



## Ministry of Health

# **Information and Communication Technology (ICT) Policy and Strategy 2018-2023**

# Foreword

In fulfillment of the mandate and functions of the Ministry of Health, Information Communication Technology (ICT) presents the Ministry innovative opportunities to improve access to health services and ensure an efficient management of health resources in its drive to build a resilient health system. The effective use of ICT systems contribute towards providing health security for the people of Liberia by reducing risks associated with epidemics and other health threats. It also accelerates Liberia's progress towards universal health coverage by improving access to safe and quality health services. With the growing need of quality health data to track the health status of the Liberian population, ICT has become integral to the health sector.

The Ministry of Health (MoH) has a growing number of data systems but the burden of collecting and managing these data has created lags in timeliness and data quality issues. However, the MoH has committed itself to instituting reforms in the health sector that will improve effectiveness, efficiency and responsiveness in the delivery of its core operational activities.

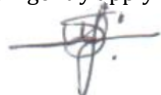
In line with this commitment, the Ministry is coordinating the development of this Information Communication Technology Policy and Strategy and Two-Year Operational Plan.

This policy incorporates the MoH's goal of integrating and harnessing the various components of its Information Communication Technology System to improve health planning. This premeditated phase is timely and a stage to raise the level of healthcare delivery in Liberia.

The Ministry has recognized that its Information Communication Unit has been struggling to perform efficiently due to the many inadequacies existing in the ICT system. To address these deficiencies, it has put some measures in place, the first of which is the Information Communication Technology Policy.

This document provides the necessary framework for the relevant components of the Information Communication Technology System to provide timely and quality information to improve health planning and fostering better decision making at senior management level.

The development of this Information Communication Technology Policy has been long overdue, and I am pleased that the Ministry has been able to achieve this milestone. It is my wish that all employees, stakeholders and health sector NGOs take note of this policy and diligently apply it as we continue to shape Liberia's health system.



Hon. Wilhemina S. Jallah, MD, MPH  
**MINISTER**

## Acknowledgements

This Information Communication Technology Policy and Strategy was developed under the guidance of the ICT Unit through a continual, consultative and participatory process involving contributions and support from the technical working group comprising individuals from various departments within the Ministry of Health. I therefore wish to extend my sincere thanks and appreciation to all those who contributed to the policy development process.

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Hon. Norwu G. Howard  
**Deputy Minister for Administration**

# Table of Contents

|                                                   |           |
|---------------------------------------------------|-----------|
| <b>Foreword</b>                                   | <b>1</b>  |
| <b>Acknowledgements</b>                           | <b>2</b>  |
| <b>Table of Contents</b>                          | <b>3</b>  |
| <b>Acronyms</b>                                   | <b>5</b>  |
| <b>1.0 Introduction</b>                           | <b>6</b>  |
| 1.1 Policy Context                                | 6         |
| 1.2 Policy Purpose and Scope                      | 6         |
| 1.2.1 Policy Purpose                              | 6         |
| 1.2.2 Policy Scope                                | 6         |
| 1.3 Policy Development Process                    | 6         |
| 1.4 Policy Priority Areas                         | 7         |
| <b>2.0 Situational Analysis</b>                   | <b>8</b>  |
| 2.1 Demography                                    | 8         |
| 2.2 ICT Penetration Rate in Liberia               | 8         |
| 2.3 Health Sector and ICT: Current Status         | 8         |
| 2.3.1 ICT Governance                              | 8         |
| 2.3.2 ICT Infrastructure and Services             | 8         |
| 2.3.2.1 Network Infrastructure                    | 8         |
| 2.3.2.2 Internet Connectivity                     | 8         |
| 2.3.2.3 Hardware and Software                     | 9         |
| 2.3.2.4 Security and Data Protection              | 9         |
| 2.3.2.5 Disaster Recovery                         | 9         |
| 2.3.4 Health Information System (HIS) Development | 9         |
| 2.3.5 Standards, Integration and Interoperability | 9         |
| 2.3.6 Maintenance and Sustainability              | 10        |
| 2.3.7 Human Resources for Health ICT Development  | 10        |
| 2.3.8 Financing ICT for Health                    | 10        |
| <b>3.0 Policy Foundations</b>                     | <b>11</b> |
| 3.1 Mission                                       | 11        |
| 3.2 Guiding Principles                            | 11        |
| <b>4.0 Policy Orientations</b>                    | <b>13</b> |

|                   |                                                                    |           |
|-------------------|--------------------------------------------------------------------|-----------|
| 4.1               | ICT Leadership, Management and Governance                          | 13        |
| 4.2               | ICT Infrastructural Development, Maintenance and Disposal          | 13        |
| 4.3               | ICT Standards, Integration and Interoperability                    | 14        |
| 4.4               | Human Recourses for Health ICT Capacity Development                | 15        |
| 4.5               | Information Systems, Services and Applications                     | 15        |
| 4.6               | Financing ICT for Health                                           | 16        |
| 4.7               | Ethical Standards and Security                                     | 16        |
| <b>5.0</b>        | <b>Roles and Responsibilities</b>                                  | <b>18</b> |
| 5.2               | Ministry of Post and Telecommunication (MoPT)                      | 18        |
| 5.3               | Ministry of Health Senior Management Team                          | 18        |
| 5.4               | MoH ICT Technical Working Group                                    | 18        |
| 5.5               | MoH ICT Unit                                                       | 18        |
| 5.6               | ICT Users                                                          | 19        |
| <b>6.0</b>        | <b>Implementation Arrangements and Monitoring &amp; Evaluation</b> | <b>20</b> |
| 6.1               | Implementation Arrangements                                        | 20        |
| 6.2               | Monitoring and Evaluation                                          | 20        |
| <b>7.0</b>        | <b>Policy Enabling Environment</b>                                 | <b>21</b> |
| 7.1               | Legal Framework                                                    | 21        |
| 7.2               | Regulation                                                         | 21        |
| 7.3               | Enforcement                                                        | 21        |
| 7.4               | Risks and Assumptions                                              | 21        |
| 7.4.1             | Risks                                                              | 21        |
| 7.4.2             | Assumptions                                                        | 21        |
| <b>Annex 1:</b>   | <b>Strategic Objectives and Proposed Interventions</b>             | <b>22</b> |
| <b>Annex 2:</b>   | <b>Proposed Monitoring and Evaluation Framework</b>                | <b>25</b> |
| <b>Annex 3:</b>   | <b>Operation Plan &amp; Costing</b>                                | <b>35</b> |
| <b>References</b> |                                                                    | <b>51</b> |

## Acronyms

|                 |                                                                     |
|-----------------|---------------------------------------------------------------------|
| <b>BCDRP</b>    | <b>Business Continuity and Disaster Recovery Plan</b>               |
| <b>CHT</b>      | <b>County Health Team</b>                                           |
| <b>EVD</b>      | <b>Ebola Virus Disease</b>                                          |
| <b>GDP</b>      | <b>Gross Domestic Product</b>                                       |
| <b>GoL</b>      | <b>Government of Liberia</b>                                        |
| <b>GovNet</b>   | <b>Government Wide Area Network</b>                                 |
| <b>HIS</b>      | <b>Health Information Systems</b>                                   |
| <b>HIV</b>      | <b>Human Immunodeficiency Virus</b>                                 |
| <b>HMIS</b>     | <b>Health Management Information System</b>                         |
| <b>ICT</b>      | <b>Information Communication and Technology</b>                     |
| <b>IDI</b>      | <b>ICT Development Index</b>                                        |
| <b>iHRIS</b>    | <b>Integrated Human Resources Information System</b>                |
| <b>ITSM</b>     | <b>IT Service Management</b>                                        |
| <b>ITU</b>      | <b>International Telecommunications Union</b>                       |
| <b>ISO</b>      | <b>International Organization for Standardization</b>               |
| <b>LDHS</b>     | <b>Liberia Demographic and Health Survey</b>                        |
| <b>LIBTELCO</b> | <b>Liberia Telecommunication Corporation</b>                        |
| <b>LISGIS</b>   | <b>Liberia Institute of Statistics and Geo-Information Services</b> |
| <b>LTA</b>      | <b>Liberia Telecommunication Authority</b>                          |
| <b>MACs</b>     | <b>Ministries, Agencies and Commissions</b>                         |
| <b>MoH</b>      | <b>Ministry of Health</b>                                           |
| <b>MoPT</b>     | <b>Ministry of Post and Telecommunications</b>                      |
| <b>M&amp;E</b>  | <b>Monitoring and Evaluation</b>                                    |
| <b>NACP</b>     | <b>National Aids Control Program</b>                                |
| <b>NDRC</b>     | <b>National Data Recovery Center</b>                                |
| <b>NDS</b>      | <b>National Drugs Services</b>                                      |
| <b>NMCP</b>     | <b>National Malaria Control Program</b>                             |
| <b>NPHIL</b>    | <b>National Public Health Institute of Liberia</b>                  |
| <b>NTLCP</b>    | <b>National Tuberculosis and Leprosy Control Program</b>            |
| <b>OGC</b>      | <b>Office of General Counsel</b>                                    |
| <b>SOPs</b>     | <b>Standard Operating Procedures</b>                                |
| <b>TB</b>       | <b>Tuberculosis</b>                                                 |
| <b>TWG</b>      | <b>Technical Working Group</b>                                      |

# 1.0 Introduction

## 1.1 Policy Context

Health sector, globally, is a priority area in which ICT policy and strategic plan greatly contribute towards the achievement of a resilient health system. In Liberia, the Ministry of Health ICT Policy and Strategy (2018-2022) is being developed to support the delivery of quality and equitable healthcare services as articulated in the National Health Policy and Plan (2011-2021) and the National Health Investment Plan (2015-2021). This ICT Policy and Strategy is informed by and aligned with varying existing policies, legal and regulatory instruments, including the National Telecommunications & ICT Policy (2010-2015), Liberia Health Information System & ICT Strategic Plan (2016-2021), Liberia eGovernment Strategy (2014-2018) and GoL ICT Handbook.

Currently, the National Health Investment Plan highlights information and communication systems as key challenges that limit the availability and use of information to guide evidence-based decision making within the health sector. As such, the development of this ICT policy and strategy to strengthen the Ministry's ICT system is not only pivotal but a key fundamental priority of the National Health Investment Plan that aims to improve the health status of the Liberian populace. The development of this policy and Strategy will ultimately fulfill the mandate of the overall national health plan and provide a medium for an improved health sector ICT system.

The ICT Policy and Strategy (2018-2022) will be updated periodically to conform to the changing realities and evolving ICT issues as required by the Ministry of Health.

## 1.2 Policy Purpose and Scope

### 1.2.1 Policy Purpose

The ICT Policy will direct the development, governance and management of ICT within the health sector. The focus of this document is to provide the legal and regulatory framework for ICT within the health sector, create an enabling environment for the rapid expansion of ICT infrastructure and services that will be accessible to all relevant stakeholders, and align with the overall National Health Policy and Plan (2011 – 2021).

### 1.2.2 Policy Scope

This policy shall apply to all Departments, Divisions, Units and Programs within the Ministry of Health. By extension, it also includes all County Health Teams (CHTs), development partners, relevant line Ministries, Agencies and Commissions (MACs) and other stakeholders within the health sector.

## 1.3 Policy Development Process

The ICT Policy development was informed by a desk review of related policies and other relevant literature both internally and externally. Primary data collection on key priority

areas was conducted through interviews to support the desk review. It considered the alignment with other sub-sector policies and GoL policies on ICT including other relevant line Ministries, Agencies and Commissions policies on ICT within Liberia. International information communication technology best practices were sought to also inform the policy during the development process.

As part of the process, the Ministry of Health set up a technical working group to guide the process to finality. The ICT Unit coordinated the policy development process with support from the Department of Policy, Planning and research. Upon completion and validation by all stakeholders, this policy, will be disseminated and subsequently implemented by the ICT Unit of the Ministry of Health under the direct supervision of the Department of Administration.

#### **1.4 Policy Priority Areas**

The ICT Policy encompasses seven (7) priority areas as below:

1. Leadership, Management and Governance
2. Infrastructural Development, Maintenance and Disposal
3. Standards, Integration and Interoperability
4. Human Resources for Health ICT Capacity Development
5. Information Systems, Services and Applications
6. Financing ICT for Health
7. Ethical Standards and Security



## 2.0 Situational Analysis

### 2.1 Demography

Liberia is a low-income country located in West Africa, with an estimated GDP per capita of USD 455.4 in 2016 (World Bank). Liberia has a population of approximately 4.1 million people and an annual growth rate of 2.1% (LISGIS 2008). It covers a land area of 111,369 square kilometers and is administratively subdivided into 15 counties and 91 health districts (LDHS, 2013). About 59% of the population lives in urban areas with more than 50% below age 35. Rain forest and swampy areas are common geographic features of Liberia (LDHS, 2013).

### 2.2 ICT Penetration Rate in Liberia

According to the ICT Development Index (IDI) 2015, Liberia is ranked 155th globally and 26th on the continent of Africa. The percentage of internet users in Liberia stands at 5.41%. Households with access to computers are 2.20% while those with internet access have increased from 8.0% in 2006 to 83% in 2016 (LTA 2016). While mobile telephone penetration in Liberia has increased from 06% in 2006 to 36.9% in 2016 (LTA 2016).

### 2.3 Health Sector and ICT: Current Status

#### 2.3.1 ICT Governance

Effective ICT leadership, management and governance are major challenges within the health sector as evidenced by the lack of policy, technical working group, and coordination mechanism. There are ICT facilities at the county level with insufficient staff with the required skills and competence to provide effective leadership and governance at that level. The lack of ICT coordination and governance reveals the current disconnect within the health sector. For instance, there is lack of SOPs and technical guidelines for ICT procurement, deployment, maintenance and disposal within the sector. Several periodic audits conducted have highlighted these issues that require urgent attention by the policy.

The lack of governance and leadership structure to inform and align decision making for ICT planning, policy, and operations within the MoH and the sector has resulted to limited investment in ICT.

#### 2.3.2 ICT Infrastructure and Services

##### 2.3.2.1 Network Infrastructure

The ICT network infrastructure is currently underdeveloped and inadequate nationally. Additionally, the absence of viable network Infrastructure for sharing resources (files, applications, printers, storage devices, etc.) is amongst several ICT infrastructural challenges within the health sector. The use of ICT devices (including portable technologies) within the sector are not harnessed to achieve its full potential due to limited capacities to sustain operational cost at all levels. This infrastructural gap has led to heterogeneous and fragmented systems that have resulted to poor integration and interoperability.

##### 2.3.2.2 Internet Connectivity

The absence of quality internet connectivity impedes reports sharing, effective communication, proper patient management and real time document

collaboration within the health sector. In spite of the current challenge, mobile broadband remains the primary source of internet connectivity that is used for communication and data exchange. Although, there exists fiber connectivity at the central MOH, the quality of connectivity is compromised by poor distribution and management by service provider. Also, there is insufficient institutional budgetary allocation for internet connectivity resulting to reliance on donors and partners support.

#### **2.3.2.3 Hardware and Software**

The lack of standards and policy are major factors contributing to incompatibility, integration, maintenance and sustainability of ICT infrastructure. ICT hardware and software applications are often acquired through direct procurement by the MOH and donations from partners with no reference to standards and policy.

#### **2.3.2.4 Security and Data Protection**

Standards on data and information security is currently lacking within the MoH. There are no clear policies and/or standard operating procedures (SOPs) on security and risk management. Therefore, issues such as physical security, cybersecurity, data and information systems security that require critical attention are often overlooked. However, the only security mechanisms that staff rely on to protect their information are access codes, username and password, computer and door locks. There are no security standards for the protection of server/switch rooms, computer and peripheral devices, data transmission (encryption and decryption) and data storage.

#### **2.3.2.5 Disaster Recovery**

Disasters are inevitable but their impact can be mitigated through an appropriate preventive measure such as having in place a disaster and risk management plan. Currently, there is no disaster and risk management plan in place at the Ministry of Health. Most of MoH information systems are at high risk due to lack of SOPs on backup and recovery. Although, there exists a National Data Recovery Center (NDRC) managed by the Liberia Telecommunication Corporation, the Ministry is not currently utilizing this facility.

### **2.3.4 Health Information System (HIS) Development**

The Ministry of Health has made significant stride in its HIS; with a number of sub-systems already developed, some in their developmental stages and others yet to be developed. While some of these sub-systems were developed using either open-sourced, proprietary or other third-party applications, integrating and interoperating these systems still remain a major challenge for the ministry. These challenges can be attributed to the lack of common standards, limited infrastructure and inadequate human resource and technical capacities.

### **2.3.5 Standards, Integration and Interoperability**

Standardization and specification for hardware and software applications have not been developed and implemented within the MoH. The lack of standards to support infrastructural compatibility (i.e. hardware, software, platforms, architecture, etc.) across

different systems continues to result in huge procurement and maintenance cost for the ministry. Additionally, differences in hardware, architecture and platform, impedes HIS integration and interoperability, thereby making data and information sharing difficult.

### 2.3.6 Maintenance and Sustainability

ICT maintenance is performed by the MOH central ICT Unit and often a times outsourced to local vendors and available only at the central ministry with limited or none at the county levels; this lack of support can be attributed to limited technical capacities at all levels. Currently there is no existing plan for preventive maintenance to safeguard infrastructural investment and prolong the lifespan of equipment. Corrective maintenance (usually done on an ad hoc or needs basis) is also a major challenge for the ICT Unit in the absence of spares to support repairs and replacement of equipment. Additionally the lack of skilled ICT staffs to carry out major repairs of equipment such as printer, copiers and servers have resulted in the MoH's reliance on third parties' support and maintenance that is sometimes very costly.

### 2.3.7 Human Resources for Health ICT Development

There are relatively limited human resource capacities to effectively manage ICT infrastructure investment and implementation within the health sector. The current skills mixed within the MOH ICT unit include network maintenance specialists (25%), computer maintenance specialists (50%), network security administrators (13%) and MS Windows system administrators (38%) (HIS/ICT Assessment Report 2015). There are technical skills and competencies gaps in computer programmers, database administrators and Linux system administrators. The MOH's ability to attract and retain qualified ICT professionals is limited due to lack of funding for ICT and comparatively low salaries and incentives packages for ICT staff. As a result, there are visible gaps in terms of ICT quality and competence to effectively and efficiently develop, manage and maintain health related ICT. Similarly, there is relatively no ICT capacity at the county and district levels to support the CHTs in their functions. Similarly, the lack of ICT capacity in the counties is due to budgetary constraints, inadequate ICT infrastructure and unskilled staff.

**Commented [1]:** Elaborate with stats

The current HIS Framework and Strategic Plan requires huge investment in ICT infrastructure and human resource for HIS to be fully functional and effective. At present, the MoH's ICT Unit lacks the technical capacity to support HIS strengthening. The core competencies needed to effectively implement the HIS Strategy such as Database development and management, software application development (programmer), Linux/Unix system Administration currently does not exist at the MOH.

### 2.3.8 Financing ICT for Health

Government of Liberia's investment in ICT is negligible if not non-existent. This low investment over the years has led to poor and inadequate health ICT infrastructure and staffing within the sector. Funding for ICT related activities are driven by partners within the sector through specific funding mechanisms, which are unpredictable and unsustainable. It is envisaged that this ICT Policy and Strategy (2017-2021) will serve as the instrument to enhance the mobilization of domestic and external resources to finance ICT for health activities.

## 3.0 Policy Foundations

### 3.1 Mission

The mission, vision and goal of the MOH Information Communication and Technology Policy are expressed as follows:

**Mission** To reform and manage the health sector to effectively and efficiently deliver comprehensive, quality health services that are equitable, accessible and sustainable for all people in Liberia through robust ICT interventions.

**Vision** Improved health information, research and communication systems for efficient communication, informed decision-making and quality service delivery.

**Goal** To improve access to health information and communication that will enhance evidence based policies, planning and the quality of healthcare in Liberia.

#### Objectives

- (a) Develop and strengthen ICT leadership, governance and management structures at all levels;
- (b) Establish a reliable, secured and interoperable ICT infrastructure that ensures confidentiality, integrity and availability of health information systems;
- (c) Establish quality control mechanisms and standardization of Ministry's ICT;
- (d) Ensure adherence to ICT best practices for acquisition, utilization and development of ICT within the Ministry;
- (e) Strengthen stakeholders' cooperation and collaboration for ensuring consistency in ICT intervention and investment; and
- (f) Maintain a skilled and effective health ICT workforce

### 3.2 Guiding Principles

This information communication Technology Policy shall be guided by the following:

- **Fit for purpose** -the ICT infrastructure used in the health system shall be set up in a manner to perform the intended purpose for which it was set up.
- **Cost Effectiveness**- the Information Communication Technology infrastructure and systems used in the health system must be affordable by the MoH in order to perform the intended functions for which they are procured.
- **Scalability** - the Information Communication Technology infrastructure and systems of the MoH shall have the capability or potential for enlargement to accommodate growth or scale back.
- **Integration**- ICT infrastructure and systems shall be integrated with government systems to ensure interoperability for effective and efficient delivery of comprehensive quality healthcare services that is equitable, accessible and sustainable.

- **Privacy and Security-** the deployment of information and communications technologies within the health system shall ensure privacy, security and confidentiality of the individuals, the systems and the information.
- **Decentralization-** the MOH shall ensure a systematic decentralization of ICT infrastructure and systems in line with the National Decentralization and Local Governance Policy to the lower levels of the health system in Liberia.
- **Sustainability-** the MoH must be able to sustain the use of its ICT infrastructure to perform its duties as the key driver of the health sector.
- **Standardization-** ICT products and services shall be standardized for quality assurance and adherence to national and international standards and best practices.

## 4.0 Policy Orientations

### 4.1 ICT Leadership, Management and Governance

Creating an enabling environment for ICT investment, development and utilization can only be achieved through the establishment of strategic ICT leadership at all levels of the health systems that will champion the case for health sector ICT political will and buy-in from existing or new administration

**Policy Statement 1:** The Ministry of Health shall set the health ICT agenda, coordinate and create the enabling and enhancing environment for ICT development and functionality within the health sector.

**Strategic Objective:** To establish a functional health sector ICT governance and leadership within the health sector and ensure its participation in National ICT governance.

**Strategy 1.1:** Establish an ICT Technical Working Group (TWG) and subgroups and ensure participation of all sub-systems, cross-cutting stakeholders in coordinating sub-systems' development, piloting, implementation, interoperability and evaluation.

**Strategy 1.2:** Establish strong collaboration between MOH, line Ministries, private sector and other government agencies to improve coordination of ICT functions.

**Strategy 1.3:** Establish ICT structure and staffing mechanisms within the MOH and health sector as a whole

### 4.2 ICT Infrastructural Development, Maintenance and Disposal

This policy emphasizes the establishment of a nationally integrated health sector ICT network infrastructure, information dissemination systems and communications platforms that will support the ministry and development partners in attaining health sector mandate and goals.

**Policy Statement 2:** The Ministry of Health shall partner with development partners, private sector and relevant stakeholders to invest and develop a robust ICT infrastructure for the health sector.

**Strategic Objective:** To improve and increase the use of Information Communications Technology (ICT) within the Health Sector

**Strategy 1.1:** Deploy a nationwide reliable efficient and effective health ICT infrastructure with sufficient capacity including high-speed network, improved connectivity, cost-effective and adaptive to the needs of the health sector.

|                      |                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategy 1.2:</b> | Explore and invest in appropriate ICT based health care systems (e-Health and m-Health) to ensure access to adequate and timely health services.                  |
| <b>Strategy 1.3:</b> | Advocate for the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange. |
| <b>Strategy 1.4:</b> | Develop mechanisms for the effective utilization of all ICT infrastructure and harmonize it for flexibility and redundancy.                                       |
| <b>Strategy 1.5:</b> | Establish a robust ICT Asset management, IT Service Management (ITSM) platform and responsive Helpdesk systems at all levels.                                     |
| <b>Strategy 1.6:</b> | Invest in continued ICT infrastructure upgrades and newer technologies in order to maintain and improve the health sector ICT deployment and usage.               |

#### **4.3 ICT Standards, Integration and Interoperability**

Standardization and specification of ICT hardware and software are prerequisites for the effective implementation of health sector ICTs. Designing and implementing effective ICT projects (and pilots) will require compatibility of operating systems, the use of common protocols for network and systems communication and platforms for integration.

|                             |                                                                                                                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Policy Statement 3:</b>  | The Ministry of Health shall set ICT standards and establish the platform for ICT integration and interoperability within the health system.                                                                            |
| <b>Strategic Objective:</b> | To promote a globally comparative health sector ICT that is compliant and consistent with ISO Standards and internationally accepted ICT Best Practices.                                                                |
| <b>Strategy 1.1:</b>        | Develop and enforce the standardization and specification for hardware equipment and software applications within the health sector.                                                                                    |
| <b>Strategy 1.2:</b>        | Establish procedures and criteria for selecting systems' hardware, architecture/platform and software applications for data collection, manipulation (storage, visualization, backup, etc.), analysis and presentation. |

#### 4.4 Human Recourses for Health ICT Capacity Development

The development of a pool of highly skilled ICT health workforce is a key success factor for achieving specific priority interventions stipulated in the Investment Plan for Building a Resilient Health System in Liberia (2015-2021). Investment in ICT capacity development, research and innovations to enhance productivity and to improve access and quality of healthcare services cannot be overemphasized. Hence, the identification of ICT skills and competencies gaps within the health system should be considered first steps toward ensuring an ICT-enabled and productive health workforce.

**Policy Statement 4:** The Ministry of Health shall make tangible investment towards the developing and retention of ICT capacities at all levels within the health system.

**Strategic Objective:** To establish a productive and viable ICT health workforce.

**Strategy 1.1:** Diversify and develop ICT capacities by recruiting and building core competencies for various aspect of ICT specialty within the health System.

**Strategy 1.2:** Sustain ICT workforce capacity through the establishment of programs with key ICT training institutions and universities.

#### 4.5 Information Systems, Services and Applications

The utilization of reliable information dissemination systems are critical to improving both management and technical capacities within the health system and should not be overlooked. Tangible investment in this area is paramount to realizing of the MOH plan for building a resilient health system through improvement in information, research and communication systems.

**Policy Statement 5:** The Ministry of Health shall engage development partners, private sector and other government agencies in supporting the development of a fully functional health information systems, services and applications within the health sector.

**Strategic Objective:** To ensure the availability of adequate and reliable data and information to support decision making and the provision of uninterrupted services to the public through the utilization of reliable systems and applications.

**Strategy 1.1:** Develop HIS sub-systems and build technical capacities to manage them.

**Strategy 1.2:** Standardize software applications to facilitate acquisition and development, promote the use of genuine application software



and prioritize the use of open-source software where applicable.

**Strategy 1.3:** Establish mechanisms to minimize services disruptions, improve users' access and respond to users' needs and queries.

#### 4.6 Financing ICT for Health

Until investment in ICT can be seen as a critical tool to enhance productivity and improve healthcare delivery in the country, financing health ICT will remain an even greater challenge in the health sector. Ensuring adequate financial resources for health ICT implementation should be one of the primary focus of government and development partners working within the health sector. The security and sustainability of the bulk of health interventions and initiatives relies on different information and communication systems for their successful implementation. Therefore the planning, mobilization and allocation of national investment in health systems programs and projects should be inclusive of ICT.

**Policy Statement 6:** The Ministry of Health shall prioritize the planning and budgeting for ICTs to ensure adequate allocation of resources to further the ICT agenda within the health sector.

**Strategic Objective:** Ensure the sustainability of ICT investments and development.

**Strategy 1.1:** Establish financial envelop to finance ICT for health

**Strategy 1.2:** Develop resource mobilization plan to finance ICT in the health sector

**Strategy 1.3:** Explore domestic and international support to finance ICT for health

#### 4.7 Ethical Standards and Security

The increase exposure to and use of the internet has numerous security implications for the health sector that must be adequately addressed. Cybercrimes including hacking, financial theft, copyright infringement, unwarranted mass-surveillance, child and human rights abuse and espionage have become prevalent in our society and the world at large. Stringent measures such as the development of robust health ICT security framework that is internally accepted and comparable, investment, development and upgrade of requisite technologies and technical capacities must be established to ensure the safety of all health sector information assets.

|                                   |                                                                                                                                                                                              |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Policy Statement 7:</i></b> | The Ministry of Health shall create an enabling environment to promote ethical standards in the use of ICT and secure the transmission of sensitive health information.                      |
| <b>Strategic Objective:</b>       | To ensure the security of all health ICT assets including hardware, software, data and information sources, communication platforms and print and electronic media.                          |
| <b>Strategy 1.1:</b>              | Establish mechanisms to ensure information security, privacy confidentiality, integrity and availability                                                                                     |
| <b>Strategy 1.2:</b>              | Establish a legal framework for ICT coordination and oversight, including issues such as ethical use, intellectual property right, service agreement, standards, and information protection. |
| <b>Strategy 1.3:</b>              | Establish security mechanisms to protect health sector cyberspace in line with national cybersecurity framework.                                                                             |
| <b>Strategy 1.4:</b>              | Develop a security policy for health ICT.                                                                                                                                                    |

## 5.0 Roles and Responsibilities

The presence of an organized, coordinated and functioning institutional framework is critical to attain all the objectives of this ICT policy. The aim of delineating roles is to ensure that the various institutions and partners within the health sector effectively play their respective interdependent roles with a view of promoting the effective development and use of the ICT infrastructure.

### 5.2 Ministry of Post and Telecommunication (MoPT)

The Ministry of Post & Telecommunication has the statutory mandate for ICT governance, within the country and at such responsible for the following:

1. Develop and implement the National ICT Policy for Liberia
2. Lead ICT development and innovation including the development of the e-Government Portal, Government Wide Area Network (GovNet), Centralized Email System, etc.
3. Facilitate ICT sustainable development and utilization across all sectors (i.e. rural community access, e-government, business communities and private sector.
4. Develop and enforce ICT Standard in Liberia.
5. Coordinate human and institutional development for the promotion of ICT development and utilization.
6. Lead advocacy for national investment in ICT infrastructure and technical capacity development and sustainability.

### 5.3 Ministry of Health Senior Management Team

1. Review and approve MoH ICT Policy.
2. Review and endorse MoH ICT technical working group
3. Ensure compliance with MoH's ICT Policy.
4. Mobilize and allocate adequate resources for ICT for health

### 5.4 MoH ICT Technical Working Group

1. Coordinate the revision of MoH ICT policy and strategy
2. Monitor the implementation of the MoH's ICT strategy
3. Review and update existing policies and strategies periodically
4. Oversee the development of MoH's ICT Enterprise Architecture and ensure alignment with the National Enterprise Architecture
5. Advise the Senior Management Team in making informed decisions for ICT
6. Advise ICT Unit on technical issues where necessary.
7. Meet on a quarterly basis but frequency should increase when need arises.
8. Ensure compliance and alignment with the National ICT Policy

### 5.5 MoH ICT Unit

1. Lead the implementation of the ICT Strategy of the MoH..
2. Monitor and enforce adherence to the ICT Policy and Strategy.
3. Build capacity for ICT across all levels of the MOH
4. Serve as custodian of all ICT resources and asset of the MoH including the vertical programs and County Health Teams (CHT).

5. Develop guidelines and procedures for the effective implementation of this policy in conformity with the National e-Government Standards and Guidelines.
6. Ensure compliance to the ICT policy and SOPs. Ensure that all MoH partners adhere to the MoH ICT standards.

#### **5.6 ICT Users**

1. Shall be responsible to safeguard ICT assets of the MoH in their custody.
2. Shall comply with this policy and all guidelines and procedures.

## 6.0 Implementation Arrangements and Monitoring & Evaluation

### 6.1 Implementation Arrangements

The Information Communication and Technology (ICT) Unit shall implement the Ministry of Health ICT Policy and Strategy with direct supervision from the Assistant Minister for Administration. On the overall, The Deputy Minister for Administration shall have oversight responsibility.

### 6.2 Monitoring and Evaluation

The Ministry of Health shall develop a monitoring framework with sets of key performance indicators to facilitate effective monitoring progress on policy implementation, assess policy impact/effect and document lessons learned to assure compatibility and compliance with best practices and standards. The ICT Policy shall be reviewed on demand to ensure alignment with emerging policy documents or decisions and to assure compatibility and compliance with best ICT practices and standards.

The ICT Steering Committee shall be established with clearly defined terms of reference, for effective ICT governance, collaboration and coordination of activities among various MOH ICT stakeholders. Member shall comprise of health sector ICT stakeholders as well as their respective counterparts in National ICT governance bodies.

## 7.0 Policy Enabling Environment

The Ministry of Health will strengthen the enabling environment for ICT by investing in its legal framework, regulation and enforcement.

### 7.1 Legal Framework

This policy shall be guided by the Liberia Telecommunication Act of 2007, National Telecommunication Policy and Strategy 2010-2015, Liberia eGovernment Strategy 2014 – 2018, the GOL ICT Handbook (2015) and other relevant regulations that may be established nationally. The Liberian Health Information System & ICT Strategic Plan (2018-2022) also forms the legal basis for the formulation and implementation of this policy. Therefore, this Policy is intended to be implemented in line with the aforementioned instruments. In the event any of the provisions of this ICT Policy comes in conflict with any provision/s of any of the said national instruments, the provisions of the subject parent instrument will prevail.

### 7.2 Regulation

The Ministry of Health, the National Public Health Institute of Liberia (NPHIL) and other relevant agencies that are either existing now or that may be created hereafter, may, pursuant to their respective acts creating them, promulgate regulations for the effective implementation of this Policy. Provided that such regulations shall not impair the spirit and intent of this policy.

### 7.3 Enforcement

The ICT Unit, through the ICT Technical Working Group, and in conjunction with the Office of General Counsel (OGC), shall monitor and enforce the provisions of this policy. The MOH will promote the monitoring and enforcement of this policy in line with existing national laws, regulations and other policies. Modalities shall be established to ensure compliance with existing ICT legislations, regulations, policies, standard operating procedures, protocols and guidelines.

### 7.4 Risks and Assumptions

#### 7.4.1 Risks

There are associated risks that are envisaged to hinder the full implementation of the MoH ICT policy that needs attention and consideration:

1. Non adherence to the ICT policy will decrease the health sector investment, ICT procurement and operational cost;
2. Insufficient resources for the monitoring and implementation of the policy will result in the policy being placed on the shelf; and
3. Weak leadership and governance will minimize the full realization of the policy objectives and goal.

#### 7.4.2 Assumptions

This policy is cognizant of the following assumptions:

1. That national stability and peace will prevail and investment in ICT shall increase to implement this policy;
2. That the policy shall serve as the agenda for the enhancement of ICT in the health sector;

# Annex 1: Strategic Objectives and Proposed Interventions

| ICT Components                                                 | Strategic Objectives                                                                                                                            | Proposed Strategic Interventions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Leadership, Management &amp; Governance</b>                 | <b>SO1:</b> To establish a functional health sector ICT coordinating mechanism and continued participation in National ICT governing mechanism. | <p><b>1.1.</b> Establish ICT Technical Working Group (TWG) and subgroups and ensure participation of all sub-systems, cross-cutting stakeholders in coordinating sub-systems' development, piloting, implementation, interoperability and evaluation.</p> <p><b>1.2.</b> Establish strong collaboration between MOH, line Ministries, private sector and other government agencies to improve coordination of ICT functions.</p> <p><b>1.3.</b> Advocate for the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange.</p> |
| <b>Infrastructural Development, Maintenance &amp; Disposal</b> | <b>SO2:</b> To improve and increase the use Information Communications Technology within the Health Sector                                      | <p><b>1.1.</b> Deploy a nationwide reliable and efficient health ICT infrastructure with sufficient capacity including high-speed network, improved connectivity, cost-effective and adaptive to the needs of the health sector.</p> <p><b>1.2.</b> Explore and invest in appropriate ICT based health care systems (e-Health and m-Health) to ensure access to adequate and timely health services.</p> <p><b>1.3.</b> Develop mechanisms for the effective utilization of all ICT infrastructure and harmonize it for flexibility and redundancy.</p>                                                               |

|                                                       |                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       |                                                                                                                                                                                          | <p><b>1.4.</b> Establish a robust ICT Asset management, IT Service Management (ITSM) platform and responsive Helpdesk systems at all levels.</p> <p><b>1.5.</b> Invest in continued ICT infrastructure upgrades and newer technologies in order to maintain and improve the health sector ICT deployment and usage.</p>                                                                            |
| <b>Standards, Integration &amp; Interoperability</b>  | <p><b>SO3:</b> To promote a globally comparative health sector ICT that is compliant and consistent with ISO Standards and internationally accepted ICT Best Practices.</p>              | <p><b>1.1.</b> Develop and enforce the standardization and specification for hardware equipment and software applications within the health sector.</p> <p><b>1.2.</b> Establish procedures and criteria for selecting systems' hardware, architecture/platform and software applications for data collection, manipulation (storage, visualization, backup, etc.), analysis and presentation.</p> |
| <b>HR for Health ICT Capacity Development</b>         | <p><b>SO4:</b> To establish a productive and viable ICT health workforce.</p>                                                                                                            | <p><b>1.1.</b> Diversify and develop ICT capacities by recruiting and building core competencies for various aspect of ICT specialty within the health System.</p> <p><b>1.2.</b> Sustain ICT workforce capacity through the establishment of programs with key ICT training institutions and universities.</p>                                                                                    |
| <b>Information Systems, Services and Applications</b> | <p><b>SO5:</b> To ensure the availability of adequate and reliable data and information to support decision making and the provision of uninterrupted services to the public through</p> | <p><b>1.1.</b> Develop HIS sub-systems and build technical capacities to manage them.</p> <p><b>1.2.</b> Standardize software applications to facilitate acquisition and development, promote the use of genuine application software and prioritize the use of open-source software where applicable.</p>                                                                                         |



|                                         |                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | the utilization of reliable systems and applications.                                                                                                                           | <b>1.3.</b> Establish mechanisms to minimize services disruptions, improve users' access and respond to users' needs and queries.                                                                                                                                                                                                                                                                                                                                                |
| <b>Financing ICT for Health</b>         | <b>SO6:</b> Ensure the sustainability of ICT investments and development.                                                                                                       | <b>1.1.</b> Establish financial envelop to finance ICT for health<br><b>1.2.</b> Develop resources mobilization plan to finance ICT in the health sector<br><b>1.3.</b> Explore domestic and international support to finance ICT for health                                                                                                                                                                                                                                     |
| <b>Ethical Standards &amp; Security</b> | <b>SO7:</b> To ensure the security of all health ICT assets including hardware, software, data and information sources, communication platforms and print and electronic media. | <b>1.1.</b> Establish mechanisms to ensure information security, privacy and confidentiality<br><b>1.2.</b> Establish a legal framework for ICT coordination and oversight, including issues such as ethical use, intellectual property right, service agreement, standards, and information protection.<br><b>1.3.</b> Implement cybersecurity framework and establish mechanisms to protect health sector cyberspace.<br><b>1.4.</b> Develop a security policy for health ICT. |

## Annex 2: Proposed Monitoring and Evaluation Framework

| # | ICT Strategic Objectives                                                                                                            | Strategic Intervention ordered by ICT Strategic Objectives                                                                                                                                                                             |                                      | Baseline | target | Data Source         | Frequency of Data collection | Responsible |
|---|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|--------|---------------------|------------------------------|-------------|
| 1 | To establish a functional health sector ICT coordinating mechanism and continued participation in National ICT governing mechanism. | Establish ICT Technical Working Group (TWG) and subgroups and ensure participation of all sub-systems, cross-cutting stakeholders in coordinating sub-systems' development, piloting, implementation, interoperability and evaluation. | Number of ICT TWG meetings conducted | 0        | 4      | TWG meeting minutes | Monthly                      | ICT Unit    |

|  |                                                                                                                                                                   |                                             |   |    |                                  |           |          |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---|----|----------------------------------|-----------|----------|
|  | Establish strong collaboration between MOH, line Ministries, private sector and other government agencies to improve coordination of ICT functions.               | Number of ICT coordination meeting attended | 0 | 12 | ICT Coordination meeting minutes | Quarterly | ICT Unit |
|  | Advocate for the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange. | TBD                                         |   |    |                                  |           |          |

|   |                                                                                                   |                                                                                                                                                                                                                   |                                                                                                        |     |     |                                                |          |  |
|---|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----|-----|------------------------------------------------|----------|--|
| 2 | To improve and increase the use of Information Communications Technology within the Health Sector | Deploy a nationwide reliable and efficient health ICT infrastructure with sufficient capacity including high-speed network, improved connectivity, cost-effective and adaptive to the needs of the health sector. | [# and %] of ICT service delivery points (CHTs, MOH Office, etc) with access to institutional internet | TBD | TBD | Quarterly ICT survey report/ ICT Help desk log | Annually |  |
|   |                                                                                                   | Explore and invest in appropriate ICT based health care systems (e-Health and m-Health) to ensure access to adequate and timely health services.                                                                  | Expenditure on ICT as percentage of total health expenditure                                           |     |     | Financial report                               | annually |  |

|  |                                                                                                                                                                  |                                                                                                          |  |                        |  |                           |  |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--|------------------------|--|---------------------------|--|
|  | Advocate for the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange | [# and %] of targeted national ICT infrastructure s deployed as planned                                  |  |                        |  | Annually                  |  |
|  |                                                                                                                                                                  |                                                                                                          |  | goods<br>Delivery note |  |                           |  |
|  | Develop mechanisms for the effective utilization of all ICT infrastructure and harmonize it for flexibility and redundancy.                                      | TBD                                                                                                      |  |                        |  |                           |  |
|  | Establish a robust ICT Asset management, IT Service Management (ITSM) platform and responsive Helpdesk systems at all levels.                                    | 1. [# and %] targeted ICT helpdesk system established<br>2. percentage of issues registered at help desk |  |                        |  | 1. Annually<br>2. monthly |  |

|  |                                                                                                                                                     |                                                                                                                    |  |  |  |  |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|  |                                                                                                                                                     | resolved within 24 hours                                                                                           |  |  |  |  |  |
|  | Invest in continued ICT Infrastructure upgrades and newer technologies in order to maintain and improve the health sector ICT deployment and usage. | [# and %] of targeted ICT infrastructure decommissioned<br>[# and %] of planned infrastructure upgrade implemented |  |  |  |  |  |

|   |                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                           |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 3 | To promote a globally comparative health sector ICT that is compliant and consistent with ISO Standards and internationally accepted ICT Best Practices. | <p>1. Develop and enforce the standardization and specification for hardware equipment and software applications within the health sector.</p> <p>2. Establish procedures and criteria for selecting systems' hardware, architecture/platform and software applications for data collection, manipulation (storage, visualization, backup, etc.), analysis and presentation.</p> | [# and %] ICT infrastructure s (equipment/h ardwares or softwres) procured in keeping with ICT resource acquisition procedural guidelines |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|

|   |                                                            |                                                                                                                                                 |                                                                                                      |  |  |  |  |  |
|---|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 4 | To establish a productive and viable ICT health workforce. | Diversify and develop ICT capacities by recruiting and building core competencies for various aspect of ICT specialty within the health System. | 1. [# and %] of core ICT HR gap (position) filled<br>2. [# and %] of targeted ICT training needs met |  |  |  |  |  |
|   |                                                            | Sustain ICT workforce capacity through the establishment of programs with key ICT training institutions and universities.                       |                                                                                                      |  |  |  |  |  |



|   |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 5 | To ensure the availability of adequate and reliable data and information to support decision making | <p>1. Develop HIS sub-systems and build technical capacities to manage them.</p> <p>2. Standardize software applications to facilitate acquisition and development, promote the use of genuine application software and prioritize the use of open-source software where applicable.</p> <p><b>3. Implement cloud based architecture and platform to ensure the real time availability of critical information and facilitate ease of integration and interoperability</b></p> <p>4. Establish mechanisms to minimize services disruptions, improve users' access and respond to users' needs and queries.</p> | <p>1. [# and %] of targeted HIS subsystems that are fully interoperable or exchanging data in accordance with Open HIE standards</p> <p>2. Number of health data source mapped</p> <p>3. [# and %] pre-identified health data catalogued and archived to a central repository</p> <p>4. [# and %] of targeted HIS subsystems migrated or hoisted in secured cloud</p> |  |  |  |  |  |
|---|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|

|   |                                                               |                                                                                                                                                                                                                      |                                                                                              |  |  |  |  |  |  |
|---|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| 6 | Ensure the sustainability of ICT investments and development. | 1. Establish financial envelop to finance ICT for health ;<br>2. Develop resources mobilization plan to finance ICT in the health sector;<br>3. Explore domestic and international support to finance ICT for health | <b>see indicator related to expenditure on ICT as percentage of total health expenditure</b> |  |  |  |  |  |  |
|---|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--|--|--|--|--|--|

[illegible]

## Annex 3: Operation Plan & Costing

| Strategic Areas                     | Specific Objectives                                                                                                                                                                                                                     | Proposed Interventions and Activities                                                          | Time Line  |          | 2018 |    |    |     | 2019 |    |    |     | MoH Unit In-Charge | External Technical Support | Costing of Activities |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------|----------|------|----|----|-----|------|----|----|-----|--------------------|----------------------------|-----------------------|
|                                     |                                                                                                                                                                                                                                         |                                                                                                | Start Date | End date | Q1   | Q2 | Q3 | Q 4 | Q1   | Q2 | Q3 | Q 4 |                    |                            |                       |
| Leadership, Management & Governance | Establish ICT Technical Working Group (TWG) and subgroups and ensure participation of all sub-systems, cross- cutting stakeholders in coordinating sub-systems' development, piloting, implementation, interoperability and evaluation. | Establish the ICT Technical Working Group(TWG) and develop(TWG) TOR                            | Jul-18     | Sep-18   |      |    |    |     |      |    |    |     | ICT                |                            | \$ 0.00               |
|                                     |                                                                                                                                                                                                                                         | Develop and implement the ICT Governance framework within the MOH in line with MOPT and DLEG   | Jul-18     | Sep-18   |      |    |    |     |      |    |    |     | ICT                | MOPT<br>DLEG<br>CIOs       | \$ 0.00               |
|                                     |                                                                                                                                                                                                                                         | Develop and implement ICT Structure, staffing mechanisms, core staffing requirements and TORs. | Oct -18    | Dec-18   |      |    |    |     |      |    |    |     | ICT, HR            |                            | \$ 0.00               |
|                                     |                                                                                                                                                                                                                                         | Participate in FY budget planning and development to ensure ICT inclusion                      | Mar-18     | Mar-19   |      |    |    |     |      |    |    |     | ICT                |                            | \$ 0.00               |

|                                                                |                                                                                                                                                          |                                                                                                                                         |        |        |  |  |  |  |  |  |  |  |     |              |               |  |  |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|-----|--------------|---------------|--|--|
|                                                                |                                                                                                                                                          | in MOH annual budget lifecycle                                                                                                          |        |        |  |  |  |  |  |  |  |  |     |              |               |  |  |
|                                                                |                                                                                                                                                          | Develop ICT SOPs and policy guidelines with Technical Assistance and support from key stakeholders (i.e. MOPT, DLEG, etc.)              | Jun-18 | Jun-18 |  |  |  |  |  |  |  |  | ICT | MOPT<br>DLEG | \$ 2,000.00   |  |  |
|                                                                |                                                                                                                                                          | Implement and monitor ICT SOPs and policy guidelines                                                                                    | Jul-18 | Dec-19 |  |  |  |  |  |  |  |  | ICT |              | \$ 1,000.00   |  |  |
|                                                                | Establish strong collaboration between MOH, line Ministries, private sector and other government agencies to improve coordination of ICT functions.      | Participate in CIO Regime to improve MOH coordination and collaboration with other sectors and stakeholders                             | Jul-18 | Sep-18 |  |  |  |  |  |  |  |  | ICT | MOPT<br>DLEG | \$ 0.00       |  |  |
| <b>Infrastructural Development, Maintenance &amp; Disposal</b> | Deploy a nationwide reliable and efficient health ICT infrastructure with sufficient capacity including high-speed network, improved connectivity, cost- | Connect/maintain MOH Offices (central, programs, service center, etc) to the Metropolitan Fiber Internet connectivity with support from | Jul-18 | Dec-18 |  |  |  |  |  |  |  |  | ICT | MOPT<br>DLEG | \$ 100,000.00 |  |  |

|  |                                                                                                                                                  |                                                                                                                                                             |        |        |  |  |  |  |  |  |  |     |           |         |               |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|-----|-----------|---------|---------------|
|  | effective and adaptive to the needs of the health sector.                                                                                        | MOPT, DLEG, LIBTELCO, etc.                                                                                                                                  |        |        |  |  |  |  |  |  |  |     |           |         |               |
|  |                                                                                                                                                  | Support and maintain Network Infrastructure and internet connectivity at EOCs in the 15 counties.                                                           | Jun-18 | Dec-19 |  |  |  |  |  |  |  |     | ICT       | NPHIL   | \$ 150,000.00 |
|  |                                                                                                                                                  | Procure, implement and sustain corporate email and messaging system within the MOH for improved communication, real-time collaboration and decision making. | May-18 | Dec-18 |  |  |  |  |  |  |  |     | ICT       |         | \$ 25,000.00  |
|  | Explore and invest in appropriate ICT based health care systems (e-Health and m-Health) to ensure access to adequate and timely health services. | Engage CIO Regime on eHealth Strategy and lead its development                                                                                              | Jul-18 | Sep-18 |  |  |  |  |  |  |  | ICT | MOPT DLEG | \$ 0.00 |               |
|  |                                                                                                                                                  | Develop applications (i.e. mobile, web-based) that supports public access to basic health information and services                                          | Oct-18 | Dec-18 |  |  |  |  |  |  |  |     | ICT       |         | \$ 3,000.00   |

|  |                                                                                                                                                                  |                                                                                                                                                                                                           |        |        |  |  |  |  |  |  |  |  |  |     |           |             |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|--|-----|-----------|-------------|
|  | Advocate for the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange | Participate in eGovernment initiatives that supports the deployment of national ICT infrastructure (i.e. architectures and platforms) that will allow e-Services and secured health information exchange. | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG | \$ 0.00     |
|  |                                                                                                                                                                  | Support the establishment of a Data warehouse and develop/implement Business Intelligence (BI) Tools (eg: dashboards, maps, pivot tables).                                                                | Jun-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |           | \$ 5,000.00 |
|  | Develop mechanisms for the effective utilization of all ICT infrastructure and harmonize it for flexibility and redundancy.                                      | Develop and disseminate user manuals for all ICT resources (including computers, printers, etc.) assigned to MOH staff                                                                                    | Jun-18 | Jul-18 |  |  |  |  |  |  |  |  |  | ICT |           | \$ 3,000.00 |

|                                                                                                                               |                                                                                                                                                                  |                                                                                      |        |        |  |  |  |  |  |  |  |  |     |           |              |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|-----|-----------|--------------|
|                                                                                                                               |                                                                                                                                                                  | Develop and enforce the 'Employee Use of ICT Agreement' at all levels within the MOH | Jun-18 | Jul-18 |  |  |  |  |  |  |  |  | ICT |           | \$ 1,000.00  |
| Establish a robust ICT Asset management, IT Service Management (ITSM) platform and responsive Helpdesk systems at all levels. | Develop ICT Asset Management Information Systems to document all ICT assets                                                                                      | May-18                                                                               | Jun-18 |        |  |  |  |  |  |  |  |  | ICT |           | \$ 2,000.00  |
|                                                                                                                               | Conduct ICT Asset assessment and document existing ICTs at all levels                                                                                            | Jan-19                                                                               | Mar-19 |        |  |  |  |  |  |  |  |  | ICT |           | \$ 7,500.00  |
|                                                                                                                               | Adopt and implement the ITIL Service Management Framework within the MOH                                                                                         | Jan-1                                                                                | Dec-19 |        |  |  |  |  |  |  |  |  | ICT | MOPT DLEG | \$ 5,000.00  |
|                                                                                                                               | Train ICT helpdesk and support staff at central and county levels ITIL Service Management and strengthen technical support, repair and maintenance capabilities. | Jan-19                                                                               | Dec-19 |        |  |  |  |  |  |  |  |  | ICT |           | \$ 10,000.00 |



|  |                                                                                                                                                     |                                                                                                                                                                                 |        |        |  |  |  |  |  |  |  |  |  |     |  |              |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|--|-----|--|--------------|
|  | Invest in continued ICT Infrastructure upgrades and newer technologies in order to maintain and improve the health sector ICT deployment and usage. | Develop and implement maintenance program/plan to ensure that hardware, software, application systems and services are regularly serviced, repaired and replaced as appropriate | Jul-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 10,000.00 |
|  |                                                                                                                                                     | Establish and maintain mechanisms and processes to guide the MoH (ICT unit) in outsourcing ICT projects and services.                                                           | Jul-18 | Jul-18 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 0.00      |
|  |                                                                                                                                                     | Develop and regular update procedures for procurement, upgrade, replacement and disposal of ICT equipment.                                                                      | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 0.00      |
|  |                                                                                                                                                     | Upgrade and maintain the MOH Website to increase utilization including                                                                                                          | May-18 | Jun-18 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 5,000.00  |



|                                           |                                                                                                                                                                |                                                                                                                                                                                        |        |        |  |  |  |  |  |  |  |  |  |     |  |             |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|--|-----|--|-------------|
| Standards, Integration & Interoperability | Develop and enforce the standardization and specification for hardware equipment and software applications within the health sector.                           | Develop and print ICT Technical Specifications Manual to guide the procurement, acquisition and usage of all ICTs including systems hardware, applications and services within the MOH | Jul-18 | Aug-18 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 3,000.00 |
|                                           |                                                                                                                                                                | Disseminate ICT Technical Specifications Manual                                                                                                                                        | Aug-18 | Sep-18 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 0.00     |
|                                           |                                                                                                                                                                | Enforce and monitor adherence to ICT Technical Specifications Manual                                                                                                                   | Aug-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 1,500.00 |
|                                           | Establish procedures and criteria for selecting systems' hardware, architecture/platform and software applications for data collection, manipulation (storage, | Develop and standardize requirement specifications for software applications, platforms and architectures that support use cases for system                                            | Jan-19 | Mar-19 |  |  |  |  |  |  |  |  |  | ICT |  | \$ 1,200.00 |

|                                           |                                                                                                                                                 |                                                                                                                                                  |        |        |  |  |  |  |  |  |  |         |  |              |  |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|---------|--|--------------|--|
|                                           | visualization, backup, etc.), analysis and presentation.                                                                                        | integration and interoperability                                                                                                                 |        |        |  |  |  |  |  |  |  |         |  |              |  |
|                                           |                                                                                                                                                 | Disseminate requirement specifications with relevant stakeholders                                                                                | Jan-19 | Mar-19 |  |  |  |  |  |  |  | ICT     |  | \$ 0.00      |  |
|                                           |                                                                                                                                                 | Enforce compliance with requirement specifications                                                                                               | Jan-19 | Mar-19 |  |  |  |  |  |  |  | ICT     |  | \$ 0.00      |  |
| HR for Health<br>ICT Capacity Development | Diversify and develop ICT capacities by recruiting and building core competencies for various aspect of ICT specialty within the health System. | Assess MOH ICT Unit staffing needs/requirements and make recommendations for improvement including general staff ICT skills and competence level | Oct-18 | Dec-18 |  |  |  |  |  |  |  | ICT, HR |  | \$ 1,500.00  |  |
|                                           |                                                                                                                                                 | Implement recommendations of MOH ICT Staffing needs assessment including the development and implement ICT training and capacity building plan   | Jan-19 | Mar-19 |  |  |  |  |  |  |  | ICT, HR |  | \$ 25,000.00 |  |

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|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|-----------|--|-------------|
|                                              |                                                                                                                                                                                               | bright and qualified ICT graduates and or interns to fill in ICT capacity gaps within the MOH                                                                                          |        |        |  |  |  |  |  |  |  |  |           |  |             |
| Information Systems, Services & Applications | Develop HIS sub-systems and build technical capacities to manage them.                                                                                                                        | Participate in the development and maintenance of HIS Sub-system (LIS, eLMIS, eIDSR, etc)                                                                                              | Jan-18 | Dec-19 |  |  |  |  |  |  |  |  | ICT, HMER |  | \$ 0.00     |
|                                              |                                                                                                                                                                                               | Train ICT Staff in managing and supporting eLMIS, eIDSR, DHIS2, iHRIS                                                                                                                  | Apr-18 | Dec-19 |  |  |  |  |  |  |  |  | ICT,HMER  |  | \$ 1,500.00 |
|                                              | Standardize software applications to facilitate acquisition and development, promote the use of genuine application software and prioritize the use of open-source software where applicable. | Assess and document software applications (Operating Systems, Anti-virus, Office Suite, etc) on all MOH computers (laptops, desktops and servers) to determine if licensed or genuine. | Jun-18 | Aug-18 |  |  |  |  |  |  |  |  | ICT       |  | \$ 0.00     |
|                                              |                                                                                                                                                                                               | Develop and standardize requirement specifications for software applications,                                                                                                          | Oct-18 | Dec-18 |  |  |  |  |  |  |  |  | ICT       |  | \$ 2,000.00 |

|  |                                                                                                                       |                                                                                                                                                                                        |        |        |  |  |  |  |  |  |  |  |  |     |  |  |              |
|--|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|--|-----|--|--|--------------|
|  |                                                                                                                       | platforms and architectures for Health Information Systems (HIS) development and deployment including application interface (front-end/GIU) and database engines (back-end processing) |        |        |  |  |  |  |  |  |  |  |  |     |  |  |              |
|  |                                                                                                                       | Disseminate requirement specifications with relevant stakeholders                                                                                                                      | -18    | Jul-18 |  |  |  |  |  |  |  |  |  | ICT |  |  | \$ 0.00      |
|  |                                                                                                                       | Enforce compliance with requirement specifications                                                                                                                                     | Jul-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |  |  | \$ 0.00      |
|  | Establish mechanisms to minimize services disruptions, improve users' access and respond to users' needs and queries. | Implement and maintain MOH Cloud Service Infrastructure on AWS to ensure high availability of critical health information systems reduce systems' downtime                             | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT |  |  | \$ 12,000.00 |

|                          |                                                       |                                                                                                                                                                          |        |        |  |  |  |  |  |  |  |  |           |  |             |
|--------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|-----------|--|-------------|
|                          |                                                       | Hire ICT/HIS point of contact (POC) to provide helpdesk and support for information systems users                                                                        | Jun-18 | Dec-18 |  |  |  |  |  |  |  |  | ICT, HMER |  | \$ 9000.00  |
| Financing ICT for Health | Establish financial envelop to finance ICT for health | Conduct fiscal space analysis for ICT                                                                                                                                    | Jul-18 | Aug-18 |  |  |  |  |  |  |  |  | ICT, HF   |  | \$ 700.00   |
|                          |                                                       | Review the HF resource tracking tool for adjusting the "Comprehensive Information & Research Management" category into sub categories to factor in (ICT, HIS, M&E. etc.) | Aug-18 | Sep-18 |  |  |  |  |  |  |  |  | ICT, HF   |  | \$ 1,500.00 |
|                          |                                                       | Develop online version of the Resource Tracking platform for capturing real time data on health investments                                                              | May-18 | Jul-18 |  |  |  |  |  |  |  |  | ICT, HF   |  | \$ 2,000.00 |
|                          | Develop resources mobilization plan to                | Conduct ICT gap analysis to inform the costing of plans                                                                                                                  | Aug-18 | Sep-18 |  |  |  |  |  |  |  |  | ICT, HF   |  | \$ 2000.00  |



|                                         |                                                                      |                                                                                                                                                            |        |        |  |  |  |  |  |  |  |         |  |             |
|-----------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|---------|--|-------------|
|                                         | finance ICT in the health sector                                     | Develop costing of ICT operational and strategic plans                                                                                                     | Aug-18 | Sep-18 |  |  |  |  |  |  |  | ICT, HF |  | \$ 0.00     |
|                                         |                                                                      | Develop investment case for ICT system strengthening and improvement for health                                                                            | Aug-18 | Sep-18 |  |  |  |  |  |  |  | ICT, HF |  | \$ 2,300.00 |
|                                         | Explore domestic and international support to finance ICT for health | Advocate for ICT budget line and allocation under specific projects, departments (eg: HR, HMER, EPI, Global Fund, FARA,etc), Central MOH and County levels | Oct-18 | Nov-18 |  |  |  |  |  |  |  | ICT, HF |  | \$ 0.00     |
|                                         |                                                                      | Align ICT with the resource mobilization strategy for the LHEF                                                                                             | Oct-18 | Nov-18 |  |  |  |  |  |  |  | ICT, HF |  | \$ 0.00     |
|                                         |                                                                      | Improve ICT support through the strengthening of TWGs                                                                                                      | Oct-18 | Nov-18 |  |  |  |  |  |  |  | ICT, HF |  | \$ 1,200.00 |
| <b>Ethical Standards &amp; Security</b> | Establish mechanisms to ensure information security,                 | Conduct security and risk assessment of all MOH systems, identify                                                                                          | Oct-18 | Dec-18 |  |  |  |  |  |  |  | ICT     |  | \$ 6,000.00 |

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|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------|--------|--|--|--|--|--|--|--|--|--|-----|--------------|----------------------|
|  | legal framework for ethical standards and security including issues such as ethical use, intellectual property right, service agreement and information protection. | Adhere to and enforce National ICT Policy                                                      | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG    | \$ 0.00              |
|  | Contribute to the national cybersecurity framework and adopt established mechanisms to protect health sector cyberspace.                                            | Attend stakeholders meetings on national cybersecurity framework                               | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG    | \$ 0.00              |
|  |                                                                                                                                                                     | Participate and contribute to cybersecurity discussions at national level (CIO Councils, MOPT) | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG    | \$ 0.00              |
|  |                                                                                                                                                                     | Adopt approved cybersecurity framework for MOH                                                 | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG    | \$ 0.00              |
|  |                                                                                                                                                                     | Select a best-practiced cybersecurity standard and implement (i.e. ISO 207001, NIST)           | May-18 | Dec-19 |  |  |  |  |  |  |  |  |  | ICT | MOPT DLEG    | \$ 0.00              |
|  |                                                                                                                                                                     |                                                                                                |        |        |  |  |  |  |  |  |  |  |  |     | <b>TOTAL</b> | <b>\$ 622,100.00</b> |

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