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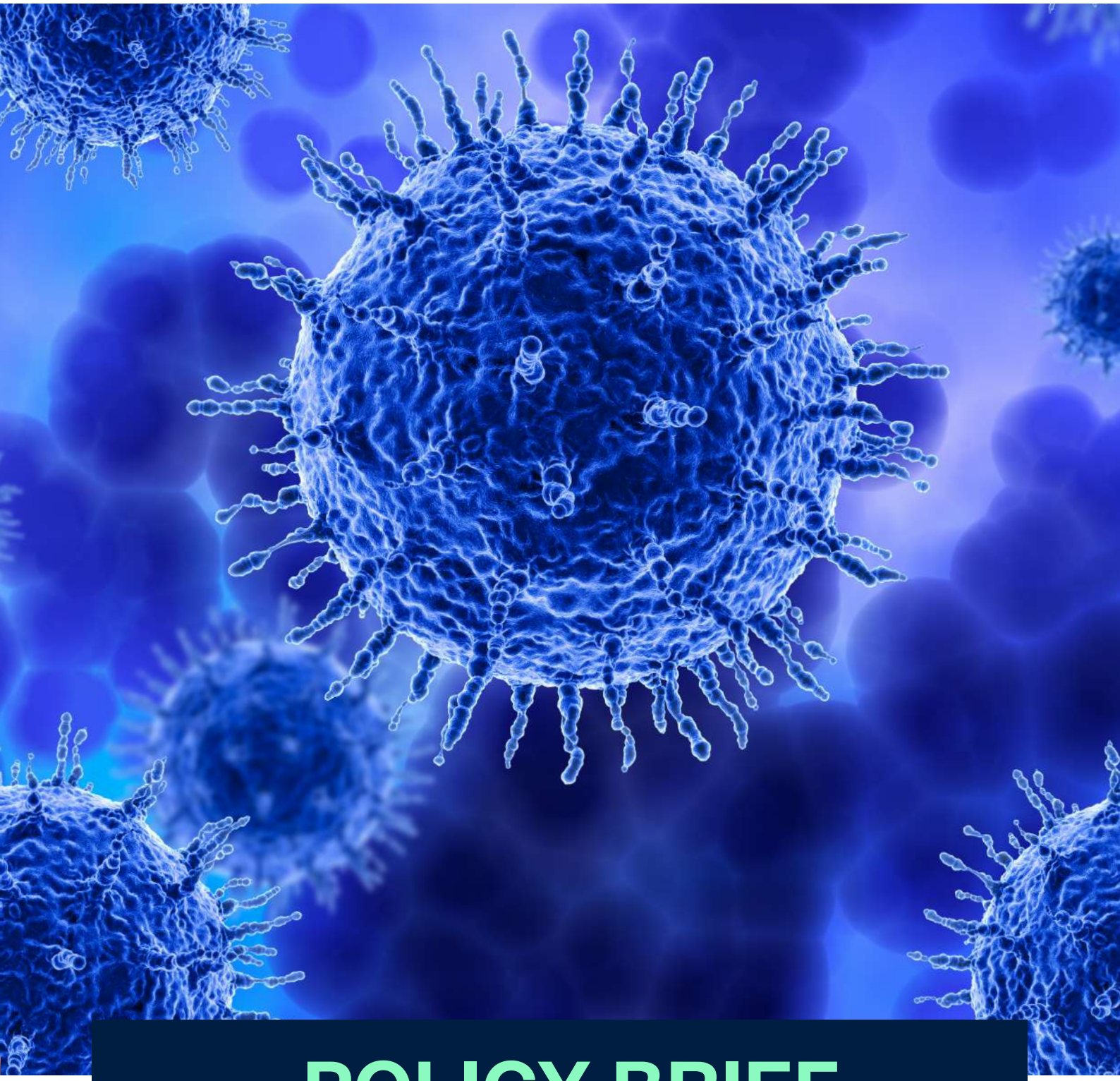


POLICY BRIEF

Strengthening biosecurity and biosafety in sub-saharan africa to enhance preparedness against emerging biological threats

Introduction

Sub-Saharan Africa (SSA) faces a disproportionate and escalating threat from emerging and re-emerging infectious diseases (EIDs). Over the past decade, the region recorded a 63% increase in zoonotic outbreaks compared to the previous decade, frequently causing Public Health Emergencies (PHEs). This growing vulnerability is driven by compounding factors ranging from microorganisms adapting to climate change, to rapid urbanization, increased human-wildlife contact, growing investment in biotechnology research, and the persistent risk posed by non-state actors potentially misusing biological agents.

Failure to address these threats leads to catastrophic human and economic costs, as demonstrated by the estimated $200 billion loss to the COVID-19 pandemic in SSA. Urgent, coordinated, and sustained policy intervention is required to build a resilient health security architecture across the continent.

Current Status and Gaps in SSA Regional Capacity

The current capacity of Sub -Saharan Africa to cope with disease outbreaks places it far below the level required for resilient health security. In spite of regional efforts spearheaded by the Africa Centre for Disease Control (Africa CDC) through its Biosafety and Biosecurity (BBI) Initiative, the continent's capabilities remain low. The regional framework aims to enhance compliance with international regulations such as the International Health Regulations (IHR) and the Biological Weapons Convention (BWC).

Strengthening biological security requires adherence to the core concepts of Biosafety and Biosecurity. Judging by the 2021 global health security index report, the average Biosafety and Biosecurity capacity score across Africa was only 32%, indicating limited preparedness among African nations to effectively prevent, detect, and respond to biological threats. The goal must be to build sustainable capacity (Level 5 on the WHO Joint External Evaluation scale) across all International Health Regulations (IHR) core capabilities, moving the region from a reactive crisis management posture to one of proactive, preventive. and containment. This requires a comprehensive, harmonized, and integrated system that ensures compliance with international standards.

Impact of Weak Biosecurity on SSA

The inadequate capacity to comprehensively respond to biological threats has direct, catastrophic consequences for the region's people and economies.

a. Economic Burden: Weak health securitytranslates directly into massive financial losses during outbreaks. The COVID-19 pandemic resulted in an estimated loss of approximately $200 billion across SSA. Likewise, the West Africa Ebola epidemic of 2012–2014 caused a loss of over $6 billion, with Guinea, Sierra Leone, and Liberia losing about $2.2 billion in their Gross Domestic Products (GDP) in 2015 alone.

b. Escalating Public Health Risk: The region is experiencing a dangerous increase in biological events, largely driven by zoonotic pathogens. Between 2012 and 2022, SSA recorded a 63% increase in zoonotic outbreaks compared to the previous decade. The vulnerability of the region is exacerbated by weak health systems, limited financing, and complex challenges like political unrest and the growing effects of climate change, which drive these emerging and re-emerging threats.

Key Policy Challenges and Vulnerabilities

These challenges can be grouped into three major categories:

1. Governance and Legal gaps

The primary challenge is the lack of coherent, centralized policies and laws.

a. Fragmented Oversight: Many countries, including Zambia, Lesotho, and Congo DRC, have limited and clear central coordinating authority for biosecurity that extends beyond genetically modified organisms (GMOs).

b. Weak Enforcement: Existing policies and regulations often suffer from poor dissemination, inconsistent adherence, and weak enforcement mechanisms, thereby creating implementation gaps. This is a common challenge shared by many nations in the region.

c. Porous Borders and Conflict: Geopolitical instability and conflicts (e.g., DRC) aggravate vulnerabilities, while porous national borders (e.g., Nigeria) enable the smuggling of harmful biological items and facilitate disease spread.

2. Resources and Infrastructure Constraints

Financial and physical infrastructure limitations directly impede preparedness.

a. Insufficient Funding: Biosafety andbiosecurity programs are severely underfunded in many nations, leading to reliance on external funding.

b. Substandard Infrastructure: Many clinical and public health laboratories across SSA lack the modern equipment, functional Biosafety Cabinets (BSCs), and appropriate Personal Protective Equipment (PPE) required to meet international standards.

3. Human capacity and Awareness Deficits

The workforce and public culture are not adequately prepared for modern biological threats.

a. Personnel Shortages: There is a severe shortage of adequately trained and skilled personnel including laboratory staff, biosecurity officers, and first responders in many SSA countries.

b. Training Gaps: Specialized training in biosafety and biosecurity best practices is limited, particularly for frontline workers in labs and agriculture.

c. Low Public Trust: Inadequate public awareness and widespread skepticism regarding biotechnology and health crises can hinder community engagement and compliance during a health emergency.

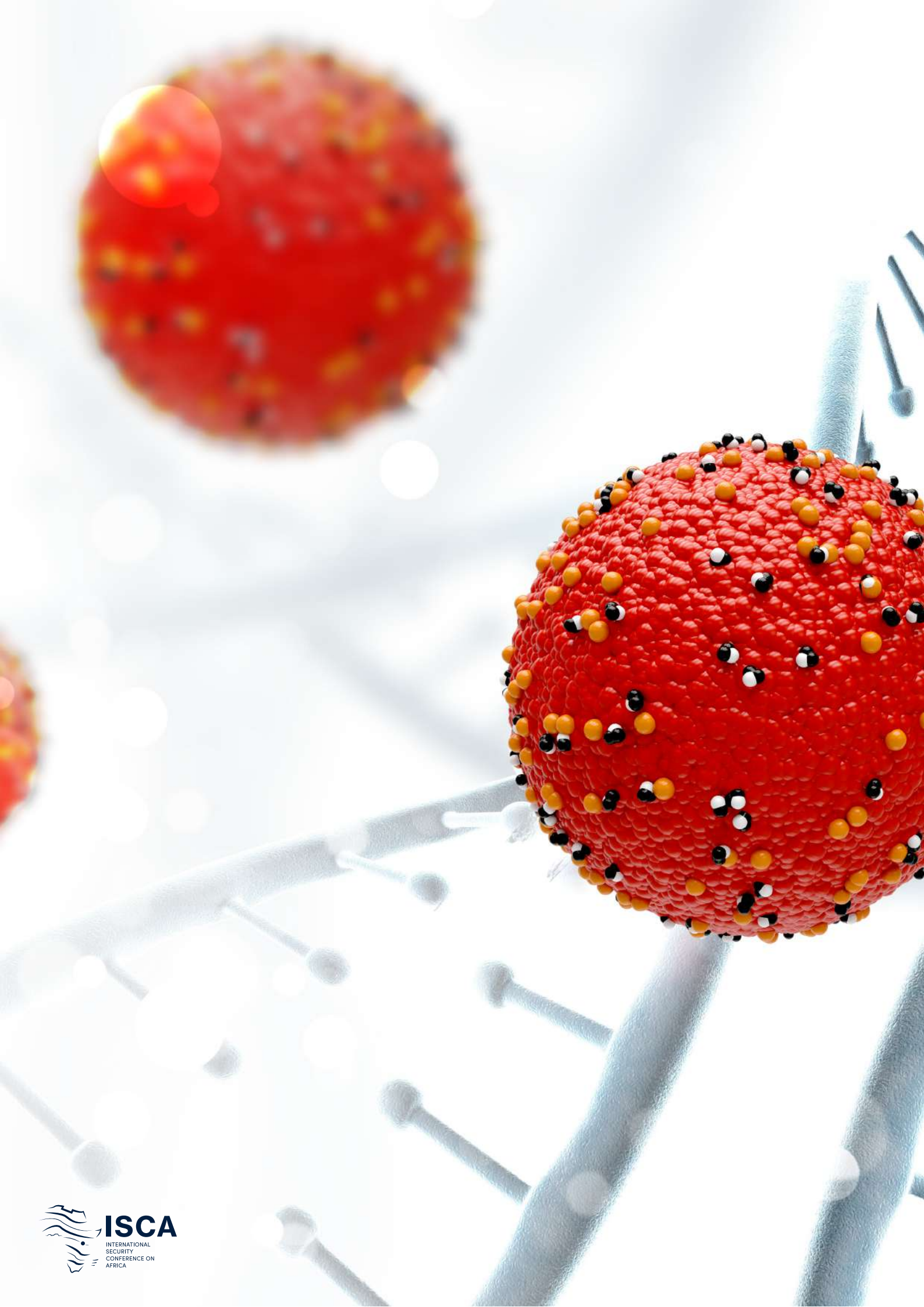
Policy Recommendations Strengthening Biosecurity and Biosafety in Sub-Saharan Africa.

Mitigating emerging biological threats in SSA requires a unified, comprehensive, and sustainably funded strategy focused on institutionalizing core capacities. Actionable recommendation to strengthen biosafety and biosecurity in Sub-Saharan Africa are presented below

Nos	Policy Pillar	Actionable Recommendations
1.	Governance & Legislative Reform	• Establish Central Authority and Legislation: Enact comprehensive National Biosecurity and Biosafety Acts and establish a clear, single lead entity responsible for coordinating all BSBS activities across human, animal, and environmental health sectors. • Implement "One Health" Approach: Mandate seamless, top-level collaboration between public health, veterinary, and environmental ministries to manage zoonotic risks and ensure coordinated response. • Inventory and Control High-Risk Agents: Develop and maintain a national list and registry of high-consequence agents and toxins (HCAT) to track their possession, use, and transfer across all research and diagnostic facilities (e.g., Nigeria, Zambia).
2.	Capacity & Infrastructure Investment	• Secure Sustainable Domestic Funding: Transition away from reliance on external donor funding by increasing dedicated, sustained financial allocation for BSBS activities in national budgets. • Upgrade and Decentralize Infrastructure: Prioritize investment to upgrade and equip laboratories to meet international standards (BSL-2/3/4). Decentralize diagnostic capabilities to provincial and local levels to reduce sample transit risks. • Strengthen Bioproduction Capacity: Prioritize innovative investment in local manufacturing capacity for vaccines, therapeutics, and diagnostics to ensure rapid, self-sufficient response during pandemics.
3.	Human Resource & Public Engagement	• Professionalize the Workforce: Develop and implement nationally adopted, comprehensive training and certification programs for BSBS professionals, laboratory personnel, and frontline workers. Mandate the appointment of a trained Biosafety Officer in every facility. • Enhance Public Awareness and Trust: Implement robust, culturally sensitive risk communication strategies and public awareness campaigns to foster community trust and promote responsible biosecurity practices (e.g., hygiene, proper antimicrobial use). • Integrate Biosecurity Education: Incorporate BSBS principles into university curricula for relevant disciplines to cultivate a sustainable culture of responsible science and expertise.

Conclusion

Developing biosafety and biosecurity standards in SSA is important to mitigating emerging biological threats. This demands a proactive, structural reform rooted in the four strategic imperatives: well-coordinated governance structure; predictable domestic financing; a formalized human resource development strategy; and integrated One Health cooperation. Only through these concerted, sustained investments will SSA mitigate future biological threats and safeguard its economic and human development trajectory.



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