

## Covid-19 Pandemic: Diagnostic Errors, Inadequate Healthcare Facilities and the Improvement of Patient Safety in Nigeria

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ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> Research Paper</p>	<p><b>Introduction:</b> Patient safety is essential to healthcare quality. Its deficiencies impact health outcomes, quality of life, healthcare effectiveness and efficiency. Its improvement should be a priority for any country particularly developing countries like Nigeria. However, the emergence of “Covid-19”, the inadequacy of healthcare facilities and the prevalence of diagnostic errors have complicated efforts to improve patient safety in Nigeria.</p>
<p><b>Article History:</b> <b>Received:</b> 22-Apr-2021 <b>Accepted:</b> 27-Oct-2021</p>	<p><b>Materials and Methods:</b> This research adopts a qualitative research approach, specifically text analysis, to review the literature on the subject. A review of the literature revealed a number of diagnostic issues which threaten patient safety. Existing literature on misdiagnosis, inaccurate, delayed, missed, and remote diagnosis, as well as the relationship between the adequacy of healthcare facilities and the advancement of patient safety, was reviewed and analyzed.</p>
<p><b>Key words:</b> Covid-19, Diagnostic Error, Inadequate Healthcare Facilities, Nigeria, Patient Safety</p>	<p><b>Results:</b> This paper finds that Patient safety cannot be guaranteed in the absence of an accurate diagnosis, access to secure infrastructure, appropriate technologies and medical devices, as well as a qualified and dedicated health workforce, among other factors. Early detection of diseases in general, and Covid-19 in particular, improves patient safety and lowers mortality rates. Inadequate healthcare facilities, diagnostic equipment, diagnostic errors, and disease information, on the other hand, make early detection difficult and have a negative impact on patient safety.</p> <p><b>Conclusion:</b> There is a need for early and accurate diagnosis of Covid-19 and this can only be achieved with adequate healthcare facilities including diagnostic equipment and laboratories. As a result, there will be fewer diagnostic errors, more effective patient management and treatment, and, ultimately, improved patient safety.</p>
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## Introduction

The core meaning of patient safety based on the definition of the World Health Organization (WHO) is in twofold: the absence of preventable harm to a patient during the process of healthcare and the reduction of risk of harm associated with healthcare to an acceptable level (1). Patient safety is a global health priority that affects all countries, regardless of their development level (2), and its advancement or improvement should be a top priority for any country (3), especially developing countries like Nigeria (4).

The outbreak of "Covid-19," a novel coronavirus disease, has complicated efforts to improve patient safety in Nigeria. Coronaviruses are a large RNA virus family that infects birds, mammals, and humans. These viruses are responsible for illnesses ranging from the common cold to more serious respiratory diseases and, in rare cases, gastroenteritis. Covid-19 is caused by a new coronavirus strain that has never been seen in humans before. It is related to the viruses that cause severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), both of which have been linked to zoonotic and person-to-person transmission (5).

Covid-19 emerged in Hunan Seafood Market of Wuhan City of the Hubei Province, China in December 2019; (6,7) it was declared a global health emergency on January 30, 2020 and a global pandemic on March 11, 2020 (8,9). Millions of people have died as a result of the disease, which has also put extreme strain on healthcare systems around the world, posing a serious threat to global public health.

It has been established that an early and accurate diagnosis of Covid-19 is critical to containing its spread, improving health outcomes, and advancing patient safety (10). For a developing country like Nigeria, which already has a weakened health system, insufficient healthcare facilities, including diagnostic equipment, a low level of preparedness, and the prevalence of diagnostic errors, the emergence of Covid-19 complicates efforts to improve patient safety. As a result, this paper considers how diagnostic errors and inadequate healthcare

facilities impede patient safety advancement during Covid-19.

## Materials and Methods

This research employs a qualitative research approach, specifically text analysis. A review of the literature revealed various diagnostic issues that jeopardize the improvement of patient safety. A review of the literature on misdiagnosis, inaccurate, delayed, missed, and remote diagnosis was conducted. Literature on the relationship between the adequacy of healthcare facilities and patient safety advancement was also reviewed and analyzed.

The terms "patient safety," "diagnostic errors," "diagnostic issues," "covid-19," and "inadequate healthcare facilities" were used in our literature search. Because Covid-19 is novel, the majority of the articles found suitable for analysis are recent. We also searched the World Health Organization (WHO), the Nigeria Centre for Disease Control (NCDC), as well as the National Primary Health Care Development Agency (NPHCDA) online databases for relevant documents. In total, twenty articles and three newspaper/online materials were reviewed, in addition to materials obtained from the NCDC, NPHCDA, and WHO websites.

## Results

The review of literature reveals that diagnostic error is a major patient safety issue that has gained global recognition in recent years (11). Inadequate healthcare facilities, including diagnostic equipment, were also found to have a negative impact on patient safety.

## Discussion

The current research aimed to analyze the impacts of diagnostic error and inadequate healthcare facilities on the advancement of patient safety, particularly during the emergence of Covid-19.

### Diagnostic error and patient safety during Covid-19

According to Graber et al., (12) diagnosis error is defined as a diagnosis that was unintentionally delayed, incorrect, or missed, as determined by the eventual

appreciation of more definitive information. Similarly, the report of the panel of the National Academy of Medicine (NAM) on diagnostic error in 2015 stated that a diagnostic error is committed when an accurate and timely explanation of the patient's health problems is not established or when that explanation is not communicated to the patient. Thus, missed diagnosis, misdiagnosis, and delayed diagnosis are common causes of preventable medical errors, which consistently rank at the top of the list of safety issues posing the greatest risk to patients. (13-16).

It has long been recognized that early and accurate diagnosis of infectious diseases is critical for disease control and effective treatment, as well as positively impacting patient safety. With evolving Covid-19 information and evidence, diagnostic issues and errors that have the potential to negatively impact patient safety are enormous. Under-diagnosis, for example, may occur when clinicians fail to identify conditions with which they have little expertise whether direct or indirect. As a result, clinicians may misdiagnose Covid-19 by mistaking the symptoms for other common respiratory ailments or infections, and where policies or resource constraints limit testing, the diagnosis of Covid-19 may be missed (17).

Alternative or co-existing infections or diseases with similar symptoms may also be overlooked or misdiagnosed as Covid-19 (18). If the symptoms resemble those of Covid-19 and the patient fits the typical Covid-19 case presentation, it is highly probable that the patient will be treated as a Covid-19 patient to protect healthcare professionals treating the patient and others who are close to the patient, as well as to give room for the taking of appropriate precautions in all suspected patients. It should however be noted that this approach frequently results in Covid-19 misdiagnosis in patients who do not have the virus while treatment for the true aetiology is delayed and allowing for a higher risk of adverse outcomes (19). Brown described an incident in which a patient with sepsis was not given antibiotics until twelve hours after his admission because he was mistakenly identified as a Covid-19 patient; this is

known as Covid blindness (20). It should be noted that not every patient who exhibits Covid-19 symptoms is infected with Covid-19, though there is a high likelihood that a patient has coronavirus when exhibiting these symptoms. Consequently, medical practitioners should conduct thorough investigations and not disregard standard diagnostic procedures. During the Covid-19 pandemic, they should continue to consider a variety of differential diagnoses in order to avoid diagnostic errors and to be able to treat or manage patients appropriately.

In addition, it has been reported that approximately 2 to 6 percent of patients with Covid-19 may also have co-infections with other respiratory pathogens. Where a patient is diagnosed with any of these pathogens, it may result in premature closure and failure to consider the likelihood of co-infection with Covid-19. The inverse is also possible. That is, if a patient has been diagnosed with Covid-19, the possibility of co-infection may be ignored and diagnostic test that would reveal other infections or serious conditions requiring specific, urgent therapy may not be ordered. Thus, while it is important to become more sophisticated in the way the disease is diagnosed, focusing on Covid-19 should not be a source of distraction, and overlooking other diagnoses should be avoided at all costs, as this can have a negative impact on patient safety (21). Literature also points to the fact that the accuracy of the test results based on the presence of false negatives, test sensitivity and specificity may also lead to diagnostic error. Laboratory-based evaluations of currently used Reverse Transcription Polymerase Chain Reaction (rRT-PCR) tests for Covid-19 reveal high analytical sensitivity and near perfect specificity without mistaking it for other common respiratory pathogens; however, there is reduced test sensitivity in clinical settings. This is largely due to variation in how specimens are collected and managed, as well as the stage of the disease when testing is performed (19). Clinical studies, for example, show that sensitivity decreases over time as an infection progresses. Although serial testing may not be an efficient use of limited resources, it has been

used to ascertain the diagnosis of Covid-19 in cases where clinical suspicion is high (18).

Furthermore, a review of the literature reveals that remote diagnosis is another area where diagnostic error can occur. Because of the social distancing, isolation and travel restrictions in place, the majority of non-critical care during the pandemic has switched to telemedicine. Diagnosis over the phone and video calls are now being accepted as the new normal. Instead of requiring patients to attend in-person visits, a lot is done for them virtually, and they do not have to worry about contracting the infection. However, remote diagnosis is fraught with dangers because many simple but important routine measures are frequently overlooked. Vital signs elements of physical examination, for example, can be difficult to incorporate into virtual care but are critical for accurate diagnosis and often contribute to missed diagnoses (21). Another patient safety concern that could lead to delay diagnosis is putting routine care on hold on account of Covid-19. Healthcare practitioners are being withdrawn from their primary place of assignment to work on inpatient Covid-19 units due to distractions and closures caused by the pressing Covid-19 circumstance. This can cause delayed diagnosis which could jeopardize patient safety (21). Therefore, improving patient safety entails that hospitals continue to provide essential services while reducing elective and non-urgent/chronic cases. For example, a General Hospital in Lagos hurriedly discharged most patients and asked them to go home while they were still recuperating. One of the patients who was not discharged claimed that the nurses had stopped treating him, giving him drugs; as well as treating his festering sores (22). Incidents like this can jeopardize patient safety. Inaccurate diagnosis, delayed diagnosis, missed diagnosis, and misdiagnosis can occur because (early) symptoms of Covid-19 are non-specific and can be associated with a variety of different conditions which complicates diagnosis (19). These patient safety issues related to diagnostic errors cannot be swept under the carpet because the management or treatment given to patients is highly influenced by their diagnosis.

### **Inadequate healthcare facilities and the improvement of patient safety**

Apart from diagnostic error, inadequate healthcare facilities are a major impediment to improving patient safety, particularly during Covid-19. Nigeria is the most populous country on the African continent, with a population of approximately 200 million people. Despite its size and population, the country's healthcare facilities are overstretched and lacking in essential services (23). The physical infrastructure, including diagnostic laboratories requires up-to-date equipment. There is also shortage of medical supplies and personal protective equipment, as well as the diversion of medical supplies to the market (24,25). Inadequate healthcare facilities also contributed to the burnout, stress and overwork experienced by healthcare workers, and this has been one of the major causes of the incessant strike actions embarked upon by healthcare workers.

The emergence of Covid-19 has necessitated a re-evaluation of the Nigerian healthcare system's adequacy and strength. According to the Nigeria Centre for Disease Control (NCDC), preparedness planning for health emergencies focuses on minimizing the burden connected to health threats in terms of mortality and morbidity, hospitalizations, and demand for healthcare goods and services; maintenance of essential services, protection of vulnerable groups, minimization of economic and social disruption, as well as making allowance for an expeditious return to normalcy. The strength and adequacy of a nation's healthcare system can also be linked to patient safety. The emergence and spread of Covid-19 exposed Nigeria's level of preparedness for public health outbreaks. For example, it was after the emergence of the virus that many states built make-shift isolation centres and infectious diseases centres which were supposed to have been in place and well managed prior to the outbreak of any public health emergencies (26). Conditions that may undermine medical workers' ability to fulfil their responsibilities of providing safe and high-quality care must also be addressed (27). In

order to improve patient safety during the Covid-19 pandemic, healthcare workers must be provided with adequate personal protective equipment (PPE). In the absence of PPE, both the doctor and the patients are at risk of contracting the virus. In this regard, the doctor is under no obligation to provide high-risk services without adequate safety and protection, and he has the right to refuse treatment unless and until adequate PPE is provided.

Thus, providing adequate PPE to medical practitioners could impact patient safety. Healthcare workers and others who work in healthcare facilities should be trained on the proper use of medical and protective devices, while cleaners should be given clear instructions on how to disinfect the environment.

The healthcare environment should be disinfected as often as possible, and recommendations for hygiene and health standards should be disseminated in the waiting room, which should not be overcrowded. The quality of healthcare facilities should also be improved as well, as this will enhance patient safety. While it's critical to make the best use of limited healthcare resources, it is also important to avoid overburdening existing healthcare infrastructures.

## Conclusion

Early and accurate diagnosis of Covid-19 is vital to the improvement of patient safety. Therefore, it is pertinent to pay more attention to and strengthen the healthcare system, (28) and also improve the healthcare facilities such as diagnostic equipment and laboratories.

The improvement of healthcare facilities will enhance accurate diagnosis, resulting in a reduction in diagnostic errors, effective patient management and treatment, and, consequently, advancement of patient safety.

Furthermore, all available resources including personnel, funding, equipment and supplies should be maximized in a collaborative effort to improve patient safety and healthcare quality in the country (29). For example, patients could be taught how to accurately check their vital signs for effective remote diagnosis.

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