THE TRENDS IN COVID-19 ADMISSIONS AMONGST PEOPLE WITH HIV (PWH) IN SOUTH AFRICA

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BACKGROUND

South Africa has experienced five COVID-19 waves and by September 2022, over 90% of the population have developed immunity. HIV prevalence among adults is 19% and over 2 million people have uncontrolled viral loads (VL), posing a risk for poor COVID-19 outcomes.

- Using a national hospital surveillance system in South Africa, we aimed to investigate the trends in COVID-19 admissions and factors associated with in-hospital mortality among PWH.

METHODS

Data source and linkage:

- Time period: March 5, 2020 and May 28, 2022
- DATCOV national COVID-19 hospital surveillance system
- SARS-CoV-2 case linelist (to ascertain prior infection)
- Electronic Vaccine Data System (EVDS) (to ascertain vaccination status)

Wave periods:

- Weekly incidence was ≥30 cases/100,000 people.
- D614G 7 Jun – 22 Aug 2020, Beta 15 Nov 2020 – 6 Feb 2021, Delta 9 May – 18 Sep 2021, Omicron BA.1/BA.2 28 Nov 2021 – 5 Feb 2022, Omicron BA.4/BA.5 17 Apr – 28 May 2022

Data analysis

- Descriptive statistics for admissions and mortality trends.
- Post-imputation random effect multivariable logistic regression models compared (a) characteristics of PWH and HIV-uninfected individuals, and (b) factors associated with mortality among PWH.

ADDITIONAL KEY INFORMATION

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HIV is a risk factor for in-hospital COVID-19 mortality.
Risk further increased with advanced HIV disease (not on ART, CD4<200 cells/µl, VL≥1000 copies/ml).
Prior SARS-CoV-2 infection and COVID-19 vaccination in PWH are protective against COVID-19 mortality.

RESULTS

- PWH accounted for 8.4% (22,978/272,287) of total admissions
- 11,545 (50.2%) PWH admitted with COVID-19 had an additional comorbidity.
- Comparing PHW with HIV-uninfected: Chronic renal and cardiac disease, malignancy and current and past TB were more likely, and hypertension and diabetes were less likely in PWH. Vaccination rates were lower among PWH (4.2%) compared to HIV-uninfected (7.1%) (p<0.001).
- CFR among PWH and HIV-uninfected was 24.3% (5,584/22,978) vs 21.7% (54,110/249,309) with greater decrease in the Omicron waves among HIV-uninfected individuals than PWH (Figure).

Among PWH, along with older age, male sex and presence of a comorbidity, there was a lower odds of mortality among individuals with prior SARS-CoV-2 infection; COVID-19 vaccination; and those admitted in the Omicron BA.1 and BA.4/BA.5 waves compared to the D614G wave. PWH not on ART, with CD4<200, and VL≥1000 had higher odds of in-hospital mortality (Table).

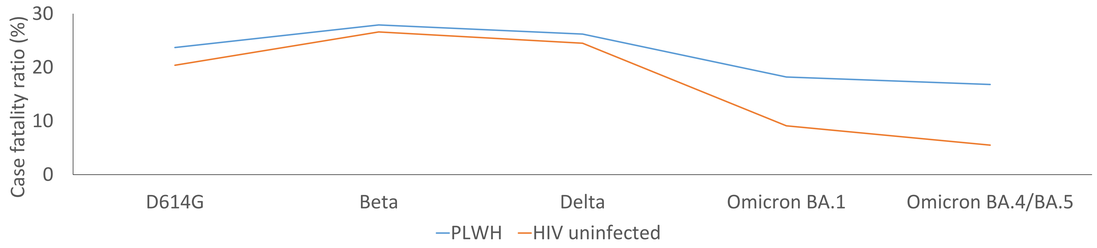

Figure: Case fatality ratio (CFR) among PWH and HIV-uninfected individuals by wave period

CONCLUSIONS

- HIV is a risk factor for COVID-19 in-hospital mortality in South Africa.
- Among PWH
  - Increased risk for mortality in individuals not on ART, CD4<200 and VL≥1000.
  - Prior immunity (SARS-CoV-2 infection or full COVID-19 vaccination) protected against mortality,
  - Risk of mortality lower in Omicron waves.
- CFR decrease in the two Omicron waves more marked among HIV-uninfected than PLWH

The study's findings are important because they emphasize the importance of HIV prevention and treatment, and increasing COVID-19 vaccination uptake among PWH, particularly PWH with advanced disease.

Table: Risk factors for mortality among PWH admitted with COVID-19

Characteristic	Case Fatality Ratio n/N (%)	aOR (95% CI)
Age group (years)		
<20	52/526 (9.9%)	Reference
20-39	1,254/8,004 (15.7%)	1.8 (1.3-2.4)
40-59	2.776/10,502 (26.4%)	3.2 (2.4-4.4)
≥60	1,363/3,190 (42.7%)	6.1 (4.5-8.3)
Sex		
Female	3,132/14,132 (22.2%)	Reference
Male	2,312/8,079 (28.6%)	1.2 (1.1-1.3)
Wave period		
D614G	1,100/4,465 (24.6%)	Reference
Beta	1,627/5,833 (27.9%)	1.0 (0.9-1.1)
Delta	1,774/6,743 (26.3%)	0.9 (0.9-1.1)
Omicron BA.1	801/4,374 (18.3%)	0.6 (0.5-0.7)
Omicron BA.4/BA.5	143/807 (17.7%)	0.6 (0.5-0.7)
Comorbidity		
No	541/3,082 (17.6%)	Reference
Yes	977/3,165 (30.9%)	1.6 (1.5-1.8)
COVID-19 vaccination		
Not vaccinated	5,173/20,869 (24.8%)	Reference
Partially vaccinated	100/379 (26.4%)	0.9 (0.7-1.2)
Fully vaccinated	169/947 (17.9%)	0.8 (0.7-0.9)
Boosted	3/27 (11.1%)	0.6 (0.2-2.2)
Prior SARS-CoV-2 infection		
No	5,376/21,608 (24.9%)	Reference
Yes	69/614 (11.2%)	0.5 (0.4-0.6)
CD4 count (cells/µL)		
≥200	1,494/7,731 (19.3%)	Reference
<200	1,530/5,225 (29.3%)	1.9 (1.7-2.1)
Viral load (copies/mL)		
<1000	1,972/8,994 (21.9%)	Reference
≥1000	665/2,788 (23.9%)	1.2 (1.0-1.3)
ART		
On ART	3,169/11,855 (26.7%)	Reference
Not on ART	353/1,253 (28.2%)	1.2 (1.0-1.4)