

Pandemic Control in Ghana

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Abstract

Ghana is a west-African country with many characteristics of particular concern when addressing the issue of pandemic prevention and control. Its tropical environment is ideal for the spread of the many mosquito borne illnesses such as malaria, yellow fever, dengue, Zika, chikungunya and other arboviruses. The close proximity of the living conditions of a majority of its people and livestock along with the presence of migratory birds creates the possibility of the transfer of zoonotic diseases to an immunologically naïve human population in this country. The lack of meaningful disease surveillance in this regard, along with the large number of people and animals transported else-where around west-Africa and then to the rest of the world, make efforts toward achieving pandemic control in Ghana important. This can be achieved by understanding the present health care system in Ghana and how it can be transformed into a health care system able to prevent and control a pandemic along with the changing of other human and animal management practices.

Pandemic Control in Ghana

Potential Pandemic Threat

Ghana is a west-African country with a primarily tropical environment. This part of the world is notorious for the persistence of mosquito borne illness such as malaria, yellow fever, dengue, Zika, chikungunya and other arboviruses. Although there has not been a known well documented outbreak of dengue in Ghana, it has been suspected that cases of dengue have been misdiagnosed as malaria. In any case, the conditions ideal for the vector mosquito *Aedes* exist, therefore, the threat of dengue is present. The same is true of Zika and chikungunya.

Tuberculosis is endemic. Undertreated cases are common; therefore, the risk of multi-resistant TB is ever present, so, then also, is the threat of the spread of resistant TB to susceptible populations world-wide. The usual host of diseases endemic to the sub-Sahara particularly: cholera, typhoid, anthrax, pertussis, varicella, measles, and infectious hepatitis are on-going. Ebola is in neighboring west-African countries.

Over 95% of livestock, which consists of cattle, sheep, goats, hogs and a variety of poultry are raised by small farmers with all varieties of animals living close to humans and each other. People and animals commonly share living spaces. Livestock production is an important part of Ghana's agriculture. This production contributes largely towards meeting food needs, providing draught power, providing manure to maintain soil fertility where crops are grown, and income, especially in the northern part of the country.

Livestock is of major importance in the socio-cultural life of the farming communities that dominate Ghana. These animals determine wealth and are used as payments of dowry. They act as a "bank" in times of difficulty. Sheep and goats are slaughtered for important occasions such as births, funerals and marriages.

Ghana hosts migratory birds which carry the potential of transmitting infectious diseases. Of particular concern is avian influenza. Given the fact that the vast majority of livestock is raised outside of more isolated confinement operations, exposure of humans and livestock to sick and dead migratory birds is wide spread.

However, the spreading of avian influenza from Asia to Europe is much more likely caused by the legal and illegal poultry trades. Recent studies have found, for example, that there were no secondary rises in infection when wild birds migrated south from their breeding grounds. Rather, the infection patterns follow the transportation systems of railroads, roads, and country borders. This suggests the poultry trade is more likely the cause of avian influenza spread. This too, then, becomes an issue to address.

The Volta River system, which includes the artificially created Lake Volta, dominates the country's river water drainage system. A careful analysis and understanding of this very large man-made lake is important to totally understanding any pandemic threat unique to Ghana and this part of west-Africa.

Ghana's Current Preparedness

The Ghanaian health care system is provided by the government. The healthcare system has five levels of providers: health posts, health centers and clinics, district hospitals, regional hospitals and tertiary hospitals. The health posts are the first level of primary care for rural areas.

Health care is extremely variable throughout Ghana. Urban centers are well served and contain most hospitals, clinics, and pharmacies in the country. Rural areas often have no modern health care. Patients in these areas either rely on traditional African medicine or travel great distances for health care. The true irony lies in the fact that only 32% of the population live in

the well served urban areas while 68% live in the variably served and under-served rural areas. After independence in 1957, health and education policies were aimed to make medical services more available and accessible. Unfortunately, these policies are still mainly targeted at urban populations with 76% of doctors practicing in urban areas while only 32% of the population live there.

Despite the existence of modern medical practices, traditional priests, clerics, and herbalists still remained important health providers, especially in rural areas where health centers are scarce.

Recommendations to Increase Resilience to Pandemic Threats

The staff in the health posts will need to have the knowledge and ability to recognize and monitor for the signs and symptoms of the conditions that could signal the start of a pandemic. They, along with the health centers and clinics, would need the knowledge and resources to intervene, investigate, quarantine, contain and treat. From my experience practicing clinical medicine in the remote rural area of northeast Ghana, presently, this is far from the case. Although this personal experience was limited to only three such clinics and my contact was only 1-2 hours each, my impression was that the health care personal had only rudimentary medical knowledge. The medical personal in the rural clinics I visited were mostly performing well baby and well child and adult care. They could, no doubt, recognize a person who was sick and recommend them to higher levels of care, but to recognize a case as having the potential for being an index case for a pandemic and then take the proper precautions is doubtful. Many of the infectious diseases that could lead to a pandemic present with signs and symptoms similar to one another and other non-infectious or less infectious diseases such as fever, headache, non-specific rash and muscle/joint pain. The existence, availability and use of rapid diagnostic tests

that are inexpensive, accurate and easy to use, would a great clinical benefit. Test results and symptoms relevant to pandemics would have to be noted at the health posts and reports made at least daily to a central authority for analysis. This would require staff at these health posts to be trained in such, and for staff at the central authority to be skilled on such analysis.

I saw no evidence of clinical protocols in place to aid in accomplishing this. Clinical protocols need to be developed by appropriate experts in the subject and distributed at the local level. The primary care medical personal in the health posts would require the training to identify when and how to use the protocols. Most importantly, they would need to “buy in to” the importance of doing so. Reviews would need to be done to confirm continued proficiency and diligence. The same would be true of those involved in domestic animal production, care and transportation as well as entities involved with wild life.

In order to respond effectively to a pandemic, is it essential a country has already in place a well-functioning health care system. As stated above, the urban areas are presently supplied with an adequate health care system for their present needs. Again, as noted previously, this only serves a third of the population and its capacity to expand in a pandemic to respond to the increased demands is doubtful. Adding to this, the tremendous increased burden caused by the influx of sick from the rural areas which are nearly devoid of the level of health care needed during a pandemic, would no doubt overwhelm and essentially “crush” Ghanaian health care as it presently exists. To respond to a pandemic, the Ghana health care system needs extensive expansion and presence in the underserved rural areas of the country.

In order for a country to survive a pandemic, that country must start with a robust health care system. To have the health care system needed to move Ghana from its present state to one that can deal with pandemics will require a significant investment from outside sources which

will no doubt be from the more affluent western world. Opposing the effectiveness of such funding will be the overwhelming corruption which will result in the disappearance of funds from inside and outside sources if safeguards are not put in place to manage the funds. However, if you put those safe guards in place, the permits and access you need to do what needs to be done, will not be granted. One commonly is left to estimate the true cost, add on another 30% minimum for African corruption, and proceed.

Required Resources, Potential Obstacles and Benefits

The lack of monetary resources will be an immense obstacle. The government of Ghana has a history of having problems with health care finance for as long as it has been an independent country. In 1957 at its founding, health care was provided to all Ghanaians by the government. Health care was financed entirely through general taxation. However, predictably, with free health care and large government spending, Ghana found itself struggling economically. By the 1980's, many social services, including healthcare, were inadequate and could not provide sufficient care and drugs in the context of healthcare being essentially free. Finally in 1981, the World Bank and International Monetary Fund pressed the government to cut public spending resulting in the Hospital Fees Regulation law which led to the requiring of Ghanaians to pay out of pocket fees at each point of service. This resulted in many lower and middle income Ghanaians being denied health care due to their inability to pay. In spite of being unpopular, this policy is credited with restoring financial stability at the time. The election of the New Patriotic Party in 2000, led to change, once again, and more care being provided by the government. Presently, the World Health Organization provides money and support to provide western medical care to Ghana.

Language will be an obstacle to effective pandemic control, as it will hinder communication. Although English is the official language in the majority of Ghana, very little of it is used outside official business. There are 50 indigenous languages with 11 more dominant tribal languages taught in the schools. Educational efforts in the public and private school systems to achieve and maintain proficiency in a common language is needed.

Transportation is a problem as true roads in most of the country are extremely poor to non-existent. This will adversely affect the movement of government and medical personnel as well as needed medicine and equipment to control a pandemic. The control of a pandemic will require the ability to quickly and effectively treat infected persons. Given the poor transportation system in Ghana at present, the transportation of medicine is greatly compromised. Aside from simply building a better roadway system, other existing technologies can help. In April 2019, Zipline began what is called the Ghana Drone Delivery Service which delivers vaccines, blood, plasma, and drugs to remote areas. Zipline works by having health workers place their orders via text messages. The deliveries arrive via a parachute drop within about 30 minutes. The drones have a round-trip range of 160 kilometers. It is estimated this can reach about 12 million people. Similar or identical services need to be developed and implemented.

The economic burden that would be placed on the majority of Ghanaian people in a country-wide “lock down” is completely impractical. Approximately fifty percent of Ghanaians live by subsistence agriculture. In this state of economic deprivation, one works today in order to feed yourself and your family today. The expectation of being able to live for two weeks without working and otherwise foraging for food is unrealistic. Further economic advancement will be required before controlling a pandemic by such measures can be utilized.

Poultry and the threat of avian flu can be used as a specific example of the complex problems involved. In the 1990's, the poultry population in developing countries such as Ghana grew 60%. This resulted in an increased prevalence of avian influenza. Improving Ghana's ability to control this problem will involve restructuring commercial markets to improve biosecurity against avian influenza. Zoning to limit poultry farming to specific areas outside of urban areas will be necessary. There will need to be a limit placed on the number of poultry traders and producers by requiring them to be licensed and stringent inspections of traders and producers will need to be made. These recommendations along with requirements to fence and house all poultry, limiting free ranging flocks, will lead to fewer small back yard producers eliminating part of their livelihoods. Obviously, some manner of economic development and transitioning will be required to provide for other means of making a livelihood.

Another approach would be to prevent and treat infected birds as opposed to letting the poultry die. Vaccines for poultry exist against several of the avian influenza strains. The World Health Organization encourages control measures for avian influenza through mass vaccinations of poultry. There are compulsory strategic vaccination programs in some countries at high risk for avian influenza spreading, although vaccine supply shortages are a problem. This would require a cost benefit analysis.

Culling is used to decrease the threat of spread from already infected birds. Such measures has its greatest devastating impact on backyard producers and small scale commercial facilities. Since poultry is a source of food security and a liquid asset, those who suffer the most are poor small scale farmers, many of whom live on incomes of \$2 a day. The loss of food security during culling of poultry has been seen in the stunting of growth in children under five

in Egypt. This also puts women in particular at risk, as small flocks are tended to by women at times. Widespread culling resulted in a decreased enrollment of girls in school in Turkey.

Understandably, the threat of having your poultry culled leads to willful non-reporting and underreporting of potential index cases, a phenomenon that will severely limit any pandemic control program. A program for compensation from the government or world health organizations will be necessary to over-come this.

Essentially identical circumstances exist with regard to the pork industry in Ghana. This part of the world has had a successful experience in controlling African Swine Flu (ASF) over the past two years. Although ASF is not a threat to humans, the possibility of a version of the swine flu pandemic reminiscent of 2009-2010 originating from or spreading to Ghana given the present conditions and rising prominence of the pork industry is a concern that will need effective measures in place to plan for it.

Plan for Implementation of Interventions

Clinical protocols need to be developed by appropriate experts in the subject areas and distributed at the local level. The primary care medical personal in the health posts will require the training to identify when and how to use the protocols. Reviews would need to be done to confirm continued proficiency and diligence. The same would be true of those involved in domestic animal production, care and transportation as well as entities involved with wild life.

As is always the case, economic development and health care effectiveness and positive health care outcomes are intimately interlinked. A country cannot advance economically if its work force is ill and under the constant threat of the deadly impact of epidemics. Neither can a health care system capable of ensuring the health of its population, even in the face of an epidemic, exist without a vigorous underlying economy. These must go forward, hand in hand.

Coordination and cooperation of the government of Ghana with the World Bank and International Monetary Fund would be necessary to achieve the monetary capability to develop the needed health care system noted above along with the economic reserves to compensate those whose animals might be culled and Ghanaians who would face a transition from their present livelihoods.

Strategy for Building Support for Implementation of Interventions

In Ghana, most health care is provided by the government and is largely administered by the Ministry of Health and Ghana Health Service. One would have to gain an understanding of how to work with these agencies to promote the training and education needed among the health care workers. These agencies would also be responsible for treatment of sick individuals, tracking cases and contacts, and quarantine measures. It would be best to have a central “pandemic surveillance and readiness” agency, but to my knowledge no such agency exists.

Vaccines will most likely be developed in more developed countries leaving the country of Ghana with the responsibility of having a system for distribution. Vaccines could be given at health posts already in place. Since readiness for pandemics requires monitoring the health of domestic and wide animals, the government agencies under which these fall will have to be determine and accessed.

Unfortunately, overlying all the above, is a prevailing cultural philosophy of fatalism. Whatever efforts are put forth, those involved in these efforts need to understand life as many Africans understand it. Close personal relationships must be made at all levels, over long periods of time, to gain the personal trust needed for success to occur. Cooperation will be necessary amongst the tribal leadership. Everyone must feel they have a voice at the table.

As is true of the rest of world, no country lives in isolation. Anything that can go wrong and lead to the next pandemic in Ghana will quickly spread to the rest of West-Africa and visa-versa. But, we must start somewhere. Ghana is regarded as having the most political stability and the best health care system in the region. This makes Ghana a good candidate for a place to start, a place to see what works, what does not work and how best to address the issues involved in pandemic control and resilience.

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