbourne at the time of writing. Nevertheless, there is no data to confirm that, even under such circumstances, it has actually worked.

As far as we know, no-one has attempted local lockdowns in the midst of widespread community transmission.