The Ebola Virus Epidemic – What Are the Lessons Africa Can Learn?

This article is dedicated to our late sister and comrade, Aminata Diaw Cissé, a philosopher by training, and both a free mind and beautiful spirit of the highest order, an esteemed fighter on all fronts of the African cause, which is none other than the cause of humankind.

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The natural history of Ebola virus disease (EVD) has proved to be enlightening in both biomedical and socio-cultural terms, providing new insight into the present state of Africa and the contemporary world.

Ebola is the main representative of a new RNA taxonomic family, the Filoviridae, whose proto-type appeared in 1967 in Marburg (Germany) and Belgrade (Yugoslavia), in a laboratory that produced polio vaccines. The Marburg virus, as it was referred to, caused the very first human epidemic of deadly haemorrhagic fever associated with a filovirus. It was isolated in a colony of green monkeys imported from Uganda (all of which ended up being euthanised) and remains today the only identified species in its genus. It was subsequently responsible for some ten additional sporadic outbreaks, mainly in East and Central Africa.

The Ebola virus genus was not discovered until nearly a decade later, in 1976, when severe outbreaks occurred almost simultaneously at Yambuku in the DRC and Nzara (South Sudan), with hundreds of cases and several dozen deaths. Since then, from the last quarter of the twentieth to the first decade of the twenty-first century, more than twenty outbreaks of haemorrhagic fevers caused by the Ebola virus were reported in what is known as Sub-Saharan Africa affecting, in addition to the two Congos and Sudan, mainly Uganda, Kenya and Gabon, but not only. A single, non-lethal human case in Côte d'Ivoire, in the Tai Forest National Park (1994) and an animal epidemic in Reston, Virginia (USA), affecting a population of macaque monkeys imported from the Philippines (1990), should be noted. This laboratory strain, referred to as Reston, is thought to be non-pathogenic for humans, while the virulence of the subtypes, known as Zaire and Sudan, is thought to vary with a case fatality rate of between 40 and 90 per cent. The pathogenicity or otherwise of the Tai Forest strain has yet to be determined. Finally, during the 2000s, another subtype named Bundibugyo was isolated and identified during the human epidemics in Uganda and the Congo. There are therefore five distinct recognised subtypes in the Ebola virus genus.

Hence, between 1976 and 2012, the emergence in the heart of the African continent of Ebola virus infections in the form of recurrent epidemics gave rise to nearly 2,000 cases, including 1,100 deaths, considering only the outbreaks that led to at least 100 properly diagnosed cases. This viral haemorrhagic fever of a new type, which had so far been considered to be confined to the forest areas of equatorial Africa, aroused little interest apart from among the populations and health authorities of the countries concerned, and among World Health Organisation (WHO) experts and other specialist research bodies such as the Centres for Disease Control and Prevention (CDC) in Atlanta (USA), the Institut Pasteur in Paris (France), the Medical Research Council (MRC) in Cambridge (UK) and the National Institute for Communicable Diseases (NICD) in Johannesburg (South Africa), in particular.

This relative lack of interest on the part of public health officials and the multinational pharmaceutical corporations, combined with the novelty of this family of epidemic viruses that are not insect-borne and therefore different from the better known arboviruses – both regional (yellow fever, Chikungunya,

Rift Valley) and global (Dengue) – explains, at least in part, the difficulties observed in the diagnosis and treatment of this emerging infectious disease. One example are the meanderings seen in determining the animal reservoir for the virus (particularly important from an epidemiological standpoint since the transmission of the pathogen is non-vector- borne) initially ascribed to small and large apes, then to rodents, before finally being attributed to fruit bats, identified as the sole, asymptomatic carriers of the Ebola virus. Furthermore, because it is an extremely dangerous virus, its culture, which is essential for in- depth investigation, requires the highest bio-security level (level 4, of which there are only three or four civilian laboratories officially recorded for the whole of Africa). As a result, there have been cumulative delays, both in research on drugs and/ or vaccines and the development of relatively simple serological tests, which has meant that molecular diagnostic techniques had to be used and this is available only in a very few specialist reference laboratories. In addition, these laboratories are generally located in cities far from the rural areas where the epidemics tend to occur.

For several decades, such was the status quo to which nobody seemed to take exception, or not until the wholly unexpected and unprecedented occurrence of the epidemic in West Africa, marking a major turning point in the natural history of EVD. From the index case that appeared in a village in the Guekedou forest area in December 2013, spreading to the districts of Macenta and Nzérékoré (Republic of Guinea), a huge epidemic erupted, beginning in rural areas but then moving to cities and gradually onwards by contiguity to neighbouring countries in the districts of Kenema and Kailahun (Sierra Leone) and Lofa (Liberia).

Hence, during 2014, out of a total of 67 districts in these three countries, 43 were affected by the extension of the epidemic, with more than 90 per cent of the confirmed, probable and suspected cases recorded in just 14 districts. Worse still, as early as July, the outbreak spread to other West African countries, with imported cases leading to fatal secondary cases, first in Nigeria and then in Mali, while a single, non-fatal imported case reached Senegal. It was not until 25 March 2014, i.e. nearly four months later, that the WHO officially announced 'the existence of an epidemic of Ebola haemorrhagic fever in West Africa'. Another four months went by before WHO officials announced, on 8 August 2014, that EVD is a 'Public Health Emergency of International Concern'. It is true that in the interim, on 2 August to be precise, when a few isolated cases exported outside of Africa involving expatriate medical and paramedical staff (two in the USA and one in Spain) were discovered, a wave of panic gripped Western public opinion, producing an instantaneous reaction on the part of what is customarily referred to as 'the international community'.

In any case, on 22 September 2014, the WHO's count for the West African epidemic stood at 5,843 cases and 2,803 fatalities; healthcare staff were severely affected, with 337 cases including 181 fatalities. Although, as stated by African and foreign experts, these figures were in all likelihood underestimates, they showed the disease to be spreading at lightning speed when compared to the previous situation report which, on 16 August, reported 2,240 confirmed, probable or suspected cases including 1,229 fatalities.

This is a patent instance of the application of the invariable unwritten 'double standards' rule, which prevails in the area of the right to health as it does to any other fundamental right of human beings, in Africa and in the rest of the world. An eloquent illustration of this is provided by the emblematic case of our devoted Sierra Leone colleague, Dr Olivet Buck, who was contaminated by her patients and died after being denied evacuation to Germany on medical grounds in spite of the pressing request made by her country's President.[1]

Numerous manifestations of inequality and iniquity in access to care, in the raising and managing of appropriate resources and in levels of information, inter alia, became apparent both in respect of the alert and the response to this threat, now seen to have the potential to become a pandemic. Only some of the more salient aspects are detailed here.

Indeed, following this spectacular announcement, the WHO triggered a series of international meetings of experts in Geneva between August and September 2014 at a time when the epidemic was expanding fast. Until then, it was commonly accepted that there was no treatment, whether preventive or curative, for EVD; the only possible interventions were palliative, aimed at relieving symptoms. The outcome for every case was therefore fundamentally dependent, as for any viral infection, on the patient's immune competence in the face of the density and virulence of the contaminant inoculums, and to a lesser extent, on the expeditiousness and quality of supportive treatment.

It therefore came as a great surprise to African specialists, not to say a source of outrage, at the end of the first major meeting of experts at

WHO headquarters, to be told that not only were there already nearly half a dozen active drugs against the Ebola virus, but also, albeit at the experimental stage (some having already reached or gone beyond the clinical trials stage), at least two candidate vaccines that were undergoing evaluation. In other words, a nearly complete range of preventive and curative therapies produced by the public or private pharmacological research sectors of Northern countries (US, Japan and Canada, among others) had already been available and had been for some time, although sometimes in limited quantities behind the backs of those primarily concerned, i.e. the populations and authorities in charge of public health in the affected African countries.

Better still, there was soon an announcement in 2015 that rapid diagnostic tests for Ebola virus human infection had been developed, making it possible to perform a quick and easy test producing an almost instantaneous diagnosis on the spot with the effect of doing away with the time constraints and preservation requirements for sending samples associated with molecular diagnostic techniques. It remained to be seen, of course, what the actual cost was and the price the suppliers would announce.

Another outcome of this belated cascade of international WHO meetings dealing with the Ebola virus was produced by the 'bioethics experts' who immediately authorised the use of 'experimental therapies', including recombinant vaccines, thereby circumventing the usual stringent certification procedures, in the name of the 'global medical emergency'. Another phenomenon that came to light through this epidemic explosion of the Ebola virus is the unreliability and indeed the unsoundness of forecasts on the probable progression of the epidemic offered by Western experts, in particular Euro-American experts.[2] They produced a plethora of bleak projections based on mathematical models claiming to be scientific that turned out to be wrong, simply because they were contradicted by actual facts. Nonetheless, these figures gave rise to various hazardous projections and fanciful extrapolations, the effect of which was to stoke up fear, cause confusion and increase the isolation of the stricken countries. This did not, by the way, come as a surprise to attentive observers who had previously followed apocalyptic predictions of the 'depopulation of Africa' obsequiously peddled by the specialist press and mass media at the height of the HIV/AIDS pandemic at the end of the twentieth century.

Here, we are dealing with a virus that is very fragile in the outdoor environment but extremely contagious by human to human contact through body fluids (blood, faeces, urine, saliva, semen, tears, etc.) and moreover one that has major epidemic potential, deriving from the fact that a single non-detected case or a single unidentified contact can be enough to trigger a new transmission chain whose progression is unpredictable. Studies subsequently showed that the viral isolate responsible for this West African epidemic of unprecedented magnitude was identical, but for a very few variations, to the initial parent strain (Zaïre). While its virulence appears to be lesser in terms of case fatality rate, there are questions about when the virus migrated outside of Central Africa and entered West Africa and the routes it followed. So Far, molecular epidemiology has not clearly answered these questions; particularly since it is now established that the virus can persist in the semen and genital secretions of the infected individuals for several months after they appear to have clinically recovered.

Furthermore, a number of facts that are never mentioned provide food for thought. For instance, it is known that the very first Ebola virus human epidemic started in Yambuku (DRC) when a new gold mine was first opened and began operations in this area of the equatorial forest. Similarly, the cross-border Mount Nimba area shared by the three member states of the Mano River Union that were most affected is famous for its huge mineral wealth, not only diamonds and gold but also ferrous and non-ferrous metals that are being 'developed'. When, additionally, one discovers that in those countries there are several research laboratories secretly engaged in the US government's 'Biological Defence Program' based at Fort Detrick (MD), initiated by the Pentagon even before the end of the Cold War in connection with the Biological Weapons Anti-terrorism Act (1989), and funded by USAID behind the facade of the CDC or the National Institute of Health (NIH) at Bethesda (USA), doubts turn into perplexity. Even though, some of these microbiological war units are engaged in official civilian cooperation with Columbia University, New York, the University of Wisconsin- Madison, or the University of Winnipeg, Canada in complete violation of the 1988 International Convention on Biological Weapons. Furthermore, after the Sierra Leone epidemic broke out, the Ministry of Health announced the decision

to (permanently?) close down the Kenema laboratory (level 4 bio-security) linked to Tulane University, New Orleans, in Louisiana. Soon afterwards, President Obama in person publicly declared: 'our official policy is now to stop this type of research'! It should be noted in passing that the Centre International de Recherche Médicale de Franceville (CIRMF-International Medical Research Centre of Franceville) in Gabon also has a level 4 bio-security laboratory where French specialists have for years investigated the bats that act as Ebola virus reservoirs.[3]

This bewilderment turns into outright distress when a microbiology professor, writing for the *Washington Post*, calmly contemplates the hypothesis of a spontaneous mutation of the Ebola virus that could make airborne transmission possible, therefore enhancing its capability to contaminate consistent with the Reston strain model of the U.S. Army Medical Research Institute of Infectious Diseases.

Is this pure theoretical speculation, or is the aim to condition public opinion psychologically and pave the way for the anticipated result of ongoing genetic manipulation of the virus? This deadly enigma should soon be elucidated by facts. In any case, it was not until 29 December 2015 that the WHO, which now no longer considered EVD to be an 'international public health emergency', lifted its temporary recommendations for the Ebola epidemic, based on 'International Health Regulations' (2005), after the disease had raged through West Africa over a period of more than two years, causing at least 11,300 deaths out of approximately 28,000 cases.

Margaret Chan, the Director-General of the WHO, answered a question about the reasons for the unusual severity of the West African epidemic of this virus that had hitherto been contained by conventional measures such as quarantine and universal rules of hygiene, in spite of no drugs or vaccines being available, saying that one major cause was 'poverty'! A cute euphemism to describe the misery rampant at this meeting point in the Gulf of Guinea. The weakness and sometimes complete lack of health facilities in these remote areas are compounded by the after-effects of two terrible civil wars (Liberia and Sierra Leone) and by an equally fearful military dictatorship (Guinea) engendering structural corruption. Matters are made worse by the loss of a significant fraction of health workers who are the primary victims of the epidemic. This is the devastated setting where 'military-humanitarian' interventions of former colonial powers come to put down roots, each in its own past possessions, in ways and means that lead to their being violently rejected by the populations that were supposed to benefit from those operations. Indeed, the police methods for tracing contacts, the prison-like procedures for enforcing quarantine in the 'Ebola treatment centres', combined with authoritarian interference in local cultural and religious traditions (the ban on food made from game – stigmatised as 'bush meat' – or burial rites where there is contact with the deceased's body, etc.) have in some cases triggered destructions of health facilities, and even deadly assaults on healthcare workers or the press in the three countries concerned. Indeed, in his field investigations, the socio-anthropologist Cheikh I. Niang underscores how these acts triggered by distrust and cultural resistance facilitated the extension of the epidemic and caused delay in controlling and eliminating the disease. In addition to extreme poverty and the inefficiency of the public health system, a third factor explains the magnitude of the latest epidemic: fear that is fostered and aggravated by ignorance. Only panic can explain some of the senseless proposals made at the height of this health crisis, such as putting whole neighbourhoods, even whole cities, in quarantine.

The same applies to the brutal closing of physical communication routes suddenly required by countries of the North, and by some African countries such as Morocco. On this topic, the fraternal and responsible behaviour of two neighbouring countries secondarily affected by the epidemic deserves tribute. In contrast with the countries situated at the epicentre of the scourge where the failure of health systems fostered the expansion of the epidemic, the spectacular results in controlling and eradicating the disease in Nigeria and Mali deserve recognition. Both for the speed and efficiency of the management of the epidemic as soon as the first imported cases were detected and for the rigorousness, vigour and pertinence of the measures taken to contain and then extinguish the threat, without infringing the traditional values of solidarity or breaching the relevant recommendations of the African Union Commission, requesting all member states to abstain from closing their borders with their affected sister countries and emphasising the need to fight the extension of this viral epidemic together. This advice was merrily ignored by Côte d'Ivoire and Senegal; they closed their land, air and sea borders with Guinea one after the other in spite of the fact that not a single endogenous case of Ebola was confirmed in

their own countries. These two counter-examples are indicative of the harmful and destabilising influence of politico-economic and diplomatic factors that increase isolation, anxiety and distress among populations that are already overwhelmed.

One last illustration of the tightly knit relationship between biomedical data, politico-economic factors and socio-cultural aspects: at the height of the West African epidemic, a debate was broadcast on German radio *Deutsche Welle* (The Voice of Germany), during 'The Palaver Tree' programme. During the discussion, Dr Félix Kabange Numbi, Minister of Health for the DRC who was about to leave for Equateur Province, where the seventh outbreak of Ebola disease had just been declared at the end of August 2014, revealed that during the very first epidemics in the late 1970s, the Congolese physician and virologist Prof. Jean-Jacques Muyembe, who is now the Director of the National Institute for Biomedical Research (INRB) in Kinshasa, had suggested to the CDC and to his North American colleagues that they might use the serum of the few convalescing patients that had survived the infection and attempt serotherapy to save patients at risk of dying. At the time, this suggestion was met with a categorical and indignant 'no' from the foreign experts who had come from Atlanta. Nonetheless, a few decades later, the American physician contaminated in Liberia and repatriated to the USA owes his survival to the ZMapp supplied by the CDC. ZMapp is none other than a preparation of anti-Ebola virus monoclonal antibodies, made from polyclonal serums taken from patients who had recovered from the infection. This recombinant derived product has naturally been registered at the US Patent Office. What might appear to be a trivial detail in fact turns out to be very informative when one considers that the same Prof. Muyembe – who furthermore discovered the Ebola virus (even if he had to go to the Institute of Tropical Medicine in Antwerp to isolate and identify this new pathogen) – on a visit in 2015 to the sister countries in West Africa that were stricken by this scourge underscored that the main objective of any campaign against Ebola should be to prevent the infection from becoming endemic in our sub-region. Matching actions with words, the DRC made nearly 200 medical and paramedical technicians specialised in combating Ebola available to the West African states concerned. With the hindsight of over a year and a half, and moreover the occurrence of additional confirmed cases in Guinea, Liberia and Sierra Leone the very next day after the WHO officially announced the 'end of the epidemic', the importance and value of the recommendations based on the experience gained by African experts are made all the more apparent. And even more so if one considers a new clinical fact that has arisen in the West African epidemic, i.e. that the typical haemorrhagic forms of the disease are becoming less and less common.

Conclusion

Like any major crisis, the Ebola virus disease has brought out into full view the multiple contradictions that characterise the societies and states of our contemporary world, magnifying but not distorting them: political domination and dependence, general physical and economic insecurity, glaring social inequalities, mass ignorance and cultural – if not ethno-racial – contempt, dispossession of the right to intellectual property, the rift between the governing and the governed, the mismatch between what law sets out a country to be and what the country actually is, or between the literate minority and the illiterate majority, urban versus rural conflict, etc.

In Africa, the interaction between these various factors gives rise to the structural weakness of the state and the extreme vulnerability of the populations to any threat, regardless of its nature or origin. If one considers the public health sector alone, whose role is crucial, it comes as no surprise that the Ebola virus disease has existed for a long time, is widespread and particularly severe on our continent. The facts reported above amply demonstrate that the emergence of such a deadly virus in a context of extreme poverty, compounded by the induced collapse of public health systems, was inevitably going to have catastrophic consequences for the populations affected. The high rates of morbidity and mortality for ordinary infectious diseases that are curable and/ or avoidable (gastroenteritis and broncho-pulmonary diseases, meningitis, malaria or tuberculosis, for instance) speak for themselves. These are undoubtedly damning healthcare indicators shared by the African diasporas in the Americas and the Caribbean. There is hardly reason to be surprised by the devastation caused, both there and in Africa, by emerging or re- emerging viruses, that are far more difficult and costly to treat, such as HIV in the past, Ebola today and, who knows, perhaps Zika or prion diseases tomorrow or the day after?

Notwithstanding, the experience accumulated by our compatriots in Central and West Africa, supported

by the positive and conclusive examples of Nigeria and Mali, in spite of being confronted with civil strife and a foreign war on the one hand, and the sluggishness and timidity of the 'international community's' response up until it felt directly threatened by the epidemic on the other, should provide abundant food for thought and materials from which to draw conclusions about the present and future of African peoples, both on the continent and in the diaspora.

One major lesson is immediately obvious: the right to health is synonymous with the right to life, and as such, it is at the same time a prerequisite and the sine qua non condition for effectively exercising all other human rights. As such, responsibility for guaranteeing this common public good lies prevalently, if not exclusively, with the sovereign state. The latter cannot decline, evade or delegate that responsibility to another public or private authority, be it national or foreign.

Clearly, the key to the future success of the fight against the Ebola virus epidemic, similarly to any other threat in the areas of health, food, security, currency or environment lies primarily in the existence of a firm, resolute political will, seeking to confront the danger from within, relying on its own forces; and secondly, on the organisational efficiency of the decisions and practical measures taken; and also, but in a subsidiary way, on aid and support from outside of Africa. In other words, the determination of the decision-makers prevails over the technical choices of experts, with foreign support acting in a supplemental capacity.

To end, here is a quotation of Article 1 of the seven articles of The Hunters' Sermon (1212) that became the Manden Charter in 1222:

> Every human life is a life.
>
> It is true that a life comes into existence before another life
>
> But no life is more 'ancient', more respectable than any other
>
> In the same way no one life is superior to any other

This is a basic African commonplace as ancient as it is futurist that must be reinstated to serve as a fundamental societal principle for the whole of humanity.

This means that only radical reform that achieves the unity and sovereignty of our states, together with the restructuring of African societies on a foundation of equality and solidarity, could produce the material and cultural conditions required to enable the peoples of the continent to effectively and successfully confront the dangers of all sorts that weigh on our collective and individual futures now, at the beginning of this menacing and disquieting third millennium.

Notes

1. Sanders, D., Sengupta, A. and Scott,V., 2015, 'Ebola epidemic exposes the pathology of the global economic and political system', *International Journal of Health Services* 45(4): 643–56.
2. See *New England Journal of Medicine*, 25 September 2014.
3. Boyle, F. A., 2006, *Biowarfare and Terrorism*, Atlanta, GA: Clarity Press.