



The intensive care capacity for severe forms of COVID-19 in Africa: why is Africa not making progress faced with this pandemic?

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Introduction

In December 2019, a viral pathogen called “severe acute respiratory syndrome-coronavirus 2” (SARS-CoV-2) emerged in Wuhan, China (1). This virus causes a very contagious and potentially life-threatening respiratory infection called coronavirus 19 disease (COVID-19) (1). The spread of COVID-19 marked the world’s history forever; within three months of its outbreak, this infectious disease transcended the Chinese boundaries to more than 50 countries worldwide infecting more than three million persons and claiming 274,985 casualties globally (2). The unprecedented rapid worldwide spread and case fatalities of the disease made WHO to declare COVID-19 a pandemic by March 3, 2020 and put all international (WHO, CDC, UN, UNICEF, UNFPA, UNAIDS, etc.) and national (Ministries of Health) health institutions on the alert (2). Death due to COVID-19 is largely fuelled by its severe forms which are life-threatening (3). The severe forms of COVID-19 warrants critical care management whose capacity is quite limited in Africa mainly as a result of the low intensive care unit (ICU) resources to resuscitate critically ill COVID-19 patients (4). Africa is known as one of the main poverty-stricken regions on earth, with a constant double public health threat from infectious diseases and non-communicable diseases (1). To the exhaustive

agenda pre-existing communicable diseases like malaria, HIV/AIDS and viral hepatitis in Africa, COVID-19 suddenly stormed the top of this list (2). COVID-19 can present either as a mild and severe/critical disease. Mild COVID-19 includes benign systemic symptoms such as fever, fatigue, rhinorrhea, diarrhea, anosmia, joint pains, and headaches which can be managed at home or may require a short hospital stay, often not in an ICU. On the other hand, severe COVID-19 manifests with potentially lethal complications like massive pulmonary embolism, severe cardiac arrhythmias, acute coronary syndrome, heart failure, cardiogenic shock, acute kidney injury, septic shock and acute respiratory distress syndrome (ARDS) necessitating urgent compulsory critical care management. Worldwide, the prevalence of severe forms of COVID-19 is estimated between patients in 15% to 20% (3,4). By virtue of the unprecedented emergence of COVID-19, the pandemic struck all ICUs worldwide like a tsunami. All over the world, ICUs and Intensivists were ill-prepared to manage a disease they had never been confronted with before. In Africa, the outbreak of severe COVID-19 was more catastrophic due to a prevailing chronic poverty, limited ICUs, resuscitation equipment and understaffed and lack of health insurance policies (3,4) which further strained the fragile healthcare systems (5). By March 20, 2020, there were 769 confirmed

cases of COVID-19 in 37 African countries, with a total of 15 COVID-19-related deaths compared with 770,956 confirmed cases in 46 African countries with 17,965 deaths by July 27, 2020 (2). This demonstrates the worrisome time trends of the pandemic in Africa. It is extrapolated that more than half of the world's population will contract COVID-19 over the next two years and Africa will bear the largest burden due to its limited workforce, and ICUs to provide proper care.

The intensive care capacity for severe forms of COVID-19 in Africa : a constant challenge for African ICUs

Several African countries have less than 24 ICU beds for their entire national inhabitants (2,6-9). WHO report the availability of fewer than 5,000 ICU beds for 43 African countries since the start of outbreak of COVID-19 in Africa. The same WHO estimates reported about five ICU beds per one million Africans compared with 4,000 beds per one million Europeans (4). The ICU bed capacity ranges from zero to 10.6 beds per 100,000 Egyptians, 6.3 beds per 100,000 inhabitants of Seychelles and 8.9 beds per 100,000 South African (10). More representative absolute figures from some African countries have showed case Kenya to have a total of 400 ICU beds, Nigeria 120 and Cameroon 601 ICU beds (1). As the pandemic progresses, although its pathophysiology, diagnosis, and provisionally treatment (in the absence of a definite curative treatment and vaccine) are been understood by intensivists, patients who become critically ill of COVID-19 still require weeks of management in African ICUs as a result of respiratory support via mechanical ventilation (7). In the same vein, Africa faces a considerable financial constraint to set up ICUs for the provision of intensive care to critically ill COVID-19 patients (1). Indeed, the burden of critical illness in most African countries is overwhelming and there is an unmatched number of ICU beds, mechanical ventilators, electrocardiograms, ultrasound machines, and defibrillators estimated at one per a million critically ill COVID-19 patients. Furthermore, the international market is overwhelmed with the high demands of ICU equipment from high-income countries and international transportations of these ICU equipment also poses a problem because of the reduced cargo space recently implemented by airlines declining their transport services to Africa (1). Apart from the shortage of ICU beds in Africa, the burden of severe COVID-19 patients is further compounded by a drastic paucity of workforce from African

Intensivists, ICU nurses, respiratory physiotherapists for the optimal management of severe forms of COVID-19. Critical care medicine is unique, challenging, dynamic and requires skilled personnel to adequately manage patients in the ICU. Unfortunately, these skilled labour remains a rare invaluable asset in Africa (3). Another barrier to the optimal care of severe COVID-19 cases in Africa is the shortage of personal protective equipment (PPE) and ventilators to provide respiratory support to patients with ARDS (9). Several COVID-19 patients with ARDS in Africa have died due to lack or insufficient ventilators. According to WHO, less than 2,000 ventilators are available in 41 African countries. For instance, in Mali, there are only 56 ventilators for 19 million inhabitants (7). A similar trend was observed in Cameroon on March 29, 2020; a total of 73 mechanical ventilators for 23 millions inhabitants and a case fatality rate of 60% among severe COVID-19 patients (8). Unfortunately, severe cases of COVID-19 in Africa continue to increase daily and it is becoming a persistent healthcare concern (2).

Future perspective in the management of severe forms of COVID-19 in Africa

The above synthesis elucidates the dramatic shortage of the intensive care capacity of Africa. The aforementioned problems can be resolved if the following recommendations are put in place. Firstly, there is a need to adequately train African Intensivists in case management of severe COVID-19. The organization of regular refresher courses in the same line is vital. Secondly, international (WHO, CDC, UN, UNICEF, UNAIDS, UNFPA, etc.) and local or national health institutions need to donate more PPE (face mask, sterile gowns, face shields), mechanical ventilators, emergency drugs, and other resuscitating equipment to African ICUs such as to enable Intensivist in this resource-constraint region to provide health care to the critically ill COVID-19 patients entrusted in their care optimally without contracting the infection themselves. If this is not done, the already low African ICU workforce may further decrease to the detriment of severe COVID-19 patients. Thirdly, to reduce the number of new infected severe cases and deaths due to of COVID-19 in Africa, the following measures need to be strictly respected; a reinforcement of Africans adherence to WHO's guidelines on COVID-19 preventive measures like regular handwashing, wearing of a face masks and physical distancing; Africans should avoid unnecessary travelling, avoid unnecessary moving

out of their homes and stay away from overcrowded areas especially if they have COVID-19 risk factors for contracting such as being aged over 60 years, having comorbidities such as obesity, cardiovascular diseases, diabetes, chronic respiratory disease or malignancies.

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