



**Clinical characterization and management of Covid-19
in Africa: a rapid scoping review**

Policy Brief

Key messages

- Coronavirus disease 2019 (Covid-19) is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and has been in human circulation since at least November 2019;
- The slow rollout of vaccines in Africa is likely to disproportionately shift the burden of disease to the continent. The situation is exacerbated by the relatively poor healthcare infrastructure across Africa and by the emergence of SARS-CoV-2 variants of concern (VOC);
- Understanding the manifestations of SARS-CoV-2 infection and Covid-19 disease is essential for clinical management and control of disease spread.
- Demographic characteristics such as age and gender are strongly associated with disease severity.
- Common comorbidities associated with disease severity are hypertension, diabetes, obesity and cardiovascular disease. There is a paucity of evidence on the impact of malaria, HIV, TB and other infectious conditions as comorbidities associated with severe Covid-19 disease in Africa.
- The most common clinical symptoms are cough, fever, fatigue and headache.
- There are various therapeutic interventions such as corticosteroids, oxygen supplementation, anticoagulants, azithromycin and hydroxychloroquine, although some of these have not yet been proven effective through clinical trials. Clinical trials to validate clinical intervention strategies are lacking, and
- There are no studies that have investigated technological platforms that can be applied in resource-limited settings as tools for systematic, easy case data collection, clinical characterisation, triage and management of Covid-19 in the African context.

Background

The novel acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has resulted in an unprecedented global pandemic with widespread health and socioeconomic losses [1]. Since the start of Covid-19 in November 2019, Africa has been spared the brunt of it, with fewer reported cases and evidently lower mortality than other regions of the world [2]. However, with slow vaccine rollout, relatively poor healthcare infrastructure and the emergence of SARS-CoV-2 variants of concern (VOC), the burden of disease is likely to shift disproportionately towards Africa [3].

The clinical presentation of SARS-CoV-2 infection and the transmission of the virus are complex processes that may depend on demographic factors, host and viral genetic factors, associated comorbidities and environmental factors, all of which may influence clinical presentation and epidemiological spread. Consequently, these factors may be important considerations in disease clinical management. Therefore, it is essential to carefully characterise patients with Covid-19 for a clear understanding of disease pathogenesis and the development of rational clinical management practices.

Clinical characterisation and management can be facilitated and enhanced by technological innovations such as digital data management systems or platforms. To-date, a number of institutions have invented digital platforms/systems to facilitate quick and precise clinical characterisation of cases. The WHO Global Clinical Platform for Covid-19 is an example of a digital platform introduced for clinical characterisation and management of hospitalised patients with suspected or confirmed Covid-19 [4]. The development of decision support tools for real-time clinical management of Covid-19 is of prime importance to assist in the triage of patients and the allocation of resources for patients at risk. This systematic scope review summarises the clinical characteristics of Covid-19 infection in African countries to assess and provide evidence for better clinical management and control of disease spread.

Objectives

1. To scope and summarise existing literature describing clinical characteristics and management of Covid-19 patients in Africa;
2. To understand the emerging/existing digital tools/platforms used for systematic clinical characterisation, triage and management of Covid-19 and their optimisation and adaptation in Africa, and
3. To identify the gaps in understanding barriers to rapid and accurate characterisation and triage for management and control of the spread of the disease.

Methodology

We conducted a rapid scoping review of the peer reviewed literature and grey literature using a methodological framework consistent with PRISMA ScR guidelines for scoping reviews [5]. We conducted a systematic search in PubMed, Cochrane, Epistemonikos and the World Health Organization website for articles containing clinical characterisation and technological platforms used in management of Covid-19 published up to July 2021. We included all studies designed in African countries; they encompass individuals of all ages infected with SARS-CoV-2 such as:

- Patients with asymptomatic, mild, moderate, severe and critical disease, including those who died.
- Hospitalised and non-hospitalised Covid-19 patients.
- Patients with persistent infection, and
- Patients with long- and short-term effects of Covid-19 infection.

The key search terms were for studies that reported clinical characteristics and management of Covid-19 patients, including clinical symptoms and signs, staging of disease (asymptomatic, mild, severe, critical) and mortality outcomes. We also included reports describing Covid-19 digital platforms/management systems.

Findings

A total of 18 studies from ten countries in Africa were included for clinical characteristics. Demographic characteristics such as age and gender were strongly associated with disease severity. Common comorbidities associated with disease severity were hypertension, diabetes, obesity and cardiovascular diseases. The most common clinical symptoms were cough, fever, fatigue and headache. The estimated median hospital stay was 11 days, with therapeutic interventions such as use of corticosteroids, oxygen supplementation, anticoagulants, azithromycin and hydroxychloroquine, although some of these have not yet been proven to be effective through clinical trials. Clinical trials to validate clinical intervention strategies are lacking at the moment. There were no studies that had investigated technological platforms that could be used in resource-limited settings as tools for systematic, easy case data collection, clinical characterisation, triage and management of Covid-19 in the African context.

The result is consistent with global evidence that clinical presentation is variable with several host, viral and environmental factors that exacerbate the severity of Covid-19 disease [6-7]. Demographic characteristics like age have been found to be strongly associated with disease severity in Africa. Adults over 50 years old have more severe outcomes [7] and children less than five years old have less severe clinical presentation [6,7]. Males appear to be more prone to severe Covid-19 than females, with correspondingly higher mortality rates [7]. This could be due to the biological differences between males and females in which women have been reported to have a more robust innate immune response than males. It may also be that well-established gender differences in health-seeking behaviours in which women are more health-conscious and seek health care correspondingly may account for some of the differential.

Evidence has emerged on disease severity of symptoms among Covid-19 patients with some non-infectious comorbidities compared to patients with no comorbidities. These comorbidities include diabetes, hypertension and cardiovascular diseases. The detrimental impact of non-infectious comorbidities appears to be true in African and non-African contexts. However, evidence suggests that comorbid conditions that could potentially impact the presentation of Covid-19 are more prevalent in Africa, such as malaria, HIV, tuberculosis and others. To-date, there is no platform in Africa that will help the clinician to characterise and manage Covid-19 patients using a standardized approach. In a global context, Clinical Platform for Covid-19 was developed by the WHO to collect information on Covid-19 [9]. Using this platform, one can enter the characteristics of patients to triage rapidly with the goal of minimising patient severity. There is a need for further research and development in this area to identify and optimise platforms that are reliably applicable in the African context. **Table 2** summarizes the major gaps identified where more research is needed.

Table 1: Major gaps and area for further research in the clinical characterisation and management of COVID-19

Key area in the clinical characteristics and management of COVID-19	What is known in the study area	Gaps and area for further research
Effect of gender on disease severity	More males are infected than females in Africa	Research is needed to learn the factors that account for this difference. For example, what are the relative contributions of biological or immunological differences (e.g., hormones, and innate immune responses (Type 1 interferons).)
Effect of genetic and geographic variant on Covid-19 symptoms and disease severity	Globally it is clear that there are factors other than comorbidities, age and sex that play a role in the severity of disease.	More studies on how clinical characteristics differ geographically is critical. Also, it's not clear if Covid-19 symptoms are variant-driven or geography-driven. This has not been well characterised in Africa

Effect of comorbidity on disease severity	Diabetes and hypertension patients have increased the mortality of Covid-19.	Further research on the role and impact of malaria, HIV, TB and other NCDs in driving symptomatology in Africa is crucial.
Long COVID/Post-acute COVID sequelae	Studies classified cases as asymptomatic, mild, moderate and severe based on respiratory symptoms and clinical observations.	Further study is needed to understand the characteristics of long COVID in Africa in terms of symptoms, period and characterisation.
Effect of age on Covid-19	There is evidence of more severe clinical presentation in advanced ages. In addition, it's evident that children are experiencing less severe clinical symptoms.	Middle-aged people are strongly affected by the new Covid-19 variant, hence further research is critical to distinguish disease severity of all age groups.
Clinical Platform for COVID-19	The Global Clinical Platform for COVID-19 was developed by the WHO to collect information on COVID-19.	Studies are needed to investigate the current usability in, and adaptability to, the WHO platform in Africa. In addition, technological platforms in the African context are necessary to rapidly document, report, triage and manage Covid-19 patients.
Treatment of Covid-19	There are several treatment protocols that are continuously revised as the pandemic has evolved. There is no definitive evidence supporting the use of existing treatments, and none has been formally recommended for use.	Further study on the impact of the treatment interventions on disease course in Africa is needed.

Policy Recommendations

Africa has the same capacity to classify cases as asymptomatic, mild, moderate and severe based on clinical observations as the rest of the world. In Africa and globally more males than females appear to suffer severe disease. There are lingering questions of whether symptoms are virus variant- or geography-driven, with very few or no studies investigating these aspects. Comparative studies on subtleties of clinical presentation in different geographic locations are

non-existent. There is a need for research to investigate the linkage among host genetics, virus genetic variants, environmental factors and clinical characteristics. On the other hand, there is robust evidence that non-communicable comorbidities play a big role in the progression of Covid-19 disease, with more research needed on the impact of infectious comorbidities endemic to Africa. Such studies will be necessary to generate the evidence required to inform policy on interventions. Moreover, there is paucity of data on suitable digital platforms and systems that can facilitate standardised and rapid identification, triage and management of clinical cases to save lives and reduce or control transmission.

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