

EDIOTRIAL

Pharmaceutical Manufacturing Plan for Africa is critical for pandemic preparedness, prevention and response

MICHAEL MYNHARDT¹ and NICAISE NDEMBI²

¹Group Executive at Avacare Health Global, Managing Director at Barrs Pharmaceutical Industries (Pty) Ltd, Ndabeni, Cape Town 7405; ²Chief Science Advisor, Office of The Director General of The Africa Center for Disease Control and Prevention (Africa CDC), South Africa

DOI: 10.4081/jphia.2023.2861

Background

The 12th International Aids Society Conference on HIV Science (1) was recently held in Brisbane, Australia, featuring a number of studies that have come to represent several important advances in HIV prevention, treatment and cure research. The conference offered the World Health Organisation (WHO) an opportunity to announce (2) that there is negligible, or almost zero risk of transmitting HIV when a person has an HIV viral load measurement of less than or equal to 1,000 viral load copies per ml, commonly referred to as having a suppressed viral load (3).

The evidence presented by the latest advancements in WHO's scientific research on HIV viral suppression confirms that people living with HIV (PLWH) who achieve and maintain an undetectable level of the virus through the consistent use of antiretroviral (ARV) therapy do not transmit HIV to their sexual partner(s) and are at low risk of transmitting HIV vertically to their children.

Meeting UNAIDS 95-95-95 targets in Africa

These findings have underscored the significance of meeting the Joint United Nations Program on HIV/AIDS (UNAIDS) '95-95-95' targets, which call for 95% of people living with HIV to be aware of their status, 95% of those aware of their

status to be on antiretroviral therapy (ART), and 95% of those on ART to achieve viral load suppression.

Achieving these targets across the African continent will remain a critical undertaking if we want to improve the lives of those living with HIV at the global epicenter of the virus. According to UNAIDS 2023 epidemiological estimates (4), over 65% of the global population living with HIV are based in eastern, southern, western and central Africa, with a collective 25.6 million infections as of 2022. Sadly, all four regions are yet to meet these targets. In the middle east and northern Africa alone, only 50% of people living with HIV are currently on ARTs, increasing the risk of transmission and rate of infection on the continent.

Thankfully, a number of countries have already met their 95-95-95 targets, including Botswana, Eswatini, Rwanda, the United Republic of Tanzania and Zimbabwe. Their commitment and dedication to this campaign offers a useful blueprint for other African countries that aspire to achieve the same targets in the long-term.

Development of local pharmaceutical manufacturing framework key

WHO's scientific research and findings must incentivise public and private stakeholders to work together to spearhead the development of Africa's pharmaceutical and biological manufacturing framework if we want to improve our ability to prevent, detect and limit the transmission of the virus. In fact, we should aim to offer a world-leading response to this crisis, given WHO's recent announcement regarding the impact of viral suppression on direct and vertical transmission rates.

In order to achieve this, we must decrease our reliance on foreign pharmaceutical imports and develop a sustainable, pharmaceutical manufacturing framework that will remain dedicated to securing Africa's supply of life-saving ARVs over the long-term.

A dedicated approach to this strategy will empower all African countries to meet their 95-95-95 targets, while simultaneously improving our continent's collective capacity to prepare, prevent and respond to the next global pandemic.

Correspondence to: Michael Mynhardt, Group Executive at Avacare Health Global, Managing Director at Barrs Pharmaceutical Industries (Pty) Ltd, Barrs Pharmaceuticals, 10 Inyoni St, Ndabeni, Cape Town 7405, South Africa
E-mail: michael.m@avacareglobal.com

Key words: pharmaceutical manufacturing in Africa, HIV, World Health Organisation, vaccine technology, healthcare systems, viral suppression, pandemic preparedness, pandemic response

Decreasing reliance on foreign imports critical for PLWH & pandemic preparedness

Africa's recent response to the global COVID-19 pandemic exposed a number of inherent weaknesses in its healthcare systems. This included our deeply unsustainable reliance on foreign medicinal imports.

At present, between 80-90% of global HIV, Tuberculosis and Malaria cases occur on the African continent, and yet, we import ~80% of the drugs required to address these health risks. A large portion of this medication is funded by international donors at an estimated US\$14 billion a year. In 2012, the Pharmaceutical Manufacturing Plan for Africa (PMPA) did propose an initial budgetary allocation of US\$54 million for the manufacture of medicinal drugs over the next 5 years. Sadly, the funding did not materialize. Today, global interest to invest in Africa's call to establish a strong, quality-assured, locally-based pharmaceutical manufacturing sector is gaining momentum. The time has come to accelerate its implementation.

Nothing could be more critical to help improve our pandemic preparedness for future generations. Medicine supply and security will also form an integral part of a Pan-African approach to meet UNAIDS targets for PLWH.

Manufacturing APIs in Africa

In order to achieve medicine supply at this level, African scientists must be supported to develop their own intellectual property for active pharmaceutical ingredients (API). Only then will we be able to build an end-to-end manufacturing framework that works on the continent. Currently, the industry is based on fill and finish operations alone. This is not strategic or economically sustainable over the long term, and reduces our medicine security across the continent.

To date, local manufacturers have remained at a competitive disadvantage when it comes to APIs, due to a number of different market forces that have included poor and inefficient production value chains, the high cost of production of medicines and vaccines, as well as poor financing and financing models. Thankfully, a number of international organizations and Development Finance Institutions (DFIs) have heeded the call to improve these circumstances, paving the way for the development of Africa's pharmaceutical and vaccine manufacturing framework.

If we are to actualize the PMPA's recommendations to establish a robust pharmaceutical manufacturing sector in Africa, we must redouble our efforts in capacity-building, knowledge transfers, cross-sector coordination, and ensure the rigorous implementation of the AfCFTA. This will be paramount to further mobilize financial resources from international financial institutions and development banks, while encouraging cross-country collaboration to strengthen human capital funding. Only then can we close the implementation gap and accelerate the development of Africa's own pharmaceutical industry.

Pan-African approach to medicine supply critical

The Partnership for African Vaccine Manufacturing (PAVM) offers a leading example of how we might take a pan-African approach towards developing significant convening power

and technical capabilities to galvanize global and regional partners towards building Africa's regulatory capacity, technical partnerships and vaccine procurement pooling mechanisms.

The PAVM recently formalized a sustainable ecosystem of action-oriented partners in support of achieving the African Union's (AU) vision of 60% locally produced vaccines by 2040 (at present, over 99% of vaccines in Africa are imported from manufacturers overseas).

To support the PAVM's vision for 2040 and the bankability of this project, the African Development Bank is implementing a flagship program in support of local vaccine manufacturing in line with its 2030 Vision for the Development of Africa's Pharmaceutical Industry and the 2040 AU/African CDC vision for increased local vaccine manufacturing.

Procurement agencies are also committed to sustaining accelerated progress. For instance, the U.S. President's Emergency Plan for AIDS Relief, PEPFAR, recently launched its 5-year strategy which aims to boost regional manufacturing in the Global South.

Access to funding available for pharmaceutical manufacturing expansion in Africa

The Access to COVID-19 Tools Accelerator (ACT-A) was an unprecedented global coordination mechanism that was co-chaired by South Africa and Norway and raised US\$24 billion, for the distribution of vaccines, diagnostics, therapeutics and personal protective equipment. Notwithstanding its phenomenal success, there were a number of serious pitfalls that could cost people their lives: it took too long to raise the financing, while vaccine deployment was delayed by issues of export bans and other geopolitical tensions. The diagnostics and therapeutics pillars did not meet their targets and the health systems connector pillar did not operationalise adequately and failed to meet its mandate, compromising critical last-mile capabilities.

As a result the ACT-A fell short of delivering equity. This is evidenced by the fact that the average vaccination rate is 67% globally, while lower income countries only average at about 27%. The ACT-A independent evaluation had also recommended the establishment of a global medical countermeasure platform to ensure equity for future pandemic response.

Successful case studies: TEI offers large-scale investment for vaccine production in Senegal

The Team Europe Initiative (TEI) on manufacturing and access to vaccines, medicines and health technologies in Africa may offer one of the most successful case studies to date. TEI recently agreed to support a large-scale investment in vaccine production by the Institut Pasteur in Dakar (5), Senegal. Their commitment to this undertaking has been rolled out alongside other support measures to reduce Africa's 99% dependence on vaccine imports and to strengthen future pandemic resilience on the continent.

The TEI MAV+ also aims to increase equitable access to safe, effective, quality and affordable essential vaccines, medicines and health technologies for all Africans. It follows a 360-degree approach to ensure supply and demand within

an enabling environment that is underpinned by six work streams, namely industrial development (supply chains and private sector), market shaping (demand and trade facilitation), regulatory strengthening, technology transfers and intellectual property management, access to finance as well as research and development (in terms of higher education and skills).

Manufacturing to improve prevention, detection & treatment of HIV virus

PrEP, or pre-exposure prophylaxis, describes the use of medications to prevent the spread of disease in people who have not yet been exposed to a disease-causing agent, usually a virus. By investing in the development of advanced HIV technology in Africa with a locally-based manufacturing framework for APIs, we could begin to manufacture PrEP locally, for people who don't have HIV and are at risk of being infected.

South Africa's present capacity to manufacture PrEP tablets remains negligible at best, and should be improved. That being said, our vision to ensure long-term medicine security should focus on the production of biologics instead. PrEP tablets need to be taken once daily, ideally at the same time of day. This daily adherence is essential to maintaining its effectiveness, and any deviation from it could result in infection. The tablets have also been documented to cause a number of side effects, including diarrhea, nausea, headache, fatigue and stomach pain. Given the risk of infection and daily adherence, injectable PrEP with cabotegravir (CAB) offers a highly effective alternative to protect adults and adolescents who are at risk of contracting HIV through sex. While Cipla has announced (6) plans to manufacture these at two of their plants in South Africa, a production date is yet to be confirmed.

Investing (locally) in a biologics facility with the capacity to manufacture APIs and supply PrEP injectables will remain a significant undertaking to help make the injectable more affordable in emerging markets across the continent today.

mRNA technology to lead the way

mRNA vaccine technology is at the very forefront of making this possible. If we can develop the technology and APIs to manufacture PrEP locally, as well as mRNA based products on our continent, South Africa can position itself at the forefront of the development of a pharmaceutical manufacturing framework for improved medicine supply across Africa in the long term.

The world-renowned Afrigen Biologics mRNA hub in Cape Town already aims to contribute significantly to this project, by working on the development of new vaccines for diseases that are rampant in lower and middle-income countries. Their very first vials should be making their way to the market by 2024.

UNAIDS targets are possible with a Pan-African approach & locally manufactured APIs

A united and coordinated approach to develop Africa's pharmaceutical manufacturing framework will remain a critical undertaking to reach global 95-95-95 targets in Africa. This must be supported by the localised production of API's, ARVs and PrEP injectables for Africa, in Africa, to simultaneously insulate the region from its reliance on HIV medicinal imports.

We will have to leverage the expertise of our closest allies and make use of all grant funding opportunities to make this a reality. One thing is certain, a united Africa is a force to be reckoned with-anything is possible if we believe in ourselves.

Acknowledgements

The authors share their gratitude with the researchers and specialists working at the United Nations Program on HIV/AIDS (UNAIDS), the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the International Aids Society, among other stakeholders, for their commitment and work to decrease the rate of transmission of HIV/AIDS in Africa.

Conflict of interest

The authors declare no potential conflict of interest.

Accepted: 28, September 2023; Submitted: 28, September 2023

References

1. IAS 2023. International AIDS Society Conference. International AIDS Society. 2023. Available from: <https://www.iasociety.org/conferences/ias2023>.
2. HIV.gov. Final IAS 2023 Conversations: HIV, STI Prevention, Stigma, and U=U. HIV.gov. July 26, 2023. Available from: <https://www.hiv.gov/blog/final-ias-2023-conversations-hiv-sti-prevention-stigma-and-u-u/>
3. World Health Organization. New WHO guidance on HIV viral suppression and scientific updates released at IAS 2023. Geneva, World Health Organization. July 23, 2023. Available from: <https://www.who.int/news/item/23-07-2023-new-who-guidance-on-hiv-viral-suppression-and-scientific-updates-released-at-ias-2023>.
4. UNAIDS. Fact Sheet: Global HIV Statistics. Geneva, UNAIDS, 2023. Available from: https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf.
5. European Investment Bank. President of Senegal Macky Sall welcomes Team Europe support to help build a manufacturing plant in Senegal to produce vaccines against COVID-19 and other endemic diseases. Luxembourg, European Investment Bank. July 09, 2021. Available from: <https://www.eib.org/en/press/all/2021-254-president-of-senegal-macky-sall-welcomes-team-europe-support-to-help-build-a-manufacturing-plant-in-senegal-to-produce-vaccines-against-covid-19-and-other-endemic-diseases>.
6. Kanene Z: The anti-HIV injection will be made in SA-it could cost between R600 and R800 a pop. Bhekisisa Centre for Health Journalism, Mail & Guardian, May 9, 2023. Available from: <https://bhekisisa.org/article/2023-05-09-the-anti-hiv-injection-will-be-made-in-sa-it-could-cost-between-r600-and-r800-a-pop/>.