

COVID-19

Hospital Surveillance-Weekly Update on Hospitalized HCWs

Update: Week 50, 2021



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This report summarises data of COVID-19 cases admitted to hospital surveillance sites in all provinces. The report is based on data collected from 5 March 2020 to 18 December 2021 on the DATCOV platform.

HIGHLIGHTS

- As of 18 December 2021 (week 50 of 2021), 9901 (2.4%) of the 415497 COVID-19 hospital admissions recorded on the DATCOV surveillance database, were health care workers (HCWs), reported from 666 facilities in all nine provinces of South Africa. Among 3003/9901 (30.3%) HCWs with available data on type of work, 1683/3003 (56.0 %) were nurses, 731/3003 (24.3%) porters or administrators, 259/3003 (8.6%) allied HCWs, 223/3003 (7.4%) doctors, 69/3003 (2.3%) paramedics, and 38/3003 (1.3%) were laboratory scientists.
 - There were 3014 (30.4%) and 6887 (69.6%) admissions reported in the public and private sectors, respectively. The majority of HCW admissions (8284/9901; 83.7%) were recorded in four provinces, with the highest number 3433/9901 (34.7%) reported in Gauteng, followed by 2324/9901 (23.5%) in KwaZulu-Natal, 1254/9901 (12.7%) in Eastern Cape and 1273/9901 (12.9%) in Western Cape Provinces. The median age of COVID-19 admissions among HCWs was 49 years (interquartile range [IQR] 39–58). There were 2021 (20.4%) admissions in HCWs 60 years and older (Figure 4). Among the admitted HCWs with COVID-19, 6656 (67.2%) were females.
 - The prevalence of comorbid diseases among HCW was 4334/8342 (52.0%). Among the 8342 HCWs who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (2977/8342; 36.7%) and diabetes (1903/8342; 22.8%). There were 5.1% (425/8342) of HCWs that were HIV positive, 5.0% (409/8342) were obese, 0.8% (65/8342) had active tuberculosis (TB) and 0.9% (76/8342) reported a previous history of TB.
 - A total of 1685 (17.0%) HCWs admitted were treated in ICU, of these treated in ICU, 1032 (61.3%) required supplemental oxygen, 582 (34.5%) required invasive mechanical ventilation and 344 (33.3%) required both treatments. Of the 9901 HCWs admitted, 8479 (85.6%) were discharged alive, 105 (1.1%) transferred out to either high-level care or step-down facilities, 1233 (12.5%) had died and 84 (0.9%) were currently in hospital. The majority of deaths among HCWs admitted with COVID-19 were reported in Gauteng (395, 32.0%) and KwaZulu-Natal 299 (24.3%), followed by the Eastern Cape (208, 16.9%) provinces. Of the HCWs who died, 763 (65.3%) had comorbid disease reported and 367 (29.7%) had more than one reported comorbidity.
 - There were 4014/84589 (4.7%), 4053/176392 (2.3%), 1834/140570 (1.3%) and 245/13945 (1.8%) admissions amongst HCWs, and 364/17419 (2.1%), 622/43531 (1.4%), and 245/33723 (0.7%) and 2/464 (0.4%) deaths amongst HCWs in the first, second, third and fourth waves respectively. The case fatality ratio (CFR) of HCWs with known in-hospital outcomes reported to DATCOV was 9.2% (364/3969), 15.6% (622/3999), 14.0% (245/1744) and 1.1% (2/188) in the first, second, third and fourth waves.
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Methods

DATCOV 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 (Table 1). A COVID-19 case was defined as a person with a positive reverse transcriptase-polymerase chain reaction (RT-PCR) assay or positive antigen test for SARS-CoV-2 who was admitted to a hospital. All hospitalized patients who were noted to be doctors, nurses, allied health care workers, laboratory staff, porters and administrative staff were captured as health care workers (HCWs). HCWs included in this surveillance report were from 20 to 79 years old, the age group of almost all HCWs in South Africa. The age group was also applied in the non-HCWs to make the two groups comparable. 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 all COVID-19 admissions are received from all private and public hospitals nationally, in all nine provinces. As new hospitals join the surveillance system, they retrospectively captured all admissions recorded. As of 18 December 2021, a total of 666 facilities, 407 from the public sector and 259 from the private sector submitted data on hospitalized patients with COVID-19 (Table 1).

Table 1: Number of hospitals reporting data on COVID-19 admissions by province and health-sector, South Africa, 5 March 2020–18 December 2021

Provinces	Public	Private
Eastern Cape	86	18
Free State	35	20
Gauteng	40	96
KwaZulu-Natal	69	47
Limpopo	41	7
Mpumalanga	31	9
North West	17	13
Northern Cape	29	6
Western Cape	59	43
South Africa	407	259

Results

From 5 March 2020 to 18 December 2021, there was a total of 9901/415497 (2.4%) COVID-19 admissions among HCWs. Of these admissions, 3014 (30.4%) and 6887 (69.6%) were reported in the public and private sectors, respectively (Figure 1). The majority of HCW admissions (7983/9540; 83.7%) were recorded in four provinces, with the highest number 3433/9901 (34.7%) reported in Gauteng, followed by 2324/9901 (23.5%) in KwaZulu-Natal, 1254/9901 (12.7%) in Eastern Cape and 1273/9901 (12.9%) in Western Cape Provinces (Figure 1).

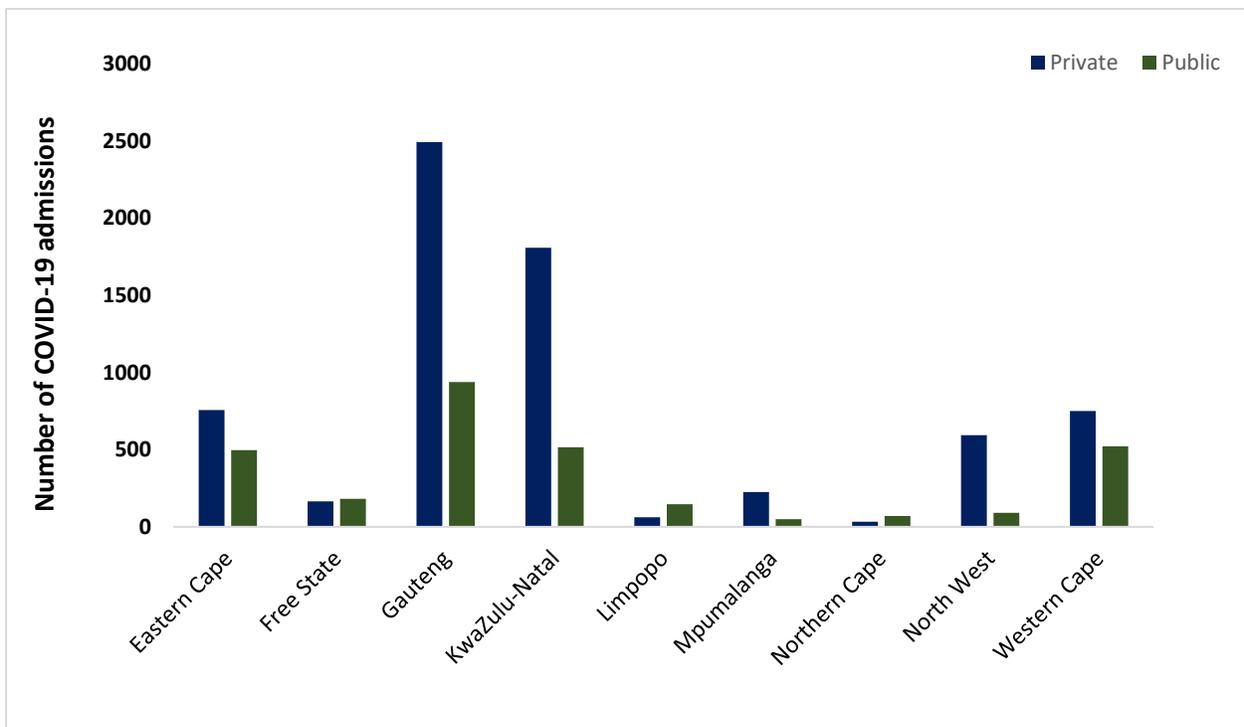


Figure 1: Number of reported COVID-19 admissions among HCWs by province and health sector, South Africa, 5 March 2020 –18 December 2021 (n=9901).

Figure 2 shows that HCW admissions peaked in week 28 of 2020 during the first wave of the pandemic, in week 1 of 2021 during the second wave, and in week 27 during the third wave. After a decline in HCW admissions during week 35 to 46 of 2021, the number of HCW admissions increased in week 48 of 2021 during the fourth wave of the COVID-19 pandemic.

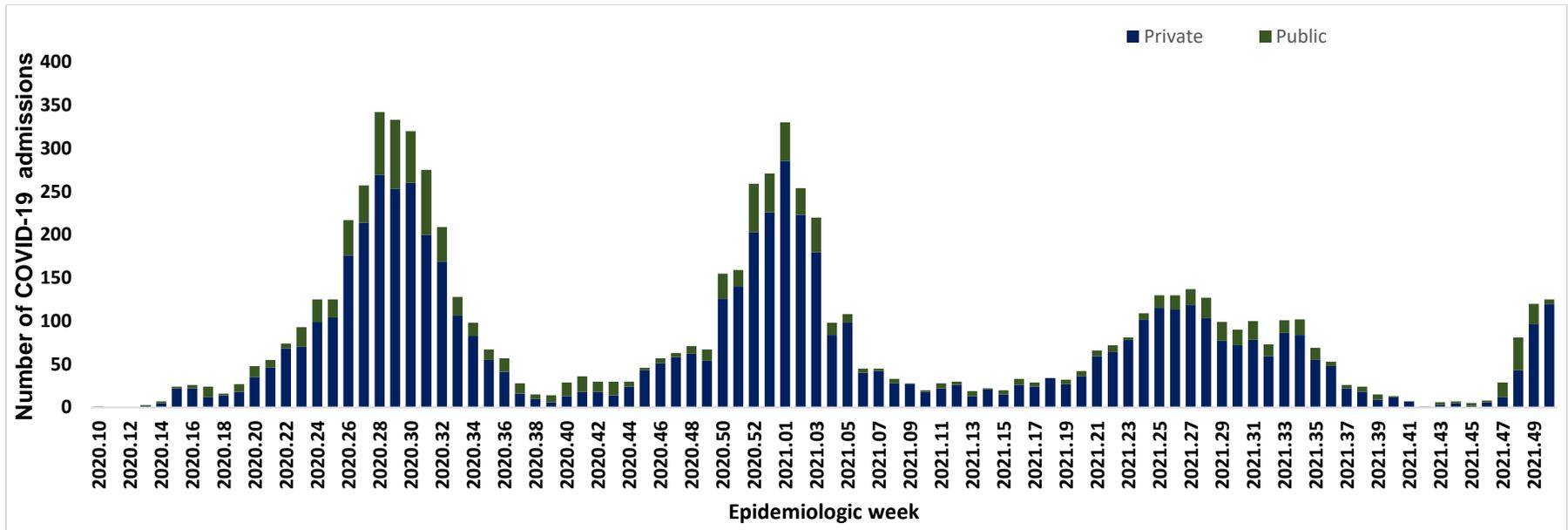


Figure 2: Number of reported COVID-19 admissions among HCWs by an epidemiologic week of diagnosis and health-sector, South Africa, 5 March 2020 –18 December 2021 (n=9901).

The numbers of HCW admissions were highest in Gauteng, KwaZulu-Natal and Eastern Cape during the first wave and highest in Gauteng, KwaZulu-Natal and Western Cape during the second wave. At the start of the third wave, the number of COVID-19 HCW admissions increased in Gauteng and it peaked in week 27 of 2021 (Figure 3). In week 33-35 of 2021, there was a slight increase in HCW admissions in Kwa-Zulu Natal, followed by a decline in number of admissions in week 37 of 2021. In the fourth wave, in the number of HCW admissions increased in Gauteng in week 48 of 2021, in KwaZulu natal in week 49 of 2021 and in the eastern cape in week 50 of 2021. Overall, there were lower HCW admissions in the fourth wave across all provinces compared to the third, second and the first wave.

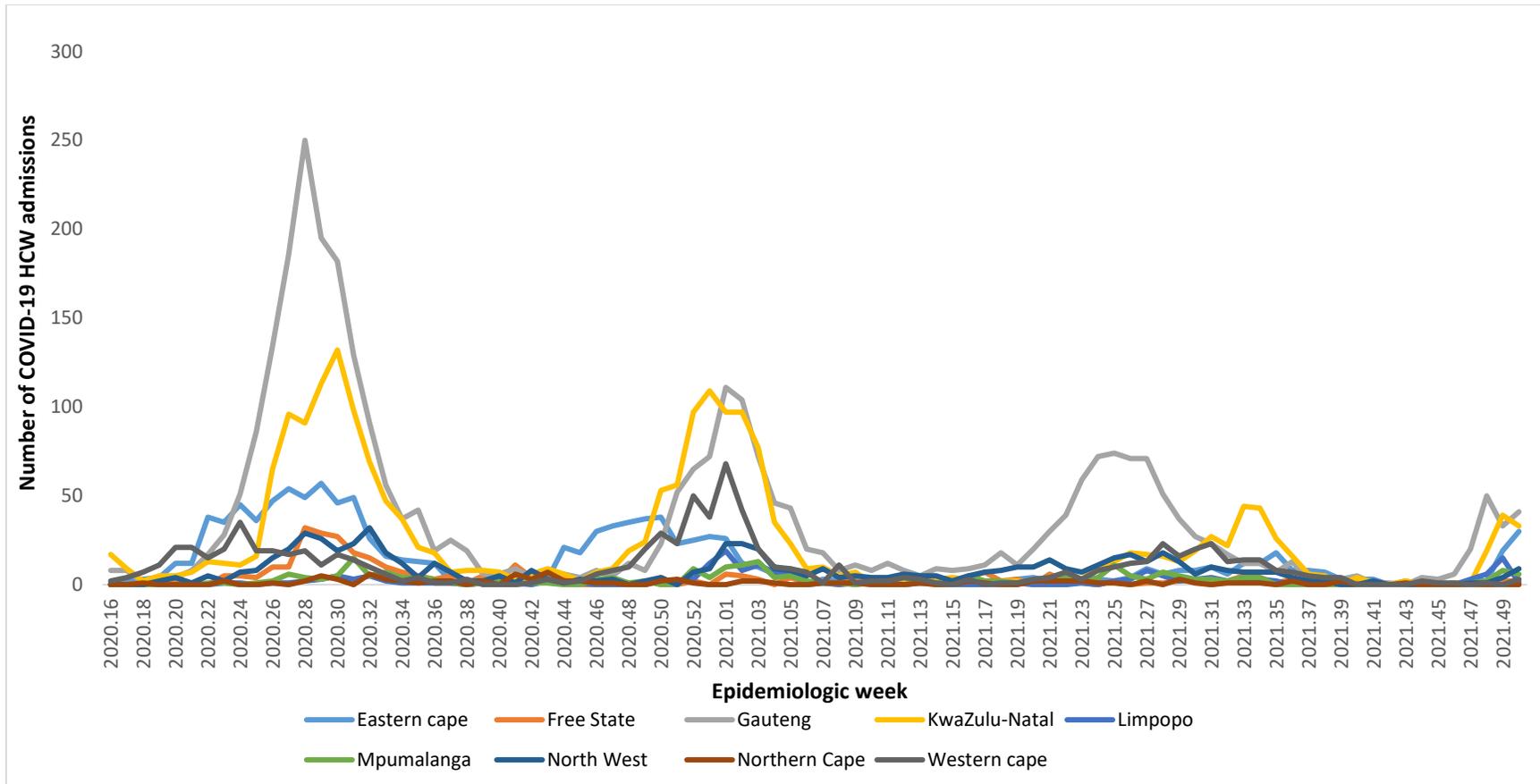


Figure 3: Number of reported COVID-19 admissions among HCWs by an epidemiologic week of diagnosis and provinces, South Africa, 5 March 2020 – 18 December 2021 (n=9901).

Demographic and clinical characteristics of HCWs admitted with COVID-19, South Africa, 5 March 2020 –18 December 2021

The median age of COVID-19 admissions among HCWs was 49 years (interquartile range [IQR] 39–58). There were 2021 (20.4%) admissions in HCW 60 years and older (Figure 4). Among the admitted HCWs with COVID-19, 6656 (67.2%) were females. The sex ratio varied by age group with females more common than males in all age groups (Figure 4). Among the 6656 female admissions, 241 (3.6%) were pregnant.

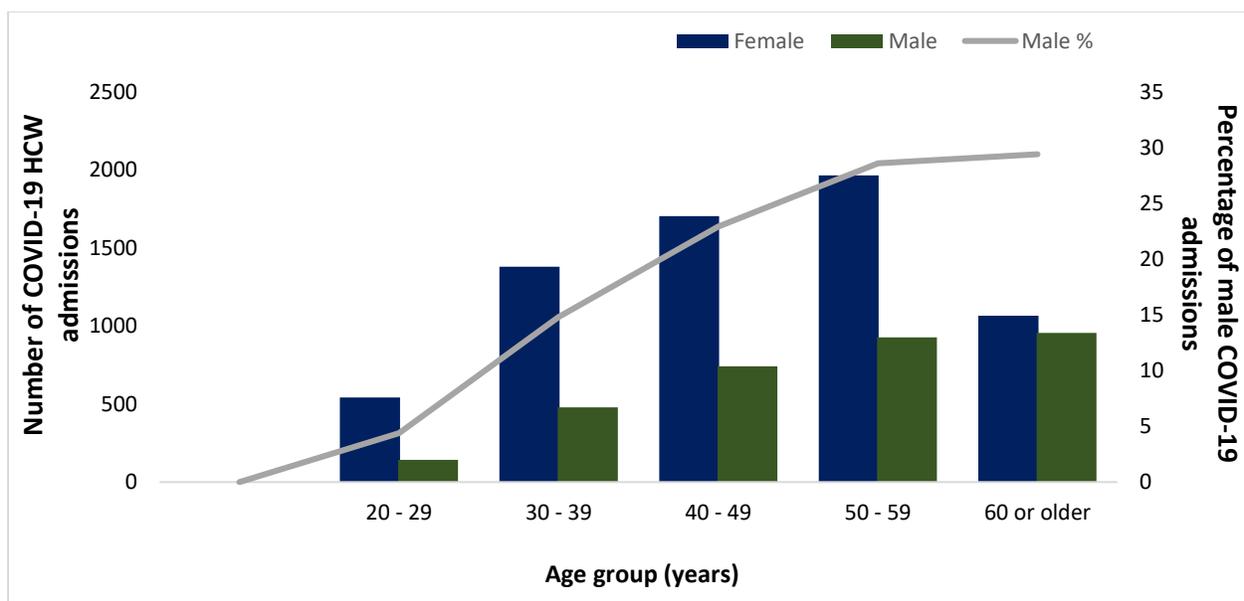


Figure 4: Number of reported HCW admitted with COVID-19 by age, gender and percentage of males, South Africa, 5 March 2020 –18 December 2021 (n=9901).

The prevalence of comorbid diseases among HCW was 4334/8342 (52.4%). Among the 8342 HCWs who had reported a comorbid condition, the most commonly reported comorbid conditions were hypertension (2977/8342; 36.7%) and diabetes (1903/8342; 22.8%). There were 5.1% (425/8342) of

HCWs that were HIV positive, 5.0% (409/8342) were obese, 0.8% (65/8342) had active tuberculosis (TB) and 0.9% (7376/8342) reported a previous history of TB (Table 2).

Table 2: The number and prevalence of comorbid diseases in HCW admitted with COVID-19, South Africa, 5 March 2020 – 18 December 2021 (n=8342)

Comorbid disease*	Frequency (n)	Percentage (%)
Hypertension	2977	35.7
Diabetes mellitus	1903	22.8
Chronic cardiac disease	155	1.9
Chronic pulmonary disease/Asthma	551	6.6
Chronic renal disease	49	0.6
Malignancy	37	0.4
HIV	425	5.1
Active tuberculosis	65	0.8
Previous history of tuberculosis	76	0.9
Obesity	409	4.9

* 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

Severity

A total of 1685 (17.0 %) HCWs admitted were treated in ICU, of those admitted to ICU, 1032 (61.3%) required supplemental oxygen, 582 (34.5%) required invasive mechanical ventilation and 344 (33.3%) required both treatments. The mean age of patients who received oxygen or ventilation as an intervention (52.4 years) was significantly older than those who did not receive oxygen or ventilation intervention (46.5 years) ($p < 0.0001$). Of the all HCW admissions treated with oxygen or ventilation, 886/4007 (22.1%) had more than one comorbid disease ($p < 0.001$).

Outcomes

Of the 9901 HCWs admitted, 8479 (85.6%) were discharged alive, 105 (1.1%) transferred out to either high-level care or step-down facilities, 1223 (12.5%) had died and 84 (0.9%) were currently in hospital. The case fatality ratio (CFR) of HCWs with known in-hospital outcomes reported to DATCOV was 12.7 % (1233/9712) compared to a CFR of 23.7% (81162/342532) among non-HCW admissions ($p < 0.001$) (Figure 5).

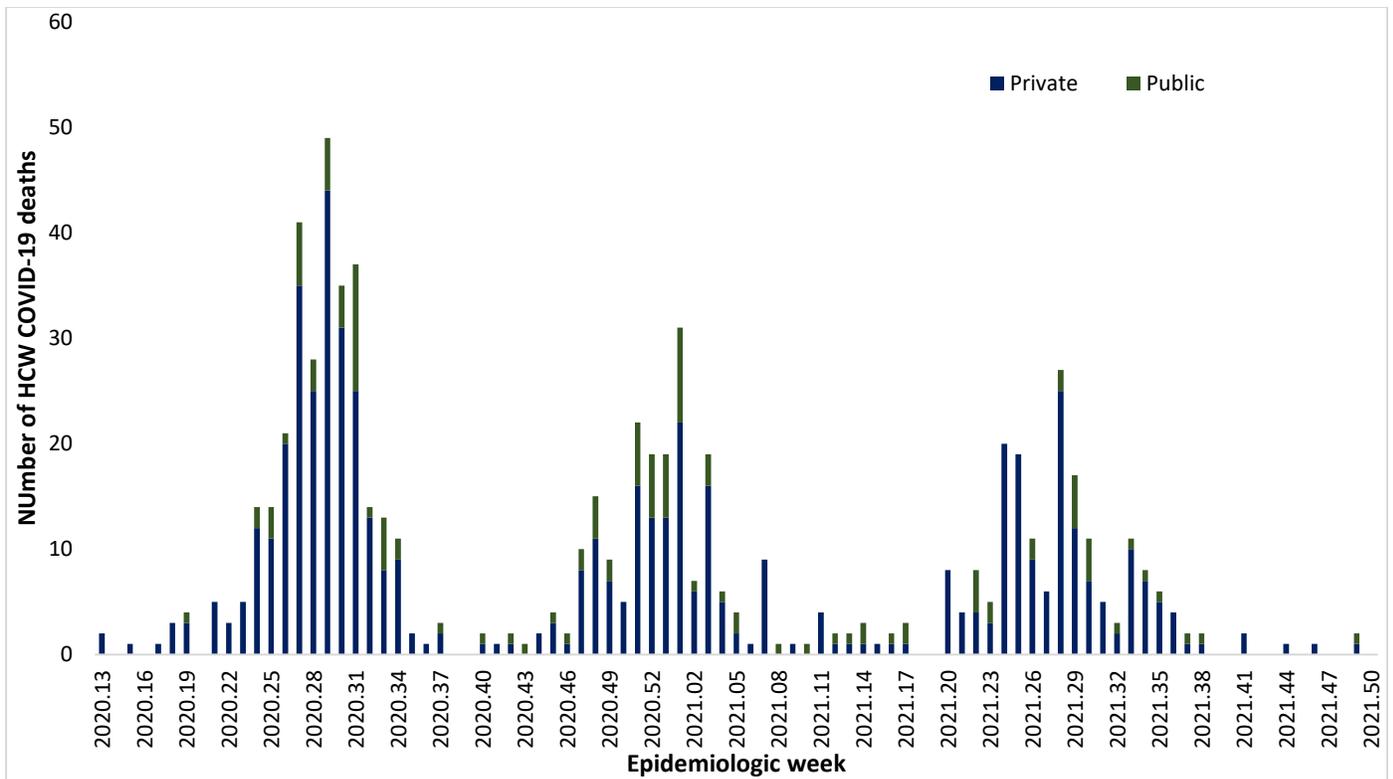


Figure 5. The number of reported COVID-19 deaths among admitted HCW by epidemiologic week in the private and public sector, South Africa, 5 March–18 December 2021.

Please note that the mortality data presented was based on available information from reporting hospitals as of 13 November 2021. Deaths that were subsequently confirmed not to be of a HCW were removed from the data set.

The majority of deaths among HCWs admitted with COVID-19 were reported in Gauteng (395, 32.0%) and KwaZulu-Natal 299 (24.3%), followed by the Eastern Cape (208, 16.9%) provinces. Five hundred and forty-nine (44.5%) of the deaths were recorded among HCWs aged 60 years and older. The median age of those who died was 58 (IQR 50 – 66) years compared to 48 (IQR 38 – 57) years for those who were still alive. Seven hundred and forty-two (60.2%) of the deceased were admitted at ICU, 376 (30.5%) were ventilated, and 744 (60.3%) were given supplemental oxygen. The median length of stay for the HCWs who died was 11 days [IQR 5 – 19] compared to 6 days [3 – 10] for those discharged alive. Of the HCWs who died, 763 (65.3%) had comorbid disease reported and 367 (30.1%) had more than one reported comorbidity. Hypertension 588 (51.2%), diabetes 422 (37.4%) and obesity 69 (24.6%) were the common reported comorbid diseases among the deceased.

Comparison of COVID-19 admissions and deaths among HCWs and non-HCWs in the first, second and third waves

Of the total COVID-19 admissions and death reported to DATCOV, there were 4014/84589 (4.7%), 4053/176392 (2.3%) and 1834/140570 (1.3%) and 245/13945 (1.8%) admissions amongst HCWs, and 364/17419 (2.1%), 622/43531 (1.4%), and 245/33723 (0.7%) and 2/464 (0.4%) deaths amongst HCWs in the first, second, third and fourth waves respectively (Figure 6). The case fatality ratio (CFR) of HCWs with known in-hospital outcomes reported to DATCOV was 9.2% (364/3969), 15.6% (622/3999), 14.0% (245/1744) and 1.1% (2/188) in the first, second, third and fourth waves.

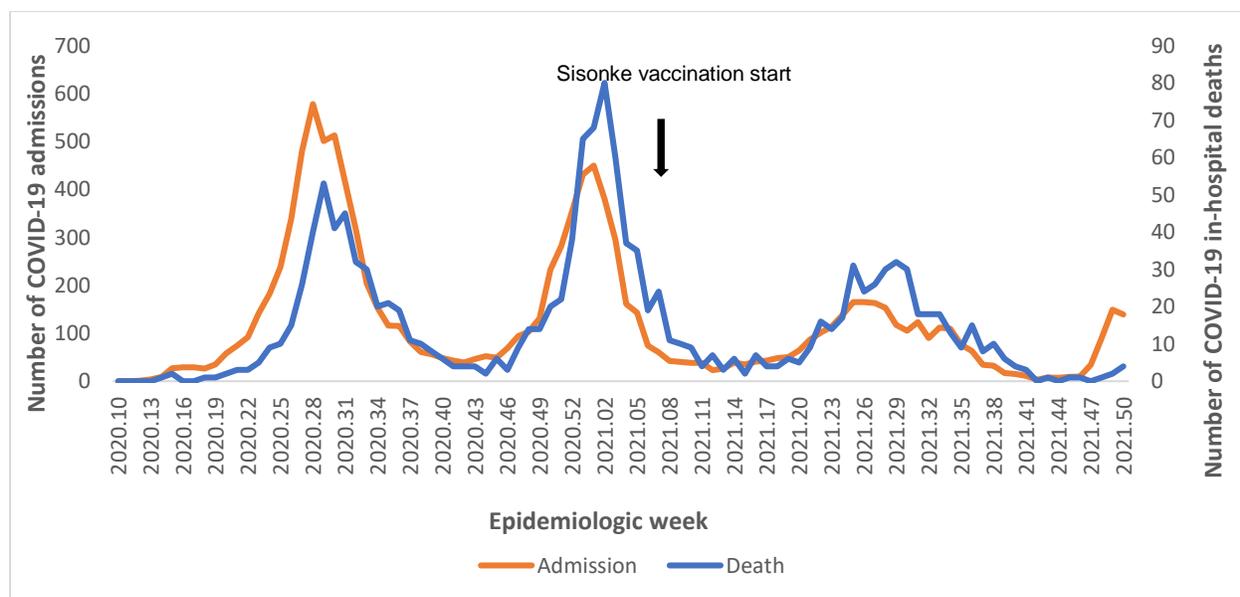


Figure 6: Number of COVID-19 HCW admissions and in-hospital mortality across South Africa, 5 March–18 December 2021.

The number of non-HCW admissions and in-hospital mortality was high in the second wave compared to the first, third and fourth wave. There were 20.2% (71887/355045), 43.2% (153209/355045); 33.6% (119204/355045) and 3.0% (10745/355045) non-HCW admissions and 18.2% (14765/81162); 37486/81162 (46.2%), 28911/81162 (35.6%) and 378/81162 (0.5%) non-HCW deaths in the first, second and third wave respectively. The case fatality ratio (CFR) of non-HCWs with known in-hospital outcomes reported to DATCOV was 20.9% (14765/70811), 25.0% (37486/150051) and 23.8% (28911/121670) in the first, second and third waves. The case fatality ratio (CFR) of non-HCWs with known in-hospital outcomes reported to DATCOV was 20.9% (14765/70811), 25.0% (37486/150051) 23.8% (28911/121670) and 6.3%(378/6023) in the first, second, third and fourth waves.

Conclusions

HCW admissions increased in the fourth wave even though vaccination among HCWs in SA started February. The reduction in HCW admissions in the third wave was likely the result of a large percent of HCW having received vaccination, as well as an effect of immunity following previous natural infection in the first two waves. In non-HCWs, admissions were high in the second wave compared to the first wave third and the fourth wave. While the numbers of admissions in HCWs are lower in the third wave, the CFR of HCWs was higher in the second and third wave than in the first and fourth wave. This is in keeping with the analysis of national in-hospital mortality in South Africa, that revealed a 31% higher mortality rate in the second wave compared to the first wave, even after adjusting for age, sex, race, province, sector and weekly hospital admissions; suggesting that the residual mortality may be associated with the SARS-CoV-2 Beta lineage (501Y.V2) (Jassat *et al.*, 2021).

Acknowledgements

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Reference

1. Jassat W, *et al.* Difference in mortality among individuals admitted to hospital with COVID-19 during the first and second waves in South Africa: a cohort study. *The Lancet: Global Health*, 2021b, 9 (9); E1216-E1225. DOI: 10.1016/S2214-109X (21)00289-8.