

COVID-19 SENTINEL HOSPITAL SURVEILLANCE UPDATE



NATIONAL INSTITUTE FOR
COMMUNICABLE DISEASES

Division of the National Health Laboratory Service

SOUTH AFRICA WEEK 27 2020

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 5 July 2020.

HIGHLIGHTS

- As of 5 July, 17 930 COVID-19 admissions were reported from 288 facilities (76 public-sector and 212 private-sector) in all nine provinces of South Africa. There was an increase of 3 375 new admissions since the last report, and 10 additional hospitals (2 public-sector and 8 private-sector) reporting COVID-19 admissions. There were 8 422 (47%) and 9 508 (53%) admissions reported in public and private sector respectively. The majority of COVID-19 admissions were reported from four provinces, 10 152 (57%) in Western Cape, 3 729 (21%) in Gauteng, 1 527 (9%) in KwaZulu-Natal and 1 267 (7%) in Eastern Cape.
- The median age of COVID-19 admissions was 50 years; 580 (3%) admissions in patients ≤18 years and 2 386 (13%) in >70 years. Fifty four percent (9 641/17 930) were female.
- Among 13 407 (75%) patients with data on comorbid conditions; 4 592 (34%) had one comorbid condition, 3 080 (23%) had two comorbid conditions and 1 650 (12%) had three or more comorbid conditions. Of the 9 322 patients who had a comorbid condition, the most commonly reported were hypertension 5 536 (59%) and diabetes 4 538 (49%); and there were 1 713 (18%) patients admitted with HIV, 341 (4%) with active tuberculosis (TB) and 838 (9%) 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 497 (3%) patients.
- Of the 17 930 admissions, 5 180 (29%) patients were in hospital at the time of this report, 10 125 (56%) patients were discharged alive or transferred out and 2 615 (15%) patients had died. There were 499 additional deaths since the last report.
- Of the 12 546 COVID-19 patients who had recorded in-hospital outcome (died and discharged), 2 615 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, Gauteng and Free State provinces; month of admission; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy, HIV and active tuberculosis.

METHODS

DATCOV, sentinel hospital surveillance for COVID-19 admissions, was initiated on 1 April 2020. Data are submitted by public and private hospitals that have agreed to report COVID-19 admissions through DATCOV 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 DATCOV 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). Case fatality ratio (CFR) was calculated for all closed cases, i.e. COVID-19 deaths divided by COVID-19 deaths plus COVID-19 discharges, excluding individuals who are still admitted in hospital.

Data are received from all private hospitals nationally, from all public hospitals in the Western Cape (WC) Province and 27 public hospitals in the other eight provinces. As new hospitals join the surveillance system, they have retrospectively captured all admissions recorded. As of 5 July 2020, a total of 288 facilities, 76 from public sector and 212 from private sector, submitted data on hospitalised COVID-19 cases (Table 1). There were 10 additional hospitals (2 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-5 July 2020

Name of province	Public Sector	Private Sector
Eastern Cape (EC)	8	13
Free State (FS)	5	15
Gauteng (GP)	5	77
KwaZulu-Natal (KZN)	5	39
Limpopo (LP)	1	6
North West (NW)	2	12
Northern Cape (NC)	1	6
Western Cape (WC)	49	36
Mpumalanga (MP)	0	8
South Africa	76	212

RESULTS

Epidemiological and geographic trends in admissions

From 5 March to 5 July, a total of 17 930 COVID-19 admissions (3 375 additional from last report) were reported from 288 facilities in all nine provinces of South Africa. Of these admissions, 8 422 (47.0%) and 9 508 (53.0%) were reported in public and private sector, respectively. Initially, most admissions were reported in the private sector; from week 17 a higher proportion of total admissions was reported in the public sector; and since week 25 a higher proportion was reported in the private sector. The decrease in reported admissions in the last epidemiological week is likely due to a delay in the submission of data from the hospitals (Figure 1).

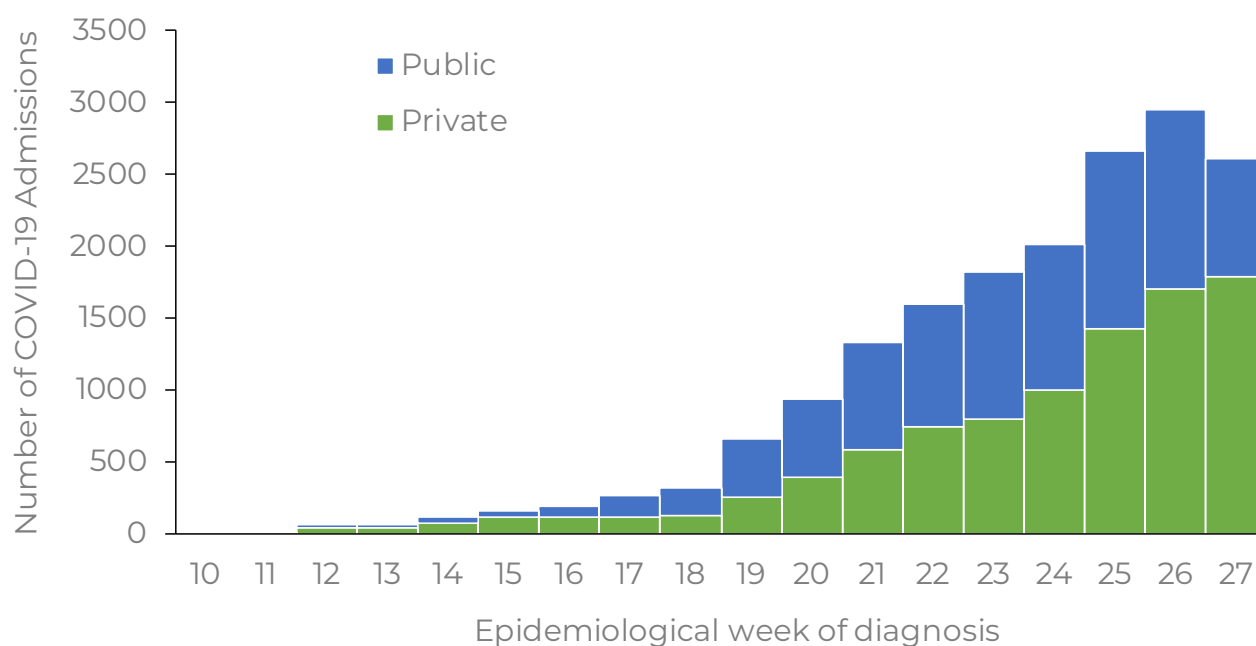


Figure 1. Number of reported COVID-19 admissions by health sector and epidemiologic week of diagnosis, 5 March-5 July 2020, n=17 930

The majority of admissions (16 675/17 930, 93.0%) were recorded in four provinces, with the highest number reported in Western Cape (10 152/17 930, 56.6%), followed by Gauteng (3 729/17 930, 20.8%), KwaZulu-Natal (1 527/17 930, 8.5%) and Eastern Cape (1 267/17 930, 7.1%) provinces. While Western Cape experienced an increase in admissions from week 18, the increase in Gauteng began in week 22 (Figure 2).

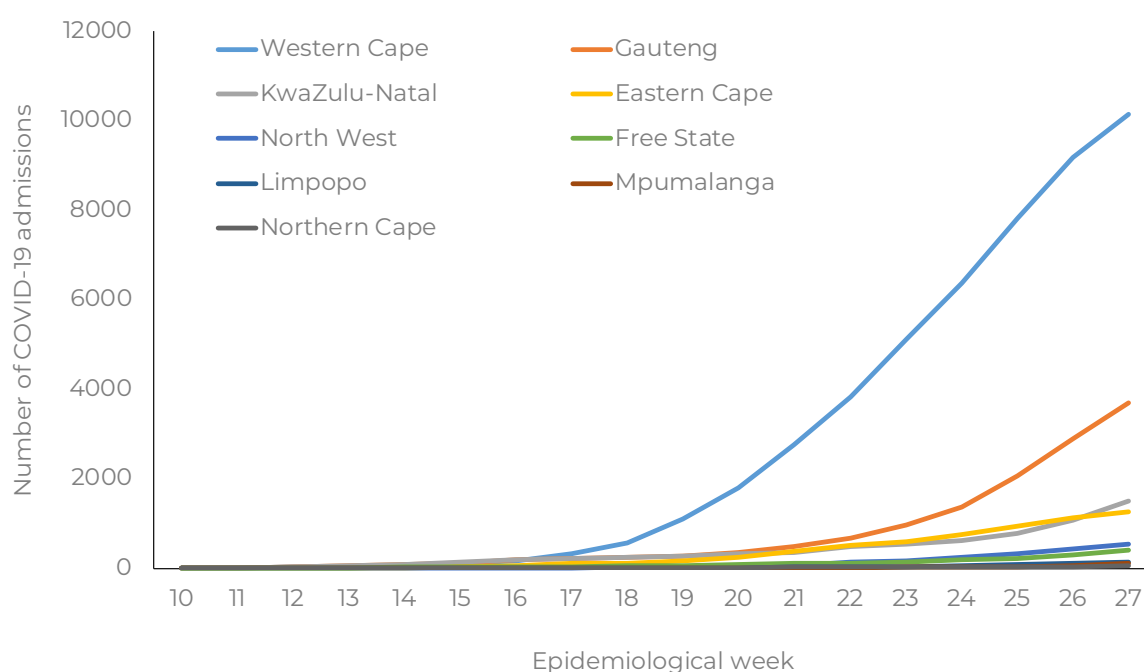


Figure 2. Cumulative numbers of reported COVID-19 admissions, by province and epidemiological week of diagnosis, South Africa, 5 March-5 July 2020, n=17 930

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF ADMISSIONS

The median age of COVID-19 admissions was 50 years (interquartile range [IQR] 38 – 62). There were 580 (3.2%) admissions in patients 18 years and younger and 2 386 (13.3%) in patients older than 70 years. Among admitted individuals with COVID-19, 9 641 (53.8%) 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).

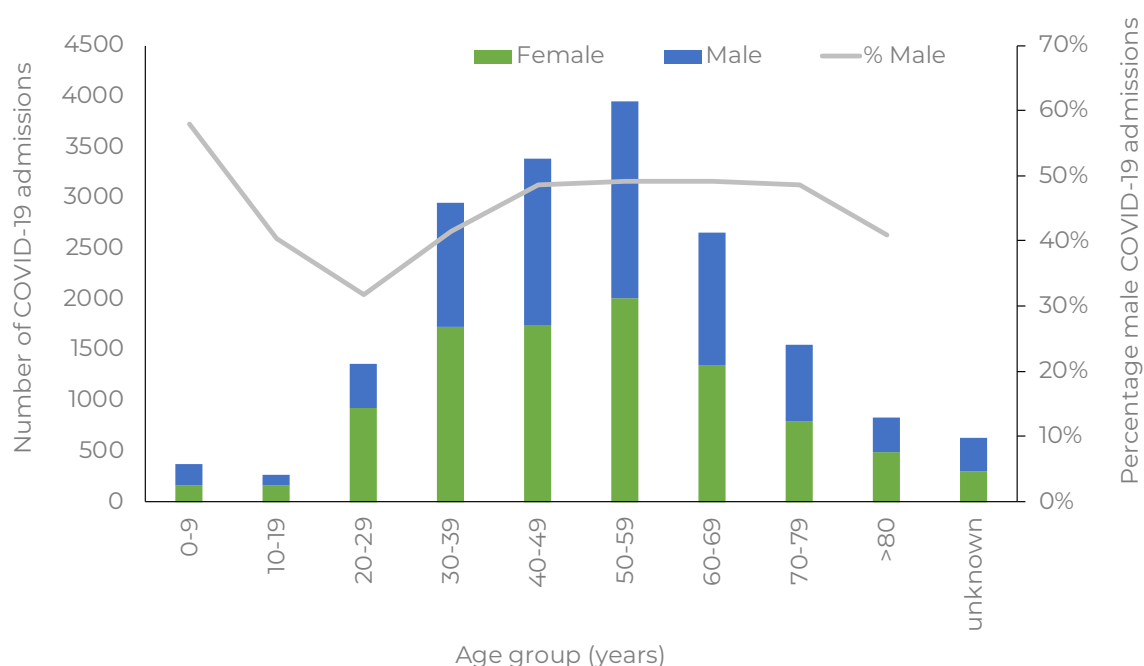


Figure 3. Number of reported COVID-19 admissions by age, gender and percentage of males, South Africa, 5 March-5 July 2020, n=17 930

Of the 7 714 (43.0%) patients for whom race was known, 5 277 (68.4%) were Black African, 1 163 (15.1%) were Coloured, 480 (6.2%) were Indian, 770 (10.0%) were White and 24 (0.3%) were classified as Other race group. There were 471 (2.6%) health care workers (HCW) that were reported to be hospitalised. Among the 9 641 female admissions, there were 506 (5.3%) females admitted who were pregnant or within 6 weeks post-partum.

Of the 13 407 (74.8%) patients for whom comorbid disease was known, 4 085 (30.5%) had no comorbid disease reported, 4 592 (34.3%) had one comorbid disease reported, 3 080 (23.0%) had two comorbid diseases and 1 650 (12.3%) had three or more comorbid diseases reported. Among the 9 322 patients who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (5 536/9 322, 59.4%) and diabetes (4 538/9 322, 48.7%); there were 1 713/9 322 (18.4%) patients who were HIV-infected, 341/9 322 (3.7%) patients with active tuberculosis (TB) and 838/9 322 (9.0%) 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 497 (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-5 July 2020, n=9 322*

Comorbid disease**	N	%
Hypertension	5 536	59.4%
Diabetes mellitus	45 38	48.7%
Chronic cardiac disease	380	4.1%
Chronic pulmonary disease/ Asthma	1 394	15.0%
Chronic renal disease	692	7.4%
Malignancy	145	1.6%
HIV	1 713	18.4%
Active tuberculosis	341	3.7%
Previous history of tuberculosis	838	9.0%

* 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

DISEASE SEVERITY

Of the 17 930 COVID-19 admissions to date, 4 199 (23.4%) met the criteria for severe disease. The median age of patients who had severe disease was 54 (IQR 44 – 64) years; compared to 49 (IQR 36 – 61) years for those who did not have severe disease. Amongst all admissions to date, 2 495 (13.9%) patients were treated in ICU and 1 989 (11.1%) were treated in High Care; 1 100 (6.1%) were ventilated and 3 968 (22.1%) received supplemental oxygen. The proportion of reported in-patients who were treated in ICU and ventilated in each epidemiological week decreased from week 15, however in the past four weeks there has been an increase in the proportion of patients who were treated in ICU (Figure 4).

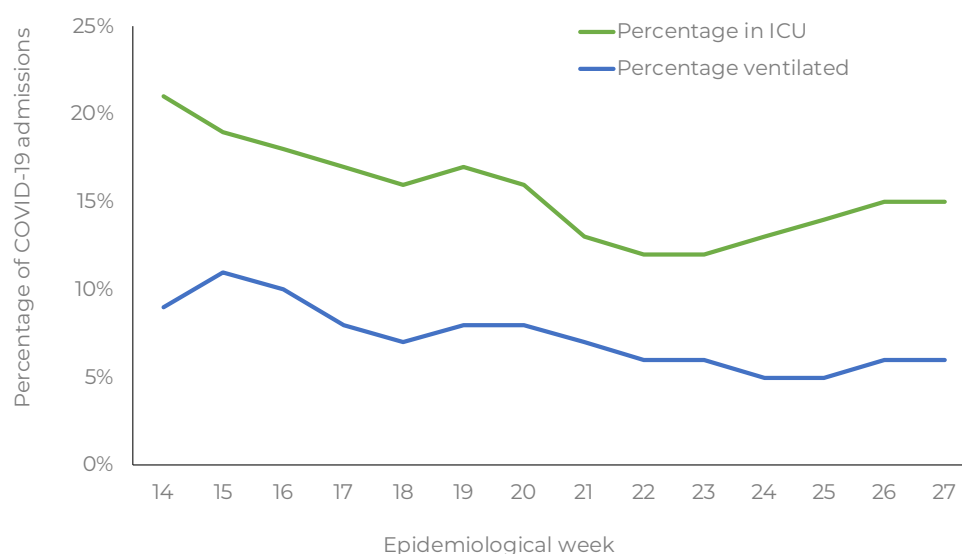


Figure 4. Proportion of COVID-19 in-patients treated in intensive care unit (ICU) and ventilated by epidemiological week, South Africa, 28 March-5 July 2020*

*Data on ventilation and ICU care was not reliable prior to epidemiological week 14

OUTCOMES

Of the 17 930 admitted individuals, 5 180 (28.9%) were currently in hospital, 9 931 (55.4%) were discharged alive, 194 (1.1%) were transferred out to either higher level care or step-down facilities and 2 615 (14.6%) had died. There were 499 additional deaths since the last report. Of the 12 546 COVID-19 patients who had recorded in-hospital outcome (died and discharged), 2 615 died, equating to a case fatality ratio (CFR) of 20.8%.

EPIDEMIOLOGICAL AND GEOGRAPHIC TRENDS IN MORTALITY

There has been an increasing trend in reported number of deaths and the CFR among hospitalised individuals increased with each month of admission: March 11.7%, April 18.2%, May 19.5%, June 21.8% and July 32.0%. The CFR in June and July was significantly greater than in March ($p=0.042$ and $p<0.001$ respectively). 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 CFR was higher in the public health sector (24.2%) than in the private health sector (16.8%) ($p<0.001$).

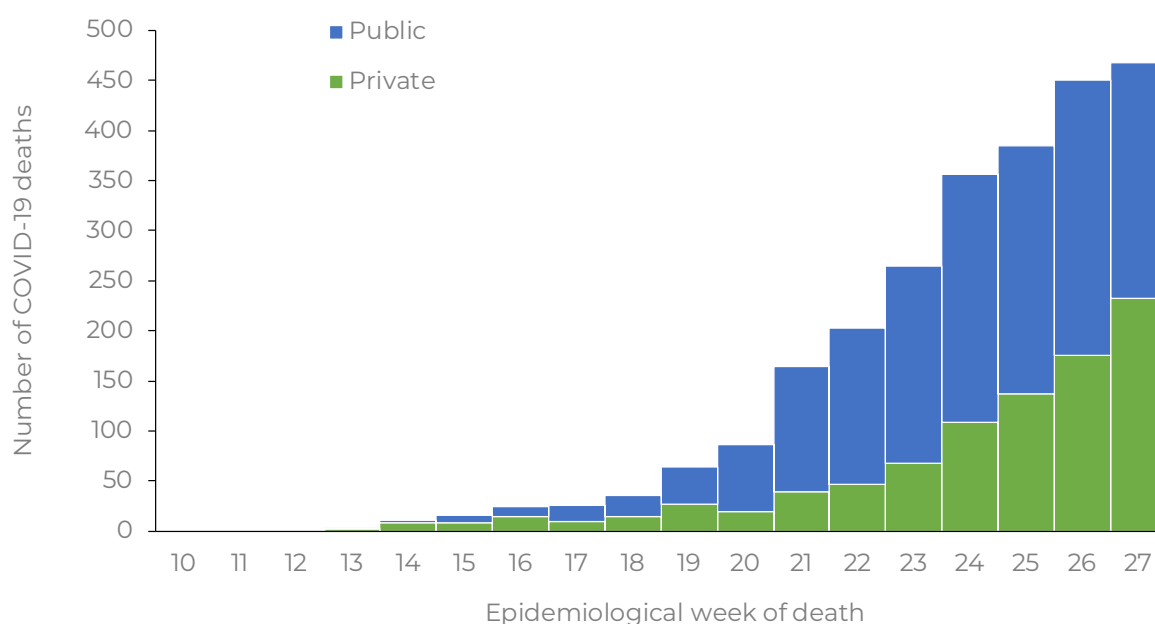


Figure 5. Number of COVID-19 deaths reported per week by health sector and epidemiologic week, South Africa, 5 March-5 July 2020, $n=2\ 615$

Most deaths were reported in Western Cape (1 811, 69.3%), followed by Gauteng (321, 12.3%) and Eastern Cape (298, 11.4%) (Figure 6). However, compared to Western Cape Province (21.6%), the CFR was significantly elevated in Eastern Cape Province (35.5%) ($p<0.001$) and Gauteng Province (17.3%) ($p=0.014$), and significantly lower in Free State (8.7%) Province ($p=0.001$).

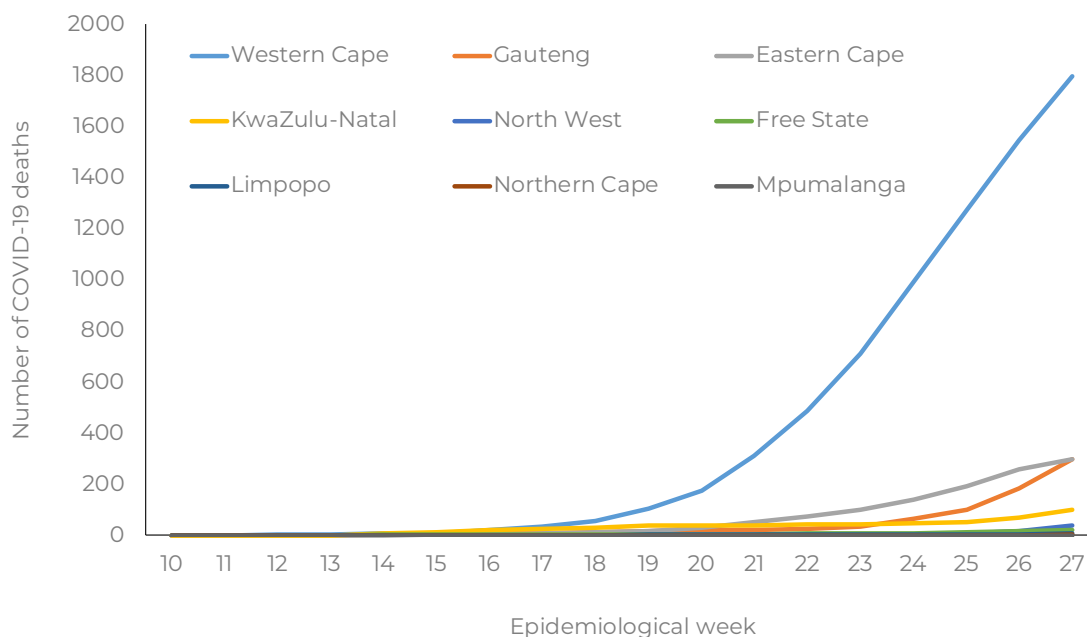


Figure 6. Cumulative numbers of reported COVID-19 deaths, by province and epidemiological week of death, South Africa, 5 March-5 July 2020, n=2 615

DEMOGRAPHIC CHARACTERISTICS OF DEATHS

The median age of patients who died was 61 (IQR 52 – 71) years, and for those who were still alive was 48 (IQR 36 – 59) years. There were 8 (0.3%) deaths in children ≤ 18 years. There were 203 (7.8%) deaths in patients younger than 40 years (Figure 7). The CFR was higher in males (24.1%) than females (18.2%) ($p < 0.001$).

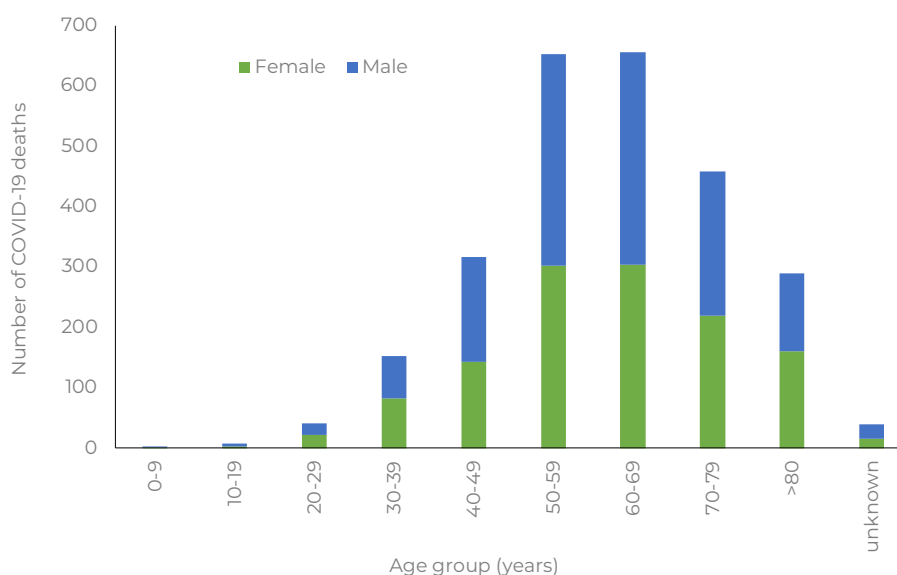


Figure 7. Number of reported COVID-19 deaths by age and gender, South Africa, 5 March-5 July 2020, n=2 615

Race was only available for 7 714 (43.0%) of all admissions. Where race was available, the CFR according to race group was as follows, Black (20.7%), Coloured (21.6%), Indian (21.8%), White (18.4%) and other race groups (25.0%), however these differences were not statistically significant.

COMMON COMORBIDITIES REPORTED AMONG DEATHS

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 8).

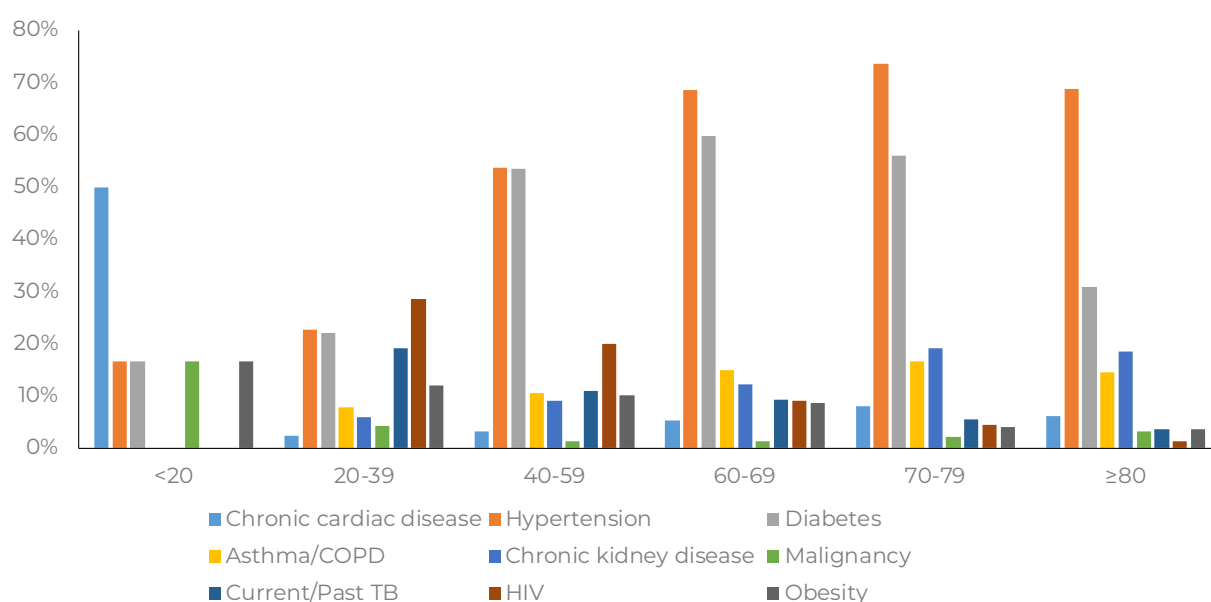


Figure 8. Frequency of comorbid conditions for reported COVID-19 deaths by age group, South Africa, 5 March-5 July 2020, n=2 615

* There were 6 people younger than 20 years that died

FACTORS ASSOCIATED WITH IN-HOSPITAL MORTALITY

On multivariable analysis, factors associated with in-hospital mortality were older age groups; male sex; admission in the public sector; more recent month of admission; and having comorbid hypertension, diabetes, chronic cardiac disease, chronic renal disease, malignancy, HIV and active tuberculosis. Compared to the Western Cape Province, individuals hospitalised in Eastern Cape and Gauteng were more likely to die in-hospital while individuals in Free State Province were less likely to die (Table 3).

Table 3. Univariate and multivariable analysis of factors associated with mortality among 12 546 with in-hospital outcome (discharges and deaths), South Africa, 5 March-5 July 2020

Characteristic	Case-fatality ratio n/N (%)	Unadjusted OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
Age group					
<20 years	9/491 (1.8)	Reference		Reference	
20-39 years	194/3 210 (6.0)	3.4 (1.8-6.8)	<0.001	2.9 (1.2-7.2)	0.021
40-59 years	970/5 131 (18.9)	12.5 (6.4-24.2)	<0.001	9.4 (3.8-23.1)	<0.001
60-69 years	1 113/2 995 (37.2)	31.7 (16.3-61.5)	<0.001	20.1 (8.2-49.2)	<0.001
70-79 years	289/588 (49.2)	51.8 (26.3-102.1)	<0.001	37.8 (15.1-94.4)	<0.001
≥80 years	40/131 (30.5)	23.5 (11.0-50.2)	<0.001	17.0 (6.3-45.5)	<0.001
Unknown age	24/90 (26.7)	24.0 (9.5-60.9)	<0.001	15.6 (4.9-49.3)	0.020
Sex					
Female	1 251/6 885 (18.2)	Reference		Reference	
Male	1 364/5 661 (24.1)	1.4 (1.3-1.6)	<0.001	1.5 (1.3-1.6)	<0.001
Race					
Black	659/3 178 (20.7)	Reference			
Coloured	191/883 (21.6)	1.1 (0.9-1.3)	0.563		
Indian	52/239 (21.8)	1.1 (0.8-1.5)	0.708		
White	80/434 (18.4)	0.9 (0.7-1.1)	0.265		
Other	3/12 (25.0)	1.3 (0.3-4.7)	0.717		
Unknown	1 630/7 800 (20.9)	1.0 (0.9-1.1)	0.851		
Healthcare worker					
No	2 597/12 263 (21.2)	Reference			
Yes	18/283 (6.4)	0.3 (0.2-0.4)	<0.001		
Peri-partum					
No	1 242/6 471 (19.2)	Reference			
Yes	9/414 (2.2)	0.1 (0.05-0.2)	<0.001		
Comorbid condition					
No co-morbidity	275/2 325 (11.8)	Reference			
1 co-morbid condition	734/3 260 (22.5)	2.2 (1.9-2.5)	<0.001		
2 comorbid conditions	678/2 248 (30.2)	3.2 (2.8-3.8)	<0.001		
≥3 comorbid conditions	469/1 308 (35.9)	4.2 (3.5-4.9)	<0.001		
Unknown	459/3 405 (13.5)	1.2 (0.99-1.4)	0.066		
Hypertension					
No	886/5 129 (17.3)	Reference		Reference	
Yes	1 270/4 012 (31.7)	2.2 (2.0-2.4)	<0.001	1.2 (1.1-1.4)	0.001
Diabetes mellitus					
No	1 088/5 778 (18.8)	Reference		Reference	
Yes	1 068/3 363 (31.8)	2.0 (1.8-2.2)	<0.001	1.4 (1.2-1.6)	<0.001

Chronic cardiac disease						
No	2 052/8 903 (23.1)	Reference		Reference		
Yes	104/238 (43.7)	2.6 (2.0-3.4)	<0.001	1.7 (1.3-2.3)	<0.001	
Chronic pulmonary disease/Asthma						
No	1 886/8 051 (23.4)	Reference				
Yes	270/1 090 (24.8)	1.1 (0.9-1.2)	0.326			
Chronic renal disease						
No	1 896/8 599 (22.1)	Reference		Reference		
Yes	260/542 (48.0)	3.3 (2.7-3.9)	<0.001	1.9 (1.6-2.3)	<0.001	
Malignancy						
No	2 115/9 049 (23.4)	Reference		Reference		
Yes	41/92 (44.6)	2.6 (1.7-4.0)	<0.001	2.5 (1.6-3.9)	<0.001	
HIV						
No	1 878/7 839 (24.0)	Reference		Reference		
Yes	2 78/1 302 (21.4)	0.9 (0.7-0.99)	0.040	1.3 (1.1-1.5)	0.002	
Tuberculosis						
No	2 090/8 897 (23.5)	Reference		Reference		
Yes	66/244 (27.1)	1.2 (0.9-1.6)	0.197	1.7 (1.3-2.4)	0.001	
Past Tuberculosis						
No	1 973/8 481 (23.3)	Reference				
Yes	183/660 (27.7)	1.3 (1.1-1.5)	0.009			
Obesity						
Unknown	2 441/12 198 (20.0)	Reference				
Yes	174/348 (50.0)	4.0 (3.2-5.0)	<0.001			
Month of admission						
March	21/180 (11.7)	Reference		Reference		
April	156/859 (18.2)	1.7 (1.03-2.7)	0.037	1.6 (0.9-2.8)	0.122	
May	837/4 290 (19.5)	1.8 (1.2-2.9)	0.010	1.5 (0.9-2.6)	0.136	
June	1 520/6 963 (21.8)	2.1 (1.3-2.3)	0.001	1.8 (1.02-3.1)	0.042	
July	81/253 (32.0)	3.6 (2.1-6.0)	<0.001	4.4 (2.3-8.4)	<0.001	
Health sector						
Private sector	967/5 743 (16.8)	Reference		Reference		
Public sector	1 648/6 803 (24.2)	1.6 (1.4-1.7)	<0.001	1.5 (1.4-1.8)	<0.001	
Province						
Western Cape	1 811/8 380 (21.6)	Reference		Reference		
Eastern Cape	298/839 (35.5)	2.0 (1.7-2.3)	<0.001	2.4 (2.0-2.8)	<0.001	
Free State	22/253 (8.7)	0.3 (0.2-0.5)	<0.001	0.4 (0.2-0.7)	0.001	
Gauteng	321/1 851 (17.3)	0.8 (0.7-0.9)	<0.001	1.3 (1.05-1.5)	0.014	
KwaZulu-Natal	108/744 (14.5)	0.6 (0.5-0.8)	<0.001	0.9 (0.7-1.2)	0.508	
Limpopo	8/96 (8.3)	0.3 (0.2-0.7)	0.003	0.6 (0.3-1.5)	0.292	
Mpumalanga	1/67 (1.5)	0.1 (0.0-0.4)	0.004	0.2 (0.02-1.4)	0.105	
North West	42/274 (15.3)	0.7 (0.5-0.9)	0.013	1.2 (0.8-1.8)	0.441	
Northern Cape	4/42 (9.5)	0.4 (0.1-1.1)	0.067	0.5 (0.1-1.6)	0.232	

Severe**			
No	1 579/9 991 (15.8)	Reference	
Yes	1 036/2 555 (40.6)	3.6 (3.3-4.0)	<0.001
Ever ICU			
No	1 875/11 074 (16.9)	Reference	
Yes	740/1 472 (50.3)	5.0 (4.4-5.6)	<0.001
Ever High Care			
No	2 314/11 325 (20.4)	Reference	
Yes	301/1 221 (24.7)	1.3 (1.1-1.5)	0.001
Ever ventilated			
No	2 160/11 870 (18.2)	Reference	
Yes	455/676 (67.3)	9.3 (7.8-10.9)	<0.001
Ever on oxygen			
No	1 937/10 326 (18.8)	Reference	
Yes	678/2 220 (30.5)	1.9 (1.7-2.1)	<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

DATCOV currently includes 17 930 admissions from 288 public and private hospitals in all nine provinces in South Africa. It also includes 2 615 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 and malignancy are consistent with data reported from other countries.¹⁻⁵ In addition, this report also quantifies the increased risk of in-hospital mortality among HIV-infected individuals and patients with active tuberculosis, which is consistent with data from the Western Cape Province.⁶

Trends in CFR over time and provincial differences may be affected by many factors such as hospital admission criteria, timeousness of closing cases, testing criteria in different provinces, and the severity of illness in admitted cases.

The availability of reliable surveillance data is of critical importance to gain 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 a more reliable picture of the epidemic progression than overall confirmed case numbers.

DATCOV provides real-time data and summary analyses, which inform modelling and reporting at a national level. It also addresses a knowledge gap, in the lack of data from 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.

We were not able to analyse the association between time of symptom onset and mortality as these data were incomplete for >50% of individuals. Data on socioeconomic status are not collected. Data on treatment and medical interventions have not been analysed because the data were incomplete. Efforts are ongoing to improve the quality and completeness of data on symptoms and medical interventions and analysis of these data will be included in future reports.

REFERENCES

1. Adhikari SP et al., Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *Infectious Diseases of Poverty*, 2020. 9(1): p. 29.
2. Docherty AB, et al., Features of 16 749 hospitalised UK patients with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol. *medRxiv*, 2020: p. 2020.04.23.20076042.
3. Lewnard JA, et al., Incidence, clinical outcomes, and transmission dynamics of severe coronavirus disease 2019 in California and Washington: prospective cohort study. *BMJ*, 2020. 369: p. m1923.
4. Petrilli CM, et al., Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BMJ*, 2020. 369: p. m1966.
5. Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. *JAMA*, 2020. 323(18): p. 1775-1776.
6. Boulle B, Davies MA. Risk of COVID-19 death among people with HIV: A population cohort analysis from the Western Cape Province, South Africa. *COVID-19 Special Public Health Surveillance Bulletin 2*. National Institute for Communicable Disease.

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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)
Khotsong TB Hospital (EC)
Zithulele Hospital (EC)
Pelonomi Hospital (FS)
National District Hospital (FS)
Universitas Hospital (FS)
Phekolong Hospital (FS)
DR JS Moroka 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)