

## **COVID-19 in South Africa**

3 July 2020 – Usher Edinburgh Webinar

Prof Cheryl Cohen (cherylc@nicd.ac.za) Head of Centre Centre for Respiratory Diseases and Meningitis National Institute for Communicable Diseases of the National Health Laboratory Service South Africa

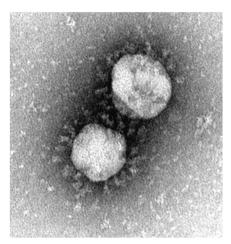


Image: Monica Birkhead, CEZPD, NICD



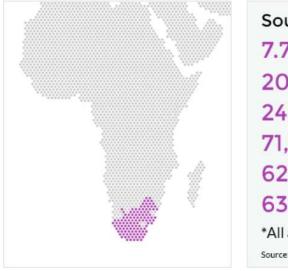
**Division of the National Health Laboratory Service** 

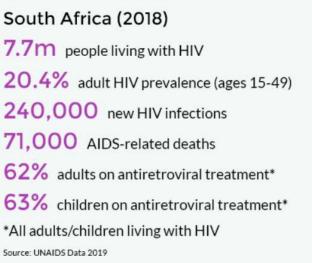
## South Africa

• Temperate climate

- Middle income (high inequality)
  - Unemployment 29% Dec 2019, forecast 35% Dec 2020
- Population 58,7 million
  - Young population, 5% aged ≥65 years, life expectancy 64 years
- 500,000 new TB cases each year
- Increasing burden of non-communicable diseases

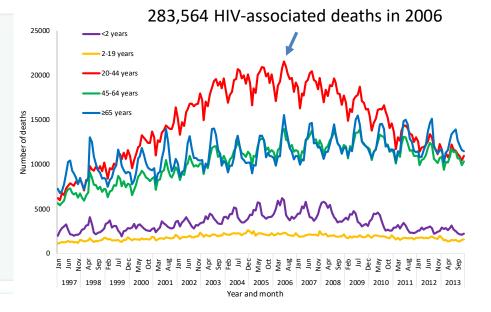
## HIV AND AIDS IN SOUTH AFRICA



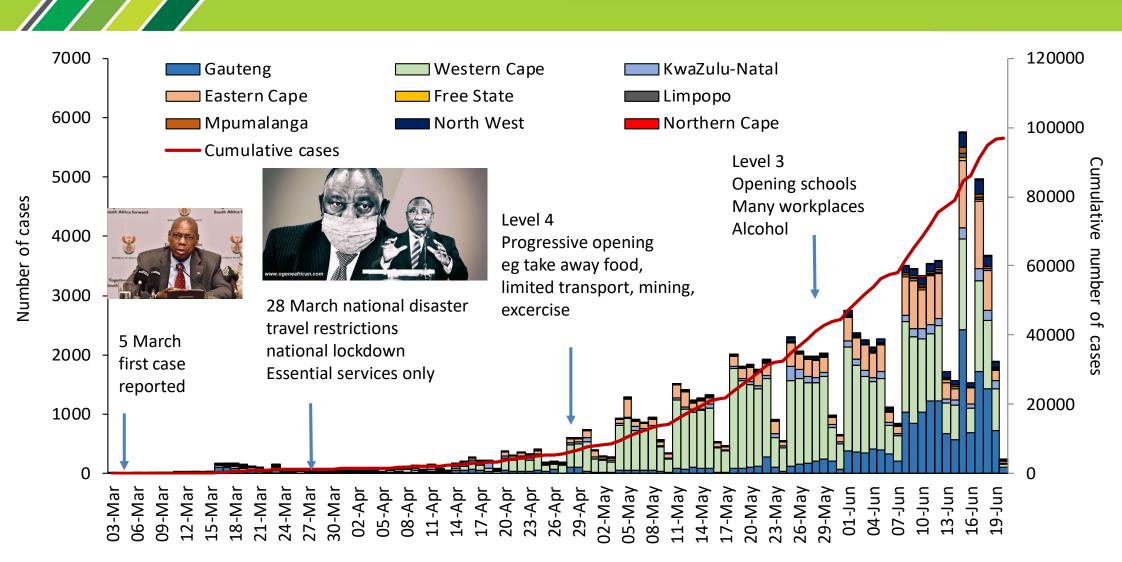




### Number of deaths by year and month, South Africa, 1997-2013



Laubscher et al SAMJ 2014

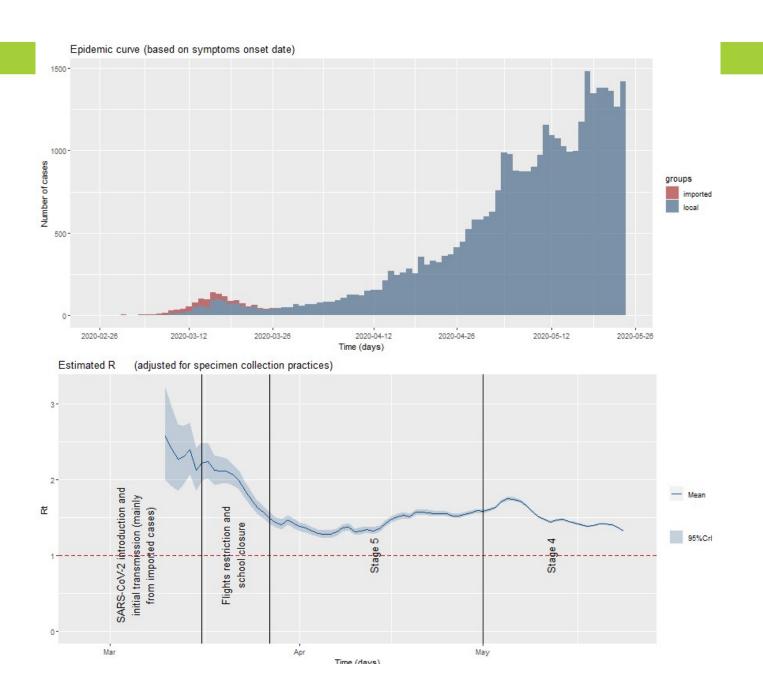


Date specimen collected\*

On 27 June 2020, South Africa had performed >1.4 million PCR tests and recorded >130,000 laboratory-confirmed cases

NICD report: The initial and daily effective reproductive number for COVID-19 in South Africa https://www.nicd.ac.za/ wp-

content/uploads/2020/0 6/Initial-and-Daily-COVID-19-Effective-Reproductive-Number-Rin-SA-11\_6\_2020.pdf

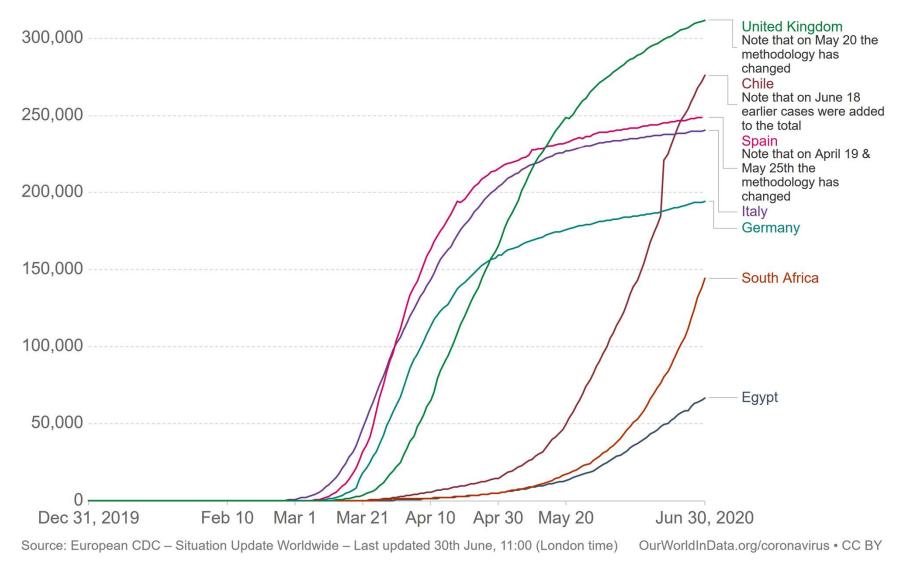


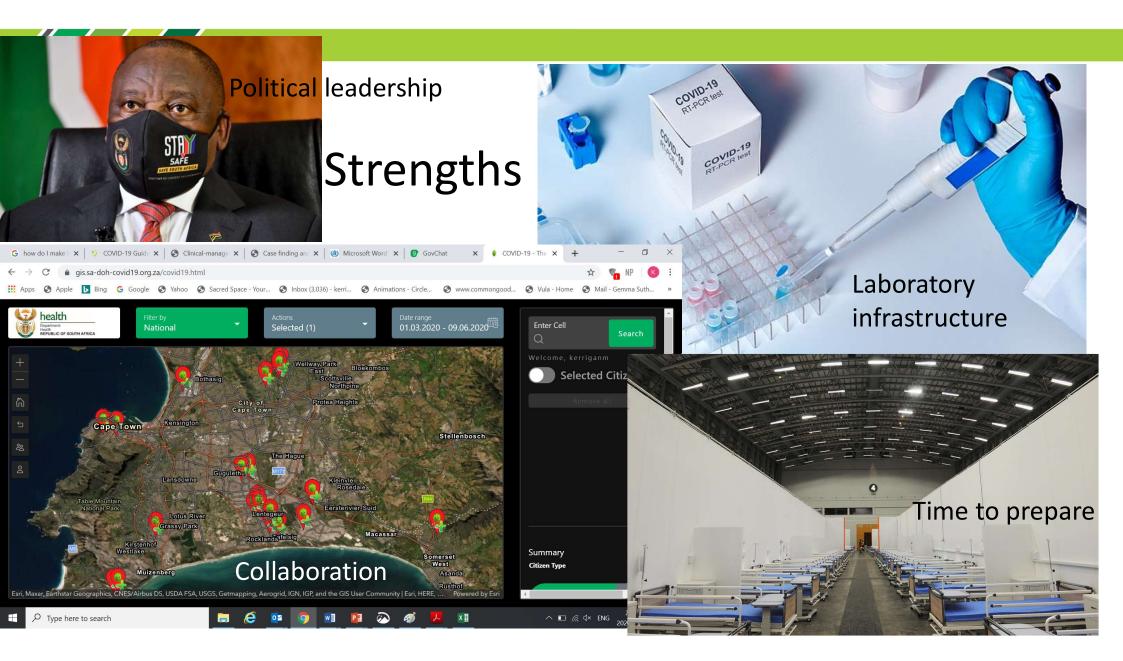


### Cumulative confirmed COVID-19 cases



The number of confirmed cases is lower than the number of total cases. The main reason for this is limited testing.





## Challenges in response

Hunger



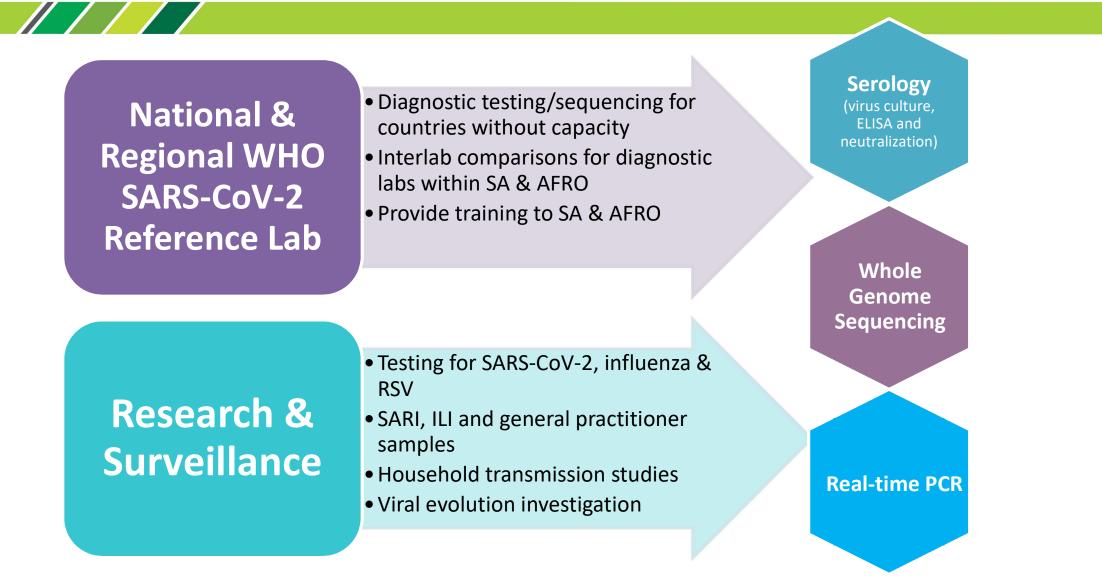
Outbreaks

Laboratory test
 supply

Pension day

TERN

Contact tracing

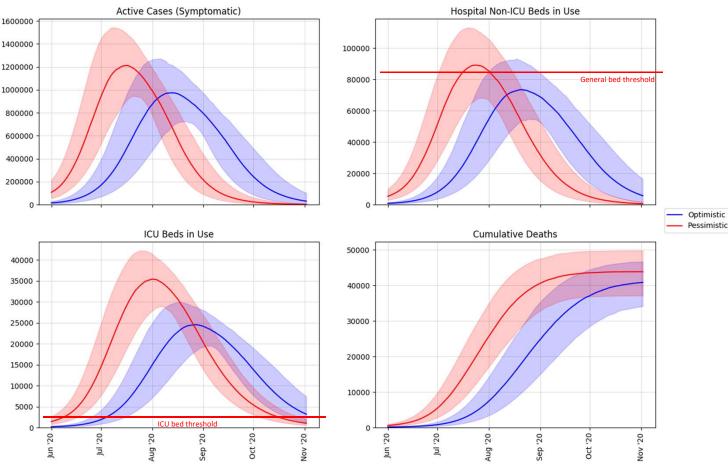


**Functions of National Institute for Communicable Diseases COVID-19 laboratory** 

### South African COVID-19 Modelling Consortium Long term projections: National (6 May)

 Models developed by MASHA, SACEMA and HE2RO in conjunction with the NICD

- Extensive and ongoing input from clinicians, virologists, intensivists and epidemiologists to refine key model assumptions and parameters
- Projections are updated regularly



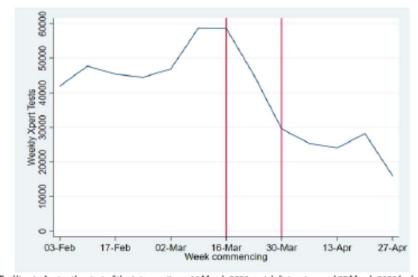
Source: NICD COVID-19 Surveillance Reports https://www.nicd.ac.za/diseases-a-z-index/covid-19/surveillance-reports/

# Uses of model outputs

- NDOH Ministerial Advisory Committee: Scenario analysis
- Facility Readiness Committee: Number of beds and expansion of facilities
- Human Resources for Health team: Staff required per level
- National Ventilator Project: Number of ventilators needed
- Oxygen planning team: O<sub>2</sub> required

- Affordable Medicines Directorate: *Drug quantities*
- National Health Laboratory Service: *Number of tests and testing algorithms*
- Isolation facilities: Cost and distribution of isolation beds
- Infrastructure: Number and placements of field hospitals
- Environmental health: *Number and placement of mortuary containers*
- NDOH/ national and provincial treasuries (via Covid-19 Costing Committee): *Covid-19 health budget*

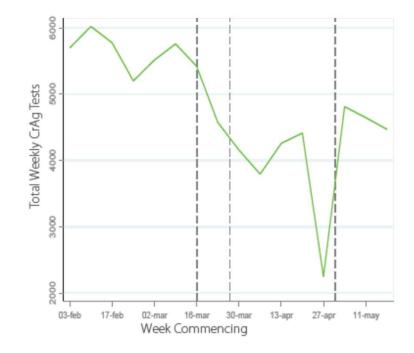
## Impact on other communicable diseases



Red line indicates the start of the interventions: 16 March 2020 social distancing and 27 March 2020 lockdown.

Figure 2a. Trends in weekly Xpert tests between 3 February 2020 to 3 May 2020, N=511 708.

Weekly CrAg tests

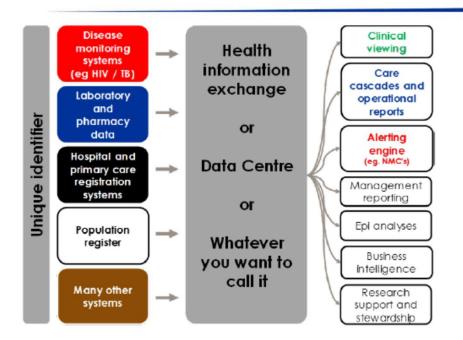


Weekly TB Tests

# Influenza and RSV detections and detection rate from sentinel surveillance

Influenza, ILI surveillance RSV, pneumonia surveillance 100 70 150 100 positive samples 0 0 0 09 Number of positive samples Percentage detection rate Percentage detection rate 80 80 60 60 40 40 Number of 1 20 20 0 0 0 Ω 2018 2019 2020 2018 2019 2020 B Epidemiologic week — % Detection — — Mean 10 year detection rate A(H3N2) RSV – A(H1N1)pdm09

### Western Cape data to look at risk factors for COVID-19 deaths



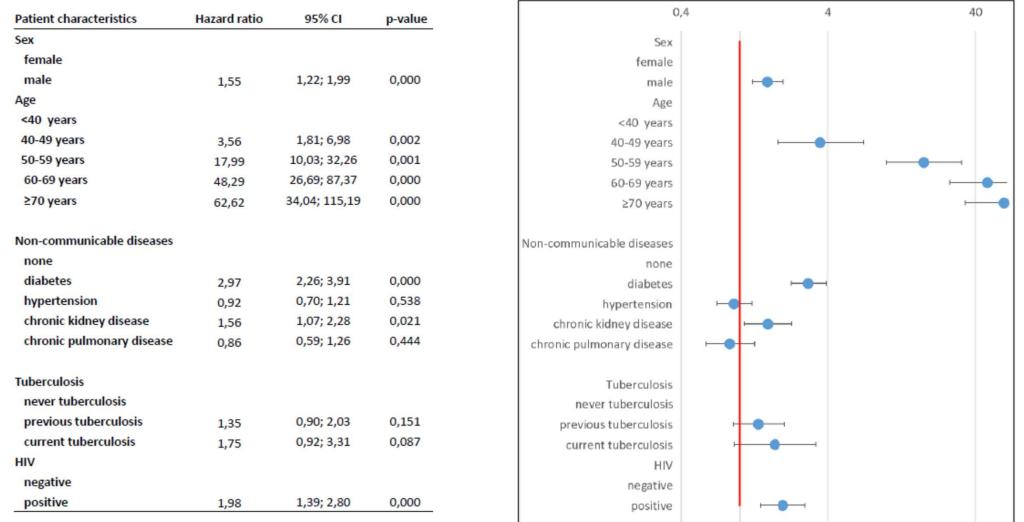
Risk of covid-19 death among people with HIV: a population cohort analysis from the western cape province, South Africa

https://www.nicd.ac.za/wp-content/uploads/2020/06/COVID-19-Special-Public-Health-Surveillance-Bulletin-22-June-2020.pdf

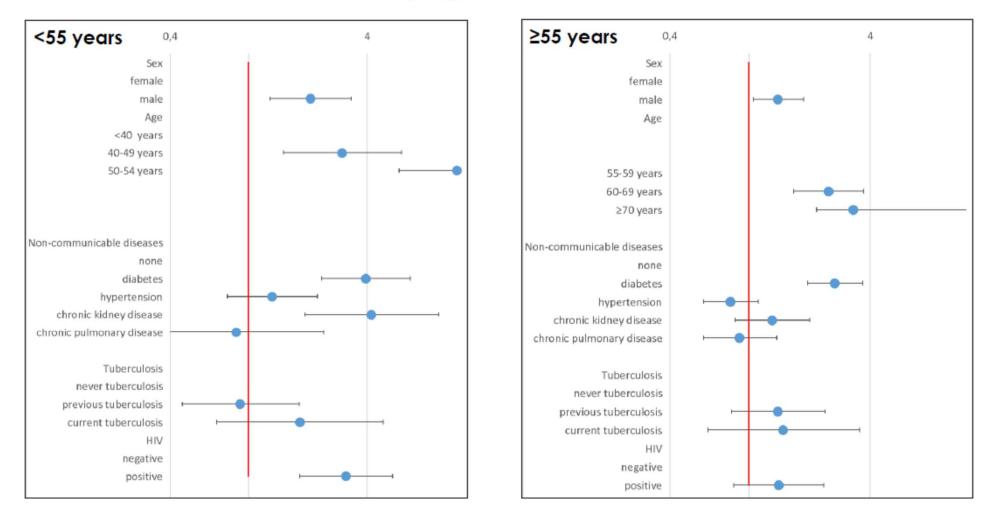
- Linked data on all public sector patients using unique identifier
- 3.5 million "active" patients ≥20 years (visit in last 3 yrs)
   & not deceased before 1 March 2020
- Comorbidities inferred from labs, drugs, encounters
  - Diabetes
  - Hypertension
  - Chronic kidney disease
  - COPD/asthma
  - Tuberculosis
  - > HIV
  - Not overweight/obesity
- Factors associated with mortality in public sector COVID-19 cases >20 years of age
- Factors associated with COVID-19 death in all public sector patients
- Standardized mortality ratio for HIV+ vs HIV- using data on age and HIV status in all deaths

Acknowledgement: Mary Ann Davies and Andrew Boulle W Cape Department of Health

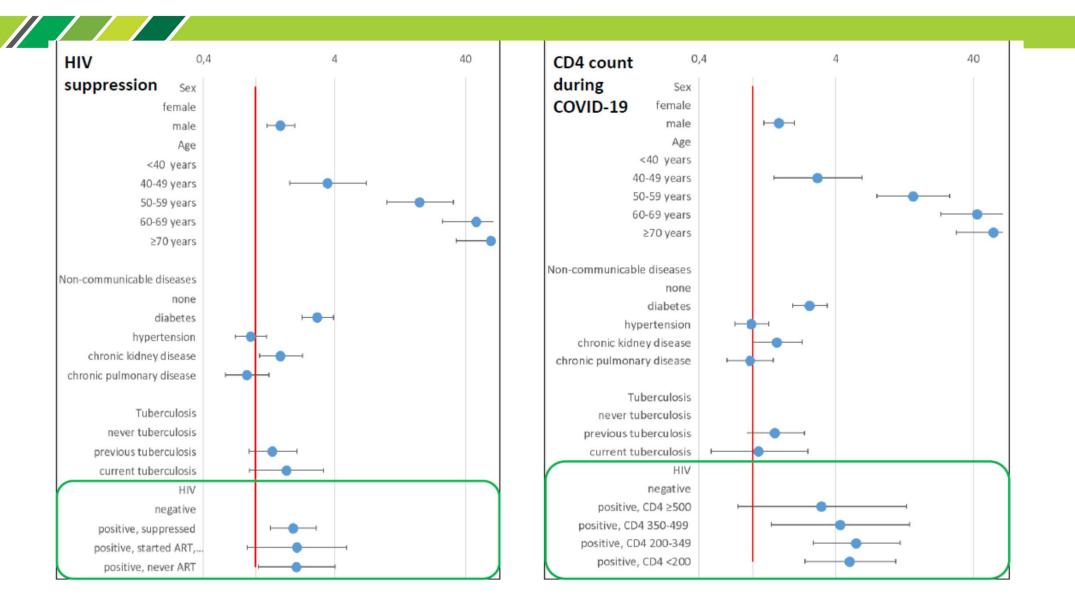
### Factors associated with death in WC public sector COVID-19 cases; n=8702



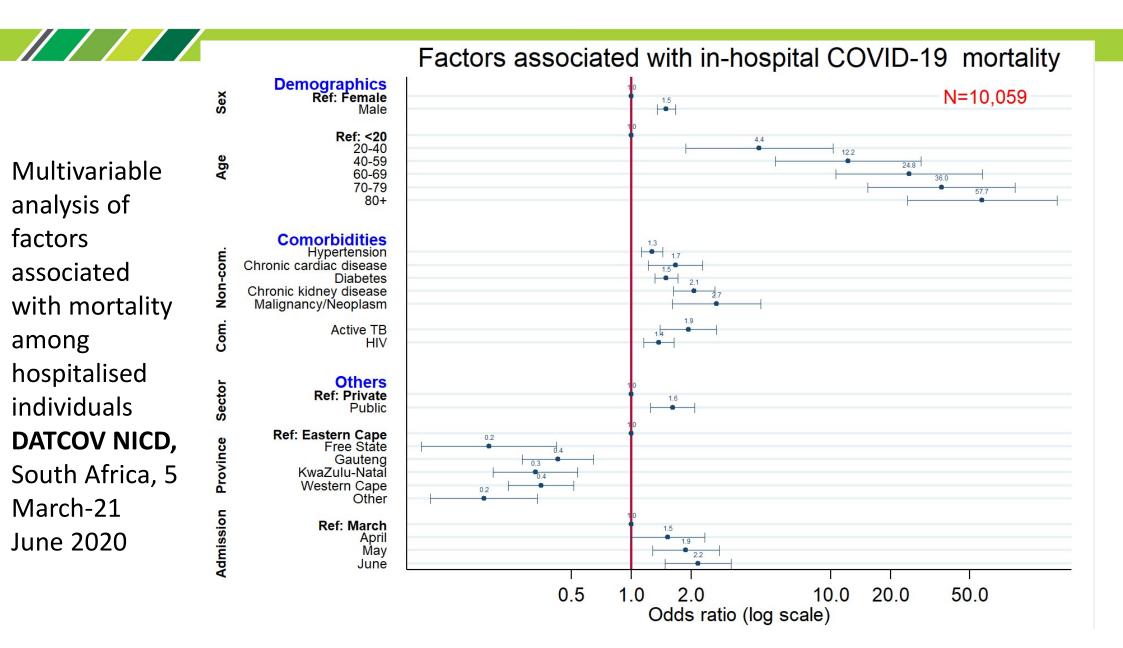
Acknowledgement: Mary Ann Davies and Andrew Boulle W Cape Department of Health https://www.nicd.ac.za/wpcontent/uploads/2020/06/COVID-19-Special-Public-Health-Surveillance-Bulletin-22-June-2020.pdf Does the effect of HIV differ by age?



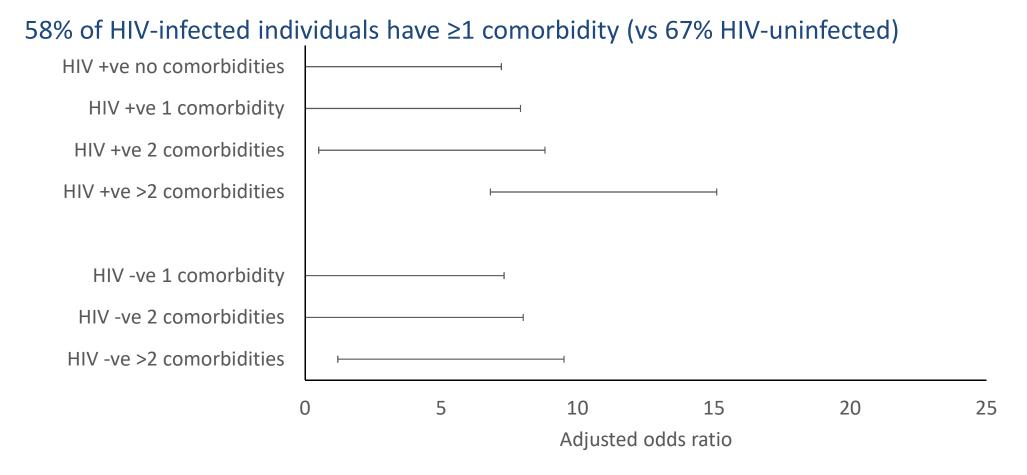
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# Effect of increasing number of comorbidities on risk of in-hospital death among HIV infected and uninfected individuals



# Research highlights in South Africa

• Surveillance platforms

- Serologic surveys to track epidemic progression in surveillance setting for burden of illness
- Shedding and antibody dynamics in HIV-infected and –uninfected hospitalized individuals
- Case-ascertained study of household transmission from HIV-infected and –uninfected individuals
- A <u>prospective</u>, randomized, placebo-controlled, blinded, phase III clinical trial of the <u>therapeutic use</u> of conval<u>escent</u> plasma in the <u>treatment</u> of <u>patients</u> with moderate to severe COVID-19: The PROTECT-Patient Trial (SANBS [South African National Blood Service])
- Cross-sectional sero-surveys of blood donors (SANBS)
- **Clinical therapeutic and vaccine trials** including ChAd5

A Prospective Household study of SARS-CoV-2, Influenza, and Respiratory Syncytial virus community burden, Transmission dynamics and viral interaction in South Africa (PHIRST-C) Established urban and rural cohorts ~100 households at each site 1000 individuals 1000 total

Incidence of infection and illness	Household transmission		PCR-confirmed infection and seroconversion		Identification of repeat infections
<ul> <li>Symptomatic vs asymptomatic</li> <li>Age group</li> <li>HIV status</li> <li>Detailed symptoms</li> </ul>	<ul> <li>Secondary infection risk (SIR)</li> <li>From symptomatic AND asymptomatic</li> <li>Age group</li> <li>HIV status</li> </ul>		<ul> <li>Correlations in symptomatic vs asymptomatic</li> </ul>		• Within a 6 month period
Public health impact					
<ul> <li>Inform physical distancing, school closure and other intervention recommendations</li> </ul>					

- Define SARS-CoV-2 immunity and its impact
- Parameterise mathematical models

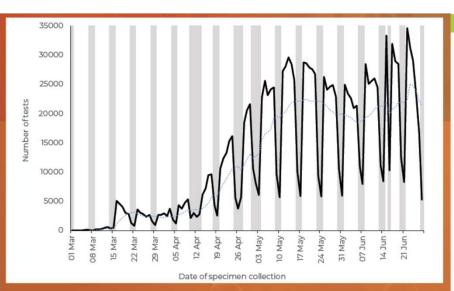


Figure 1. Number of laboratory tests conducted by date of specimen collection, South Africa, 1 March – 27 June 2020. Blue dotte ine shows the 7-day moving average of the num ber of tests conducted. Grey bars highlight weekend days and public holiday

> MAVERICK CITIZEN EDITORIAL Saving Eastern Cape from Covid-19 existential threat

By Estelle Ellis • 30 June 2020 🧿

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This week was only the start of the 'peak' predicted for the Eastern Cape and yet the province is already overwhelmed. People are dying in the streets and mortuaries have run out of space. The Eastern Cape needs a new dawn. It needs a deep cleansing of its government and a national plan to make that happen. The province needs a strong voice, the president's, preferably, that says enough is enough.

It has been a very dark week in the Eastern Cape as all the unheeded warnings, the hidden agendas, natchy leadership and years of prograstination and misguided priorities all seemed to hit at once, creating

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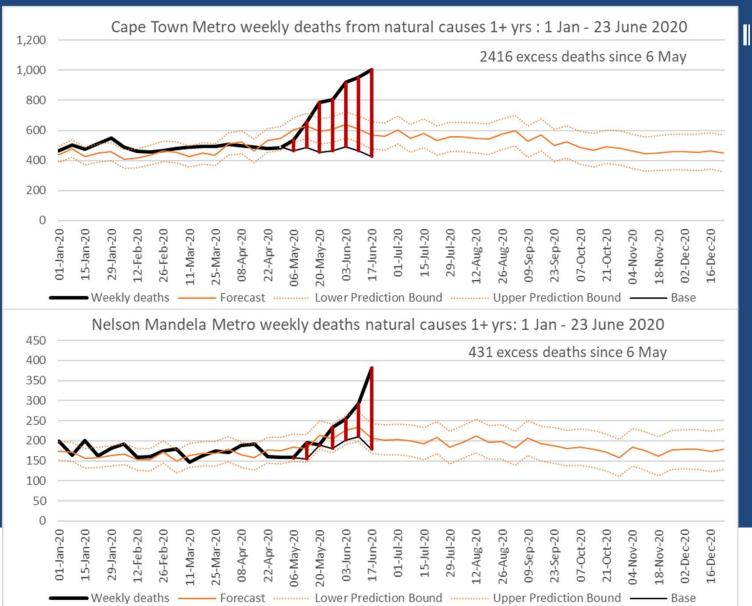
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### 

5018 excess deaths from natural causes vs 2456 laboratoryconfirmed deaths

Acknowledgement Debbie Bradshaw SAMRC Burden of Disease Unit https://www.samrc.ac.za/n ews/report-weekly-deathssouth-africa



## https://www.nicd.ac.za/diseases-a-z-index/covid-19/surveillance-reports/

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NATIONAL INSTITUTE FOR NOTIFIABLE MEDICAL CONDITIONS Q COVID-19 CENTRES OUR SERVICES MEDIA ABOUT US COVID-19 OME » DISEASES A-Z INDEX » COVID-19 ٠ .11 SURVEILLANCE REPORTS **GUIDELINES TECHNICAL RESOURCES** National COVID-19 surveillance reports, Various guidelines on the treatment and Acknowledgements prevention of COVID-19 including clinical including weekly summary of findings management of cases and the use of cloth monitored through various COVID-19 **NICD COVID-19 response team** surveillance systems. masks. **COVID Incident Management Team** Western Cape Department of Health **MRC Burden of Disease Unit TESTING SITES** ADVICE FOR RETURNING TRAVELLERS A list of testing sites across South Africa.

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