SA's Covid-19 epidemic: Trends & Next steps

Prepared for Minister of Health Zweli Mkhize



Prepared on 13th April 2020 by Salim S. Abdool Karim, FRS

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Outline

Part 1: The Coronavirus epidemic

- The Coronavirus epidemic in South Africa
- Why is South Africa not on the expected Covid epidemic trajectory?
- How much community transmission in SA?
- Some future epidemic scenarios

Part 2: South Africa's Covid-19 response

- Stages of the SA Covid-19 response
- Next steps: Stopping small flames to reduce the risk of raging fires
- Conclusion



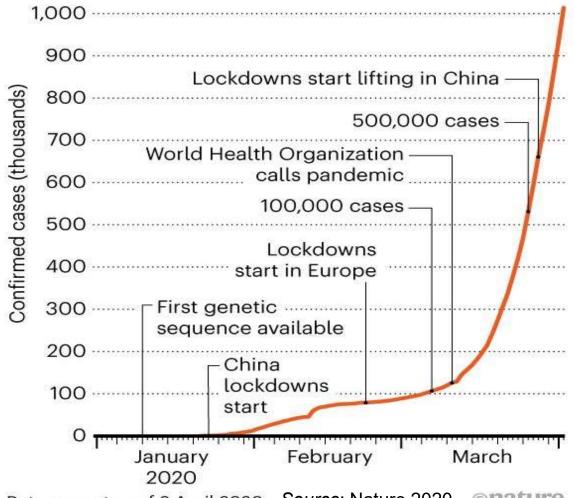


The first million cases of Covid-19

Wuhan seafood market





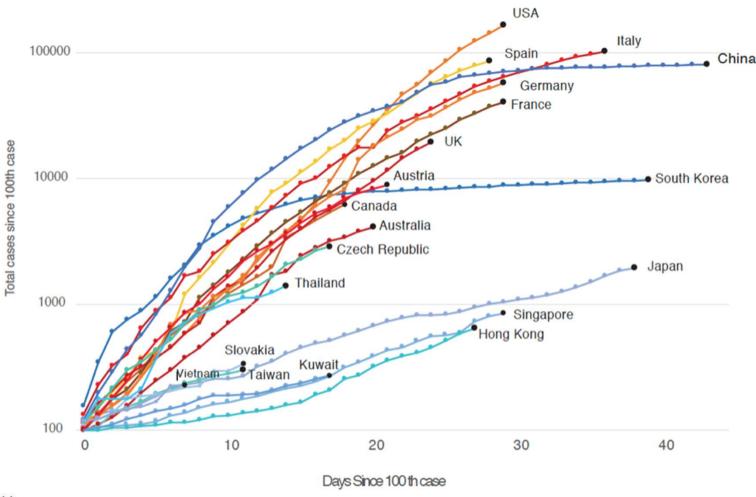








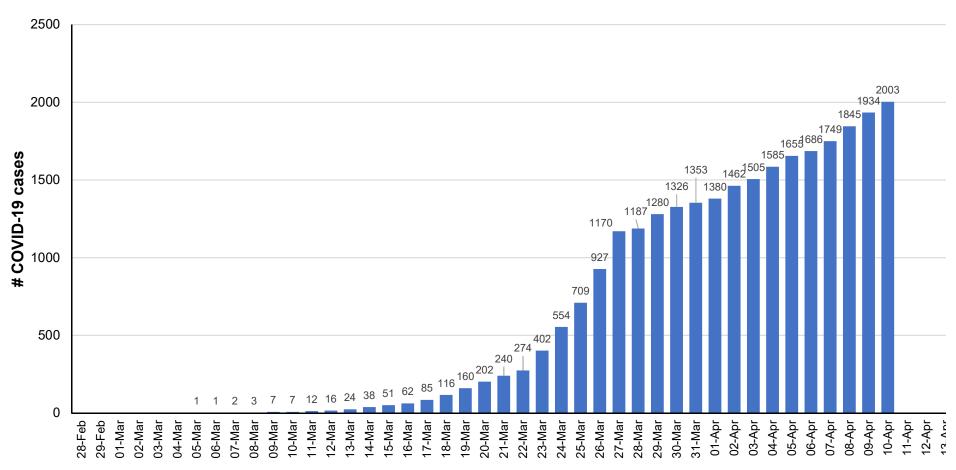
Country level epidemic trajectories







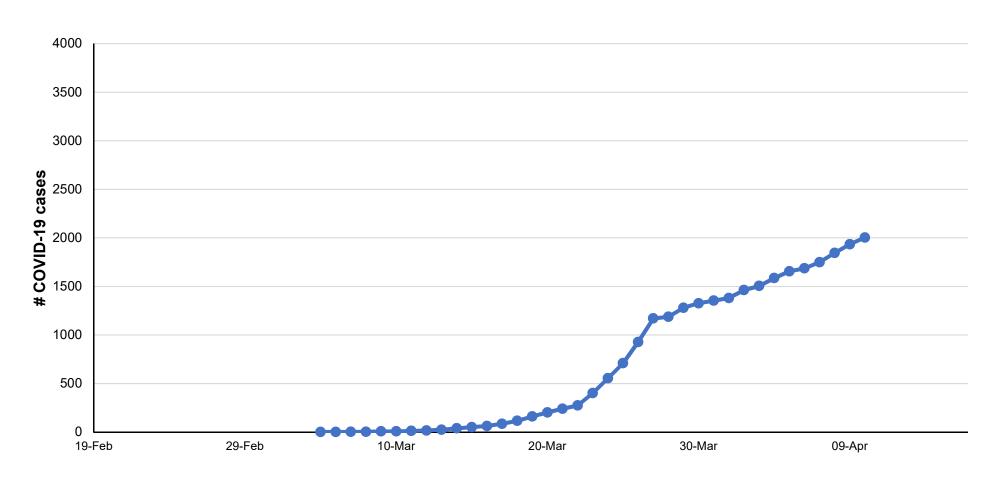
SA's SARS-CoV-2 epidemic - 1 Cumulative number of cases







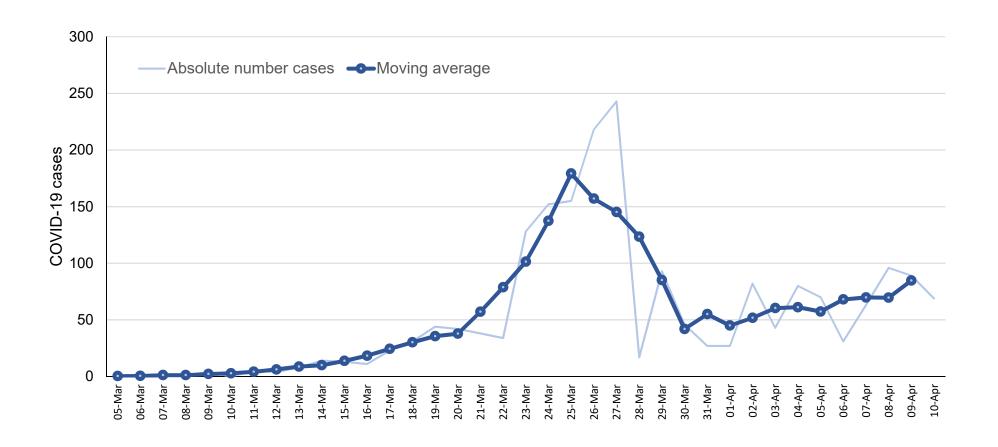
SA's SARS-CoV-2 epidemic - 2 Trends in cumulative cases







SA's SARS-CoV-2 epidemic - 3 Trends in new cases







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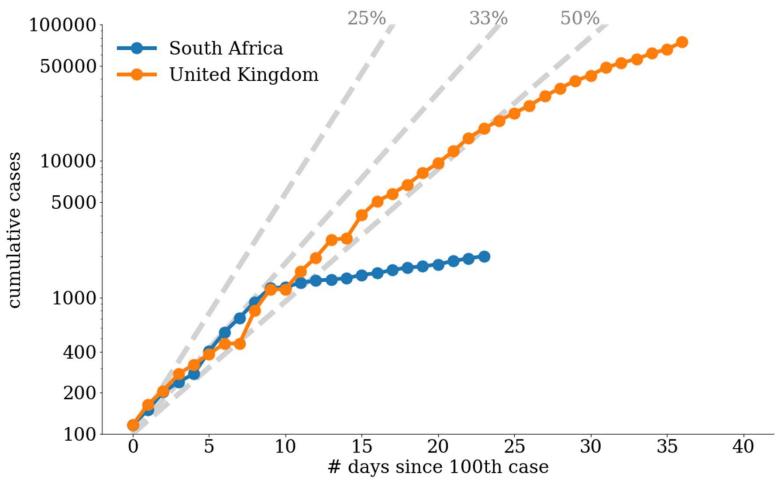
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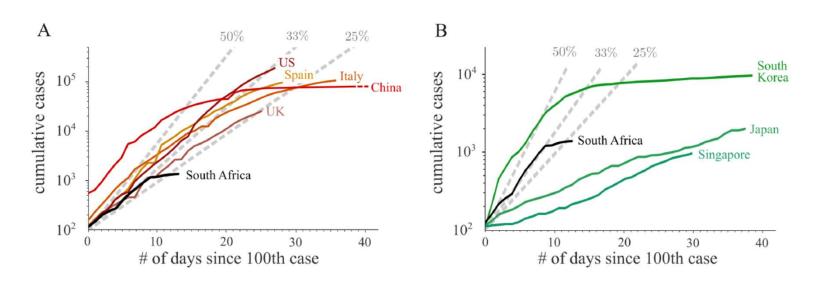
Covid-19 cases - SA vs UK SA's expected vs actual trajectory







SA's epidemic trajectory is unique...



Why is SA different - new cases declining to a plateau:

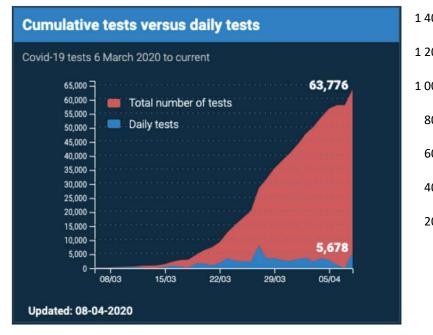
- Are we missing cases due to low or declining testing coverage?
- Are there missing cases in poor communities due to skewed higher private lab testing?
- Is the reduction genuine and due to the interventions in SA's Covid-19 response?

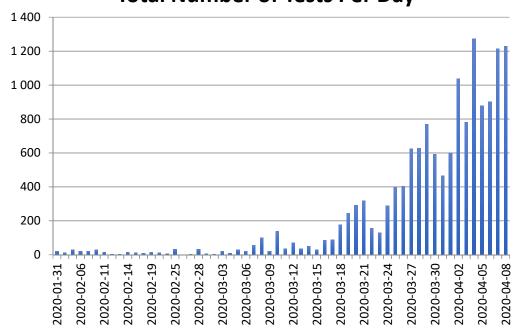




Trends in cumulative private & NHLS Covid-19 tests show steady increase







Covid-19 cases have declined in the last 2 weeks while NHLS test numbers increased ie. while testing in people and communities without medical aid increased Note: Overall testing is still below the target of 10-15,000 / day





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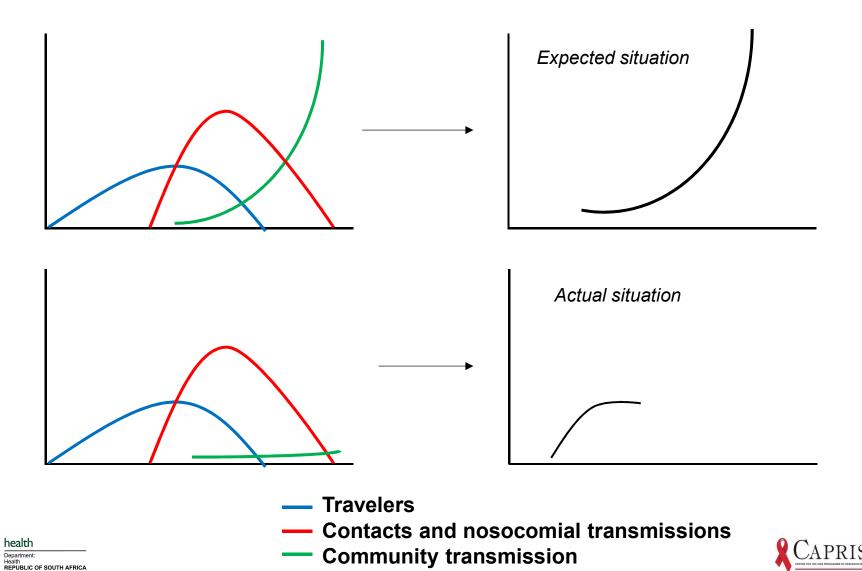
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The 3 waves of the SA epidemic



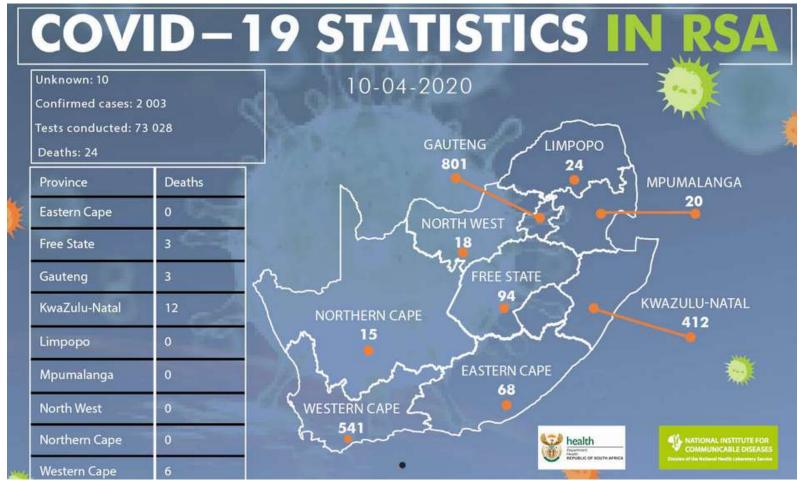
Why did SA not follow the expected epidemic curve?

- First & second waves did not bridge spread effectively into the general community
 - No exponential increase in cases
 - If R_o > 1 daily average cases each fortnight/week would go up
 - Infectiousness is ~2 weeks fortnight average of 65 cases/day before and 72 cases/day after lockdown suggests R_o ~1 around lockdown (Note: all cases are infections before lockdown)
 - No evident national increases in acute respiratory distress (may have some pockets)
- If community transmission is low, cases decline
- If community transmission is increasing then cases will increase and exponential curve will start again





Where is the highest risk of community transmissions in SA?







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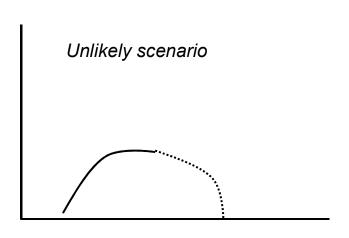
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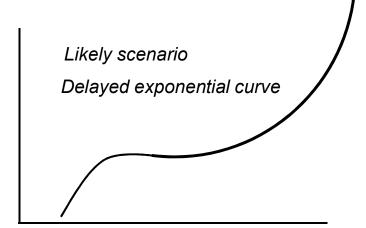
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So what's next?





LOCKDOWN IMPACT India has enforced a 21 day lockdown that will end on April 15. How much will this bring down the infection count? - Forecast - Data Lockdown Single hard lockdown Lockdown 4000 (21 days) 皇 3000 A 2000 India Mar 18 Apr 15 May 13 May 27 Jun 10

Predicted lockdown impact in India and Wuhan







A difficult truth...

Can SA escape the worst of this epidemic? Is exponential spread avoidable?

- No! Not unless SA has a special protective factor (mojo) not present anywhere else in the world
- Our population will be at high risk again after the lockdown
 - Infectiousness period includes 4-7 days before symptoms ie. people can spread it without knowing
 - The virus spreads too fast normally
- Government interventions have slowed viral spread, the curve has been impacted and we have gained some time





Why the delay is important?

- Time to flatten the curve even more
- South Africa has a unique component to its response, ie. active case finding
- Only South Africa has >28,000 community health care workers going house-to-house in vulnerable community for screening & testing to find cases
- New quicker and simpler diagnostics becoming available
- New treatments become available
- Time to prepare for the medical care needs





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Current stages of SA's response

Stage 1: Preparation

- Community education
- Establishing lab capacity
- Surveillance

Stage 2: Primary prevention

- Social distancing & hand-washing
- Closing schools and reduced gathering
- Close the borders to international travel

Stage 3: Lockdown

Intensifying curtailment of human interaction

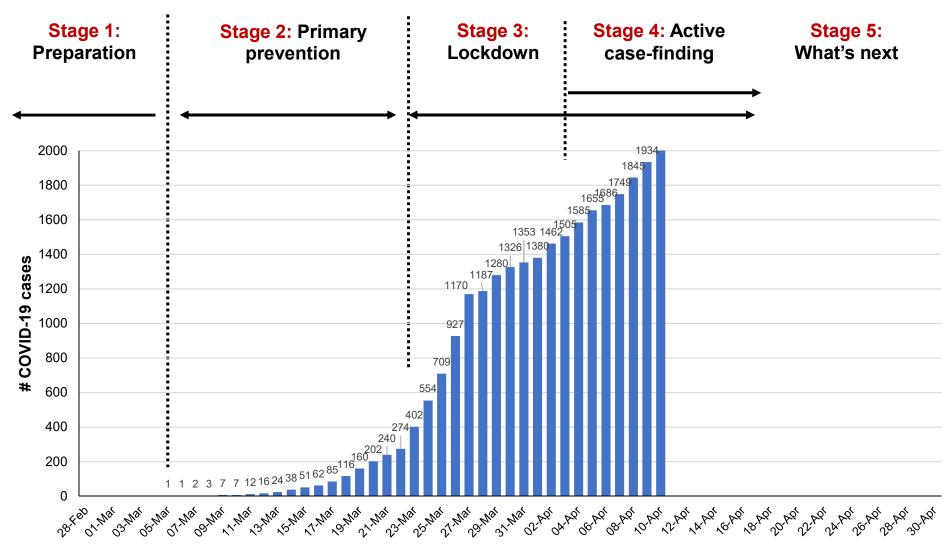
Stage 4: Surveillance & active case-finding

 The Community response: door-to-door screening, testing, isolation and contact tracing





Stages of SA's COVID-19 response

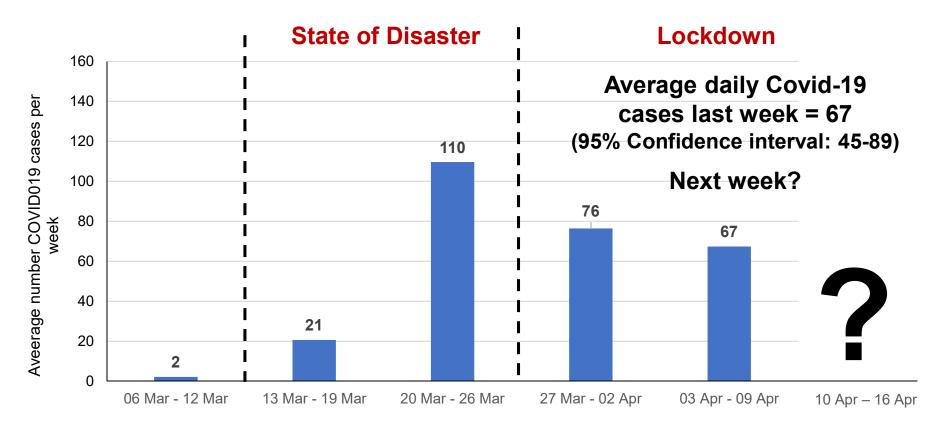






What should we do this week?

Follow the lockdown rules and monitor community transmission by average daily cases & community positivity/screened







Community transmission levels to guide next steps & the lockdown

- By 18th April, will know if community transmission interpretation accurate (~67 cases/day; CI: 45 - 89)
- Epidemiological (R_o) criterion for lockdown if average daily cases (- active screening) from 10 – 16 April is:
 - 90+, then continue lockdown
 - 45 89 AND CHW rate is >0.1% then continue lockdown
 - 45 89 AND CHW rate is ≤0.1% then ease lockdown
 - ≤ 44, then ease lockdown
- Expect large daily variations & some increases in +ve
 tests due to active case-finding (passive vs active cases)
- Abrupt return may increase spread plan the systematic easing of the lockdown over several days:
 - Stepwise approach to reduce risk of rapid transmission taking economic imperatives & social disruption into consideration





Next stages of South Africa's response

Stage 5: Hotspots

- Surveillance to identify & intervene in hotspots
- Spatial monitoring of new cases
- Outbreak investigation & intervention teams

Stage 6: Medical Care (for the peak)

- Surveillance on case load & capacity
- Managing staff exposures and infections
- Building field hospitals for triage
- Expand ICU bed and ventilator numbers

Stage 7: Bereavement & the Aftermath

- Expanding burial capacity
- Regulations on funerals
- Managing psychological and social impact

Stage 8: Ongoing Vigilance

- Monitoring Ab levels
- Administer vaccines, if available
- Ongoing surveillance for new cases

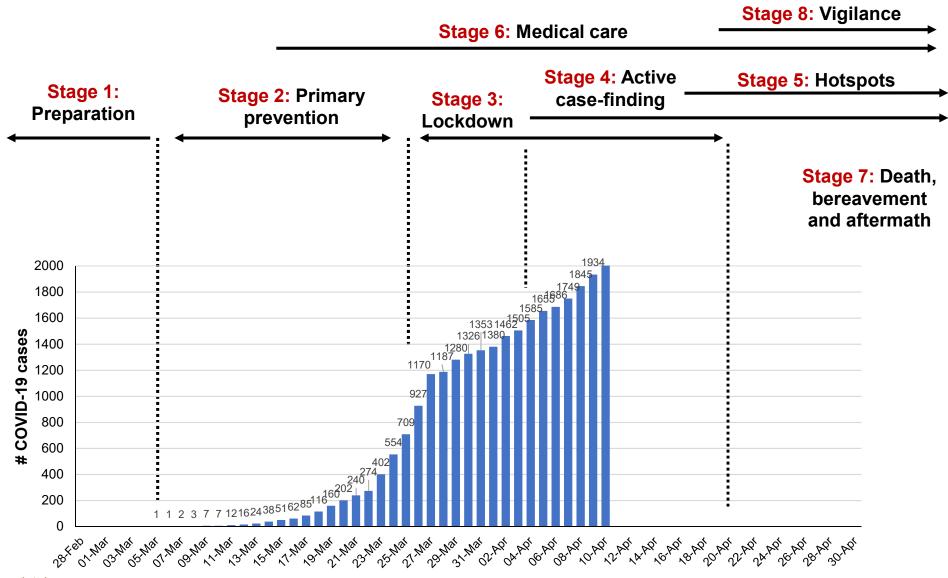








Stages of SA's COVID-19 response







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Stage 8: Vigilance / surveillance

- Need to stay one step ahead of viral spread and not wait for patients to arrive in hospitals to act
- 3 components to surveillance:
 - Ongoing CHW house-to-house screening and testing especially in vulnerable communities
 - One day each month health worker surveillance
 - One day each month National surveillance day for schools, mines, prisons & big companies
 - For now self-taken swabs (later change to fingerprick) from a small sample of people in each setting





Major concerns for stage 6 – The medical care response

- Poor health care access = ↑ deaths (NY)
- Need an effective ambulance system
- HIV+ (not on ART) & TB patients may ↑ severity
- Both Covid & Flu epidemics intermingled
- Need a voluntary partial lockdown until end September just for old people (>70 or >60) and those with co-morbidities to reduce exposure
- Field hospitals for triage, mainly in big cities
- Getting staff ready for the exponential curve, hospitals with makeshift ICUs, more ventilators & PPE





Conclusions

- SA has a unique epidemic trajectory
- Current trajectory due to curtailed community transmission from effective early interventions
- The exponential curve is almost inevitable
- Lockdown bought SA some time (about 4 to 6 weeks)
 and will likely reduce peak case load (flattened curve)
- Systematic approach to keeping infection rates low while easing lockdown in stages
- Focus shifts to Stage 5 of hotspot identification and intervention (fighting flames before they become fires), to
 Stage 6 preparing for peak medical care response
 Stage 8 Vigilance & national surveillance





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- The Ministerial Advisory Committee for Covid-19
- The National Covid Command Council
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