

# COVID-19 SENTINEL HOSPITAL SURVEILLANCE UPDATE



NATIONAL INSTITUTE FOR  
COMMUNICABLE DISEASES

Division of the National Health Laboratory Service

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## OVERVIEW

**This report summarises data of COVID-19 cases admitted to sentinel hospital surveillance sites in all provinces. The report is based on data collected from 5 March to 21 June 2020**

## HIGHLIGHTS

- As of 21 June, 10 700 COVID-19 admissions were reported from 269 facilities (71 public-sector and 198 private-sector) in all nine provinces of South Africa. There was an increase of 2 408 new admissions since the last report, and 12 additional hospitals (4 public-sector and 8 private-sector) reporting COVID-19 admissions. There were 5 223 (49%) and 5477 (51%) admissions reported in private and public sector respectively. The majority of COVID-19 admissions were reported from four provinces, 6912 (65%) in Western Cape, 1621 (15%) in Gauteng, 846 (8%) in Eastern Cape and 701 (7%) in KwaZulu-Natal.
- The median age of COVID-19 admissions was 50 years; 338 (3%) admissions in patients ≤18 years and 1386 (13%) in >70 years. Fifty four percent (5 778/10 700) were female.
- Among 8 245 (77%) patients with data on comorbid conditions; 2 810 (34%) had one comorbid condition and 3126 (37%) had two or more comorbid conditions. Of the 5 836 patients who had a comorbid condition, the most commonly reported were hypertension 3419 (59%) and diabetes 2813 (48%); and there were 1 116 (19%) patients admitted with HIV, 240 (4%) with active tuberculosis (TB) and 579 (10%) patients with previous history of tuberculosis.
- Obesity, while not consistently recorded for all reported COVID-19 admissions, was noted by clinicians as a risk factor in 297 (3%) patients.
- Of the 10 700 admissions, 3 260 (31%) patients were in hospital at the time of this report, 5 925 (55%) patients were discharged alive or transferred out and 1 515 (14%) patients had died. There were 359 additional deaths since the last report.
- Of the 7 324 COVID-19 patients who had recorded in-hospital outcome (died and discharged), 1 515 died, equating to a case fatality ratio (CFR) of 21%. On multivariable analysis, factors associated with in-hospital mortality were older age groups; male sex; admission in the public sector and in Eastern Cape, Free State, Gauteng and KwaZulu-Natal provinces; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy, HIV and obesity.

## METHODS

DATCOV19, sentinel hospital surveillance for COVID-19 admissions, was initiated on the 1 April 2020. Data are submitted by public and private hospitals that have agreed to report COVID-19 admissions through DATCOV19 surveillance in all nine provinces of South Africa. A COVID-19 case was defined as a person with a positive reverse transcriptase polymerase chain reaction (RT-PCR) assay for SARS-CoV-2 who was admitted to a DATCOV19 sentinel hospital. An individual was defined as having severe disease if treated in high care or intensive care unit (ICU), or ventilated or diagnosed with acute respiratory distress syndrome (ARDS).

Data on hospitalised cases who were diagnosed with COVID-19 from 5 March to 21 June 2020 were collected. Data are received from all private hospitals nationally, and a subset of public hospitals in all nine provinces (data are received from all public hospitals in the Western Cape (WC) Province). As new hospitals join the surveillance system, they have retrospectively captured all admissions recorded. As of 21 June 2020, a total of 269 facilities, 71 from public sector and 198 from private sector, submitted data on hospitalised COVID-19 cases (Table 1). There were 12 additional hospitals (4 public-sector and 8 private-sector) reporting COVID-19 admissions since the last report.

Table 1. Number of hospitals reporting data on COVID-19 admissions by province and sector, South Africa, 5 March-21 June 2020

Name of province	Public Sector	Private Sector
Eastern Cape (EC)	6	12
Free State (FS)	3	12
Gauteng (GP)	5	73
KwaZulu-Natal (KZN)	5	36
Limpopo (LP)	1	6
North West (NW)	2	12
Northern Cape (NC)	1	5
Western Cape (WC)	48	36
Mpumalanga (MP)	0	6
<b>South Africa</b>	<b>71</b>	<b>198</b>

## RESULTS

From 5 March to 21 June, a total of 10 700 COVID-19 admissions (2 408 additional from last report) were reported from 269 facilities in all nine provinces of South Africa. Of these admissions, 5 223 (48.8%) and 5 477 (51.2%) were reported in private and public sector, respectively (Figure 1). The majority of admissions (10 080/10 700, 94.2%) were recorded in four provinces, with the highest number (6 912/10 700, 64.6%) reported in Western Cape (WC), followed by (1 621/10 700; 15.1%) in Gauteng (GP), (8 46/10 700, 7.9%) in Eastern Cape (EC), and (701/10 700, 6.6%) in KwaZulu-Natal (KZN) provinces (Figure 1).

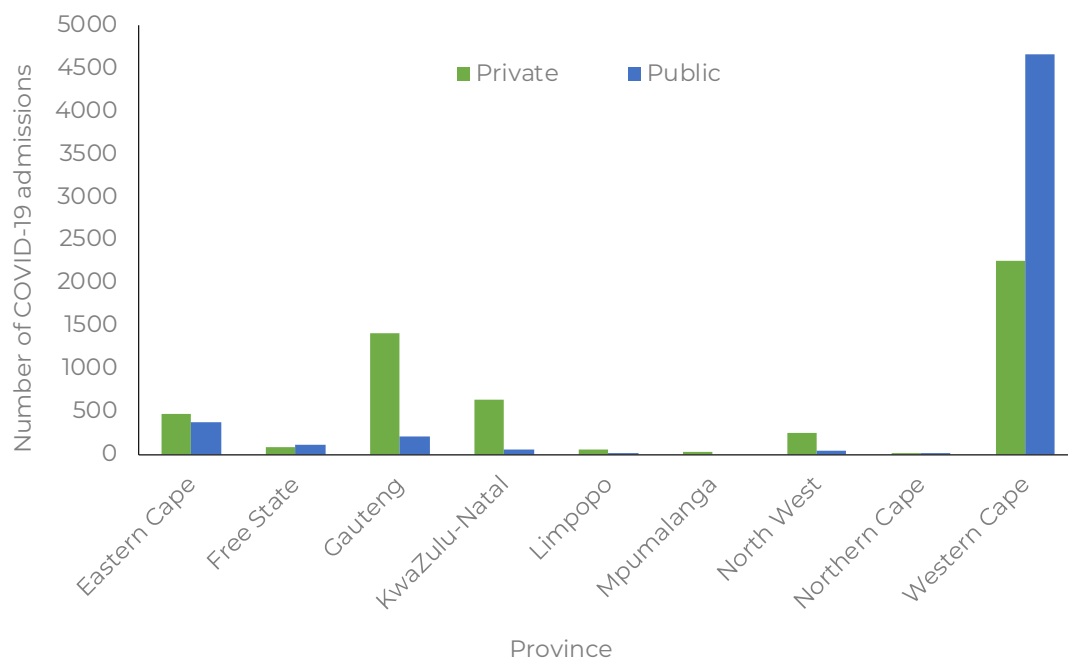


Figure 1: Number of reported COVID-19 admissions by province and health-sector, South Africa, 5 March-21 June 2020, n=10 700

Initially, most reported admissions were in the private sector; from week 17 a higher proportion of total admissions was reported in the public sector; and since week 24 a higher proportion was reported in the private sector (Figure 2).

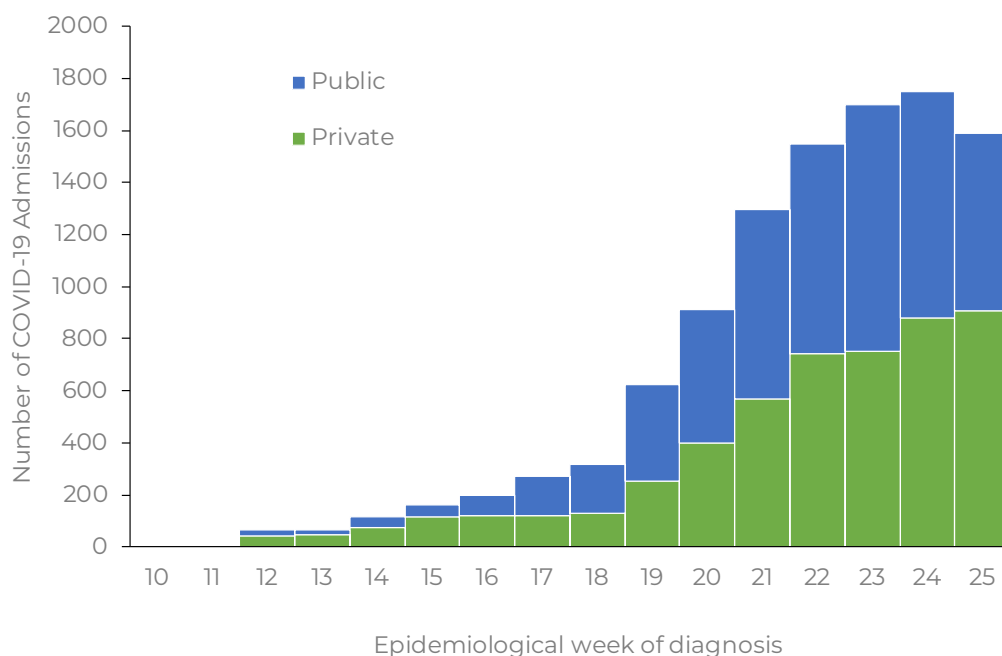


Figure 2: Number of reported COVID-19 admissions by health sector and epidemiologic week of diagnosis, 5 March-21 June 2020, n=10 700

# DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF COVID-19 ADMISSIONS

The median age of COVID-19 admissions was 50 years (interquartile range [IQR] 37 – 61). There were 338 (3.2%) admissions in patients 18 years and younger and 1 386 (13.0%) in patients older than 70 years. Among admitted individuals with COVID-19, 5 778 (54.0%) were female. The sex ratio varied by age group with females more common than males in all age groups except in patients younger than 10 years (Figure 3).

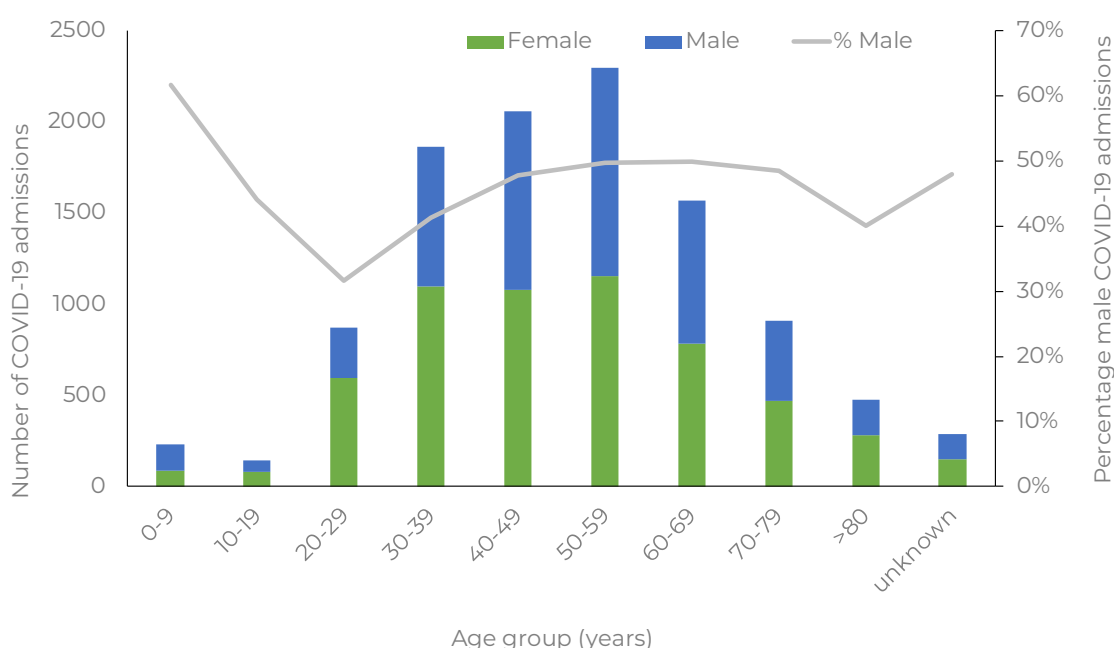


Figure 3: Number of reported COVID-19 admissions by age, gender and percentage of males, South Africa, 5 March-21 June 2020, n=10 700

Of the 4 534 (42.4%) patients for whom race was known, 3 004 (66.3%) were Black African, 834 (18.4%) were Coloured, 263 (5.8%) were Indian, 414 (9.1%) were White and 19 (0.4%) were classified as Other race group. There were 290 (2.7%) health care workers (HCW) that were reported to be hospitalised. Among the 5 778 female admissions, there were 297 (5.1%) females admitted who were pregnant or within 6 weeks post-partum.

Of the 8245 (77.1%) patients for whom comorbid disease was known, 2 409 (29.2%) had no comorbid disease reported, 2810 (34.1%) had one comorbid disease reported and 3 026 (36.7%) had two or more comorbid diseases reported. Among the 5836 patients who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (3 419/5 836, 58.6%) and diabetes (2 813/5 836, 48.2%); there were 1 116/5 836 (19.1%) patients who were HIV-infected, 240/5836 (4.1%) patients with active tuberculosis (TB) and 579/5 836 (9.9%) patients with previous history of TB (Table 2). Obesity, while not consistently recorded for all reported COVID-19 admissions, was recorded as a risk factor in 297 (2.8%) of all patients hospitalised.

Table 2. Reported comorbid diseases among COVID-19 admissions reporting at least one comorbid disease, South Africa, 5 March-21 June 2020, n=5 836\*

Comorbid disease**	n	%
Hypertension	3 419	58.6%
Diabetes mellitus	2 813	48.2%
Chronic cardiac disease	224	3.8%
Chronic pulmonary disease/ Asthma	907	15.5%
Chronic renal disease	436	7.5%
Malignancy	94	1.6%
HIV	1 116	19.1%
Active tuberculosis	240	4.1%
Previous history of tuberculosis	579	9.9%

\* Multiple comorbid conditions would be counted more than once so the total number may be more than the total number of individuals reporting comorbid conditions

\*\* Presence of a comorbid disease includes only the conditions reported in the table; obesity is not included

## SEVERITY

Of the 10 700 COVID-19 admissions to date, 2 333 (21.8%) met the criteria for severe disease. The median age of patients who had severe disease was 54 (IQR 44 – 63) years; compared to 48 (IQR 35 – 61) years for those who did not have severe disease. Amongst admissions that reported in-hospital outcome (died and discharged), 782 (10.7%) patients were treated in ICU and 666 (9.1%) were treated in High Care; 389 (5.3%) were ventilated and 1073 (14.7%) received supplemental oxygen. The proportion of reported in-patients who were treated in ICU and ventilated in each epidemiological week has decreased in the past ten weeks (Figure 4).

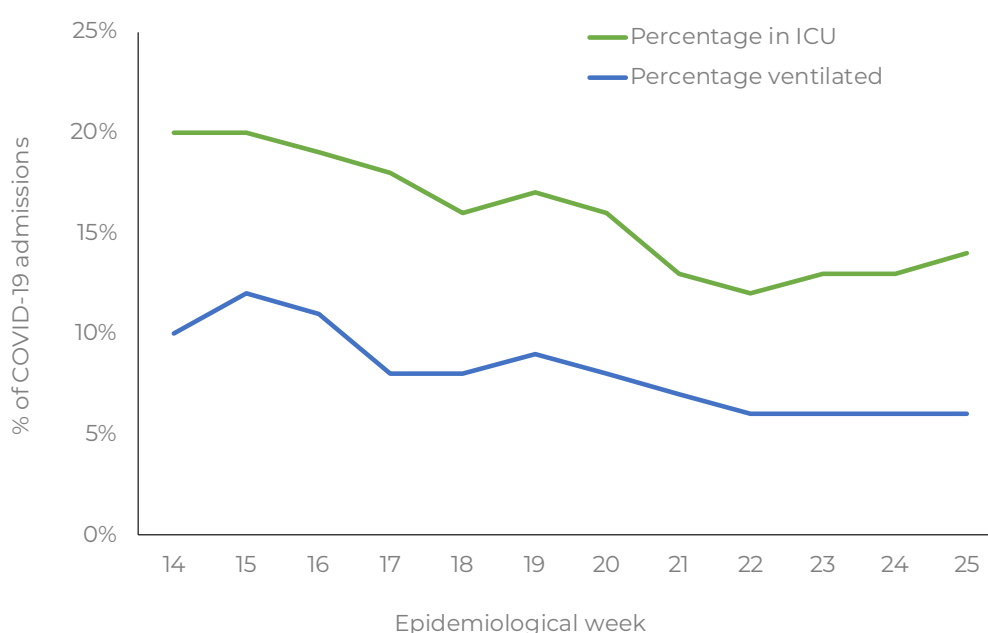


Figure 3: Number of reported COVID-19 admissions by age, gender and percentage of males, South Africa, 5 March-21 June 2020, n=10 700

## OUTCOMES

Of the 10 700 admitted individuals, 3 260 (30.5%) were currently in hospital, 5 809 (54.3%) were discharged alive, 116 (1.1%) were transferred out to either higher level care or step-down facilities and 1515 (14.2%) had died. There were 359 additional deaths since the last report.

## MORTALITY

In the first few weeks of the outbreak most deaths were reported in the private sector but since week 17 a higher proportion of reported deaths was in the public sector (Figure 5). The decrease in reported deaths in the last two epidemiological weeks is likely due to a delay in the submission of outcome data from the hospitals.

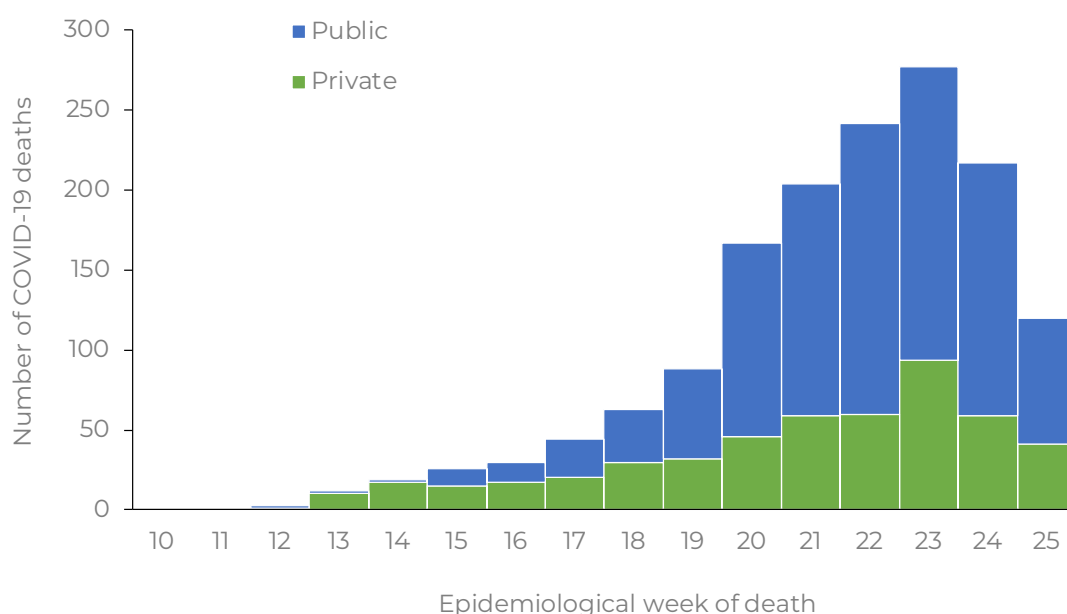


Figure 5: Number of COVID-19 deaths reported per week by health sector and epidemiologic week, South Africa, 5 March-21 June 2020, n=1 515

The median age of patients who died was 61 (IQR 52 – 71) years, and for those who were still alive was 47 (IQR 35 – 59) years. There were 117 (7.7%) deaths in patients younger than 40 years (Figure 6).



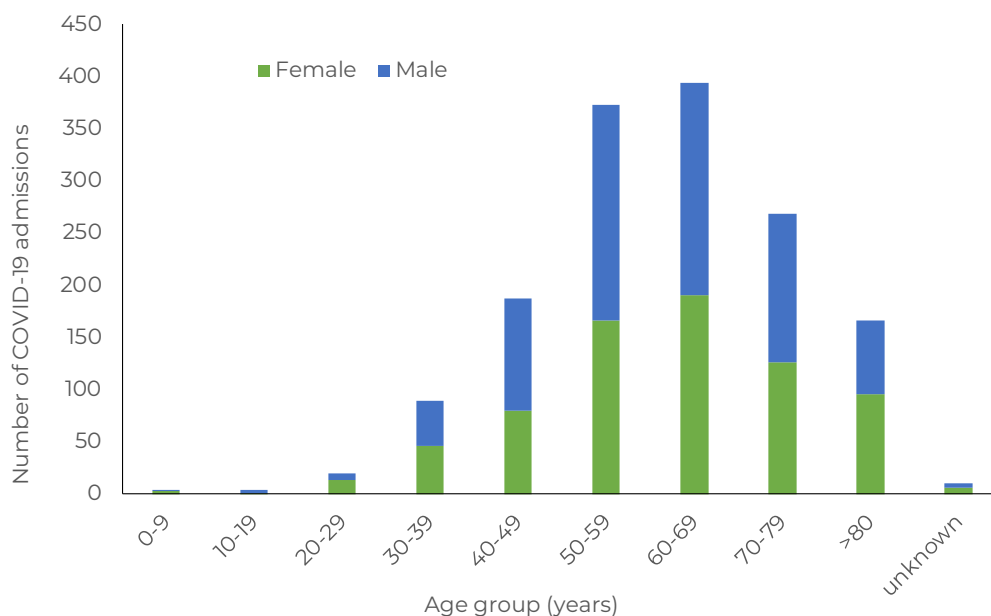


Figure 6: Number of reported COVID-19 deaths by age and gender, South Africa, 5 March-21 June 2020, n=1 515

In all age groups except <20 years, hypertension and diabetes were most commonly reported comorbidities among patients who died. In addition, in patients younger than 60 years, HIV, tuberculosis and obesity were common while in those older than 60 years, asthma/COPD and chronic renal disease were common comorbidities (Figure 7).

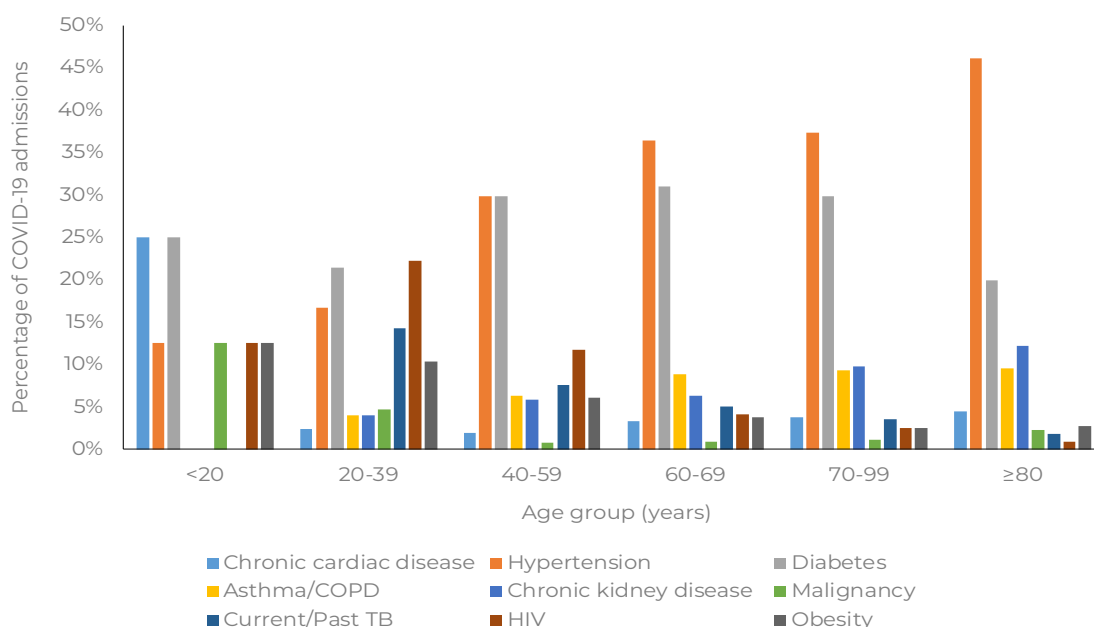


Figure 7: Frequency of comorbid conditions for reported COVID-19 deaths by age group, South Africa, 5 March-21 June 2020, n=1 515

\* There were 8 people younger than 20 years that died

Of the 7 324 COVID-19 patients who had recorded in-hospital outcome (died and discharged), 1 515 died, equating to a case fatality ratio (CFR) of 20.7%. On multivariable analysis, factors associated with in-hospital mortality were older age groups; male sex; admission in the public sector and in Eastern Cape, Free State, Gauteng and KwaZulu-Natal provinces; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy, HIV and obesity (Table 3).

Table 3. Univariate and multivariable analysis of factors associated with mortality among 7 324 separations (discharges and deaths), South Africa, 5 March-21 June 2020

Characteristic	Case-fatality ratio n/N (%)	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
<b>Age group</b>					
<20 years	8/296 (2.7)	Reference		Reference	
20-39 years	109/1 957 (5.6)	2.1 (1.02-4.4)	0.043	1.5 (0.6-3.5)	0.388
40-59 years	560/2 963 (18.9)	8.4 (4.1-17.0)	<0.001	4.5 (1.9-10.4)	<0.001
60-69 years	394/1 086 (36.3)	20.5 (10.0-41.8)	<0.001	9.4 (4.0-22.1)	<0.001
70-79 years	268/637 (42.1)	26.1 (12.7-53.7)	<0.001	12.1 (5.1-28.4)	<0.001
≥80 years	166/324 (51.2)	37.8 (18.1-78.9)	<0.001	20.7 (8.6-49.7)	<0.001
Unknown age	10/61 (16.4)	7.1 (2.7-18.7)	<0.001	3.9 (1.2-12.4)	0.020
<b>Sex</b>					
Female	728/4032 (18.1)	Reference		Reference	
Male	787/3292 (23.9)	1.4 (1.3-1.6)	<0.001	1.6 (1.4-1.8)	<0.001
<b>Race</b>					
Black	325/1 783 (18.2)	Reference			
Coloured	127/552 (23.0)	1.3 (1.1-1.7)	0.013		
Indian	26/147 (17.7)	1.0 (0.6-1.5)	0.870		
White	39/267 (14.6)	0.8 (0.5-1.1)	0.150		
Other	2/9 (22.2)	1.3 (0.3-6.2)	0.758		
Unknown	996/4 566 (21.8)	1.3 (1.1-1.4)	0.002		
<b>Occupation</b>					
Not Healthcare worker	1 506/7 131 (21.1)	Reference			
Healthcare worker	9/193 (4.7)	0.2 (0.1-0.4)	<0.001		
<b>Peri-partum</b>				1.2 (1.1-1.4)*	
No	724/3 783 (19.1)	Reference			
Yes	4/249 (1.6)	0.1 (0.03-0.2)	<0.001		
<b>Comorbid condition</b>				1.5 (1.3-1.7)*	
No co-morbidity	128/1 396 (9.2)	Reference			
1 co-morbid condition	417/1 938 (21.5)	2.7 (2.2-3.4)	<0.001		
≥2 comorbid conditions	736/2 195 (33.5)	5.0 (4.1-6.1)	<0.001		
Unknown	234/1 795 (13.0)	1.5 (1.2-1.9)	0.001		



<b>Hypertension</b>					
No	496/3108 (16.0)	Reference		Reference	
Yes	786/2430 (32.4)	2.5 (2.2-2.9)	<0.001	2.0 (1.6-2.6)*	0.005
<b>Diabetes mellitus</b>					
No	614/3 526 (17.4)	Reference		Reference	
Yes	668/2 012 (33.2)	2.4 (2.1-2.7)	<0.001	1.5 (1.3-1.7)*	<0.001
<b>Chronic cardiac disease</b>					
No	1212/5 375 (22.6)	Reference		Reference	
Yes	69/154 (44.8)	2.8 (2.0-3.9)	<0.001	1.9 (1.3-2.7)*	0.001
<b>Chronic pulmonary disease/Asthma</b>					
No	1 101/4 850 (22.7)	Reference			
Yes	181/688 (26.3)	1.2 (1.01-1.5)	0.036		
<b>Chronic renal disease</b>					
No	1 115/5 212 (21.4)	Reference		Reference	
Yes	167/326 (51.2)	3.9 (3.1-4.8)	<0.001	2.0 (1.6-2.6)*	<0.001
<b>Malignancy</b>		3.9 (3.1-4.8)			
No	1 252/5 478 (22.9)	Reference		Reference	
Yes	30/60 (50.0)	3.4 (2.0-5.6)	<0.001	3.6 (2.1-6.5)*	<0.001
<b>HIV</b>					
No	1 107/4 732 (23.4)	Reference		Reference	
Yes	175/806 (21.7)	0.9 (0.8-1.1)	0.296	1.4 (1.1-1.7)*	0.006
<b>Tuberculosis</b>					
No	1 238/5 371 (23.1)	Reference		Reference	
Yes	44/167 (26.4)	1.2 (0.8-1.7)	0.320	1.4 (0.9-2.2)*	0.103
<b>Past Tuberculosis</b>					
No	1 154/5 110 (22.6)	Reference		Reference	
Yes	128/428 (29.9)	1.5 (1.2-1.8)	0.001	1.3 (0.97-1.7)	0.086
<b>Obesity</b>					
Unknown	1 405/7 105 (19.8)	Reference		Reference	
Yes	110/219 (50.2)	4.1 (3.1-5.4)	<0.001	4.3 (3.1-5.9)	<0.001
<b>Month of admission</b>					
March	20/177 (11.3)	Reference		Reference	
April	157/838 (18.7)	1.8 (1.1-3.0)	0.019	1.4 (0.7-2.5)	0.307
May	748/3 830 (19.5)	1.9 (1.2-3.1)	0.007	1.3 (0.7-2.3)	0.421
June	588/2 476 (23.8)	2.4 (1.5-3.9)	<0.001	1.7 (0.95-3.1)	0.073
<b>Health sector</b>					
Private sector	501/3 141 (16.0)	Reference		Reference	
Public sector	1014/4 183 (24.2)	1.7 (1.5-1.9)	<0.001	1.4 (1.2-1.7)	<0.001

Province					
Western Cape	1 187/5 232 (22.7)	Reference		Reference	
Eastern Cape	162/504 (32.1)	1.6 (1.3-2.0)	<0.001	1.8 (1.4-2.2)	<0.001
Free State	11/151 (7.3)	0.3 (0.1-0.5)	<0.001	0.2 (0.1-0.5)	<0.001
Gauteng	91/770 (11.8)	0.5 (0.4-0.6)	<0.001	0.7 (0.6-0.98)	0.035
KwaZulu-Natal	54/459 (11.8)	0.5 (0.3-0.6)	<0.001	0.7 (0.5-0.96)	0.029
Limpopo	2/38 (5.3)	0.2 (0.05-0.8)	0.022	0.4 (0.1-1.8)	0.218
Mpumalanga	0/28 (0)	Not estimated	-	Not estimated	-
North West	7/122 (5.7)	0.2 (0.1-0.4)	<0.001	0.5 (0.2-1.2)	0.109
Northern Cape	1/20 (5.0)	0.2 (0.02-1.3)	0.094	0.2 (0.03-1.7)	0.138
Severe**					
No	994/5 969 (16.7)	Reference			
Yes	521/1 355 (38.5)	3.1 (2.7-3.6)	<0.001		
Ever ICU					
No	1 119/6 542 (17.1)	Reference			
Yes	396/782 (50.6)	5.0 (4.3-5.8)	<0.001		
Ever High Care					
No	1 377/6 658 (20.7)	Reference			
Yes	138/666 (20.7)	1.0 (0.8-1.2)	0.981		
Ever ventilated					
No	1 250/6 935 (18.0)	Reference			
Yes	265/389 (68.1)	9.7 (7.8-12.1)	<0.001		
Ever on oxygen					
No	1 183/6 251 (18.9)	Reference			
Yes	332/1 073 (30.9)	1.9 (1.7-2.2)	<0.001		

\* Multivariable model excluded all individuals with unknown comorbid conditions

\*\* Severe disease was defined as any individual who was treated in high care or intensive care unit (ICU), ventilated or diagnosed with acute respiratory distress syndrome (ARDS)

## DISCUSSION

The availability of reliable surveillance data is of critical importance to gain a better understanding of the epidemiology of COVID-19 in South Africa, to monitor the COVID-19 epidemic and to respond with adequate control measures. It has been suggested that when local transmission is widespread and testing strategies change, hospital admission or mortality surveillance systems provide the most reliable picture of the epidemic.

DATCOV currently includes 10 700 admissions from 269 public and private hospitals in all nine provinces in South Africa. It also includes 1 515 deaths that have occurred to date. The factors reported to be associated with in-hospital mortality, older age groups; male sex; and comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy and obesity are consistent with data reported from other countries. In addition, this report also quantifies the increased risk of mortality for HIV-infected individuals.

DATCOV provides real-time data and summary analysis, which inform modelling and reporting at a national level. It also addresses a knowledge gap in low and middle income countries (LMIC), allowing for analysis of COVID-19 epidemiology in a country with a younger population, unique disease profile with epidemics of both infectious (HIV and tuberculosis) and non-communicable diseases, and an overburdened public health system.

## LIMITATIONS

DATCOV is a sentinel surveillance system and does not include all hospitals with COVID-19 admissions and therefore may not be truly representative of hospital admissions for COVID-19 throughout South Africa. DATCOV only reports hospital-based admissions and deaths and therefore does not include deaths occurring outside hospitals. Data quality in a surveillance system is dependent on the information submitted by healthcare institutions. It is not possible for the NICD to verify or check the quality of all these data. However, the NICD has built-in data quality checks.

## ACKNOWLEDGEMENTS

### Private hospital groups submitting data to DATCOV19:

Netcare  
Life Healthcare  
Mediclinic Southern Africa  
National Hospital Network (NHN)  
Clinix Health Group  
Lenmed  
Joint Medical Holdings (JMH)

### Western Cape province: all public sector hospitals submitting data to DATCOV19

### Public hospitals using DATCOV19 surveillance online platform:

Dora Nginza Hospital (EC)  
Frere Hospital (EC)  
Livingstone Hospital (EC)  
Madwaleni Hospital (EC)  
Uitenhage Hospital (EC)  
Stutterheim Hospital (EC)  
Bedford Hospital (EC)  
Cradock Hospital (EC)  
Pelonomi Hospital (FS)  
National District Hospital (FS)  
Universitas Hospital (FS)  
Tambo Memorial Hospital (GP)  
Steve Biko Academic Hospital (GP)  
Charlotte Maxeke Johannesburg Academic Hospital (GP)  
Helen Joseph Hospital (GP)  
Leratong Hospital (GP)  
Greys Hospital (KZN)  
Ladysmith Hospital (KZN)  
Manguzi Hospital (KZN)  
Addington Hospital (KZN)  
General Justice Gizenga Mpanza Hospital (KZN)  
Polokwane Hospital (LP)  
Robert Mangaliso Sobukwe Hospital (NC)  
Tshepong Hospital (NW)  
Job Shimankana Thabane Hospital (NW)  
Tygerberg Hospital (WC)