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Improving International Health Security in Resource-Scarce Regions: Leveraging upon the Initial Success of Combating COVID-19 to Fight Emerging Health Threats

Daniel Lawer Egbenya

Abstract

In this Chapter, an overview of health security in different regions of the world will be considered with emphasis on the situation in low resource settings such as the global south and Asia since they share a lot in common. Additionally, how countries in these areas, especially sub-Saharan Africa, used existing health infrastructure, local resources and policy to somehow successfully (at least, presently) combat the ongoing COVID-19 pandemic will be elucidated. Ways in which the current approach being adopted by these countries could be used to fight other emerging health conditions such as rising cases of cardiovascular and chronic conditions in these countries will be considered in this Chapter. These measures may boost and ensure sustainability of overall healthcare capacities of these countries.

Keywords: international health security, COVID-19, emerging health threats, low-resource settings, healthcare

1. Introduction

Among the many lessons being learnt from the ongoing coronavirus disease 2019 (COVID-19) pandemic is that the state of health of each country may be intricately linked to all other countries on the globe. This comes to buttress what the world witnessed during epidemics in the recent past, particularly the Ebola virus disease of 2014–2016. Impliedly, whatever happens in the health system of any country in the 21st century is likely to have some effect on many other countries due to the high interconnectedness and interdependence of our world. Frequent and rapid travel possibilities have facilitated movement of disease causing agents such as seen in the emergence of COVID-19. Millions of lives and properties are lost in the wake of infectious diseases. Infectious diseases may have killed more humans than wars have ever done in human existence. These call for strengthening international health security especially in resource-constraint regions of the world so as to fight future epidemics and other diseases. This may be done by instituting appropriate healthcare policies based on local contexts and establishment of requisite healthcare infrastructure. Also, the World Health Organisation (WHO) should be

strengthened and resourced as well as a demonstration of a high sense of commitment on the part of countries to adhere to international health treaties [1, 2].

Emerging health threats are constituted by a number of new, unknown and evolving health conditions that a group of people encounter every now and then. These complications may result from environmental destruction, infectious diseases, population and lifestyle events, chemical exposure and natural disasters. The possibility of deliberate or accidental release of pathogens as bioweapons should also not be lost on us. These health threats may be faced from time to time and their effects may be experienced on a daily basis. Additionally, the emerging burden of disease in Africa, a resource-constrained region, shows a trend in which the predominantly infectious disease-burdened region is now grappling with non-communicable diseases [3].

In the midst of the deadly COVID-19 pandemic, resource-scarce countries may potentially marshal some inherent resources to combat emerging health threats. While the availability of a full functioning and inclusive healthcare system is desirable in all countries including low- and middle- income countries (LMICs), to effectively tackle emerging and re-emerging health threats, LMICs may start off by strengthening their low-level resources while scaling up with the construction of the needed huge infrastructural healthcare facilities.

As being witnessed in some places, particularly in developing countries, readiness of the populace to follow through with the COVID-19 protocols without extreme recourse to challenging the need for instituting those protocols vis-à-vis infringement on human rights, disease mitigating measures have the potential to achieve worthwhile results in the direst of circumstances. This is contrary to what transpired in the West, especially in the early days of the emergence of COVID-19, where there were elaborate roadblocks set in the path of these same protocols. For instance, while the generality of the Ghanaian population, and indeed some parts of Africa, largely accepted and embraced the wearing of face masks and used same as a fashion trend, that was to be missing in the West.

In protecting a country's health security, the said country is indirectly contributing to protecting and promoting international health. Unfortunately, about 70% of the world's countries assert that they cannot independently fight off an outbreak [4]. This calls for urgent steps in scaling up the healthcare resources of these countries. Technical and financial assistance for epidemic preparedness should be advocated and closely monitored. For example, intensive personnel training, spearheaded by the Centres for Disease Control and Prevention (CDC), highly contributed to Nigeria's success at fighting the 2014 EBOLA epidemic [5]. Prevention, early detection and treatment are the surest and most efficient ways to fight off epidemics. Despite advanced countries have the moral obligation to assist their less-developed counterparts, owing to our interdependence, the latter needs to harness local resources aimed at achieving same target.

2. Brief overview of international health security

Good health is essential for the full functionality of humans. Determinants of quality and adequate health security of a population include a number of factors. These include the availability of a well-laid out quality healthcare policy and programmes, health facilities including hospitals and fully-functional diagnostic laboratories as well as a qualified and highly-motivated healthcare workforce. The availability of these varies from place to place, globally.

Health security in the developed world is one of topmost priority to governments in those countries. In such places, there is massive investment in both basic

and applied health research, for example. The availability of comprehensive health-care policy complemented with advanced, state-of-the-art healthcare infrastructure enabled these countries to adequately provide for the health needs of their people. Such countries have effective and elaborate surveillance system in place to quickly identify any emerging health threat and provide the necessary remedy in a timely and effective manner, in most stances. When they even delay in doing so, it sounds to reason that the turn-around time would have even be higher should same condition be found in the developing world.

In resource-scarce regions of the world such as parts of Africa and Asia, however, there is a wide gap in providing the essentials needed for quality healthcare. These affect the overall quality of healthcare services rendered to people in these areas. More importantly, should there be an epidemic such as the EBOLA virus disease of 2014–2016 in parts of West Africa, there might be dire consequences for the lives of people not only in the epicentres of the infections but potentially, everywhere else.

Inadequate healthcare infrastructure to combat infectious disease outbreaks is a major occurrence in many LMICs. Despite the need for foreign aids to scale-up the number of key healthcare infrastructures in LMICs, these should not in any way be strictly tied to complicated strings that have the potential to affect the sovereignty and overall human security of these countries.

Early detection of outbreaks, which is essential for containment, takes place in a well-functioning healthcare system [6]. In places where the healthcare system is not properly functioning and where some groups of people do not have access to the country's healthcare system, outbreaks of infections may go undetected and unreported for months hence causing more havoc in the population. This may occur mostly in developing and resource-scarce countries, as shown by the EBOLA virus disease of 2014 in Guinea, West Africa. Moreover, the implementation of sanctions such as travel bans instead of provision of financial and technical support to countries that report the presence of unusual pathogens and infections in their jurisdictions may deter some of these countries from reporting such outbreaks early enough to world regulatory bodies such as WHO despite being obligated under the international health regulations to report such issues.

3. Method

To obtain papers for the current work, literature search was conducted in electronic databases and search engines, namely; Google scholar, PubMed and Google search engine. Phrases such as international health security, WHO phases of pandemic, fighting COVID-19 in Africa, second wave of COVID-19 and emerging health threats in Africa were searched. After going through the suggested papers by the searches, the papers used were selected. Papers included were written in English language. Additionally, based on the content of the current chapter, WHO and CDC, two prominent healthcare agencies, were heavily relied on to obtain the requisite papers for the present work.

4. Phases of the COVID-19 pandemic

Pandemics are marked by phases which identify key observations including their emergence and possible interventions. Similarly, COVID-19 has noticeable phases. These phases are important as they reflect possible preventive and mitigation measures to adopt at any point in the course of the pathogen invasion.

For instance, instituting social and physical distancing protocols and the decision to close a country's borders to traffic (air, land and sea) may be largely influenced by the rate of spread of an epidemic or a pandemic. The COVID-19 phases presented here are based on the WHO pandemic phase descriptions used for influenza [7]. In phase one, no novel coronavirus found in animals was deemed to cause infections in humans hence no need for mitigating measures. In Phase two, however, a novel coronavirus in animals was deemed to be the causative agent of a human infection. Specifically, a pneumonia outbreak with unknown aetiology was noticed in Wuhan city, Hubei province of China in late December, 2019 [8]. Subsequently, this outbreak was found to have commenced at a seafood market in the Wuhan city. Thereafter (12 January 2020), China shared data on a newly discovered coronavirus, initially named 2019 novel coronavirus (2019-nCoV), which was found to cause the pneumonia reported in the previous month.

About a month later, 11 February 2020, the International Committee on Taxonomy of Viruses (ICTV) officially named the virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and WHO named the condition caused by this virus, coronavirus disease 2019 (COVID-19) [9]. The name of the virus reflects the family of viruses from which SARS-CoV-2 emanates from. Collectively, SARS-CoV-2 together with the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) constitute a subfamily of coronaviruses called β -coronavirus, a viral group [10]. Coronaviruses infect both man and animals leading to both acute and chronic conditions [11]. A phase three of the viral spread would be the situation where the virus does not lead to community level transmission because there is no human-to-human contact transmission. Impliedly, the virus in the animal contact may have led to few cases of infection and appropriate containment measures taken to prevent its spread. However, this was not to be the case of COVID-19 as it led to community level or horizontal transmissions. Therefore, phase three of COVID-19 had the virus spreading within the Wuhan city and the Hubei province. Consequently, the first imported case of COVID-19 from Wuhan City, globally, was reported by Thailand on 13 January 2020 [8]. This commenced the cross-country transmission of the disease and phase four of the spread of the pandemic. On 11 March 2020, owing to the over 118,000 confirmed cases in 114 countries in which 4,291 lives were lost, WHO declared COVID-19 a pandemic [12]. This is the Phase five of the spread of the virus.

A post-peak period of the pandemic occurs where there is a reduction in pandemic levels (number of cases) in most countries to levels below the observed peak levels. While this might have occurred in specific WHO regions such as Africa (in July), South-East Asia (in September) and Eastern Mediterranean (in November), the global post-peak period is, presently, unknown due to increasing cases in the Americas and across Europe [13]. However, currently, there is a second wave of spread of the virus in which other variants, different from the initially reported strain of the virus, are being found in some countries. With the raging second wave in countries such as the United Kingdom and South Africa, all countries need to strengthen their surveillance as well as mitigating measures so as to avoid the spread of the virus. Finally, a post-pandemic phase will set in when the disease will be reduced to normal levels. During such periods, surveillance and infection preparedness should still be put in place so as to prevent any future outbreak. The WHO phases, largely, correlate with the CDC influenza phases being applied to the surveillance and management of COVID-19 in the United States. These phases are, namely; investigation, recognition, initiation, acceleration, deceleration and preparation with the first four phases termed prepandemic intervals and the remaining, dubbed; pandemic intervals [14].

5. How have countries in the different regions of the world fared during the COVID-19 pandemic?

As at 14 December 2020, globally, there are over 70 million confirmed cases of COVID-19 resulting in about 1.6 million deaths with about 47 million recoveries [15, 16]. The current epicentre of the disease which doubles as the region with the highest number of cases, the Americas, has recorded over 30 million cases, representing about 42% of global infection rate with the United States of America alone accounting for about 16 million of this. Asia, where COVID-19's patient zero is located, currently falls below Europe based on the number of confirmed cases of COVID-19. The lowest case infection rate, till date, has been recorded in the WHO African region where a total of 1.6 million cases have been reported, that is, about 2.3% of the global infection rate. Similarly, while the Americas have reported 780, 904 deaths so far, the Africa region has reported 35, 879 COVID-19 associated deaths (that is about 2.6% and 2.2% death rate, respectively, in the two regions; both of which are around the global death rate of about 2.3%). There are a number of possibility that may have accounted for the significant variations in the number of cases and deaths reported in the different regions of the world. These may include genetic and temperature variations. Presently, there is a second wave of COVID-19 infections in a number of countries across the globe particularly in Europe.

The outbreak of COVID-19 in China, Asia, and subsequent report of its spread to Europe led many researchers, scientists and policy makers to probe how well the different regions of the world may combat the deadly infectious disease. While there was high hope for the more advanced countries to fiercely fight off COVID-19, owing to the superior healthcare infrastructure in those countries, many wonder how resource-scarce regions will fare in dealing with the pandemic. As expected, many countries put in measures to combat the virus. These included closure of entry points like airports, lockdowns and purchase of personal protective equipment.

Per the current death rate data as well as adherence to COVID-19 protocols, Africa may be doing fairly well in the management of the pandemic. The region has one of the lowest COVID-19 death rate (as stated above) and a recovery rate of as high as 85% [17], exceeding the global average rate of 67%. With this appreciable recovery rate, some lessons might be learnt from the management of the pandemic so as to improve healthcare in the region.

6. Boosting the healthcare needs of resource-scarce countries to fight emerging health threats

The world's population is projected to witness a huge rise in its ageing index, particularly in developing areas such as Africa [18]. Ageing is associated with increasing probability of proneness to infections due to reduced immune strength. Should these occur without corresponding improvement in healthcare infrastructure and services, there may be dire consequences on the population in these areas in the years ahead. In cases where there are hospitals to admit the aged, in-hospital infection risk needs to be critically checked.

Also, the increasing population of LMICs portends a fertile avenue for the emergence and spread of infections. Infectious diseases account for about half of the total death in Africa [19]. With increasing population implies that inadequate and overcrowded healthcare facilities may serve as vital spreading grounds for infections. Closely related to the increasing population is unplanned and uncoordinated urbanisation in these countries. Due to a number of factors including,

predominantly, the burning desire to seek for jobs in the urban and peri-urban areas in these countries, there is bound to be excessive urbanisation. The effect of this was felt in major cities across Africa during the COVID-19 lockdowns initiated in some of these cities. In Accra, Ghana, for example, it was a nightmare providing for most of these people who moved to the cities in search of non-existent jobs hence have no savings to depend on during the brief period of lockdown. If left unchecked, increasing population and its associated urbanisation may pose major obstacles in the fight against emerging and re-emerging infectious diseases in LMICs.

The effect of human-induced global environmental health challenges as evidenced by the problems associated with climate change may be harshly felt by LMICs in the coming years. While these countries may argue that they contribute less to climate change, in comparison to advanced economies, they (LMICs) may severely experience the blunt of climate change-associated problems such as emergence of environmental health conditions owing to their insufficient healthcare resources to combat same. Conversely, the advanced countries have high quality and adequate healthcare infrastructure to, somewhat, more effectively fight off health complications resulting from the changing environmental trends. Low resource settings need to adopt some local, contextualised measures to combat emerging and re-emerging infections in the years ahead.

6.1 Community resource utilisation in healthcare management

Community and traditional leadership can be marshalled to combat some healthcare challenges particularly in remote areas where mainstream healthcare facilities are either lacking completely or highly insufficient. Community mitigation measures have to be initiated and/or intensified through education and awareness campaigns. A large part of the population of many LMICs including Ghana live in remote areas who, due to information gap, do not have a good understanding of developments in relation to many health conditions; just as the emergence of COVID-19 had shown.

To make good use of community involvement in disease prevention and control, effective and efficient community engagement approach needs to be designed and implemented. In particular, key community leaders such as chiefs, assembly and unit committee members/opinion leaders should be involved in the local awareness creation and educational campaigns against diseases. These individuals are well respected in their communities and so would contribute to the dissemination of multilingual, contextually relevant public education and awareness campaign [20]. Where there are Community-based Health Planning and Services (CHPS) centres (mini health centres), the work of the community leaders will complement the activities of the CHPS staff. Also, most villages now have public address platforms where relevant, local information are passed on to residents. This is being used in some places during the COVID-19 pandemic to educate inhabitants. Such awareness creation may be intensified and repeated a number of times on these community platforms. In Kenya, East Africa, for instance, daily broadcast of COVID-19 adverts in local languages in communities were carried out. Central governments should also encourage community-based non-governmental organisations (NGOs) and decentralised governmental institutions located across the various districts to assist in public education on key health issues. This is because these organisations have established good working relationship with their respective communities and so have good understanding and knowledge of the local dynamics hence are able to deliver impactful awareness and education on major health conditions in their catchment areas.

6.2 Harnessing ingenuity and innovation in resource-scarce regions

When it matters most, when the lives of entire communities, cities and countries in some of the world's poorest places is threatened, ordinary citizens rose to the call. These citizens drew on their inherent ingenuity and devised preventive or protective apparatus against COVID-19. From very simple devices such as a handwashing plastic container with a tap fixed at one side of its lower part, popularly called Veronica bucket in Ghana, mechanised washing devices to solar and electricity powered handwashing apparatus as well as locally-produced digitised thermometer, a number of devices were manufactured within a short space of time during the COVID-19 pandemic. Interestingly, each new device manufactured showed to be an improvement over an existing similar device.

Similarly, many African countries saw the need to increase local productions of personal protective equipment (PPE). Ghana, for example, had unprecedented governmental support for the local textile industry to produce PPE including medical gowns and face masks in large quantities. Hitherto, these PPE are imported from countries such as China. Also, the increased level of technological innovation during the pandemic will be essential if the continent can fight emerging health threats in the future. Since the virus was found to be localised on surfaces including currencies, the predominant cash economies in Africa were at a disadvantage. Technological improvement led to an increasing pace of cashless payments including mobile money payments for public transportation and cost of purchased items. These and other innovative strategies were seen in places such as Ghana, Nigeria and Kenya.

Giving the innovative ideas shared and devices produced during the COVID-19 outbreak in many LMICs, it is not far-fetched to suggest that when people feel that their very basic existence as a community or nation is threatened, they are likely to come up with strategies and programmes to ameliorate the supposed daunting challenges. These innovations can be utilised in fighting emerging infectious diseases in many places.

6.3 Building of capacity of healthcare personnel as well as the establishment of the requisite infrastructure

Capacity building of the requisite human resource capital is critical if resource-scarce regions of the world will be able to win the war against emerging health threats. The often too inadequate healthcare professionals in these countries can no longer stand the test of time. Healthcare professionals ranging from health promotion officers, public health experts, community health assistants, laboratory technicians, pharmacists, nurses and medical doctors ought to be trained and frequently undergo continuous professional development so as to boost their capacity to effectively tackle health challenges in contemporary times. As has been clearly shown by COVID-19, advanced countries which serve as health tourism destinations for some citizens of LMICs cannot be available for use at certain times since they are also overburdened by cases in their respective countries. It, therefore, implies that elaborate and concerted efforts should be taken, going forward, to boost the capacity of healthcare professionals in LMICs if these countries are to survive the next deadly epidemic or pandemic.

Establishment of a state-of-the-art advanced laboratory alone is not enough. While this is a critical necessity, its maintenance is even more important taking into perspective the lack of maintenance culture in many developing countries. The importance of advanced laboratories in infectious disease prevention and management cannot be overemphasised. Accurate diagnoses and case management

are dependent on accurate laboratory investigations. In the same vein, accurate laboratory investigations are obtained from well-equipped, advanced laboratories, with sophisticated equipment. Unfortunately, most countries in LMICs lack the availability of such laboratories. Apart from the need for the establishment of such laboratories, maintenance culture, ironically, in resource-scarce countries is abysmally poor. Ordinarily, one would expect that such countries would rather maintain the few equipment and facilities in their possession. A culture of maintenance needs to be urgently developed in these countries. Standard operating procedures, where they exist, should be strengthened and vigorously followed. In instances where these do not exist presently, strenuous steps should be taken to, as a matter of urgency, put in such protocols. Without this, even should the establishment of advanced laboratories come to fruition, they will not adequately serve the purpose for their establishment. People who default in adhering to the maintenance routine should be penalised severely. This is because refusal to strictly adhere to such practices will result in mass murder in the foreseeable future as those facilities cannot be utilised when they are needed should the next epidemic or pandemic occur.

6.4 Private sector and donor participation in healthcare system development

Active involvement of the private sector was seen in the fight against COVID-19. In Ghana, for instance, the private sector and individuals mobilised and built an infectious disease centre, in record time, for the government and people of Ghana. More importantly, this is the first centre wholly built to serve as an infectious disease centre in the country. This is a great initiative that must be modelled, going forward, so as to help strengthen healthcare infrastructure in the country. Likewise, it is an initiative worthy of emulation by other LMICs.

As could be seen from the ongoing pandemic, no one country can successfully fight against a deadly infectious disease. Foreign assistance and careful utilisation of grants/aids and loans obtained from donor agencies and countries must be considered in the development of the healthcare system of LMICs. Unfortunately, misuse and abuse of healthcare support and aids have retarded the development of healthcare system in many of these countries. If countries will make any headway in confronting the challenges posed by emerging health threats in the 21st century, appropriate strategies have to be put in place to curb corruption in the health sector. The abuse of such financial assistance only enriches the few individuals involved but leaves the lives of countless number of people in danger as the intended infrastructure to be built will not see the light of day. Both the receiving country and the donor agency should enhance monitoring measures to ensure effective utilisation of such donations and apply severe sanctions on culprits who will engage in nefarious acts. It is through such means that resources can be put to their intended uses and provide the needed healthcare infrastructure in LMICs enabling the world to prepare and contain emerging infections.

6.5 Intensification of health promotion

Many countries in the global south have instituted health promotion programmes as an integral part of their national health policies. This is a cost-effective approach that can be utilised by resource-constraint countries. Health promotion ensures the adoption and inculcation of appropriate behavioural changes in the population so as to produce desirable results. Health promotion promises to achieve appreciable success in fighting diseases such as malaria and tuberculosis (TB) in Africa.

Emerging health threats in Africa such as cardiovascular diseases and obesity whose causes are linked to sedentary lifestyle and associated behavioural tendencies can be fought through extensive and coordinated health promotion approach. With the increasing burden of non-communicable diseases on the continent, health promotion may be instrumental in managing these conditions [3]. The middle class in these countries spend hours unend in their air-conditioned houses, cars and offices with little room for physical exercise. Fast food, rich in calories, in recent years, is a major delicacy for many in some developing countries. Frequent and consistent exercise and change in dietary content, for instance, need to be taken up seriously by the middle class in these countries who due to the nature of their work tend to live sedentary lifestyles. For instance, immune enhancing diet was highlighted by the government and health experts during the peak of COVID-19 in Ghana. This strategy could be used to fight off many infections.

6.6 Public education in fighting zoonotic infections

Over the years, deadly epidemics and pandemics have originated from human-pathogen contacts [21]. Notably, deadly infectious diseases such as EBOLA virus disease, influenza H1N1 and COVID-19 have been linked to animals such as bat and swine. There is the need for determined efforts by countries to reduce, where appropriate, these possible contacts. Similarly, the increasing change in human-animal ecosystem needs to be checked since this may be an avenue for spread of zoonotic infections.

There might be increasing contacts with hitherto un-encountered animal species. Human-pathogen contacts leading to infections of zoonosis types, for instance, can be reduced if appropriate steps are put in place. It is expedient that governments should institute awareness creation campaigns to educate the populace on the need to avoid excessive contacts of suspected animals. Bushmeat (meat delicacy obtained from wild animals) should be reduced as many of these animals may carry pathogens which may be harmful to human health. Being a major hub of bushmeat, LMICs need to increase surveillance of the consumption of the delicacy so as to reduce zoonotic infectious diseases [18, 19]. Hunters and other persons who may patronise these delicacies should be on the lookout for unusual signs and symptoms so as to quickly report to the hospital should any unknown sign and symptom be seen or felt. These would help prevent or reduce the possibility of getting infected with zoonotic infections in the future.

7. Conclusion

The fight against emerging and re-emerging infections and diseases needs to be won by all; irrespective of geographical differences. Through the collective efforts of both resource-scarce and advanced countries, appropriate measures could be put in place to strengthen the healthcare system of all countries. This is very necessary to build a resilient international health security owing to the interconnectedness of our world in contemporary times in which an outbreak in the remotest places can in no time reach the busiest of cities with its damning trails. Despite the need for advanced countries and donor agencies to assist resource-constraint regions of the world in building both the human and infrastructural capacity in the less developed countries with the ultimate aim of safeguarding the health of both regions, it is expedient that the less-developed nations draw on the strength of their basic and local potentials, as being exhibited in the COVID-19 fight. The battle against the

next possible epidemic or pandemic will be won if and only if individual countries institute appropriate measures (or are assisted to) so as to prevent, detect and contain any future outbreak.

Conflict of interest

None.

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