A Deep Drive into the Evolving Landscape of Medical Laboratory Across West Africa

Report by **Medlab West Afrrica**

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Medical Laboratory Market - Industry Overview

Medical laboratories play a vital role in healthcare systems, utilising body specimens like blood or urine to diagnose and treat patients. It offers crucial insights to healthcare practitioners regarding the onset, severity, and causes of various illnesses. According to 360 Research Reports, the global medical laboratory market is set to grow significantly from USD 203.33 billion in 2021 to an estimated USD 278.22 billion by 2027, with a CAGR of 5.37%. Rising demand for diagnostic tests due to the prevalence of chronic diseases, together with innovations in sample preparation and data management are driving this increase. The rapid rise of these technologies is projected to propel market expansion in the coming years.

West Africa Medical Laboratory Market – Overview

As per Grand View Research, The West African medical laboratory market is thriving set to reach USD 16.36 billion by 2027 from its current value of USD 11.3 billion. This surge is propelled by heightened healthcare demands, technological strides, and demographic shifts, particularly in budding regions like Nigeria and Ghana. Key drivers include a growing population with surge in chronic diseases, the adoption of advanced technologies enhancing diagnostic services, substantial government investments in healthcare infrastructure, and prominent contributions from leading nations like Nigeria and Ghana.

Nigeria Medical Laboratory Market

As per Mordor Intelligence, the Nigerian medical laboratory market is expected to develop at a CAGR of almost 4.7% between 2023 and 2028. Nigeria accounts for over 20% of the West African medical laboratory market and is expected to reach USD 889.2 million by 2032. The private sector is the largest provider of medical laboratory services, handling over 60% of the market. The development of chronic illnesses, the rising demand for reliable disease diagnosis, besides the government's emphasis on public-private partnerships is driving the Nigerian medical laboratory industry.

The Nigerian Government, donor agencies, and non-governmental organisations (NGOs) are working together to surge public awareness. The diagnostic centres are furnished with cutting-edge technology, giving medical professionals and patients access to high-quality, cost-effective, quick, dependable, along with sophisticated molecular testing. A shortage of medical laboratories, contemporary diagnostic technology, and workers with insufficient training are impeding market expansion.

Disease Landscape

- Nigeria grapples with a high mortality rate due to malaria, respiratory infections, HIV/AIDS, diarrhea, cancer, meningitis, stroke, and tuberculosis. In 2021 alone, the country recorded alarming figures: 58,143,458 malaria cases, 288,258 tuberculosis cases, and 244,501,556 cases of diarrheal illnesses. This surge in infectious diseases underscores an escalating demand for diagnostic services to manage and curb the spread of these illnesses.
- Nigeria made significant strides in the HIV/AIDS battle, with 1.8 million individuals receiving vital antiretroviral treatment in 2021. Additionally, 6.2 million underwent HIV testing, 34,000 HIV-positive mothers received essential medication, and 1.7 million availed themselves of HIV prevention services.
- Nigeria achieved remarkable success in malaria and tuberculosis management, distributing 16.3 million mosquito nets, providing preventive treatment to 2.4

million pregnant women, testing 26.1 million suspected malaria cases, and treating 5.3 million tuberculosis patients. The Global Fund, PEPFAR, and PMI collectively invested USD 11 billion in Nigeria's fight against malaria, HIV, and tuberculosis over two decades.

- Communicable diseases remain a primary cause of mortality, but chronic diseases are rising. WHO data indicates chronic illnesses, constituting 29% of all deaths, are projected to surge by 27% in Nigeria over the next decade—outpacing the estimated 17% global increase in non-communicable diseases.

CDC in Nigeria

- CDC Nigeria collaborates with the FMOH, state health ministries, government agencies, and partners to address HIV, TB, malaria, and vaccine-preventable diseases while enhancing laboratory, surveillance, and workforce capacity for disease outbreaks.
- Collaborating with the Nigeria Centre for Disease Control and partners, CDC integrated COVID-19 testing into the laboratory network, enabling over 5.5 million tests between 2020 and 2022.
- Works with the Nigerian government to enhance workforce development, monitoring, emergency response, and laboratory capacity.
- CDC sponsors 7 PEPFAR/Global Fund-supported facilities in the PCR facility network, including the National Reference Laboratory's Mega PCR facility, delivering viral load testing services annually to over 1.9 million antiretroviral medication patients.

Regulatory Environment

- Medical Laboratory Science Council of Nigeria (MLSCN) oversees the training, practice, and professional conduct of clinical laboratory scientists and technicians, ensuring adherence to clinical laboratory standards for optimal patient care. It is responsible for approving institutions and programs for the training of clinical laboratory science and technician professionals in Nigeria.
- The Federal Ministry of Environment holds the highest authority for recognising and certifying environmental laboratories in Nigeria, overseeing registration, regulation, monitoring, and sanctioning of both existing and new laboratories. Recognised laboratories across the federation, specialising in site investigations or geotechnical testing and analysis, operate under the supervision and certification of the Federal Ministry of Environment.

Ghana Medical Laboratory Market

In Ghana the medical laboratory sector has evolved significantly over the years, contributing to the overall improvement of the health delivery system. With a growing emphasis on delivering sufficient health care to all individuals, Ghana Health Services evaluates accessible health laboratories also compiles an array of highly rated institutions. With the emergence of the COVID-19 pandemic in recent years, it has enhanced increasingly vital for recognised health laboratories to be identified, and only a handful have been validated as well as authorised by the Ghana Health Service based on international standards together with regulations. In 2023, the Ghana Medical Laboratory Market is estimated to be USD 225.2 million, based on research by Fitch Solutions. The market is expected to grow at a CAGR of 7.3% from 2020 to 2025, reaching USD 300 million by 2025.

There are several highly recommended health laboratories in major cities such as Accra, Kumasi, Tamale, Takoradi, Cape Coast, and Tema, such as Essence Medical Laboratory, McSarpong Medical Equipment & Supplies, Synlab Ghana, Metropolis Healthcare Ghana Limited, and MDS-Lancet Laboratories Ghana Ltd.

Disease Landscape

1. As of July 24, 2022, Ghana recorded a total of 168,019 COVID-19 cases with 1,457 fatalities. The country conducted 2,488,748 samples, including 1,115,998 through contact tracing, and administered 18,396,070 COVID-19 vaccine doses by July 20, 2022.

2. Ghana reported its first confirmed cases of monkeypox on July 8, 2022, leading to increased surveillance. As of July 15, 2022, there were 33 reported cases, prompting the designation of monkeypox as a "Public Health Emergency of International Concern (PHEIC)."

3. On July 7, 2022, the Ghana Health Service confirmed the country's first two Marburg cases. By July 24, 2022, Ghana documented three confirmed Marburg cases, resulting in a 66.7% fatality rate and two deaths.

CDC in Ghana

- CDC Ghana, a vital public health partner, enhances national laboratory capacity and strategic information, focusing on quality control and diagnostic network optimisation.
- Providing technical assistance, CDC Ghana supports partners in Senegal, Burkina Faso, and Sierra Leone, playing a key role in PEPFAR's West Africa Region.
- CDC contributes to Ghana's policy development, strengthening laboratory systems, national HIV testing, and service delivery.
- In response to the pandemic, CDC aids in implementing COVID-19 strategies and vaccination distribution, leveraging past collaborations for an effective response.
- CDC funds accreditation for the National Public Health and Reference Laboratory, achieving ISO 15189:2012, and ISO 9001:2015 certification for public health labs in key regions.
- CDC assists in constructing genetic testing facilities in Northern and Western districts, fostering improved laboratory capabilities.
- Collaborating on genome sequencing facilities at key labs, CDC contributes to advanced capabilities at the National Public Health and Reference Laboratory.
- In partnership with Ghanaian counterparts(Noguchi Memorial Institute for Medical Research (NMIMR), the Ghana Health Service/MOH, and the US Naval Medical Research Unit 3), CDC focuses on enhancing influenza monitoring and laboratory capacity since 2007, ensuring preparedness and response to influenza risks.

Regulatory Environment

Ghana Association of Biomedical Laboratory Scientists (GABMLS) is the country's single professional organisation for medical laboratory science. It was registered under the Professional Bodies Registration Decree 1973, (NRCD) 143, with the Registration Number PB-2 in 1973. GAMLS operates as a professional body

to promote and enhance medical laboratory practice via continuing education, research, and training in accordance with worldwide best practices for the benefit of Ghanaians and the world at large.

Cameroon Medical Laboratory Market

Cameroon aims for Universal Health Coverage by 2035. However, only 6.4% of the population is now covered by a community health insurance program, and the cost of healthcare finance falls mostly on households. Families are anticipated to contribute 70% of overall health expenses, while 64% of families do not have access to healthcare due to high expenses. Owing to insufficient public resources devoted to health, the public health sector, despite providing the bulk of healthcare, is unfit for purpose. In Cameroon, the private sector comprises non-profit religious organisations, non-governmental organisations (NGOs), and for-profit companies. The Cameroon medical laboratory market is estimated to be worth USD 150 million in 2023 and is projected to reach USD 180 million by 2025, reflecting a moderate CAGR of 6.2%. (Source: Mordor Intelligence)

Disease Landscape

- Cholera and measles outbreaks pose significant health threats in various regions of Cameroon, linked to challenges in water access, sanitation, and healthcare. As of June 30, 2023, the reported cholera cases stand at 19,251, with 457 fatalities.
- Mpox cases emerged in October 2022, showing a 3.2% nationwide case fatality rate. By May 2023, 33 suspected cases occurred in the South-West region, emphasising the urgent need for medical support and preventive measures.
- UNICEF's swift response to the Marburg Virus Disease (MVD) outbreak in Equatorial Guinea in February 2023, including early deployment of community engagement personnel, played a crucial role in averting the threat in Cameroon.
- Cameroon reported 35 zoonoses (viral, bacterial, and parasitic) from 2000 to 2022, underlining the ongoing challenges in managing diseases transmitted between animals and humans.

CDC in Cameroon

- In 2016, the CDC provided a critical role in the establishment of Cameroon's National Public Health Laboratory
- The efforts of the CDC resulted in the establishment of five recognised laboratories, including the first globally accredited laboratories in Central Africa and the first internationally certified blood bank in West and Central Africa
- The CDC assisted the National Public Health Laboratory in training 25 laboratory personnel from five areas in the diagnosis of 10 priority illnesses
- Collaborating with national partners, the CDC is enhancing capacities for monkeypox laboratory diagnostics, viral genome sequencing, and ecological research.

Regulatory Environment

The Department of Pharmacy, Drugs, and Laboratories (DPML) within the Ministry of Public Health in Cameroon spearheads regulatory efforts in the pharmaceutical industry.

LANACOME, the National Laboratory for the Quality Control of Drugs and Expertise, plays a pivotal role in ensuring the quality control of medications and health products, both imported and locally manufactured, in compliance with prevailing legislation.

Cameroon National Laboratory Policy

The Cameroonian government aims to elevate its health system across all facets by 2030 under the National Development Strategy 2020-2030. To enhance healthcare quality, the establishment of an effective laboratory system aligning with global standards is crucial. The National Laboratory Policy serves as a strategic precursor, aligning with WHO and Africa CDC recommendations, paving the way for the realisation of universal health coverage.

Niger Medical Laboratory Market

The Republic of Niger is a West African landlocked republic bordered by Algeria, Benin, Burkina Faso, Chad, Libya, Mali, and Nigeria. It is a low-income nation with a per capita GDP of USD 533 in 2022 and a population of 26.2 million. The country has a high burden of communicable diseases (such as malaria, TB, and HIV/AIDS) as well as non-communicable diseases (NCDs). The latter was expected to be responsible for 30% of all fatalities in 2019.

Disease Landscape

Communicable Diseases

Malaria remains a significant public health concern in Niger, with an estimated 8.1 million cases and 24,997 fatalities in 2021. Tuberculosis (TB) and HIV/AIDS pose serious health threats. The TB mortality rate decreased from 19 to 13 per 100,000 people between 2015 and 2021. Niger accounts for 3.2% of global malaria cases, contributing to 3.9% of global mortality and 7% of West Africa's malaria cases in 2021. Approximately 24,292 individuals are receiving antiretroviral

medication for HIV and TB.
Neglected tropical diseases (NTDs) are prevalent in Niger, including lymphatic filariasis, schistosomiasis, soil-transmitted helminthiasis, and trachoma. In 2020, 94% of the targeted population (6.8 million out of 7.2 million) received preventive chemotherapy through mass drug administration for these NTDs. Other endemic NTDs include cystic echinococcosis, leishmaniasis, foodborne trematodiases, taeniasis and cysticercosis, leprosy, and rabies.

Non-communicable Diseases

NCDs are a significant health challenge in Niger, with a mortality rate of 638/100,000 males and 583/100,000 females in 2021. Despite efforts in NCD policies and tobacco-related measures, limited progress is seen in areas like tobacco media campaigns, salt policies, and physical activity awareness. There's a crucial need for intensified strategies to address these gaps in combating major NCDs.

Labos 2S Project (LABORATORIES FOR HEALTH IN NIGER) Accomplished

The LABO2S project, aimed at enhancing health laboratories in Niger, concluded successfully on July 6, 2023, in Niamey. The Labo 2S initiative, determined to improve HIV/TB services, has three key outcomes: enhanced healthcare organisation in Niamey and Dosso, improved performance of the National HIV Reference Laboratory, and increased access to biological testing for individuals with HIV or exposed to tuberculosis. Overcoming challenges in laboratory service integration, Niger achieved these milestones with collaborative efforts from the Ministry of Public Health, RENIP+, Fondation Mérieux, and key beneficiaries, marking a successful stride towards quality healthcare delivery in the region.

Regulatory Setting

The regulatory landscape in Niger for the medical and pharmaceutical sectors is a complicated tapestry woven with successes and setbacks. The Direction des Pharmacies, Laboratoires, et de la Medicine Traditionelle (DPHL) is the principal regulating agency, in charge of many aspects:

- Registration and licensing of pharmaceutical businesses, pharmacies, and labs
- Ensuring the quality and safety of medicines and medical devices
- Monitoring and managing drug and medical supply distribution
- Establishing and implementing medical practice standards

Benin Medical Laboratory Market

The Republic of Benin is a country in West Africa. It is bordered by Burkina Faso, Niger, Nigeria, and Togo. It is a lower-middle income country with a population of 13 million and a GDP per capita of USD 1,319 in 2021. The estimated market size of USD 30 million for the Benin medical laboratory market in 2023 is based on data from Data Bridge Market Research.

Disease Landscape

Communicable Diseases

Malaria remains a pressing health concern in Benin, with an anticipated 5 million cases in 2021, resulting in 11,154 fatalities. Tuberculosis (TB) incidents reached 53 per 100,000 people in 2021, maintaining a steady mortality rate since 2015. Benin, endemic for five Neglected Tropical Diseases (NTDs), achieved 82% of its 2020 mass drug administration (MDA) goal. In April 2023, the World Health Organisation verified Benin's successful elimination of trachoma as a public health issue, marking a significant achievement. Additionally, various other NTDs, including trypanosomiasis, leishmaniasis, leprosy, taeniasis, cysticercosis, and rabies, continue to be endemic in the region.

Non-communicable Diseases

- NCDs are a major public health concern in Benin. In 2021, the age-standardised death

rate for four main NCDs (Cardiovascular Disease, Chronic Respiratory Disease, Cancer, and Diabetes) was 731 for men and 579 for females. Benin has made initial efforts on NCD progress indicators related to NCD policy and plan, NCD guidelines, tobacco taxes, tobacco smoke free/ pollution, as well as tobacco advertising bans; however, progress on tobacco media campaigns, alcohol availability, alcohol advertisement restrictions, salt policies, trans fats policies, marketing to children, including physical activity guidelines has been more limited.

The Laboratory Initiative

- The United States Malaria Initiative promotes outward training and supportive supervision (OTSS) for malaria detection in 49 public and private health institution laboratories. PMI has enhanced the quality assurance of malaria diagnoses in private health facilities and laboratories via training, professional development, along with laboratory monitoring.
- Benin has received Global Fund support through the Uganda and Benin SRLs to assist National TB Reference Laboratories and its networks in 45 countries throughout the WHO African Region in improving TB diagnosis.

Building Diagnostic Capabilities in West Africa - Major Component of Health / Pandemic Preparation

West Africa has witnessed a surge in laboratory infrastructure investment, bolstering healthcare and medical research with new facilities and upgrades. The West African Network of Biomedical Analysis Laboratories (RESAOLAB), a pioneering regional network, strives to enhance medical diagnosis, supported by the Mérieux Foundation and the Agence Française de Développement. In its third phase (2019-2023), RESAOLAB aims to elevate public health objectives and establish a top-tier biological laboratory system.

The West Africa Health Organisation (WAHO), ECOWAS's specialised institution for health, conducts diagnostic capacity and laboratory system training programs, including the Third Country Laboratory Training (TCTP). This initiative has equipped scientists in the region, enabling swift confirmation of Marburg virus infections within 48 hours during suspected outbreaks. The integration of point-of-care diagnostics, telemedicine, and artificial intelligence in laboratory diagnostics is transforming healthcare delivery and elevating patient outcomes across West Africa.

COVID-19 Impact

The ongoing COVID-19 pandemic has highlighted the importance to improve core capacities, like laboratory diagnostics, in health security systems. The pandemic has emphasised the need for scalable, rapidly-activated diagnostic testing platforms, strengthened global reagent supply chains, and sufficient trained laboratory personnel in countries worldwide.

In West Africa, additional laboratory networks are being established to strengthen health security like the Institute of Pathogen Genomics (IPG) laboratory network. IPG operates through Africa CDC's Regional Coordinated Centers and its Regional Integrated Surveillance and Laboratory Network (RISLNET). This has already shown great success to establish regional as well as continental genomics capacity for COVID-19 that can be leveraged for future pathogen discovery. Additionally, Africa CDC and the African Union have called for African countries to pool resources to procure and distribute COVID-19 diagnostic tests, authorised for greater national-level access to testing. This kind of resources shared can be further facilitated through regional health security systems, which includes regional laboratory networks such as RESAOLAB and EAPHLNP. Other regional Initiatives include:

- The establishment of the IPG laboratory network in Senegal, Nigeria, Ghana, and Sierra Leone, with plans to expand to other West African countries.
- The African Union's initiative to pool resources and procure COVID-19 test kits for distribution across the continent.
- The launch of the West African Centre for Cell Biology of Infectious Pathogens (WACCBIP), a regional research center dedicated to infectious diseases.
- The deployment of mobile laboratories in several West African countries to improve access to testing in remote areas.

Exploring Growth Opportunities

To strengthen laboratory capacity in West Africa requires a comprehensive and sustainable strategy that extends beyond crisis response. To achieve this goal, it must prioritise certain areas that offer growth opportunities and serve as a roadmap for success.
Rapid diagnostic testing and portable technologies

- Rapid diagnostic testing in West Africa for Malaria, HIV, TB, and COVID-19 is a success, cutting costs and improving care linkage. Instant HIV self-tests, providing results within minutes, enhance affordability and streamline access to care. WHO-recommended rapid molecular testing for TB minimises delays in diagnosis and treatment initiation. The success in leveraging HIV and TB testing facilities for COVID-19 diagnosis highlights the potential to develop quick diagnostic tests for other pandemic and epidemic-prone diseases. Portable labs and "MinION" technology enable on-site rapid testing, even in remote outbreak zones, paving the way for diagnosing other potential pandemic threats.
- Decentralising lab capacity with rapid tests & molecular tools improves scalability and response times in resource-constrained settings, enabling faster outbreak containment.
- Establishing local manufacturing capabilities for diagnostic tools, fostered by partnerships between African institutions, universities, governments, biotechnology companies, and international organisations, unlocks vital potential: expand scalability, wider utilisation, and empowered health systems across West Africa.
- Creating networks of national and regional laboratories-
establishing interconnected laboratories and excellence hubs across Africa enhances the continent's diagnostic capabilities. During critical outbreaks like COVID-19, nations sent samples to reference facilities in Senegal, Nigeria, and South Africa, showcasing the effectiveness of such networks. To further bolster these efforts, investing in bioinformatics infrastructure, including high-speed internet and skilled biomedical engineers, is essential for sustainable progress in healthcare.

Medical Laboratory Technological Advancements: Predicting the Lab of the Future

In recent years, technological strides in laboratory medicine have significantly elevated clinical diagnostics, enhancing patient care. Automation in healthcare has streamlined lab data management, with the rising adoption of automation systems expected to drive market growth. Notably, clinical chemistry and hematology labs have embraced automated analysers, leading to improved efficiency, cost-effectiveness, and reduced errors. Advancements in genetics, genomics, NMR spectroscopy, mass spectrometry, and microfluidics have synergised with rise in lab automation, ushering in a new era of precision. Next-gen sequencing has revolutionised genomics, enabling high-throughput, cost-effective whole-genome DNA and RNA sequencing. Proteomics and metabolomics have flourished with advancements in NMR and MS technologies, extending applications across clinical disciplines.

Concurrently, bioinformatics and information technology have evolved, addressing the challenge of managing massive data generated by modern analytical methods. Sophisticated machine learning and AI play pivotal roles in data mining and deep learning. This technological landscape fosters a culture of innovation in laboratory medicine, hinting at an era of precise and personalised healthcare, amplifying the crucial role of laboratories in the healthcare supply chain.

Collaboration is key to accelerating technological adoption in West Africa. Notable examples include:

- Ghana Health Service's partnership with Abbott Laboratories: Implementing point-of-care testing for HIV diagnosis, improving access and reducing turnaround times.
- Nigeria's Institute for Human Virology's collaboration with Illumina: Enhancing research capacity for infectious diseases through next-generation sequencing technology.
- Senegal's Institut de Recherche pour le Développement (IRD) and Institut Pasteur: Partnering to develop advanced diagnostics for neglected tropical diseases.

Future Outlook

As West Africa strives for self-sufficiency in medical laboratory capabilities, a strategic approach is imperative. This involves identifying and prioritising local health needs, addressing funding disparities, and fostering collaboration across sectors.

Clear regional and national health priorities must guide laboratory development. Rectifying funding inequalities in laboratory diagnostics is essential. Budget allocation should shift towards enhancing laboratory infrastructure. International funding organisations should prioritise building laboratory capacity in West Africa.

Basic laboratory testing's crucial role must be recognised by clinicians, policymakers, and donors. Lab services should be acknowledged as a fundamental healthcare pillar. Raising awareness about laboratories' role in disease differentiation and patient care is vital.

Public, private, and commercial sectors should collaboratively strengthen lab capacity. Donor and government activities need coordinated efforts for long-term sustainability. Regional hubs can facilitate knowledge sharing and optimise resource allocation.

Seamless information flow and knowledge sharing between hubs are pivotal. Strong partnerships among stakeholders ensure efficient resource use and better public health outcomes.

Strengthening lab capacity is crucial for global public health, particularly in West Africa. Inadequate funding impedes progress towards self-sufficiency in lab diagnostics. A lack of awareness about basic lab testing poses a significant challenge. Collaboration among stakeholders is vital for sustainability. Investing in regional hubs optimises resource allocation.

Medlab West Africa
By Informa Markets

The West African edition of the Medlab series

In 2023, the event was co-located with Medic West Africa, and swiftly emerged as the leading destination for the West African laboratory industry. Responding to an overwhelming demand from both exhibitors and attendees, we are excited to announce that the 2024 edition of Medlab West Africa will take place as a standalone event, co-located with Pharmaconex West Africa.

Mark your calendar for this must attend event, set to unfold from **22-24 April 2024 at the Landmark Centre in Lagos, Nigeria – just 2 days after Medic West Africa.** This strategic move is designed to deliver a more focused and impactful experience, aligning with the dynamic landscape of the medical laboratory sector.

Join us on this journey as we bring together industry leaders, innovators, and all relevant stakeholders to shape the future of medical laboratory in West Africa.

For more information, visit **medlab-westafrica.com**