Foreword

The recent unprecedented epidemic of Ebola Virus Disease (EVD) in West Africa highlighted the need for the establishment of a public health institution in Liberia to support National Health Service delivery. As part of its plan to revitalize health services in the country, the Government of Liberia established a National Public Health Institute of Liberia (NPHIL or Institute), a structure that can collaborate with the Ministry of Health and strengthen existing infection prevention and control efforts, laboratories, surveillance, infectious disease control, public health capacity building, response to outbreaks, monitoring of diseases with epidemic potential, clinical and biomedical research, and environmental and occupational health protection. Investment in public health strengthening has been shown to have a greater impact on the health of a population than investment in the regular health system that is curative-driven. It reduces the cost of the care itself while it contributes directly to the health of the population.

The Strategic Plan for a proposed NPHIL was first developed in January 2016 and has evolved as conversations about the scope and activities of the Institute have taken place. The Act to Establish the National Public Health Institute of Liberia that was approved December 27, 2016 states the NPHIL’s objective – to improve the health of the Liberian population in collaboration with relevant agencies and institutions of government. The vision for the NPHIL is to be a center of excellence for better health outcomes for Liberians through a strong health system. The Institute will work to prevent and control public health threats by promoting healthy outcomes and serving as a source of knowledge and expertise.

The Act also listed the strategic objectives and functions that the Institute is required to fulfill on behalf of the people of Liberia in the areas of capacity building, epidemiology and surveillance and response, laboratory and public health diagnostics, environmental and occupational health, public health and medical research and development, and global health and partnerships. The Operational Plan that accompanies this Strategic Plan converts those broad strategic objectives into concrete targets and activities that the NPHIL will pursue in the first two years of the plan, FY2017-2019.

The establishment of the NPHIL is both a great accomplishment and a significant challenge. The Institute brings together some of the functions and organizations that were formerly part of the Ministry of Health and involves the creation of new functional areas and programs. I am confident that we will meet this challenge and, by following this roadmap and collaborating with the Ministry of Health, other government agencies, and our many partners, will demonstrate rapid progress in strengthening our health system and improving health outcomes for Liberians.

Dr. Moses B.F. Massaquoi, MD, MPH
Chair, Board of Directors/NPHIL
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It is our hope that this plan will serve as the National Agenda for the improvement of public health emergencies, surveillance, preparedness and response. With concerted efforts, commitment and resources, we will implement and achieve the goals and objectives set forth in this document.

Tolbert G. Nyenswah, LLB, MPH Director General

Strategic Plan for the National Public Health Institute of Liberia, 2017-2022
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Acronyms and abbreviations

AMR  Anti-Microbial Resistance
CBRN  Chemical, biological, radiological, and nuclear
CDC  Centers for Disease Control and Prevention, United States Government
CLTS  Community Led Total Sanitation
CSO  County Surveillance Officer
DEOH  Environmental and Occupational Health
DSO  District Surveillance Officer
DTRA  Defense Threat Reduction Agency, United States Government
eDEWS  Electronic Disease Early Warning System
EOC  Emergency Operations Center
EPA  Environmental Protection Agency
EPRP  Emergency Preparedness and Response Plan
EVD  Ebola Virus Disease
FETP  Field Epidemiology Training Program
GDP  Gross Domestic Product
GOL  Government of Liberia
HIS  Health Information System
HMIS  Health Management Information System
IDE  Infectious Disease and Epidemiology
IDSR  Integrated Disease Surveillance and Response
IHR  International Health Regulations 2005
LIBR  Liberia Institute for Biomedical Research
LMHRA  Medical and Health Regulatory Authority
LMIS  Laboratory Management Information System
LNREB  Liberia National Research Ethics Board
MOH  Ministry of Health, Government of Liberia
NAMRU-3  United States Naval Medical Research Unit No. 3
NERC  National Epidemic and Response Committee
NGO  Non-governmental organization
NIH  National Institutes of Health, United States Government
NPHIL  National Public Health Institute of Liberia (also “Institute”)
NPHRL  National Public Health Reference Laboratory
PHI  Public Health Institute
PHEIC  Potential public health emergencies of international concern
PPE  Personal protective equipment
QMS  Quality Management System
RTA  Road traffic accidents
PoE  Point of entry
SARS  Severe acute respiratory syndrome
SDG  Sustainable Development Goals
SOP        Standard Operating Procedures
SWAP       Sector-Wide Approach Program
SWOT       Strength-Weaknesses-Opportunities-Threats Analysis
USAID      United States Agency for International Development
USAMRIID   United States Army Medical Research Institute of Infectious Diseases
USD        US Dollars
WAHO       West African Health Organization
WHO        World Health Organization
Section One: Introduction and Background

1.1 Introduction

Liberia is a West African country with a developing economy and stable political situation. The country has experienced democratic governance and a reviving socio-economic situation since the end of a protracted civil war in 2003. Since then, the social sector has been at the heart of the political drive and the health sector was in recovery and showing positive progress when the Ebola Virus Disease outbreak struck in 2014. This unprecedented outbreak exposed the fragility and vulnerability health system and the weakness of the public health sector’s ability to prevent, detect and adequately respond to public health event.

Since the Ebola outbreak was declared over, the health system is currently in a recovery and restoration phase. However, human resource capacity and establishment of an equitable and sustainable health care delivery system remain a challenge. Though health care delivery in principle has assumed public provision and public financing, recovery takes time. Investment in secondary and tertiary hospitals have dominated spending, despite a primary health care oriented National Health Policy and Strategic Plan.

Although the health system benefits from development partners, the alignment and harmonization of vertical disease programs rather than a unified, comprehensive national public health system based on national priorities remain a huge challenge.

1.2 NPHIL Establishment

In April 2015, the World Health Organization (WHO) and the Ministry of Health convened a meeting in Geneva to establish a Public Health Institute for Liberia, as endorsed in the Investment Plan for Building a Resilient Health System 2015-2021; the output was a Concept Paper for the Establishment of Liberia’s Public Health Institute (May 2015). MOH with key stakeholders’ participation planning meeting was held in Liberia August 2015. It had two primary objectives: (1) to review the functions of the proposed public health institute; and (2) to develop a structured agenda for study tours including key goals, learning objectives, expected outcomes, list of potential countries, and related logistics.

Several follow-up meetings were held between December 2015 and January 2017, resulting in the Act to Establish the National Public Health Institute of Liberia. The Senate passed it on
September 21 and the House of Representatives concurred on December 8. It was signed into Law by the President on December 27, 2016 and published by the Ministry of Foreign Affairs on January 26, 2017.

1.3 Public Health Legal Framework

In September 2016, the Ministry of Health, in collaboration with relevant line ministries, agencies and development partners, conducted an International Health Regulation (IHR) Joint External Evaluation (JEE). The evaluation revealed that Liberia’s public health regulations and legislations are adequate but require revision. The findings also indicated that the Public Health Law and the Environmental Protection Act provide minimum IHR core capacities for the country. The current Public Health Law is being revised to address emerging public health issues. There is strong political will and partners are committed to implementing the law so that these core capacities will be sustained. The “One Health Coordination Platform” has been launched to ensure that the relevant capacity in both animal and human health are available.

Although these legal instruments exist, fragmentation and the absence of laws that govern surveillance of zoonotic diseases, food safety, chemical events and road traffic regulations remain a problem. These conditions avial an opportunity for the NPHIL to formulate a Public Health Act or strengthen the current Public Health Law to address emerging issues.

The main challenges to implementation of the existing legislation are the limited mechanisms for enforcement, monitoring, and evaluation and inadequate financial and human resources to implement at all levels.

1.4 Scope of the Institute

NPHIL is mandated to improve the public health status of the Liberian population in collaboration with relevant agencies and government institutions, in alignment with IHR core capacities (prevention, detection, and response to public health threats and events). It shall provide real-time surveillance and expert advice on public health morbidity and mortality to the Government of Liberia, key stakeholders, and the public. Public health workforce training and capacity building is an integral component of the Institute. NPHIL will conduct and coordinate research to inform evidence-based decision and policy-making. Public health laboratory, environmental and occupational health, Global Health and partnerships, are all key NPHIL components.

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1 Liberia 2016 International Health Regulation Joint External Evaluation Report
The Ministry of Health (MOH) is the lead health sector agency; NPHIL compliments and supports MOH activities at all levels. Key divisions and units have transitioned from MOH to the newly established NPHIL in line with the Act establishing the NPHIL. These include the Division of Environmental and Occupational Health, Disease Prevention and Control, the National Reference Laboratory, and Liberian Institute for Biomedical Research. The functions of these units will be maintained at the national level. However, at the county level these functions will remain integrated as part of the county health team.
Section Two: Situational Analysis

2.1 Demography and Socio-economic Situation

Liberia is situated on the West Coast of Africa and borders Sierra Leone on the West, Guinea to its North, and Ivory Coast on the East. It covers an area of 111,369 square kilometers with a projected population of 4.1 million, of which 17% are children below five years of age. It has 59% of its population in urban areas. Life expectancy is 61 years and an estimated 54% live in poverty. Liberia is divided into 15 counties, which are subdivided into 91 health districts and managed by a decentralized health system.

Liberia is a low-income country with an estimated Gross Domestic Product (GDP) per capita of approximately US Dollars (USD) 456 in 2015. Although the real GDP growth in 2014 had been projected at 5.8%, it declined to 0% in 2015 due to the EVD crisis.

The Demography and Health Survey report (LDHS 2013) shows that the fertility rate is 4.65 births per woman (2015), maternal mortality was estimated at 1,072 deaths per 100,000 live births and infant mortality at 54 deaths per 1,000 live births. Population access to health care is 71%. In recent times, the global recession has impacted the national budget, thus stagnating funding to the health sector.

2.2 Health Situation

2.2.1 Health services

Liberia’s health services have been severely disrupted by years of conflict and the EVD outbreak in 2014. While revitalization of the health services has begun, it is still far from satisfactory. Access to health care is low, with approximately 29% of the population without basic health care within one hour of walk or within 5 kilometers.

Liberians suffer from a high maternal mortality rate of 1,072 per 100,000 live births (DHS 2013), an infant mortality rate of 54 deaths per 1,000 live births (DHS 2013), and an under five mortality rate of 94 deaths per 1,000 live births (DHS 2013). Communicable and infectious diseases like malaria, TB, and HIV and outbreaks from epidemic prone diseases

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like Lassa fever, yellow fever, and EVD are increasingly presenting threats to the already vulnerable and weak health system.

Liberia, with some improvement in capacity to detect, notify and respond to most infectious diseases of public health concern, continues to build its capacity to respond to viral hemorrhagic fevers like Ebola, Lassa fever, and Marburg. The National Public Health Reference Laboratory (NPHRL) conducts confirmatory diagnostic testing for measles & rubella, cholera, shigellosis, typhoid fever, meningitis, and yellow fever. However, limitations exist in conducting confirmatory testing for Lassa fever and multi-drug resistant TB (MDR). Diagnosis of most bacterial, parasitic, and viral infections is done at the health facility level, though often not referred for confirmation by the NPHRL. There is a specimen system that supports transport of clinical and public health specimens from health care facilities in the counties to centrally located laboratories.

Laboratory infrastructure is a serious challenge. The NPHRL is currently housed in a section of the Liberia Institute for Biomedical Research (LIBR) Building. Only two of the proposed five public health regional laboratories (Phebe and Tappita) have been constructed. The other three regional laboratories are yet to be constructed. Therefore, decentralization of testing for all diseases of public health concern is not currently possible. The NPHRL is unable to cope with testing a high volume of samples, as is presently the case with the EVD outbreak. Limited human resource capacity further compounds the problem. Finally, the laboratory lacks Internet connectivity and a Laboratory Management Information System (LMIS). The LMIS is not yet linked with the Health Management Information System (HMIS) and is not linked with epidemic preparedness and response. Also, cold-chain management of samples continues to be a challenge due to lack of refrigeration for sample storage at county levels.

2.2.2 Human resources

The conflict and EVD epidemic impacted the health workforce, leading to insufficient skilled and qualified health workers. Lack of human resource capacity, including high turnover rates, presents a huge challenge for implementation of Integrated Disease Surveillance and Response (IDSR) and the International Health Regulation (IHR) 2005. Most counties do not have the capacities to rapidly respond to public health emergencies within 48 hours. Over the years, the Ministry of Health has trained rapid response teams at the county and district levels, but they have not been retained due to inadequate salaries and poor housing conditions.

The current number of health workforce is 16,064 health workers (10,672 public), of which 33% are clinicians (5,294): 241 medical doctors, 829 certified midwives, 3,191 nurses, and
453 physician assistants. The majority of the health workforce resides within the urban areas (National Health Workforce Census 2016).

The availability and quality of training institutions is very poor. There is one Medical School, one school of pharmacy, and one school of public health. Training for additional specialties such as veterinary medicine, bio-statistics, laboratory science, and epidemiology is inadequate. Since 2016, Liberia has conducted a training program in Field Epidemiology with support of its partners. It has produced over 75 frontline officers trained in Basic Field Epidemiology and IDSR and 15 in Advanced Field Epidemiology, to support the surveillance and preparedness activities across the country.

2.2.3 Preparedness and Response

The NPHIL and Ministry of Health have made efforts to strengthen surveillance and response capacity in the country based on the IDSR, a WHO Africa Regional strategy for the detection and control of communicable and non-communicable diseases, and public health events of international concern. It also promotes integration of surveillance activities.

The surveillance system relies heavily on the Acute Flaccid Paralysis surveillance platform, which progressively contributed to an improved surveillance system for the 17 priority diseases / events: meningitis, acute hemorrhagic fever, malaria, typhoid fever, yellow fever, polio, measles, cholera, influenza-like illness, bloody diarrhea, severe acute respiratory syndrome (SARS), plague, human rabies, Lassa fever, hepatitis, and maternal and neonatal deaths. These are reported weekly since 2008.

While guidelines and manuals exist (including standard case definitions) for these events, there is limited surveillance for food-borne diseases, nosocomial infections, chemical spills, anti-microbial resistance (AMR), toxicological agents, radiation-related events, and zoonotic diseases, as well as road traffic accidents (RTA). Likewise, no vector control activities exist at ports of entry. At Roberts International Airport, the port health offices are understaffed and poorly equipped. Furthermore, the coordination structure with other agencies at the seaport and other crossing points are inefficient.

The National Health Policy and Plan 2011-2021 prioritizes epidemics, though there is no budget line for epidemics and disasters. Similarly, the Emergency Preparedness and Response Plan (EPRP) for epidemics does not address all risks comprehensively and is not funded. Other events, such as chemical poisoning, are not given adequate attention in the plan. Emergency preparedness and response plans for infectious events have been tested to a limited degree in actual outbreaks.
Response capacity is available to some extent; however, it additional capacity is required to address chemical, radiological, and nuclear threats. There are inadequate stockpiles available and they do not include provisions for response to other IHR-related hazards.

The country has been able to develop a Disaster Management Strategy and a National Disaster Management Agency has been established and held its first disaster risk reduction stakeholders consultative meeting in July 2016.

The establishment of the national and county Emergency Operation Centers (EOC) is one of the key strategies and approaches used to fight the Ebola Virus Disease (EVD) outbreak in 2014-2015. During the EVD, outbreak 13 county EOCs were rehabilitated and two county EOCs and the national EOC were fully constructed. The EOCs were equipped with office furniture, computers, TV monitors, internet service, generators, and telephones. These resources will need maintenance to remain operational; hence sustainability is an issue.

Liberia has developed a policy document and has attained the political will for medical counter-measures. Bodies to govern and oversee the deployment of medical personnel and utilization of human health products and technology have been formed. These governing bodies have demonstrated their function in the most recent Ebola outbreak (EVD) in 2014-2015 and three (3) subsequent flares ups in 2015-2016 where there was significant influx of medical counter-measures and foreign medical teams.

2.3 Public Health Financing

Prior to the creation of the NPHIL in 2017, donors and external partners predominantly financed Liberia’s public health system. The National Health Budget is skewed towards curative services with little resources allocated to preventive services. Over two-third of donor funding are earmarked for malaria, HIV/AIDs, tuberculosis, childhood immunization, and maternal and child health services. Additionally, most of these funds are channelled through vertical programs that are not linked directly to public health surveillance, preparedness, and response. According to the World Health Organization, nearly 50% of overseas development assistance in 2012 was spent on the Millennium Development Goal Six (WHO, 2012), which focused on the control of HIV/AIDS, tuberculosis, malaria and other diseases, but do not strengthen the overall public health workforce and system.

During and after the Ebola outbreak in Liberia, development partners have made and continue to make substantial contribution to public health in the areas such as disease surveillance, strengthening of public health laboratory, medical research, and public health workforce capacity development. In an effort to build a resilient health care system to effectively respond to future health emergencies, the Government of Liberia established
the NPHIL and is providing direct budget support towards public health system improvement. In fiscal year 2016-17, the government provided the NPHIL with US$ 500,000 and in fiscal year 2017-18 US$ 3 million has been approved with prospect to progressively increase funding as the institution takes on additional public health responsibilities. However, the current national budgetary allocation is approximately one-quarter of what is needed to strengthen the current public health system and response. The Institute anticipates additional donor support to implement its strategic plan and build a resilient public health system.

2.4 Ebola Outbreak

The West Africa Region experienced the largest Ebola Virus Disease (EVD) outbreak in history during 2013-14. Liberia reported its first cases in March 2014. The impact of the outbreak shattered an already weak and vulnerable health care system. The lapses in infection control at healthcare facilities led to deaths of almost 50% (184/372) of infected health workers (HWs). This caused fear among service providers working in facilities because of the risk of the disease that was estimated at 30 times higher amongst health workers than in the general population. Many public and private health facilities were temporarily closed.

The EVD outbreak impacted every aspect of the country. During the outbreak, over 10,000 Liberians were infected, of whom over 4,000 died. The economic and fiscal impact has outlasted the epidemiological impact due to severe shocks to investment, production, and consumption throughout the West African Region, coupled with commodity price shocks. Since Liberia’s economy is heavily dependent on imports, it experienced serious impacts. At the peak of the outbreak, schools had to close and, as a result, the World Bank Group reported that Liberia students lost 582 hours of school time. Health center attendance by pregnant women also dropped during the outbreak.

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4 Draft Fiscal Year 2017/18 National Budget, Republic of Liberia
2.5 National Public Health Institute of Liberia

2.5.1 Public health work force

There is a critical lack of trained and motivated health workers in Liberia, which is acute in the public health work force. There was a 37% increase in the density of core health professionals between 2010 and 2015, from 6.3 to 8.6 per 10,000 population, which included 117 physicians (0.03 per 1,000 population), 436 physician assistants (0.08 per 1,000 population), 2,137 nurses in both RN and LPN categories (0.4 per 1,000 population), and 659 midwives (0.12 per 1,000 population). However, very few public health specialists, epidemiologists, public health diagnosticians, and public health/medical research scientists were recruited or trained during the same period. Public health capacity in the private sector data is incomplete.

There are few pre-service education institutions training on public health and only one private institute that provides master’s degree in public health. There are limited programs to train health managers, logisticians, field epidemiologists, biostatisticians, information specialist and other cadres that are critical to the health system. Having said that, human health has appreciable human resource capacity compared to animal health, where the gaps are critical.

2.5.2 Infectious Disease and Epidemiology (IDE)

The division of Infectious Disease and Epidemiology is currently responsible for active surveillance, early warning, epidemic preparedness and response, and Port Health and Cross-Border Surveillance. Additionally, there are multiple initiatives that are addressing other core components of the IHR and Integrated Disease Surveillance and Response (IDSR), which are coordinated to a limited degree by other line ministries including the Ministry of Agriculture, Forestry Development Authority, and the Environmental Protection Agency (EPA).

The country has developed a national IDSR 5-year strategic plan that covers the period 2016 to 2020, which will give direction to stakeholders on the IDSR implementation. There are guidelines, case definitions, and mechanisms in place to report on the ten reportable diseases plus four events of international public health concern, including maternal and neonatal death. The Electronic Disease Early Warning System (eDEWS) is being piloted in four (4) counties.
Across the country, IDSR is implemented using the surveillance structure through the County Surveillance Officers (CSOs), District Surveillance Officers (DSOs), and Zonal Surveillance Officers (ZSOs), as well as livestock officers, all of whom have undergone the Basic Field Epidemiology Training Program (FETP). There has been a rollout of Community Event-Based Surveillance (CEBS) to increase the sensitivity of the surveillance system; it is operational in 11 out of the 15 counties. The country has trained 3,247 out of the deployed 7,158 Community Health Volunteers who collect and report information on diseases and events in the community.

Although surveillance has been instituted for IDSR, there is not a comparable system for animal health diseases among livestock or wildlife.

While the surveillance system has been established, there are ongoing issues with turnaround time of laboratory specimens. There is limited coordination between DIDE and other programs for surveillance data collection (e.g. Expanded Program on Immunization, Family Health Division, Community Health, Health Management Information Systems, Monitoring and Evaluation, Research, and Health Promotion). There is also limited capacity for clinical and public health laboratory services to support real-time surveillance.

2.5.3 Laboratory and Public Health Diagnostics

Liberia has limited laboratory capacity to detect, notify and respond to most infectious diseases of public health concern. It continues to build its capacity to respond to viral hemorrhagic fevers like Ebola, Lassa fever, and Marburg. The National Public Health Reference Laboratory (NPHRL) conducts confirmatory diagnostic testing for measles & rubella, cholera, shigellosis, typhoid fever, meningitis, and yellow fever. However, limitations exist in conducting confirmatory testing for Lassa fever and multi-drug resistant TB (MDR-TB). Samples are normally sent out of country to international reference laboratories such as the Lassa Fever Diagnosis Center in Kenema, Sierra Leone. EVD testing capacity testing is available at Phebe and Tapitta regional labs. Diagnosis of some bacterial, parasitic, and viral infections is done at the health facility level, though often not referred for confirmation by the NPHRL. There is a specimen transportation system to move specimens from health care facilities to centrally located laboratories. This system is implemented by Riders for Health and supported by U.S. CDC for now.

Laboratory infrastructure is a serious challenge; only two of the proposed five public health regional laboratories (Phebe and Tapitta) have been constructed. Consequently, decentralized testing for diseases of international public health concern is currently not
feasible. The NPHRL was unable to cope with the required high-volume testing of samples during the last EVD outbreak. Limited human resource capacity further compounds the problem. The laboratory lacks a Laboratory Management Information System (LMIS). The LMIS is not yet linked with the Health Management Information System (HMIS) and is not linked with epidemic preparedness and response. Cold-chain management of samples continues to be a challenge due to lack of refrigeration for sample storage at county levels.

2.5.4 Public Health and Medical Research

The division of Public Health and Medical Research has focused primarily on biomedical research based at LIBR. There is a small veterinary laboratory at the Ministry of Agriculture. Radio nuclear events are regulated by the Environmental Protection Agency (EPA). The research activities of the EPA, the Ministry of Agriculture and the Department of Public Health and Medical Research and Development need to be linked for the purpose of the IDSR. There is limited human resource capacity (trained scientist). There is no clearly articulated research agenda for the country, which covers medical, clinical, public health and translational research.

2.5.5 Environmental and Occupational Health

The division of Environmental and Occupational Health (DEOH) was previously within the Ministry of Health. Now transitioned to NPHIL, it is responsible for food safety, WASH, water quality, vector and chemical control, healthcare waste management, occupational health and safety, and other environmental issues in the community and health facilities. The work of the Division is cross-cutting with other ministries and agencies and is a decentralized program.

There is a National Standard Laboratory that is currently involved in the testing of water brands, with limited capacity. There is a small water quality laboratory that needs to be expanded. There are mini water quality testing laboratories in each of the fifteen counties.

There is a lack of in-service training program for Environmental Health Technicians and Officers. There is limited research on environmental health issues. The division has a National Environmental and Occupational Health Policy and Standard Operating Procedures (SOPs). There is limited capacity to implement public health inspection, particularly for urban communities and to enforce public health laws in areas of fines and penalties.
2.5.6 Global Health and Relations

The Division is a newly formed unit at the NPHIL. The goal is to globally promote the Institute, by strengthening the relationship between NPHIL and national and international health partners. The Division serves as a coordinating arm of the NPHIL to: build partnership and inter-connectedness with national and international stakeholders; coordinate NPHIL’s implementation of the One Health and GHSA strategies; mobilize resources to support NPHIL’s Mission; and raise awareness, nationally and globally, regarding NPHIL’s activities for the prevention and control of public health threats consistent with the GHSA and IHR recommendations.

During the EVD outbreak there were over 100 development partners and a host of local actors combining efforts and resource to bring the situation to a halt. These multiple actors and stakeholders present coordination challenges. Over the years, coordination in the sector has improved gradually through the establishment of coordination platforms and mechanisms. The main coordination challenges include fragmentation and duplication of activities, poor communication amongst actors and limited financial transparency and accountability. On the other hand, partnership in the sector is cordial. Donors and development partners attend regular sector meetings and provide support for the improvement of the system. There are overwhelming partners support towards health emergencies and their financial and technical resources has contributed immensely to the gains made in the public health sector.

2.5.7 Finance and Operations

NPHIL has been in transition from the MOH since the passage of Act establishing the Institute. The Institute has administrative and financial autonomy. Various divisions to support administrative and financial functions, including human resources, finance, and procurement are being newly established. There is a clear need to establish system and processes that provide robust support services to technical interventions. NPHIL infrastructure at the national level is grossly inadequate to meet the huge demands for surveillance and laboratory, epidemic preparedness and response, and environmental and occupational health. Additionally, there is a mismatch of human resources for the institute. NPHIL has a large number of personnel that were inherited from the EVD response and from the transition from MOH. Most of these staff do not have the requisite qualifications and/or experience to accomplish the task at hand. Quite a few of them have reached status of retirement as well. Budgetary allocation to the institute is minimal, at least for the first year. Currently there is no formal financial resource mobilization strategy in place. Addressing the current situation will require considerable coordination and collaboration with other departments.
2.5.8 Planning, Monitoring, and Evaluation

The Division of Planning, Monitoring and Evaluation is newly established at NPHIL to monitor implementation of NPHIL strategic, operational plans, amongst other key plans (NAPHS, etc.). For this to occur, there will be collaboration with the Division of Health Information System at the MOH. Prior to 2016, data collection occurred across different units of MOH and NPHIL, resulting in parallel systems for health information limiting ability to make informed decisions.
Section Three: NPHIL Mission, Vision, Goal, and Strategic Objectives

3.1 Mission and Vision

Mission

The National Public Health Institute of Liberia prevents and controls public health threats by promoting healthy outcomes and serving as a source of knowledge and expertise.

Vision

The National Public Health Institute of Liberia will be a Center of Excellence for better health outcomes for Liberians through a strong health system.

3.2 Core Values

Core values represent the durable and supporting qualities that shape and guide all activities that the National Public Health Institute of Liberia will undertake.

- **Ethics and integrity**: The NPHIL upholds generally accepted high standards of ethical codes of conduct. All those involved with the NPHIL conduct themselves in a professional manner that reflects favorably on the institute and the Government of Liberia.

- **Transparency**: The NPHIL communicates honestly and openly about its activities, their results, their impacts on the health outcomes of Liberians, and the budget and finances of the Institute.

- **Accountability**: The NPHIL sets high expectations for its performance, all those involved take responsibility for what they do, and they demonstrate that they use the resources entrusted to the Institute to serve the people of Liberia. The NPHIL is accountable to the beneficiaries, the Government of Liberia, and the donors.

- **Equity**: The NPHIL openly recognizes disparities within the organization and in health outcomes of the people of Liberia and is committed to reducing health inequalities and increasing equity for all.

- **Partnership**: The NPHIL recognizes that sustainable success involves collaboration—among the staff of the Institute, with other agencies of the Government of Liberia, with communities, and with external partners—based on mutual trust and respect, a shared vision and goals, commitment, and active participation by all involved.
• **Quality:** The NPHIL delivers high-quality programs, services, knowledge, and expertise.

• **Productivity:** The NPHIL generates tangible results that contribute to the prevention and control of public health threats.

• **Innovation:** The NPHIL is a learning institution that takes pride in the ability and willingness of its staff to initiate innovative approaches that contribute to achieving the Institute’s mission.

### 3.3 Goal and Strategic Objectives

The goal of the Institute is to improve the public health of the Liberian population in collaboration with relevant agencies and institutions of government.

The operational timeline for this strategic plan is five years, beginning in FY2017-18. The strategic objectives of the NPHIL for this period align with the functions articulated in the Act that established the Institute.

The NPHIL will collaborate with the Ministry of Health and other relevant stakeholders to achieve eight strategic objectives:

1. Contribute to development and sustainability of the public health workforce
2. Develop, enhance, and expand the surveillance platform
3. Establish a comprehensive, integrated, and sustainable public health diagnostic system
4. Establish multi-sectoral epidemic preparedness and response capacities and capabilities
5. Develop, enhance, and expand processes and structures to protect environmental and occupational health
6. Expand, conduct, and coordinate public health and medical research to inform Liberian public health policies
7. Strengthen the relationship between NPHIL and national and international public health partners
8. Ensure sustainable financing and operations of the NPHIL
Section Four: Strategic Objectives, Strategic Interventions, and Key Activities

4.1 Public Health Workforce

A strong public health system requires an appropriately trained workforce with expertise across a wide-range of fields, including epidemiology, laboratory sciences, health policy, health communications, information technology, and management. The NPHIL will help develop a public health workforce that is responsive to and adequate for the needs of both the NPHIL itself and the broader public health community.

To achieve the above, NPHIL will assess the workforce in terms of existing capacity and unmet needs, providing training and continuing education for NPHIL employees and other public health professionals. NPHIL will advocate for establishing and strengthening existing public health programs in universities.

Retention of skilled public health workers is important; NPHIL will provide opportunities and incentives (both short-term and specialized) for public health practitioners to remain in the public health workforce.

**Strategic Objective 1:** Contribute to development and sustainability of the public health workforce

<table>
<thead>
<tr>
<th>No.</th>
<th>Strategic Intervention</th>
<th>Key Activities</th>
</tr>
</thead>
</table>
| 1.1 | Establish new and strengthen existing public health degree programs, pre-service institutions, and FETP training | • Establish public health and One Health programs at BSc and Master’s levels at the University of Liberia  
• Strengthen existing public health programs at the BSc and Master’s levels, including at Cuttington and Tubman Universities  
• Collaborate with the MOA to incorporate public health into the veterinary science component of agriculture BSc programs at Cuttington University and the University of Liberia  
• Expand the Field Epidemiology Training Program and Field Epidemiology Training Program – Veterinary to the advanced level  
• Upgrade the laboratory diploma programs at Tubman National Institute and Phebe to |
<table>
<thead>
<tr>
<th>1.2</th>
<th>Provide opportunities for Liberians to obtain degrees, diplomas, and certificates in public health and related areas inside and outside Liberia</th>
</tr>
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<tbody>
<tr>
<td>1.3</td>
<td>Enhance coordination of human resource capacity development in NPHIL core functions</td>
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<td>1.4</td>
<td>Implement outreach program to Liberians in the diaspora</td>
</tr>
<tr>
<td>1.5</td>
<td>Implement internship program</td>
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<tr>
<td>1.6</td>
<td>Establish NPHIL Resource Center</td>
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<table>
<thead>
<tr>
<th>BSc</th>
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<tbody>
<tr>
<td>Review and update training school curricula to ensure comprehensive training in laboratory core competencies</td>
</tr>
<tr>
<td>Review and update the School of Environmental and Occupational Health curriculum to address IHR core capacity requirement</td>
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<tr>
<td>Work with pre-service institutions to enhance or incorporate fundamental public health concepts and courses in their curricula</td>
</tr>
<tr>
<td>Develop and implement a scholarship program</td>
</tr>
<tr>
<td>Develop and maintain international partnerships with institutions that provide degrees, diplomas, and certificates</td>
</tr>
<tr>
<td>Develop plan to fill priority skill gaps in the Liberian workforce</td>
</tr>
<tr>
<td>Coordinate and enhance in-service and short-term training in all NPHIL functional areas</td>
</tr>
<tr>
<td>Establish relationships with other institutions for knowledge transfer</td>
</tr>
<tr>
<td>Identify pool of NPHIL SME’s and trainings and publicize and coordinate making them available outside NPHIL</td>
</tr>
<tr>
<td>Develop and maintain database of Liberians with specialized public health degrees and expertise living outside Liberia</td>
</tr>
<tr>
<td>Conduct outreach to Liberians with public health and biomedical skills and expertise living outside Liberia</td>
</tr>
<tr>
<td>Establish and implement internship guidelines and structure for both Liberian and foreign students</td>
</tr>
<tr>
<td>Conduct outreach about the internship program to public health degree and certificate programs in Liberia</td>
</tr>
<tr>
<td>Develop and implement a Resource Center operational plan</td>
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</table>
4.2 Real-Time Surveillance

A functioning public health surveillance system prevents or promptly identifies events of public health concern; analyzes and links real-time surveillance systems, in accordance with IHR core capacity requirements.

Public health decision-making is critically dependent on the timely availability of reliable data. Public health information systems allow the Ministry of Health to collect, collate, analyze, and disseminate data for decision-making at all levels of healthcare delivery environment. The recent EVD epidemic had provided an important awakening on the need of a robust public health information system that is reliable and timely. While it is envisioned that the primary responsibility for the Health Information System (HIS) will remain with the Ministry of Health, it is critical that there be close coordination between the Institute and the MOH, providing for ways to integrate the data that the Institute collects and for the Institute to access the information required to carry out its work.

**Strategic Objective 2: Develop, enhance, and expand the surveillance platforms**

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<thead>
<tr>
<th>No.</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</table>
| 2.1 | Strengthen indicator, syndrome, and event-based early warning surveillance systems to detect events indicative of public health emergencies | • Develop, adopt, and adapt standards and guidelines  
• Establish relevant public infrastructure and capacities at all surveillance levels  
• Improve rumor verification and outbreak investigation  
• Establish and improve timely detection of any potential hazard occurring at **Point of Entry (PoE)**  
• Expand and reinforce community event-based surveillance  
• Implement routine public health risk assessment, surveillance evaluations, and program reviews  
• Collaborate with the MOH and key stakeholders to develop SOPs  
• Implement processes for screening, case detection, and referral |
| 2.2 | Develop and sustain an interoperable, inter-                                          | Design, develop, and implement electronic tools for surveillance and early warning                                                      |
### 2.3 Strengthen capacities at Points of Entry (PoEs) to detect and respond to public health emergencies at sea, airports, and key ground crossings, according to IHR

- Collaborate with Environmental and Occupational Health to establish and maintain a joint coordination platform for PoEs
- Collaborate with E&OH to conduct a needs assessment of capacity and capabilities of designated POEs (ground, sea, and air)
- Collaborate with E&OH to develop and implement a national plan for PoE management
- Collaborate with E&OH to identify, deploy, equip, and train PoE staff
- Collaborate with E&OH to expand support of PoE public awareness sensitization at border communities combined with international travellers
- Collaborate with E&OH to update PoE SOPs
- Develop screening and response tools
- Implement annual simulation activities, tabletop exercises, and / or drills

### 4.3 Public Health Laboratory Diagnostic System

The NPHIL will develop a bio-surveillance and laboratory diagnostic system that supports public health diagnosis, safe and secure transport of specimens, and reliable conduct of core tests. Its focus will be to detect and characterize pathogens causing epidemic disease, both known and unknown threats, from all parts of the country and support clinical laboratories.

**Strategic Objective 3:** Establish a comprehensive, integrated, and sustainable public health diagnostic system.
<table>
<thead>
<tr>
<th>No.</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</thead>
</table>
| 3.1 | Participate in developing the National Laboratory System (Reference Lab, animal labs, clinical labs) | • Facilitate the finalization and validation of and participate in implementing the National Laboratory System Strategic Plan  
• Modify / update and implement policy and standard operating procedures for secure laboratory data sharing, exchange, and transmission  
• Develop national regulations for biosafety and biosecurity  
 □ Define basic standards for facilities at each tier of the system |
| 3.2 | Coordinate, expand, and decentralize diagnostic capacity and infrastructure              | □ Enhance coordination of laboratory testing in Liberia using a One Health Approach  
 □ Expand diagnostic capacity to cover IDSR diseases including immediately reportable, epidemic prone and IHR core tests  
 □ Strengthen diagnostic capacity for developing new medicine, diagnostic tools, vaccines and other prevention interventions  
 □ Establish and maintain service contracts to provide and repair equipment with specialized requirements  
 □ Develop and implement guidelines for equipment donations  
 □ Decentralize diagnostic capacity to regional public health labs  
 □ Implement new and rapid diagnostic tools  
 □ Implement structured quarterly supervision, mentorship, and monitoring |
| 3.3 | Strengthen anti-microbial resistant pathogen detection and knowledge development         | □ Strengthen laboratory capacity to diagnose potential pathogens contributing to antimicrobial resistance (microbiological, bacteriological)  
 □ Equip public health and private labs for testing pathogens in antimicrobial resistance and link referrals  
 □ Develop standardized collection and reporting tools achieving and inventory system (quality control) |
<table>
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<tr>
<th>Section</th>
<th>Objective</th>
<th>Actions</th>
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</thead>
</table>
| 3.4     | Establish guidelines and system for coordination of specimen collection, transfer, testing, and reporting | - Facilitate inclusion of appropriate use of antimicrobial agents in public health research agenda  
- Collaborate with MOH National Diagnostics Unit to conduct public awareness education on antimicrobial resistance in labs |
| 3.5     | Establish an interoperable laboratory information system | - Develop plans for receiving and testing routine and priority specimens in accordance with integrated disease surveillance and response (IDSR)  
- Establish standards for reporting of results and implement monitoring system  
- Establish metrics of laboratory operations and implement monitoring system |
| 3.6     | Implement a laboratory quality management system | - Establish priority agreements for referring specimens to international reference laboratories and associated agreements with international partners |
| 3.7     | Strengthen the bio-safety and bio-security system | - Enhance the design and implement an efficient interoperable LMIS  
- Establish and enforce the use of a unique identifier system for identifying human and animal specimens, tracking results, and monitoring  
- Revise total quality management SOPs  
- Expand training of lab staff in implementation of the total quality management system  
- Implement TQMS quality standards in line with ISO15189  
- Implement routine quality monitoring including internal and external quality assurance programs  
- Develop national guidelines and standards for biosafety and biosecurity  
- Establish education and monitoring to ensure that infection prevention and control and biosecurity principles are followed  
- Develop tools to ensure hazards are identified and managed according to national guidelines  
- Develop and implement an SOP for transfer of samples from the national and regional reference labs to the NPHIL bio-repository |
| 3.8 | Implement system for vaccination of staff and lab workers against pathogens | ☐ Collaborate with LPHMR to develop system for vaccination against existing and new pathogens (e.g., tetanus, Hepatitis A/B/C, yellow fever, meningitis, and other VPDs)  
☐ Implement vaccination system |
| 3.9 | Foster a One Health philosophy of human, veterinary and environmental laboratory activities | ☐ Establish formal lines of communication and data sharing with the Ministry of Agriculture, the Central Veterinary Reference Laboratory, and other labs  
☐ Establish formal lines of communication and data sharing with the environmental health labs  
☐ Assess feasibility for co-locating animal and human laboratories |

### 4.4 Epidemic Preparedness and Response

The country has a National Pandemic Preparedness and Response Plan, which was developed in collaboration with MOA in 2007 that needs to be updated. Similarly, a National Epidemic Preparedness and Response (EPR) plan exists and focuses on the IDSR epidemic prone diseases. However, the country does not have a Multi-Hazard National Public Health Emergency Preparedness and Response Plan, although an EVD surge capacity is available.

Risk and resource mapping has been conducted to address IHR relevant hazards and priority risks. The government mobilizes resources and allocates funding for the existing coordination mechanism. Emergency response capacity is available to some extent in certain IDSR reportable diseases (e.g. Ebola, meningitis). However, there is a need to develop capacity for other epidemic prone diseases (e.g. Dengue Fever).

**Strategic Objective 4:** Establish a comprehensive, integrated, and sustainable public health response system that is capable to safely and accurately control any pathogens linked to epidemic-prone diseases, including known, re-emerging, and novel threats.
<table>
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<tr>
<th>No</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</thead>
</table>
| 4.1 | Strengthen multi-sectoral public health emergency preparedness and response capacity to respond to priority events and emerging and re-emerging diseases | - Update and monitor implementation of national and county epidemic preparedness and response plans, tools, and SOPs  
- Develop, reproduce, and disseminate IDSR priority diseases treatment guidelines  
- Train and establish functional multi-disciplinary rapid response teams at all levels, including Ports of Entry and EOCs  
- Facilitate regular simulations at national and county levels  
- Ensure and maintain updated outbreak surge database  
- Institutionalize routine risk profiling and resource mapping to accommodate emerging threats  
- Develop priority events specific contingency plans  
- Implement and maintain system to ensure the availability of essential emergency preparedness and response stocks at national, regional, and county levels  
- Enhance structures for multi-sectoral epidemic preparedness and response coordination during an outbreak  
- Increase EOC financial resources and logistics  
- Collaborate with MOH and relevant partners to enhance EMS services (Call Center) |
| 4.2 | Support multi-hazard emergencies with human health consequences | □ Contribute to conduct of multi-hazard vulnerability assessment and resource mapping  
□ Contribute to development and implementation of the national multi-hazard preparedness and response plan |

### 4.5 Environmental and Occupational Health

The Division of Environmental and Occupational Health (DEOH) has transitioned from the Ministry of Health and is currently within the NPHIL. The revised Public Health law (1976) of Liberia has enshrined in it seven key mandates of the environmental and occupational health program. These mandates include: Food safety, water quality, vector control, chemical safety and management, port health services, occupational health and safety and environmental sanitation including healthcare waste. However, it is recognized that the Ministry of Health in collaboration with NPHIL will handle healthcare waste management in health facilities.
Environmental and occupational health services are cardinal to public health. The DEOH has over the years established water quality laboratories in the 15 counties of Liberia and routine water quality monitoring is conducted by county level Environmental Health Technicians (EHTs).

Environmental health workforce cuts across all 15 county health teams and partner institutions. Inter-sectoral collaboration and coordination is widely practiced among line institutions responsible for environmental management.

**Strategic Objective 5:** Develop, enhance, and expand processes and structures to protect environmental and occupational health

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<thead>
<tr>
<th>No</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</thead>
</table>
| 5.1 | Review and update environmental and occupational health policy and guidelines | • Finalize guidelines on occupational health and safety, healthcare waste management, cremation, exhumation, and water quality  
• Develop a national water quality control standard and plan  
• Revise national environmental occupational policy |
| 5.2 | Ensure access to safe potable water among the population | • Conduct National Water Quality Assessment  
• Procure and install laboratory equipment, reagents, and logistics  
• Recruit, train, and deploy water quality technicians in all 15 counties  
• Conduct training of community members on household water treatment and safe storage (HWTS) promotion  
☐ Procure and distribute water treatment commodities for responding to public health emergencies  
☐ Conduct routine monitoring of drinking water sources/points nationwide  
☐ Conduct research on emerging water quality issues |
| 5.3 | Increase hygiene awareness and ensure acceptable practices in hygiene and sanitation | ☐ Scale up Community Led Total Sanitation (CLTS) in rural communities  
☐ Conduct community training on hygiene promotion methodologies including PHAST, SARA, etc. |
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<tr>
<th>5.4</th>
<th>Increase food safety awareness and ensure compliance of food for quality</th>
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<tbody>
<tr>
<td></td>
<td>- Support and collaborate with county health teams to provide hygiene promotion services in communities during public health emergencies</td>
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<td></td>
<td>- Conduct national food safety study</td>
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<td></td>
<td>- Conduct trainings and public awareness on food safety</td>
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<td></td>
<td>- Monitor food and food centers for quality and safety</td>
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<td></td>
<td>- Issue permits/certificates for food and food establishments</td>
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<tr>
<td></td>
<td>- Conduct routine disposal of unsafe food</td>
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<tr>
<td></td>
<td>- Establish a comprehensive food-borne disease surveillance system</td>
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<td></td>
<td>- Strengthen inter-sectoral collaboration on food safety</td>
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<tr>
<th>5.5</th>
<th>Increase control of vectors and vermin of public health importance</th>
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<tr>
<td></td>
<td>- Map vectors and vermin hotspots of public health importance</td>
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<td></td>
<td>- Conduct vector and vermin control interventions</td>
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<tr>
<td></td>
<td>- Identify and procure relevant chemicals and equipment for vector/vermin control</td>
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<td></td>
<td>- Conduct mass awareness on vector and vermin control nationwide</td>
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<tr>
<td></td>
<td>- Strengthen monitoring of safe handling, usage and storage of chemicals in line with IHR at the county level</td>
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<td></td>
<td>- Establish and conduct annual vector and vermin assessment of facilities</td>
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</tbody>
</table>

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<thead>
<tr>
<th>5.6</th>
<th>Improve port health services at Points of Entry (PoEs) in line with the International Health Regulations</th>
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<tbody>
<tr>
<td></td>
<td>- Collaborate with Infectious Disease and Epidemiology to establish and maintain a joint coordination platform for PoEs</td>
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</tbody>
</table>

<p>| Health Regulations | |</p>
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<tr>
<th>5.7</th>
<th>Improve management of health care waste</th>
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<tbody>
<tr>
<td></td>
<td>□ Support county teams to create awareness on health care waste handling</td>
</tr>
<tr>
<td></td>
<td>□ Ensure that all facilities have health care waste management equipment and logistics</td>
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<tr>
<td></td>
<td>□ Coordinate with partners and local authorities to ensure safe and dignified burial (dead body management)</td>
</tr>
<tr>
<td></td>
<td>□ Strengthen monitoring of health facilities for health care waste handling and safety</td>
</tr>
<tr>
<td></td>
<td>□ Conduct national assessment on chemical, biological, radiological, and nuclear (CBRN) in Liberia</td>
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<td></td>
<td>□ Conduct monitoring of universal precautions in health facilities at the county level</td>
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<th>5.8</th>
<th>Improve occupational health and safety at work places</th>
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<tbody>
<tr>
<td></td>
<td>□ Develop and implement national Occupational Health and Safety guidelines</td>
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<tr>
<th>5.9</th>
<th>Increase capacity to effectively deliver environmental and occupational health services at all levels</th>
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<tbody>
<tr>
<td></td>
<td>□ Strengthen County Environmental Health Teams to monitor programs by procuring and distributing 4x4 pickups and motorbikes</td>
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<td></td>
<td>□ Participate in international conferences and seminars on Environmental and Occupational Health</td>
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<td></td>
<td>□ Conduct county level review sessions with environmental health teams</td>
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<tr>
<th>5.10</th>
<th>Strengthen structures for the safe handling and disposal of chemicals for the protection of human health</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>□ Conduct assessment on chemicals handling and storage in Liberia</td>
</tr>
<tr>
<td></td>
<td>□ Develop and maintain a national database for chemicals in use in Liberia</td>
</tr>
</tbody>
</table>
Conduct chemical safety public awareness activities
Develop and update guidelines for the management of chemicals
Develop emergency preparedness plans for chemical accidents including spills and poisoning
Strengthen monitoring of safe handling, usage and storage of chemical in line with IHR at the county level

4.6 Public Health and Medical Research

The Liberia Institute of Biomedical Research, established in the 1980’s, is now the Division of Public Health and Medical Research and integrated into NPHIL. The 2014-2015 Ebola epidemic highlighted Government of Liberia’s capacity to provide leadership in the development of a research agenda to address questions regarding prevention and control of the epidemic-prone diseases, and the long-term health consequences from these epidemics.

A comprehensive approach to funding research is required, especially as currently research is funded through partners in response to the Ebola epidemic rather than Government of Liberia resources. Fund-raising is dependent upon the demonstration of accomplishments through publications and presentations responsive to the needs of Liberia and of interest to potential future partners. Outside sponsors who desire to conduct research in Liberia may be a source of infrastructure development and funding.

Strategic Objective 6: Expand, conduct, and coordinate public health and medical research to inform Liberian public health policies

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<thead>
<tr>
<th>No</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</table>
| 6.1  | Create a well-informed national public health research agenda | • Establish process for annual public health research review to identify gaps and needs for future research  
• Develop and update the NPHIL research agenda annually and articulate the value of doing research in Liberia |
<p>| 6.2  | Coordinate public health and medical research activities in  | • Identify all partners involved in research in Liberia and how their research and interests align with the NPHIL research agenda |
|      | Liberia to minimize duplication and optimize synergies       | • Create and maintain a registry of research in Liberia, coordinated with relevant international public health organizations |</p>
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<tbody>
<tr>
<td></td>
<td>Create and maintain a group for the review of ongoing research to ensure coordination</td>
<td>Organize regular meetings of all partners collaborating with NPHIL on public health and medical research</td>
</tr>
<tr>
<td></td>
<td>Organize regular meetings of all those conducting public health and medical research in Liberia</td>
<td>Collaborate with the MOH to maintain and sustain the Liberia National Research Ethics Board (LNREB)</td>
</tr>
<tr>
<td></td>
<td>Develop and enhance collaboration with MOH, University of Liberia, and the Liberia Medical and Health Regulatory Authority</td>
<td>Develop and sustain a relationship with the Liberia Dental and Medical Council in the regulation of medical devices, practitioners, and facilities</td>
</tr>
<tr>
<td></td>
<td>Complete a comprehensive update on live samples transferred to the US and bioinformatics information sent</td>
<td>Implement protocol for transfer of live samples</td>
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<tr>
<td></td>
<td>Enhance biorepository and develop registry of available samples</td>
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</table>

6.3 Implement system for vaccination of staff and lab workers against pathogens

- Collaborate with NRL to develop system for vaccination against existing and new pathogens (e.g., tetanus, Hepatitis A/B/C, yellow fever, meningitis, and other VPDs)
- Implement vaccination system

6.4 Expand public health and medical research conducted

- Operationalize research SOPs, manuals, and templates for internal and partner research (including signing of MoUs)
- Train researchers in bioinformatics software and sample inventory process
- Implement internal process for protocol development and prioritization
- Establish research management team to oversee implementation of research SOPs, MOU implementation, protocol development and prioritization, and manuscript development
- Develop and maintain an NPHIL Internal Review Board to review protocols for alignment with the NPHIL’s goals, scientific soundness, and ethics and regulatory aspects
| 6.5 | Expand support for the development of Liberian researchers |
|-------------------------------------------------------------|
| - Implement program to support locally identified scientists with Masters Degrees and above who have received training in research and developed plans and protocols for specific research projects |
| - Identify partner resources to support local Liberian scientists who obtained their degrees from other countries and have done research |
| - Coordinate with partners conducting research in Liberia about employment and training opportunities for Liberians |
| - Establish a seed grant program |

| 6.6 | Disseminate and share public health research findings |
|---------------------------------------------|
| - Establish and maintain regular public health research bulletin |
| - Sponsor and hold national and international research symposia / conferences |
| - Provide mentoring and support for scientific presentations and manuscripts |
4.7 Global Health and Partnerships

Lessons learned from the Ebola crisis in Liberia revealed to the NPHIL the crucial need to create and strengthen linkages with national and international partners in order to harness the unique comparative advantage. Accordingly, the NPHIL will develop collaborative partnerships to facilitate more effective accomplishment of its overarching goal and strategic objectives.

This responsibility includes interacting with existing and potential partners at key meetings and events, identifying and securing funding (e.g., grant) opportunities that address needs within NPHIL and the overall public health system, connecting NPHIL personnel with appropriate partners or funding opportunities based on mutual interests, and raising awareness about what partnership with NPHIL entails, including expectations and potential benefits.

**Strategic Objective 7: Strengthen the relationship between NPHIL as well as national and international public health partners**

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<tr>
<th>No</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</table>
| 7.1| Strengthen and establish collaborative partnerships with major stakeholders nationally and internationally | • Develop guidelines for NPHIL partnerships  
• Develop and maintain a database of potential partners and public health institutes worldwide  
• Create and regularly update map of areas of potential collaboration and support  
• Organize tours out of Liberia and visits to Liberia with key partners and public health institutes  
• Establish a structure and process to coordinate existing public health-related partners |
7.2 Strengthen One Health / GHSA coordination mechanism at national, county, and district levels

- Implement processes for coordination of NPHIL One Health activities
- Collaborate with the GOL One Health Coordinator on implementation of One Health activities
- Support NPHIL implementation of Global Health Security Agenda programs
- Establish functional One Health coordination structures at county and district levels
- Support development of policies, standards, and / or guidelines for One Health Implementation

7.3 Establish processes for the mobilization of grant and other resources and development and management of grant projects

- Develop a strategy to mobilize grants and other resources
- Create and implement a grant proposal development process
- Organize regular training and support for NPHIL staff in grant proposal development, writing, and management

4.8 Public Health Financing and Operations

Financial sustainability of the NPHIL is unlikely to be achieved through incremental changes. Instead, transformative solutions will be needed – solutions that will require cooperation across sectors. Creating and building momentum to develop and maintain public health capacity that maximizes assets and resources is critical. It means creating institutional policies and practices from national to subnational levels that include non-governmental organizations (NGOs). Sustainability is not just about achieving public health goals, it also relates to social justice and socio-economics. To ensure sustainability, public health tasks must be clear, reasonable, endorsed by government leaders, and supported by partners. A sustainable public health system requires the existence of structures and processes that allow a program to leverage resources to most effectively implement evidence-based policies and activities over time.
The establishment of the operational structure of the NPHIL will need to be a major focus for the first two years. The formation of the NPHIL will involve the transfer of staff and property from several existing components of the MOH, assessing that existing staff and property, reallocation them to the appropriate departments of the Institute, and filling gaps. Systems and processes for all aspects of operations will need to be developed and implemented. Both temporary and permanent physical infrastructure will have to be identified, reorganized and constructed, equipped, and managed.

**Strategic Objective 8:** Ensure sustainable financing and operations of the NPHIL

<table>
<thead>
<tr>
<th>No</th>
<th>Strategic Interventions</th>
<th>Key Activities</th>
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</table>
| 8.1 | Establish and expand diverse funding portfolio for the Institute | • Establish and maintain a Financial Resource Map  
• Develop and enhance diverse funding portfolio with buy-in from government decision makers and other stakeholders  
• Develop and implement resource mobilization strategy |
| 8.2 | Establish and update administrative mechanisms for financial and non-financial operations of the NPHIL | • Implement fully transparent and accountable financial management system  
• Develop and update comprehensive budget |
| 8.3 | Improve human resource management | □ Institute and maintain internal audit system  
□ Initiate and maintain external audit  
□ Develop and update financial management policy  
□ Develop and update policy on indirect costs for research conducted in NPHIL facilities  
□ Develop and update procurement policy  
□ Develop and update asset management policy  
□ Implement NPHIL HR Reform Process  
□ Manage and update organogram  
□ Develop and update Human Resources Policy and Plan  
□ Establish and maintain staff database |
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<tr>
<td></td>
<td>Develop incentive programs to encourage diaspora Liberians with public health and biomedical skills to return to Liberia</td>
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<td>8.4</td>
<td>Improve physical and technical infrastructure</td>
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<tr>
<td></td>
<td>Create and manage NPHIL infrastructure development plan</td>
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<td></td>
<td>Design and construct headquarters</td>
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<td>Implement Resettlement Action Plan (RAP)</td>
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<td>Construct water quality lab</td>
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<td>Renovate facilities at the former LIBR</td>
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<td>Acquire additional land at LIBR and Disco Hill</td>
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<td>Design and construct regional labs</td>
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<td>8.5</td>
<td>Establish and maintain an efficient and effective procurement system</td>
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<td></td>
<td>Develop Annual Procurement Plan</td>
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<td>Develop, track, and maintain database on suppliers and contractors</td>
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<td>Develop and update procurement SOP and tools</td>
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<td>Implement process of regular working sessions with divisions on procurement roles and SOP</td>
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<td>Conduct regular market survey of goods, services, and suppliers</td>
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<td>8.6</td>
<td>Implement sustainable supply chain management system coordinated with the MOH and relevant partners</td>
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<td>Design and maintain internal supply chain management system for NPHIL</td>
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<td>Implement supply chain management system for outbreak and response</td>
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<td></td>
<td>Establish and implement Asset Management System</td>
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<td>8.7</td>
<td>Expand public education and dissemination of NPHIL news and activities</td>
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<tr>
<td></td>
<td>Produce regular newsletter</td>
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<td>Expand dissemination of public health information in collaboration with MOH and other health-related institutions</td>
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<td>Expand engagement and awareness of NPHIL and its activities with the counties</td>
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<td>Produce documentary on the NPHIL formation process</td>
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<td>8.8</td>
<td>Establish and enhance Information Communication Technology systems and data management</td>
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<td></td>
<td>□ Implement process for scheduling and conducting PR activities for all divisions</td>
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<td>□ Develop, update, and distribute brochures, fact sheets, publications, press reviews, audio-visual materials, and electronic documents</td>
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<td></td>
<td>□ Expand and enhance content on NPHIL website, Twitter, and Facebook page</td>
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<td></td>
<td>□ Strengthen network infrastructure</td>
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<td>□ Develop and maintain effective data storage</td>
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<td>□ Develop and maintain an effective ICT system linking the national and county levels</td>
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<td>□ Establish and facilitate ICT leadership and governance</td>
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<td>□ Enhance communication and information sharing (e.g., corporate email, web presence site, social media, Resource Center)</td>
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<td>□ Implement regular staff training on ICT skills and database use</td>
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<tr>
<th>8.9</th>
<th>Expand and enhance planning, monitoring, and evaluation of program outcomes and impact</th>
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<tr>
<td></td>
<td>□ Develop and implement M&amp;E Plan</td>
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<td></td>
<td>□ Finalize, review, and update five-year Strategic Plan (mid-term and final)</td>
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<td>□ Develop and update the two-year Operational Plan and related Annual Plans</td>
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<td>□ Implement process for quarterly and annual monitoring of divisions and programs</td>
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<td>□ Develop, manage, and maintain NPHIL M&amp;E database</td>
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<th>8.10</th>
<th>Establish and strengthen the framework for NPHIL legal guidance</th>
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<tr>
<td></td>
<td>□ Support the acquisition of external and internal assets and obligations by NPHIL</td>
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<td></td>
<td>□ Support the development and updating of internal and external policies</td>
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<td>□ Support documentation and provide advice on personnel actions</td>
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<td></td>
<td>□ Conduct research and documentation on issues related to legal epidemiology, public health law, and other activities of NPHIL</td>
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Section Five: Strategic Plan Cost Estimate

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<tr>
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<th>Components</th>
<th>Timeline</th>
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<tr>
<td></td>
<td></td>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
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<tr>
<td>1</td>
<td>Public Health Workforce</td>
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<td>2</td>
<td>Real-Time Surveillance</td>
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<td>3</td>
<td>Public Health Bio-surveillance and Laboratory diagnostic System</td>
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<td>4</td>
<td>Public Health and Medical Research</td>
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<tr>
<td>5</td>
<td>Environmental and Occupational Health</td>
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<td>6</td>
<td>Global Health and Partnerships</td>
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<tr>
<td>7</td>
<td>Public Health Financing</td>
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<td>8</td>
<td>Partnership and Coordination</td>
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Section Six: Implementation Arrangements and M&E

6.1 Assumptions

This Strategic Plan is based on the assumption that:

1. National stability will prevail and resources will be made available through national budget and development partners for the implementation of this strategy.
2. Leadership and political will be sustained.
3. The strategy will serve as the national agenda for surveillance and preparedness improvement in Liberia.

4. The health infrastructure, particularly in rural areas, will be improved to diagnose, manage, and respond to health emergencies, including disease outbreaks.

5. The support of donors and other partners will align to the priorities in this strategy.

6. A robust information system will be established to understand the changing environment and introduce appropriate adjustments to the strategy and various guidelines and standards operating procedures (SOPs).

6.2 Risks

There are associated risks that are considered in the implementation of this strategy:

1. Fragmentation and non-alignment of thematic pillar activities in the strategic priorities will increase public health spending with no or little improvement;

2. Inadequate resources for monitoring and implementation of the strategy will result in the document becoming irrelevant.

3. Poor coordination and collaboration with other sectors will threaten the realization of the strategic goals and objectives of the plan.

6.3 Risk Mitigation

These risks will be mitigated by:

1. Integration and alignment of the strategic plan and thematic pillar activities.

2. Allocation of adequate resources for monitoring and implementation of strategy.

3. Strong multi-sectoral coordination and collaboration to ensure strategic goals and objectives are met.

6.4 Implementation Arrangements

The Strategic Plan will be implemented in phases and through enhanced partnership with donors and development partners. Coordination with relevant government agencies and key stakeholders shall be strengthened to achieve the strategic objectives in the short, medium, and long term. This is also in line with the One Health Coordination Approach and the SDGs to achieve public health security.

There are many interventions embedded in the strategic plan that should be sequenced according to their priority and timelines. The Strategic Plan will be implemented through Annual Operational Plans; the operational plan consists of detailed/specific activities and funding sources. The operational plans will establish a clear relation with the strategic objectives and priority interventions.
The 5-year Strategic Plan will be implemented in two phases; the first phase will concentrate on ensuring that the institutional structures are in place and functional. This phase will focus on building the right capacities, formulating policies and operational framework that will facilitate the smooth operations of the institution to provide the right leadership and governance. This phase will run for two years beginning fiscal year 2017/18 and end in 2018/19. The institution will conduct a comprehensive evaluation of its activities at the close of phase one in 2019.

The second phase, which will start in fiscal year 2019/20, will comprise of an improved surveillance and response system with the right technology and capacities to detect and tackle disease outbreak vigorously. It will consolidate gains made and strengthen the health system to prevent, detect, confirm and respond to public health threats with ultimate purpose of attaining sustainability and resilience.

6.5 Monitoring and Evaluation

Successful implementation of this 5-year Strategic plan depends on close monitoring and evaluation through annual progress reviews and mid and end of term evaluations. NPHIL will develop a comprehensive monitoring and evaluation plan that accompanies the Strategic Plan. In the meantime, NPHIL has produced a temporary monitoring framework with core performance indicators. Most indicators can be estimated with information already collected through the health sector information system (e.g., DHIS, LMIS, HRIS, eDRIS, and LIS). This framework will serve as the monitoring tool for the institution. Some initial effort will be essential to calculate a reliable baseline for most of the selected indicators and targets where necessary.