Management of Epidemic in Africa; should Science Seek the Help of Law?

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ABSTRACT

Preceding the introduction of institutionalized regulatory system, the relationship between science and law first satisfies the individual basis for existence before considering any room for collaboration. Meaning, at that time, the relationship was not collaborative. Both science and law were individually concerned with what each do and not what the other does.

This research article explores the science and law relationship in order to understand possible strains and identify the underlying factors affecting epidemic management. Human health, as primary beneficiary of scientific inventions and innovations has seen challenges that science alone has not been able to solve. Developed countries have better structures for managing health issues, yet intervention of law, though obligatory, it's still doing more to catch up with evolving developments for the sake of protecting human health. Africa is a developing continent facing challenges in managing epidemic. There has not been shortage of scientific inputs into how best to respond to sudden breakout of epidemic, but there is lack of regulatory directive that is beyond the level of an administrative plan. The question of if science is governed by its own laws and may not necessarily need a conventional law in certain situations such as epidemic breakout is answered by examining the theoretical approach of scientific law as different from specific scientific theory. While there are scholarly opinions from the comparison of their importance- for example, the assertion that science is the best tool we have to understand the problem of the natural world, this research article steps forward to assert that understanding alone does not produce the solution and if it does, administering the solution does not have to rely on science alone. Study of the impact of science in responding to epidemic breakout without subjection to or in collaboration with law is made by studying the Ebola crises in Africa; a comparative study of how Nigeria, Liberia and Sierra Leone responded is presented here and the role of law identified, though there was no definite scientific solution at that time. This helps in giving a concise view of the challenge scientific effort alone will face in a possible pandemic situation like the coronavirus situation and the role of law.

Key words: *Science, Epidemic, Comparative Law*

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Introduction

Science as a field that has experienced a domineering rise in its relevance to life and the society in general was initially given an isolated space to operate independent of the law. Great scientists and inventors never attracted the attention of policy and law makers until their invention breaks through the wall of societal unbelief. Even at that, society and the law regulating science only concerns itself with the physical impact they see and not the possible effect they have perceived. Amid the cravings for more solutions, society identifies more problems they hitherto passed to be part of normal living.

At the advent of medieval science, as it were then, there was the Church and the Crown that were the overall regulatory institutions and had absolute powers to regulate science[1]. At that time, the Church finds any scientific postulation or invention that appears to alter any act of God as treacherous. This shows that there was never a lack of regulatory control over science, howbeit discretionary or statutory. Science has always wanted to be independent of any control mechanism. However, can science solve the problems before it without the input of law? The question has an air of correctness and it's within this context that this article examines the approach in how medical science has been confronting the challenge of epidemic breakout in Africa and if and where law can be helpful in a collaborative approach.

This article analytically studied the relationship between science and law; identify where they have agreed to work together and where one had restrained

the other. Then it looks at how the relationship has affected or impacted on management of epidemics in Africa using a comparative method in descriptive form. In furtherance of understanding the peculiarity of what I call the African situation, the basis of what the challenges in managing epidemic in Africa rests on will be explained in three perspectives: culture, conflicts and cooperation. The three "C"s will help provide us with the view of where the successes of medical science have been overshadowed by factors that are peculiar to the African ecosystem and if law would have helped in avoiding or minimizing the possibility relapses experienced.

Interrelation of Science and Law

Philosophical scientists in giving a meaning to science asked two questions about science; first, what are the aims of science? Second, how should one interpret the result of science? Karl popper refers to this questions as central in understanding the distinction between science and 'nonscience'[2]. The answer given to the first question is; science attempts to seek the truth about observable phenomena. That answer is often relayed by scientific realists who believe the findings of science must be seen as true, approximately true or likely true. Antirealists disagree with such revered description of science. They admit that science is useful even if its discoveries are unlikely to be true. The law and science relationship has been a subject of social discuss that gravitates towards the notion of the morality to allow what is naturally within the control of nature or human discretion to be improved upon [3]. I choose the word "improve" because medical science in particular will never agree that it does anything that contributes to making life less desirable. Human being had and still has a sense of absolute entitlement to their body and so should have total control of affairs that concerns how their body generally or in parts are cared for, alive or dead. For example, our belief in the absoluteness of our right to our body has been extended to even right to die and decide how to die [4]. Because there was lack of clarity in how the aforementioned rights are applicable to an ever evolving social system, science appears to be at the mercy of either the individuals that can decide what to do with science or authorities that choose what they viewed as being beneficial to them as an institution. As scientific innovations began to contribute more towards the certainty of life, law began to find its way around understanding how medical innovations are administered on humans. At that stage, humans began to have a feel of how law can impact on science.

The social context that provides the premise for the advancement of medical science is supplied by law not as a way of solidarity with science but has duty to ensuring that the society does not fall a victim of what only a minority understands. However, much of the tension in the relationship between science and law has been with, first, the fast pace of development of science and law trying to catch up. Second, the divergent views of proponents and opponents of either sides on which is making the society better or worse, and thirdly, which should consult the other [5].

The understanding of how medical science should relate with law has elicit discussions that revolves more around rights than normative legal procedures. For example, the question of whether right to die exist just as right to life; right to quality health care or right to choose health care; right to preventive medical procedure or right to refuse immunization or vaccination are subjects of legal debates and litigation in parliaments and courts in different countries of the world [6]. Discussions around these legal issues have gone beyond theoretical introspection to practical and real happenings that have sought and, in some cases, gotten the intervention of Courts in different jurisdiction, albeit producing different decisions. Such judicial interventions predate the era of rapid technological inventions driven by the introduction of the Internet. For example, In the United States of America, the Court ordered that a Kidney be removed from a 27 year old institutionalized mentally ill patient and be donated to his brother who was suffering from a fatal kidney disease [7]. This case sets a precedent for another where a Court in Texas ordered the transplantation of a kidney from a 14 year old girl suffering from Down syndrome to her brother [8]. Furthermore, on a larger scale of intervention of law in medical science, regulatory control of how scientific innovations are administered has been the main junction of interaction between science and law. Even at that, science and law do not enjoy such a comfortable relationship, and the tension is nothing new giving the notion by scientist that regulation can be overcautious at times. In Africa, there have been dire situations that called for a large scale medical science interventions, how such interventions have been successful in some areas and failed in other areas can be a subject of review of the interaction of science with law in managing such peculiar situations.

Epidemic Breakouts in Africa

Africa has suffered and still suffering from some epidemics in the past seven decades. Three notable ones are Meningitis, Polio and the most recent which is Ebola virus. Most of the epidemic crises are country- confined crises that later became regional crises. There has never been continent-wide crises, but the entire continent is always on its toes when a highly contagious virus breaks out in any part of the continent.

Cases of three countries are studied and the successes of science in each of the cases highlighted and

analyzed to understand how effective was or is the management mechanism adopted by medical scientists in each case with or without the input of law. The countries under review by this study are Burkina Faso, Nigeria, Sierra Leone, Liberia and the Democratic Republic of Congo.

Meningitis: Burkina Faso

Burkina Faso is a West African Country with a population of about 20 million [9]. It has suffered severally from hyper endemic rates of meningitis. In 2002, there was the largest reported outbreak caused by the n. meningitis serogroup W135 with almost 13,000 suspected cases [10]. During the period of the outbreak, the highest attack rate was recorded amongst children within the age bracket of zero to 5 years old. Vaccine against the W135 serogroup is expensive and was in short supply. The government of Burkina Faso has always been in a situation of helplessness in the area of medical research and treatment due to the overwhelming nature of the national crises, the economy and poor medical infrastructure of the country. So far, from 2002 to February 2019, the country has been receiving support from international partners in combating the epidemic.

In response to the challenge, the Ministry of Health in collaboration with the World Health Organization, the Center for Disease Control and the Association for Preventive Medicine set up scientific group to serve as a crises committee [11].

Study has showed that collaborative efforts of international scientific partners with the government has helped in saving hundreds of thousands of lives in the past 17 years' history of meningitis epidemic breakout in Burkina Faso [12]. Much focus has been given to scientific and social approaches to the management of meningitis epidemic in Burkina Faso. However, in spite of several vaccination campaigns, outbreaks of meningitis have been reoccurring.

Ebola: West Africa - Nigeria, Sierra Leon and Liberia

The Democratic Republic of Congo (DRC), a former Belgian colony with an estimated population of 85 million people comprising of over 200 African ethnic groups has been existing with the painful experience of the deadly Ebola virus epidemic [13]. Ebola virus disease (EVD) is a severe and highly contagious disease that first caught the world's attention in 1976. From the DRC, it has spread to some other African countries, especially in West Africa. The frequency of its out breaks halted for some years as no cases or outbreaks was reported between 1979 and 1994. However, from 1995 the frequency of outbreaks has increased in a with the DRC recording case fatality rate of up to 89% in 2002/2003. On 1 August 2018, the DRC declared its tenth outbreak of Ebola 40years. It is reported as the country's largest-ever Ebola outbreak. Also, it is the second biggest Ebola epidemic after the West-African outbreak. From 2018 till date, over 2500 cases have been reported with more than 1700 deaths [14].

In 2013, the Ebola epidemic broke out in West Africa but was reported to the World Health Organization (WHO) in 2014. It spread across Liberia, Nigeria and Sierra Leon between 2014 and 2015. In Nigeria, the first case was a diplomat that traveled from Liberia to Nigeria through Lagos. Through him, the virus spread to 19 laboratories confirmed EVD cases. In Liberia, the Ebola crises almost lead to the complete shutdown of the entire country as over 113 new cases were reported within 24 hours on a particular day and out of total of 15 counties, 14 had reported cases. Sierra Leon also had a very terrible situation with 1,026 reported in August 2014 alone.

The attention of the world was on West Africa with the international community seeking for collaborative ways of containing the epidemic.

Since the beginning of international collaborative efforts towards finding a way to overcome the epidemic, it has shown that the only way to available for now is to prevent and control the outbreak and spread of the disease as finding a cure in the near future is not a realistic goal. International attention and effort against Ebola increased during the 2014/2015 outbreak that affected several West African countries. At that stage the need to collaborate and build on the existing candidate vaccines that could be developed for clinical evaluation became very urgent. On 8 August, 2014, WHO led by its Director-General declared the EVD a Public Health Emergency of International Concern [15]. The declaration was followed with a chain of wide consulting processes that involved interactions with international scientific, ethics, regulatory, vaccine development, public health partners, industry and funders' communities.

Indeed, it's been a long while that the world witnesses a global response that is as coordinated as the response to the 2014/2015 EVD crises. A comprehensive research and development of policy and pathway for production of vaccine was a priority. For the sake of the urgency of the situation at that time, it was agreed that the WHO should be the institution to oversee and coordinate the effort of the scientific and research organizations pursuing the development of a vaccine. It is interesting to note that at the time the global effort for a vaccine against EVD was ongoing in 2014/2015, the EVD was not at the level of Epidemic situation in DRC. Subsequently, the interaction of the WHO with government representatives, development partners and representatives from Ebola-affected countries, scientists, vaccine manufacturers,

regulatory authorities, international organizations, funding agencies and civil society representatives led to consensus on three important commitments [16]:

- That the first phase of the clinical trials of the vaccines that have been discovered to be most advanced and hold stronger hope should be accelerated and concluded promptly. Also, before 2014 ends, trials should be initiated in the three most affected countries, notwithstanding the pending results from the first phase of the clinical trials and candidate vaccines must be tested until proved to be unsafe or ineffective for purpose.
- Pharmaceutical companies that have been working on developing vaccines for EVD should commit to increasing their production capacity in 2015.
- Social engagement should be generated between local communities, national governments, and other stakeholders to ensure success.

These are the key responses of each of the countries to the Ebola Epidemic.

Nigeria

The virus entered Nigeria through the very busy Lagos Airport on 20 July 2014 when a traveler whose close relative just died from Ebola in Liberia arrived to attend a scheduled meeting. He is a diplomat so the protocol officer that picked him up was identified and confirmed to have contracted the virus. Other contact persons were swiftly identified, traced and tested. Those that were confirmed to be infected were isolated at a special infectious diseases center. Strategic emergency centers were set up in readiness for the detection of other cases outside Lagos. Also, surveillance and was heightened at all port of entry into the country. Finally, there was regular sensitization of the public on what they should do to protect themselves and contact persons they should call if they suspect anyone around them have contracted the virus.

Sierra Leon

First the government set up of the National Ebola Task Force which further expanded into a national response mechanism with the traditional institution incorporated into the response mechanism. Nominated members of communities were trained on tracing contact persons, social orientation and mobilization and laws were made restricting movements.

In July 2014, it dawned on the government that the national task force mechanism was not functional. Subsequently, the Ministry of Health Services established an Ebola Operations Center (EOC) in July. The EOC was co-coordinated by the Ministry of Health Services (MOHS) and the WHO and comprised of the government officials, United Nations (UN) representatives, and other international partners. It was later discovered that the EOC is also not performing as expected, so the President set up the Presidential Task Force on Ebola and the EOC reformed. The EOC still did not help the situation. The president ultimately reached out to the UK. The UK responded by sending military and civilian personnel to set up a proper response architecture. Based on the advice of the UK government, the President established the National Ebola Response Center (NERC) to be under the control of the Minister of Defense of Sierra Leon. Also, there are District Ebola Response Centers headed by appointed district coordinators. The NERC and the DERCs were operational until January 2016. In March 2016, Sierra Leone was declared Ebola free by the WHO [17].

Liberia

Liberia had the worst-case situation during the 2014/2015 Ebola epidemic crises because the health system lack the physical infrastructure and resource structure to respond to the situation. Just like Sierra Leon, It has still struggling to get to its feet after a bloody civil war which made it extremely difficult to even organize a local response mechanism when the epidemic broke out. Unlike Sierra Leon, who made some efforts at the local level before reaching out to international partners, the response to the Ebola epidemic was spearheaded by a combination of nations and international organizations. The external response partners met no local response mechanism on ground and did not bother to exploring the setting up of any before taking actions. The result was that even with the competency of medical scientific resources they brought into Liberia, the situation grew worse.

The global approach to the EVD crises of 2014-2015 accelerated the production of vaccines and presented the vaccines presently been administered in DRC following the most recent outbreak of EVD in 2018. Presently, the vaccine (rVSV-ZEBOV) being administered using the ring vaccination strategy is showing positive results. But factors such as the free movement of persons across border countries and most importantly the conflict in the affected regions of the DRC was not allowing the success of the vaccination campaign to achieve the desired objective until movement across borders was suspended and the movement in the affected areas restricted. March 4, it was reported by the WHO that the last Ebola patient in DRC has been discharged [18].

Polio: Nigeria

Nigeria, a West African country with a population

of about 200 million has been facing the challenge of eradicating a virus that has caused its victims much pain and even threatened the level of productivity of most affected areas [19]. The virus is called the Polio virus. It is an Enterovirus that occurs naturally in humans. When it's most severe, the disease attacks the nervous system thereby causing paralysis, muscular atrophy, deformation and in some cases death. Developing countries are more vulnerable to it. In 2012, the polio situation in Nigeria rose to serious crises level. Nigeria became Africa's only remaining polio endemic country. The Northern part of Nigeria has been most hit by the virus. According to WHO report, Nigeria accounts for 77% of cases of polio in the world.

In the fight against polio in Nigeria, the government and international partners have embarked on massive vaccination campaign which led to Nigeria celebrating a full year and a half without a new case of wild full blown polio virus. Though in 2016, there was a set back as three new cases were reported, so far the vaccination campaign has been celebrated as successful. However, the frustrating experience has been that just when the country is almost celebrating total eradication of polio, a new case is reported from somewhere. It shows there is a gap somewhere that medical science alone cannot help.

Legal Considerations in Epidemic Control

In the intervention of medical science in an epidemic situation, anywhere in the world, there are legal considerations that draws the line on how government allows or applies science to managed the crises. There is the question of the rights of the infected, the suspected infected and the rest of the population that needs protection. There is also the ethics of medical practice that can put constrains on the medical scientists even at the expense of their rights, depending on the situation and jurisdiction. Two fundamental human rights as enshrined in the United Nations Universal Declaration on Human Rights have experienced limitations or outright suspensions in different parts of the world during epidemic situations; right to privacy and right to freedom of movement.

Members of the United Nations recognized these rights by enshrining them in their national law. However, there are varying degrees of limitations that individual national laws have listed as exceptions to the rights. Some countries have expressly mentioned "for the general welfare of the people" as condition justifying limiting or suspending the exercise of these rights. The present Coronavirus epidemic which originated in China and causing serious emergency in countries around the world has seen nations exercise states powers limiting the rights of citizens and residents as parts of efforts to control the spread of the virus [20]. In Russia, a woman who returned from China and reported sick in a hospital in St Petersburg was quarantined by doctors. Upon being tested after treatment for another illness different from Coronavirus, she was told that she is healthy but will be quarantined for two weeks. She fled the hospital, but a St Petersburg court ordered that she be confined to the hospital [21]. Three other people have been reported to have escaped from different quarantine facilities within Russia. This has put to test the Russian law which provides for the right for freedom of movement [22] on conditions upon which such rights can be suspended by the state in the interest of the general population. It is interesting to note that the recent order of the court may be contested in future in the light of Russian health protection law which guarantees the right of Russians and residents to consent to or refuse medical intervention [23].

In contrast, China, where the epicenter of the Coronavirus epidemic is located has been responding to the epidemic without any legal framework that should guide the government and medical scientist on how health of everyone can be protected within the confines of national and international human rights law. The approach has been ore of "martial law" approach with the lockdown of the Wuhan city, forced quarantine of suspected infected persons, forced hospitalization and isolation of persons. Videos of persons being forcefully dragged from their homes has been shared on social media [24]. The word "forced" is used because there is no legal backing for the actions of the Chinese government. The Chinese president admitted the huge gap created by the lack of legal framework for an epidemic situation like the present one when he said, "the nation's legal system had a key role to play in helping to contain the virus" [25]. He further said, it is essential that laws covering the trade in wild animals and the management of public health incidents are strictly enforced.

Summary Analysis

In addressing serious crises that involves lives, medical science has done so much and still seeking for more ways of getting solution to emergency health crises ravaging various countries around the world. In the case of Burkina Faso and Nigeria, the governments of both countries were able to integrate policies of government with the approach of the medical scientist. However, policies, especially in developing countries are like unanchored ships. They are at the mercies of waves of political circumstances. That is why, results achieved when there was a response to an epidemic outbreak is more likely to be unsustainable and then increasing the risk of another outbreak. For example, in Nigeria, the vaccination campaign against polio was on a steady course until there was an issue in the Northern part of Nigeria

which was raised by a section of Muslims there. They suspected that the vaccine could affect the fertility of recipients. That caused a set back and some new cases of wild blown polio were reported. At the end, it was not about if there was not a consensus on policy applied, it is more about the exposure of the scientific approach to political conflicts of interest. Of the three cases, the most challenged for science is the ongoing case of DRC. Vaccination campaign is not been taken serious by the people as many are skeptical about its efficacy and side effects. Science has done its part, but laws are needed to be made and enforced that will make the work of science impactful.

Where the relations of science and law is defined as collaborative, the question of how legally prescribed measures that help in controlling the spread of viral diseases in epidemic situation infringe on human rights of people is a factor that some countries may find difficult to balance the imperative of the scientific intervention. For example, where the law allows forced hospitalization or restriction of movement and same country has laws that recognizes the right of the citizens to reject hospitalization and freedom of movement. Interestingly, for a country like China that has an unenviable record human right record, the people still find it difficult to understand why the measures of forceful hospitalization is justified for the protection of the entire population. It shows that countries with good human rights record will find it more difficult to implement measures under the law that will suspend the rights of certain individuals or persons in an epidemic situation.

Individual rights versus public interest in an epidemic breakout

Rights are not in all cases enshrined as absolute. Article 29(2) of the UDHR provides that rights and freedoms of persons can be fettered on the grounds of protecting the general welfare of the larger population. The provision of the UDHR, though general and not specific, mirrors the legal qualification national laws may grant clauses that are exceptions to the rights guaranteed by the constitution in ensuring that the public health is protected. The case of Kaci Hickox is illustrative of the difficulty in finding a balance between individual rights and public health which is a collective right, even if not explicit enshrined as such [27). Kaci Hickox is a nurse attached to Doctors Without Borders (DWB) she was stationed in Sierra Leone where she worked with patients that were infected with the Ebola virus. Upon her return to the United States, she was quarantined first by officials in New Jersey and then by the government of her home state of Maine. She breached the quarantine and claimed that the order violates her human right to freedom of movement. She won at the court and told should could self-monitor in her private home during the incubation period.

In Russia and the United States, the different positions of the courts on individual rights verses public health has implications on divergent scale. In the United States, the court may have a different opinion if the country were in danger of a widespread epidemic situation.

Conclusion

How can Law Help Science?

Intervention of science in the management of Epidemic in anywhere in the world will need a firmer and sustainable approach. The only way that can be achieved is by having an institutionalized approach that is backed by statutory laws and not administrative directives. For example, if scientists believe vaccination campaign has to be done to achieve the desired result, certain restrictions have to be enforced, administrative directive alone will not enforce such restrictions. However, before any legal backing can be given to an intervention of science that could temporarily suspend certain legal rights in an epidemic situation, three factors need to be carefully considered; Conflict, Culture and Cooperation. Conflicts in countries such as DRC where there is Ebola epidemic, makes the work of medical scientists to be more difficult. Same with the Boko haram crises in the Northern part of Nigeria, that has claimed the lives of several health workers helping with the vaccination campaign in the areas affected by the conflict. An enforceable state of emergency will be needed for a successful and sustainable medical intervention.

Cultural differences are the second factor that should determine the legal backing that the work of scientists will need to effectively in epidemic situation in African countries. Most African societies practice conservative cultures and it will be difficult if not impossible to change what they are ancestrally attached to. For example, some tribes in DRC, the culture is that the corpse of the dead must be washed by relatives before burial. Such practice opens up 90% chances of being infected by Ebola virus, thereby frustrating the efforts of science as circle of infection will continue to get wider [28]. In 2014 when Liberia had the outbreak of Ebola, the government introduced cremation and it caused a serious uproar as relatives of infected persons stopped reporting incident of death to the government. A law can be made where designated persons undertake the final rites in a safe way in the presence of the family members.

Cooperation amongst the countries sharing border with countries(s) experiencing epidemic is a major factor. For example, countries that form the Economic Community of West African States (ECOWAS) regional economic block in West Africa have a protocol that allows free movement of persons across

borders. Indeed, that is a level of cooperation within the context of economic cooperation. However, in a situation where movement of persons across borders is putting the lives of millions of people within the region at great risk, then no matter how hard science tries to help in managing an epidemic, it will not make any headway. Perhaps that was the thought of Austria when it recently announced suspension of train transport to and from Italy because of the increasing rate of incidents of persons infected with the Coronavirus in Italy. There can be a strict enforcement of conditional right to movement of persons, such that only those identified to have been vaccinated will be allowed to enjoy free movement across borders. The present crises in Covid-19 pandemic needs the interventions of law in restricting movements and making vaccination compulsory when a vaccine is developed. This will make the work of medical scientist to be more effective.

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