

Qualitative exploration of health system response to COVID-19 pandemic applying the WHO health systems framework: Case study of a Nigerian state[☆]



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ABSTRACT

Pandemics can result in significantly high rates of morbidity and mortality with higher impact in Lower- and Middle-Income Countries like Nigeria. Health systems have an important role in a multi-sector response to pandemics, as there are already concerns that COVID-19 will significantly divert limited health care resources. This study appraised the readiness and resilience of the Nigerian health system to the COVID-19 pandemic, using Oyo State, southwest Nigeria, as a case study. This study was a cross-sectional qualitative study involving key informant and in-depth interviews. Purposive sampling was used in recruiting participants who were members of the Task Force on COVID-19 in the state and Emergency Operations Centre (EOC) members (physicians, nurses, laboratory scientists, "contact tracers", logistic managers) and other partners. The state's health system response to COVID 19 was assessed using the WHO health systems framework. Audio recordings of the interviews done in English were transcribed and thematic analysis of these transcripts was carried out using NVIVO software. Results show that the state government responded promptly by putting in place measures to address the COVID-19 pandemic. However, the response was not adequate owing to the fact that the health system has already been weakened by various challenges like poor funding of the health system, shortage of human resources and inadequate infrastructure. These contributed to the health system's sub-optimal response to the pandemic. In order to arm the health system for adequate and appropriate response during major health disasters like pandemics, fundamental pillars of the health system-finance, human resources, information and technology, medical equipment and leadership - need to be addressed in order to have a resilient health system.

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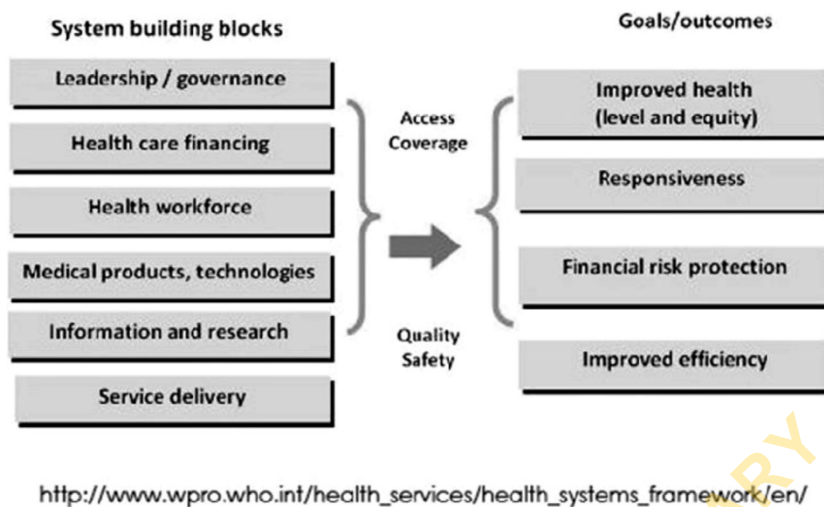


Fig. 1. World Health Organisation (WHO) health systems framework.

Introduction

A pandemic may be defined as “an epidemic happening over a wide region, crossing global boundaries, and typically influencing countless individuals” [1]. Pandemics are outbreaks of infectious diseases that occur on a large scale and can result in a high level of morbidity and mortality across countries causing a significant negative effect in economic, social and political [2]. The likelihood of pandemics is believed to have increased in the last century because of increased worldwide travel [3,4].

SARS-CoV-2, a novel coronavirus, started a global pandemic of respiratory illness, named COVID-19 in December 2019 [5]. COVID-19 presents with a spectrum of symptoms ranging from a mild, self-limiting respiratory tract illness to severe progressive pneumonia, multi-organ failure, and death [6]. The vast majority of deaths from COVID-19 have occurred in Italy, China, Spain and United States of America—all countries with good health care resources [7]. The first case of COVID-19 in Nigeria was reported in February 2020 and since then the number of cases has gradually increased to more than 159,000 as at the time of putting together this paper [8].

Pandemics can result in significantly high rates of morbidity and mortality with the impacts being higher in lower- and middle-income Countries (LMIC) like Nigeria [2]. Health systems have an important role in a multisector response to pandemics, as there are already concerns that COVID-19 will severely divert limited health care resources [9,10].

Responsiveness is a key objective of national health systems. Responsive health systems anticipate and adapt to existing and future health needs, thus contributing to better health outcomes [11]. This study assessed the health system’s response to the global COVID-19 pandemic in a resource-limited context like Nigeria and provided lessons which may help ready the health system for future public health emergencies in a setting like this.

Conceptual framework

The purpose of the World Health Organisation (WHO) Health Systems Framework [12] is to promote a common understanding of what a health system is and what constitutes health systems strengthening. The building blocks as shown in the Fig. 1 above are: leadership and governance (stewardship), health care financing, health workforce, medical products, vaccines and technologies, information and research and service delivery.

Leadership is a necessary element of strong health systems. Leadership and governance of health systems, also referred to as stewardship, has been described as the most complex but critical building block of any health system [12,13]. According to the WHO [12], leadership and governance are associated with the role of the government in health and its relation to other actors whose activities have an impact on health; this involves overseeing and guiding the whole health system in order to protect the public interest. Governance plays a critical role in creating an environment that facilitates productive partnerships for strengthening competencies within the health system and across sectors [14].

The lack of effective leadership and governance in the health sector is a major contributor to the failure of health systems in most LMICs, including Nigeria [15]. Nigeria’s Federal Ministry of Health [16] observed that the lack of performance of the country’s health system is attributable to the weakness in the leadership/stewardship role of government in health.

Financing the health system is aimed at covering the health needs of the people both individually and collectively through the mobilization, accumulation and allocation of funds which will cover the health needs of the populace [17]. According to the WHO [12], a good health financing system raises funds that are adequate for health which ensures that

people get access to the health services they need and are protected from impoverishment and incurring catastrophic expenditures associated with having to pay for health.

A competent health workforce is a vital resource for health services delivery, dictating the extent to which services are capable of responding to health needs [18]. Human Resource for Health (HRH) development operations in Nigeria are sub-optimal, as in other LMICs [15]. Health systems can only function with health workers; improving health service coverage and realizing the right to the enjoyment of the highest attainable standard of health is dependent on their availability, accessibility, acceptability and quality. The health workforce has a vital role in building the resilience of communities and health systems to respond to disasters caused by natural or man-made hazards, as well as related environmental, technological and biological hazards and risks.

A well-functioning health system ensures access to essential medical products, vaccines and technologies of assured quality, safety, efficacy and cost effectiveness. According to the WHO framework for health systems [19], this is one of the six building blocks of health systems and technology which is used in all types of health facilities, plays a major role in contemporary health care systems and contributes directly to the quality of patient care. Advances in information and communication technologies (ICTs) could play an important role in improving health systems in developing countries [20]. Information systems have great potential to reduce healthcare costs and improve outcomes [21].

Therefore, the aim of this study was to explore the health system response and resilience to the COVID-19 pandemic in Oyo State, Southwest Nigeria and to document lessons learnt for future public health emergencies.

Methodology

Study area

The study was carried out in Oyo state, south-west geopolitical zone of Nigeria. It covers 28, 454 km land area, with a population of 5,580,894. The state capital is Ibadan [22,23].

Study site

The study site is the Oyo State Ministry of Health, established in 1957 and one of the oldest in the southwest region. The ministry is saddled with the responsibility of policy initiation and implementation on issues relating to the health and wellbeing of the people of the State.

Study population

Respondents in this study include Emergency Operating Centre (EOC) members (physicians, nurses, lab scientists, "contact tracers", logistic managers) officials from the Ministry of Health, WHO and other partners in Oyo State

Study design

This study is a cross-sectional qualitative study. It involved key informant interviews, in-depth interviews and desk review of documents.

Sample size

Interviews were conducted with 13 participants until saturation was reached, a point when similar responses are being collected with no new or additional information [24,25].

Sampling technique

Purposive sampling method was used to select participants, based on ability to provide required information to answer the study's research question: how did the COVID-19 pandemic affect the functioning of the health system?

Inclusion and exclusion criteria

Participants were those who have been involved one way or the other in the COVID-19 response in Oyo state including health workers involved in the management of health facilities in the state.

Instrument for data collection

An interview guide containing questions and probe questions was used. The guide covered questions on the response of the leadership to the pandemic, availability of funds and medical equipment and adequacy of health workers. All intended participants are health workers with a minimum of a first degree done in English. The interviews were therefore conducted in English.

Table 1
Sociodemographic characteristics of the participants (N = 13).

Variable	Frequency (Percentage)
Age Group (years)	
< 40	5(38.5)
≥40	8(61.5)
Mean age 45.1± 14.7	
Gender	
Male	10(76.9)
Female	3(23.1)
Profession	
Doctor	9(69.2)
Nurse	1(7.7)
Medical Laboratory Scientist	2(15.4)
Public Health Professional	1(7.7)
Years of work experience	
< 5	2(15.4)
5-10	2(15.4)
11 years and above	9(69.2)
Place of Primary Employment	
Public sector	8(61.5)
Private sector	5(38.5)

Statement of confidentiality of data collected from the subjects

All data collected from participants were treated with confidentiality and not shared with anyone except for the purpose of publications.

Data collection techniques

Interviews were conducted by the last author assisted by two research assistants. All interviews were conducted in English, audio-recorded and then transcribed in full. All authors are medical doctors who practice in Oyo State.

Data analysis and management

Interview transcripts were uploaded into the NVIVO software version 10 and then analysed iteratively based on the thematic framework earlier developed. Using a codebook, the first and last authors coded independently and later compared and matched the codes. Codes that emerged from reading the manuscripts were added to a priori themes. The Standards for Reporting Qualitative Research guidelines [26] for qualitative studies were used in the preparation of this manuscript.

Ethical issues/Consideration

Ethical approval for this study was obtained from the Oyo State Ministry of Health Ethics Review Committee (Reference number: AD13/479/1796^A). No known identifiers were used during the interviews and while transcribing so as to maintain the confidentiality of the participants. No part of this study caused any of the participants harm. The findings from this study provided recommendations on how to strengthen the health system especially during pandemics. Participation in the study was voluntary and participants were aware that they could decide at any point to opt out. Both verbal and written informed consent was taken from participants.

Results

From Table 1, a total of 13 participants were interviewed for the study. Majority were male (76.9%), aged 40 years and above (61.5%) with a mean age of 45.1± 14.7 years. Based on their place of primary employment, more than half of the respondents (61.5%) work in the public sector.

Leadership and governance

When asked about their view on how the leadership of the state addressed COVID-19 pandemic, some of respondents believed that the leadership had taken proactive steps to combat the pandemic. This was demonstrated by the creation of an EOC even before there was any case of COVID-19 in the state. They responded thus:

"I think it's not been a bad leadership; it has been good in the sense that the governor took it upon himself to be the coordinator of the task force, he viewed it as something of urgent national interest and a pacesetter state, and he needed to be involved.

In terms of leadership, I think they haven't done badly, all the pillars for managing the cases were in place though not without few lapses but by and large one will score the government to have done reasonably well." **(male, doctor)**

"Okay, I will give the leadership of the health system of Oyo state a pass mark because rising up to the challenges of Covid-19 is not an easy task. I was privileged to be there when they were inaugurating the Emergency Operating Center (EOC) in Oyo state, there was none before now in existence in the state but immediately Covid-19 started and we had the first case in the country, we started to mobilize all machineries to ensure that Oyo state is well positioned to tackle Covid-19. The EOC was inaugurated specifically on the 23rd of March, 2020 and despite the fact that such a thing has never existed; we were still able to gather expertise and it has really assisted with how things should be put in place tackle the pandemic." **(male, doctor)**

However, a different opinion was expressed by some other respondent who believed that the leadership could have done better as they did not prepare well for the enormity of the pandemic They said:

"I think given the circumstances, the quality of the governance structure, the quality of the infrastructure in our local context, while we have not done all that we could, we have tried to some extent considering our limitations. I will say that the state health system did not prepare enough or did not prepare for the enormity of the problem till it was already in the state. All the times we had as lead-time to adequately prepare did not particularly materialize. However, the governance structure that we have has responded to a fairly acceptable degree in addressing the pandemic in the state." **(female, doctor)**

"...Could say that the response has been a bit slow because several times we have been behind the news with respect to some particular steps. I say again as a practitioner, when the pandemic started the private practitioners were not onboard and I think this was a major flop in the sense that we know people will likely come to a private facility first even before presenting at the teaching hospital, I think it is not just a state failure but a national scene because they should have thought in advance" **(female, doctor)**

Health financing

The financing of the health system was also explored with respect to the adequacy, effectiveness and transparency of funds. Some believed that the impact of the pandemic has affected health financing globally but the state has made some progress through the provision of basic health services and awareness.

"On that, I will say the government is doing her best even though the best may not be adequate; not adequate because of the massive impact of the pandemic, we have never experienced something of this nature before." **(female, nurse)**

"Regarding adequacy, money can never be enough even globally, people are even looking for fund to tackle the pandemic not to talk of a resource constrained setting, but I think that the government has been able to provide funding for the basic services that are being provided during the pandemic in addressing jingle, ensuring that the isolation centers are equipped and all of that." **(female, doctor)**

Whereas, some respondents felt the available infrastructure did not match the funds said to have been disbursed or spent and doubted the transparency. Their responses are quoted below:

"I cannot say I have seen expenditure that appears to match the funds that were said to have been received. I have not seen PPE being distributed to public facilities, state owned facility that will match what is given per state, as an observer I will say there is a lot of disparity between what has been received and what was disbursed." **(female, doctor)**

"You only hear of billion being spent without the effect on the populace, the spending is done absurdly and it is one sided." **(male, doctor)**

Health workforce

With regards to the availability and adequacy of the health workforce, the general consensus was that before the outbreak of the pandemic, Oyo state and Nigeria as a whole had a shortage of health workers. This shortage has however worsened due to the pandemic.

Some of the responses are quoted below

"The number of the health worker is very low, apart from the funding the personnel are not there." **(male, doctor)**

"In term of the adequacy of the personnel, I won't say they are adequate or inadequate because this situation is not peculiar to Oyo state alone but it is across the country, health work force in Nigeria has never been adequate. They are inadequate. In terms of the capacity; to some extent I will say it is inadequate because the majority of the people we have there are general practitioners, but when need arises that we need specialist care there is collaboration with UCH together few other specialists that we have at the state level. I will say as much as I know they are motivated and well catered for" **(male, doctor)**

"We didn't have enough before the pandemic; we have been on chronic shortage because the shortage has been for a long time. It has been on for 6-7 years, the shortage is more in Oyo state. The work force is very inadequate and the government of the day was about addressing that before this pandemic" **(female, nurse)**

Medical products and technologies

The respondents were of the opinion that these medical products were already lacking before the pandemic and the inadequacy worsened with the pandemic. Some of the responses are quoted below

"The little I know about that; at the initial stage when the government started with the lockdown, I can tell you it was inadequate but subsequently from May/June I don't know if the government made up for the inadequacies. At the beginning of the pandemic, there just four ventilators in Oyo state and those were in UCH, PPEs were either scarce or unavailable but I don't know whether the government has made adequate provision at the isolation centers presently." **(male, doctor)**

"They are not adequate, going by our population, we have 8.8 million people in Oyo state and when you are talking of adequacy, the government is trying because we didn't know this will happen" **(female, nurse)**

"Infrastructural deficit had always existed, I think Covid-19 just showed us the stark reality that the health sector needed to be better supported for events like Covid-19 or any other that can come because you never know what is next." **(male, doctor)**

Information and research

On their views on the information dissemination system within the state, one of the respondents believed the dissemination did not reach rural areas, he responded thus:

"Generally, I will also give it a pass mark; although it could be better, there is generally a room for improvement. Radio, television made attempts to reach out to people but I think we could still have gone to very remote places; places where they don't have access to television." **(male, doctor)**

Another respondent who believed the use of non-health professionals for health education may have been detrimental because the populace tends to trust information coming from a certified health professional more is quoted below:

"I think IEC materials have been readily available everywhere and the media have been used a lot. You hardly listen to a radio for an hour without hearing about covid-19, but I think the people and the source of information especially on radio should be monitored. The trust for information might be different with places; when a radio personality is talking about covid-19, it will be different to when a health worker is. We should look into this; people tend to believe in the health worker and religious leaders than just a random speaker." **(male, doctor)**

Furthermore, another respondent faulted some of the information as the information provided on the media was different from what was seen at the test centers. He provided a practical example and is quoted below:

"Information has been abysmal; because you hear on radio that 'come to Adamasingba (test center) and have your test, it is free', and people go there and don't get any test or they said they have finished for the day. Like I said earlier my staff went there and didn't get the result of their tests. The jingles don't match up with the reality." **(male, doctor)**

Service delivery

We asked the respondents on their thoughts on how the pandemic has affected service delivery in the health system in the state. The responses showed that the pandemic has had a major impact and affected service delivery negatively, especially through the disruption of the appointment system, emergency and routine services, as well as diversion of health resources to the control of the pandemic.

"I think that in many places where many health centers where people could walk in before, with or without appointment to see doctors and get managed, that has been totally disrupted and especially with people that have chronic disease such as diabetes, cancer, hypertension who may not be able to access healthcare and special care as required. Many of them have not been able to access healthcare and even getting to the hospital to be seen by healthcare worker is not as easy as it used to be. So, it has disrupted a lot of things such as access to emergency, routine care, care for the elderly and unfortunately, we do not have strong telemedicine facility in place because we didn't see this coming." **(female, doctor)**

"Initially, there were reports of hospitals that wouldn't take patient without first having been tested, and this largely affected service delivery in so many hospitals. With time, this pillar particularly rolled out training for health workers because the action was out of fear, they were trained on how to protect themselves, and it has been able to reduce the problem with service delivery but not as optimal as it used to be." **(male, doctor)**

"Based on the sudden impact we are having due to the virus, a lot of attention is on covid-19, at least for us to overcome it. During the time of the lockdown, some HIV patients found it very difficult to access their medication at the health facilities because of little or no movement restricted their access to health services. It affected patients with other ailments." **(male, public health professional)**

Discussion

In this study, the opinion about the response of the leadership and governance in addressing the pandemic was divided. While some believed the government's response was prompt, others thought there was a lag in response to the COVID-19 pandemic. Chukwuorji and Iorfa [27] from their study concluded that there was prompt response to the COVID-19 outbreak by the Nigerian government but the effectiveness of the response was undermined by a lack of preexisting social infrastructure. This is similar to our findings. The response of the Nigerian government to COVID-19 was also observed by Awofeso and Irabor [28] to be ineffective due to the ineffective coordination of lockdown across states and sustaining the economy. Unlike the initial health response to COVID-19, it has been reported that the South African government was slow in responding to economic concerns [29]. It was also observed that governments in Africa made noteworthy interventions

to contain the virus but such interventions had to be relaxed as it may cause more deaths from hunger and other diseases besides Corona virus [30].

Respondents admitted that the state's health sector and that of the country as a whole did not have adequate funding prior to the onset of the pandemic and this worsened afterwards. However, the popular opinion was that the State government has been able to provide some of the required resources like facemask and PPE despite the lack of funds. This is corroborated by Ejiogu and colleagues [10] who observed from their study that Nigeria's health sector has faced decades of poor funding and mismanagement and was noted by the World Bank to have spent less on health than nearly every country in the world. Similarly, financial resources should be pooled from the government, non-governmental and private sources in order to shore up health systems' preparedness for future pandemics, particularly in LMICs [31,32].

Furthermore, Bong et al. [9] predicted that the COVID-19 pandemic would have a negative effect on the health system of LMICs in the area of health care personnel due to the overwhelming shortage already experienced. Findings from this study support this prediction as respondents reported that there was already a shortage of health workers in the state which worsened due to the pandemic. Globally, the COVID-19 pandemic also decimated the number of health workers available to keep health systems running [32,33]. This is also true for Nigeria as a country as previous studies have shown that there is a shortage of health workers in the country which has contributed to the challenges faced by the health system [34,35].

Besides, availability of medical products is essential to the health system. The weak health system in Nigeria is also faced with inadequacy of medical products and technologies. In addition, there is a significant shortage of resources needed to care for patients with severe respiratory failure like oxygen, ventilators and infusions pumps besides from water and electricity supplies [9]. Apart from the usual facilities in place in the health system, the pandemic required the use of PPEs and ventilators among other things. Findings from this study support previous research as it showed that the inadequacy of medical resources worsened with the COVID-19 pandemic. Vaccines have also become an important aspect of this pandemic [7,32]. Vaccines have been developed and administration has commenced in various countries, however Nigeria does not have a functional vaccine production facility. Thus, the country had to source vaccines from outside the country [36].

Also, health education is an important tool for the prevention of diseases. The pandemic came with a lot of new information and it involved research and information dissemination. This was done via several media platforms to increase awareness of the people. Information dissemination within the state was perceived to be adequate as all available media platforms were used to sensitize the populace.

Being a novel disease, the COVID-19 pandemic had a deleterious effect on service delivery. Prior to its occurrence there were no preparations or facilities in place to address such a disease and the enormous impact it had on the health system. Prior to the onset of COVID-19, health inequalities have been observed in LMICs including Nigeria, and it was predicted that this would worsen at the beginning of the pandemic [37]. This has been proven true by studies that have shown that patients requiring surgical care are being deprived of access with an increasing strain on the delivery of essential surgical care due to the demand for personnel and other resources to cater for patients with COVID-19 [38]. Findings from this study also show that other patients with chronic diseases like HIV have found it difficult to access care due to the various interventions like movement restriction, lockdown of parts of the hospital put in place to respond to the pandemic in the state.

Limitations

One of the limitations of this study is the subjectivity of self-reports, for some of the questions, participants had to assess how well their unit had performed in the course of the pandemic. To reduce this bias, concepts were properly explained and confidentiality of information shared was also assured. Another limitation was social desirability bias, some of the questions had to do with providing information on how the government has fared and most of the respondents were government employees. Participants may therefore respond in ways that put the government and leadership in good light. However, despite these limitations, this study provides important exploratory data on how the health systems responds to health emergencies in a LMIC setting.

Conclusion

The COVID-19 pandemic has had a major effect on health systems across the globe. This effect has however been greatly multiplied in a LMIC like Nigeria and in Oyo state due to the weak health system characterized by shortage of health personnel, medical resources and technology and presence of health inequalities. Despite attempts made by the government to address the pandemic, the effect of these interventions has not been considered successful.

In order to address the pandemic effectively government has to improve on the health system of the State based on the major building blocks. This will involve addressing the challenges with health personnel, medical resources and technologies and also health financing. This will ensure that the health system is resilient to handle health emergencies of same magnitude as the COVID-19 pandemic successfully in the future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Competing Interest

The authors declare no conflict of interest.

CRediT authorship contribution statement

Oluwaseun Oladapo Akinyemi: Conceptualization, Visualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Adeola Fowotade:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Olukemi Adekanmbi:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Eniola O. Cadmus:** Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **Adebusola Adebayo:** Visualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing.

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