Clinical Infectious Diseases

EDITORIAL COMMENTARY

Extensive Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Transmission Associated With Low Mortality in Kinshasa, Democratic Republic of the Congo: For How Long?

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(See the Major Article by Nkuba et al on pages 882–90.)

So far, sub-Saharan Africa (SSA) has experiencing less coronavirus disease 2019 (COVID-19)–related mortality compared with most other parts of the world. It has even been suggested in the social media that more people died in SSA because of lockdown measures than because of COVID-19 infection [1]. Several studies have confirmed the widespread community transmission of COVID-19 in SSA. However, until recently, the COVID-19–related mortality has remained low. This is illustrated in the study by Nkuba et al [2] published in this issue of *Clinical Infectious Diseases*.

In October 2020, after the first wave of COVID-19, Nkuba et al conducted a population-based severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) seroprevalence study in Kinshasa, in the Democratic Republic of the Congo (DRC). They randomly selected 292 households from 42 clusters from different parts of Kinshasa; 1233 individuals were retained in the analysis. The overall weighted, age-standardized SARS-CoV-2 seroprevalence was 16.6% (95% confidence interval [CI], 14.0–19.5%) if those with immunoglobulin (Ig) G (IgG) reacting to both the spike and nucleocapsid proteins were classified as positive, but the prevalence doubled when considering those reacting to either protein. This prevalence may be even higher if IgM or nucleic acid amplification tests were performed. The estimated infection-to-case ratio (292:1) was considerably lower than the 11:1 estimate in a meta-analysis of studies from around the world [3]. The findings of Nkuba et al demonstrate that the incidence of SARS-CoV-2 in the DRC is much higher than the figure derived from the number of COVID-19 cases. However, this high incidence was not associated with higher mortality rates or saturation of hospital services. Remarkably, no significant difference was found between participants who did and did not present symptoms in the past 8 months and no association was found with any clinical symptom. No risk factors for seropositivity were identified, but adherence to COVID-19–preventive measures was only assessed superficially (eg, no information concerning face-mask use and respecting physical distancing was obtained). Surprisingly, none of the households reported deaths with symptoms related to COVID-19. Key linked findings of this study are therefore that the reported numbers of COVID-19 cases in SSA countries are a serious underestimation of the total number of cases and that COVID-19–related mortality has generally been low.

The estimated SARS-CoV-2 seroprevalence for Kinshasa is very similar to that reported for the entire African region in a recent meta-analysis of seroprevalence studies (16.3%; 95% CI, 0–34%) [3]. In a representative household-based, cross-sectional serosurvey in Juba, South Sudan, the SARS-CoV-2 prevalence was estimated to be 38.3% (95% credible interval, 31.8–46.5%) [4]. As in Kinshasa, a low proportion of seropositive patients reported respiratory symptoms.

A number of explanations have been advanced to explain this low COVID-19 mortality in SSA. The younger age of its population has likely played a role [5, 6]. The high prevalence of various parasitic infections could also protect against severe COVID-19 disease. For example, it has been hypothesized that the immunological memory against *Plasmodium falciparum* merozoites primes SARS-CoV-2–infected cells for early phagocytosis and therefore may protect persons with a recent *P. falciparum* infection against severe COVID-19 disease [7].

The severe trajectory of COVID-19 in South Africa provides an important cautionary footnote. South Africa is listed 14th on the list of countries with the highest

Received 22 June 2021; editorial decision 23 June 2021; published online 28 June 2021.

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Clinical Infectious Diseases® 2022;74(5):891–2

https://doi.org/10.1093/cid/ciab593

excess mortality per capita since the start of the epidemic [8]. Seroprevalence surveys found that between 32% and 63% of the population in various provinces had been infected prior to the third wave [9]. This more severe epidemic in South Africa may be explained by a lower prevalence of parasitic infections or a higher percentage of older individuals and a high prevalence of persons with comorbidities, such as obesity, diabetes [10], hypertension, human immunodeficiency virus (HIV), and tuberculosis, which have been reported as risk factors for severe COVID-19–related disease [11].

We cannot assume that whatever provided some protection to much of SSA during the previous COVID-19 waves will continue to provide protection. Countries such as India, Uruguay, and Czechia, which were relatively spared from the first COVID-19 wave, have recently experienced devastating epidemics [12]. In part, this is related to the emergence of novel SARS-CoV-2 variants. The relaxing of control measures, however, also played a role [12].

The dramatic increase in COVID-19 infections in a number of African countries is of huge concern in this regard. Reported weekly cases increased recently in Zambia with 125% and in Uganda with 48% [13]. A number of hospitals in Johannesburg, South Africa, are overflowing with COVID-19 admissions [14]. Uganda is running out of oxygen in some of its hospitals [15]. Preliminary data suggest that the Beta, Alpha but increasingly the Delta variants are responsible for most infections in South Africa [16]. At the same time, vaccination coverage remains very low in most of SSA, primarily because of insufficient access to vaccines. Limited distribution capacity and a high degree of vaccine hesitancy have also played a role [17]. Vaccine hesitancy may be related to the perception that COVID-19 provides a low risk, the reports of severe blood coagulation problems following administration of the AstraZeneca and the Johnson & Johnson vaccine, and anti-vaccination messages circulating in the social and traditional media [17]. In a recent survey in the DRC, the COVID-19 vaccine acceptance rate was only 55.9% and being a healthcare worker was even associated with a decreased willingness to be vaccinated [18].

These findings suggest that there is no room for complacency in SSA. Ongoing surveillance including monitoring the types of circulating SARS-CoV-2 variants and COVID-19 mortality is vital. Expanding vaccine access will be crucial to attaining herd immunity and thereby curtailing the COVD-19 pandemic in SSA. By April 2021, only 0.2% of the 700 million COVID-19 vaccine doses have been distributed in low-income countries, while more than 87% of global vaccine stocks have gone to high-income countries [19]. Recently, world leaders at the G7 summit promised to donate 1 billion COVID-19 doses to low-income countries [20]. However, at the moment, much of SSA is not well prepared for organizing large-scale COVID-19 vaccination campaigns and it is also unclear when these vaccines will arrive. Let's hope it will not be too late.

Note

Potential conflicts of interest. R. L. C. reports funding from VLIRUOS (Flemish Interuniversity Council for University Development Cooperation) to work on the impact of COVID-19 on low-income countries, but not specifically for writing this paper, during the conduct of the study. C. K. reports no potential conflicts. Both authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

References

1. Kassa MD, Grace JM. Race against death or starvation? COVID-19 and its impact on African populations. Public Health Rev **2020**; 41:30.
2. Nkuba AN, Makiala SM, Guichet E, et al. High prevalence of anti-SARS-CoV-2 antibodies after the first wave of COVID-19 in Kinshasa, Democratic Republic of the Congo: results of a cross-sectional household-based survey. Clin Infect Dis **2021**.
3. Chen X, Chen Z, Azman AS, et al. Serological evidence of human infection with SARS-CoV-2: a systematic review and meta-analysis. Lancet Glob Health **2021**; 9:e598–609.
4. Wiens KE, Mawien PN, Rumunu J, et al. Seroprevalence of anti-SARS-CoV-2 IgG antibodies in Juba, South Sudan: a population-based study. Emerg Infect Dis **2021**; 27:1598–606.
5. Maeda JM, Nkengasong JN. The puzzle of the COVID-19 pandemic in Africa. Science **2021**; 371:27–8.
6. Musa HH, Musa TH, Musa IH, Musa IH, Ranciaro A, Campbell MC. Addressing Africa's pandemic puzzle: perspectives on COVID-19 transmission and mortality in sub-Saharan Africa. Int J Infect Dis **2021**; 102:483–8.
7. Kalungi A, Kinyanda E, Akena DH, Kaleebu P, Bisangwa IM. Less severe cases of COVID-19 in Sub-Saharan Africa: could co-infection or a recent history of plasmodium falciparum infection be protective? Front Immunol **2021**; 12:565625.
8. Anonymous. Tracking Covid-19 excess deaths across countries. The Economist May 11, **2021**. Available at: https://www.economist.com/graphic-detail/coronavirus-excess-deaths-tracker. Accessed 20 June 2021.
9. Sykes W, Mhlanga L, Swanevelder R, et al. Prevalence of anti-SARS-CoV-2 antibodies among blood donors in Northern Cape, KwaZulu-Natal, Eastern Cape, and Free State provinces of South Africa in January 2021. Res Square **2021**.
10. Rastad H, Ejtahed HS, Shafiee G, et al. The risk factors associated with COVID-19-related death among patients with end-stage renal disease. BMC Nephrol **2021**; 22:33.
11. Boulle A, Davies MA, Hussey H, et al. Risk factors for COVID-19 death in a population cohort study from the Western Cape Province, South Africa. Clin Infect Dis **2020**.
12. Vaidyanathan G. Coronavirus variants are spreading in India—what scientists know so far. Nature **2021**; 593:321–2.
13. World Health Organization. Weekly epidemiological update on COVID-19 - 15 June 2021. Available at: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---15-june-2021. Accessed 20 June 2021.
14. Heywood M. Gauteng's third wave health emergency: desperate doctors appeal for more support. 18 June **2021**. Available at: https://subscriptions.touchbasepro.com/t/d-l-qhdddkd-wyddjkdm-k/. Accessed 6 July 2021.
15. Athumani H. COVID-19 pandemic. Uganda imposes 42-day COVID-19 lockdown. Available at: https://wwwvoanewscom/covid-19-pandemic/uganda-imposes-42-day-covid-19-lockdown. Accessed 19 June 2021.
16. Abdool Karim A. Three for three: understanding the 3 COVID variants circulating during SA's third wave. Bhekisa; **2021**. Available at: https://bhekisisa.org/article/2021-06-11-three-for-three-understanding-the-3-covid-variants-circulating-during-sas-third-wave/. Accessed 21 June 2021.
17. Bono SA, Faria de Moura Villela E, Siau CS, et al. Factors affecting COVID-19 vaccine acceptance: an international survey among low- and middle-income countries. Vaccines (Basel) **2021**; 9:515.
18. Ditekemena JD, Nkamba DM, Mutwadi A, et al. COVID-19 vaccine acceptance in the Democratic Republic of Congo: a cross-sectional survey. Vaccines (Basel) **2021**; 18:2525.
19. Miao H. WHO says more than 87% of the world's Covid vaccine supply has gone to higher-income countries. 9 May **2021**. Available at: https://wwwcnbccom/2021/04/09/who-says-poor-countries-have-received-just-0point2percent-of-worlds-vaccine-supplyhtml. Accessed 9 May 2021.
20. Anonymous. Leaders-of-the-g7-nations-will-offer-plans-to-bring-the-pandemic-to-an-end. *New York Times*. 6 June **2021**. Available at: https://www.nytimes.com/live/2021/06/11/world/g7-summit#leaders-of-the-g7-nations-will-offer-plans-to-bring-the-pandemic-to-an-end. Accessed 21 June 2021.