

# Be-cause Health

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## Severity of COVID-19 pandemic in sub-Saharan Africa

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Early 2020, dramatic predictions  
for sub-Saharan Africa (sSA)



COVID-19  
in sub-  
Saharan  
Africa

Since: divergent views

“Most of sSA  
escaped the worst”

(South Africa =  
exception)

if adjusted for younger  
population,

“COVID-19 equal or  
even worse in sSA”

# (COVID) Epidemic: 3 dimensions:

**Biological  
burden**

Virus - spread – infections – disease – deaths

**Counted:**  
“confirmed cases & deaths”  
– “excess deaths”

**+ Human  
response**

Fear &  
anxiety

Coping strategies  
by individuals &  
households

Collective strategies  
by communities &  
public authorities

**+ Collateral  
burden**

Other health effects:  
other diseases – health services – mental health ...

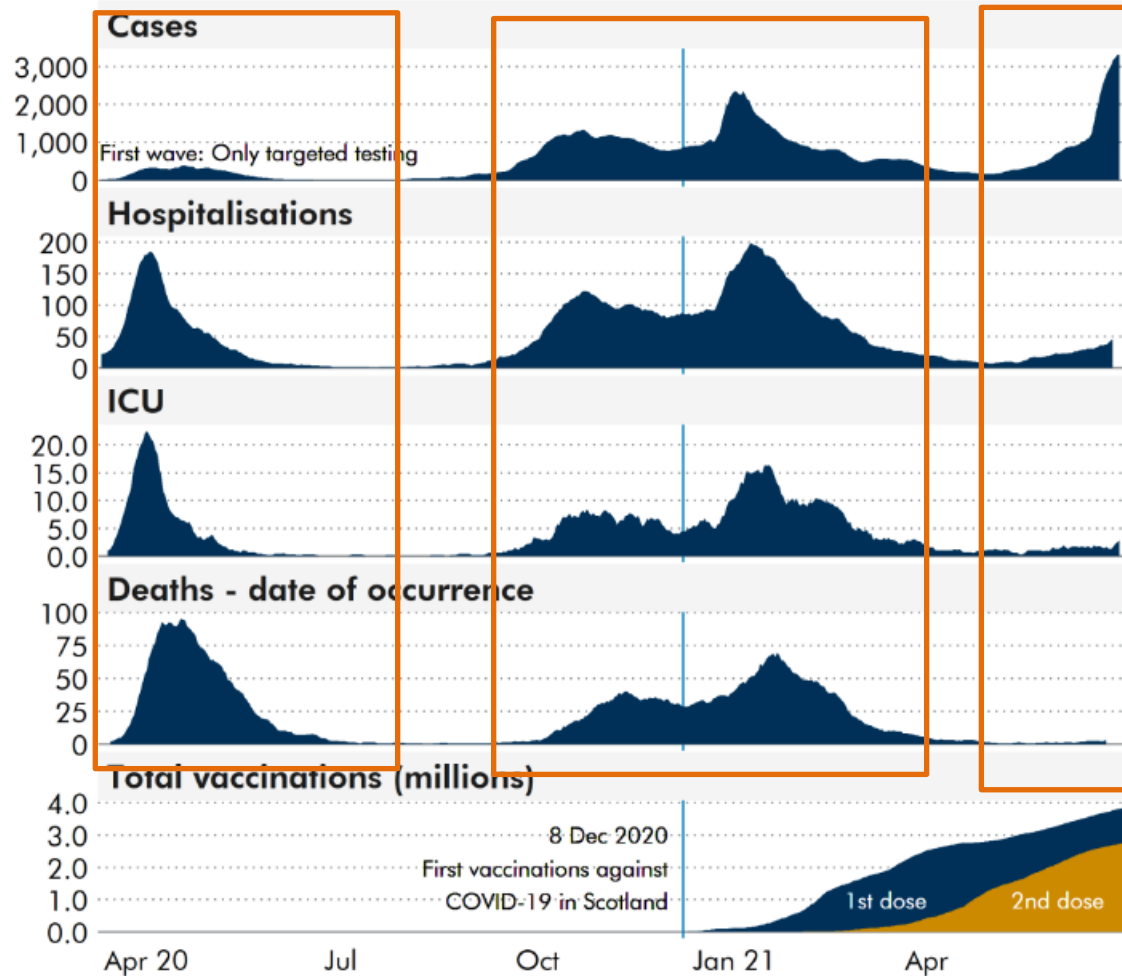
Effects on other sectors:  
Economy - Education – Religion – Culture ...

Routine  
data from  
COVID  
Response

Measure	Limitations
COVID “cases” (= positive tests)	
COVID “hospitalisations”  (COVID patients in ICU)	
COVID “deaths”	

# Trends in COVID-19 cases, hospital admissions, ICU admissions, deaths and vaccinations in Scotland since the start of the pandemic

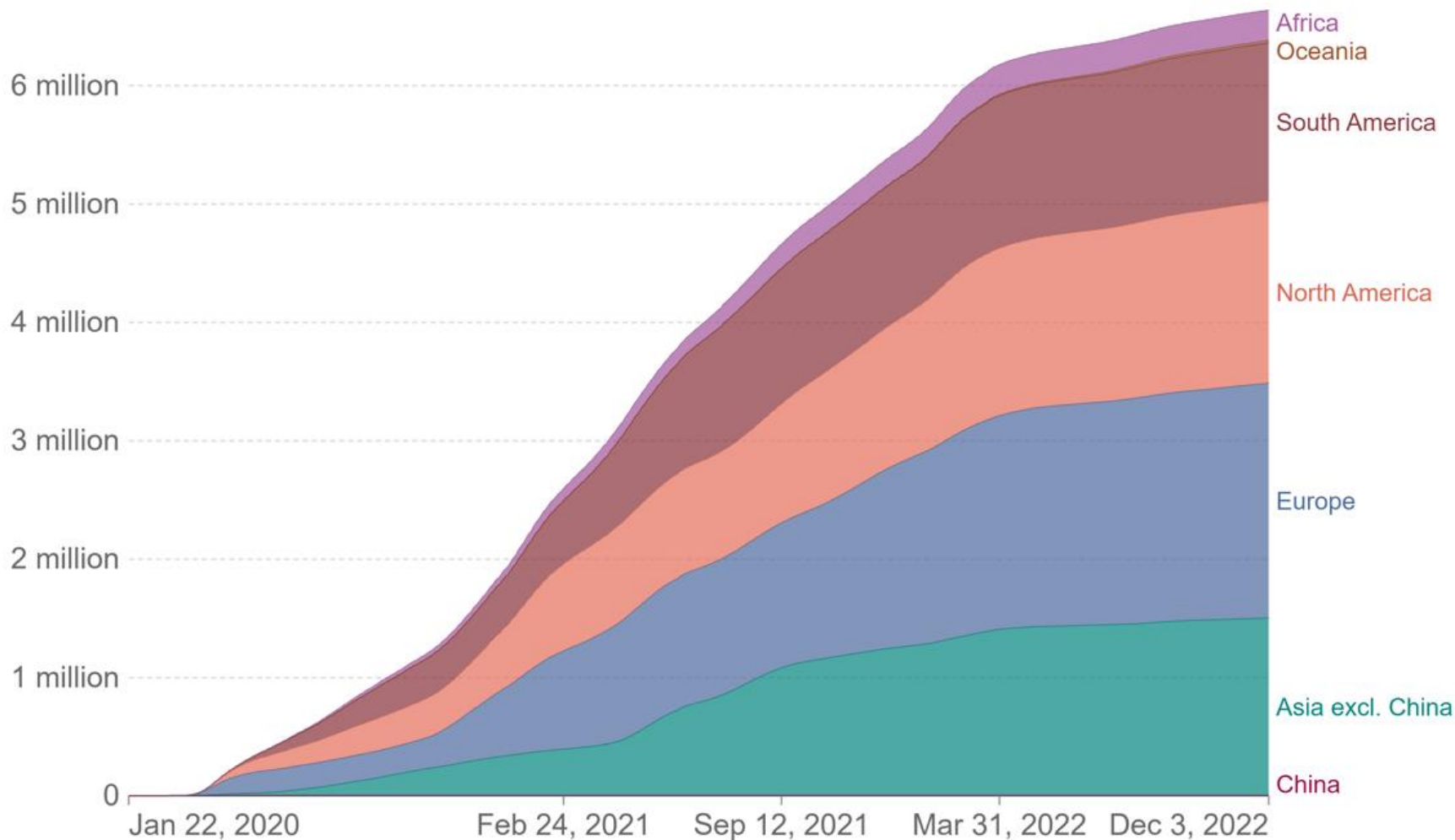
7 day averages | Data as at 7 July 2021



Source: Public Health Scotland and National Records of Scotland

# Cumulative confirmed COVID-19 deaths by world region

Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.



# But, routine data have their **limitations** ...

Measure	Limitations
COVID <b>“cases”</b> (= positive tests)	Availability of testing Hometests not reported Intensity of testing; Contact tracing and testing? ....
COVID <b>“hospitalisations”</b>  (COVID patients in ICU)	Criteria for hospitalisation Health seeking behaviour – (financial) access Hospital capacity COVID+, but hospitalised for other disease ....
COVID <b>“deaths”</b>	Definition of “death due to COVID” ...

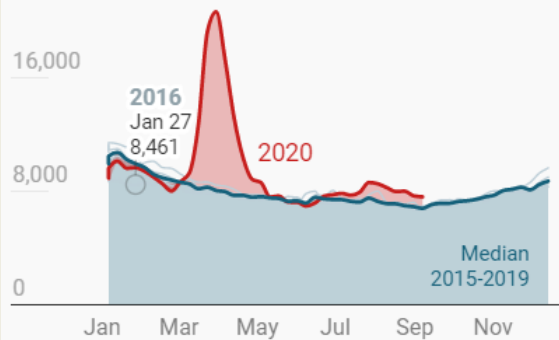
# Additional information sources

Measure	Limitations
<b>Excess mortality</b>  2020-2021-2022 compared with average of previous years	Reliability of civil registration  Deaths due to COVID, or due to other causes? Less access to “other essential services”, resulting in - delayed care; lack of access; - discontinuation routine vaccination;  Deaths “avoided” due to lockdowns (less influenza, road traffic accidents, ...)  ....
<b>Sero-surveys</b> SARS-CoV-2 Ab	Cross-reactivity Validation of various tests in diverse settings (esp. for sSA) Setting: e.g. urban vs rural Selection of participants Sero-reversions Timing of surveys (e.g. during or after waves ...)  ...



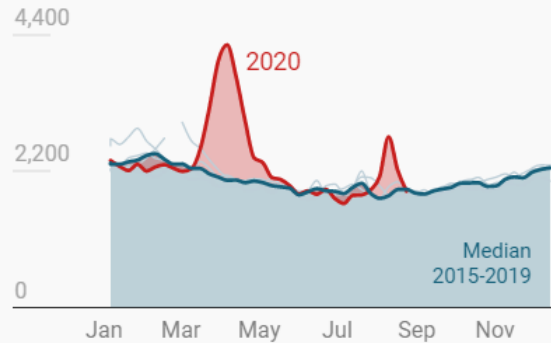
# Early 2020: dramatic epidemics; mostly in urban areas in Northern hemisphere (**excess deaths**)

Weekly mortality in ES **Spain**



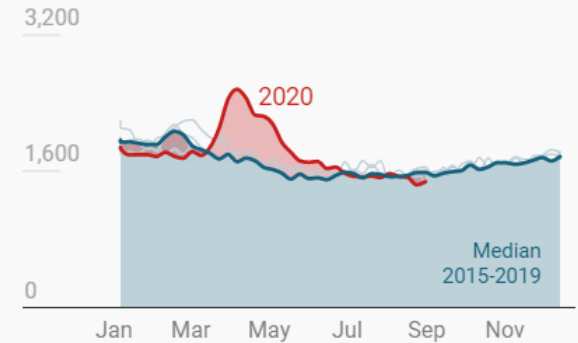
Source: [Financial Times](#) / [Institute of Health Carlos III](#)

Weekly mortality in BE **Belgium**



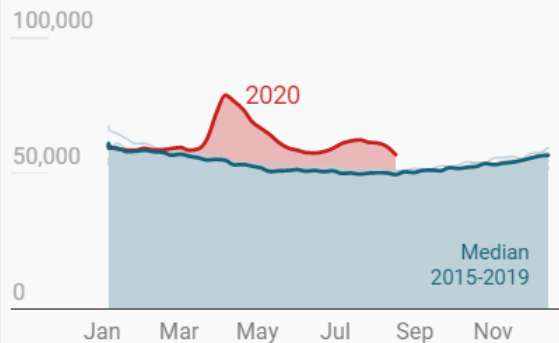
Source: [Financial Times](#) / [Sciensano](#)

Weekly mortality in SE **Sweden**

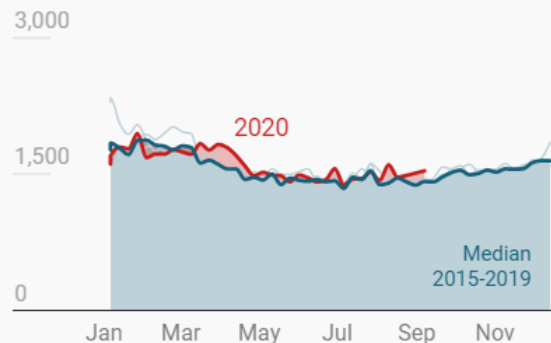


Source: [Financial Times](#) / [Statistics Sweden](#)

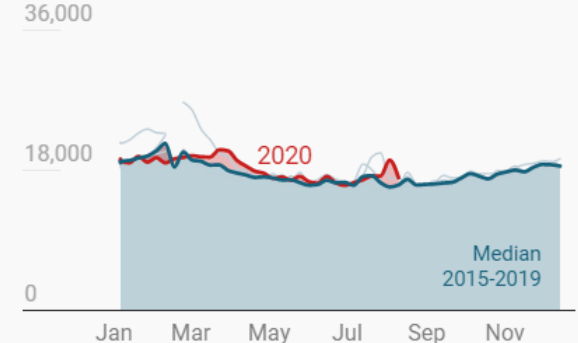
Weekly mortality in the us **United States**



Weekly mortality in AT **Austria**



Weekly mortality in DE **Germany**



But, few countries in Africa have reliable mortality data.

## **Modelling of Excess Mortality** as a substitute for reliable data

Mostly by the Economist and IHME (in Lancet) – very accessible online in “Our World in Data”.

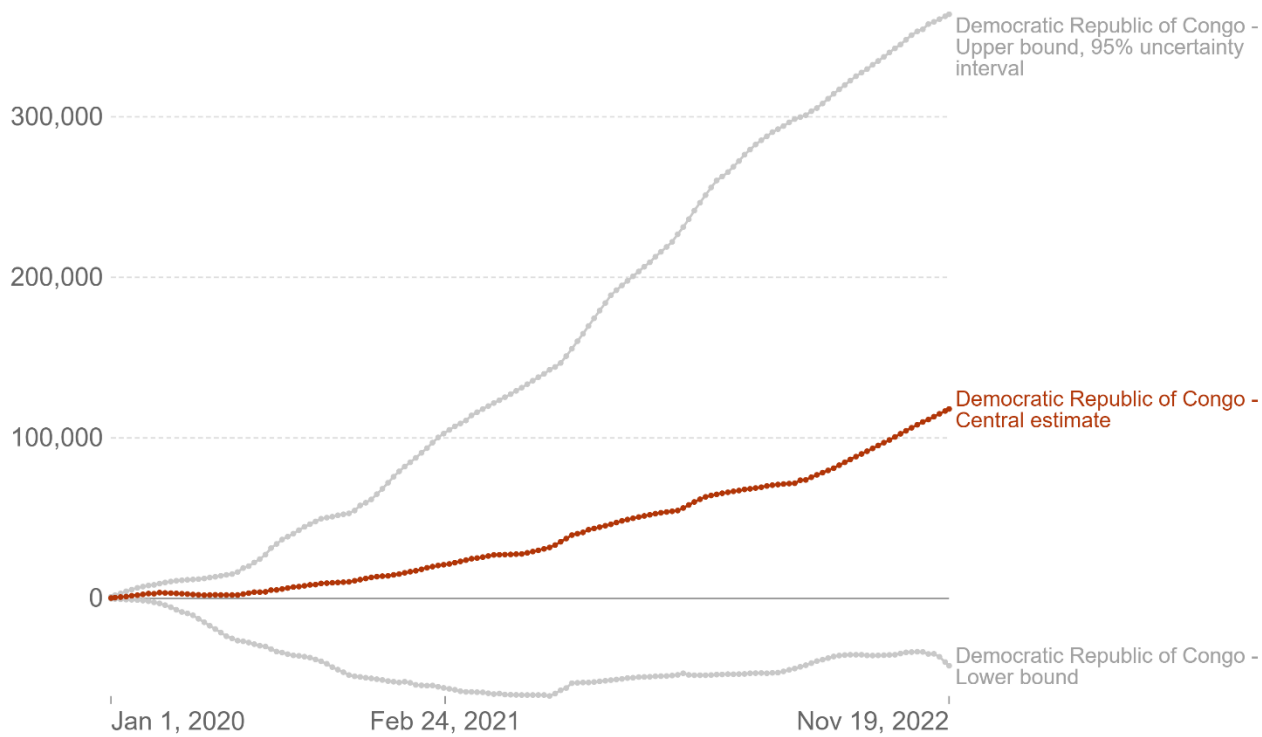
➔ For Africa: Modelling, with extrapolation from Egypt to South Africa to “any country in-between”

# Results of modelling for DRC

## Estimated cumulative excess deaths during COVID



For countries that have not reported all-cause mortality data for a given week, an estimate is shown, with uncertainty interval. If reported data is available, that value only is shown.



Source: The Economist (2022)

OurWorldInData.org/coronavirus • CC BY

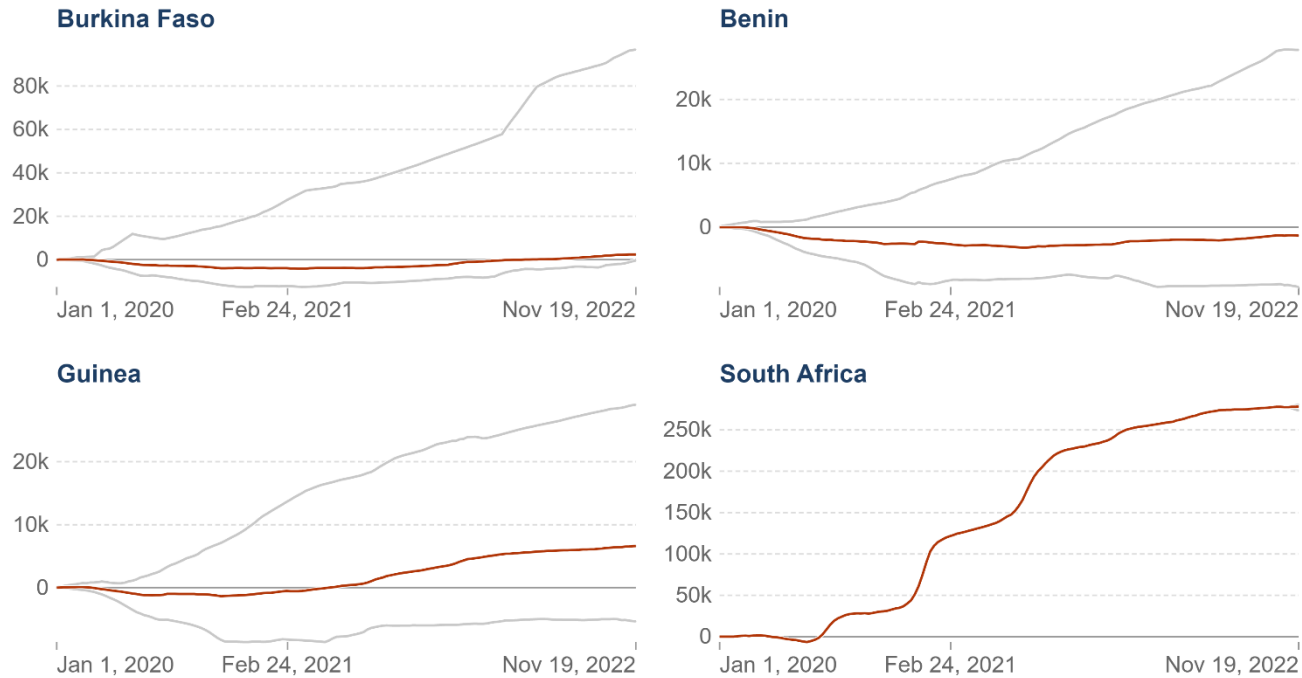
# Other countries in sSA

## Estimated cumulative excess deaths during COVID



For countries that have not reported all-cause mortality data for a given week, an estimate is shown, with uncertainty interval. If reported data is available, that value only is shown.

■ Central estimate ■ Upper bound, 95% uncertainty interval ■ Lower bound



Source: The Economist (2022)

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**Scientific rationale  
for lower COVID severity  
in sSA**

# COVID in sub-Saharan Africa

- SARS-CoV-2 virus spread widely  
(high seroprevalence)
- But: low morbidity and mortality reported
- Certainly under-reporting
  - But: few indications of large increase of severe disease (hospitalisations and deaths)
  - But: reasonable scientific plausibility

# Factors plausibly explaining lower proportion of severe COVID in sSA




Caveat: Exceptions: small urban elite; South Africa

Universally accepted	<ul style="list-style-type: none"><li>- Younger age pyramid</li><li>- Less co-morbidities (in general population)</li></ul>
Less accepted	Largely living outdoors → lower infectious inoculum when infected
Controversial	Better “trained immune system”, due to <ul style="list-style-type: none"><li>- Prior infections, esp chronic parasitic infections</li><li>- More balanced microbiome</li></ul>



*Review*

# What Could Explain the Lower COVID-19 Burden in Africa despite Considerable Circulation of the SARS-CoV-2 Virus?

Richard G. Wamai <sup>1,\*</sup> , Jason L. Hirsch <sup>1</sup> , Wim Van Damme <sup>2</sup> , David Alnwick <sup>3</sup>, Robert C. Bailey <sup>4</sup>, Stephen Hodgins <sup>5</sup>, Uzma Alam <sup>6</sup> and Mamka Anyona <sup>7</sup>





Contents lists available at [ScienceDirect](#)

## Medical Hypotheses

journal homepage: [www.elsevier.com/locate/mehy](http://www.elsevier.com/locate/mehy)

COVID-19: Does the infectious inoculum dose-response relationship contribute to understanding heterogeneity in disease severity and transmission dynamics?

Wim Van Damme<sup>a,\*</sup>, Ritwik Dahake<sup>b</sup>, Remco van de Pas<sup>a</sup>, Guido Vanham<sup>a</sup>, Yibeltal Assefa<sup>c</sup>

[www.thelancet.com](http://www.thelancet.com) Vol 400 August 6, 2022

# COVID-19 and microbiome diversity in sub-Saharan Africa

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Yibeltal Assefa, Laurens Liesenborghs,  
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## Author's reply

We thank Wim Van Damme and colleagues for their interest in our work and their Correspondence. Their comments highlight unique aspects of how the COVID-19 pandemic has unfolded in sub-Saharan Africa. These include the difficulty of estimating