

# NEWSLETTER

GET AFRICA NEWSLETTER ON ONE HEALTH AND BIOSECURITY

VOLUME 10 | SEPTEMBER 2022



**ENHANCING BIOSECURITY AND BIOSAFETY  
STANDARDS FOR EFFECTIVE HEALTH SECURITY  
AND BIOLOGICAL NON – PROLIFERATION IN AFRICA**

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# WELCOME ADDRESS



It is with great delight that I introduce the tenth (10th) edition of the Global Emerging Pathogens Treatment Consortium (GET) Newsletter. GET newsletter is a highly educative quarterly newsletter that publishes research articles in the field of One Health and Biosecurity. We are glad to be publishing the tenth edition in September 2022. This newsletter edition focuses on enhancing biosecurity and biosafety standards for effective health security and biological non-proliferation in Africa. Africa is a heterogeneous continent with a population of about 1.2 billion people from 54 different countries. All African


countries are classified as either least developed or developing. As such, interconnected with socio-economic realities, public health constitutes a core dimension of the vulnerabilities experienced by Africans across all constituent countries. The recent increasing outbreaks of diseases such as Ebola, Lassa fever and COVID - 19 have underscored the need for Africa to intensify cooperation and coordination to prevent the spread of diseases and effectively counter epidemics and other newly emerging types of crises.

It has become important to develop biosecurity and biosafety measures in our laboratories to prevent the deliberate or unintentional release of dangerous pathogens into the environment. The increase in frequency and impact of infectious disease outbreaks coupled with increased investment in research on biological and living materials has led to a significant increase in the number of diagnostic and molecular Laboratories in Africa and compounded by the possibility of non-state actors deliberately using biological agents as WMD has necessitated the development of specific biosecurity measures to prevent biological agents from being diverted for proliferation purposes.

We have interesting articles from global experts in the field of biosecurity, such as experts from the Implementation Support Unit (ISU) of the Biological Weapons Convention in this edition. The articles are focused on developing measures and frameworks for enhancing biosecurity and biosafety in Africa. This edition also includes a bonus package on GET activities such as GET participation in the Coordination Workshop for Africa Projects on supporting universalization and effective implementation of the BWC in Africa held in Geneva, Switzerland and GET participation in the African climate change week held in Libreville, Gabon.

Finally, I am using this platform to invite you all to the eighth (8th) African conference on One Health and Biosecurity coming up from 2nd-4th November 2022 at the Civic Center, Victoria Island, Lagos, Nigeria. The theme of the conference is "Strengthening Health Security and Mitigating Biological threats in Africa". The conference is one of the biggest transdisciplinary gatherings of biosecurity experts in the world. Kindly go to the GET website via [www.getafrica.org](http://www.getafrica.org) to register and attend the conference.

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## **IMPROVING BIOSAFETY, BIOSECURITY AND BIOLOGICAL NON-PROLIFERATION FRAMEWORKS IN AFRICA: A CONSOLIDATED APPROACH AND A NEW PROJECT UNDER THE BIOLOGICAL WEAPONS CONVENTION**

### **1. Introduction**

Biological threats belong, together with chemical, nuclear, and radiological threats, to the category of threats that have the potential to create mass damage, environmental catastrophes, and loss of life. Biological weapons disseminate disease-causing organisms or toxins to harm or kill humans, animals, or plants. They can be deadly and highly contagious. The Biological Weapons Convention (BWC), the first international legal instrument to outlaw a full category of weapons of mass destruction, provides the framework for prohibiting and preventing the misuse of biological agents for hostile purposes, as well as for promoting international cooperation in biological sciences for peaceful purposes.

The exponential advances in biological sciences pose both an opportunity and a challenge for African countries as they seek to benefit from the advantages that life sciences bring to the health of their populations and to their technological and economic development while ensuring that any associated risks are properly managed. Universalization and effective implementation of the BWC in Africa provides a useful vehicle for improving biosafety, biosecurity and biological non-proliferation at the national and regional levels. A new project being implemented by the BWC's Implementation Support Unit (ISU) within the United Nations Office for Disarmament Affairs (UNODA) , with funding from the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction , aims to work with African countries towards this goal.

### **2. The Biological Weapons Convention**

The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction or Biological Weapons Convention (BWC), was opened for signature on 10 April 1972 and entered into force on 26 March 1975. It was the first multilateral disarmament treaty banning an entire category of weapons of mass destruction. With 184 States Parties and four Signatory States the BWC has established an unequivocal norm against biological weapons, while also facilitating assistance, international cooperation and capacity-building on matters such as biological science and technology . In particular, the COVID-19 pandemic has shown the vulnerability of modern societies to large-scale disease outbreaks and the need to proactively address biothreats.

It should be noted that, although the terms biosafety and biosecurity are not referred to in the text of the BWC, the value of biosafety and biosecurity measures for the implementation of the BWC has

long been recognized by BWC States Parties, as these measures contribute to preventing the development, acquisition or use of biological and toxin weapons.



When assessing the status of participation in the BWC, three main elements may typically be considered, namely the status of national measures such as legislation for implementing the various provisions of the BWC, participation in BWC Confidence-Building Measures (CBMs) and designation of BWC national contact points (NCPs).

- a) BWC Implementing Legislation. To ensure that States Parties fulfil their international obligations under the BWC, the adoption of national implementing measures is essential, as clearly established in Article IV of the Convention. Such measures can include the enactment of the necessary legislation to establish, inter alia:
  - (i) offences and penalties for activities prohibited under the BWC;
  - (ii) strategic trade controls for BWC relevant transfers, including the establishment of a list of items subject to control;
  - (iii) a national control regime over BWC relevant biological agents as well as associated activities and facilities, including a risk-based list of agents subject to control; and (iv) measures for the establishment of biosafety and biosecurity requirements for the conduct of controlled activities.
- b) Confidence-Building Measures (CBMs). The requirement to submit CBMs was introduced in 1987 following a decision by the Second Review Conference in 1986. The objective of CBMs is to prevent or reduce the occurrence of ambiguities, doubts and suspicions and to improve international cooperation in the field of peaceful biological activities. BWC States Parties should submit their national CBM reports no later than 15 April every

year to the BWC Implementation Support

- c) National Contact Points (NCPs). The Sixth Review Conference in 2006 decided that each State Party should designate a national point of contact for coordinating national implementation of the Convention, communicating with other States Parties and relevant international organizations, preparing the submission of confidence-building measures, and facilitating information exchange of universalization efforts.

### **3. Global Partnership-ISU Project for Universalization and Effective Implementation of the BWC in Africa**

With seven African States having yet to join the BWC, Africa is a key region for universalization efforts. In addition, several States Parties from Africa have expressed interest in receiving support to enhance national implementation of the BWC. In recent years, the ISU has provided support upon request to several countries in the region in the framework of specific projects. With an increasing demand for assistance throughout the region, it was considered that, for larger impact and sustainability, a longer-term engagement with, and continued support to, African countries was necessary. The Signature Initiative to Mitigate Deliberate Biological Threats in Africa adopted by the Global Partnership Against Weapons and Materials of Mass Destruction provided a timely opportunity for the ISU to develop and implement a project that comprehensively supports African countries in their efforts to enhance BWC implementation and promote universalization in the region.

The Project on 'Supporting Universalization and Effective Implementation of the BWC in Africa' sponsored by the Global Partnership is a four-year project being implemented by the ISU from 2022 until 2026. It aims at increasing the number of African States Parties as well as submissions of Confidence-Building Measures and contact point designations by African States Parties. It also aims at enhancing the status of BWC implementing legislation in countries in the region.

Under the Project, support will be provided to African States interested in joining the BWC or in enhancing their domestic implementation in line with identified plans, priorities and needs through a combination of regional, sub-regional and national activities focusing on the following:

- Raising awareness among policy-makers and other key stakeholders of the importance of the BWC;
- Providing training to government officials and NCPs on the BWC, related national implementing measures, as well as the associated roles and responsibilities in order to facilitate the designation of NCPs and the effective performance of their tasks;
- Support in the preparation and submission of CBMs, as well as sharing best practices from other States Parties;
- Research, assessment and drafting assistance for reviewing, amending, developing and/or enacting BWC implementing legislation; and
- Developing outreach and reference material for use by national stakeholders in support of their efforts to raise awareness, disseminate information and improve understanding of the BWC and related implementation requirements.



The Project is expected to provide concrete benefits at the national, regional and international levels. At the national level, African States will benefit from tailored support to address their needs and priorities for enhancing BWC implementation. Furthermore, African States will benefit from an increased awareness, understanding and expertise about the BWC among national biosafety, biosecurity and non-proliferation stakeholders. At the regional and sub-regional level, African States will benefit from an exchange of national experiences in implementing the BWC and achieving the benefits of full and effective implementation. At the international level,

enlarged BWC membership and improved implementation in Africa will significantly strengthen the global norm against the deliberate use of disease.

## 4. Coordination Workshop

As the largest project implemented to date by the ISU to date, a consolidated and strategic implementation approach was considered crucial to ensure the achievement of the project's goals. A Coordination Workshop was therefore organized in Geneva, Switzerland, from 26-27 July 2022. The workshop was designed to gather feedback from key project partners on the proposed implementation framework for the project so that best practices and lessons learned from relevant programmes in Africa may be taken into account, while ensuring a harmonized and coordinated approach with such programmes when implementing project activities. A total of 42 participants from 16 States Parties, four regional or international organizations, three UN entities and four NGOs attended the event.

The workshop paved the way for a successful implementation of the project by providing valuable input for identifying and addressing the challenges faced by African States in their efforts to join and enhance the implementation of the BWC, including on the following:

- Approaches and modalities for implementation of project activities that incorporate a needs-based approach and that ensure impact and sustainability;
- Venues for collaboration with key project partners and coordination mechanisms;
- Effective implementation of a gender perspective in project activities; and



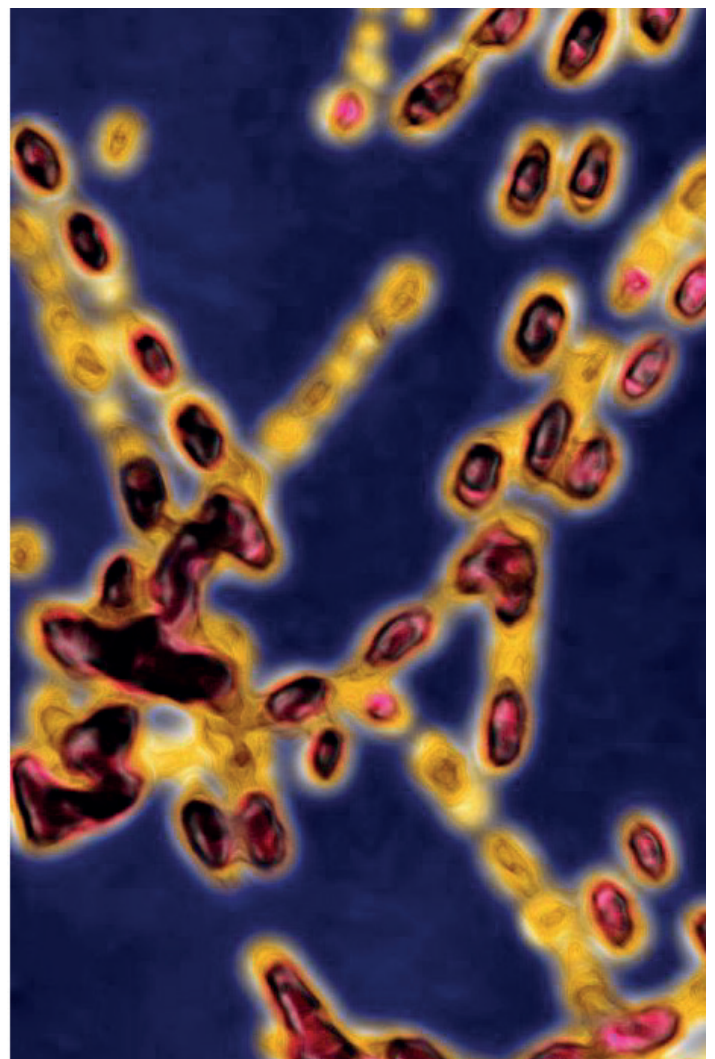
- Strategies, opportunities and mechanisms to promote interest and ownership of national stakeholders in project outcomes.

Overall lack of awareness about the BWC, competing priorities, lack of a designated institution to deal with BWC matters and the multiplicity of actors to be engaged were among the challenges identified during the workshop that the Project would need to address to achieve results. The relevance of making use of synergies and complementarities with regional partners and initiatives, such as UN Security Council resolution 1540 , the Biosafety and Security Initiative 2021-2025 of the Africa Centres for Disease Control and Prevention and the respective European Union Council Decisions in support of the BWC , was also highlighted.

Following the phased approach envisaged for project implementation, a series of subregional workshops will be held in 2022 and 2033 to assess regional and national needs and to identify activities that may support regional and national plans to enhance BWC implementation, including biosafety and biosecurity. The first subregional workshop will be held for Eastern Africa in Kenya in October 2022.

## 5. Conclusion

Biotechnology development, as well as improving biosafety, biosecurity and biological non-proliferation frameworks, consistent with international obligations such as those arising from the BWC, is a priority for Africa. The Global Partnership-ISU Project on 'Supporting Universalization and Effective Implementation of the BWC in Africa' offers African Governments the opportunity to enhance their participation in the BWC and thus improve the overall environment for the development of biotechnology industries in line with the Sustainable Development Goals. The subregional workshops scheduled in the framework of the Project will provide venues for further identifying country needs in terms of BWC implementation and related elements of biosafety and biosecurity so that project activities may be tailored to national circumstances. The Project will also provide an opportunity for African Governments, global and regional partners to enhance coordination and take concrete steps towards the common goal of preventing the risk of proliferation of biological weapons in the African continent, and worldwide, in the framework of the BWC.



## Reference

1. The views expressed in this article are those of the authors and do not necessarily reflect the views of the United Nations.
2. United Nations Security Council Resolution 1540 provides the overall framework for the efforts of the international community to prevent the proliferation of weapons of mass destruction. <https://www.un.org/disarmament/wmd/sc1540/>
3. The Implementation Support Unit (ISU) was established within the Geneva Branch of the United Nations Office for Disarmament Affairs after the BWC Sixth Review Conference in 2006 to provide administrative support to meetings agreed by the Review Conference as well as comprehensive implementation and universalization of the Convention and the exchange of confidence-building measures. <https://www.un.org/disarmament/biological-weapons/implementation-support-unit/>
4. The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (the Global Partnership) is a G7-led, 31-member international initiative aimed at preventing the proliferation of chemical, biological, radiological, and nuclear (CBRN) weapons and related materials. <https://www.gpwmd.com/>
5. <https://www.un.org/disarmament/biological-weapons/about/universalization-and-joining-the-bwc/>
6. Under Article X of the BWC, (1) The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology (biology) for prevention of disease, or for other peaceful purposes. (2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the international exchange of bacteriological (biological) agents and toxins and equipment for the processing, use or production of bacteriological (biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.
7. States Parties have gradually elaborated upon the Convention's provisions by reaching additional agreements and understandings at its Review Conferences, which have usually been held every five years. A total of eight Review Conferences have taken place since the first one in 1980. The Ninth Review Conference is due to take place in November-December 2022.
8. Report of the 2008 Meeting of States Parties, <https://digitallibrary.un.org/record/671388>
9. Under Article IV of the BWC, each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere.
10. <https://www.un.org/disarmament/biological-weapons/confidence-building-measures/>
11. <https://www.un.org/disarmament/biological-weapons/national-implementation/>
12. <https://www.gpwmd.com/africa-signature-intitiative>
13. <https://www.un.org/disarmament/wmd/sc1540/>
14. <https://africacdc.org/>
15. <https://www.un.org/disarmament/biological-weapons/eu-support-to-the-bwc>






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# MEDICAL WASTE MANAGEMENT STRATEGIES AS A BIOSECURITY MEASURE

## Introduction

Biosecurity refers to measures aimed at preventing the introduction and/or spread of harmful organisms to animals and plants in order to minimize the risk of transmitting infectious diseases. The term encompasses biological threats to humans, including those from pandemic diseases and bioterrorism. Globally, there is an increasing need to improve biosecurity by restricting access to harmful biological agents that can pose serious threats to human, animal, and plant health, biodiversity, the environment, and socioeconomic development. The COVID-19 pandemic is a recent example of a threat that requires biosecurity measures in all countries around the world.

Research has identified some countries in East and West Africa as the nations' bearing the greatest burden of neglected zoonoses not only in Africa but globally due to high wildlife biodiversity, rapid population growth, land-use changes and recurrent outbreaks of emerging infectious diseases of zoonotic origin. Nigeria is recognized as one of the countries with the highest burden of endemic diseases in the world and one of the four countries that account for 44% of the world's poorest ranchers (1). Recently, the Nigerian federal government launched the new National Biosecurity Policy 2022-2026, which aims to promote an integrated and holistic biosecurity strategy implemented through a one-health approach for the prevention, early detection, rapid response to biosecurity threats and recovery from biosecurity incidents (2). A biosecurity policy is a key to combating biosecurity threats, and violations as biosecurity violations can result in gaps between various control measures, such as access control in laboratories and safety devices, improper handling of pathogens in the laboratory or safety devices and mechanisms for safe waste disposal.

## Medical Waste Management Strategies as a Biosecurity Measure

Healthcare waste includes all waste generated in healthcare facilities, research centres and laboratories related to medical procedures. Laboratory-generated waste contains both active and inactivated forms of biological pathogens and chemicals and, therefore must be treated as potentially infectious/ hazardous material and disposed of safely. Biomedical waste (BMW) remains a major challenge, particularly in most healthcare facilities in developing countries, where it is hampered by technological, economic, and social difficulties and insufficient training of the staff responsible for handling the waste. Bad behaviour and inappropriate management and disposal methods employed during the handling and disposal of medical waste are increasingly significant health and environmental pollution/hazards due to the infectious nature and unpleasant odour of the waste.

Since the start of COVID-19, more biomedical waste has been generated worldwide, majorly in facilities where COVID-19 is being tested or treated. Personal protective equipment (PPE) and testing kits have contributed to the largest volume of waste and can be of high public health concern if improperly managed. Proper disposal of COVID waste is therefore required without delay to reduce the risk of the pandemic spreading and to sustainably manage the environmental hazards. Measures to safely dispose of laboratory waste begin with proper waste segregation, collection, treatment, and disposal. It was reported and estimated that there are approximately 8 to 16 million new cases of hepatitis B virus (HBV), 2.3–4.7 million cases of Hepatitis C virus (HCV) and 80,000–160,000 cases of Human Immunodeficiency Virus (HIV) due to unsafe injection disposal and mainly due to very poor waste

many people are unaware that medical waste is a major contributor to environmental pollution and hazard. This is reflected in a lack of awareness and specific policies to address the threat of healthcare facility waste, some of which are considered hazardous. It is important to note that healthcare waste, if not properly disposed of, can pose an even greater threat and hazard than the original diseases. It is the duty of hospitals and health centres to take care of public health issues such as medical waste.

Due to the fact that waste regulations vary from state to state, disposal must comply with all applicable local, regional, national, and international regulations. Personnel should follow guidelines as required by federal, state, local, tribal, and provincial government agencies. In Nigeria, the Laboratory Practice Regulatory Authority MLSCN (Medical



disposal systems (3)

Good medical waste management in hospitals depends on a dedicated waste management team, good administration, careful planning, sound organization, underpinning legislation, adequate funding, and full involvement of trained staff. However, it is important that before adopting any of these options, hospitals and medical institutions must assess the issues and propose a management strategy that fits their economic circumstances and is also sustainable for use and based on local technology. Paradoxically, it is known that health activities intended to protect the health, heal patients, and save lives also generate waste, of which around 20% of this waste pose a high risk of infection and chemicals or radiation.

In Nigeria, a typical developing country in Africa

Laboratory Science Council of Nigeria) has developed a general guideline for the segregation, collection, storage and disposal of laboratory waste (4). Biological waste can be chemically treated/disinfected, sterilized by autoclaving, and disposed of by trained persons/entities or incinerated. Chemical waste, on the other hand, is best disposed of according to the guidelines in the safety data sheet or by neutralization and dilution with other chemical substances. For example, the population of Lagos State is increasing, and the amount of hospital waste generated is increasing at alarming rates due to population growth and healthcare facilities. However, Lagos state has devised a means for collecting and disposing of biomedical waste, and this should be replicated across all states in Nigeria.

Also, effluents from the laboratory should be properly disposed of so that it does not

enter the municipal water source or open water source to prevent outbreaks/infection. Facilities must work with the relevant authorities to ensure that wastewater is routed to treatment facilities and also conduct site-specific and activity-specific assessments to identify and mitigate waste disposal risks. Risk assessments and mitigation measures depend on several factors: the procedures being performed, the identification of the hazards associated with the process and/or procedures, the skill level of the personnel performing the procedures, the laboratory equipment, and the resources available.

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1. [https://ncdc.gov.ng/themes/common/docs/protocols/93\\_1566785462.pdf](https://ncdc.gov.ng/themes/common/docs/protocols/93_1566785462.pdf)
2. <https://nnn.ng/unveils-national-biosecurity/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2557740/>
4. <https://web.mlscn.gov.ng/wp-content/uploads/mdocs/Guideline%20on%20Waste%20Management.pdf>



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## ENHANCING BIOSECURITY AND BIOSAFETY STANDARDS THROUGH PROPER MANAGEMENT OF LABORATORY AND HOSPITAL WASTE

The proliferation of diagnostic laboratories and emergency quarantine facilities in and outside hospital environments following the first wave of covid-19 mid-2020 has immensely increased the number of previously existing laboratories and health facilities around the continent. Laboratories and hospitals will always inevitably produce hazardous waste, which, if not properly managed, can damage the environment, cause safety issues, or even catastrophic accidents. By reducing the amount of waste generated and altering how it is managed, you can prevent health and safety risks and improve the system's efficiency.

The Africa Centres for Disease Control (Africa CDC), having been officially launched in January 2017, is mandated to promote the prevention and control of diseases as well as the promotion of partnership and collaboration among member states to address emerging and endemic diseases and public health emergencies. Over the past four (4) years, Africa CDC has developed and adopted a number of public health policies and reforms with a view to strengthening the capacity of public health institutions in the Member States to enable them to respond adequately to epidemics and other health threats that could affect countries.

Recognizing the continued increase in threats and risks of catastrophic biological events, emergence and re-emergence of infectious diseases, and other events of public health concerns related to rapid advances in technology and creation and manipulation of pathogens with pandemic potential, Africa CDC launched the Biosafety and Biosecurity Initiative to strengthen the biosafety and biosecurity systems of African Union (AU) Member States (MS) to comply with the international requirements and regulations such as the International Health Regulations (IHR) (2005), the Biological Weapons Convention (BWC), and United Nations Security Council Resolution (UNSCR) 1540. Amongst the key objectives of the initiative is the development of the Regional Biosafety and Biosecurity Legal Framework.

A new article on vaccines, co-authored by Jonas Sandbrink, University of Oxford, and Dr Gregory Koblenz, George Mason University, discusses the biosecurity risks surrounding vaccine platform technologies. Vaccine platforms have been critical for accelerating the timeline of COVID-19 vaccine development. Further investment into the development of these important technologies should consider the dual-use potential of such research and the risk of such research informing or enabling pathogen engineering by malicious actors. Research on virally vectored vaccines exhibits relatively high dual-use potential through (1) generating insights on circumventing pre-existing immune responses and (2) increasing the number of individuals capable of engineering viruses of particular concern,

including variola virus, through work on related viruses. The biosecurity risk associated with platform advancement may be minimized by focusing preferentially on circumventing anti-vector immunity with non-genetic rather than genetic modifications, using vectors that are not based on viruses pathogenic to humans, and preferential investment into promising low dual-use risk RNA-based vaccine approaches.

High-income countries generate, on average, up to 0.5 kg of hazardous waste per hospital bed daily; Low-income countries produce an average of 0.2 kilograms. However, in low-income countries, medical waste is not usually classified as hazardous or non-hazardous waste, making the actual amount of hazardous waste much higher. These hazardous wastes are infectious, toxic, or radioactive. Some of the wastes generated include used needles, dressing materials, syringes, diagnostic samples, body parts, radioactive materials, medical equipment, medicines, chemicals, and blood. Poor disposal of medical waste can adversely affect patients, workers, waste handlers, the larger community, and the environment as a whole. They can seriously contaminate the environment, leading to infection and injury. All medical waste must be immediately isolated and adequately disposed of.



When garbage rots, it causes water and soil pollution, which affects human health. Proper disposal of medical wastes reduces pollution and harm and does not emit greenhouse gases. In order to successfully treat medical wastes and reduce pollution, the corresponding treatment process can be selected according to the yield, source, and characteristics. At the same time, the wish for medical waste resource utilization can also be realized. Minerals preserved in waste, including minerals other than wood and metals, can be easily recycled into other useful resources. Using scientific waste disposal methods to realize the reuse of medical waste can not only reduce harm to the environment and human beings but also create profits for relevant hospitals or medical institutions.

Proper medical waste disposal ensures further disinfection and safety of medical facilities. At present, the process of sterilization followed by crushing is adopted. This is currently the most widely used medical waste treatment technology. The medical waste will be loaded into a special sterilization car and the whole into the sterilization room for sterilization. After treatment, the waste will be poured into the crusher for shape destruction treatment and then compressed and reduced capacity after sending it to the landfill. Medical Waste Treatment system includes medical waste autoclave, medical waste shredder, medical waste balers, conveyor system, and automatic transport rail systems to meet the needs of medical centres, clinics,

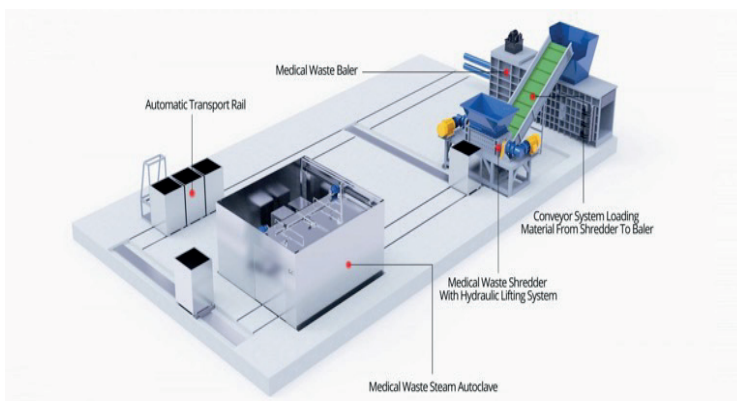


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hospitals, and laboratories of all sizes, producing biohazardous waste from several kilograms to several tons per day. Once the medical waste has been treated, all types of medical waste are transformed into sterile, inert, and unidentifiable waste that can be considered ordinary municipal waste and poses no biological risk to anyone handling it.

### Advantages :

- The technology can avoid the spread of bacteria in medical waste before treatment
- The technology sterilizer can easily meet the requirements of the change of medical waste disposal volume and can achieve simplified or continuous operation.
- Better automatic control of the working process of medical waste treatment, effectively protect the safety of employees and avoid the existence of human factors .
- The first sterilization after the crushing process has a more mature experience.



Africa Centres for Disease Control and Prevention (Africa CDC) Receives a \$100 Million Grant from the World Bank to Strengthen Continental Public Health Preparedness [africacdc@africa-union.org](mailto:africacdc@africa-union.org) (28th August 2022).doi:10.3389/micb.2020.631736

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**Dr. Victor Uchenna Chigozie** is a principal scientific officer at the Ministry of the Environment and Water Resources, Lagos State, Nigeria; and an affiliate of the Nnamdi Azikiwe University, Awka in the department of Pharmaceutical Microbiology and Biotechnology. Dr. Chigozie, a travel grant awardee at the National Foundation for infectious disease (NFID), Baltimore, Maryland, US focuses his research on Natural Products Studies, Pharmaceutical Biotechnology, Microbiology and immunology research, and Infectious diseases and Biosecurity studies. Furthermore, section of his PhD research work on Bioactivities and of a

morphologically identified endophytic *Aspergillus* fungus isolated from *Mangifera indica* produced a very interesting results which was published in a SCOPUS ranked journal, (*Journal of Natural Product Studies*). He as a Global Outreach (GO) Postdoctoral member of the American Society of Microbiology (ASM). He is also a member of Nigerian Bioinformatics and Genomics Network (NBGN). Dr Chigozie is an advocate for academic and research excellence among in the Nigeria Universities.





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## ADDRESSING THE GLOBAL SHORTAGE OF BIOSAFETY & BIOSECURITY PROFESSIONALS TO ENHANCE PROFESSIONAL STANDARDS

The release of biological agents, whether due to natural, accidental, or deliberate causes, can spread rapidly from one country to many others in a short time, resulting in epidemics/pandemics if not properly contained. Biosafety and biosecurity are essential pillars of international health security and cross-cutting elements of biological nonproliferation. Achieving effective, comprehensive biosecurity to prevent these is a shared responsibility in different countries, especially in Africa, since infectious diseases know no borders.

Biosafety and biosecurity professionals provide a vital role in safeguarding infectious disease agents in research and clinical laboratories and other settings where biological materials are handled. The COVID-19 pandemic has brought into focus the significant demand for the profession, and many countries face a general shortage of these specialized individuals. Given that biosafety and biosecurity professionals work in laboratories behind the scenes of the front-line response, the profession remains largely unknown to students focused on pursuing a career in the sciences. (Elis, 2022).

To address this gap, the IFBA is leading a multisectoral effort toward a future sustainable workforce by formalizing a biosafety & biosecurity career path within the higher education system. Now is the right time since the recent lived COVID-19 experiences of youth have motivated them to become involved. Over the past six (6) months, and with funding support from Global Affairs Canada, the IFBA has been collaborating with Kenya's Masinde Muliro University of Science and Technology (MMUST) to develop and pilot a new undergraduate BSc degree program specifically in Biosafety and Biosecurity. This new BSc program leverages MMUST's existing programs in the Department of Medical Laboratory Sciences. (Mambo, 2022).

Competent biosafety & biosecurity professionals are a foundational element to support the safety of individuals handling biological materials in the laboratory and to safeguard the community and environment from the risks associated with working with these pathogens.

"Biosafety Program Management" identifies a knowledgeable and capable biosafety officer as a requirement for an organization's biosafety and biosecurity program. Whether a full-time or part-time employee or contractor, organizations handling biological materials must be able to employ an individual with the necessary expertise to oversee biosafety and biosecurity programs. (WHO, 2020)

The ISO 35001 states that "a competent individual(s) shall be designated to provide advice, guidance, and assurance on bio risk management issues". The document defines a process to identify, assess, control, and monitor the risks associated with hazardous biological materials. It is applicable to any laboratory or other organization that works with, stores, transports, and/or disposes of hazardous biological materials. (ISO, 2019)

Medical laboratories are potentially dangerous places to work because of chemical, mechanical, physical, electrical, and mainly biological hazards. In light of this, it is very important to always reduce every risk in the laboratory, and a method to achieve this is to initiate procedures for safe behaviour. Examples are safety rules for personnel and visitors in the facility, procedures for the safe handling of samples, safe handling of equipment, etc. The facility should also permit the safe handling of micro-organisms.

ISO 15189 has only one requirement on safety, merely stating that the laboratory must be safe and should comply with good practices and applicable requirements. This requires specialized training and much staff time. The process of improving and controlling the safety of the laboratory needs good coordination. For this, a Biosafety Officer must be appointed. (INT, p. 2015)

Despite the important role of biosafety and biosecurity capacity and expertise in safeguarding public health security, "it still remains one of the weakest core capacities of Member States identified by IHR monitoring and evaluation activities".

WHO Member States need to develop capacities to identify, store and securely handle and manage dangerous biological agents and toxins according to international best practices.

Although biosafety & biosecurity awareness and proficiency have improved greatly in the past few decades through the availability of more effective safety equipment and automated diagnostic technologies, it remains one of the weakest core capacities of Member States identified by International Health Regulations (IHR) monitoring and evaluation activities



WHO helps Member States to build their national biosafety and biosecurity capacity through tools, technical assistance, guidance documents, and resource mobilization. This includes supporting various training on biological risk management, providing regulatory frameworks, sharing best practices through workshops and meetings, and ensuring biological agents are safely transported.

During disease outbreaks, countries also need to have the expertise and capacity to safely transport infectious substances between national, regional, or international laboratories as outlined in the International Health Regulations (IHR). WHO has developed guidance and training resources on the movement of infectious substances to help shippers and other personnel observe the United Nations Model Regulations for the transportation of infectious substances.



Available evidence demonstrates that the COVID-19 pandemic placed a significant demand on the profession and that many countries face a general shortage of these specialized individuals. The pandemic created uncertainty around laboratory biosafety protocols and increased the workload of biosafety professionals who struggled to accommodate the ever-increasing number of untrained individuals handling infectious specimens. In addition to their traditional roles and responsibilities in laboratories and clinical settings, biosafety professionals were also called upon to provide surge support to public health efforts, communities, and individuals in responding to the pandemic.

The World Health Organization's Joint External Evaluations (JEE) led by African Union member states between 2016 & 2019 and the Global Health Security Index (GHSI) published in 2019 demonstrated weak biosafety and biosecurity capacities among the African Union (AU) Member

the Spread of Weapons and Materials of Mass Destruction.

Biosafety professionals played important roles during the COVID-19 pandemic, from developing safety protocols for laboratories to resourcing personal protective equipment during a global shortage. They experienced challenges when balancing their home/work lives. Some biosafety professionals were involved in clinical trials and vaccination efforts, while the majority were not. Comprehensively, there were significant differences in how biosafety professionals were involved in pandemic response efforts. (Gillum, 2022)

In its Biosafety and Biosecurity five (5) Year Strategic Plan (2021-2025), the Africa CDC planned to collaborate with Member States to address identified priorities. The process of identifying regional priorities was initiated in 2019 with a technical workshop hosted by the Africa CDC Regional Collaborating Centers



States. In response, in May 2019, the Africa CDC, supported by its regional and international partners, launched the Biosafety and Biosecurity Initiative (BBI) aimed at strengthening the biosafety and biosecurity systems of AU Member States to comply with the international requirements and regulations such as the International Health Regulations (IHR) (2005), the Biological Weapons Convention (BWC), and United Nations Security Council Resolution (UNSCR) 1540. This work is in alignment with global initiatives like the Global Health Security Agenda and the Global Partnership Against

(RCCs) and coordinated by Nuclear Threat Initiative (NTI), the U.S. Centers for Disease Control and Prevention and the U.S. Defense Threat Reduction Agency, supported with resources including an online survey by Africa CDC. (Initiative, 2021). In Africa, the next steps and way forward should include but not be limited to:

1. Development of regulations for waste management.
2. Identification of priority research areas in Biosafety and Biosecurity.

3. Training in the areas of Occupational Health and Safety, Infection Prevention and Control, Genomics & Bioinformatics, Bioethics and dual-use research of concern, Risk assessment and Risk management, Lab-Based Surveillance, and Threats Hazards Identification and Risk Assessment.

4. Establishment/strengthening of national biosafety and biosecurity technical working groups (TWGs).

5. Establishing an educational career and path for Biosafety and Biosecurity professionals.

Training activities strengthen partnerships to with

clinical laboratory partners and allow trainees gain competence in all areas and at multiple levels in the laboratory. Outreach to undergraduate and graduate-level trainees aids in recruitment and retention efforts by introducing new trainees to public health and providing staff leadership and training opportunities. By nurturing collaboration with laboratory partners and providing current staff members with continuing development opportunities, countries are able to stay ahead of workforce recruitment issues and retain current staff members. These practices have helped states in developed countries overcome workforce challenges and can be used by others elsewhere to overcome challenges in their own laboratories. (Strain, Nov-Dec 2019).



**James Robert Wakungwi Sakwa** has a higher diploma in medical parasitology & Entomology, and he has a degree in medical laboratory science from Kenya medical training college and Mount Kenya University, respectively. He has facilitation, surveying, and technical assessment expertise in medical laboratory testing in general and has twenty-eight (28) years of progressive experience in senior technical management and supervision in the health sector. He has more than twelve (12) years of Laboratory quality management system, biosafety /biosecurity and continuous quality improvement experience that supports health systems. He joined Masinde Muliro University of science and technology in 2013 as a senior medical laboratory technologist/clinical instructor and is currently a principal medical scientist. In this position, he has been involved in several facilitations, assessments, and surveillance projects both nationally and internationally.



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## ABATTOIR AND SLAUGHTERHOUSE WASTE: IMPLICATIONS ON ENVIRONMENTAL BIOSAFETY AND BIOSECURITY

Abattoir wastes are pollutants that have always been neglected by society, especially in Nigeria and most African countries. These biowastes are a significant volume of biohazards that poses a high risk of contamination to the environment, cause an outbreak of diseases, and cause insecure food safety (Al-Gheethi et al., 2021). Unsafe and improper disposal of such wastes can lead to tremendous ecological and environmental troubles, serving as potential reservoirs for microbial and viral diseases, antibiotic residues, and antibiotic-resistant bacteria, thereby raising safety concerns (Alam et al., 2019). The waste produced by abattoirs has over the years increased tremendously and is recognized as harmful and threatening due to the complex composition of pathogens, toxic metals, and veterinary pharmaceuticals; hence, the implications of these biowastes disposed into the ecological system should not be disregarded (Aleksic et al., 2020).

In Nigeria and some African countries, burial, burning, and discharging into available water bodies are the most common disposal methods of animal wastes, making them an ideal way for disease pathogen transmission and ecological concerns; hence proper management of abattoirs is subjected to the spotlight for possible biosafety and biosecurity threat; hence, more transparent management is demanded. Wastewater from abattoirs contains several toxic materials, such as nitrate, detergents, surfactants, chloric anions (emerging contaminants), and antibiotic residues, which cause increased distribution of antibiotic-resistant bacteria in the environment (Latiffi et al., 2021).

Some common pathogenic bacteria in abattoir wastes with infection potential have been identified and have been associated with high cases of disease outbreaks such as cholera and typhoid, and these are due to the increasing number of flies found in the waste of abattoirs (Maizatul et al., 2017). Zoonotic transmission represents 60% of human pathogens from wildlife and livestock and is a threat to both the food industry and human health (Rahman et al., 2020). *Campylobacter* spp, *Salmonella* spp, Shiga toxin-producing *E. coli*, Hepatitis E virus from pigs, and avian influenza virus are common pathogens detected in abattoirs, and with recent outbreaks, this puts the utmost attention on abattoirs and their waste (Mizumoto et al., 2020). With the rapid increase of the food production industry, health risk aspects associated with abattoirs should not be neglected as these are of broad spectrum and breeding grounds for infectious diseases

The different variants of biowaste composition require proper sorting and segregation for efficient waste management and selection for efficient treatment methods and disposal. Developed countries have been applying automation in processing and recycling large-scale biowastes from abattoirs, which is a huge contrast with the processes in abattoirs of underdeveloped countries, in which the slaughtering is

performed in an under-privileged setup, with direct disposal of animal wastes into the land and water bodies. Therefore, the rotting of biowastes on land promotes environmental depletion, along with the growth of infectious diseases. Moreover, the accumulation of these biowastes in water bodies increases the content of nitrates and ammonia, inducing uncontrollable ecological problems, such as algae bloom. Land and river contaminations become more dreadful when pathogens and veterinary pharmaceutical chemicals are disposed of through biowastes from abattoirs into water bodies. Hence, the public and governmental bodies should be concerned with appropriate waste management and safe disposal regulations for disease prevention.

## WAY FORWARD

- Investments in basic protective equipment, such as masks, gloves, and goggles, to prevent direct contact with any discharges from animals.
- Training and re-training of butchers, meat inspectors, as well as abattoir managers, particularly on personal hygiene and the use of protective clothing, is pivotal to reducing the spread of zoonotic pathogens from abattoirs.
- There is a need to integrate the abattoir waste disposal management into the general municipal waste management system.
- Individuals and corporate bodies can be encouraged to own private abattoirs as obtained in developed countries. However, these privately owned abattoirs must be routinely supervised and regulated by the relevant agencies.
- There is also a need to introduce modern equipment into the abattoir operations in Nigeria to replace obsolete, non-animal, and non-environmentally friendly practices.
- Establishing redefining policies that integrate the One Health programs.
- Effective techniques for slaughterhouse biowaste recycling should be introduced.
- The arrangement of mixed-animal slaughtering in the same slaughterhouse should be banned to avoid cross-contamination of microbes from different livestock to cut the potential of zoonotic transmission.
- Collaboration and data sharing between parastatals on public health should be encouraged to ensure refinements in the predictions of viral emergences, disease severity, and reduction of disease transmission.



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**Dr Chinomso Gift Ebirim** graduated from the University of Nigeria where she obtained a Doctor of Veterinary Medicine. She also obtained her master's in veterinary public health and Master of Veterinary Science (Avian Medicine) from the University of Ibadan and the Pan African University Life and Earth Sciences including Health and Agriculture, Ibadan. Dr Chinomso is a One Health and Antibiotic Residues/Resistance Advocate.

# SAVE THE DATE FOR THE 8TH AFRICAN CONFERENCE (NOV. 2-4, 2022)

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## 8th African Conference on One Health and Biosecurity

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**Amb. Bonnie Jenkins**  
Under Secretary of States for Arm Control and International Security Affairs, USA.

## CONFERENCE SPECIAL ACTIVITIES

### Side-Events

- Strategic importance of UNSCR 1540 in Mitigating biological threats in Africa  
**Organizer:** Expert Group of the 1540 Committee
- United Nations Office for Disarmament Affairs (UNODA): United Nations Secretary-General's Mechanism for Investigation for Alleged Use of Chemical and Biological Weapons (UNSGM).  
**Organizer:** United Nations Office for Disarmament Affairs (UNODA)
- Overview of Health in Lagos State during the current Administration  
**Organizer:** Lagos State Ministry of Health
- Supporting the universalization and implementation of the Biological Weapons Convention in Africa.  
**Organizer:** BWC Experts

### Panel Discussions

- The Unlearned lessons from Epidemics in Africa
- The Role of CSOs and NCOs in strengthening Health Security in Africa

### Training Sessions

- Infection Prevention and Control (IPC) Training  
**Facilitating Organization:** DRASA Health Trust
- Biosafety and Biosecurity Training  
**Facilitating Organization:** Nigerian Biological Safety Association (NBSA)
- Bioinformatic and Data Management  
**Facilitating Organization:** South African National Bioinformatics Institute (SANBI)

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**Prof. Akin Abeyomi**  
Honorable Commissioner for Health, Lagos State.



**Dr. Hedaya Adetifa**  
Director General, Nigeria Centre for Disease Control (NCDC).



**Prof. Rebecca Katz**  
Director, Center for Global Health Science and Security.



**Senator (Dr) The Most Hon. Jerome Xavier Welcott**  
Foreign Minister of Barbados.



**Dr. Ayodekun Bobadayo**  
Chief Operating Officer, GET Consortium.



**Mr. O'Neil D. Hamilton**  
CARSCOM Regional Implementation Coordinator United Nations Security Council Resolution 1540.



**Dr. Abasi Ene-Obong**  
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**Dr. Kirk Douglas**  
Director of e-eye for Biosecurity Studies, University of West Indies, Barbados.



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**Dr. Levin Damisah**  
Office of the National Security Adviser (ONSA).



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**Dr. Wadiri George**  
Senior Member of Technical Staff at Genetic National Laboratories United States.



**Dr. Jaures Noumareds**  
Biosafety and Biosecurity Technical Officer, Africa CDC.



## 8th African Conference on One Health and Biosecurity

Theme: Strengthening Health Security  
and Mitigating Biological Threats in Africa



2nd - 4th November, 2022



Civic Center, Lagos, Nigeria

## CONFERENCE SPECIAL HIGHLIGHTS

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- I Strategic importance of UNSCR 1540 in Mitigating biological threats in Africa  
Organizer: Presentation by 1540 Committee
- II United Nations Secretary-General's Mechanism for Investigation for Alleged Use of Chemical and Biological Weapons (UNSGM).  
Organizer: United Nations Office for Disarmament Affairs (UNODA)
- III Overview of Health in Lagos State during the current administration  
Organizer: Lagos State Ministry of Health
- IV "Supporting the universalization and implementation of the Biological Weapons Convention in Africa"  
Organizer: BWC EXPERTS

### Training Sessions

- I "Bioinformatics and Data management"  
*Facilitating Organization: South African National Bioinformatics Institute (SANBI)*
- II "Biosafety and Biosecurity"  
*Facilitating Organization: Nigerian Biological Safety Association (NiBSA)*
- III "Infection and Prevention Control (IPC)  
*Facilitating Organization: DRASA Health Trust*

### Panel Discussion

- I "The Role of CSOs and NGOs in strengthening Health Security in Africa"
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Theme:  
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**Wednesday, July 27, 2022** **12:00pm (WAT)**

**Speakers:**



**Dr. Bobadoye Ayodotun**  
Chief Operating Officer,  
GET Consortium



**Dr. Stephanie Salyer**  
Technical Advisor,  
Africa Centre for Disease  
Control and Prevention



**Dr. Kirk Douglas**  
Director, Centre for  
Biosecurity Studies  
The University of West  
Indies, Barbados



**Dr. Babatunde Taiwo**  
Project Officer,  
GET Consortium  
**Moderator**

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## GET WEBINAR SERIES: AUGUST EDITION

Topic: The Role of Epidemic Intelligence and Surveillance in Predicting and Managing Epidemics in Africa

**31 AUGUST WEDNESDAY** **12:00 PM (WAT)**

**SPEAKERS:**



**Dr. Geoffrey Namara**  
Health Emergency  
Information and Risk  
Assessment (HIM) Lead, WHO.



**Prof. Marion Koopmans**  
Director, Collaborating  
Centre for Emerging  
infectious Disease.



**Dr. Biniam Getachew**  
**Kabethymer**  
PhD in Epidemiology,  
WHO Consultant.

**MODERATOR:**



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# GET PARTICIPATION IN THE COORDINATION WORKSHOP FOR AFRICA PROJECT ON 'SUPPORTING UNIVERSALIZATION AND EFFECTIVE IMPLEMENTATION OF THE BWC IN AFRICA'

GET participated in the Coordination Workshop for the Project on “**Supporting Universalization and Effective Implementation of the BWC (Biological Weapons Convention) in Africa**”; organized by the United Nations Office for Disarmament Affairs (**UNODA**) through the Implementation Support Unit (**ISU**) for the Biological Weapons Convention (**BWC**).

Our Chief Operating Officer, Dr. Bobadoye Ayodotun attended and gave a presentation at the workshop which was held at the United Nations Office in Geneva, Switzerland from 26 to 27 July 2022.

Project partners, technical experts from African states, other BWC States Parties and relevant regional, international organizations and NGOs engaging in biosecurity programmes in Africa were invited to participate in the workshop and GET happened to be the only NGO that was invited from Africa!



GET COO at the United Nations Office in Geneva, Switzerland

# GET INVOLVEMENT IN THE AFRICA CLIMATE WEEK (ACW) 2022

GET participated at the Africa Climate Week (ACW) which held from August 29 to September 2, 2022, at Le Vent Tent, Libreville Boulevard de Nice, Gabon. Dr Dotun Bobadoye was physically present at the Climate Change Week to speak at one of the side events themed “Towards Multi-Sectoral Approach: Addressing the Impact of Climate Change on Health” on the 2nd of September 2022.

**Towards Multi-Sectoral Approach**  
Addressing the Impact of Climate change on Health.

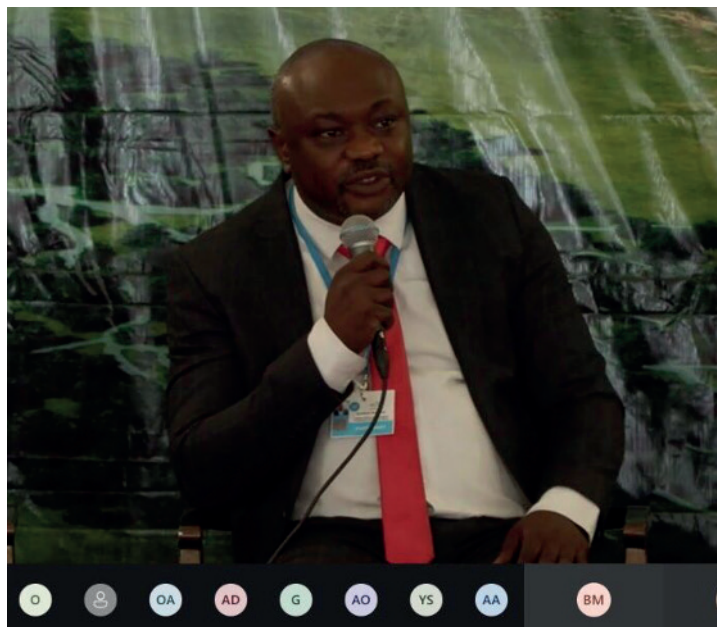
Date: 2nd September 2022 | Time: 11:00 am - 12:00 noon Gabon Time  
Venue: Le Vent Tent,  
Libreville Boulevard de Nice

**A side event at the African Climate week 2022**

**Our Speakers**

 <b>Prof Akin Abayomi</b> <i>Honourable Commissioner for Health, Lagos State</i>	 <b>Dr. Dolapo Fasawe</b> <i>General Manager- Lagos State Environmental Protection Agency</i>	 <b>Martin Muchangi</b> <i>Director, WASH, NTDs &amp; PHER – Amref Health Africa</i>
 <b>Mr. Micheal Bankole</b> <i>Director, Climate Change Department, Lagos State Ministry of The Environment and water resources</i>	 <b>Ms Titilope Akosa</b> <i>Executive Director, Centre For 21st Century Issues(C21st)</i>	 <b>DR. Dotun Bobadoye</b> <i>CEO, Global Emerging Pathogens Treatment Consortium</i>

## Our Partners





# SCHOLARSHIPS AND GRANTS OPPORTUNITIES

## **Global Undergraduate Exchange Program: Global UGRAD (Fully funded to USA)**

<https://www.opportunitiesforyouth.org/2022/08/21/global-undergraduate-exchange-program-global-ugrad-fully-funded-to-usa#.YxCjH3bMLIU>

**Application Deadline:** 21 September 2022

## **Johnson & Johnson WiSTEM2D Scholars Award Program 2023 for female leaders in STEM discipline (\$150,000 Award)**

<https://www.opportunitiesforafricans.com/johnson-johnson-wistem2d-scholars-award-program-2023/>

**Application Deadline:** 30 September 2022

## **Elisabeth & Amelie Fund- Scholarships 2022 for students from developing countries studying in Belgium**

<https://www.opportunitiesforafricans.com/elisabeth-amelie-fund-scholarships-2022/>

**Application Deadline:** 20 October 2022

## **Climate Tech Run – Global Competition 2022 for Tech Startups (USD 150, 000 Prize)**

<https://www.opportunitiesforafricans.com/climatetech-run-global-competition-2022/>

**Application Deadline:** 20 October 2022

## **Global Leadership Challenge 2022: Apply Now (Fully funded)**

<https://www.opportunitiesforafricans.com/absa-gena-global-markets-2023/>

**Application Deadline:** 24 October 2022

## **Beit Trust Postgraduate Scholarships for Study in South Africa & United Kingdom**

<https://www.opportunitiesforafricans.com/2024-2025-beit-trust-postgraduate-scholarships/>

**Application Deadline:** February 20, 2023

## **Fully Funded Humber Scholarships in Canada for International Students 2022/2023**

<https://www.advance-africa.com/Humber-Scholarships-in-Canada-for-International-Students.html>

**Applications:** Accepted throughout the year



## UPCOMING INTERNATIONAL CONFERENCES

**World Conference on Climate Change,  
October 19-20, 2022 - Barcelona, Spain**

**International Conference on Bacteriology and Antibiotics,  
Oct. 24-25, 2022-Zurich, Switzerland**

**8th African Conference on One Health and Biosecurity,  
Nov. 2 - 4, 2022 - Lagos, Nigeria**

**7th International Conference on Bioscience & Biotechnology,  
Nov. 21-22 20220-Singapore**

For more, visit: <https://www.conferenceseries.com/>



## **EDITORIAL TEAM**

Prof. Akin Abayomi  
Prof. Morenike Folayan  
Dr. Jennyfer Amber  
Prof. Oyewale Tomori  
Dr. Samuel Uweje  
Dr. Tom Rausch  
Mr. Pasquale de Blasio  
Dr. Bobadoye Ayodotun  
Ms. Omowunmi Okunniyi  
Ms. Ifeoluwa Alabi  
Mr. Alhassan B. Dantata

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### **FIND OUT MORE ABOUT THE ORGANIZATION**

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