COVID-19 SENTINEL HOSPITAL SURVEILLANCE UPDATE

SOUTH AFRICA | WEEK **24** 2020

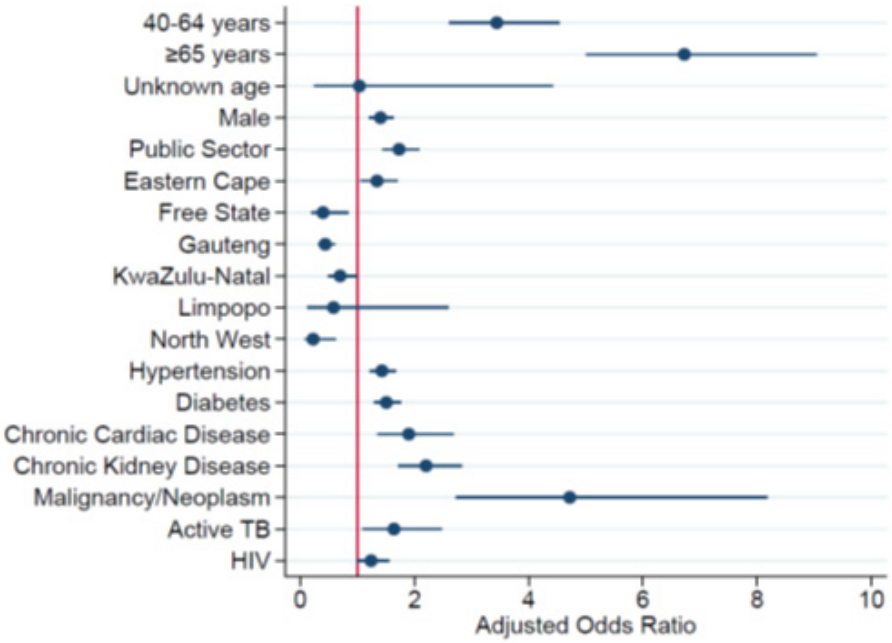
NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
Division of the National Health Laboratory Service

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 14 June 2020.

HIGHLIGHTS

- As of 14 June, 8292 COVID-19 admissions were reported from 257 facilities (67 public-sector and 190 private-sector) in all nine provinces of South Africa. There was an increase of 1939 new admissions since the last report, and 15 additional hospitals (3 public-sector and 12 private-sector) reporting COVID-19 admissions. There were 3924 (47%) and 4368 (53%) admissions reported in private and public sector respectively. The majority of COVID-19 admissions were reported from four provinces, 5553 (67%) in Western Cape, 1050 (13%) in Gauteng, 655 (8%) in Eastern Cape and 576 (7%) in KwaZulu-Natal.
- The median age of COVID-19 admissions was 49 years; 283 (3%) admissions in patients ≤18 years and 1062 (13%) in >70 years. Fifty four percent (4488/8292) were female.
- Among 6454 (78%) patients with data on comorbid conditions; 2151 (33%) had one comorbid condition and 2391 (37%) had two or more comorbid conditions. Of the 4542 patients who had a comorbid condition, the most commonly reported were hypertension 2689 (59%) and diabetes 2206 (49%); and there were 897 (20%) patients admitted with HIV, 190 (4%) with active tuberculosis (TB) and 473 (10%) patients with previous history of TB.
- Obesity, while not consistently recorded for all reported COVID-19 admissions, was noted by clinicians as a risk factor in 253 (3%) patients.
- Of the 8292 admissions, 2461 (30%) patients were in hospital at the time of this report, 4675 (56%) patients were discharged alive or transferred out and 1156 (14%) patients had died. There were 302 additional deaths since the last report.
- On multivariable analysis, factors associated with in-hospital mortality were older age groups; male sex; being admitted in the public sector and being admitted in Eastern Cape, Free State, Gauteng, KwaZulu-Natal and North West provinces; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy and active tuberculosis. Odds ratios for in-hospital mortality were elevated for patients with comorbid HIV, however the confidence interval included 1.



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 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 14 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 14 June 2020, a total of 257 facilities, 67 from public sector and 190 from private sector, submitted data on hospitalised COVID-19 cases (Table 1). There were 15 additional hospitals (3 public-sector and 12 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-14 June 2020

Name of province	Public Sector	Private Sector
Eastern Cape (EC)	5	11
Free State (FS)	3	9
Gauteng (GP)	5	69
KwaZulu-Natal (KZN)	5	36
Limpopo (LP)	1	6
North West (NW)	2	12
Northern Cape (NC)	1	5
Western Cape (WC)	45	36
Mpumalanga (MP)	0	6
South Africa	**67**	**190**

RESULTS

From 5 March to 14 June, a total of 8292 COVID-19 admissions (1939 additional from last report) were reported from 257 facilities in all nine provinces of South Africa. Of these admissions, 3924 (47.3%) and 4368 (52.7%) were reported in private and public sector, respectively (Figure 1). The majority of admissions (7834/8292, 94.5%) were recorded in four provinces, with the highest number (5553/8292, 67.0%) reported in Western Cape (WC), followed by (1050/8292; 12.7%) in Gauteng (GP), (655/8292, 7.9%) in Eastern Cape (EC), and (576/8292, 6.9%) in KwaZulu-Natal (KZN) provinces (Figure 1).

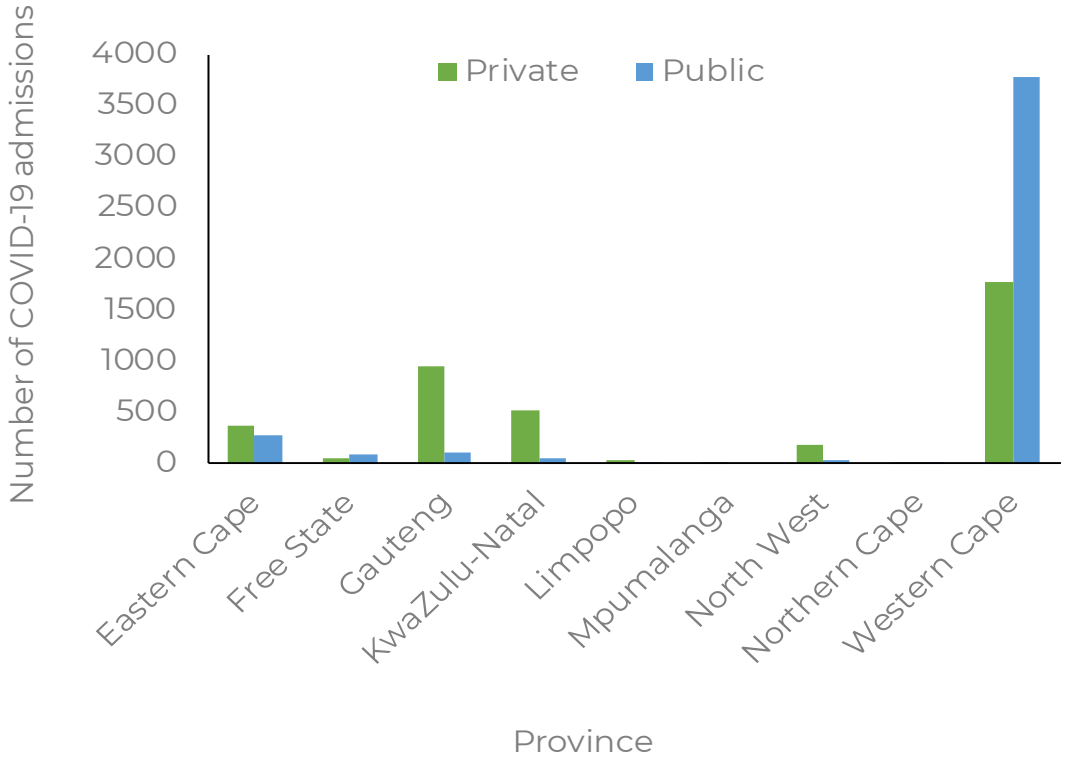


Figure 1: Number of reported COVID-19 admissions by province and health-sector, South Africa, 5 March-14 June 2020, n=8292

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

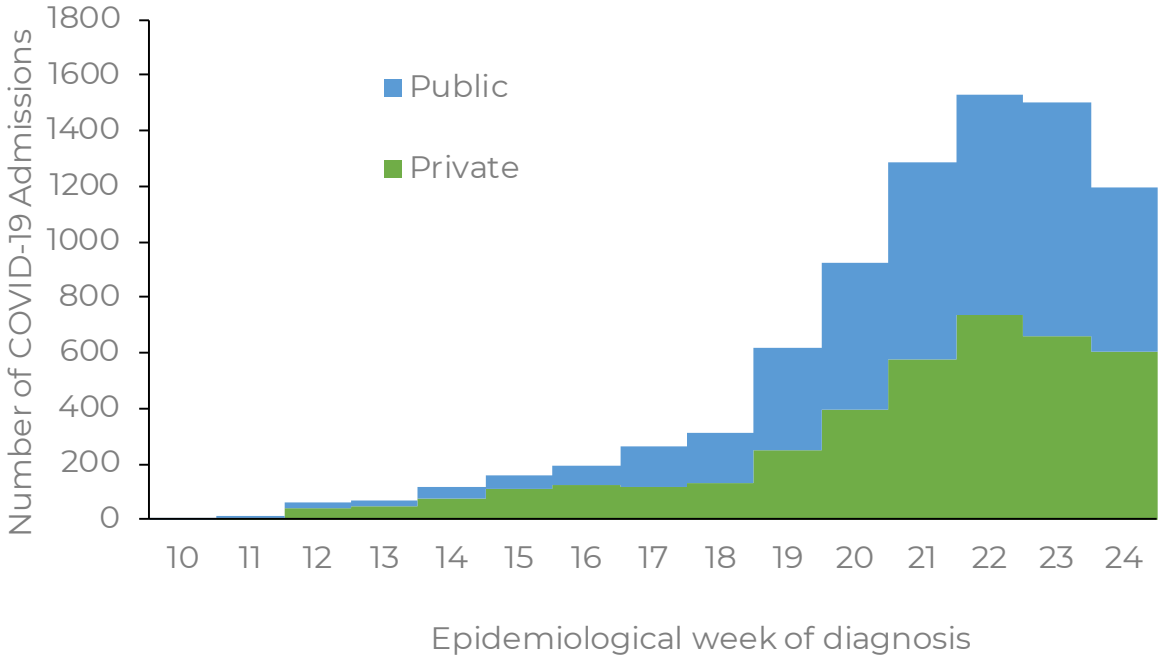


Figure 2: Number of reported COVID-19 admissions by province and health-sector and epidemiologic week of diagnosis, 5 March-14 June 2020, n=8292

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF COVID-19 ADMISSIONS

The median age of COVID-19 admissions was 49 years (interquartile range [IQR] 36 – 61). There were 283 (3.4%) admissions in patients 18 years and younger and 1062 (12.8%) in patients older than 70 years. Among admitted individuals with COVID-19, 4488 (54.1%) 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).

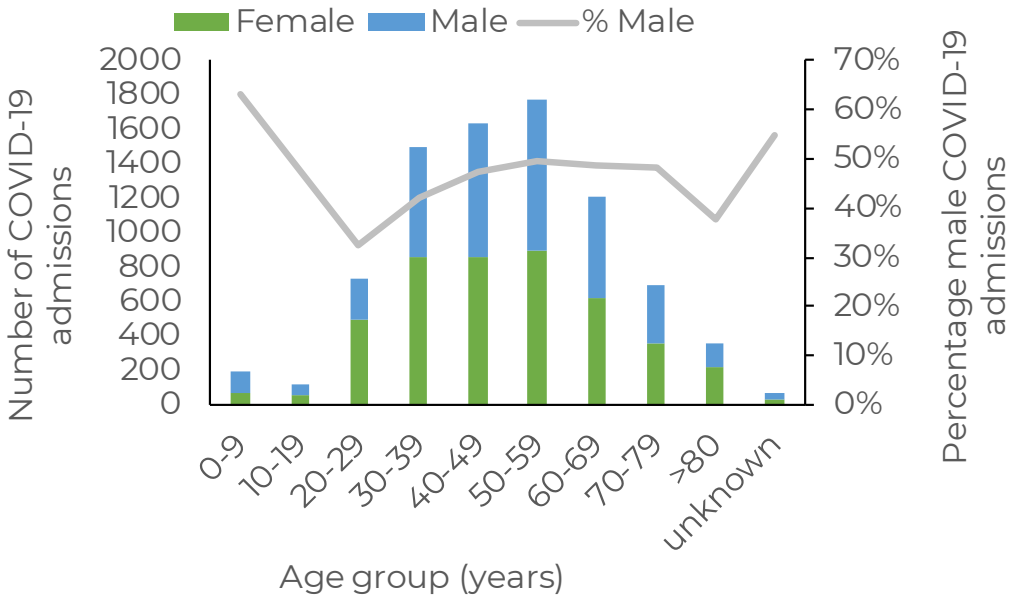


Figure 3: Number of reported COVID-19 admissions by age, gender and percentage of males, South Africa, 5 March-14 June 2020, n=8292

Of the 3569 (43.0%) patients for whom race was known, 2319 (65.0%) were Black African, 682 (19.1%) were Coloured, 198 (5.6%) were Indian, 342 (9.6%) were White and 28 (0.8%) were classified as Other race group. There were 239 (2.9%) health care workers (HCW) that were reported to be hospitalised. Among the 4488 female admissions, there were 287 (6.4%) females admitted who were pregnant or within 6 weeks post-partum.

Of the 6454 (77.8%) patients for whom comorbid disease was known, 1912/6454 (29.6%) had no comorbid disease reported, 2151/6454 (33.3%) had one comorbid disease reported and 2391/6454 (37.1%) had two or more comorbid diseases reported. Among the 4542 patients who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (2689/4542, 59.2%) and diabetes (2206/4542, 48.6%). There were 897/4542 (19.7%) patients who were HIV-infected, 190/4542 (4.2%) patients with active tuberculosis (TB) and 473/4542 (10.4%) 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 253 (3.1%) of all patients hospitalised.

Table 2: Reported comorbid diseases among COVID-19 admissions reporting at least one comorbid disease, South Africa, 5 March-14 June 2020 (n=4542*)

Comorbid disease**	n	%
Hypertension	2689	59.2%
Diabetes mellitus	2206	48.6%
Chronic cardiac disease	190	4.2%
Chronic pulmonary disease/ Asthma	712	15.7%
Chronic renal disease	335	7.4%
Malignancy	69	1.5%
HIV	897	19.7%
Active TB	190	4.2%
Previous history of TB	473	10.4%

* 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 8292 COVID-19 admissions to date, 1729 (20.7%) met the criteria for severe disease. The median age of patients who had severe disease was 53 (IQR 44 – 64) years; compared to 48 (IQR 35 – 60) years for those who did not have severe disease. Amongst all reported admissions, 1037 (12.5%) patients were treated in ICU and 653 (10.3%) were treated in High Care; 507 (6.1%) were ventilated and 1430 (17.3%) 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 nine weeks (Figure 4).

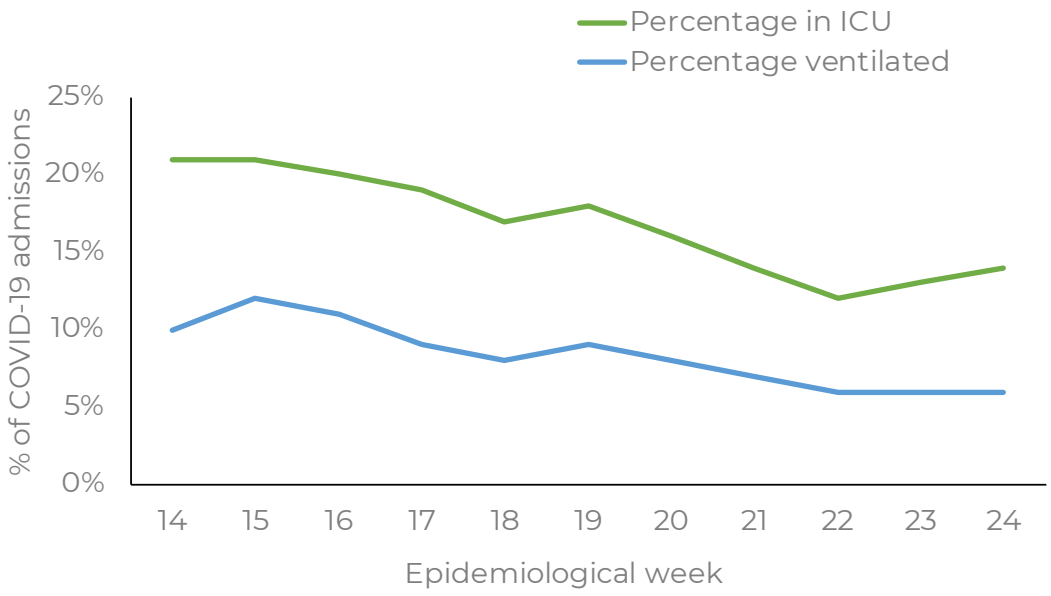


Figure 4: Proportion of COVID-19 in-patients treated in intensive care unit (ICU) and ventilated by epidemiological week, South Africa, 28 March-14 June 2020*
*Data on ventilation and ICU care was not reliable prior to epidemiological week 14

OUTCOMES

Of the 8292 admitted individuals, 2461 (29.7%) were currently in hospital, 4583 (55.3%) were discharged alive, 92 (1.1%) were transferred out to either higher level care or step-down facilities and 1156 (13.9%) had died.

MORTALITY

Of the 8292 COVID-19 patients admitted, 1156 died, case fatality ratio (CFR) 13.9% (302 additional deaths from last report). 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).

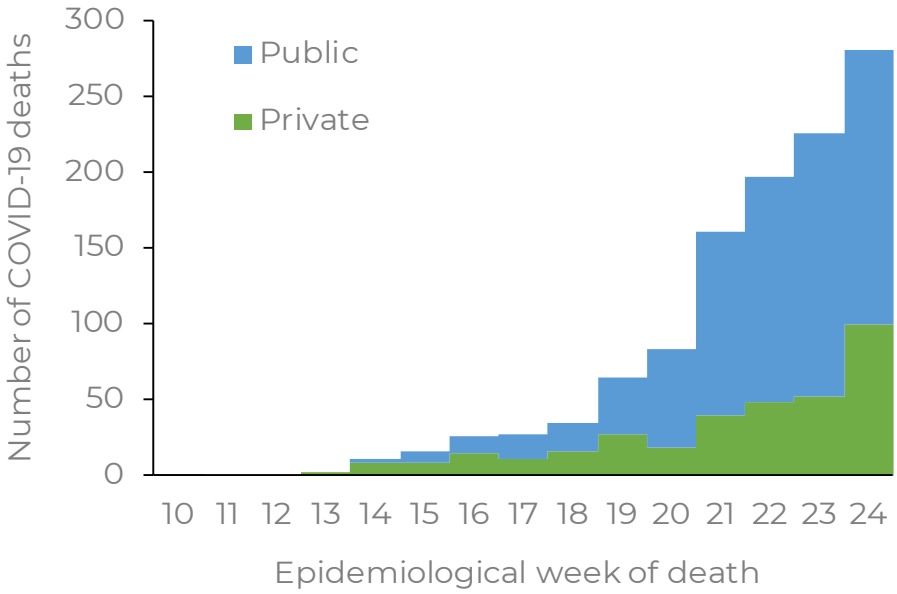


Figure 5: Number of COVID-19 deaths reported per week by health sector and epidemiologic week, South Africa, 5 March-14 June 2020, n=1156

The median age of patients who died was 61 (IQR 52 – 71) years, and for those who were still alive was 47 (IQR 35 – 58) years.There were 88 (7.6%)deaths in patients younger than 40 years (Figure 6).

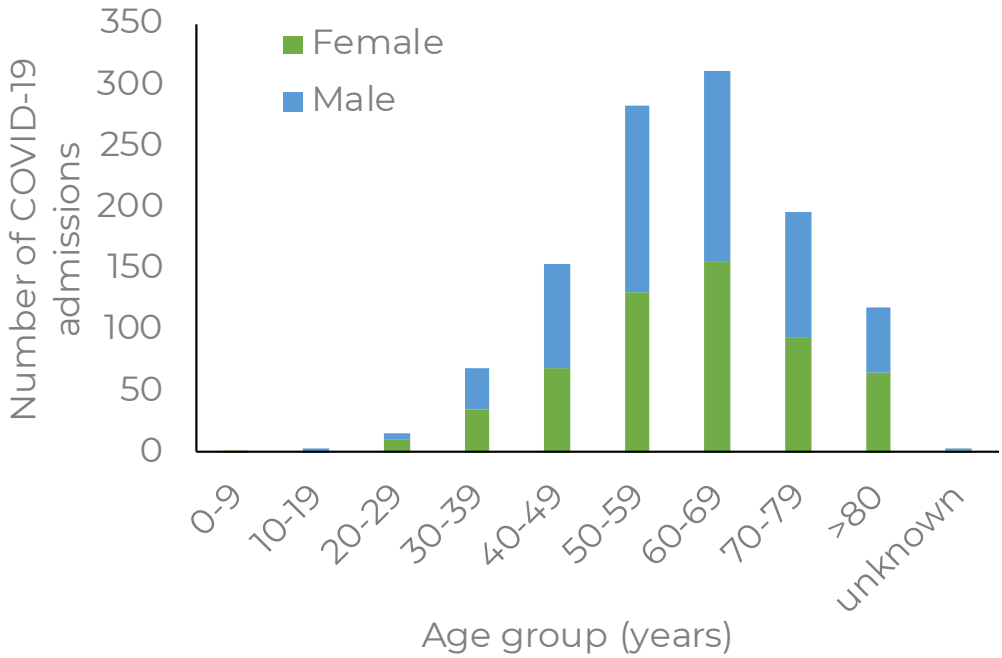


Figure 6: Number of reported COVID-19 deaths by age and gender, South Africa, 5 March-14 June 2020, n=1156

In all ages hypertension and diabetes were most common. In addition, in patients younger than 50 years, HIV, tuberculosis and obesity were important while in those older than 50 years, asthma and chronic renal disease were important comorbidities. (Figure 7).

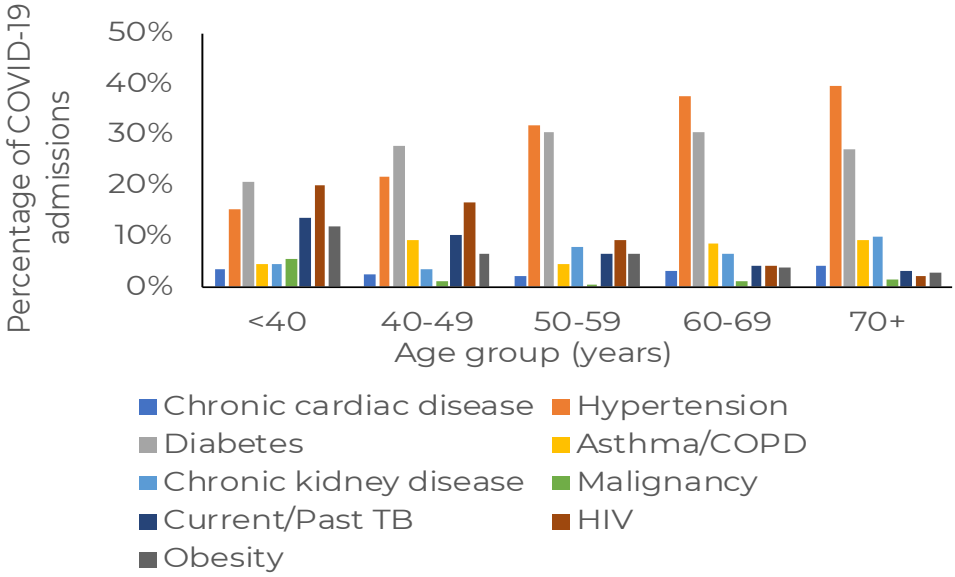


Figure 7: Frequency of comorbid conditions of reported COVID-19 deaths by age group, South Africa, 5 March-14 June 2020, n=1156

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, KwaZulu-Natal and North West provinces; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy and active tuberculosis. Odds ratios for in-hospital mortality were elevated for patients with comorbid HIV, however the confidence interval included 1 (Table 3 and Figure 8).

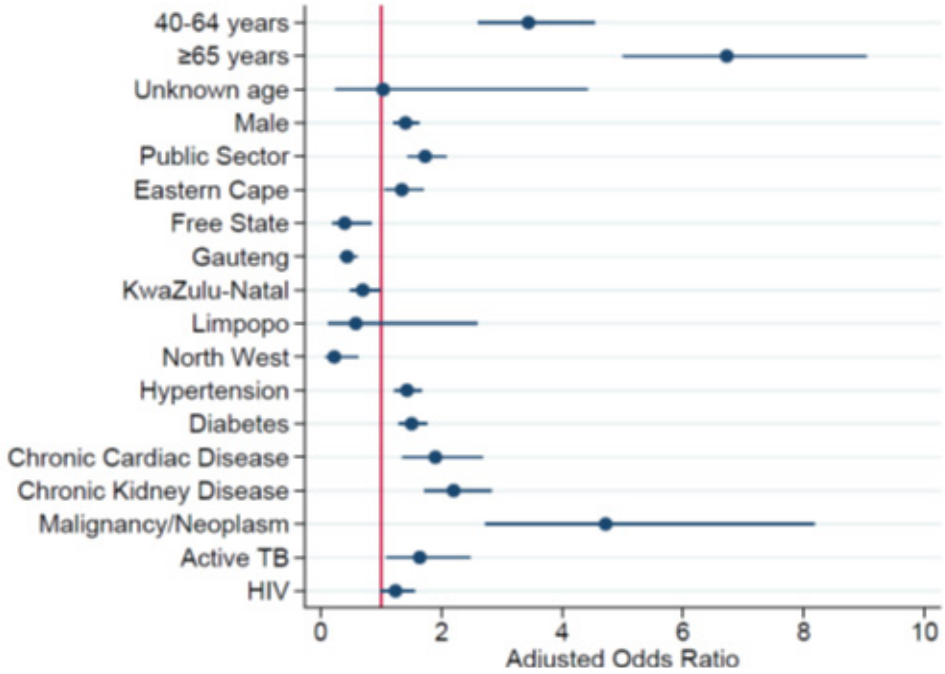


Figure 8: Factors associated with mortality among 8292 admissions, South Africa, 5 March-14 June 2020

* Reference is <40 years for age group, and Western Cape for province (Mpumalanga and Northern Cape not demonstrated as OR=1)

Patients with comorbid conditions are compared to those without, and analysis restricted to patients with available data on included variables

Table 3: Univariate and multivariable analysis of factors associated with mortality among 8292 admissions, South Africa, 5 March-14 June 2020

Characteristic	Case-fatality ratio n/N (%)	Unadjusted OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Age group					
<40 years	88/2 540 (3.5)	Reference		Reference	
40-64 years	597/4 082 (14.6)	4.8 (3.8-6.0)	<0.001	3.4 (2.6-4.5)	<0.001
≥65 years	468/1 606 (29.1)	11.5 (9.0-14.5)	<0.001	6.7 (5.0-9.0)	<0.001
Unknown	3/64 (4.7)	1.4 (0.2-4.4)	0.600	1.0 (0.2-4.4)	0.964
Sex					
Female	561/4 488 (12.5)	Reference		Reference	
Male	595/3 804 (15.6)	1.3 (1.1-1.5)	0.001	1.4 (1.2-1.6)	<0.001
Occupation Not Healthcare worker	1 147/8 053 (14.2)	Reference			
Healthcare worker	9/239 (3.8)	0.2 (0.1-0.5)	<0.001		
Peri-partum No Yes	 556/4 201 (13.2) 5/287 (1.7)	 Reference 0.1 (0.5-0.3)	 <0.001		
Comorbid condition					
No co-morbidity	89/1 912 (4.7)	Reference			
1 co-morbid condition	313/2 151 (14.6)	3.5 (2.7-4.5)	<0.001		
≥2 comorbid conditions Unknown	581/2 391 (24.3) 173/1 838 (9.4)	6.6 (5.2-8.3) 2.1 (1.6-2.8)	<0.001 <0.001		
Hypertension No Yes	 368/3 765 (9.8) 615/2 049 (22.9)	 Reference 2.7 (2.4-3.1)	 <0.001	 Reference 1.4 (1.2-1.7)*	 0.001
Diabetes mellitus No Yes	 453/4 248 (10.7) 530/2 206 (24.0)	 Reference 2.6 (2.3-3.0)	 <0.001	 Reference 1.5 (1.3-1.8)*	 <0.001
Chronic cardiac disease No Yes	 924/6 264 (14.8) 59/190 (31.1)	 Reference 2.6 (1.9-3.6)	 <0.001	 Reference 1.5(1.3-2.7)*	<0.001
Chronic pulmonary disease/ Asthma No Yes	 845/5 742 (14.7) 138/712 (19.4)	 Reference 1.4 (1.1-1.7)	 0.001		
Chronic renal disease No Yes	 848/6 119 (13.9) 135/335 (40.3)	 Reference 4.2 (3.3-5.3)	 <0.001	 Reference 2.2 (1.7-2.8)*	 <0.001
Malignancy No Yes	 957/6 385 (15.1) 26/69 (37.7)	 Reference 3.4 (2.1-5.6)	 <0.059	 Reference 4.7 (2.7-8.2)*	 0.001
HIV No Yes	 843/5 557 (15.2) 140/897 (15.6)	 Reference 1.03 (0.9-1.3)	 0.735	 Reference 1.2 (0.98-1.6)*	 0.064

Tuberculosis No Yes	 946/6 264 (15.1) 37/190 (19.5)	 Reference 1.4 (0.9-2.0)	 0.100	 Reference 1.6(1.2-2.5)*	 0.018
Past Tuberculosis No Yes	 883/5 981 (14.8) 100/473 (21.1)	 Reference 1.5 (1.2-2.0)	 <0.01		
Health sector Private sector Public sector	 372/3 924 (9.5) 784/4 368 (18.1)	 Reference 2.1 (1.8-2.4)	 <0.001	 Reference 1.7 (1.4-2.1)	 <0.001
Province					
Western Cape	924/5 553 (16.6)	Reference		Reference	
Eestern Cape	116/665 (17.7)	1.1 (0.9-1.3)	0.488	1.3 (1.1-1.7)	0.014
Free State	10/157 (6.4)	0.3 (0.2-0.6)	0.001	0.4 (0.2-0.8)	0.014
Gauteng	52/1 050 (5.0)	0.3 (0.2-0.3)	<0.001	0.4 (0.3-0.6)	<0.001
KwaZulu-Natal	47/567 (8.2)	0.4 (0.3-0.6)	<0.001	0.7 (0.5-0.99)	0.045
Limpopo	2/42 (4.8)	0.3 (0.1-1.04)	0.056	0.6 (0.1-2.6)	0.477
Mpumalanga	1/23 (4.4)	0.2 (0.03-1.7)	0.148	1	-
North West	4/214 (1.9)	0.1 (0.04 - 0.3)	<0.001	0.2 (0.1-0.6)	0.004
Northern Cape	0/22 (0)	1	-	1	-
Severe** No Yes	 749/4 975 (10.8) 407/1 720 (23.7)	 Reference 2.4 (2.1-2.8)	 <0.001		
Ever ICU No Yes	 841/7 255 (11.6) 315/1 037 (30.4)	 Reference 3.3 (2.9-3.9)	 <0.001		
Ever High Care No Yes	 1 047/7 467 (14.0) 109/825 (13.2)	 Reference 0.9 (0.8-1.2)	 0.524		
Ever ventilated No Yes	 932/7 785 (12.0) 224/507 (44.2)	 Reference 5.8 (4.8-7.0)	 <0.001		
Ever on oxygen No Yes	 880/6 862 (12.0) 275/1 430 (19.3)	 Reference 1.6 (1.4-1.9)	 <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).

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)
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)
General Justice Gizenga Mpanza Hospital (KZN)
Addington Hospital (KZN)
Polokwane Hospital (LP)
Robert Mangaliso Sobukwe Hospital (NC)
Tshepong Hospital (NW)
Job Shimankana Thabane Hospital (NW)
Tygerberg Hospital (WC)
Helderberg Hospital (WC)