An Investment In Africa’s Bioeconomy is A step Towards The Fight Against COVID-19 and Future Outbreaks and Pandemics

Harry Akligoh

The modern world is plagued with a growing number of known outbreaks, emerging or unknown infectious diseases   (WHO, 2017). Poliomyelitis, meningitis, HIV/AIDS, measles, influenza (H1N1, H5N1 and H7N9), Middle East respiratory syndrome coronavirus (MERS-CoV), Ebola virus disease, Zika virus disease and lately the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are some of the diseases that the international community has been dealing with.

*The WHO Emerging and Dangerous Pathogens Laboratory Network (EDPLN) in one of its report highlighted that  "The continuing emergence and re-emergence of novel and dangerous pathogens of epidemic potential is a permanent threat to the health of populations around the world and a major challenge to global health security.*(EMRO, 2015)

However,  efforts to combat these infectious diseases in the past decade have underscored the fragile and neglected nature of some national health laboratories in Africa (Alemnji et al., 2014) and other inherent incapabilities with research and development on the African continent. Following these revelations, It became critical to develop a platform that will serve as the foundation for national health laboratory infrastructure enhancement, capacity development and overall quality system improvement in countries with poor national health laboratory infrastructure. Programs including;  the establishment of the African-based World Health Organization Regional Office for Africa (WHO-AFRO); Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA); development of the Strengthening Laboratory Management Toward Accreditation (SLMTA) training programme; and launching of a Pan African-based institution, the African Society for Laboratory Medicine (ASLM) were among many strategies and policy driven efforts instituted by key partners mainly WHO, CDC and some African governments at the time. Thankfully, the continent can now boast of the establishment of the African-based World Health Organization Regional Office for Africa ([WHO-AFRO](https://www.afro.who.int/)) and the [African Society of Laboratory Medicine](https://aslm.org/) (ASLM) which were part of recommendations by the WHO and her partners.

On the contrary, most of the quality improvement and capacity building programmes including SLMTA and SLIPTA came to a halt due to poor management, conflict of interest and politico-labour related issues among various groups working within the healthcare delivery chain. Fast forward into the start of a new decade, the world came crashing down following the outbreak of the novel SARS-CoV-2 in Wuhan, China which has since migrated into different geographical locations globally.  Consequentially, the debilitating effects of the virus is not only exposing earlier challenges like the weak national health laboratory system in Africa but also her fragile capacity to conduct relevant biomedical research to inform public health decision making, difficulties with medical supply chain and the redundancy to embrace new technologies like biotechnology to drive R & D.

Questions like how can Africa be better prepared in handling future outbreaks still linger with yet unknown answers. However, individual countries have been taking pragmatic steps in ramping up efforts to curtail the spread of the virus and also bearing in mind the need for these solutions to have future benefits. Notable examples include, the infectious disease isolation unit under construction by the government of Ghana and the repurposing of small and medium scale companies to manufacture personal protective equipment (PPEs) including face-masks, scrubs, etc locally aside the test-trace-track protocol which is currently been used. Though these responses are laudable and serve as protocols in any outbreak situation, they still do not qualify as solutions which will provide long term benefits and the right environments for fighting future outbreaks or pandemics. According to a recent publication by (Havemann et al., 2020), it is important for Africa to harness the open science infrastructure as a response to the COVID-19 pandemic. The open science infrastructure which encomapasses collaboration, open source hardware, DIY Biology, etc has the potential to enhance cross-disciplinary solutions targeted towards hardware development for medical supplies, research capacity development for biomedical science research and vaccine development all of which are important in overcoming the medical supply chain issues in Africa hence providing a solid foundation which anchors African countries to be better prepared for future outbreak.

Therefore, it is important to mention that the solution to the fight against COVID-19 and the preparedness of African countries for future outbreaks or pandemics cannot be entirely guaranteed without a plan to foster local manufacturing hinged on biotechnology and engineering biology. The role of biotechnology and engineering biology is undoubtedly irreplaceable in understanding disease transmission, pathogenicity, drug and vaccine development, medical supply manufacturing, eg; PPEs and public health response during any outbreak or pandemic. The advanced economies again have demonstrated the importance of biotechnology and engineering biology through their rapid response in PCR-based tests development and initial attempts in drug and vaccine development. What Africa needs now is the right investment in home grown biotechnology solutions by her governments. It is obvious the problem is not about human capital rather investment.

In a publication by the United Nations Industrial Development Organization (UNIDO) on April 20, 2020 she underscored the challenges of global shortage of COVID-19 critical items saying;

*As the global COVID-19 emergency continues to unfold, one urgent problem is the shortage of critical supplies such as masks, ventilator and test kits for both the healthcare sector and the wider population. Policy makers are calling for firms across manufacturing sectors to temporarily repurpose their production in order to increase global production capacity.*

These and many other calls should remind African governments that the fight against COVID-19 and how she can be better prepared to handle future outbreaks should see her take the following steps;

1. Strengthen her national health laboratory systems by implementing already existing policy documents and capacity development programmes (SLMTA and SLIPTA) to enable their national health laboratories meet international standards to enable them serve as testing and surveillance centers during and post any outbreak situation.
2. Define a continent wide and country specific bioeconomy policy that set the agenda for developing an African bioeconomy and investment in biotechnology to drive the local manufacturing of biologics eg; vaccines and medicines, reagents, etc and research on the continent.

It is only when these steps are taken can we say confidently that Africa is prepared against winning the war against the virus.

# References

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