Review Article

Ebola virus disease in West Africa: a call to overhaul health systems in sub-Saharan Africa

Samuel Munalula Munjita[1], Mwaba Chileshe[2], Sikaniso Mutemwa[3]

[1]Department of Biomedical Sciences, School of Medicine, University of Zambia, Lusaka, Zambia.
[2]Department of Nursing Sciences, School of Medicine, University of Zambia, Lusaka, Zambia.
[3]Department of Anatomy, School of Medicine, University of Zambia, Lusaka, Zambia.
Correspondence to: Samuel Munalula Munjita, E-mail: samuelmunjita@gmail.com

Received February 3, 2015. Accepted April 11, 2015

Abstract

In March 2014, the World Health Organization (WHO) was notified of an outbreak of Ebola virus disease (EVD) in West Africa. This has turned out to be the largest and most heartbreaking epidemic since the first outbreaks recorded in 1976. There are several reasons that have made the control of this outbreak difficult. Broken down health systems, slow response, poverty, poor sanitation and local traditions such as kissing and washing of the dead top the list of challenges that complicated the control of the out-break. Unfortunately, these challenges are not limited to the three countries (Liberia, Sierra Leone and Guinea Conakry) most hit by Ebola virus disease but cut across many health systems in sub-Saharan Africa. The epidemic has not only highlighted the health challenges faced by many poor countries in sub-Saharan Africa but serves as an urgent call to overhaul the weak health systems. This article reviews the status of health systems in sub-Saharan Africa and provides possible suggestions to improve responses to future outbreaks of EVD and other infectious diseases.

KEY WORDS: Ebola virus disease, health systems, sub-Saharan Africa

Introduction

The current outbreak of Ebola virus disease (EVD) in Liberia, Guinea Conakry and Sierra Leone has claimed the lives of 10, 899 people out of 26,312 confirmed,probable, and suspected cases, from March 2014 to April 26, 2015 (1). EVD is caused by a single stranded, negative sense, nonsegmented, enveloped RNA filovirus belonging to the genus Ebolavirus. This genus has 5 species (Reston ebolavirus, Sudan ebolavirus, Zaire ebolavirus, Bundibugyo ebolavirus, and Taï Forest ebolavirus Virus. Zaire ebolavirus is the causative agent for the current EVD outbreak in West Africa. EVD is characterised by initial non-specific symptoms such as sudden onset of fever, malaise, myalgia, headache, abdominal pain, diarrhoea, and vomiting(2). The incubation period varies from 2-21days(2). Haemorrhagic symptoms such as haematochezia, epistaxis, bleeding from injection sites and haematemesis appear later in the course of the disease in approximately less than 50% of the patients(2). It is believed that humans initially acquire the infection from fruit bats of the Pteropodidae family but this suggestion remains a classroom theory as no infectious Ebola virus (EBOV) has ever been isolated from bats. EVD spreads from human to human through contact with infected body fluids such as blood, urine, feces, saliva, and sweat[2]. The virus is still transmissible from fluids of dead people (2). In the current outbreak, the spread of the disease was compounded by the slow global respose to the disease, very weak health systems and local traditions such as kissing and washing of the dead. There is no licensed vaccine or drug for treatment of EVD. Treatment is mainly symptomatic. The spread of the virus can be controlled through strict hygiene in hospitals and other affected areas, strategic quarantine measures, proper communication strategies about the disease, and the presence of functional health systems. Application of these strategies and presence of strong health systems enabled the United States of America, Spain, and Nigeria to control

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2015.03022015216	

Table 1: Density of medical doctors and nurses/midwives in three Ebola-hit countries in West Africa[6]

Country	Population (millions)	Density of doctors*	Absolute number of doctors	Density of nurses and midwives*	Absolute number of nurses/midwives	Ebola virus disease deaths up to December 31, 2014[1]
Sierra Leone	5,979,000	0.2	136	1.7	1,017	2,758
Liberia	4,190,000	0.1	51	2.7	978	3,423
Guinea	11,451,000	NA	941	NA	4,408	1,708

*Per 10,000 people (2006–2013).

the few cases of imported EVD from West Africa. Despite the inexcusable slow global response to the outbreak of EVD, the disease has exposed the weak health systems in the three countries(Liberia, Sierra Leone and Guinea Conakry) most hit by EVD. However, the harsh reality is that most countries in sub-Saharan Africa have very weak health systems.

Consequently, the health of many people, especially women and children, across sub-Saharan Africa remains in danger. One in six African children dies before the age of 5 and maternal mortality is more than hundred times higher than that in developed countries.[3] On average, life expectancy in sub-Saharan Africa is 54 years, 26 years lower than that in developed countries.[4] However, considering that many sub-Saharan African countries are only half a century old, a life expectancy of 54 years is not bad and it is 3 years higher than that in the USA a century ago.[5] On the other hand, many countries in sub-Saharan Africa will not meet the United Nation (UN) Millennium Development Goals for health to reduce infant and maternal mortality.[3] Sub-Saharan Africa's fundamental problem is a lack of access to primary health care, especially in remote rural areas, mainly due to inadequate health centers/health personnel and long distances to available health centers. Many people walk very long distances to access health care and the roads are non-existent or in very poor state for any mobile health services.[3] Knapp et al.,[3] writing in the *McKinsey Quarterly*, reported that conservative estimates indicate that 4 in 10 people in sub-Saharan Africa have no access to health-care facilities and/or health-care personnel. Furthermore, they indicated that only 60% of the sub-Saharan population has even nominal access to health facilities but the figure may be much lower when the number of doctors, access to drugs and equipment, and the productivity of health workers are put into consideration.[3]

The Health Systems in Sub-Saharan Africa

In 2006, the WHO world health report on human resources for health recognized 57 countries globally, including Liberia, Sierra Leone, and Guinea, that have a critical shortage of skilled health workers; among them 36 (63%) were in Africa.[6] According to the 2013 WHO (World Health Organization) report, Africa has a shortage of 1.8 million skilled health workers and only 1% of the global health expenditure is from Africa even though the continent has a 24% share of the global burden of disease.[6] The number of doctors and nurses in the three countries most hit by EVD is very low and considerable investments will be required to improve the current densities of doctors and nurses per 10,000 people [Table 1]. For example, health facilities in Liberia and Sierra Leone are understaffed by poorly trained and overworked health-care workers.[7] In addition, the majority of health-care personnel have little or no training in infection control and work in conditions that are not supported by sufficient logistics.[7] Personal protective equipment to protect health workers from infections are not always available.[7] Consequently, Ebola has taken a heavy toll among health workers in Liberia, Guinea, and Sierra Leone. Nosocomial transmission, where the health system becomes a reservoir of infections, has resulted in patients and health workers carrying the infection to the general population.[7] Sadly, this is also true for the majority of health workers and health systems in sub-Saharan Africa. It is not a surprising situation for Liberia and Sierra Leone bearing in mind that they are still recovering from the effects of brutal civil wars that ended about a decade ago.

The health systems of Liberia, Sierra Leone, and Guinea were barely functional even before the outbreak of EVD.[8] This outbreak is also making it difficult for people to get treatment for other diseases due to overburdened health care centers, shut down hospitals, frightened citizens shunning health centers, and health workers fleeing from the Ebola epidemic.[9] Clearly, the ability of the health systems of these Ebola hit countries to provide vital services for maternal and child health, HIV/AIDS, malaria, and other ailments has been compromised, resulting in increased mortalities from those diseases in addition to the lives lost from EVD.[7] In addition, laboratory facilities for Ebola virus testing are also in short supply. For example, before the arrival of donated mobile laboratories, Sierra Leone only had one proper laboratory to carter for a population of about 6 million people.[8] The challenges faced by these countries during this outbreak are a glimpse into the many health challenges faced by several countries in sub-Saharan Africa. Moreover, the EVD epidemic has aggravated the health systems challenges of insufficient financing, health worker shortages, insufficient diagnostic facilities, inadequate isolation wards and protective equipment, limited leadership to deliver quality health services, inadequate and/or lack of disease surveillance systems, and fragmented information systems in Liberia, Guinea, and Sierra Leone, the three countries most hit by the Ebola epidemic.[7] All these challenges coupled with porous/neglected borders, uncooperative communities, and a lack of experience with EVD made it very easy for the disease to spread from the initial source of infection in Guinea into

Liberia and Sierra Leone. This also affected the capability of the three health systems of these countries to recognize and respond quickly to the criis before becoming overwhelmed.[7] The response from the global community was also sluggish and something the world would want to experience again.

In several countries across Africa, the ministries of health are responsible only for employing health workers but not for the overall categories of health professionals who are educated, in relation to national needs.[6] In other words, data on the required skill mix, deployment, and distribution of health professionals relative to the health-care needs of the population are often incomplete, thereby creating an imbalance in the categories of health-care professionals that a country needs. In addition, poor coordination, misallocation of resources, and investment challenges are undermining the training of health professionals in sub-Saharan Africa.[6] To add salt to the already irritable wound, migration of skilled health workers from Africa to developed nations searching for greener pastures is one of the major constraints to development of Africa's health systems and provision of health care. Many African countries have little or no capacity to stop this scourge and it is likely to continue as long as the conditions of service for health workers remain poor. African countries with low health worker densities are hard hit by health worker migration unlike countries like Egypt and South Africa that have higher health worker densities per 10,000 people. The current context of globalization benefits only the rich nations while partly condemning poor nations to the gallows of poverty through the promotion of brain drain. Qualified health workers from sub-Saharan Africa have not been spared by policies that promote brain drain.[4] In France, they call it selective immigration policy; in Canada, it is qualified workers immigration policy; whereas in the USA, such policies are termed immigration by lottery procedure.[4] Whatever the name given to policies that promote brain drain, the effects of such policies on sub-Saharan Africa's health systems and provision of health care cannot be underestimated.

Sub-Saharan Africa's Expenditure on Health

Since 2001 when African governments signed the Abuja declaration to commit 15% of national budget to health, there has been a considerable percentage increase in allocation.[10] However, from 2000 to 2010, only five countries managed to go beyond the 15% mark of budget allocation to health [Togo (15.4%), Malawi (18.5%), Rwanda (23.3%), Zambia (16%), Burkina Faso (15.7%)].[10] Surprisingly, countries that exceeded the 15% target had greater support from external donors, suggesting that without aid, those countries would not have gone beyond the set mark.[1] Sadly, such extensively donor-supported countries are very vulnerable to retrogressive health shocks in the event donors pull out. For example, the ending of the World Bank's community response to HIV/AIDS program in Zambia in 2008 resulted in reduced support for orphans and vulnerable children and nutritional support to people living with HIV/AIDS.[11] In other words, health systems cannot be sustained by donations. Therefore, African countries need to become self-sufficient if they are to improve health care among its people because donor aid comes with restrictions that may not allow governments to use the aid in the way they want, resulting in stagnation of other health sectors not covered by the aid agreement. The average percentage allocation of African countries' national budgets to health increased from 8.1% in 2000 to 9.6% in 2010.[10] Decrease or increase in percentage allocation is not an accurate measure of improved or worsened investment in health unless it is analyzed alongside GDP and per capita investment. Regardless of the improved percentage allocation of national budgets to health, per capita investment in health in Africa has also grown over the past 14 years except in Cape Verde where per capita investment fell from $43 in 2000 to $34 in 2010.[10] However, sustainable improvement is still farfetched unless per capita investment reaches approximately $44 or above.[12] Overall, per capita growth and improved budget allocation in health in sub-Saharan Africa is diluted by lack of proper sanitation and clean water, poor nutrition, inadequate skilled health work force, lack of diagnostic equipment in hospitals, and inadequate clinic/hospital facilities in rural areas.[10]

Communities/Traditions–Health System Interaction

Africa is deeply rooted in its traditional values and any intervention to tackle any disease outbreak must always put these values into consideration. More often, disregarding these traditions and traditional leaders results in misunderstandings and obstructions to delivery of health.[13] Hence, a bottom-up approach is the most appropriate way of undertaking any health implementations to ensure that communities get involved and understand what they are getting into. The current EVD has provided insights into the need to involve communities in public health interventions. There are confirmed reports of people in rural communities of Guinea, Liberia, and Sierra Leone accusing health workers of spreading the disease and many are turning to traditional healers for treatment whereas others rely on self-medication.[7,14] Clearly, this is a reflection of the failure of ministries of health in all the three Ebola-hit countries and their partners to explain the transmission dynamics of EVD and the interventions they had put in place. Well-organized public health campaigns using the bottom-up approach involving traditional leaders and community health workers would have made the spread of this disease very difficult. When the public is fully educated about a disease and are fully involved to fight it, controlling a disease outbreak is simplified. The killing of eight public health workers by irate villagers in rural Guinea could have been prevented had the community been well educated and involved in health interventions.[14] In the initial months of the outbreak, the affected countries and NGOs could have

focused on carrying out vigorous campaigns to educate people on Ebola and the preventive measures that specific governments had put in place. Unfortunately, some of these measures came too little, too late.

In addition, many health workers had little or no training in proper infection control measures to protect themselves, the communities, and the patients.[13] Consequently, their initial role in preventing the spread of the disease to communities was diluted by their apparent lack of knowledge in infection control. To a certain extent, the communities were right to accuse the health workers of spreading the disease. Introduction of curfews in Sierra Leone and Liberia to contain the Ebola outbreak was also done without proper consultation and proper explanations to people in shanty communities; thus, the violence that the whole world observed was inevitable.[14] This Ebola outbreak has provided evidence that poor communication and lack of transparency raise anxiety, spread rumors, and encourage other counterproductive behaviors such as killing of health workers and blockage of health interventions. Therefore, it is important to understand that the interaction between communities and functional health systems is essential in controlling disease outbreaks such as the current EVD epidemic.[7] However, the clear lesson from this outbreak is that trust and effective communication between communities and health systems can only be built before the outbreak of any disease. Anything after that is a shear waste of resources and difficult to implement. A classic example where building trust and effective communication has helped fight EVD is Uganda. Since the outbreak of EVD in 2000, the Ugandan Ministry of Health continuously educates health workers and the general public on EVD symptoms.[7] For this reason, each subsequent outbreak of EVD in Uganda is usually smaller than the one before.

Way Forward for Sub-Saharan Africa's Health Systems

The current EVD epidemic in West Africa is a reminder of the brutal consequences of limited infectious disease surveillance and response capacities, broken down health systems, and the vast developmental needs that persist in sub-Saharan Africa and other poorer nations across the globe. Clearly, at the center of this epidemic is a matter of health systems. The performance of health systems across sub-Saharan Africa has been weakened by critical shortages of health workers, disjointed information systems, insufficient funding, inadequate diagnostic laboratories, and inexperienced leadership in the fight against infectious diseases.[15] Preventing and controlling future outbreaks of Ebola and other deadly infectious diseases will require a complete overhaul of sub-Saharan Africa's fractured health-care systems. Future investments on health must focus on training of more health professionals and community health workers, improving working conditions of health workers to reduce emigration to richer nations, building information systems/databases for effective statistics-based decision making, and building more diagnostic laboratories. Proper investments to overhaul sub-Saharan Africa's weak health system will require that the continent rids itself of complete dependence of donor aid and begin to benefit more from its vast natural resources.[16]

Sub-Saharan Africa is at the stage of development where community health workers are very important for fighting both communicable and noncommunicable diseases. Therefore, investments to train community health workers should be sub-Saharan Africa's top priority. Fragile and conflict-affected countries such as Cambodia, Democratic Republic of Congo, Haiti, Rwanda, and South Sudan have shown that deploying community health workers ensures that people in remote areas have access to essential health services.[7] In addition, community health workers form an effective linkage between health systems and communities. It is easier for authorities to effectively communicate to people on the outbreak of a disease and the interventions that a government has put in place through these workers. This is because they live within the communities and understand the local traditions that may sometimes be a barrier to delivery of health interventions. In other words, community health workers are keys to creating much trust and confidence between communities and health systems for effective delivery of health interventions. The current Ebola outbreak in West Africa has taught us that fostering trust and communication is key to building resilient and responsive health systems that communities will easily embrace.[7] Therefore, investing in health systems without establishing effective communication systems is fertile ground for conflict and misunderstandings.

Sub-Saharan Africa's investments in health must extend to the social determinants of health such as sanitation and nutrition. Investments in health are undermined by poor sanitation, poverty, lack of clean water, and poor nutrition.[12,17] As long as these determinants of health are not taken care of, the fight against infectious diseases in sub-Saharan Africa will not bear the expected results. The current Ebola epidemic in West Africa has clearly demonstrated that fighting diseases is not just about vaccines and infusing drugs but must be a multisectoral approach based on statistical evidence and social/economic/health needs of a country. Imported health solutions may not be the answer to sub-Saharan Africa's health problems. The Ebola epidemic has reminded us that the fight against infectious diseases is a global effort and requires significant investments in health systems and social determinants of health. It is encouraging that the donor communities are moving forward to quickly rebuild the health systems of Guinea, Liberia, Sierra Leone, and other vulnerable countries throughout the West African region.[7] This will include a focus on restoring equitable access to essential health services, training more health workers to build a sufficient health workforce, and ensuring preparedness and response capacity throughout the region.[7]

Conclusion

In summary, the heartbreaking and devastating Ebola epidemic in West Africa is a sobering call to overhaul sub-Saharan Africa's health systems. Sadly, the broken down and overwhelmed health systems of Liberia, Sierra Leone, and Guinea are also a reality across many sub-Saharan African countries. It is the duty of African countries and the international community to work together and fight trans-boundary infectious diseases. Overlooking this call is tantamount to digging our own graves.

Acknowledgments

We thank Mr Kelvin Mulungu for editing the grammar in this article.

References

1. Ebola situation reports. (WHO 2015, April 26). http://apps.who.int/ebola/en/ebola-situation-reports (last accessed on May 02, 2015).
2. Ebola virus disease. (WHO 2015, April). http://www.who.int/mediacentre/factsheets/fs103/en/ (last accessed on April 10, 2015).
3. Knapp T, Richardson B, Viranna S. Three practical steps to better health for Africans. *McKinsey Q* 2010; 1–8.
4. Sieleunou I. Health worker migration and universal health care in Sub-Saharan Africa. Pan Afr Med J 2011;10:55.
5. Arias E. United States life tables 2006. Natl Vital Stat Rep 2010;58(21):1–40.
6. Afri-Dev.Info. *Ebola Epidemic and Human Resources for Health Challenges: 2014 Africa Factsheet on Health Workforce*. Nigeria: Afri-Dev.Info.
7. Fustukian S, Cavanaugh K. Ebola emerges in fragile states: another "wake- up" call for action on health systems in conflict affected states? (Health Systems Global 2014, Nov 3). www.healthsystemsglobal.org (last accessed on December 10, 2014).
8. Ebola outbreak: weaknesses in health-care systems in Liberia, Sierra Leone Revealed. (CBC News 2014, December 11). www.cbc.ca/m/news/health (last accessed on December 15, 2014).
9. Dawson S. Ebola outbreak: Liberia's health care system "collapsing" amid epidemic. (The Independent 2014, August 7). www.independent.co.uk/news/Africa (last accessed on December 10, 2014).
10. Afri-Dev.info. (Post Abuja+12) 2013 Africa health financing scorecard-featuring year 2000 to 2010 indicative progress summary. Afri-Dev.info.
11. IFGH: What happens when donors withdraw? Community based organisations and the World Bank in Zambia? (Irish Forum for Global Health 2010, Nov 30) www.globalhealth.ie/ifgh-2010. (last accessed on December 17, 2014).
12. Africa Public Health.Info. 2012 *Africa Health Financing Scorecard*. AU July 2012 Summit, & Joint Conference of Ministers of Finance and Health (Africa public health.info).
13. Ebola in West Africa: gaining community trust and confidence. Lancet 2014;383:1946
14. Ebola outbreak: Guinea health team killed. (BBC 2014, September 19). http://www.bbc.com/news/world-africa-29256443 (last accessed on December 10, 2014).
15. Thomas C. At the heart of Ebola—health systems that need strengthening. (USAID 2014, Oct 6). usaid.gov/2014/10. (last accessed on January 5, 2015).
16. Beaglehole R, Sanders D, Dal Poz M. The public health workforce in sub-Saharan Africa: challenges and opportunities. Ethn Dis 2003;13(2):S24–S30.
17. Ross P. Ebola in West Africa: stopping future outbreaks requires building health care systems from ground up. (International Business Times 2014, Nov 10). Retrieved from http://www.ibtimes.com/ebola-west-africa-stopping-future-outbreaks-requires-building-health-care-systems-1721386.

How to cite this article: Munjita SM, Mutemwa S, Chileshe M. Ebola virus disease in West Africa: a call to overhaul health systems in sub-Saharan Africa. Int J Med Sci Public Health 2015;4:873-877

Source of Support: Nil, **Conflict of Interest:** None declared.