Developing An Integrated Biodefense Strategy and Implementation Plan for Nigeria.

January 2023.

Produced by: GET Global Emerging Pathogens Treatment Consortium

ACRONYMS

AIDS- Acquired Immunodeficiency Syndrome

CFR- Case Fatality Ratio

COVID-19- Coronavirus disease

DRC- Democratic Republic of Congo

DURC- Dual-use research of concern

EVD- Ebola Virus Diseases

LF- Lassa Fever

GDP-Gross Domestic Product

HCEs- Healthcare Establishments

HIV- Human Immunodeficiency Virus

NGO- Non-governmental Organization

WHO- World Health Organization

YFD- Yellow Fever Disease

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Chapter One

Introduction

The diversity of infectious disease outbreaks and other biological threats currently facing humanity is unprecedented. We are in the epidemic era with increased frequency and intensity of emerging and re-emerging infectious diseases. The twenty-first century has experienced a wave of severe infectious disease outbreaks, including the recent outbreak of COVID-19 pandemic, which had a devastating impact on lives and livelihoods globally. There has been substantial morbidity as a result of the emergence and cross-border spread of some infectious diseases, such as severe acute respiratory syndrome (2003), coronavirus outbreak, swine flu pandemic (2009), Middle East respiratory syndrome coronavirus outbreak (2012), the 2013–2016 Ebola virus disease epidemic in West Africa and the 2015 Zika virus disease.

These extreme biological events are magnified by global travel and trade, urbanization, interest in weapons of mass destruction by some terrorists, and rapid technological advances that can create and manipulate pathogens with pandemic potential. The accelerating environmental and climate change, biotechnology development, and socio-economic globalization increase the potential for biosecurity threats in many countries.

Africa is characterized by the most significant infectious burden as a region. Half of all deaths in Africa are caused by infectious diseases, compared to only 2% in Europe. Low investment in healthcare, Poverty, poor education, inadequate health knowledge, poor infrastructure, geographic factors, lifestyle, and environmental

factors (i.e., limited access to resources such as clean water) have been identified as primary factors contributing to the high incidence of infectious diseases in Africa. Nigeria ranks as the most populous country on the continent of Africa, with an estimated population of over 200 million is also burdened with increasing infectious disease outbreaks. Nigeria has witnessed over 20 public health emergencies and infectious disease outbreaks between 2016 and 2018 alone; the country is currently among the five members of the World Health Organization (WHO) African Region to report five or more public health events per annum.

The COVID-19 pandemic has dramatically demonstrated the impact of health emergencies on health and national security, the economy and social welfare. Risks from natural and artificial hazards are also likely to result in major health emergencies of increasing frequency and impact, given the weakened systems that the pandemic would leave in its wake, coupled with the accumulating risk due to climate change. As the biological threat landscape continues to advance, so must our preparedness and biodefense capabilities. It is important that Nigeria should develop capacities to assess, prevent, prepare for, respond to, and recover from biological threats at all levels. This biosecurity framework is important to prevent natural and intentional biological threats to subnational and national health and economic security.

Ignoring the link between health security, economic and political security is at our peril. Whether it occurs by a quirk of nature or through a terrorist, epidemiologists have reported that a fast-moving airborne pathogen can kill more than 30 million people in less than a year. It has also been reported that there is a reasonable probability the world will experience such an outbreak within the next 10-15 years".

Chapter Two

History of Common Emerging and Re-emerging Infectious Diseases in Nigeria

Emerging infectious diseases are diseases that either have never occurred in humans before, previously occurred but only affected a limited number of people in the affected places or have occurred throughout history but only recently identified as distinctly due to its infectious agent; while re-emerging infectious diseases are those that were once major public health problems globally for a significant portion of the population.

Monkeypox disease

The monkeypox virus was first identified in 1958 in captive monkeys imported into Copenhagen, Denmark, from Africa. Although the first human case of monkeypox was identified in a 9-year-old in the village of Bukenda, Zaire (now the Democratic Republic of Congo (DRC). Between 1970 and 1978, Nigeria reported a total of 3 cases of human monkeypox infection, one in 1970 and two in 1978 and none until 38 years later, in September 2017, when a re-emergence of what would be the largest-ever recorded outbreak of the West African Clade of human monkeypox, with 228 suspected cases (and 60 confirmed) in 24 of 36 states in the country.

Lassa fever (LF)

LF is an acute viral hemorrhagic fever that was first discovered in Lassa village, Borno state in Nigeria. It has been known to be associated closely with seasonal variations, peaking in the dry season, usually between December and April, a situation attributed

to the migration of rodent reservoirs into human settlements in search of food. LF is one infectious disease that has caused emerging and re-emerging outbreaks in Nigeria. Since its discovery in 1969, there have been outbreaks in many states in Nigeria. It remains one infectious disease that has re-emerged several times and continues to pose a significant challenge to the Nigerian health system.

Coronavirus disease (COVID-19)

COVID-19 is a highly infectious disease caused by the SARS-CoV-2 virus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment. However, some might become seriously ill, requiring urgent medical attention. The first COVID-19 case in Nigeria was confirmed 0n February 27 2020. As of January 13, 2023, 266,463 cases have been confirmed, 259,850 cases have been discharged, and 3,155 deaths have been recorded in Nigeria.

Ebola virus disease (EVD)

EVD is an acute viral hemorrhagic fever caused by the Ebola virus. Ebola is a deadly disease with a case fatality rate varying from 25% to 90% in past outbreaks. The first case of EVD in Nigeria was confirmed on July 25, 2014, triggering an outbreak infecting 20 people and killing 8 (CFR = 40%). The Nigerian outbreak was brought under control in record time, with the World Health Organization (WHO) declaring the nation free from Ebola transmission on October 20, 2014.

Yellow fever disease (YFD)

YFD is an acute viral hemorrhagic fever caused by the yellow fever virus and transmitted by an infected female Aedes mosquito. The first recorded yellow fever outbreak in Nigeria occurred in Lagos in 1864. This was followed by other outbreaks in Lagos in 1894, 1905, 1906, 1925 and 1926. The next outbreak happened in Jos in 1969,

infecting over 100,000 people, then in 1987 and 1996, infecting over 120,000 people in different parts of the country. There were only sporadic cases after this period and for 21 years till September 2017, when Nigeria had an outbreak of 4,189 suspected cases and 604 confirmed nationwide. Following the 2017 outbreak, the nation has fought yearly outbreaks since then-in, 2018, 2019 and 2020.

Chapter Three

Pandemics and National Security

Recent trajectories of emerging infectious diseases such as COVID-19 and Ebola disease clearly demonstrate that whether caused by natural or unintentional activities, pandemics and epidemics cause severe human suffering, create panic, disrupt the social and economic structure, and can impede development in the affected communities. Past experiences show that pandemics do not only destroy immune systems but also undermine the social, economic, and political systems that support entire nations and regions.

The traditional definition of national security as protecting the state from physical threats, both internal and external aggression, needs to be reviewed and expanded. The last few decades have witnessed a massive increase in nontraditional threats, such as terrorism, drug trafficking, human trafficking, and disease. Emerging and re-emerging diseases, and their pandemic potential, pose a challenge to national security in the 21st century that cannot be ignored.

The ongoing COVID-19 pandemic and the outbreak of HIV/AIDS, Influenza H1N1 and SARS in the recent past are just a few examples of diseases that can profoundly threaten the physical integrity of a state. Diseases such as COVID-19 and Ebola demonstrate that they are more damaging to the populations and economies of nations than a military or terrorist attack and are directly responsible for events that jeopardize states' stability, capacity, or viability. A pandemic can threaten the national security of a state in the following ways.

1. **Increased morbidity and mortality:** Pandemics and other extreme biosecurity threats cause increased rates of illness and mortality, putting huge strains on public health and the nation's workforce, leading to political instability, class strife, and economic recession. For example, the ongoing COVID-19 disease, as of January 2023 has infected 667 million people and led to the death of 6.7 million people worldwide. HIV/AIDS has also led to numerous problems in many African countries. These diseases have a severe impact on the population, the economy, and the very fabric of our societies, undermining not only development but posing a serious threat to our security and life as we know it.

2. **Impact on government stability:** The functions of established and recently formed governments may become threatened by pandemics and other extreme biosecurity threats. As society is degraded by infectious disease, its populace may lose confidence in a government that seems unable to control the disease. Such a loss in confidence, it has been asserted, results in a degradation of a government's legitimacy and may lead to increased migration or increased vulnerability to economic or military competition from other nations. Furthermore, there is a clear link between infectious disease outbreaks and the prevalence of political instability, especially in (but not limited to) developing countries. This was demonstrated clearly during the ongoing COVID-19 pandemic in Nigeria and many other developing countries in Africa. The lockdown during the pandemic led to serious social unrest in major cities in Nigeria, with youths in Nigeria for weeks grounding both political and economic activities in Lagos, Abuja and other major cities in the country. In the event of a pandemic, the level of the weakness of a government may be exploited by dissidents or outsiders, while the legitimacy of an established government may become threatened among its citizens.

3. **Health and stability of security personnel:** Infectious disease outbreaks can significantly impact the health and stability of the defence force in a country. Ministries of defence in some sub-Saharan African countries report HIV prevalence averages of 20–40 per cent in their armed services, potentially affecting their military capabilities. In fact, the disease has historically been responsible for more battlefield hospitalizations than combat injuries. We are now living in an era of rapidly advancing biotechnology with the capacity to modify or create novel pathogens for medical advances and/or nefarious reasons, i.e., dual use. In the short run, the succumbing of soldiers to disease can result in direct inhibition of the performance of military missions that range from peacekeeping to defending the homeland by having a fundamental impact on combat readiness. In the long run, a population with a difficult time overcoming a public health emergency would produce fewer suitable military recruits, and ultimately, the quality of military leadership will suffer.

4. **Economic growth and livelihood:** The economic effects of infectious diseases, whether endemic, e.g., malaria, or epidemic, e.g., Ebola, can be devastating. As just one example, it has been estimated that Africa's gross domestic product would be nearly one-third higher if malaria alone had been eliminated several decades ago (U.S. General Accounting Office, 2001). Many of these effects are indirect (e.g., loss of productivity and commerce), but there are also direct economic costs (e.g., culling of animal herds and medical costs of treating humans) that may affect security. The COVID-19 pandemic significantly impacted the world's economy, especially in developing countries like Nigeria. Reports show that the total Gross Domestic Product (GDP) fell 23% during the lockdown. The Agrifood system GDP fell 11%, primarily due to restrictions on food services. Household incomes fell by a quarter, leading to a 9% increase in the national poverty rate.

Chapter Four

Nigeria Biodefense Strategy

This Strategy acknowledges that ensuring a biosecure country is a shared responsibility and everybody's business. It sets out recommended strategic direction for all stakeholders in Nigeria to work towards addressing biosecurity threats in Nigeria. It provides the foundation for governments, industries, non-government organizations and the community to collaborate and share resources, knowledge, and expertise to develop a solid and integrated biodefense strategy for Nigeria.

Need for A National Biodefense Strategy for Nigeria

Biological threats affect humans, animals, plants, and the environment, resulting in significant health, economic, social, and national security impacts. Addressing biological threats is an important requisite for human health, animal health and biodiversity conservation. Preventing the introduction and spread of pathogens either through natural or artificial activities is essential. Although several international instruments are relevant in this regard, it is imperative for a country to have a strategy to address biological threats.

Nigeria is a signatory to several relevant international protocols and treaties and has a few internal mechanisms to address biological threats and the proliferation of weapons of mass destruction. However, the national drive and Strategy for addressing biological threats remains, at best passive. There needs to be a deliberate attempt to domesticate and implement the elements of these

treaties that ensure a health security agenda for a country. The needed bite and hold will be best achieved with the development, adoption and implementation of a National Biodefense Strategy, which will provoke the proactive elements always required to address unending biosecurity threats.

The threat of bioterrorism is fast becoming one of the major issues contending with Nigeria and other countries in sub–Saharan Africa. The increase in the number of laboratories and research centres in the country with little to no supervision of the activities taking place in the laboratories, coupled with the increase in the activities of non-state actors in the country, has brought the issue of bioterrorism to the front burner. Our systems in Nigeria: thinking, training, legislation and policies have lagged far behind momentous changes in science, leaving us vulnerable to population-level harm from bioterrorism and biotechnology. Synthetic viruses and genetic engineering of pathogens are a reality, with a rapid acceleration of dual-use research of concern (DURC), which is research intended for good which may also be used to cause harm to humans. The public availability of methods for DURC genetic engineering risks of laboratory accidents, coupled with the insider threat, poses an unprecedented risk for global biosecurity. Whether a disease outbreak is natural or man-made, the health response to all disease outbreaks is the same. Building a strong biodefense strategy is, therefore, the foundation for addressing biological threats in any country.

Chapter Five

Emerging Sources of Biological Threats In Nigeria

1. ***Increased activities of non-state actors.***
2. ***Increase in the number of molecular laboratories in Nigeria.***
3. ***Globalization.***
4. ***Climate change, deforestation and biodiversity loss***

1. INCREASE IN THE NUMBER OF MOLECULAR LABORATORIES IN NIGERIA

Diagnostic and molecular Laboratories have contributed in no small means to controlling infectious disease outbreaks through prompt diagnosis, surveillance capacity and epidemiology studies. Despite the beneficial contribution of the Laboratories, there are also some biosecurity concerns in activities such as Waste Disposal Management Practice, Samples and Data Management and Research activities. Healthcare establishments HCEs such as primary, secondary and tertiary hospitals, research institutions and diagnostic laboratories analyze, generate, handle, treat and dispose of biomedical wastes of various types, including pathogenic microorganisms. Disposal of these biomedical wastes, if not carefully and adequately managed, could pose grave human, animal and environmental health implications.

The risk of laboratory accidents is increased with the rise in the number of laboratories conducting high-risk life sciences research and various research with potential pandemic pathogens without appropriate oversight.

While this research is important for developing countermeasures and understanding and predicting future outbreaks, laboratories with insufficient biocontainment or biosafety protocols and practices exacerbate the risk of an outbreak through laboratory-acquired infections or accidental release of a pathogen into the environment. Even with state-of-the-art equipment and standard biosafety protocols, laboratory accidents are possible due to human error or mechanical failures.

Nigeria operates a very fragile healthcare system and vague regulatory framework for establishing diagnostic LaboratoryLaboratory, making it especially vulnerable to compromised Laboratories practices. The following concepts of diagnostic laboratory need critical evaluation.

- Research Activities in the Laboratories

It is imperative to understand ongoing research activities in Laboratories in Nigeria. The research activities are majorly influenced by the motives and competency of the personnel. Standard practices of Laboratories identify research concepts such as 'dual use of biospecimen i.e the same piece of scientific research sometimes has the potential to be used for harm as well as for good, and gain of function- an extension of microbe's capacity beyond its natural ability. Typically, the research activities on the gain of function might intend no harm, but a genuine error that could trigger a biological threat.

- Data generation and Management

Laboratories process and store sensitive data during four major phases: arrival of patients in the Laboratory premises and registration of their data, pre-analytical, analytical and post-analytical phases. Data generated from Laboratories should be adequately regulated and protected. Data that escape to the wrong hands, including those of non-state actors, may be manipulated for biosecurity breach.

2. INCREASED ACTIVITIES OF NON-STATE ACTORS IN NIGERIA

Increasing radicalization ideology and ongoing insurgency in Northern and Southern Nigeria pose a grave danger to Nigeria's biosecurity. There is a chance that non-state actors could invade some of our Laboratories and engage in nefarious research activities if there are no excellent supervision and monitoring. In many countries around the globe, most pathogens are stored in laboratories with no appropriate biosecurity measures and could be easily accessed by actors who wish to harm. Furthermore, thousands of clinical samples generated from an epidemic could pose a biosecurity vulnerability if handled without appropriate security consciousness, which could potentially facilitate access to materials and information that could be useful in developing a biological weapon.

Biologic agents are essential for public health research, including developing novel diagnostics, treatments, and vaccines. However, handling pathogenic samples invariably entails biosafety risks (relating to accidental exposure to dangerous biological agents) and biosecurity risks (relating to the deliberate misuse or release of biological materials.

3. GLOBALIZATION

As Nigeria becomes the largest economy in Africa, the floodgate of activities has transformed the country's economic disposition. Such activities include an increase in international trade of food and agricultural products, an increase in the influx of international flights and growing tourism. These are some of the identified potential biosecurity threats confronting Nigeria. The index cases of the previous biological threats: COVID-19 and EBOLA in Nigeria, was incident from foreign traveller.

4. CLIMATE CHANGE, DEFORESTATION AND BIODIVERSITY LOSS

Globalization, Urbanization, Climate change, biodiversity loss and food insecurity have put the world at high risk in biosecurity threats and public health emergencies. A study has identified some countries in East and West Africa as the nations that bear the greatest burden of neglected zoonoses not only in Africa but globally. Some African countries are also considered potential hotspots for biosecurity issues as a result of zoonotic emergence because of high wildlife biodiversity, rapid human population growth, change in land use and recurrent outbreaks of emerging infectious diseases of zoonotic origin. Increasing land use change, urbanization and industrialization are accelerating changes in the biosphere, causing significant damage to biodiversity, deterioration of ecosystems, and considerable migratory movement of both human and animals. These rapid environmental changes have been linked to increases in the occurrence of infectious disease outbreaks. Nigeria with a population with over 200 million, has triggers increased pressure on the environment leading to land use change, deforestation and encroachment on wildlife habitat, is considered to have one of the highest burdens of endemic diseases globally and one of the four countries that contribute 44% of the world’s poorest livestock keepers.

The World Health Organization (WHO) and most infectious disease experts reported that the source of the next human biological threat is likely to be zoonotic and wildlife is likely the prime suspect. In rural communities of Nigeria, which are mostly agrarian, people's lives are intimately related to the natural environment and the productivity of livestock. This increases the vulnerability of Nigeria to emerging biosecurity threats due to pathogenic spillover.

Chapter Six

Biological Risk Management

Biological risk management requires the understanding and assessing of biological risks and taking steps to mitigate those risks, regardless of whether they originate Naturally or intentionally. It also requires shared international recognition that the risk is global to empower effective, collective mitigation. As the biological threat landscape continues to develop, so must our countermeasures strategies. Preventing the acquisition of dangerous pathogens, equipment, and expertise for nefarious purposes, as well as maintaining the capability to rapidly control outbreaks in the events of a biological attack, are the key strategies to mitigate against biological threats. It is important that Nigeria develop an efficient capacity for early and rapid detection, characterization, and attribution of biological threats in Nigeria.

Strategies to Adequately Detect and Identify Biosecurity Threats in Nigeria:

1. Understanding of Potential Biological Threat: There is an urgent need to understand and address the structural drivers of biological threats. The most difficult part of a bioweapons attack is the recognition of the threat. Adequate capacity building is needed to understand and detect biological threats.

2. Deployment of Effective Surveillance Infrastructure: Nigeria should design an effective monitoring system for biosecurity threats. This facilitates the country to rapidly identify cases and clusters to provide optimal clinical care; to isolate cases, to prevent further transmission. It also involves identifying, managing and follow up contacts to recognize early signs of infection; protect frontline

health workers; identify risk groups, and to tailor effective control and prevention measures. Timely deployment of strategic contact tracing layered with other nonpharmaceutical interventions will provide an effective public health tool for mitigating and suppressing infectious disease outbreaks by decreasing disease incidence, transmission, and resulting hospitalizations and mortality.

4. Assessment of Biosecurity and Biosafety Measures in Laboratories in Nigeria: Nigeria operates a very fragile healthcare system as well as inefficient regulatory framework for establishing diagnostic Laboratory. This makes Nigeria vulnerable to compromised Laboratories practices. Despite the contribution of laboratories in addressing infectious disease burdens in Africa, there is need for effective monitoring and standardization of practice to prevent biosafety and biosecurity lapses.

5. Prompt Antimicrobial Resistance Surveillance: Massive deployment of antibiotics in animal husbandry as antimicrobials and growth promoters, extensive abuse, and unregulated use of antibiotics by humans and disposal of antibiotic-laden wastes in water bodies, in agricultural soils via irrigation with antibiotic-polluted waters and antibiotic-laden manure have opened new vistas for spread and dissemination of antimicrobial resistance genes and heighten the emergence of multidrug resistant pathogens. As bacteria become more resistant to commonly used antibiotics it is becoming increasingly difficult to treat a range of infectious diseases using existing antibiotics.

Chapter Seven

Strategic Goals and Objectives

The biodefense Strategy has Seven (7) goals for strengthening biodefense in Nigeria and enhancing the ability to predict, anticipate and prevent biological threats; identify a threat when it emerges and stop it promptly.

GOAL 1: Enable biological threat prediction and anticipation for effective preparation and response by stakeholders.

The Nigerian government will build a robust biological threat monitoring system that will be able to predict and anticipate both internal and external biological threats effectively. This will be done through coordinated One Health approach surveillance, data gathering and analysis, and information sharing.

Objectives of the goal:

- Ensure decision-making is based on data-based biological risk assessment and forecasting
- Minimize the risk of transmission of pathogens between humans, animals (zoonotic), insects, micro-environment, and plants.
- Ensure early warning and prediction of potential outbreaks, identification, and characterization of agents of infection and toxins.

GOAL 2: Enhance biological threat awareness and risk communication in Nigeria.

The government of Nigeria will develop a biological risk awareness

and risk communication strategy among all stakeholders for effective biological threat identification and communication.

Objectives of the goal:

- Ensure effective dissemination of information on biological threat prevention, detection and response.
- Ensure synergy and cooperation among relevant stakeholders.
- Ensure a coordinated approach to detection, response and recovery from a biological threat

GOAL 3: Enforce regulation of LaboratoryLaboratory, contained and confined field trials to prevent loss, theft, diversion of, unauthorized access to or unauthorized release of valuable biological materials.

The government of Nigeria will enforce necessary regulations and policies to prevent the risk of laboratory accidents and strengthen biosafety and biosecurity measures in the laboratories to prevent accidental or deliberate misuse of valuable biological materials.

Objectives of the goal

- Provide security of laboratories, health, and research facilities to prevent unauthorized entry and safeguard against theft or other unauthorized releases of biological agents.
- Strengthen biosafety and biosecurity practices in the laboratories to prevent the deliberate or accidental release of valuable biological materials.
- Reduce all biological risks associated with life sciences research and advances in biotechnology

GOAL 4: Enhance the ability to prevent non-state actors and the terrorist group from having access to biological materials for malicious use.

Nigeria will strengthen biosecurity to prevent non-state actors from acquiring or using biological material or equipment for malicious purposes. This goal will ensure the implementation of national and international policies and conventions that prevents the ability of non-state actors from acquiring, stockpiling or using a biological weapon.

Objectives of the goal:

- Deter, detect and prevent non-state actors' and terrorist groups' attempts to acquire and use biological weapons.
- Implement national and international regulations and conventions to prevent non-state actors having access to dangerous biological materials for malicious use.

GOAL 5: Ensure stakeholder preparedness to reduce the impacts of extreme biological events.

Nigeria will take measures to reduce the impacts of extreme biological events by maintaining a national diagnostic and surveillance system to support biodefence and promote the development of infrastructures to enhance human, animal, and plant health. This goal will also ensure effective countermeasures to reduce the impact of extreme biological events.

Objectives of the goal:

- Promote a vibrant and effective laboratory network for the detection of biological threats.
- Promote investment in science and technology and biomanufacturing to support biodefense.
- Ensure a strong infrastructure for human, veterinary, and plant health.
- Develop and update prevention, response, and recovery plans and capabilities.

- Enhance preparedness to support decontamination, waste management, and other methods of suppressing pathogens during biological events.

GOAL 6: Ensure a rapid response system to limit the impacts of extreme biological events.

Nigeria will ensure an effective rapid response system through research, surveillance and coordinated response operations to limit the impact of extreme biological events.

Objectives of the goal:

- Conduct federal coordinate response operations to limit the impact of disease outbreaks and other extreme biological events.
- Coordinate stakeholders (private sector, non-governmental organizations, faith-based organizations, communities and international partners) to effectively participate in responding to and mitigating the impact of extreme biological events
- Ensure effective communication and information dissemination systems to respond to and mitigate the impact of an extreme biological event

GOAL 7: Ensure recovery to restore the economy, environment, and community after extreme biological events.

Nigeria's government will provide recovery support to communities, support livelihood restoration, and restore critical infrastructure and services after an extreme biological event.

Objectives of the goal:

Support restoration of sources of livelihood in communities after extreme biological event.

- Promote the restoration of critical infrastructure capability and capacity to enable the resumption of government activities
- Provide recovery support and develop long-term mitigation plan to prevent the future occurrence of extreme biological events.

Chapter Eight

Implementation Framework for the National Biodefense Strategy

GENERAL IMPLEMENTATION REQUIREMENT

Dissemination of the Strategy:

1. The federal government of Nigeria, through the office of the National Security Adviser, shall ensure the dissemination and implementation of this Strategy

Strategic Plans

1. The Federal government of Nigeria shall set up a biodefense commission which shall be responsible for implementing the biodefence strategy.
2. The commission shall report directly to the presidency through the office of the National Security Adviser.

STAKEHOLDERS' ROLES AND RESPONSIBILITIES FOR THE IMPLEMENTATION OF THE STRATEGY

S/N	Stakeholders	Roles and Responsibilities
1.	The President of the federal republic of Nigeria	• Shall adopt the National biodefence strategy. • Shall set up a National Biodefense and Biosecurity Commission that will ensure the implementation of the Strategy by working with relevant government ministries, agencies, departments, and the private sector.

S/N	Stakeholders	Roles and Responsibilities
		• Shall ensure adequate provision of funds for the implementation of the policy.
2.	National Security Adviser	• Shall Supervise the activities of the National Biodefense and Biosecurity Commission. • Shall provide the necessary support to ensure the implementation of the biodefense strategy by the National Biodefense and Biosecurity Commission • Shall advise the President on emerging biothreats in Nigeria
3.	National Biodefense and Biosecurity Commission	• Shall ensure the implementation of the Biodefense strategy in Nigeria • Shall ensure adequate planning, budgeting, and effective use of resources to achieve the objectives of the biosecurity policy • Shall ensure that all relevant stakeholders participate fully in decision-making and implementation of the Strategy

S/N	Stakeholders	Roles and Responsibilities
		• Ensure an effective early warning system. Develop the ability to rapidly detect, characterize, report, forecast, and share vital information (including genetic sequence data) appropriate for pathogens that pose a biological threat of national or international concern immediately after they emerge in humans, animals and plants. • Ensure the building of a robust biological threat monitoring system using one health approach that would be able to predict and anticipate both internal and external biological threats effectively. • Ensure strengthening of laboratory biosafety and biosecurity practices and oversight to reduce biological risks associated with life sciences research and development and advances in biotechnology • Promote effective and Secured research in Biotechnology and Biomanufacturing to Support Biodefense • Conduct Evidence-Driven Federal Response Operations and Implement a Federal Research Agenda in Coordination with relevant stakeholders.

S/N	Stakeholders	Roles and Responsibilities
		• Enhance Preparedness to Limit the Spread of Disease through Community Mitigation Measure • Ensure a Strong human, Veterinary, and Plant Health Infrastructure • Ensure Coordination of Recovery Activities across All Levels of Government
4.	The National Assembly	• Shall facilitate the passage of relevant sponsored biodefense bills • Shall ensure that relevant aspect of the biodefense policy is reflected in the constitution of Nigeria • Shall ensure that adequate resources are appropriated and disbursed to ensure that biodefense related activities are carried out as planned • Shall carryout regular oversight of biodefense activities
5.	Ministry of Health	• ·Shall ensure the widespread dissemination of the biodefense strategy and relevant document through various channels • ·Shall be actively involved in the implementation of the national biodefense strategy

S/N	Stakeholders	Roles and Responsibilities
		• Shall ensure timely release and disbursement of allocated fund to achieve the objectives of the biodefense strategy • Coordinate agencies in the ministry to achieve the objectives of the biodefense strategy
6.	Nigeria Center for Disease Control	• Coordinate Prevention, detection, and control diseases of public health importance. • Coordinate surveillance systems to collect, analyze and interpret data on diseases of public health importance. • Support states in responding to small outbreaks and lead the response to large disease outbreaks. • Develop and maintain a network of reference and specialized laboratories. • Conduct, collate, synthesize, and disseminate public health research to inform policy. • Lead Nigeria's engagement with the international community on diseases of public health relevance.

S/N	Stakeholders	Roles and Responsibilities
7.	Ministry of Défense	• Shall strengthen the capacity of the security agencies in counter bioterrorism measures • Shall ensure enforcement of rules and regulation for effective delivery of biodefense strategies. • Shall ensure provision of adequate funding for security apparatus to implement the biodefense strategy • Shall strengthen security surveillance especially around health infrastructures and institutions to safeguard dangerous biological materials
8.	Ministry of Environment	• Shall mainstream the biodefense strategy in the environment sector • ·Shall coordinate the implementation of the biodefense strategy in the environment sector • Shall participate in the multi sectoral forum on implementing the biodefense strategy
9.	National Biosafety Management Agency	• ·Ensure measures to prevent, respond to and recover harmful biological substances that may threaten the health of humans, animals, the environment, and the economy.

S/N	Stakeholders	Roles and Responsibilities
		• Ensure that Nigeria becomes self-reliant in the development and application of biotechnology-based products and services. • Ensure that Nigerians have access to and benefit from safe, ethical, and profitable uses of biotechnology-based products and services. • Ensure that biotechnology is profitably applied to the government's stewardship such as assurance of high-quality health services, food security, environmental protection and safety. • Promote sustenance in the development and application of acceptable and profitable technologies through strategic investments in biotech R and D to support innovation and economic development. • Ensure global competitiveness and the export of products of the Nigerian biotechnology industry. • Develop suitable mechanisms and activities to support the emergence of biotechnology enterprises for the commercialization of biotechnology products; so as to ensure sustainable food security, job and wealth creation, efficient and cheap healthcare delivery as well a safe environment.

S/N	Stakeholders	Roles and Responsibilities
		• Maintain sustainable exploitation of bioresources for our food and agriculture, health care delivery, and industrial utilization. • Ensure sustainable mechanisms for adequate funding of biotechnology activities through national and international funding agencies.
10.	Ministry of Justice	• Establish an appropriate legal framework for effective implementation of the biodefense strategy • Shall be actively involved in multi-sectoral forum for implementing the biodefense strategy.
11.	Ministry of Information	• Shall disseminate all information about the biodefense strategy
12.	Academia, research organisations and think tanks	• Shall participate in research and development to reduce biological threats in Nigeria • Shall develop a curriculum for capacity building on biosecurity and biosafety. • Contribute to implementation of the biodefense strategy.

S/N	Stakeholders	Roles and Responsibilities
13.	Civil Societies and NGOs	• Shall act as instrument for ensuring accountability and monitoring of the biodefense strategy • Shall mobilize communities and other relevant stakeholders in the implementation of the biodefense strategy • Shall contribute to the implementation of the biosecurity policy.
14.	Private sector	• Shall invest in the implementation of the biodefense strategy • Shall always comply with the provision of the biodefense strategy.
15.	Relevant Professional regulatory bodies	• Shall regulate the practice of biosecurity and biosafety professionals • Shall conduct capacity building trainings and certification exams for members.

Global Emerging Pathogens Treatment Consortium

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ABOUT GET

The Global Emerging Pathogens Treatment Consortium (GET) was established in 2014 as a direct response to the 2014-2016 Ebola virus disease outbreak in West Africa. GET now operates firmly in the African Biosecurity space and functions as a think tank. Providing high level advocacy, research, operational and necessary expertise to support countries and communities achieve improved resources to combat outbreaks and other biosecurity threats that can threaten stability, peace and security thereby undermining economic growth and wellbeing.

GET is legally registered in Nigeria, Accra, Ghana, Sierra Leone, and United State of America. Our primary purpose is to develop African-led and Afrocentric strategies within an international context to effectively address emerging biosecurity threats. We have collaborations and partnerships with many organizations within and outside Africa.

Our activities are focused on (1) capacity building (2) Research (3) logistics (4) Publication (5) Outreach and community engagement (6) Policy advocacy.

Website: www.getafrica.org
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