

# THE RISK OF SEVERE COVID-19 AND MORTALITY FROM COVID-19 IN PEOPLE LIVING WITH HIV COMPARED TO INDIVIDUALS WITHOUT HIV - A SYSTEMATIC REVIEW AND META-ANALYSIS OF 1 268 676 INDIVIDUALS

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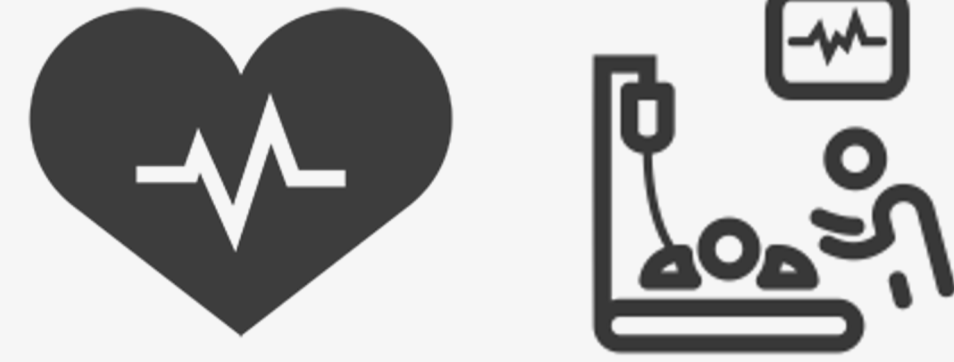
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UNDEGRADUATE STUDENTS,  
HEALTH AND BIOMEICAL SCIENCES

## INTRODUCTION

### HIV epidemic meets COVID-19 pandemic

- As of 2020 at least 38 million people were living with HIV globally, more than two-thirds of PLHIV being in Sub-Saharan Africa<sup>1</sup>.
- Since December 2020, the number of confirmed cases of COVID-19 has increased in Sub-Saharan Africa<sup>2</sup>, where health systems are ill equipped to treat surges in the need for hospitalization, mechanical ventilation and intensive care services associated with severe COVID-19.
- Identifying groups of people who are susceptible to severe COVID-19 and death from COVID-19 is a priority, as these groups may need additional protections and prioritization for vaccination against COVID-19<sup>3,4</sup>.
- There are indications that people living with HIV (PLHIV) may be one such vulnerable group due to persistent immune-suppression<sup>5</sup>.
- There is conflicting evidence about the risk of mortality and severe disease due to COVID-19 in people living with HIV (PLHIV).



## AIM

To compare mortality, hospitalization, and the need for intensive care services due to COVID-19 between PLHIV & individuals without HIV based on data from the existing literature

## MATERIALS AND METHODS

1st January 2020

A comprehensive search in PubMed, Cochrane Library, Scopus, China Academic Journals Full Text Database, the Database of Abstracts of Reviews of Effectiveness (DARE) and the medRxiv and bioRxiv databases of preprints was carried out.

20th February 2020

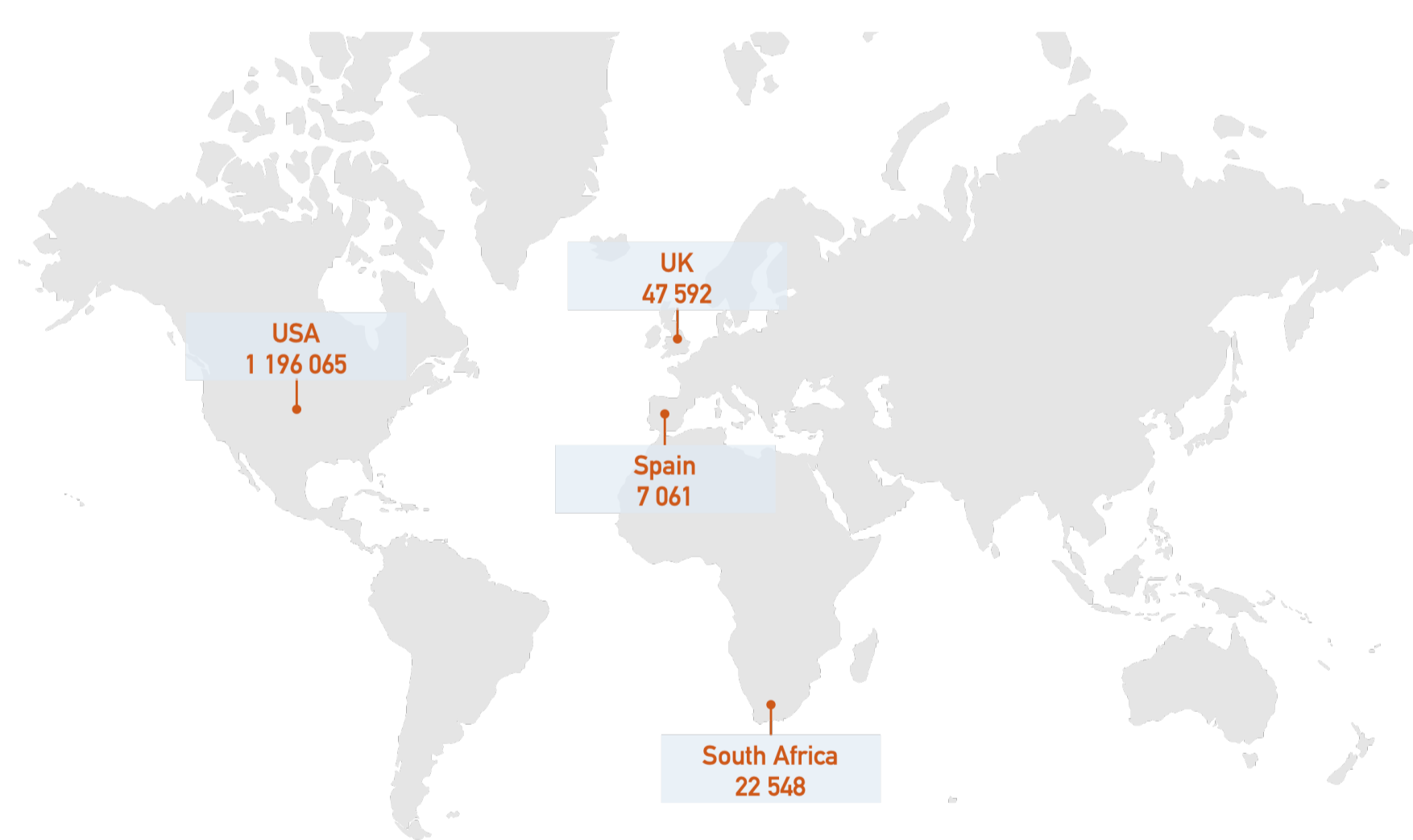
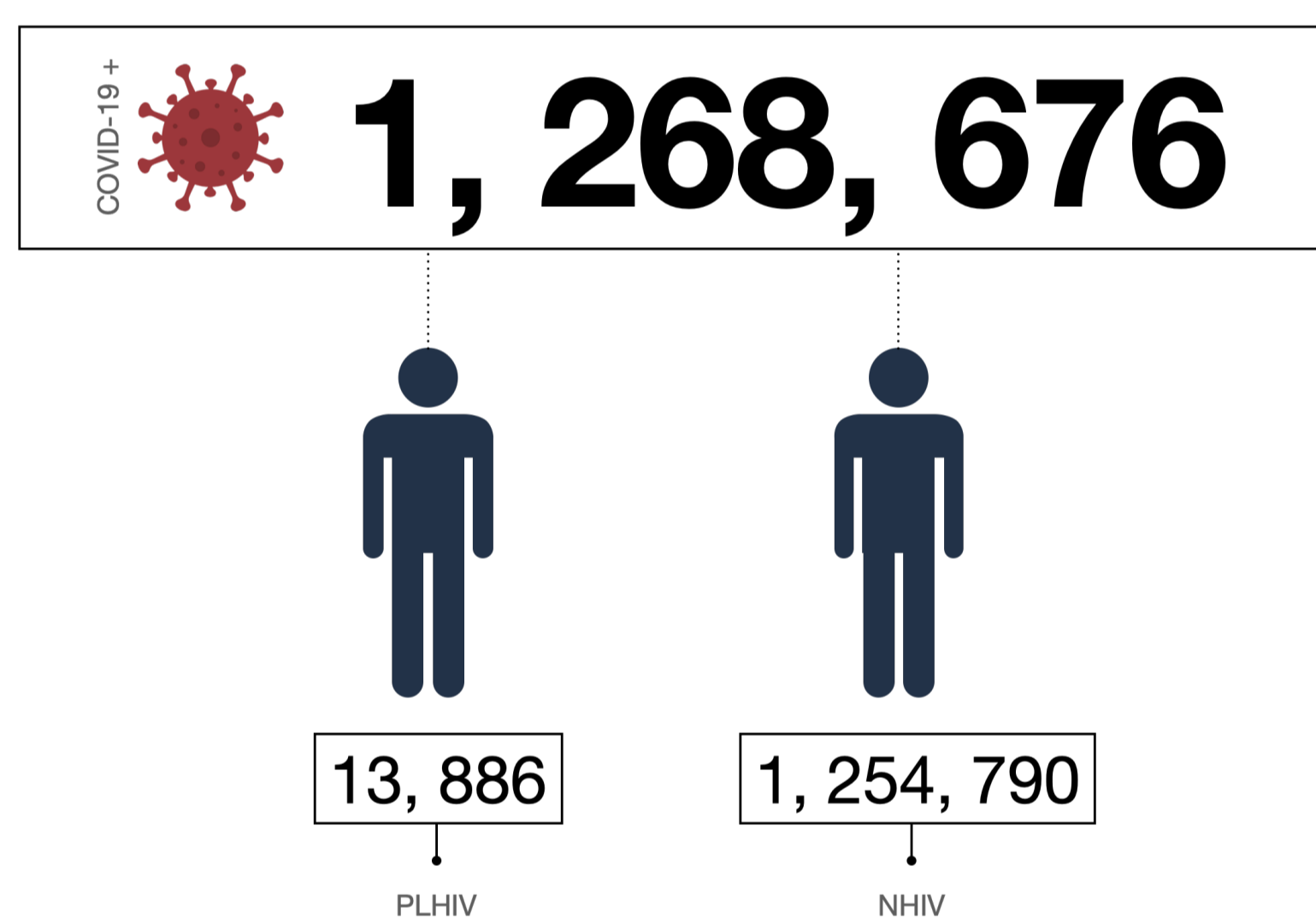
- Eligible studies were case control, cross-sectional and cohort studies where participants had confirmed COVID-19.
- From each study, data on numbers of PLHIV and individuals without HIV for each outcome were extracted.



Eligible Studies (N = 11)

Study quality was assessed using the Methodological Standard for Epidemiological Research (MASTER) scale. Data synthesis used a bias adjusted model and predefined age and geographical subgroups were analysed.

## RESULTS



### MORTALITY

In pooled analyses, there were a total of 428 deaths out of 7 836 PLHIV, compared to 33 440 deaths out of 502 778 individuals without HIV (NHIV)

- The pooled unadjusted OR for overall mortality in PLHIV, compared to individuals without HIV, was 1.3 (95%CI 0.9-2.0,  $p=0.198$ ) with high heterogeneity ( $I^2=78.6\%$ ,  $p<0.001$ )
- In people aged <60 years, the pooled odds of mortality in PLHIV were almost three-fold the odds for mortality in NHIV (OR 2.7, 95%CI 1.1-6.5,  $I^2=95.7\%$ ,  $p<0.001$ ). In people aged  $\geq 60$  years, the odds for mortality in PLHIV were similar to the odds in the overall model (OR 1.3, 95%CI 0.8 – 2.0,  $I^2=58.2\%$ ,  $p=0.092$ )

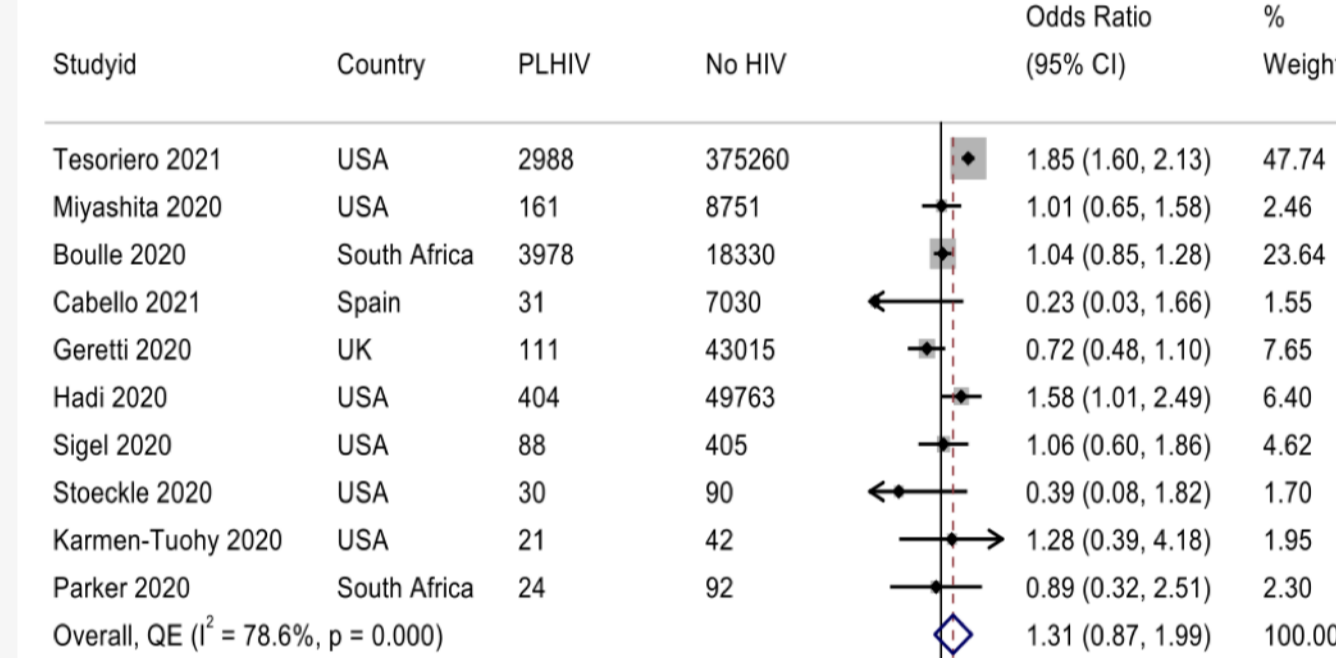


Figure 1: Odds ratios for overall mortality in PLHIV compared to NHIV. NOTE: Weights are from Der's Quality Effects model

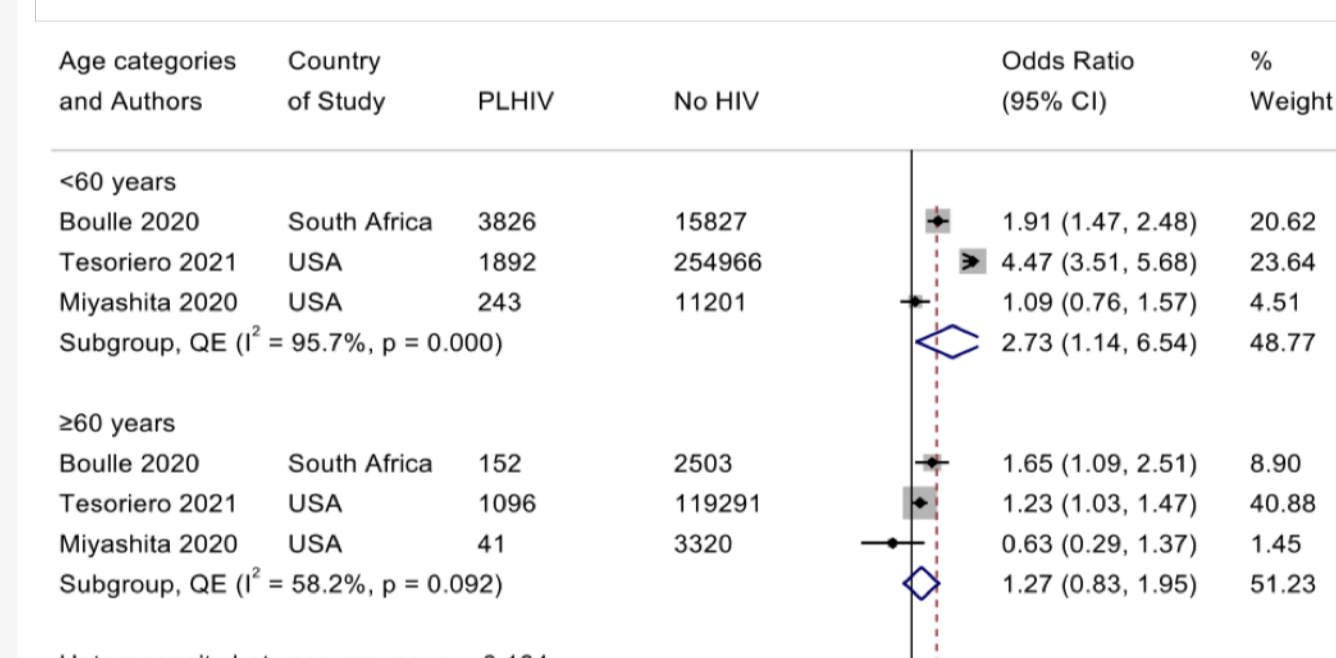


Figure 2: Odds ratios for mortality in PLHIV compared to NHIV, by age. NOTE: Weights and between-subgroup heterogeneity test are from Der's Quality Effects model

### HOSPITALIZATION

- 5 studies<sup>6-8</sup> with a total sample size of 1 215 846 of which 13 451 were PLHIV and 1 202 395 had no HIV, reported data on hospitalization due to COVID-19. In pooled analyses, a total of 3 583 individuals out of 13 451 PLHIV were hospitalized for COVID-19, compared to 233 051 individuals out of 1 202 395 NHIV.
- The pooled OR for hospitalization in PLHIV, compared to NHIV was 1.7 (95% CI 1.3-2.1,) with high heterogeneity ( $I^2=96.0\%$ ,  $p<0.001$ ).

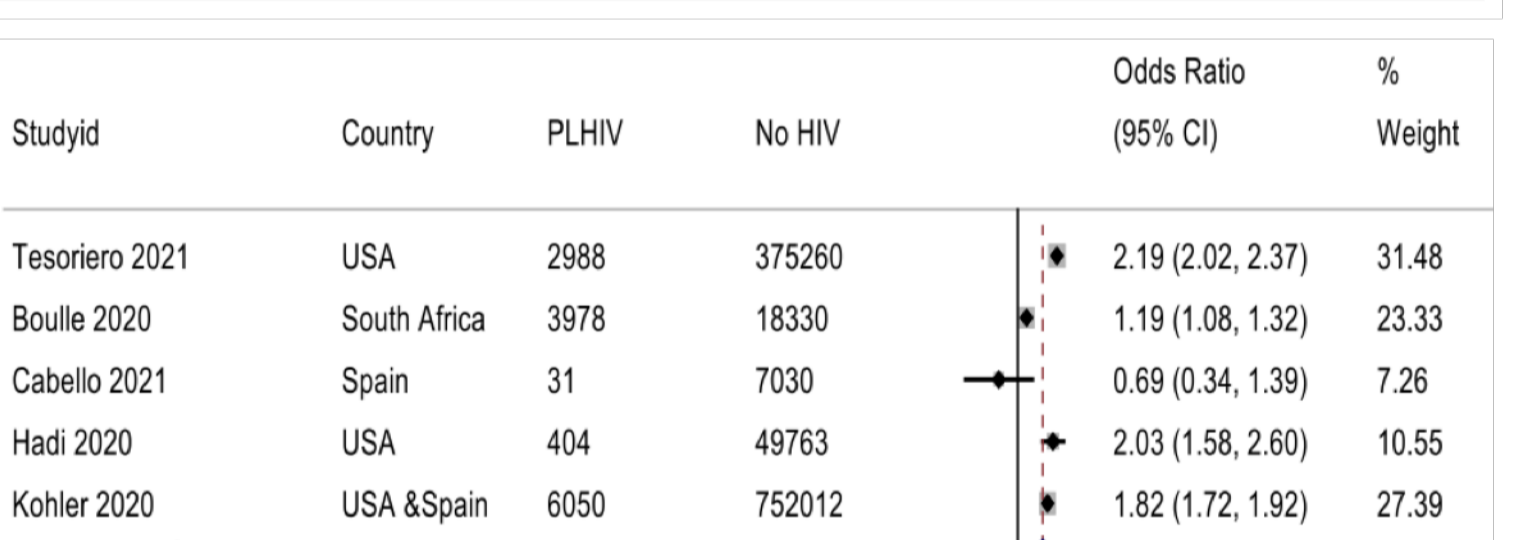


Figure 3: Odds ratios for hospitalization for COVID-19 in PLHIV compared to NHIV. NOTE: Weights are from Der's Quality Effects model

### ICU SERVICES

- 8 studies<sup>9-10</sup> with a total of 6 239 PLHIV and 693 066 NHIV, reported data comparing the need for intensive care services. In pooled analysis, 401 individuals out of 6 239 PLHIV needed intensive care services, compared to 29 006 individuals out of 693 066 NHIV.
- The pooled OR for the need of intensive care services for PLHIV, compared to NHIV, was 1.4 (95% CI 0.9-2.0) with substantial heterogeneity ( $I^2=74\%$ ,  $p<0.001$ ).

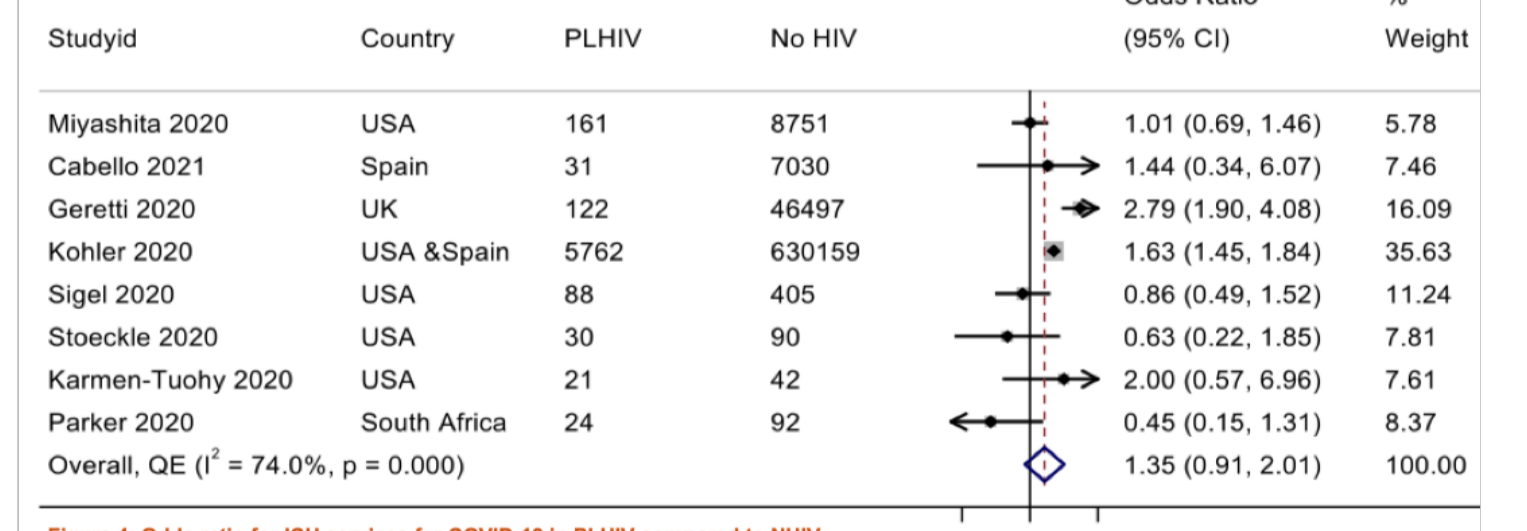


Figure 4: Odds ratios for ICU services for COVID-19 in PLHIV compared to NHIV. NOTE: Weights are from Der's Quality Effects model

## CONCLUSION

- In this meta-analysis of 11 studies with 1 268 676 individuals with confirmed COVID-19, we found a stronger difference in mortality by HIV status for those individuals below the age of 60 years, and over this age, HIV had an attenuated effect on mortality, suggesting that age-related mortality overshadows PLHIV related mortality.
- Further, PLHIV had increased odds of being hospitalized and needing intensive care services, probably related to increased COVID-19 severity in PLHIV.
- A secondary analysis of the included studies suggested no difference in the prevalence of pre-existing conditions.

## IMPLICATIONS

Our findings suggest that PLHIV are at higher risk than the general population and should be prioritized for vaccine coverage and monitoring if diagnosed with COVID-19. This is especially important for countries in Sub-Saharan Africa that have a high burden of HIV in the younger populations who are more vulnerable

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