

MAXIMIZING THE GLOBAL MRNA TECHNOLOGY TRANSFER HUB TO ENHANCE VACCINE PRODUCTION IN AFRICA

Background

The world, especially Africa, has experienced an increase in the frequency and intensity of infectious diseases outbreaks in the last few decades. About 27 reported outbreaks of Ebola disease have been reported since 1976 in sub-Saharan Africa, with the 2014 - 2016 outbreaks in West Africa being the deadliest, with about 28,000 infections and 13,000 mortality reported. Despite having the highest incidence of mortality caused by infectious diseases, Africa remarkably does not have the capacity to manufacture vaccines that are essential to reduce mortality, improve life expectancy, and promote economic growth. Researchers across African countries displayed abysmal low participation and involvement in the development of an effective vaccine for the COVID-19 pandemic.

The devastating effect of the ongoing COVID-19 pandemic on the global economy induced major global stakeholders to galvanize efforts at fast-tracking the development of the COVID-19 vaccine. In an unprecedented manner, effective COVID-19 vaccines were developed by different biotechnology companies. In addition to the development of the therapy, some countries were prompt in willingness and preparedness to procure and access the vaccine while most African countries showed a great deal of apathy towards the procurement of the vaccine for its citizens. Hence, this greatly skewed the distribution favouring some countries, while African countries depend mainly on donations from developed countries, which are rarely prioritized. In the midst of a concerted effort by CONVAX to ensure equitable access to safe and effective COVID-19 vaccines globally, it achieved minimal impact. It is obvious that African Leaders were not proactive in COVID-19 vaccine acquisition and distribution to their citizens.

It is quite insightful to note that African countries import 99% of the vaccines used on the continent and only produce 1%. We consume about 25% of the world's vaccines. This is quite unimpressive, and it needs to change. Some countries in Africa like Rwanda and Senegal took the leadership role in the continent to engage a German vaccine manufacturing company BioNTech to establish a vaccine manufacturing facility in Rwanda and Senegal. BioNTech as one of the developers of Pfizer COVID-19 vaccine plans to initiate the construction of the first state-of-the-art manufacturing site for mRNA-based vaccines in the two African countries.

In a similar vein, World Health Organization (WHO), a South African consortium with a partnership from COVAX, set up a technology transfer hub for mRNA vaccines in South Africa. This vaccine hub is to help boost and scale up vaccine production in Africa for Africans. The mRNA vaccine technology transfer hub offers a host of benefits for low and medium-income countries, such as Ease of vaccine production by pharmaceutical industries, Free from Intellectual property right challenge, enhanced capacity building and technology transfer for African scientists.

The hub is set to develop capacity building for African personnel on the mRNA vaccine production technology. Since the inauguration of the concept, six countries: Egypt, Kenya, Nigeria, Senegal, South Africa and Tunisia, applied and were selected to be recipients of the mRNA vaccine technology training and technical know-how to boost and scaled up vaccine production in Africa.

This hub, situated in South Africa, comprises Afrigen Biologics, the South African Medical Research Council (SAMRC), and offers training to the six recipient countries referred to as Spokes. The hub has already established mRNA vaccine production at a laboratory scale and is currently scaling up and validating production on a commercial scale. This initiative is one of WHO's efforts aimed at empowering low- and middle-income countries to produce their own vaccines, medicines, and diagnostics to address health emergencies and reach universal health coverage. This approach also offers improved public health benefits that will ensure global health security.

Considering how laudable and lofty this initiative is to Africa and the world, the Global Emerging Pathogens Treatment Consortium (GET) in its monthly webinar series, mobilized vaccine development experts to engage the public in its March webinar session titled "Maximizing the Global mRNA Technology Transfer Hub to Enhance Vaccine Production in Africa". The webinar made a conscious campaign to maximize this technology hub for COVID-19 vaccine production and vaccine production technology transfer and capacity building in Africa. The Hub should also exploit the benefit of extending vaccine production techniques to other recurrent epidemics on the continent, such as EBOLA, LASSA Fever, Tuberculosis and HIV.

Strategies for harnessing the Global mRNA Technology Transfer Hub in Africa

1. African governments should invest in research and provide enabling environment for experts and investors to commit resources to research and produce vaccines in response to the attendant challenges of emerging infectious diseases.
2. Government should create platforms for training, capacity building and technology transfer to African scientists

3. Participating countries should create enabling environment which includes counterpart funding, necessary infrastructure, and adequate personnel for the smooth running of the Technology Transfer Hub

4. Interested institutions and pharmaceuticals should be ambitious in upscaling the mRNA technology beyond COVID-19 vaccine and applying the technology to other health challenges such as malaria, tuberculosis, cancer and HIV.

Recommendations:

i. African governments should support researchers and institutions to strengthen biomedical research through increased funding and creating platforms for collaboration and cooperation amongst researchers across the continent.

ii. Participating countries should enforce strict adherence to common standards and compliance with binding agreements, Protocols and Standard Operating Procedures.

iii. The partnership deal should incorporate a clear roadmap that would encourage smooth access to market for manufactured vaccine as it will promote the sustainability of the project.

iv. There should be a constant review of operational activities of participating institutions and pharmaceuticals that could suggest potential to upscale the mRNA technology beyond COVID-19 vaccine production.

About GET

Global Emerging Pathogens Treatment Consortium (GET) was established in 2014 as a direct response to the 2014-16 Ebola virus disease outbreak in West Africa and ongoing outbreaks of Lassa Fever, Meningitis, Multidrug resistance (MDR) enteric fevers and Yellow Fever across the sub region. There was clearly a need to create an African-led multidisciplinary forum of experts capable of working together with international partners to strengthen Africa's preparedness and resilience in tackling such infectious disease outbreaks caused by emerging pathogens, public health emergencies and pandemics.

GET found the understanding of biosecurity to be a very underdeveloped area on the continent with clear opportunities for using biosecurity to dramatically improve on capacity for prevention and medical countermeasures during public health crises. GET now operates firmly in the African Biosecurity and pandemic preparedness, space and functions as a think tank, providing high level advocacy and operational and necessary expertise to support Countries and communities achieve improved resources to combat outbreaks and other

public health emergencies that can threaten stability, peace and security thereby undermining economic growth and well being. The consortium is working with international collaborators with a goal of providing strategic recommendations and establishing infrastructure and research capacity to respond to highly infectious emerging Pathogens such Ebola, ongoing COVID-19 Pandemic.

The Consortium creates a rapid informed response strategy and provides advice and guidance to African countries, and a point of reference for international funding and aid agencies.