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Excess COVID-19 mortality among critically ill patients in Africa

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As of March 25, 2021, a global total of 124 215 843 cases of COVID-19, including 2 734 374 deaths, had been reported to WHO.¹ COVID-19 is now the 12th leading cause of death worldwide, the sixth leading cause of death in high-income countries, and the 41st leading cause of death in sub-Saharan Africa.² However, the reasons why there are lower numbers of cases and deaths reported in sub-Saharan Africa are unclear. One possibility is that there are inadequate levels of testing, which could translate to unreported COVID-19 deaths (both in hospital and those that occur outside of hospital).³

A study³ in Zambia detected COVID-19 in 70 (19.2%) of 364 deceased individuals, most of these occurring outside of hospital. In their multicentre, prospective, observational cohort study of 3140 critically ill patients (60.6% male, mean age 55.6 years [SD 16.1]) enrolled from 64 hospitals in ten African countries reported in *The Lancet*, the African COVID-19 Critical Care Outcomes Study (ACCCOS) Investigators⁴ show that, despite having low COVID-19 mortality rates, Africa has the highest global mortality rate in patients with COVID-19 who are critically ill: 48.2% (95% CI 46.4–50.0; 1483 of 3077 patients) against a global average of 31.5% (27.5–35.5). In addition to the previously reported drivers of mortality (eg, the patient's disease severity at presentation and having comorbidities such as HIV/AIDS, diabetes, and chronic liver disease), the ACCCOS Investigators found that having HIV/AIDS (odds ratio 1.91) and delayed access to high-care units and intensive care units (2.14) were drivers of mortality.

Their study is, to the best of our knowledge, the first multicountry report of outcomes of critically ill patients with COVID-19 in Africa. The question is which factors drive this high mortality in a continent with lower cases of COVID-19 and overall lower mortality rates? The authors provide some insights into possible causes, such as a shortage of critical care resources and underuse of those that are available. The underuse of resources is an intriguing finding and contrary to popular belief that resources are scarce. It is shocking to see that 68% of hospitals had access to dialysis but only 10% of the patients received it, as well as to see that proning was not optimised. It is important to think beyond the availability of resources and to also consider issues of functionality. It is common in low-income countries to have expensive equipment that is non-functional due to poor maintenance or lack of skilled human resources. It has been estimated that 40% of the medical equipment in many low-income countries is out of service.⁵

The ACCCOS Investigators also report high rates of 24 h physician coverage and a nurse-to-patient ratio of 1:2. Despite this fairly good physician and nurse coverage, mortality was high, possibly because of inadequate skill sets. There are only a small number of pulmonary and critical care training programmes in Africa. Only recently has critical care been added to the anaesthesia curricula in a few African countries. With the exception of Ethiopia, most pulmonary and critical care programmes are in South Africa.⁶ In Tanzania, a survey found that there were 0.04 anaesthetists per 100 000 population and 0.15 anaesthetists of any type per 100 000 population.⁷

The high COVID-19-related mortality in Africa could also be a reflection of the virulence of SARS-CoV-2 as a pathogen. Never before has the world seen a disease that causes the severity of respiratory failure like that caused by SARS-CoV-2. Viruses constantly mutate, leading to variants. Variants of SARS-CoV-2 have recently emerged, including B.1.1.7, a highly transmissible variant that was initially identified in the south of England in September, 2020; P.1, circulating in Brazil since the middle of 2020; and B.1.351, which was first detected in South Africa in late 2020.⁸ The capacity



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to detect variants in Africa is limited because of inadequate skill and infrastructure for genomic sequencing. The variants have been associated with increased transmissibility and could affect the effectiveness of COVID-19 vaccines. The role of SARS-CoV-2 variants in disease severity is unclear, with only a few reports of increased severity.⁹ Could variants be responsible for the severity seen in this study? This is a question which, in a continent with severe shortage of sequencing, could take a long time to answer.

This study has several strengths, including a large sample size, robust analyses, as well as having a multisite and prospective design. However, the authors also recognise some limitations, including that the study was done in tertiary hospitals. Moreover, 23 (36%) of 64 hospitals were in South Africa and Egypt, which are better resourced countries compared with some other African countries; mortality is probably higher in lower-income African countries. Missing data were overcome by imputation. The authors, however, do not report reasons why one in two patients died without receiving oxygen. Overall, this is a well done study and the team must be congratulated.

We declare no competing interests.

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Patient safety: the value of the nurse

The nursing profession has never been more visible, thrust into the spotlight of the COVID-19 pandemic. This focus has not only brought gratitude and fleeting displays of public support for so-called health-care heroes, but also vulnerability for patients and nurses alike.¹ The importance of a competent, confident, and credentialed nurse has never been more crucial, yet in many settings, a robust nursing workforce and a safe health system are elusive.

Nurses comprise more than half the skilled health-care workforce worldwide and have an essential role in patient outcomes, yet their contribution is not always valued or acknowledged.^{2,3} In the past 150 years, there has been a rapid change from apprenticeship and traineeship to the current, predominantly university-educated nursing workforce. This professional transition has been neither smooth nor globally equitable. Across the world, there is heterogeneity in the education and preparation of nurses, and their roles and competencies are highly variable. WHO's *State of the World's Nursing*

Report 2020 underscored the challenges in the nomenclature surrounding the professional title of nursing and the heterogeneity of educational pathways, as well as the importance of nurses in achieving the Sustainable Development Goals and universal health coverage.³

Patients enter health-care settings with an expectation of safety. In *The Lancet*, Matthew McHugh and colleagues⁴ show again that nurses are a key resource to achieve this safety. In Queensland, Australia, minimum nurse-to-patient ratios were implemented in selected hospitals in 2016. McHugh and colleagues obtained data on patient characteristics and outcomes for more than 400 000 medical-surgical patients and survey data from 17 010 nurses in a panel of 27 intervention and 28 comparison hospitals before and after policy implementation. 231 902 patients (142 986 in intervention hospitals and 88 916 in comparison hospitals) were assessed at baseline (2016) and 257 253 patients (160 167 in intervention hospitals and 97 086 in comparison hospitals) were assessed in



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