REPUBLIC OF KENYA

HARAMBEE

MINISTRY OF HEALTH

KENYA NATIONAL eHEALTH POLICY 2016-2030

Towards attainment of the highest standard of health through adoption and use of ICT

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FORWARD

The Kenya Constitution (2010) and Vision 2030 development blueprint requires the country to provide the highest attainable standard of healthcare. To fulfil this mandate, the Ministry of Health developed the Kenya Health Policy (2014-2030). One of the revised policy objectives is to plan, design and install Information and Communications Technology (ICT) infrastructure, and software for the management and delivery of essential healthcare.

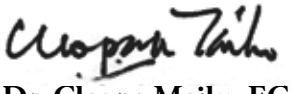
Globally, there are concerted efforts aimed at transforming access, care delivery, patient experiences, and health outcomes through electronic health (eHealth). However, in Kenya, eHealth remains at its infancy due to social, economic, and technical challenges. It is noteworthy to point out that some of these challenges include high cost of eHealth systems and innovations; low ICT literacy amongst users; lack of interoperability of eHealth systems; market fragmentation; weak regulatory framework; and possible violation of patients' privacy and confidentiality.

The Ministry of Health has recognized and prioritized the need to develop and operationalize a comprehensive National eHealth Policy that clearly outlines the strategic direction on the use of ICTs in the health sector. It is envisaged that the National and County Governments will benefit from this policy since it will guide them as they plan and budget for healthcare services at all levels of care. Moreover, this policy will accelerate the realization of Sustainable Development Goals (SDGs) and foster economic growth.

I'm happy to note that this policy document has been developed and realized through an elaborate, inclusive, participatory and consultative process involving a wide range of stakeholders drawn from the Ministry of Health; County Governments; Development Partners, especially WHO; Civil Society; Research Institutions; Academia from Universities; and the International Community.

It is my sincere hope that this well informed document will create sanity in the application of ICTs to support health information management while underscoring the importance of adhering to the core principles, values, the right to information, and the bill of rights as enshrined in the constitution and medical practice.

Lastly, I'm positive that all the stakeholders will embrace this policy in order to realize the shared benefits that this policy will bring to the health sector as we fully embrace the automation agenda. It is envisaged that this policy will spur the uptake and adoption of Information Technology in the sector and thus improve service delivery and quality of care with resultant improvement in health outcomes.



Dr. Cleopa Mailu, EGH
CABINET SECRETARY

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Julius Korir, CBS
PRINCIPAL SECRETARY

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ABBREVIATIONS AND ACRONYMS

4G	Fourth Generation (Mobile Telecommunication)
AMREF	African Medical and Research Foundation
CBO	Community Based Organization
CR	Client Registry
CS	Cabinet Secretary
DHIS2	District Health Information System 2
DICOM	Digital Imaging and Communications in Medicine
DMS	Director of Medical Services
EAC	East Africa Community
EDC	Electronic Data Capture
EHR	Electronic Health Records
EMR	Electronic Medical Records
FBO	Faith Based Organisation
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HL7	Health Level Seven International
HMIS	Health Management Information Systems
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Organization for Standardization
ITU	International Telecommunication Union
KEPH	Kenya Essential Package for Health
KHPF	Kenya Health Policy Framework
KHSSP	Kenya Health Sector Strategic Plan
mHealth	Mobile Health
MNH	Maternal and Newborn Health
MoH	Ministry of Health
MoICT	Ministry of Information and Communications and Technology
MPI	Master Patient Index
NEMA	National Electrical Manufacturers Association
NGO	Non-Governmental Organization
NHIF	National Hospital Insurance Fund
NUPI	National Unique Patient Identifier
PHR	Personal Health Record
SDGs	Sustainable Development Goals
SDO	Standards Development Organization
TWG	Technical Working Group
WHO	World Health Organization

PART ONE
BACKGROUND

CHAPTER 1: INTRODUCTION

1.1 Background Information

Healthcare systems in developed and the developing countries face numerous challenges including demand for high quality and equitable distribution. This is the motivation behind healthcare providers and the governments focus on eHealth as an adjunct to overcome these challenges. The term eHealth stands for electronic health, defined by World Health Organization (WHO) as the use of ICT for health. Although there are numerous eHealth interventions being piloted in Sub-Sahara-Africa, a 2014 report from a joint survey by WHO and International Telecommunications Union (ITU) revealed that most of these initiatives are weak platforms that have failed to transit to actual practice. This calls for urgent need to develop long term strategies, policy guidelines, standards and legislations that govern the adoption, deployment and utilization of eHealth products and services in Kenya. Furthermore, the eHealth conference held at the Bellagio Center in Italy between July and August, 2008 raised pertinent issues that require sound eHealth policy. This need has also been reaffirmed by the Constitution of Kenya 2010, Kenya Health Policy (2014-2030), Vision 2030, Kenya eHealth Strategy (2011-2017), ICT Master Plan, and the Health Bill. This is the rationale behind development of the Kenya eHealth Policy (2016-2030) (KeHP) as a subset of the sector-wide Kenya Health Policy to strengthen and accelerate integration of ICTs into healthcare system.

1.2 Vision for eHealth

The vision of Kenya eHealth is to create an enabling environment for the sustainable adoption, implementation and efficient use of eHealth products and services at all levels of healthcare delivery in Kenya.

1.3 Legislative and Regulatory Instruments

The Kenya eHealth Policy draws its strength from various legislative and regulatory instruments among them Constitution of Kenya 2010, legislations (Draft Health Bill 2016; Data Protection Act, 2012, Kenya Information and Communications Act, 2015, and the Access to Information Act, 2016), Strategic Plans, Policies, and eHealth Standards.

- **Constitution of Kenya 2010:** The constitution of Kenya provides a legal framework to ensure a comprehensive rights-based approach to delivery of health services. It obligates every State organ to take legislative, policy and other measures, including setting of standards to achieve the progressive

realization of the rights guaranteed in Article 43.

- **Legislations:** Some of the legislations that seek to protect one's privacy include Kenya Information and Communications Act, 2015; the Draft Health Bill, 2016; Open Data Protection Bill, 2013; Draft Cyber Security and Protection Bill, 2016; and the Access to Information Act, 2016. The revised Kenya Information and Communications Act has provisions on electronic transactions and cyber security. Furthermore, once the Draft Health Bill 2016 is enacted, the law will protect and regulate use of eHealth in the collection, retrieval, processing, storage, use and disclosure of personal health information.
- **Strategic and action plans:** Some of the strategic and action plans that form the foundation of the KeHP include: Sustainable Development Goals (SDGs), Kenya eHealth Strategy (2011-2017), Kenya Health Sector Strategic and Investment Plan (2014-2018), Vision 2030, and the National ICTMaster Plan.
- **Policy documents:** Given that eHealth policy cannot be implemented in isolation, this document is anchored on the policy frameworks provided by the Kenya Health Policy (2014-2030), Health Information Policy (2014-2030), and the ICT Policy 2006.
- **Global eHealth standards:** There are several standards that have been developed to ensure interoperability, security, quality and meaningful use of ICTs in healthcare. Table 1 shows global and local standards/initiatives relevant to the deployment of eHealth systems and services:

Table 1: Global and Local Standards/Initiative relating to eHealth

ORGANIZATION	STANDARD/INITIATIVES
National Electrical Manufacturers Association (NEMA)	Digital Imaging and Communications in Medicine (DICOM)
Health Level Seven International (HL7)	HL7 family of standards relating to the exchange, storage, and use of electronic health information
World Health Organization (WHO)	Global Observatory for eHealth
Comité Européen de Normalization (CEN)	CEN/TS 15699:2009: Health Informatics
International Telecommunication Union (ITU)	Multimedia Framework for eHealth Applications; and Emergency eHealth Services Standardization

International Organization for Standardization/ Institute of Electrical and Electronics Engineers (ISO/IEEE)	ISO/IEEE 11073 Medical/Health Device Communication Standards
Ministry of Medical Services, and Ministry of Public Health and Sanitation, Kenya	Standards and Guidelines Electronic Medical Record (EMR) Systems in Kenya, 2010
Ministry of Health (MoH), Kenya	Kenya Health Enterprise Architecture, 2015
Ministry of Health (MoH), Kenya	Kenya Standards for E-Health Systems Interoperability, 2015

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CHAPTER 2: SITUATIONAL ANALYSIS

2.1 Kenya's Health System

Kenya has a wide range of health facilities operated by the government, faith-based organizations Non-Governmental Organizations (NGOs), international community and individuals. Health facilities operated by the government are classified into levels 1 to 6 as defined in the National Health Sector Strategic Plan II. The classification defines level 1 as the community, level 2 being dispensaries, level 3 are health-centres, level 4 district hospitals, level 5 provincial (secondary) hospitals and level 6 are tertiary (national) referral hospitals. In devolved system of government, the County health services are organized into three levels namely Community, Primary care, and Referral services. The rationale behind the devolved health system is to address the burden of disease and injuries across the continuum of care.

Statistics from Ministry of Health indicate that about 70% of total causes of outpatient morbidity is from malaria, diseases of the respiratory system, skin diseases, diarrhoea and accidents. To reverse this trend, the Ministry of Health developed the Kenya Health Policy that provides long term strategies for improving health and well-being of all Kenyans. Six policy objectives are defined each with specific strategies to enable attainment of the following policy objectives:

- **Eliminate communicable conditions:** The Health Policy aimed to achieve this objective by forcing down the burden of communicable diseases until they are of no major health concern.
- **Halt and reverse the rising burden of non-communicable conditions:** Ensuring clear strategies for the implementation of the policy to address all identified non-communicable conditions in the country.
- **Reduce the burden of violence and injuries:** The policy aims to achieve this objective by directly putting in place strategies that address the causes of injuries and violence.
- **Provide essential healthcare:** Ensure that medical services are affordable, equitable, accessible and responsive to client's needs.
- **Minimize exposure to health risk factors:** This objective is to be achieved by strengthening and promoting health interventions that lead to health seeking behaviour.
- **Strengthen collaboration with health related sectors:** The policy aims to achieve this objective by ensuring the Health Sector interacts with and influences design, implementation and monitoring processes in health related actions.

To realize these objectives, the government is eagerly exploring strategies for the adoption, implementation and cost-effective utilization of eHealth systems such as mHealth, telemedicine, and Health Information Systems.

2.2 Status of eHealth in Kenya

The Kenya eHealth Development Unit falls under stewardship of the Division of Monitoring and Evaluation, Health Research Development and Informatics. Currently, the link between the Division and the Ministry of ICT (MoICT) is not well structured making it difficult to assess, monitor and regulate eHealth systems operating in Kenya. Furthermore, the ministries do not maintain a centralized registry of all eHealth projects under implementation in Kenya. To evaluate the status of eHealth in Kenya, this policy development team used hybrid research methodology. This approach combined field surveys across the country with meta-analysis of journals articles, conferences papers, and other reports focusing on Kenya eHealth ecosystem.

2.2.1 Kenya eHealth Ecosystems

To transform the country into a middle-level economy, the government has initiated long term development strategies that recognizes Science, Technology and Innovation (ST&I) as the drivers to the realization of Vision 2030 and Sustainable Development Goals (SDGs). Results from a field study in 2016 and meta-analysis of articles on eHealth published 2017 indicate that there has been significant increase in uptake of eHealth interventions since the first initiative recorded in 2001. Since 2010, we have witnessed accelerated deployment of eHealth interventions. This trend may be attributed to the government's recognition of ICT as a key enabler to social, economic, and political development. It is from this long-term blueprint that policies, strategy documents, legislations, and standards need to be developed and operationalized. This will help in accelerating the integration of eHealth systems like telemedicine, health information systems, mHealth and eLearning into the healthcare system.

Another important observation from the study is that most of eHealth interventions are delivered through mHealth due to the high geographical coverage of mobile network. Furthermore, due to infrastructure limitations, most of these initiatives are SMS-based platforms that focus on primary care in HIV/AIDS, MNH, and malaria. Currently, over 35 counties have at least one eHealth project with Nairobi, Mombasa and Kisumu Counties taking the lion share of the projects. Comparatively, peri-urban regions like Busia, Kakamega and Vihiga have a good number of eHealth

projects while Counties in Arid and Semi-Arid regions such as Turkana, Wajir, Garissa, Samburu, Marsabit and Mandera have the least number of eHealth systems and interventions.

In terms of investment and ownership, the study revealed that most eHealth projects implemented are mostly funded by development partners and Non-Governmental Organisations (NGOs) raising the issue of ownership and sustainability. This creates the need for an eHealth policy and regulatory framework that provides guidance on ownership of eHealth projects. This policy will minimize duplication and fragmentation of these interventions while increasing acceptability and sustainability of eHealth interventions in conventional healthcare sector.

2.2.2 Infrastructure

Generally, the term infrastructure refers to physical and organizational structures e.g. communication network, buildings, roads, and power supplies needed for operations in a society or enterprise. The ICT policy recognizes the need for infrastructure-related policy interventions as the key to successful implementation and adoption of eHealth systems. The development and provision of a robust ICT infrastructure underpins sustainable growth in the sector. Towards this end, the government has initiated infrastructure projects such as connection to submarine optical fibre cables and the laying of the national optic fibre backbone linking major towns. Through public-private partnerships, the government continues to promote availability and access to efficient, reliable and affordable high-speed wireless broadband connectivity. These initiatives coupled with the increasing penetration of mobile technologies will provide necessary infrastructural impetus for implementation of eHealth systems.

2.2.3 Standards and Guidelines

Standards provide for common rules and procedures that provide the optimum degree of order in a given context. One of the challenges to the adoption of eHealth is the lack of standards and guidelines that are localized to the context of use. This has forced most eHealth product and service providers to opt for proprietary standards from developed countries that may not be applicable in Kenyan. In Kenya, the slow pace in developing localized eHealth standard may be attributed to the following factors:

- Limited participation in standards development process in the global arena;
- Lack of appropriate experience in the implementation and use of standards;
- Lack of understanding of the importance of standards at national level;
- High cost of converting legacy systems to new standard-based solutions.

2.2.4 Legal and Ethical Requirements

Lack of a comprehensive legal framework on adoption and use of eHealth systems and services may expose patients and healthcare providers to unlawful and unethical practices. Consequently, the release of standards and guidelines for the Electronic Medical Records (EMR) in 2010, eHealth Strategic Plan (2011-2017), ICT policy (2006), and Kenya Communications Act (2012) marked an important milestone towards creating a regulatory framework conducive for the adoption and utilization of eHealth in Kenya. However, the government is still faced with legal challenges in regulating eHealth systems due to lack of eHealth legislations. This policy therefore recognizes the need for a comprehensive legal framework that regulates adoption and use of eHealth systems and services in Kenya.

2.2.5 eHealth Challenges

Several challenges hinder successful implementation of most eHealth systems in Kenya. Some of the limitations include poor infrastructure, low literacy, inadequate technical expertise, unreliable power supply, limited funding, and lack of government involvement in most eHealth projects. Therefore, to accelerate seamless integration of eHealth into conventional healthcare systems, WHO/ITU's Global Observarory Survey report (2014) points to the need for developing countries to formulate eHealth strategies for overcoming these challenges. Some of the strategies and interventions being applied include broadband connectivity, policy formulation, setting eHealth standards, creating private-public partnership, and capacity building.

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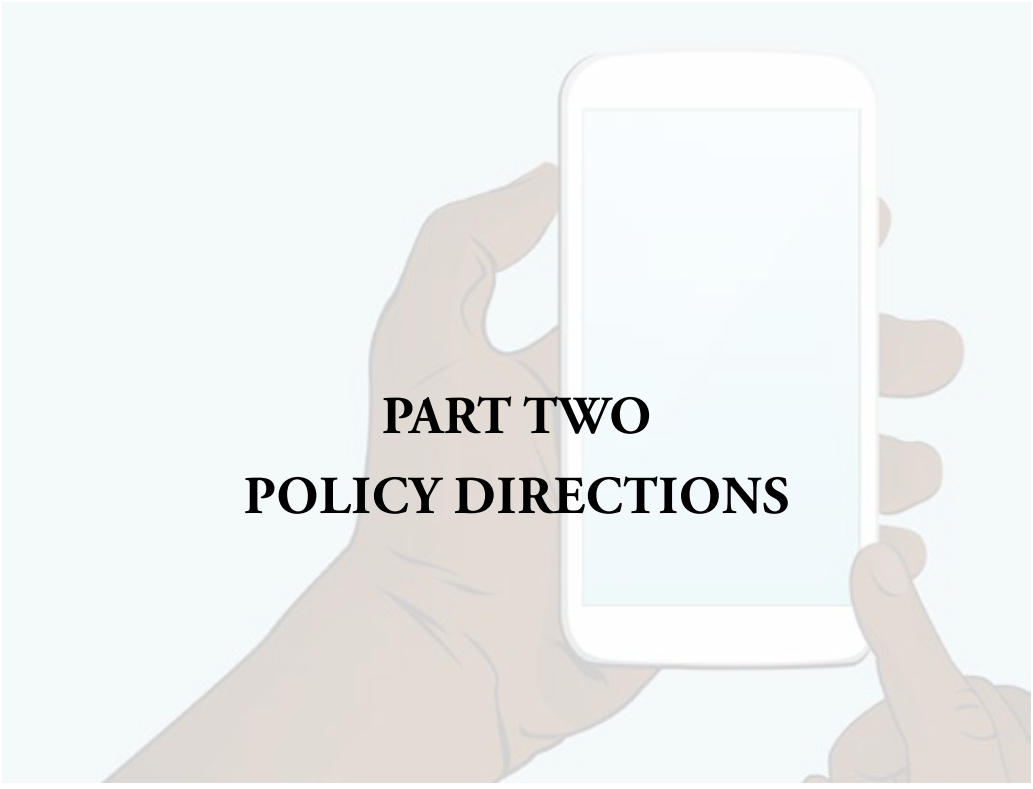

PART TWO
POLICY DIRECTIONS

CHAPTER 3: GUIDING PRINCIPLES AND eHEALTH POLICY FRAMEWORK

3.1 Policy Guiding Principles

Technologically, eHealth is one of the vehicles which health service providers will use to provide the highest standards of health as enshrined in the constitution using ICTs as envisioned in the ICT Policy. Through eHealth, equitable, affordable and convenient health services will be delivered to all Kenyans. This section provides the policy guiding principles that will drive the health sector towards realization of better healthcare outcomes through adoption of eHealth innovations. The six guiding principles illustrated in Figure 3.1 will ensure that implementation of the eHealth Policy is user-centric, focused, and aimed at guiding on investments in healthcare to achieve vision 2030 goals that focus on quality of healthcare access and delivery regardless of religious, economic or political differences.

Figure 3.1: eHealth Policy Guiding Principles

3.1.1 Equitable Access to Quality Healthcare Services Using ICTs

Adoption of eHealth as a model of care will go a long way in mitigating health inequalities that result from differences in the social and economic conditions across geographical and political boundaries. The healthcare services and information provided through eHealth should be of good quality.

3.1.2 Patient-centred Healthcare Services

Patient-Centred care involves use of point-of-care devices to attend to patients in a manner that is meaningful and valuable. This includes involving the patient in a respectful, responsive way in accordance to their preferences, needs and values; while ensuring that patient values inform clinical decisions at all times.

3.1.3 Standardization of eHealth Solutions

Appropriate standards for eHealth hardware and software will be a requirement. Other areas that require standardization include procurement of eHealth solutions to ensure quality, confidentiality, privacy, security, and the integrity of health data.

3.1.4 Integration into Existing Systems

Implementation of eHealth will bring together clinicians and health informatics experts to develop a unified model for integrating eHealth into the healthcare systems. The model will be anchored on available technologies, infrastructure, health enterprise architecture, data repositories, policies, and standard operating procedures (SOPs) already in place for smooth adoption, implementation and utilization of eHealth applications.

3.1.5 Participatory Approach

Different players in engineering, health, ICT sectors as well as end users will be involved in the design, development and implementation of eHealth interventions for the best outcomes. Public-private partnerships may be necessary in order to expedite eHealth adoption.

3.1.6 Research and Development

Implementing eHealth solutions shall generate a lot of health data and information. This data shall be used anonymously to conduct research on many aspects of health issues affecting the population.

3.2 eHealth Policy Framework

The health sector shall adopt the eHealth framework presented in this section to address all salient issues surrounding the implementation of eHealth systems. The illustration shown in Figure 3.2 depicts how the **policy objectives**, **guiding principles**, and **orientations** relate to the overall **policy goal**.

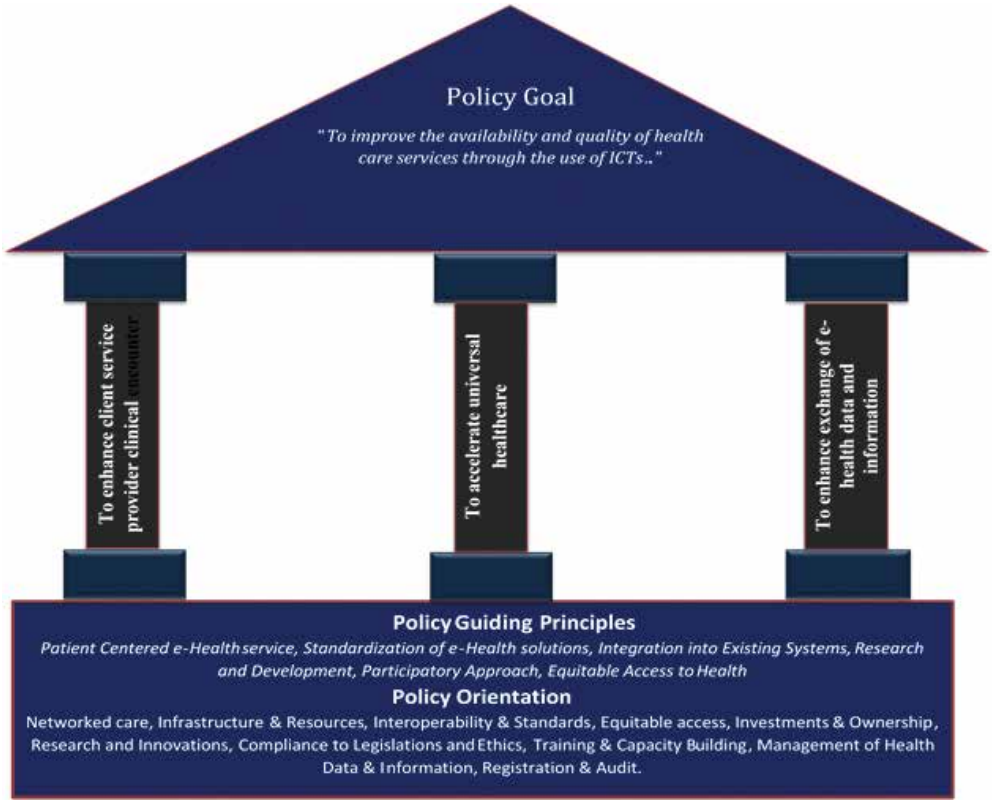

Figure 3.2 Framework for eHealth Policy

The following is a brief overview of the main components of the eHealth framework illustrated by the figure above:

- **Policy goal** states the overall focus and impact the policy is designed to accomplish regarding the adoption of eHealth service provision in Kenya.
- **Policy objectives** defines the health sector's focus relating to the expected healthcare service outcomes needed to facilitate the attainment of the overall goal.
- **Policy guiding principles** outlined earlier forms one of the foundations of the eHealth policy that informs on investments that are necessary to realize

the policy objectives and the overall policy goal.

- **Policy orientations** define the health sector's focus relating to investments to be made, which will facilitate the realization of the policy objectives. They are specific and address all the areas covered by the eHealth policy. The metric for effectiveness is the improvement of health service provision through an informed adoption of eHealth.

To achieve the overall goal, this policy is comprehensive, balanced and coherent. The policy is comprehensive in the sense that it provides guidelines on adoption, implementation and utilization of eHealth in a broader spectrum. It is balanced in the sense that it covers the diverse areas of eHealth giving appropriate weighting to their relative importance. This policy is coherent due to the fact that different policy directions are tailored towards contributing to the realization of the overall eHealth policy goal.

CHAPTER 4: POLICY GOAL, OBJECTIVES AND ORIENTATIONS

4.1 Policy Goal

The goal of eHealth policy is to improve the availability and quality of healthcare services through the use of ICTs. This policy will go a long way in providing directions on adoption and utilization of technologies for collection, storage, retrieval, analysis and exchange of patients' medical health information in an ethical, efficient, cost-effective, and secure manner.

By leveraging eHealth to improve national and county health systems, the health sector will provide affordable and equitable electronic health information and services. In the policy period, the sector will seek to ensure progressive implementation of eHealth systems at the national and county levels in a systematic manner. To realize this agenda, the health sector will employ a patient centric approach to the management and use of electronic data in a way that will guarantee confidentiality, integrity, and privacy of patients at all times.

4.2 Policy Objectives

The eHealth policy framework comprises of the following three objectives as the key pillars for the realization of overall policy goal:

4.2.1 Policy Objective 1: Enhance interaction between client and health service provider

The priority strategies for this objective include the following:

1. Promote electronic access to quality healthcare through establishing interaction platforms between the client and health service providers;
2. Enable health service providers and their clients to easily collaborate and consult each other electronically;
3. Improve client-provider interaction through ICTs;
4. Promote clients' decision making and management of their health.

4.2.2 Policy Objective 2: Accelerate achievement of universal health coverage

The priority policy strategies include the following:

1. Improve health literacy levels by providing materials including but not limited to written, printed and spoken words to patients on how to use eHealth.

2. Promote availability, accessibility and affordability of ICT infrastructure, devices and connectivity.
3. Ensure deployment of user-friendly eHealth platforms for ease of use

4.2.3 Policy Objective 3: Enhance electronic exchange of health data and information

The priority policy strategies include the following:

1. Ensure standardization of stored data to promote interoperability of eHealth systems
2. Continuous improvement of infrastructure and resources to support cost-effective implementation of telehealth applications.
3. Ensure prompt and convenient access to patient's demographic and clinical data to privileged healthcare providers.

4.3 Focus of the eHealth Policy

To realize the three policy objectives, investment will focus on ten policy orientations illustrated using Figure 4. At the core to each orientation are priorities and interventions that give directions on how the eHealth policy will be implemented towards attainment of the overall eHealth policy goal.

Figure 4: eHealth Policy Orientations

4.3.1 Policy Orientation 1: Networked Care and Professional Practice

Networked Care refers to seamless exchange of health data and information to improve quality of health outcomes while lowering costs and the time required for accessing health information and services. This policy recognizes the critical role of ICTs in harnessing Networked Care through collaborations within the health ecosystem. The network of care between healthcare providers in clinical and public health will be required to implement technology-driven interventions that reduce the burden of disease through surveillance, monitoring and reporting. To promote network of care, the following section outlines priorities areas and interventions that should be implemented.

Policy Priority 1: Sharing of health information, knowledge and practice

To ensure the sharing of information, knowledge and practice, the government through the Ministry of Health shall oversee implementation of the following **interventions**:

1. Support the creation and enforcements of legislations for secure sharing of patient health records among healthcare providers;
2. Provide guidelines regarding sharing of teaching material, literature and other information of explicit knowledge;
3. Promote sharing of services including but not limited to consultations on electronic prescription;
4. Where necessary, subscribe to and adopt international conventions and protocols to regulate standards for interoperability across international, national and local geographical boundaries across different platforms used in eHealth;
5. Facilitate creation of regional Centres of Excellence that promote collaboration and sharing of health experience and eHealth innovations;
6. Promote use of eHealth innovations to support healthcare service provision, management, capacity building and planning;
7. Ensure redundancy and real-time backup in mission critical aspects of telemedicine applications such as tele-surgery.

Policy Priority 2: Secure transfer of health information

To ensure secure transfer of health information, the government through the Ministry of Health shall oversee implementation of the following **interventions**:

1. Ensure confidentiality of information is maintained during transmission in the networked environment;

2. Ensure integrity of data is maintained during transmission in networked environment;
3. Provide policy guidelines on management of health data and information without compromising patient's privacy and safety.

4.3.2 Policy Orientation 2: Infrastructure and Resources

In this context, infrastructure refers to communication network while resources refer to hardware and software products required for the deployment and use of eHealth interventions. In Kenya, lack of adequate infrastructure to support quality, high-speed Internet connections is one of the reasons for poor uptake of eHealth applications in rural and remote regions. This policy requires policymakers in the ministries of health, and information technology to collaborate in identifying effective approaches for improving infrastructure, and cost of network access. To maximize utilization of available infrastructure and resources, the following is the priority and interventions that should be implemented:

Policy Priority: Foundations for eHealth Infrastructure

To establish the technical foundations for the eHealth infrastructure and resources, the government through the Ministry of Health shall oversee implementation of the following **interventions**:

1. Develop a national enterprise health systems architecture as a blueprint for design and implementation of eHealth systems;
2. Provide guidelines to ensure deployment of appropriate hardware, software and network technologies;
3. Ensure deployment of qualified human resources capable of developing, implementing and maintaining eHealth systems.
4. Develop standard operational guidelines on development, hosting and secure use of cloud-based eHealth services and applications.

4.3.3 Policy Orientation 3: Interoperability and Standards

Interoperability is the ability of an electronic system to communicate and exchange data in an accurate, reliable, and meaningful way with another information system so that the operational purpose and meaning of the data are preserved and unaltered. This policy also recognizes the need for shared health records though development of Client Registry (CR) that encompasses National Unique Patient Identifier (NUPI), Master Patient Index (MPI), Terminology Service (TS), Health Information Exchange (HIE), and Personal Health Record (PHR). This unified approach will ensure that

health data is available regardless of differences in architecture, service providers, technology used or locality. All eHealth systems implemented in the health sector shall be linked with the existing Data Aggregators like DHIS2, Integrated Human Resource Information System (iHRMIS), and Logistics Management Information Systems (LMIS). The integration will create a central health data repository shared by health institutions.

To realize full integration and interoperability, the government will be required to collaborate with Standards Development Organizations (SDOs) to develop or identify appropriate standards for secure communication, networking, and processing of clinical documents. This policy therefore shall support the achievement of desired eHealth systems interoperability through the following priority and interventions:

Policy Priority 1: Standards and Guidelines

To ensure easy transfer of health information, the government through the Ministry of Health shall oversee implementation of the following **interventions**:

1. Develop Electronic Health Records (EHR) standards and guidelines that will among other things, regulate how data will be captured from patients;
2. Develop Telemedicine standards and guidelines that will regulate sharing of health data information from applications such as teleradiolgy, telepathology, teledarmatolgy and telediagnostics through communication networks.
3. Develop Interoperability Framework for eHealth systems and services;
4. Operationalize and implement eHealth Interoperability Standards and Guidelines;
5. Develop standards and guidelines for mHealth Systems to guide in the implementation and use of mHealth products and services.

Policy Priority 2: Interoperability and Data Interchange

In order to facilitate interoperability between both homogenous and heterogeneous systems in the health sector, the Government though Ministry of Health shall support the following **interventions**:

1. Operationalize and implement the Kenya Health Enterprise Architecture (KHEA) at National and County levels to ensure seamless communication, and data exchange;
2. Ensure functional interoperability by providing guidance on acquisition or development of hardware and software tools that will facilitate easy transfer of information between different systems;

3. Ensure semantic interoperability so that information transferred between parties is easily interpreted the way as it was intended;
4. Ensure change in business models in health sector, including medical insurance services are clearly understood.

4.3.4 Policy Orientation 4: Equitable Access to Healthcare

Due to shortage of healthcare workers, adoption and use of eHealth and mHealth technologies is critical to enhancing equitable access to healthcare in Kenya. To address this shortage, the Government in collaboration with private sector should promote use of eHealth technologies such as telemedicine to increase reach to the underserved Counties in Kenya. There is no doubt adoption of eHealth will provide the health system with capabilities for reaching vulnerable population groups especially in low-resource settings. This Policy therefore supports the achievement of desired quality of delivery and access to healthcare services through the following priority and interventions:

Policy Priority: Digital Access to Healthcare

To ensure that health services are electronically accessible to patients at all levels of the economy, the government through the Ministry of Health shall be responsible for the implementation of the following **interventions**:

1. Ensure that health information on the eHealth platforms for patients and physicians is multilingual, multicultural, multi-professional, and multijurisdictional;
2. Ensure affordable broadband Internet connectivity to all parts of the country to enable online access to eHealth services and information;
3. Ensure that services are offered across a variety of eHealth access platforms including but not limited to mobile devices and community digital centres;
4. Facilitate the use of telemedicine by caregivers in geographically isolated communities to provide healthcare services;
5. Promote cross-border sharing of health information about the medical incidences and history of a particular patient by healthcare professionals without compromising his/her privacy.

4.3.5 Policy Orientation 5: Investment and Ownership

Sustainability and success of eHealth deployment is largely dependent on strong government leadership and ownership of eHealth programmes for prudent use of resources. However, in most developing countries, there is minimal government

involvement in eHealth projects hence raising the issue of ownership. This is further complicated by the huge financial and human resource investment by donors making the government unable to continue supporting most of the interventions beyond the pilot phase. To address this gap, the government should develop regulatory framework that govern investment and ownership of eHealth products and services. One of the components of the framework should be Total Cost of Ownership (TCO) for determining ownership based on cost of acquiring, implementation, and maintenance of eHealth systems and services. The overall goal of the framework should be optimal selection of technologies that minimize TCO while meeting minimum functional and operational requirements. To realize this agenda, this orientation provides guidelines on investment and ownership through the following priorities and interventions:

Policy Priority 1: Funding of eHealth programmes

To provide investments for a sustainable eHealth system, the government shall implement the following **interventions**:

1. Develop guidelines on budget and funding of eHealth systems at national and county levels;
2. Encourage public-private partnerships to source for interested stakeholders to supplement government investments and funding;
3. Develop and implement an eHealth investment plan. Where possible, priority should be given to open source platforms to reduce the TCO.
4. Promote, encourage and demand for empirical evidence that demonstrates effectiveness of the proposed eHealth investments.

Policy Priority 2: Ownership of eHealth Systems

To oversee ownership of eHealth system, the government shall implement the following **interventions**:

1. Develop standards and guidelines that define minimum requirements for ownership of devices, services, data and information generated from eHealth systems;
2. Manage a comprehensive list of eHealth products and service ownership within the framework of Kenya Master Health Facility List (KMHFL);
3. Publish quarterly and annual summaries that provide a snapshot of licensed eHealth projects and their ownership.

4.3.6 Policy Orientation 6: Research and Innovations

The rapid changes in ICT and its applications in health sector calls for continuous research to develop innovations that optimally address the country's health priorities and patients' needs. Furthermore, this policy recognizes the need for collaboration between the health-sector, academia, innovation champions, government and the global community in transforming research outcomes into new eHealth innovations as well as using Business Intelligence (BI) and Analytics to improve quality of healthcare services. This orientation provides guidelines on eHealth innovations, research and development through the following priority and interventions:

Policy Priority 1: Health Informatics Research

To promote health informatics research, the government shall implement the following **interventions**:

1. Develop standards and guidelines for electronic use of health data and information in health informatics studies;
2. Ensure anonymization of data used for health informatics research to protect identity and privacy of the subject;
3. Encourage collaborative health informatics research that focus on improvement of quality, and access to health services and information;
4. Encourage building of collaborations and partnerships with academia and other research bodies both locally and internationally;
5. Ensure that all scientific health informatics studies and their findings are disseminated through internationally recognized journals and conferences;
6. Ensure that there is evidence of impact evaluation on eHealth interventions implemented at all levels of governance.

Policy Priority 2: eHealth Innovations

To promote innovations that focus on health promotion, the government shall facilitate implementation of the following **interventions**:

1. Provide an enabling environment and support to nurture innovations and entrepreneurial culture based on evidence and best practices;
2. Develop standards and guidelines for the implementation of eHealth innovations at national and county levels;
3. Develop strategies for the support of eHealth innovations through intergovernmental and private-public partnership collaboration;
4. Empower innovation champions whose role is to accelerate adoption and use of new eHealth products and services.

4.3.7 Policy Orientation 7: Compliance to Legislations and Ethics

Rapid growth of ICT has resulted in the emergence of eHealth innovations making the task of enacting laws to regulate their implementation and use difficult. Although most countries in Sub-Sahara Africa do not have legal provisions on eHealth, Kenya is in the process of enacting the draft Health Bill, 2016 that recognizes eHealth as a mode of health delivery. Once enacted, the eHealth provisions of the Bill shall protect the safety and privacy of patients from unlawful and unethical collection of demographic and health data.

To address the issue of unlawful acquisition and usage of uncertified point-of-care devices in clinical research and practice, the government should develop a framework for monitoring compliance to eHealth legal and ethical requirements. This policy provides guideline on compliance to legal and ethical requirements through the following priority and interventions:

Policy Priority: Monitoring Compliance

To monitor compliance to legal and ethical requirements, the government shall oversee implementation of the following **interventions**:

1. Provide legislation for consent for care in eHealth, to ensure that consent is sought before transferring or sharing patient information electronically through platforms such as social media, short messaging service (SMS) or video-conferencing applications;
2. Provide legislation governing medico-legal issues in eHealth applications;
3. Provide legislation/policy regarding a patient's right to access their own health information.

4.3.8 Policy Orientation 8: Training and Capacity Building

The Kenya Government has recognized the need for an increase in trained workforce to implement, operate and effectively use eHealth technologies to improve health. This orientation provides priority areas and interventions that promote development and maintenance of national eHealth training and capacity building initiatives to increase the number of health professionals with experience in various eHealth domains. To realize this agenda, this policy requires the Ministry of Health to develop strategies and partnerships that ensure Kenyans have basic literacy on eHealth regardless of their geographical or demographic differences. This policy supports this orientation through the following priorities and interventions

Policy Priority 1: Professional Training

To develop appropriate expertise in eHealth applications, the government shall develop strategies for implementing the following **interventions**:

1. Provide continuous education, sensitization and technical support to users of eHealth system;
2. Provide for eHealth to be integrated in the existing education and training curricula at different levels of education and training.

Policy Priority 2: Capacity Building

To develop appropriate capacity for the adoption and utilization of eHealth products and services, the government shall implement the following **interventions**:

1. Promote Continuing Professional Development (CPD) through e-learning platforms;
2. Organize training workshops and seminars from time to time with a view to impart new skills needed to use and maintain eHealth systems.

4.3.9 Policy Orientation 9: Management of Health Data and Information

Security, privacy and confidentiality are key factors that influence adoption and utilization of eHealth products and services not only in Kenya but also in developed world. Security is the protection of personal health information from unauthorized access, use or disclosure. This requires protection of information, network, software and hardware against attack and unauthorized access. On the other hand, privacy requires individuals to determine when, how, and to what extent information about them is communicated to others while confidentiality is non-disclosure of private information with which one is entrusted. In healthcare domain, privacy may be a legal and ethical barrier to the adoption of eHealth applications because health providers hesitate using ICTs that may result in litigations or violations of patient's rights. This policy provides guidelines on management of security, privacy and confidentiality through the following priorities and interventions:

Policy Priority 1: Managing privacy, confidentiality and integrity

To secure privacy, confidentiality and integrity of patient health information, the government shall implement the following **interventions**:

1. Develop standard and guidelines on privacy, confidentiality and integrity of health data and information;
2. Ensure that all patient health records containing problems, medication list, test

and examination results, procedures and management plans is synchronized with the Central Registry (CR);

3. Ensure sensitive health data and information is stored in anonymized or encrypted format in access controlled repositories physically domiciled within the country or as otherwise advised by the Department responsible for Standards, Quality Assurance and Regulations from the Ministry of Health;
4. Ensure appropriate security is put in place to maintain integrity of electronic health records.

Policy Priority 2: Patient-centred Access to Healthcare

To ensure an eHealth system is patient-centred and responsive to patients' needs, the government shall develop strategies for the following **interventions**:

1. Ensure the patient has right of access to their health records, and control over who should access own health data and/or information;
2. Establish a Central Registry (CR) that shall store all patients' health records containing problems, medication list, tests and examination results, procedures and management plans;
3. Ensure appropriate information access privileges are put in place to guarantee that a healthcare giver shall view client-health-information specific to the care they are giving;
4. Develop policy guidelines that provides directions on storage, access control, audit and backup plan of health data and information.

Policy Priority 3: Data Acquisition within Point-of-Care Delivery

To ensure the eHealth systems capture quality data at the point of care that may be used across heterogeneous platforms, the government shall develop strategies for the following **interventions**:

1. Establish or Identify clinical and demographic data suitable for decision making by the government, insurers, and healthcare providers;
2. Promote the safe use of Electronic Data Capture (EDC) systems, and other standard clinical equipment as the source of data while protecting privacy and confidentiality of patients.

4.3.10 Policy Orientation 10: Registration and Audit of eHealth Systems

Currently there is no inventory or centralized database of all eHealth programmes, or projects under implementation in Kenya. To avoid duplication of efforts in deployment

of eHealth interventions, it is crucial that the Ministry of Health keeps an up-to-date database of all eHealth interventions and pilot projects under implementation in Kenya. The Ministry should also develop eHealth applications licensing and audit guidelines that control deployment and use of eHealth applications for public and clinical health practices. This policy addresses the issue of eHealth registration and audit through the following priority and interventions:

Policy Priority 1: eHealth Systems Registration

To manage registration of eHealth systems, the government shall implement the following **interventions**:

1. Develop Information Systems Certification Framework (ICSF) used to regulate acquisition and installation, use, support and maintenance of eHealth systems;
2. Creating a comprehensive, up-to-date database of certified eHealth systems, its components characteristics, availability and details of ownership;
3. Revoke registration certificate and license(s) of eHealth components, system or service that violate legal and policy requirements.

Policy Priority 2: eHealth systems Audit

To manage audit of eHealth systems, the government shall implement the following interventions:

1. Develop Information Systems Audit Standards and Strategies (ICAS) used to monitor eHealth systems compliance to legal and ethical requirements;
2. Provide guidelines for monitoring, oversight and evaluation of eHealth applications deployed for public and clinical healthcare practice;
3. Set-up certification body whose role is to perform annual surveillance audits and periodic assessment audits to proactively verify that certified eHealth owners or company maintains compliance with legal and policy requirements.

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PART THREE
POLICY IMPLEMENTATION

CHAPTER 5: POLICY IMPLEMENTATION FRAMEWORK

5.1 Institutional and Governance Structure for Implementation of eHealth Policy

The Kenya eHealth Policy is alive to the devolved system of government in the constitution that outlines healthcare functions assigned to the national and county governments. This eHealth Policy shall be implemented using the Governance Framework shown in Figure 5.1.

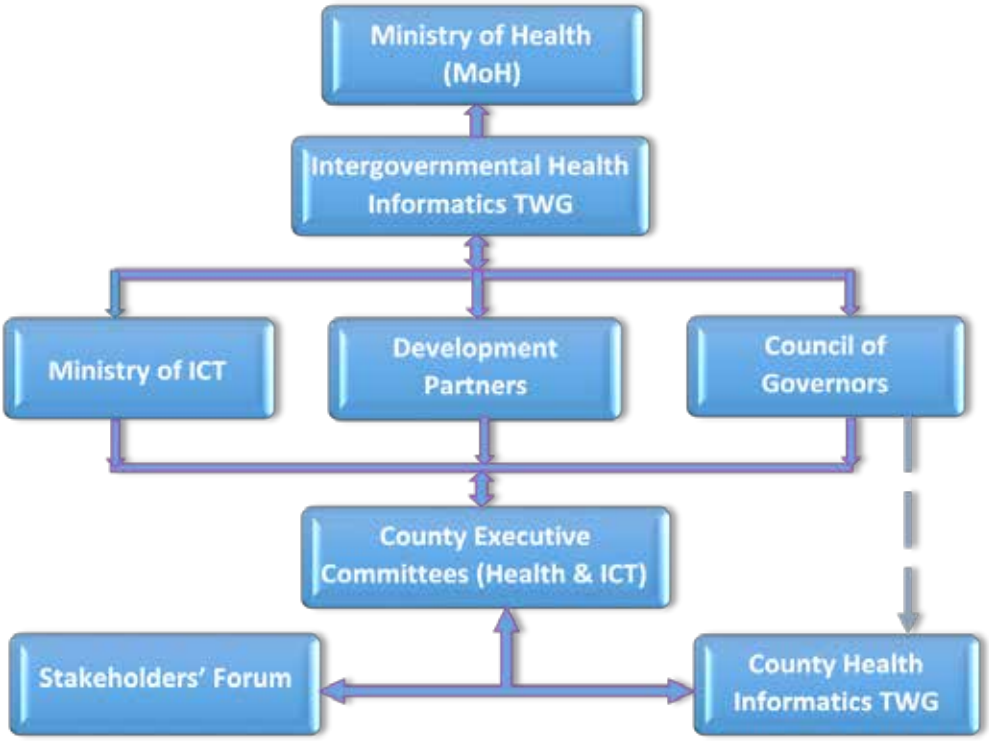

Figure 5.1: Institutional and Governance Structure for eHealth Policy Implementation

5.1.1 Ministry of Health

The Ministry of Health (MoH) is the overall custodian of this eHealth policy whose main responsibilities include:

1. Initiation and coordination of eHealth development, implementation, evaluation and review at national level through the department responsible for Policy Planning;
2. Facilitation of requisite linkages with inter-ministerial committees, parliament

and the cabinet on matters concerning eHealth policy;

3. Maintaining centralized database or register containing details of all eHealth programmes, research projects, and case studies being implemented in Kenya.

5.1.2 National Health Informatics Technical Working Group

The National Health Informatics Technical Working Group (Hi-TWG) is a high-level technical committee comprising of representatives from Ministry of Health, MoICT, health professionals, ICT industry, county governments, academia, CSOs, and development partners. The main task of Hi-TWG is to provide policy interpretations and oversee smooth implementation of the eHealth policy at national and county levels of governance.

To avoid overlap and duplication of roles, Hi-TWG will work in consultation with Ministries of Health, and ICT both at National and County levels. More specifically, the Hi-TWG shall be responsible for:

1. Monitoring compliance to the Kenya Health Enterprise Architecture (KHEA) model in the implementation of eHealth systems and applications;
2. Overseeing intergovernmental and inter-ministerial collaboration in the implementation of eHealth programmes, legislations, standards, and eHealth strategic plans at national and County levels;
3. Evaluating the progress and performance of the national and county governments in the realizing eHealth goals and targets with a view to recommending appropriate actions;
4. Building capacity of county governments to effectively monitor delivery of quality and ethically sound eHealth services.

5.1.3 Ministry of ICT

The Ministry of Information and Communications Technology (MoICT) is one of the crucial ministries whose responsibilities include:

1 Provision of technical support and advice required during development, implementation and review of this policy, and eHealth standards;

2 Monitoring and evaluation of organizational compliance with standards and guidelines for eHealth infrastructure, device specifications and software.

5.1.4 Council of Governors

The constitution of Kenya through article 6(2) require governments at both levels to conduct their mutual relations on the basis of consultation and cooperation. This article is operationalized by establishment of the Intergovernmental Relations

Act 2012 that established the Council of Governors as a forum for consultations and co-operation between the County and National governments. The act also established the National and County Government Coordinating Summit as the apex for intergovernmental relations. It is through these bodies that both levels of government are expected to consult and co-operate in matters relating to the eHealth Policy. This act also formed the basis for the establishment of the Health Committee whose functions are to:

1. Analyze international best practices and emerging trends and technologies on healthcare delivery;
2. Provide guidance on national policies dealing with health care delivery;
3. Study current Bills affecting healthcare before the national assembly, senate and county assemblies;
4. Review reports affecting health systems at county levels;
5. Consider funding for ICT-related healthcare interventions and services.

To provide guidance on national policies dealing with healthcare delivery, the Health Committee shall be required to put in place eHealth departments or sections responsible for the following functions:

1. Initiating, planning, development, and coordination of approved eHealth programmes and projects at the county level;
2. Management and accounting for expenses and revenue collected from eHealth services in the country and sub-county managed health facilities;
3. Building capacity of county health management staff and Community Health Volunteers to effectively coordinate and monitor delivery and access to eHealth services;
4. Monitoring implementation of eHealth policies and standards in collaboration with the local community, national government, and development partners;
5. Any other function agreed upon by Council of Governors during the intergovernmental consultative forums.

5.1.5 Development Partners

Development partners from Private Sector, International Organizations, Non-governmental Organizations (NGOs), Faith Based Organisations (FBOs), and Civil Society Organization (CSOs) have made significant contributions in the health sector. The role of development partners in the implementation of eHealth policy include:

1. Establishing partnerships with the national and county governments to strengthen institutions technical and financial capacity to implement the eHealth Policy;

2. Contributing to the efforts of the national and county governments in use of ICT to transform healthcare systems to improve access and quality of care;
3. Sensitizing the national and county governments on concerns, global trends, and best practices relating to use of eHealth to accelerate achievement of Sustainable Development Goals (SDGs).

5.1.6 County Executive Committees (Health & ICTs)

The county departments in charge of Health and ICT will act as the link through which the national government and the Council of Governors will interact with the stakeholders and the County Health Informatics Technical Working Group (Chi-TWG). More specifically, the County Executive Committees (CECs) in charge of Health and ICTs shall be responsible for the following:

1. Implementation of county legislations relating to implementation and use of eHealth applications and services;
2. Implementation of eHealth policy at county level though resource mobilization and capacity building;
3. Budgeting for resources required for the implementation of eHealth products and services but in consultation with county department in charge of ICT;
4. Manage and coordinate the functions of the county government in the implementation and monitoring eHealth systems, and research activities within the county;
5. Preparation of annual reports on health statistics pertaining to the current status of eHealth in the county.

5.1.7 County Health Informatics Technical Working Group

The County Health Informatics Technical Working Group CHi-TWG shall work in consultation with the stakeholders, and the County departments in charge of Health and ICT to fulfil the following roles:

1. Monitor compliance to eHealth policy in the implementation of eHealth systems and applications in each county;
2. Oversee county inter-departmental collaboration in the implementation of eHealth policy, programmes, by-laws, and strategic plans;
3. Evaluate the progress and performance of the county governments in realizing the objectives and priorities outlined in the eHealth Policy and Strategic plans;
4. Consider eHealth issues and recommendations that may be referred to the council of governors and then national government for appropriate actions.

5.1.8 Stakeholders Forum

The Ministry of Health recognizes the fact that successful implementation of eHealth policy is dependent on collaboration between various stakeholders. Thus, implementation of eHealth policy shall adopt a multi-sectoral stakeholders' forum comprising of members from national government, county government, legislature, regulatory agencies, ICT experts, health workers, private sector, civil organizations (CSOs, FBOs, and NGOs), development partners, and consumers. One of the key roles of the stakeholders' forum is to identify and request for review of this policy in order to address inconsistencies or emerging issues. It is through the stakeholders' forum that this policy seek to enhance consumer awareness on risks and benefits of using eHealth applications and services.

5.2 Policy Dissemination and Advocacy

5.2.1 Policy Dissemination

The Ministry of Health shall notify all Directors and Section Managers on this eHealth policy, its implementation and reviews through official communication channels which include emails, memos and newsletters. This will require the Ministry to provide communication plan that will reflect amongst other things timescales, legislative requirements, staff briefs, and communication protocols.

The Ministry of Health shall disseminate the progress and impact of eHealth policy implementation through departmental reports. Where issues are raised such as confusion around meaning of certain terms, the matter will be referred to the National eHealth TWG for interpretation and guidance. Quarterly and annual reports on the level of compliance shall be circulated amongst Senior Section Managers for appropriate action.

5.2.2 Policy Advocacy

In order to create awareness on the launch, review and implementation of eHealth policy, the government shall:

1 Establish platforms for dissemination of eHealth information to the general public, international community, patients and health service providers.
2 Establish mechanisms for measuring effectiveness of engagement and awareness.
3 Promote public-private partnership to engage targeted stakeholders to establish and sustain implementation of eHealth both at national and county level.

5.3 Monitoring and Evaluation Framework

Monitoring and Evaluation (M&E) refers to the periodic collection and analysis of information on the progress towards realization of eHealth objectives. The M&E Framework for this policy should be anchored on the Kenya Health Policy (2014–2030) that provides a long-term direction for health in Kenya. In this regard, we propose Result-based Framework shown in Figure 5.2 that may be customized to tools suitable for monitoring and evaluating short-term, medium term and long-term implementation and impact of eHealth policy.

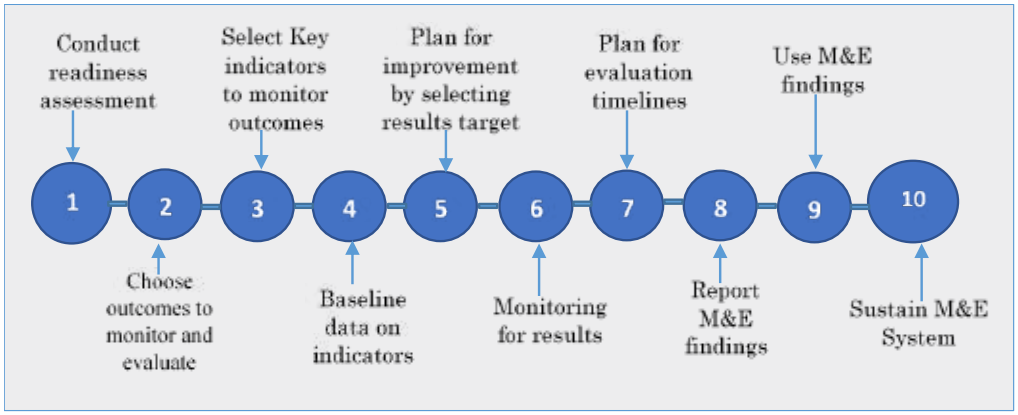

Figure 5.2: Framework for Result-based eHealth Policy M&E

To evaluate attainment of objectives stated in the health policy, this eHealth policy will be evaluated using target and process indicators in two phases. Phase one will comprise of readiness assessment through baseline surveys while phase two will measure adoption, uptake and usability against baseline indicators. The targets will reflect the constitutional requirements, national goals, health sector priorities, and county-specific goals elaborated in the County Multi-year Sectoral Plans. The process of implementing this policy shall begin by conducting readiness assessment that will be instrumental to choosing the outcomes to be monitored. Once the baseline data is collected and analyzed, plans for periodic observatory survey should be developed. The purpose of the observatory survey conducted after every three years is to evaluate success of eHealth policy implementation at national and county levels of government. The last step in the framework requires development of mechanisms for sustaining results-based M&E systems that include definition of roles and responsibilities, documenting trustworthy and credible information, accountability, capacity building, and giving appropriate incentives.

5.4 Review of eHealth Policy

The scheduled periodic review period is typically every five years, or as directed by the State Department of Health responsible for Policy and Regulation. The process of reviewing this eHealth policy will be initiated by the Ministry of Health to either reconfirm the policy with no changes, or make recommendations on modifications that may be required based on the findings of the latest observatory survey.

Changes on eHealth policy will be informed by health and ICT experts' opinion, feedback from general public, or need to align it to new legislations or global standards. The changes to the policy should be communicated to all the stakeholders who shall have a part to play policy review process. Any changes made on this policy whether in content or typographical must be documented and published as provided by Ministry of Health documents handling policy and procedures.

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CHAPTER 6: CONCLUSION

The Kenya eHealth Policy represents a commitment towards using ICT innovations to improve health and wellness of Kenyans. The eHealth Policy proposes a comprehensive and innovative approach to addressing a broad spectrum of eHealth practices, research and development that represent a radical departure from traditional healthcare delivery and access models. Moreover, the policy is anchored in the Constitution of Kenya 2010, Vision 2030, ICT Policy 2006 and the Health Policy (2014-2030) to accelerate the attainment of Sustainable Development Goals (SDGs).

Since healthcare is a complex ecosystem, this Policy was developed through a consultative approach that brought together stakeholders from various sectors. To begin with, a situation analysis was undertaken to investigate the status of eHealth in the country. It is from this study that the eHealth policy development team designed the policy framework comprising of policy goal, objectives, guiding principles, and orientations. The policy also creates a balanced implementation framework that delimits the roles of different stakeholders under the devolved system of healthcare management. Finally, the national eHealth policy defines mechanisms for monitoring, evaluating and review process to align this document to ever changing technological and stakeholders needs.

ANNEX

A. Glossary of terms

Cross Border Healthcare: Sharing information about incidence, medical background and history of a patient by a healthcare professional in different countries

eHealth policy: A set of statements, directives, regulations, laws, and judicial interpretations that direct and manage the lifecycle of eHealth.

eHealth outcomes: Defines what is to be achieved or changed through use of eHealth interventions in delivery and access to healthcare services and information

eHealth policy issue: A point or matter of discussion, debate, or dispute that may promote or inhibit inter-jurisdictional eHealth interventions.

eHealth: Refers to use of information and communication technologies (ICTs) such as computers, mobile phones and radios to deliver or access healthcare services and information.

Health: A state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity

Health system: The mechanism to deliver healthcare services to all people when and where they need them.

Healthcare services: Prevention and management of disease, illness, injury, and other physical and mental impairments delivered by healthcare professionals to individuals through the healthcare system.

Health workers: The workforce whose key responsibility is the provision of healthcare services irrespective of their organizations.

Jurisdiction: Identifiable unit that possesses some autonomy in providing or presiding over healthcare services within a defined sphere of authority such as hospital, administrative region, country, or international agency.

Low-resource settings: Underserved rural and urban areas characterized by poor infrastructure, inferior technologies, limited access to basic needs and poor lifestyle.

Non-state Actors: Individuals or institutions that are not part of the state but their primary role is provision of health-related services and information.

Outcome indicators: Indicators that provide insights into the tangible results that results from adoption and use of eHealth systems.

Policy: A plan or course of action of a government, political party, or business

intended to influence and determine decisions, actions, and other matters."

Vital Signs: Physiological parameters such as temperature, respiratory rate, pulse, blood pressure and haemoglobin that provide information about one's state of health.

B. References

[1] D. Cabrnoch, D. Jan Rys and D. Lloyd Williams, "E-Quality in E-Health", Health First Europe, February, 2011.

[2] The Kenya Government, "The Kenya Information and Communications Act (Chapter 411A)", National for Law Reporting, Nairobi, 2011.

[3] Ministry of Medical Services, "Standards and Guidelines for Electronic Medical Records Systems in Kenya", Ministry of Medical Services, Nairobi, 2010.

[4] Kenya Government, The Kenya Gazette, "The Health BILL, 2016", No. 44 of 2015, Government Printer, March 2016.

[5] Kenya Government, The Kenya Gazette, "Cyber Security and Protection Bill, 2016" Government Printer, July 2016.

[6] Principles for Digital Development. Accessed from http://digitalprinciples.org/wp-content/uploads/2015/05/Principles-Overview.pdf

[7] Ministry of ICT, "The Kenya National ICT Masterplan", Nairobi, April 2014

[8] S. Khoja, H. Durrani, P. Nayani, and A. Fahim, "Scope of policy issues in eHealth: results from a structured literature review," Journal of medical Internet research, vol. 14, p. e34, 2012.

[9] C, Omaswa, "Uganda National E-health Policy 2013", Ministry of Health, Kampala, April. 2013.

[10] Ministry of Health, "Kenya Health Policy 2014-2030", Ministry of Health, Nairobi, July 2014.

[11] M. Mars and R. E. Scott, "Global e-health policy: a work in progress," *Health Affairs,* vol. 29, pp. 237-243, 2010.

[12] T. Baardseng, "Telemedicine and eHealth in Norway: administration and delivery of services," *International journal of circumpolar health,* vol. 63, pp. 328-335, 2004.

[13] M. Njoroge, D. Zurovac, E. A. Ogara, J. Chuma, and D. Kirigia, "Assessing the feasibility of eHealth and mHealth: a systematic review and analysis of initiatives implemented in Kenya," *BMC Research Notes,* vol. 10, p. 90, 2017.

[14] K. A. Stroetmann, J. Artmann, V. N. Stroetmann, and D. Whitehousee, "European countries on their journey towards national eHealth infrastructures," *Luxembourg: Office for Official Publications of the European Communities,* 2011.

[15] P. Sylva, B. Abeysinghe, C. James, A. Jayatilake, S. Lunuwila, D. Sanath, *et al.*,

"A review of eHealth policies that underpin global health care digitization," *Sri Lanka Journal of Bio-Medical Informatics,* vol. 2, 2012.

[16] M. Barua, X. Liang, R. Lu, and X. Shen, "ESPAC: Enabling Security and Patient-centric Access Control for eHealth in cloud computing," *International Journal of Security and Networks,* vol. 6, pp. 67-76, 2011.

[17] T. Greenhalgh and J. Russell, "Why do evaluations of eHealth programs fail? An alternative set of guiding principles," *PLoS Med,* vol. 7, p. e1000360, 2010.

[18] D. K. Ahern, J. M. Kreslake, and J. M. Phalen, "What is eHealth (6): perspectives on the evolution of eHealth research," *Journal of medical Internet research,* vol. 8, p. e4, 2006.

[19] H. Hyppönen, "Towards a Joint View of the European eHealth Priorities," *SWOT Analysis of Patient Empowerment and Patient Summary activities in Europe. Reports,* vol. 15, p. 2008, 2008.

[20] S. Widén and W. Haseltine, "Case Study: The Estonian eHealth and eGovernance System," *New York: Access Health International,* 2015.

[21] D. Grunwell, R. Gajanayake, and T. Sahama, "Improving usefulness of ehealth systems through information accountability," *e-Health Technical Committee Newsletter,* vol. 2, pp. 3-5, 2013.

[22] P. Kierkegaard, "Governance structures impact on eHealth," *Health Policy and Technology,* vol. 4, pp. 39-46, 2015.

[23] R. E. Scott and A. Saeed, "Global eHealth: measuring outcomes: why, what, and how," *Bellagio: The Rockefeller Foundation,* 2008.

[24] K. Alsulame, M. Khalifa, and M. Househ, "eHealth in Saudi Arabia: Current Trends, Challenges and Recommendations," *Stud Health Technol Inform,* vol. 213, pp. 233-236, 2015.

[25] World Health Organization (WHO) and International Telecommunication Union (ITU), *National eHealth strategy toolkit*: Geneva, 2012.

[26] K. Juma, M. Nahason, W. Apollo, W. Gregory, and O. Patrick, "Current Status of E-Health in Kenya and Emerging Global Research Trends 1," 2012.

[27] M. E. Odhiambo, "A framework for implementation of e-health in Kenya public hospitals," Strathmore University, 2015.

[28] R. Wootton, *Telehealth in the developing world*: IDRC, 2009.

[29] J. Bend, *Public value and e-health*: Institute for Public Policy Research, 2004.

[30] R. Tezera, "E-health Policies in the Ethiopian Policy and Strategy Documents," AAU, 2013.

[31] H. Frasier, M. A. May, and R. Wanchoo, "e-Health Rwanda case study," American *Medical Informafics Associafion,* 2008.

[32] S. Yusif and S. Jeffrey, "Preparedness for e-Health in developing countries: the case of Ghana," *Journal of Health Informatics in Developing Countries,* vol. 8, 2014.

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