

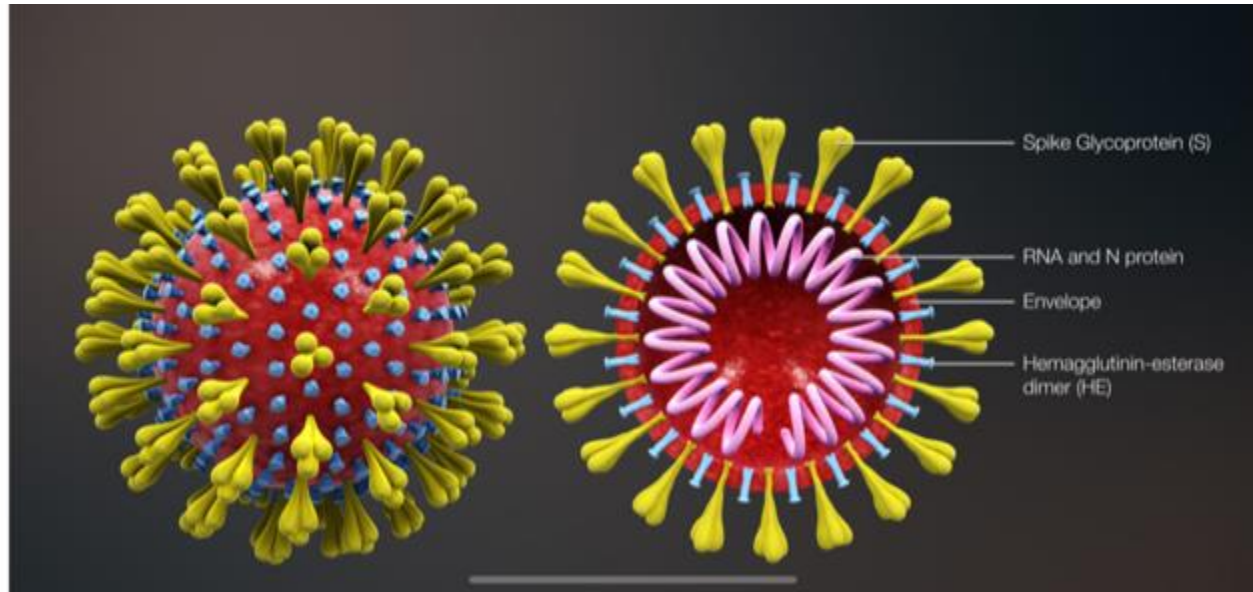


Shabir A Madhi

Professor of Vaccinology, University of the Witwatersrand

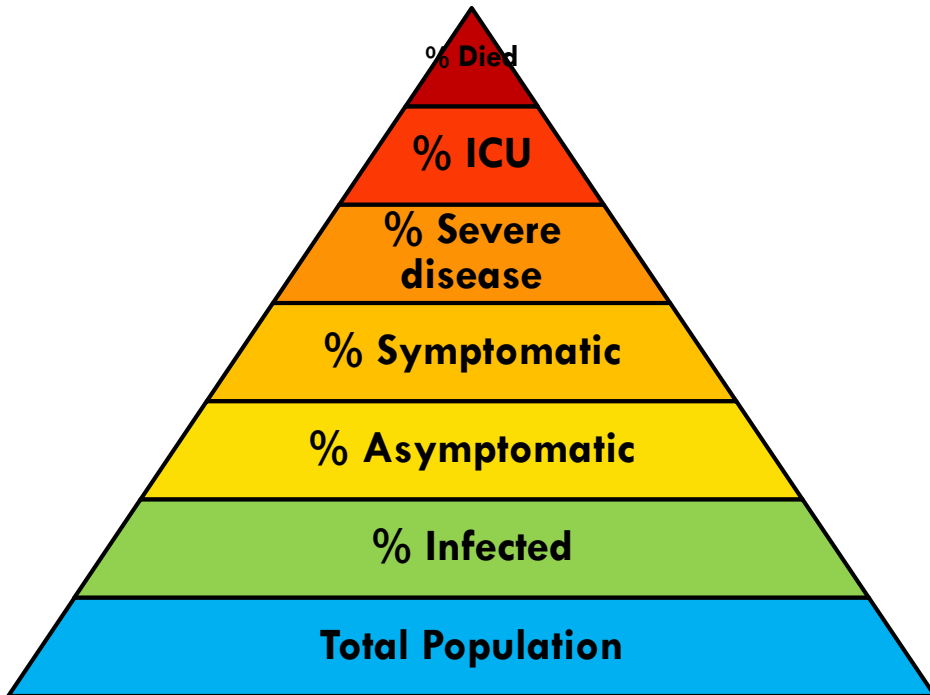
Director: MRC Respiratory and Meningeal Pathogens Research Unit

**Virus: A “non-living” infective agent, only able to multiply in living cells of a host.**



- ❑ **Mainly droplet spread transmission:**
  - ❑ possibly direct inoculation.
  - ❑ Self-inoculation following contact with contaminated surfaces.
- ❑ **Exact numbers infected unknown, since sensitive to who is tested (bias against asymptomatic and mild illness).**
- ❑ **Reproductive rate of  $\sim 2.5$  and case fatality rate 1-2% .**
- ❑ **Expect “herd immunity” once approximately one-third of population are infected.**

# What to expect from SARS-CoV-2, which causes COVID-19.



- **20-80% asymptomatic (carrying virus but not ill).**
- **Of the symptomatic (fever or respiratory symptoms), 10-15% with severe illness.**
- **Approximately 5% require ventilation/ICU**
- **Case fatality risks 1-2% (variable based on denominator); and differ with co-morbidities.**

# Global burden of COVID-19: 3 April 2020

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Coronavirus Cases:

**1,030,633**

[view by country](#)

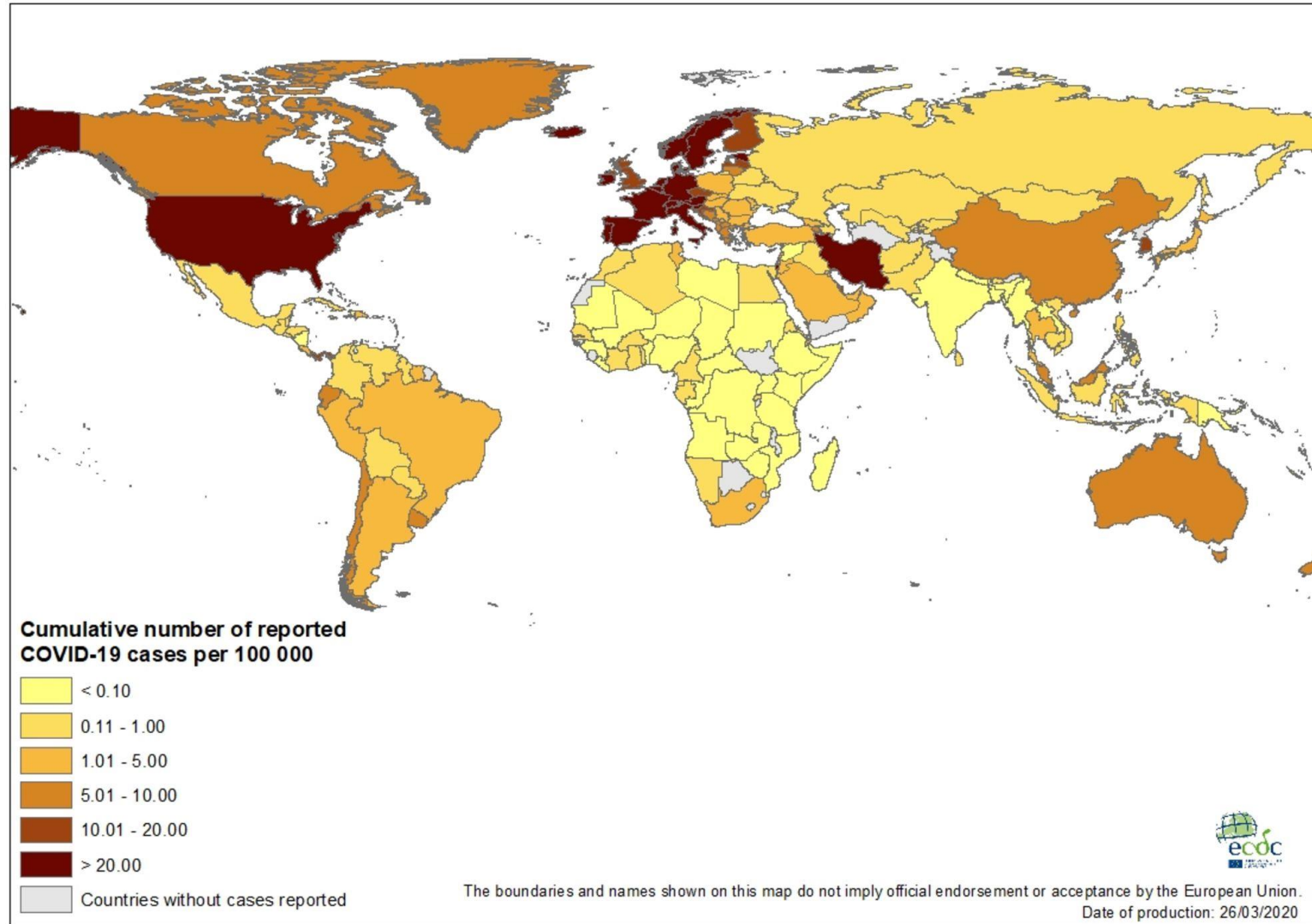
Deaths:

**54,229**

Recovered:

**220,003**

# Geographic distribution of cumulative number of reported COVID-19 cases per 100 000 population, worldwide, as of 26 March 2020



# Country distribution of COVID-19 cases (29 March 2020)

The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.

Country, Other	Total Cases	Confirmed	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Case fatality risk (CFR) (26 Mar)			
World	1,030,633	+15,568	54,229	+1,062	220,003	756,401	38,178	132.2	7.0	1.5%
<a href="#">USA</a>	245,442	+565	6,098	+28	10,411	228,933	5,421	742	18	10.2%
<a href="#">Spain</a>	117,710	+5,645	10,935	+587	30,513	76,262	6,416	2,518	234	4.5%
<a href="#">Italy</a>	115,242		13,915		18,278	83,049	4,053	1,906	230	7.6%
<a href="#">Germany</a>	85,063	+269	1,111	+4	22,440	61,512	3,936	1,015	13	5.9%
<a href="#">China</a>	81,620	+31	3,322	+4	76,571	1,727	379	57	2	7.6%
<a href="#">France</a>	59,105		5,387		12,428	41,290	6,399	905	83	5.8%
<a href="#">Iran</a>	53,183	+2,715	3,294	+134	17,935	31,954	4,035	633	39	1.6%
<a href="#">UK</a>	33,718		2,921		135	30,662	163	497	43	5.0%
<a href="#">Switzerland</a>	19,303	+476	573	+37	4,846	13,884	348	2,230	66	1.5%

- Case fatality risk (CFR) does not account for cases still under treatment (may be higher)
- Differences in threshold for investigating will influence CFR.
- Differences in population demographic and co-morbidities affect attack rate and CFR

# Country distribution of COVID-19 cases (3 Apr 2020)

The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.

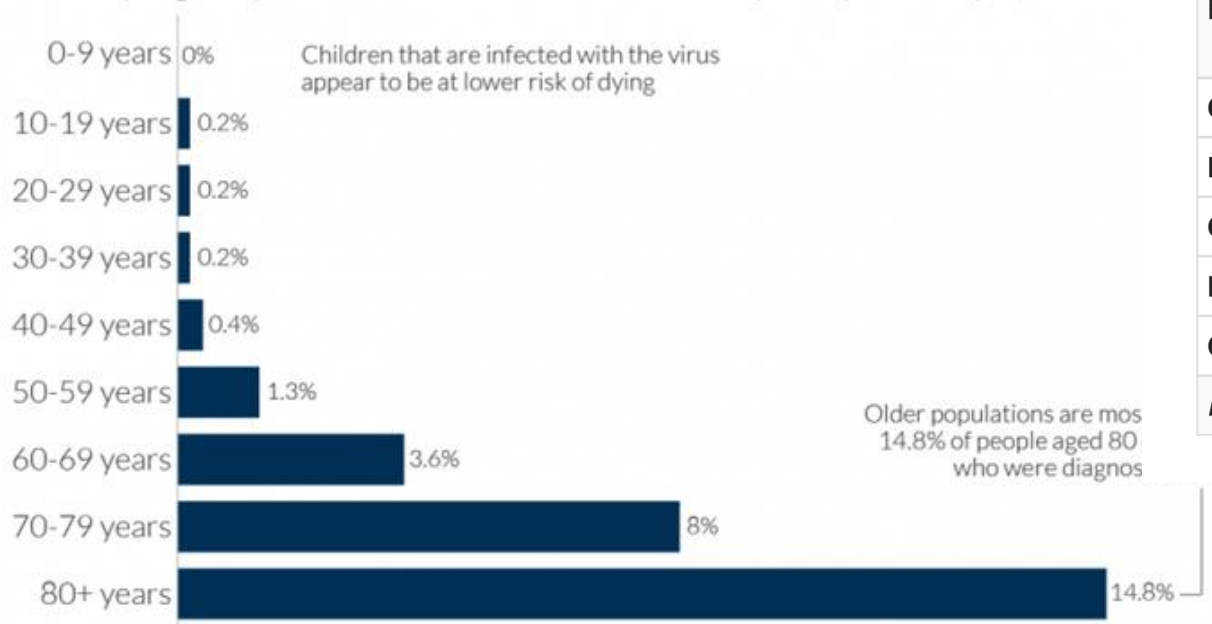
Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop
South Africa	1,462		5		95	1,362	7	25	0.08
Peru	1,414		55		537	822	51	43	2
Dominican Republic	1,380		60		16	1,304	147	127	6
Iceland	1,319		4		284	1,031	12	3,865	12
Argentina	1,265		37	+1	256	972		28	0.8
Serbia	1,171		31		42	1,098	81	134	4
Colombia	1,161		19		55	1,087	50	23	0.4
Singapore	1,114	+65	5	+1	266	843	24	190	0.9
UAE	1,024		8		96	920	2	104	0.8
Croatia	1,011		7		88	916	34	246	2
<a href="#">Algeria</a>	986		<del>86</del>		<del>61</del>	839		22	2

# Risk for infection similar across age-group, but older individuals more susceptible to fatal outcome.

## Coronavirus: early-stage case fatality rates by age-group in China



Case fatality rate (CFR) is calculated by dividing the total number of deaths from a disease by the number of confirmed cases. Data is based on early-stage analysis of the COVID-19 outbreak in China in the period up to February 11, 2020.



PRE-EXISTING CONDITION	DEATH RATE confirmed cases	DEATH RATE all cases
Cardiovascular disease	13.2%	10.5%
Diabetes	9.2%	7.3%
Chronic respiratory disease	8.0%	6.3%
Hypertension	8.4%	6.0%
Cancer	7.6%	5.6%
<i>no pre-existing conditions</i>		0.9%

### Case fatality risk:

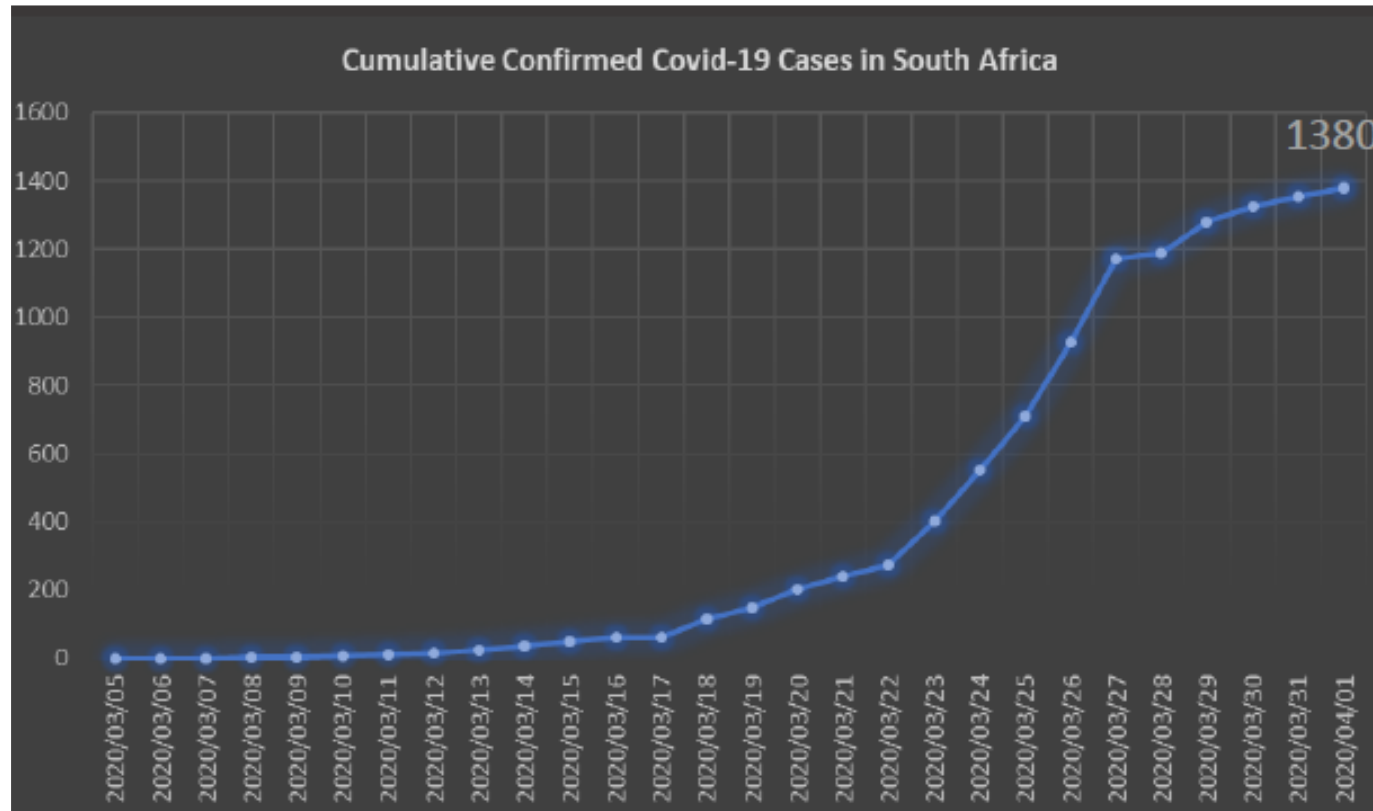
- ?HIV (7 million) and TB (300,000)
- Seasonal influenza 40-fold increased risk mortality in PLWH

Data source: Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. Vital surveillance: the epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. China CDC Weekly. OurWorldinData.org – Research and data to make progress against the world’s largest problems. Licensed under CC-BY by the authors.



# Covid-19 cases as of 2 April 2020 in South Africa

The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.



- Biases in terms of select group tested.
- Majority of testing in private sector and using algorithm geared toward detecting imported cases and their contacts.
- Emergence of “sporadic cases”, including health care workers- indicating community transmission.
- Current figures an under-estimate of burden of COVID-19 in SA, yet doubling time of three days.

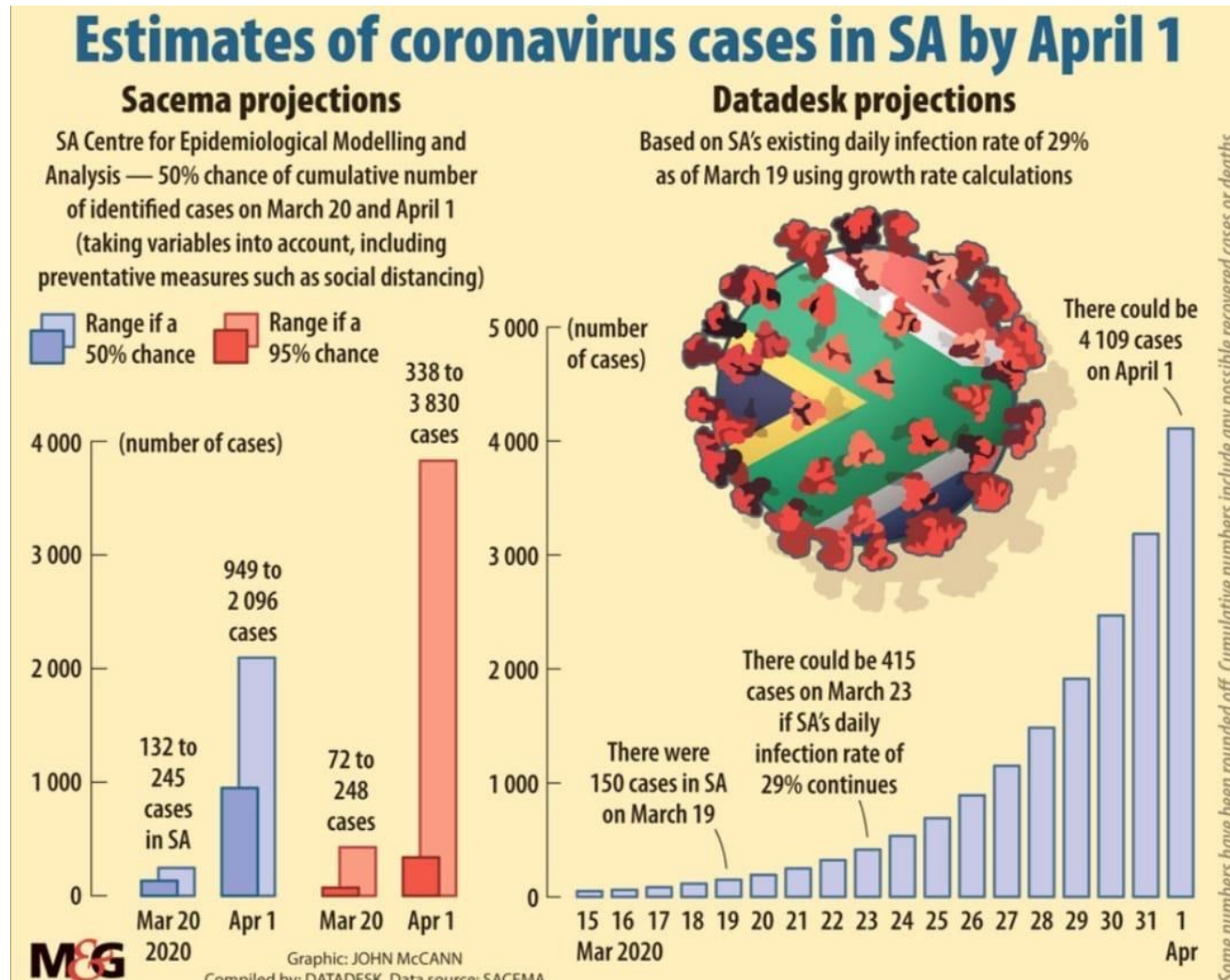
# Covid-19 cases as of 29 March 2020 in South Africa

**The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.**

GAUTENG	584
WESTERN CAPE	310
KWAZULU – NATAL	167
FREE STATE	72
NORTH WEST	6
MPUMALANGA	11
LIMPOPO	12
EASTERN CAPE	12
NORTHERN CAPE	6
UNALLOCATED	100

- Biases in terms of select group tested.
- Majority of testing in private sector and using algorithm geared toward detecting imported cases and their contacts.
- Emergence of “sporadic cases”, including health care workers- indicating community transmission.
- **Current figures an under-estimate of burden of COVID-19 in SA, yet doubling time of three days.**

Doubling time of 3-4 days in number of COVID-19 cases, despite very restrictive threshold for testing.

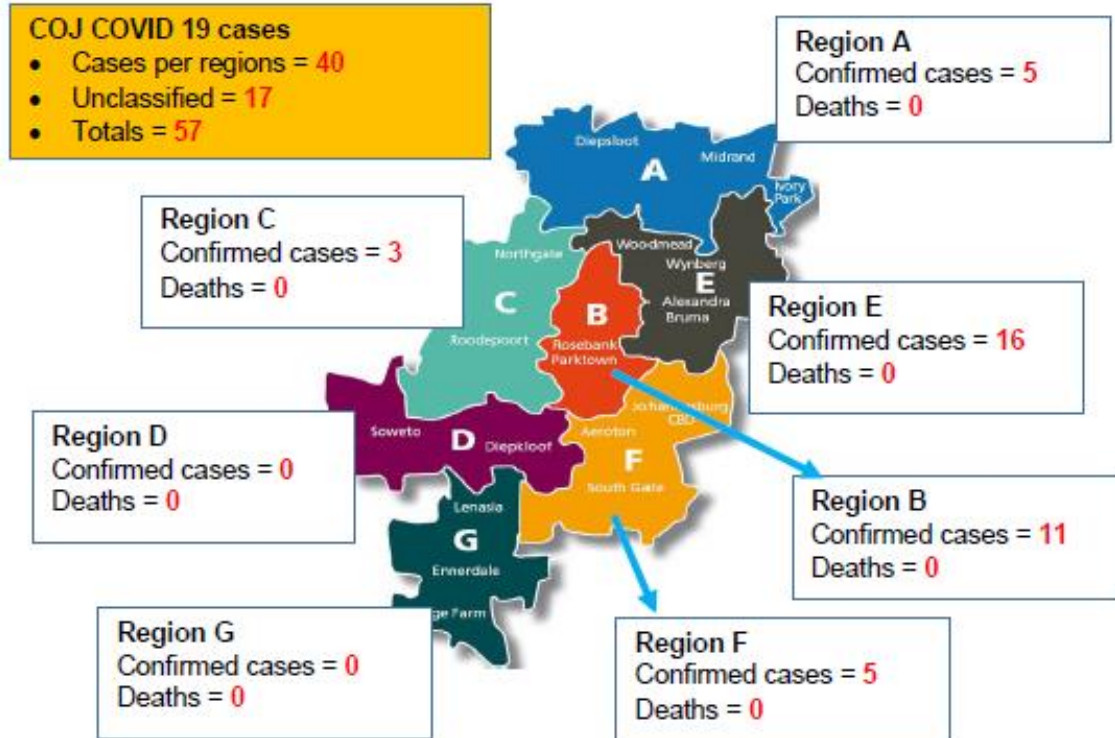


- Projection based on restrictive testing algorithm, and no intervention.
- Expect acceleration in number of cases with change in criteria for testing (i.e. irrespective of travel or contact).
- Likely reduction in doubling time to 24 hours.
- Change in demographics and outcome with changes in testing algorithm.

# Spatial distribution of COVID-19 cases in Johannesburg: Absence of identifying cases $\neq$ absence of disease

**The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.**

## Reported confirmed COVID19 cases and deaths in the City of Johannesburg



City of Joburg Corona Virus Disease (COVID19) Situational Report, as on 20<sup>th</sup> March 2020



## Media release

**Media Release: Update on the Coronavirus by Premier Alan Winde- call 10111 to report lockdown transgressions**  
29 March 2020

### Latest cases:

As of 00h01 on March 29, the Western Cape had recorded 310 COVID-19 infections.

### District breakdown

City of Cape Town – 256  
Cape Winelands – 17  
Garden Route – 21  
Overberg – 7

### Subdistrict breakdown (maps detailing the sub-districts are attached)

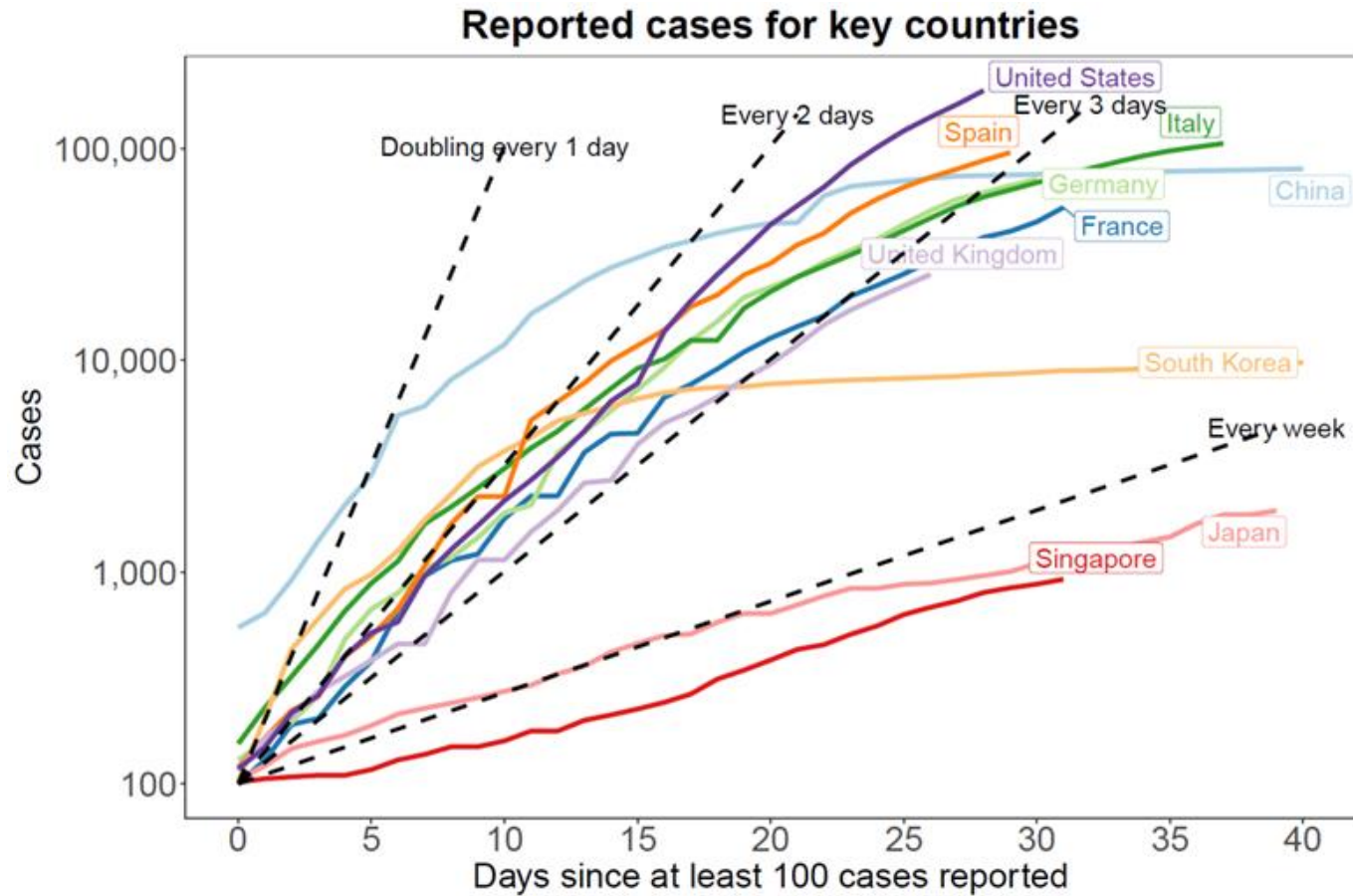
#### Cape Town Metro Sub-Districts

Western-106  
Southern-98  
Northern-16  
Tygerberg-15  
Eastern-10  
Klipfontein-5  
Mitchells Plain-5  
Khayelitsha- 1

#### Other sub-districts

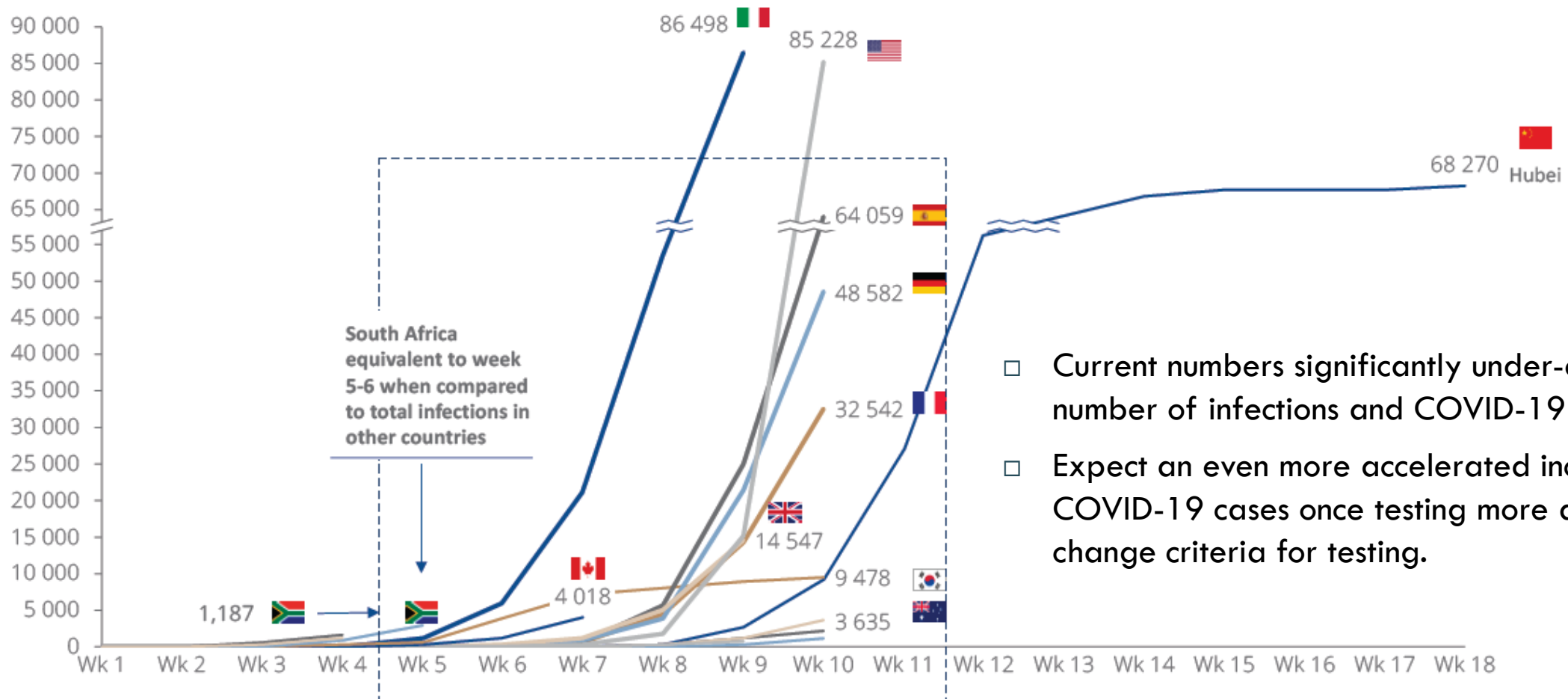
Bitou – 9  
Stellenbosch – 8  
Drakenstein – 6  
George – 6  
Overstrand – 5  
Breede Valley – 3  
Hessequa – 3  
Mossel Bay – 3  
Swellendam – 1

Urgent need for scaling up of testing facilities, with low threshold for indication for testing across the country, and especially in major metro in Gauteng, WC, KZN.



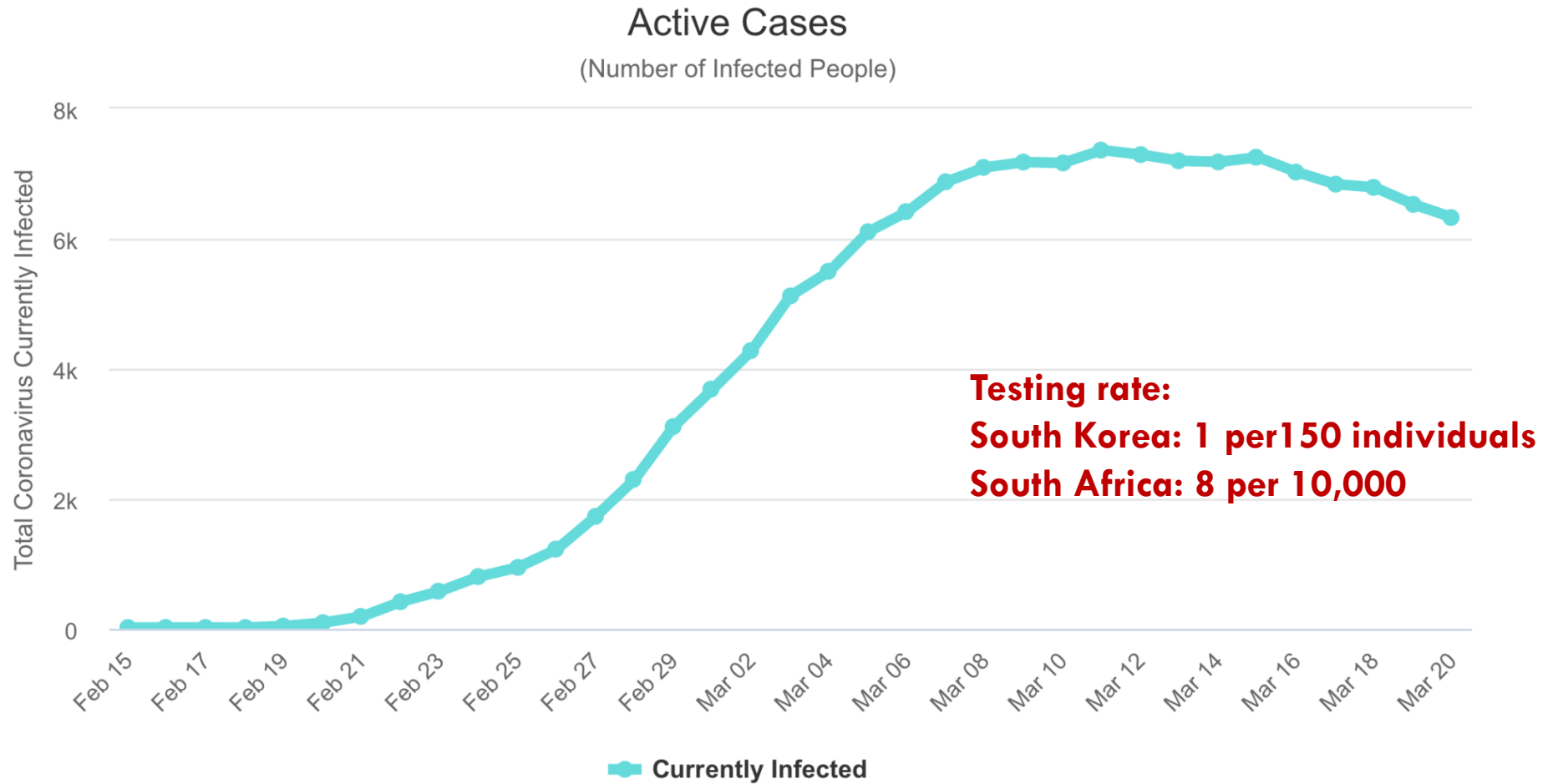
# Where are we in the epidemic???

The number of confirmed cases is lower than the number of total cases; due to limited and/or restrictive testing criteria.

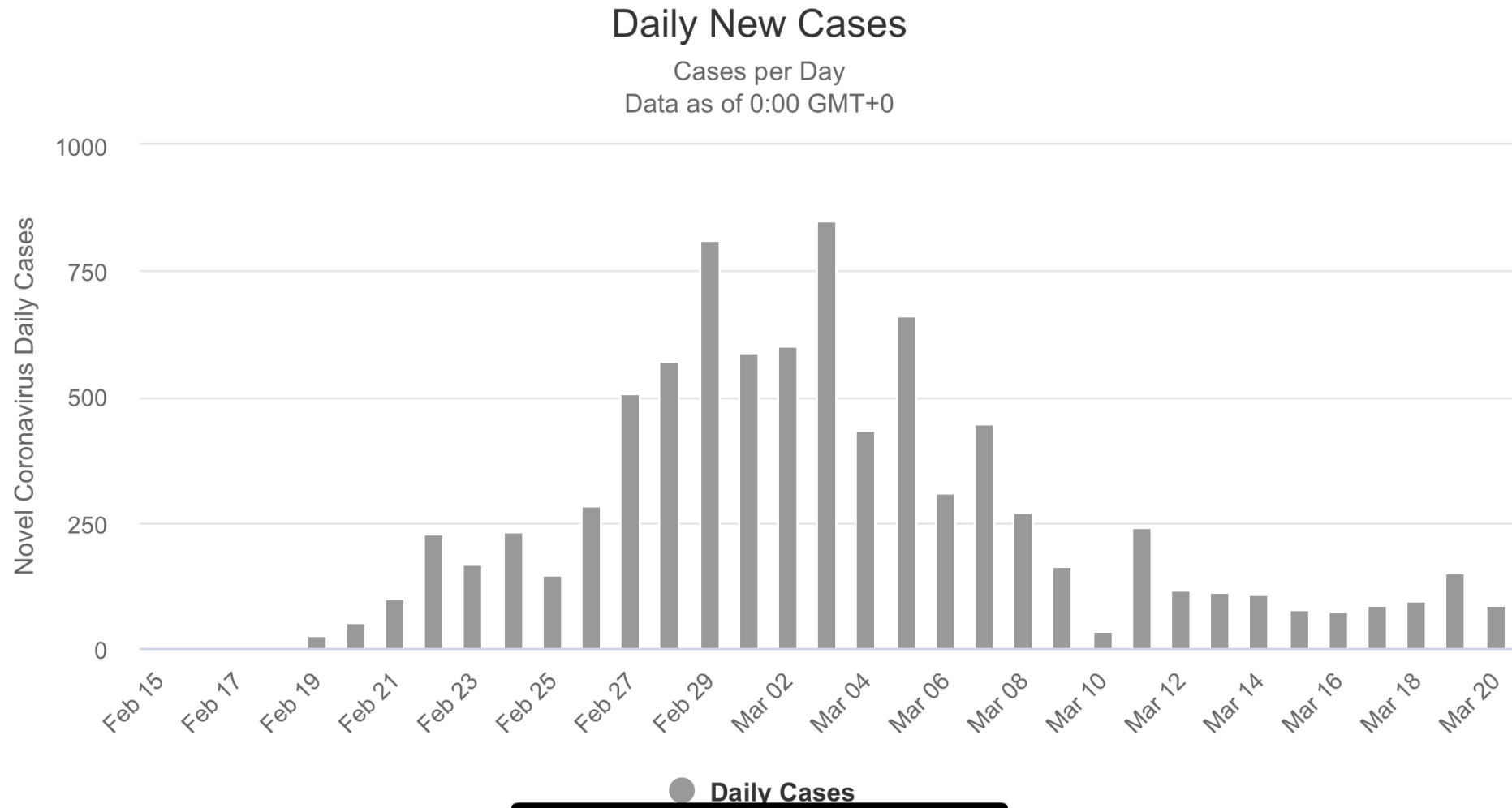


- Current numbers significantly under-estimate actual number of infections and COVID-19 cases.
- Expect an even more accelerated increase in COVID-19 cases once testing more available and change criteria for testing.

# South Korea cases



# South Korea cases





# “Countries can't simply lock down their societies to defeat coronavirus”

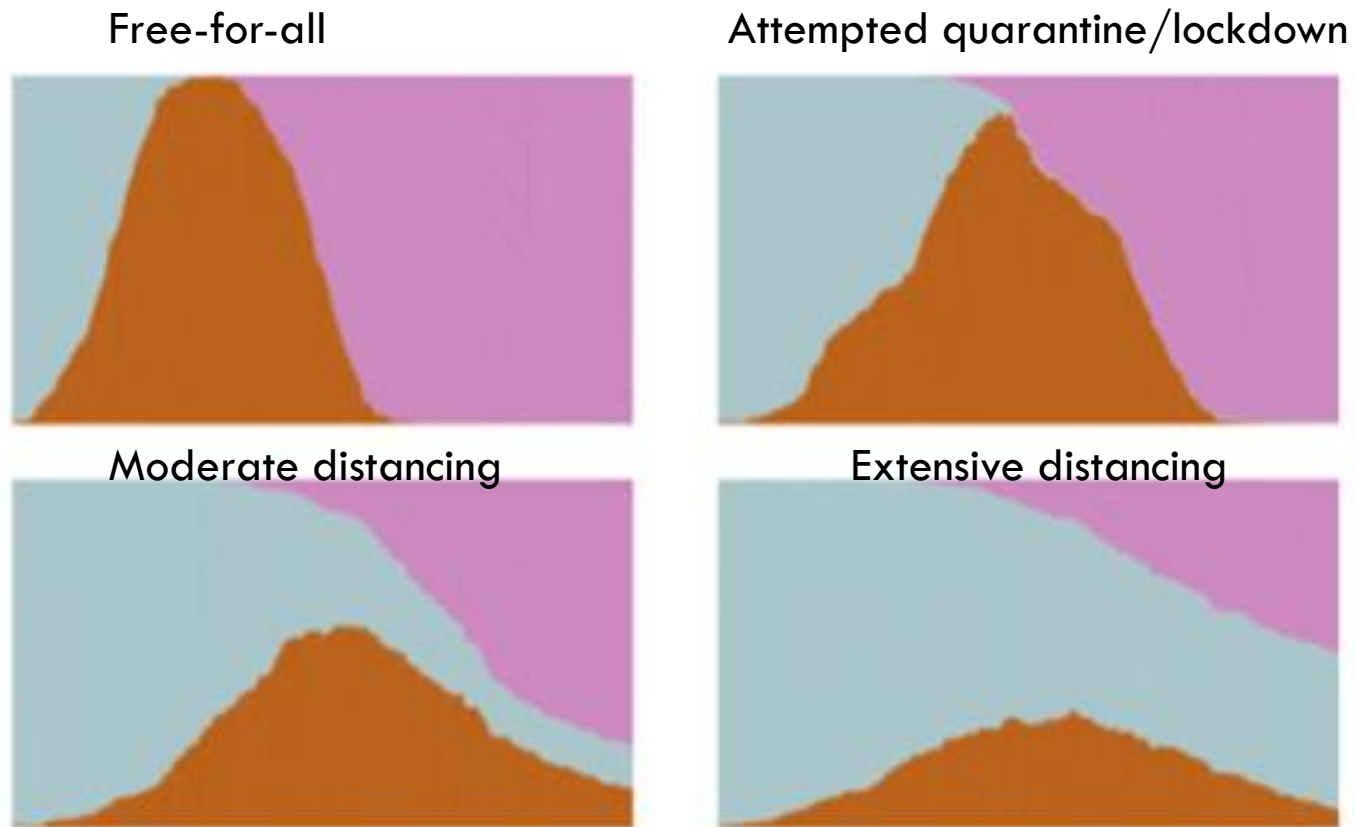


Mike Ryan, WHO, Assistant Director General for Emergencies

“What we really need to focus on is finding those who are sick, those who have the virus, and isolate them, find their contacts and isolate them”.

“The danger right now with the lockdowns ... if we don't put in place the strong public health measures now, when those movement restrictions and lockdowns are lifted, the danger is the disease will jump back up.”

# What to expect from the lockdown



<https://www.washingtonpost.com/graphics/2020/world/corona-simulator/>

# Considerations

- **Duration of lockdown?**
- **Implication of residual circulation of SARS-CoV-2, post lockdown**
- **Social distancing and other precautionary/preventative measures**
- **Role of higher institutions in supporting Government response**
- **Implications for academic year in higher education**
- **Community mobilisation at multiple fronts**

# Priority areas for action

- ❑ **Scaling up Country-wide Diagnostic Capacity**
- ❑ **Safety and Protection of Frontline Healthcare Personnel**
- ❑ **Increase Access to Mandatory Influenza Vaccination**
- ❑ **Centralized and Decentralised Containment Areas**
- ❑ **Enhance Clinical Care Capacity**
- ❑ **Systems Management and Logistic Support for Public Hospitals**
- ❑ **Immediate Private- Public Healthcare Partnership Agreement**
- ❑ **Psychological Preparedness and Support for Frontline Healthcare Personnel.**
- ❑ **Community mobilisation at multiple fronts**