

LETTER TO THE EDITOR

We must revise the current logic to protect our humanity from Infectious disease outbreaks

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*Our World is linked like an umbilical cord***Dear Editor,**

By September 2014, the once isolated Ebola had traveled on major highways to the densely populated cities of Liberia, Sierra Leone and Guinea (1). As have been demonstrated in previous epidemics, the world went from panic to neglect of Ebola, so that by November 2022, similar to Ebola Zaire in West Africa, Ebola Sudan made its way from the rural Mabande District to the densely populated city of Kampala (2,3). And in each of these instances, as we are now seeing in Equatorial Guinea with Marburg Virus outbreak, our World was unprepared with vaccines and therapeutics (4).

We are courting with danger when we fail to use these experiences to prepare for future pandemics and epidemics. This is because these highly virulence diseases are lurking around our cities with a higher potential to disrupt our lives, economies and security (5). There was a time, during the apex of the COVID-19 outbreak, in New York City, in Italy and other developed and developing countries where the immense number of corpses surpassed the capacity of the all the mortuaries. There were long lines of corpses in stadium due to the lack of space. In these instances, COVID-19 clearly demonstrated the devastating impact of infectious disease on our humanity. There were photos of animals roaming the street in California without a single human being. We were locked in our homes awaiting the impending deaths (6-8). COVID-19 migrated from Wuhan to the world and for the first time we shut down all air travels. Despite the devastating effects of 9/11, flights were restricted for hours, but a single infectious disease like COVID-19 forced us to shut down flights for many months. Similarly in the 2014/2015, Ebola Zaire outbreak in West Africa, made its way on airplanes to advanced cities

in the US, Spain and Europe (9). We invest billions in new generation weapons for our fellow human beings, but we have a more sinister and deadly enemies-infectious disease- lurking in isolated and poor areas and waiting for the right opportunity to strike at our greatest vulnerabilities. We have ample evidence to demonstrate that these pathogens have the potential to disrupt everything we consider normal and everything we cherish dearly (5).

Following the catastrophe of the 2014/2015 Ebola Zaire Outbreak in West Africa, there were global goodwill and commitment to invest in Vaccines, diagnostic and therapeutic as the magic bullet to stop these epidemics and pandemics in their track. This global goodwill resulted in the creation of CEPI to support R&D in this area. The WHO R&D intensified its activities to achieve these noble public health goals. However, we have never succeeded in having these vaccines and therapeutics readily available in a timely fashion to avert the deaths and suffering or prevent the threat of global spread (4). Hence, I proffer a three-pronged strategy to better prepare humanity to prevent, if not to detect and respond.

There is a need for investment in robust traditional public health systems that can complement or buy the time delays before vaccines and therapeutics, which usually comes later. There cannot be a choice between the two, we cannot skew the funding to R&D of vaccines alone but not concomitantly strengthen traditional Public health system. History is replete with examples where the traditional public health measures ended the outbreaks before the vaccines were ready for deployment. Even if these vaccines have proven efficacious, the overall efficacy may not be cleared. Even in stances where the vaccines are readily available, hesitancy and resistance may delay the deployment of vaccine, Hence, the first two approaches are continuous strengthening of Public Health institutions from the community to national public health institutes and pan- continental Public Health institutions like Africa Center for Disease Control and Prevention which are then complemented with new vaccines and therapeutics (11-15). Finally, every outbreak should provide the unique opportunities to answered research questions for more robust vaccines and therapeutics. Protocols, plans and ethical agreements must be pre-developed to ensure robust and ethically sound studies during an outbreak as the only way to get meaningful clinical data. Thus, a rigorous study design and preparedness agreements which include response

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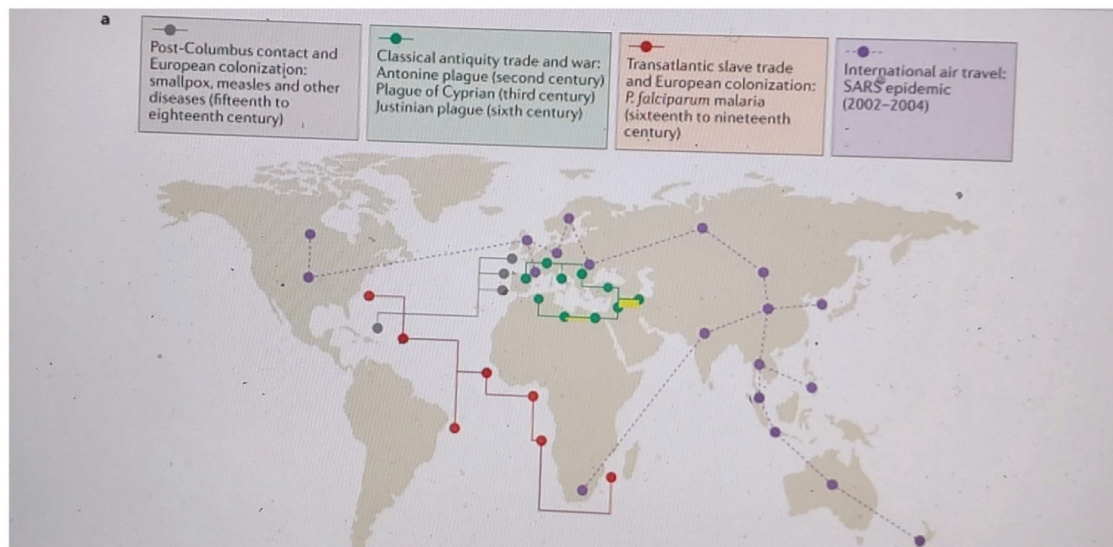


Figure 1: Global travel and trade has increased our vulnerabilities to once isolated infectious- moral imperative to invest in the neglected spots of the World (adapted from: Baker, R.E., Mahmud, A.S., Miller, I.F. *et al.* Infectious disease in an era of global change. *Nat Rev Microbiol* 20, 193–205 (2022). <https://doi.org/10.1038/s41579-021-00639-z>).

protocols which are rigorously designed is the third element in my three-pronged strategy (16).

I am not unaware that my strategies will engender criticisms from my public health colleagues and other scientists. The major one would be an efficacious vaccine works quickly and reduces the threat of spread and thus our returns from the investments in the manufacturing of vaccines, therapeutics and diagnostics is higher than the investment in the traditional public health sectors. Others may argue that using outbreaks to implement robust randomized control trial may have some unethical underpinnings. When you randomized during an outbreak you denied others the only potential source of life. However, our response to outbreaks has never succeeded in getting vaccine with clear efficacy readily available to population at risks. From monkeyPox, to Ebola Zaire, Ebola Sudan and now Marburg, the only measures that has helped to blunt the excessive negative impact of these outbreaks are the traditional public health measures.

The rapid technological advances that have intensified our global connectivity increase our vulnerabilities to deadly consequences to infectious disease outbreaks that were once confined to isolated and poor rural villages (17,18). Barely two months after Ebola Sudan, we have confirmed cases of Marburg viral diseases (19). While the world was battling COVID-19, we had to rapidly shift to deal with MonkeyPox in Europe and the Americas (20). The disease that was once confined to Africa or Southeast Asia now threaten our global health security (Fig. 1). We have never been prepared with the appropriate vaccines and therapeutic when these infectious disease outbreaks happen. In spite of these challenges, there are overemphasis to invest more money into research for vaccines for the next outbreak. While this is great, but we should ensure we further increase investment in the traditional Public health measures as these have been our only ally in most of these outbreaks. Finally, we must ensure that every outbreak provide a means for a rapid

initiation of sound clinical research to quickly answer questions on efficacy and move these vaccines and therapeutics to the citizen. We must reduce our vulnerabilities as time is running out and the next big pandemic may be more deadly than COVID-19.

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