Republic of Zambia

Ministry of Health

E-Health Strategy 2013-2016

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Foreword

The Government of the Republic of Zambia aims to deliver the highest quality of healthcare services to its citizenship. To this effect, it has embraced the use of Information and Communication Technology (ICT) in its service delivery channels. Information and Communication Technologies have, over the past few years, significantly impacted many aspects of society and has the potential to impact positively on the delivery of health care services. The development of the national e-health strategy comes at critical moment when the ability of ICTs to support and transform health care has been recognised. In Zambia, e-health plays a central role in facilitating the harmonisation of the previously fragmented and disjointed systems and approaches in implementation and maintenance of Health initiatives.

Equally, it is anticipated that once this e-Health strategy is implemented, it would enhance sustainability of ICT projects and would be factored in the implementation of health initiatives thereby reducing donor dependency in ICTs. In addition, it would also assist in developing the much needed human resource capacity as well as utilise the available staff prudently through the use of ICTs.

At the national level, the importance of ICT in national development is demonstrated by the launch of the National ICT Policy in 2007 and the inclusion of ICT as a priority sector in the Fifth National Development Plan 2006-2010. A challenge has now arisen for the country to implement the e-health strategy and therefore all stakeholders are called upon to rise to the challenge. The need for the government to develop its e-health strategy that will guide the health sector and regulate the use of its ICT resources could not be over emphasized. This e-health strategy therefore will give well defined guidelines in the manner in which all issues relating to ICT will be managed.

It is my considered view that, with appropriate levels of commitment and support from the Government, Cooperating Partners (CPs), health workers and other key stakeholders, this strategy would significantly improve the management of the public health sector and lead to improvement of the health status of Zambians and significantly contribute to national development. I therefore, urge all stakeholders involved in the implementation of this e-health strategy to fully educate themselves to this important document. The Ministry is committed to ensuring the successful implementation of it.

Dr. Kasonde

Minister of Health

Acknowledgement

This e-health strategy has been developed through an iterative, participative and consultative process involving significant contributions and support from various individuals and institutions. I therefore wish to extend my sincere appreciation to all those that contributed to the process of developing it. While it is recognized that a large number of individuals and institutions contributed to this process, I wish to pay special tribute to the successful completion of this document to the following technical team members:

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22. Mr Chris Opit - USAID/DELIVER Project: Senior IT Advisor
23. Mr. Kelly Simpamba - Computer Society of Zambia: Vice President

On behalf of the Ministry of Health, I also wish to acknowledge the financial and technical support rendered to us by our Cooperating Partners in supporting this process. Without the direction and valuable support of our Cooperating Partners and other line ministries, we would not have managed to successfully complete this document.

Finally, I wish to thank all members of staff of the Ministry of Health for their participation, contributions and support to the process of formulating this e-health strategy.

Dr Peter Mwaba

Permanent Secretary

MINISTRY OF HEALTH

ACRONYMS

CDC	Centres for Disease Control & Prevention
CIDRZ	Centre for Infectious Disease Research in Zambia
CPs	Cooperating Partners
DHIS	District Health Information System
DMO	District Medical Office
Email	Electronic Mail
GIS	Geographic Information System
HIV/ AIDS	Human Immune Virus/ Acquired Immune Disease Syndrome
HMIS	Health Management Information System
HPCZ	Health Professionals Council of Zambia
HR	Human Resource
HRH	Human Resources for Health
HRIS	Human Resources Information System
ICT	Information and Communication Technology
IEC	Information Education and Communication
JSI	John Snow Inc – USAID| Deliver Project
LAN	Local Area Network
LMIS	Logistics Management Information System
M & E	Monitoring & Evaluation
MCDMCH	Ministry of Community Development Mother and Child Health
MoE	Ministry of Education
MoFNP	Ministry of Finance and National Planning
MoH	Ministry of Health
MSL	Medical Stores Limited
NCDs	Non-Communicable Diseases
PMO	Provincial Medical Office
TB	Tuberculosis
VCT	Voluntary Counselling and Testing
VoIP	Voice Over Internet Protocol
WAN	Wide Area Network
WHO	World Health Organisation
ZDHS	Zambia Demographic Health Survey
ZPCT	Zambia Prevention and Care Treatment

1. BACKGROUND

The Government of the Republic of Zambia is committed to delivering better and more practical measures that would ensure the uniform growth of Information and Communications Technology (ICT) in all sectors. Government Ministries are expected to take the lead thereby enabling stakeholders and the public to benefit from the speedy availability of accurate data and information.

In March 2007, the National ICT Policy was launched by the then President of the Republic of Zambia, Dr. Levy Mwanawasa. The National ICT Policy provides the guiding principles around which sector ICT policies should be developed. It therefore became necessary for each sector of the Public Service to formulate its own ICT Policy as a conduit for implementing the National ICT policy. The ministry rose to this challenge and included a chapter on ICT in rhe MOH National Policy that was launched in September 2012. Other documents for the Government of the Republic of Zambia include: the Vision 2030 plan which seeks to empower the Zambian populace with information among other things; The Fifth National Development Plan (2006-2010); the National Health Strategic Plan (2006 - 2010) and the Ministry of Health Strategic Plan 2005 – 2009 which also provides impetus to the process as it stresses systems strengthening, infrastructure and equipment among its priorities.

The Ministry of Health has a number of ICT operational guidelines for different information systems. However, in some areas of ICT application, there have been no guidelines. Against this back ground, it was found to be expedient that all the available ICT guideline documents be harmonised and incorporate the missing guidelines and consolidate them into one document.

2. INTRODUCTION

This e-health strategy is a product of research and consultations. The effective and efficient use of ICTs will not only translate into better and efficient service delivery but will also improve planning and accountability in the health sector. The e-health strategy provides the Ministry with clear guidelines that will drive growth and transformation through the effective use of Information and Communications Technology (ICT).This strategy will give broad operational guidelines to the various e-Health stakeholders working with the ministries responsible for health. It will identify focus areas such as Information Systems, ICT Infrastructure, Human Resource Development and Administrative functions. Furthermore, the strategy has been designed to provide all ICT users in the ministries responsible for health, with new opportunities for learning, developing skills, and accessing important information and services. In order to harness and provide adequate protection to the ICT resources, various components of this strategy will ensure that ICTs are well developed, maintained and utilised.

3. PROBLEM STATEMENT

The Zambian health system is facing challenges to cope with the high disease burden against the backdrop of shortage of health care professionals, and inadequacies in drugs and medical supplies, funding, equipment and infrastructure including ICTs. The vision of the Ministry of Health is “a nation of healthy and productive people”.

Even though there has been substantial investment into information systems in the health sector; it has been characterised by the following key challenges:

1. Fragmented approach in implementation and maintenance of e-Health initiatives.
2. Existence of disjointed systems that do not communicate with each other
3. Lack of an e-Health strategy
4. Sustainability of ICT projects is not factored in the implementation and results in donor dependency
5. Limited human resource capacity and insufficiently developed or underutilized infrastructure.

With the current ICT advancement and growing influence, there is need to adopt and use such systems and a conducive environment for successful implementation of e-Health systems.

4. SITUATIONAL ANALYSIS

Zambia like many other countries has a tiered health care structure that facilitates a referral system with complicated cases moving from primary, secondary to tertiary level. The private sector and church run units complement government efforts. Zambia has also not been spared from challenges with respect to healthcare workers. The current establishment is inadequate at all levels of the health care delivery system. Hence, health seeking behaviour has also included consultations with traditional healers as an alternative. This is especially true for hard-to-reach areas and rural Zambia.

Zambia has a high burden of disease, which is mainly characterised by communicable diseases, particularly, malaria, HIV and AIDS, STIs, and TB, and high maternal, neonatal and child morbidities and mortalities. Non-communicable diseases are also on the rise, including mental health, diabetes, cardio-vascular diseases and violence[i].

According to the 2007 Zambia Demographic and Health Survey (ZDHS 2007), Maternal Mortality Ratio (MMR) reduced, from 729 deaths per 100,000 live births in 2002, to 591 in 2007; Under-Five Mortality Rate (U5MR) reduced from 168 per 1000 live births in 2002, to 119 in 2007; Infant Mortality Rate (IMR) from 95 to 70; and Neonatal Mortality Rate (NMR) reduced from 37 to 34, over the same period.

The malaria and TB programme performance reviews conducted in 2010, and other reporting health systems, also reported major improvements in the prevention and control of malaria and TB. Malaria incidence per 1000 population dropped from 412 in 2006, to 246 in 2009. TB treatment success rate improved from 79percent in 2005 to 86percent in 2008.

However, despite these achievements, the sector continues to face major challenges, which include: high disease burden; inadequate medical staff; weak logistics management in the supply of drugs and medical supplies; inadequate and inequitable distribution of health infrastructure; obsolete equipment and depleted transport; challenges related to health information systems; inadequate financing; and identified weaknesses in the health systems governance.

Zambia has long identified the critical shortages of health workers, as a major obstacle to the attainment of the national health priorities including health related MDGs as availability of adequate numbers of appropriately qualified and experienced health workers, in the right skills-mix, is a major determinant of health service performance.

The two main problems concerning the human resource situation are the critical shortages of health workers, leading to abnormal staff to patient ratios, and the inequitable distribution of the available health workers, leading to imbalances. The Table below presents the development of human resources 2005-10:

Table 1: Number of staff posted per category in public sector by 2005 and September 2010, and the approved establishment for 2010

Health Staff	No. Of Staff 2005	No. of Staff 2010	Increase of Staff	Estab. 2010	Gap to Estab.	Gap to Estab. (%)
Clinical Officer	1,161	1,535	374	4,000	2,465	62
Dentistry	56	257	201	633	376	59
Doctors	646	911	265	2,300	1,389	60
Nutrition	65	139	74	200	61	31
Laboratory Services	417	939	222	1,560	921	59
Pharmacy	108	371	263	347	- 24	- 7
Physiotherapy	86	239	153	300	61	20
Radiography	142	259	117	233	- 26	- 11
Midwives	2,273	2,671	398	5,600	2,929	52
Nurses	6,096	7,669	1,573	16,732	9,063	54
Environmental health	803	1,203	400	1,640	437	27
Other Health Worker	320	363	43	5,818	5,452	94
Total clinical staff	**12,173**	**16,256**	**4,083**	**39,360**	**23,104**	**59**
Administration	11,003	14,457	3,454	12,054	- 2,403	- 20
Overall total	**23,176**	**30,713**	**7,537**	**51,414**	**20,701**	**40**

Although the ministry of health has realised that some of the challenges being experienced in the healthcare delivery system could be mitigated through the use of ICTs. This however has not been without its own share of challenges. These include among others decision making challenges arising from the lack of integrated information systems. Added to this are inadequate numbers of ICT technical staff and the lack of appropriate skill-sets to maintain the existing ICT infrastructure. In addition, there has been a challenge with procurement of ICT equipment. This has

not been done through a coordinated procurement plan using a standard ICT equipment specification in line with government procurement policy and guidelines. Lastly, the current supply chain management system is inadequate to support the demands of healthcare delivery system. A Telemedicine system and infrastructure has been deployed at the University Teaching Hospital through the Pan-African e-Network support programme. Three components are currently functional: tele-consultation, e-learning and tele-radiology. The system is linked to twelve Indian teaching hospitals and five African countries (Nigeria, DRC Congo, Mauritius, Egypt and Senegal).

The **SmartCare** Electronic Health Record system (EHR) has been developed and deployed by The Ministry of Health (MOH) Zambia, in collaboration with the Centers for Disease Control and Prevention (CDC) and many other implementing partners.

SmartCare is a fully integrated electronic health record system to provide continuity of care and a clinical management information system at the facility and district level. It is a key component in 'one National M&E system'. Currently, SmartCare is deployed in close to 600 facilities in all districts of Zambia. Partners are supporting deployment in government and private facilities but government deployments & enrolment rates are increasing most rapidly

The HMIS was introduced in Zambia in 1996 and currently captures data on disease morbidity and mortality, maternal and child health services, service delivery (staff workload, health facilities utilization, availability of essential drugs etc.), surveillance and financial services. Environmental health and administrative data are also captured on an adhoc basis. HMIS data collection is conducted at the health facility level using a paper based system and is aggregated and computerised from district to national level.

Project Mwana is an innovative mhealth initiative implemented by the Zambian Ministry of Health with the support of UNICEF and its collaborating partners: the Zambia Centre for Applied Health Research and Development (ZCHARD), a Boston University affiliate; the Zambia Prevention, Care and Treatment Partnership (ZPCT); and the Clinton Health Access Initiative (CHAI). The m-Health system is also formerly called SMS technology system. This system uses mobile technology to improve early infant diagnosis of HIV to address early Infant Diagnosis of HIV and

post-natal follow-up and care by way of sending infant HIV test results from the three PCR laboratories to the health centres.

5. SWOT ANALYSIS

Strengths	Weakness
1. Cooperating partners good-will to support the e-Health strategy - Enabling environment for partnership 2. Some Nursing and Paramedical training institutions already have computer laboratory as an aid to teaching and practicing computer skills. Introduction of HMIS course in the curriculum for pre service training institutions creates an e-Health ready environment 3. MOH National Health Policy that recognizes e-Health as a national priority	1. Inadequate referral health institutions capable of carrying out complex medical procedures 2. Under-utilisation and lack of integration of modern medical equipment and adequate skill to manage them. 3. Insufficient Human Resource for Health compounded by High staff attrition and shortage of ICT staff to support and maintain infrastructure. 4. Absence of a national e-Health Strategy to guide implementation of e-Health initiatives 5. Limited exchange and sharing of information among health stakeholders 6. Low awareness of e-Health
Opportunities	**Threats**
1. Growth of the telecommunications infrastructure capacity makes e-Health applications more viable and, as a result this will increase the number of networked transactions to produce an explosive growth in telecommunications usage and an increasing rate of change of healthcare processes. 2. High penetration of mobile devices 3. Technological advancement in application of ICT in health such as in the use of Geographical Information Systems for facility and equipment mapping 4. Enabling environment for e-health through government legislation - ICT Policy,2006, ICT Act,2009, ECT Act 2009 a National e-Government Strategy in place	1. Delays in project implementation due to government bureaucracy 2. Over dependence on donor funding for local initiatives 3. Data security and communication threats through cybercrimes 4. Unreliable power supply resulting in systems outages 5. Lack of expertise in project management in the public service. 6. There are points of strain between patients and some physicians who feel a loss of control over their patients' care; Security Concerns-the perception of a lack of security will inhibit the use of the Internet for personal clinical information in the near term.

6. STRATEGIC FOCUS

6.1. Vision

A quality innovative e-Health system that will effectively contribute to a nation of healthy, productive people

6.2. Mission

To promote effective and efficient use of ICTs in order to support equitable access to cost effective, quality health services, as close to the family as possible.

6.3. Guiding Principles

The following principles shall guide the e-health strategy

6.3.1. Primary Health Care (PHC) approach

To consistently adhere to the PHC approach to organization, management and control of the health service delivery systems, in line with the relevant World Health Assembly (WHA) declarations, as endorsed by the WHO African region at the Ouagadougou Declaration of 2008.

6.3.2. Equity of access

To ensure equitable access to healthcare services for all, regardless of their geographical location, gender, age, race, social, economic, cultural or political status

6.3.3. Affordability

To ensure affordability of healthcare services to all, taking into account the socio-economic status of the people.

6.3.4. Cost-effectiveness

To ensure efficient and cost-effective delivery of healthcare services, always ensuring “Value for Money”.

6.3.5. Transparency and accountability

To ensure highest standards of transparency in the management of the health sector at all levels, and accountability for the actions taken, resources utilised and to the communities served at all levels.

6.3.6. Decentralisation

To further strengthen decentralization of health service management and delivery, in line with the National Decentralisation Policy of 2003.

6.3.7. Partnerships

To continuously review and strengthen partnerships with all the main stakeholders, through stronger and effective coordination and harmonization, in line with the relevant international protocols.

6.3.8. Gender sensitivity

To ensure gender sensitivity and balancing in the management of the health system and delivery of health services at all levels.

6.3.9. Leadership

To ensure appropriate, visionary, efficient and effective leadership in the management and control of the health sector at all the levels.

7. STRATEGIC PRIORITIES

The e-Health strategy will address the following key focus areas: Telemedicine; Information Systems; IEC through Health Promotion; m-Health; e-Learning and capacity building. This will entail the redesigning of existing Health Information Systems and development and/or implementation of new innovative solutions to aid improvement of health service delivery. This conceptual framework will support the development of standards and procedures for leveraging existing technology and development, customisation and implementation of systems such as electronic health records, supply chain management, education management systems, mobile applications, data transmission systems, and human resource systems.

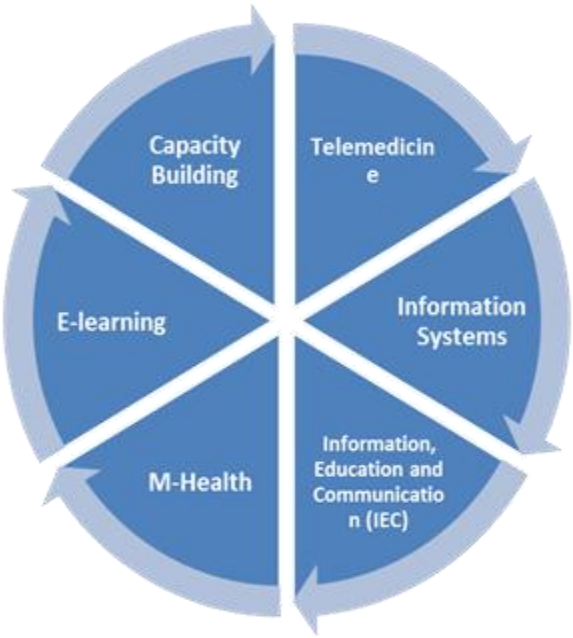

Figure 1: Focus Areas for the E-Health Strategy

The inherent interdependence of health services calls for recognition of overlapping outputs from intervention in these areas of focus and the need for mechanisms for maintaining cohesion in their management.

7.1. Information Systems

Information System is a combination of people, hardware, software, communication devices, network and data resources that processes data and information for a specific purpose. The operation theory is just similar to any other system, which needs inputs from users. The captured data will then be processed using devices such as computers, and produce output that will be sent to another user or other systems via a network and a feedback method that controls the operation.

Objective

1) To improve availability of relevant, accurate, timely and accessible health care data to support patient care and management, planning, coordination, and monitoring and evaluation of health care services

Key Strategies

a) Strengthen Health Information Systems such as HMIS and SmartCare

b) Strengthen research in e-health

c) Develop standards and guidelines for design of e-health applications

d) Strengthen harmonisation to enhance interoperability of different health management information systems among programmes

Objective

2) Improve district, provincial and national level demand for health data for planning purposes.

Key Strategy

a. Improve district, provincial and national level demand for health data for planning purposes.

Objective

3) Improve availability and access to essential health commodities for clients and service providers.

Key Strategies

a) Strengthen Logistics Management Systems for health commodities

b) Provide reliable and timely data for forecasting and quantification of national health commodity requirements

Objective

4. Enhance the efficient delivery and management of health facility support services and resources through e-health solutions.

Key Strategies

a) Maintain an updated catalogue of e-health system requirements.

Objective

5. Strengthen GISs and maintain comprehensive databases for efficient analysis of health information

Key Strategies

a) Maintain an updated health facility mapping database

b) Integrate GIS functions in existing and new information systems

7.2. Telemedicine

There is need to embrace and promote telemedicine as an intervention where the geographical divide between the patient and the health specialist is bridged through the use of appropriate ICTs.

Objective

To deliver expert skills in health care to all at a distance with the help of information and communications technologies (ICT)

Key Strategies

a. Promote the use of telemedicine in the health sector by developing a comprehensive framework, guidelines and operational model on the use of telemedicine.
b. Selection of priority hospitals, training schools and health facilities to deploy the system
c. Setup and implement link to health facilities using WAN and provide telemedicine services

7.3. m-Health

Mobile technology offers great potential to revolutionize healthcare delivery in Zambia. Stemming from the rapid rise of mobile phone penetration in Zambia, m-Health has in the recent years emerged as an application for these nations[1]. In Zambia, a country with a subscriber base of 10.5 million [2] and 70percent coverage, the field, largely emerges as a means of providing greater access to larger segments of a population, as well as improving the capacity of health systems in the provision of quality healthcare[3].

Objective

To increase access to quality of healthcare and health-related information through the use of mobile technologies

Key Strategies

a) Promoting the use of m-health in the health sector by establishing a mHealth technical working group, a framework, guidelines, procedures and protocols
b) Expand the scope of m-Health applications and support health service delivery by creating linkages to Electronic Health Records Systems
c) Ensure the timely availability of health information for quality patient care and decision making
d) Lobby and advocate for mHealth by creating awareness through conducting sensitization meetings and dissemination of results from successful mHealth implementations both locally and internationally

[1] National Health Strategic Plan 2011-2015
[2] ZICTA ICT Sector Report 2012
[3] www.unicef.org

7.4. E-Learning

Electronic learning also known as eLearning is an educational approach that is increasing in demand with the advent of technological advancement ICTs. E-learning is a useful tool in resource constrained environments to deliver education. It helps in addressing issues of access and providing access to training. E-learning includes the use of multimedia learning, technology-enhanced learning, computer-based learning, internet-based training, online education, virtual education among others.. The National Information, Communication and Technology Policy supports the use of ICTs in education, research and development. The e-Health strategy provides opportunities and a platform for e-learning that is related to health issues for the citizens as well as building capacities of Human Resource for Health (HRH).

Objective

1. To expand access to training institutions for all citizens at all levels through e-learning

Key Strategies

a. Develop e-learning standards and guidelines

b. Provide incentives to e-learning initiatives and projects

c. Promote the use of e-learning as an authentic mode of learning

Objective

2. To provide innovative and effective Learner support services

Key Strategies

a. Facilitate easy tracking, feedback and support for learners

b. Enhance ICT skills of the e-learning instructors and learners

c. Enforce effective records management practices at institutional level

d. Enhance learner support services

e. Establish and encourage research and development in e-learning

Objective

3. To provide skills-based training through demand-driven courses by e-learning

Key Strategies

a. Enhance competencies in national priority skills areas
b. Provide responsive e-learning curriculum to support the flexible delivery of health services to the various learners at all levels

7.5. Capacity Building

MoH recognizes the need for e-Health capacity improvement for achievement of its strategic objective because Integration of e-Health programmes and trainings is inevitable.

Objective

To strengthen human resources capacity and create an environment in which e-health can effectively contribute to quality and health care service delivery

Key Strategies

a. Strengthening and building the capacity of health information cadres at all levels in order to improve the efficiency, quality and timeliness and availability of data
b. Strengthen data capturing capacity of HMIS to include other important conditions such as NCDs and eye diseases
c. Undertake a comprehensive change management exercise
d. Build capacity in the use of the Human Resource information Management System
e. Build capacity in the use of Laboratory Management Information System
f. Strengthen and build capacity for all hospital staff in the use of Hospital Information Management System
g. Enhance the use and support of the Geographical Information System
h. Build capacity of e-learning providers in material development and learner support
i. Make ICT skills mandatory for all healthcare professionals thus achieving computer literacy within 48 months
j. Liberalize e-Health capacity building in the health sector

7.6. Health Promotion

Health promotion has been defined by the World Health Organization's (WHO) 2005 Bangkok Charter for Health Promotion in a Globalized World as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health".[1] The primary means of health promotion occur through developing healthy public policy that addresses the prerequisites of health such as income, housing, food security, employment, and quality working conditions.

Objective

To provide efficient and effective IEC to empower communities with appropriate knowledge to develop and practice healthy lifestyles and stimulate access to appropriate health services.

Key Strategies

a. Support health communication research in health promotion programmes and services to generate evidence-based e-health information and learning
b. Ensure e-health information databases are effectively managed and updated
c. To create a platform to effectively support publication of health documentations and publications

d. Lobby and advocacy promote e-health promotion policies to inform and increase awareness among decision-makers and senior officials

7.7. Implementation framework

In October 2012, a broad range of stakeholders from government, private sector and cooperating partners held the first meeting in Lusaka. A follow up meeting was held in Livingstone in May 2013 to prioritize the strategic areas of intervention and device an implementation framework for the strategy.

The technical team identified the following strategic priorities:

1. Information systems
2. Telemedicine
3. m-Health
4. e-Learning
5. Capacity building
6. Health promotions

Envisaged timelines for the implementation of the focus areas have been tabulated within a 3 year time frame and are shown in the logical framework given as annex (ii).

8. Policy and Regulatory framework

This strategy will be mainly guided by and will comply with the MOH National Health Policy, National Health Service Act, the National Decentralization Policy and the National Health Strategic Plan 2011-2015 in order to facilitate improved service delivery and other relevant policies. Various government institutions and stakeholders will be involved in monitoring and providing clear guidelines through the term of this strategic document.

8.1. Legal References

The areas to be addressed via legislation and other legal mechanisms in order to foster smooth transaction to e-health include compliance with:

a. The Constitution and Laws of Zambia
b. The Penal Code
c. ZICTA, Information Communication Technologies ICT Act No.15 of 2009
d. ZICTA, Statutory Instrument on the Registration of Electronic Communication Apparatus No. 65 of 2011
e. National ICT Policy, , Zambia
f. The regulatory documents for bodies such as the Health Professional Council, Zambia Institute of Chartered Accountants and the Computer Society of Zambia

8.2. Institutional and Coordination Framework

This strategy will be implemented through the existing health sector institutional structures and coordinating framework. MOH will take the overall responsibility for coordinating and ensuring successful implementation and attainment of the objectives of this plan. However, several other players will be involved in its implementation, including: other line ministries and government departments;

Churches Health Association of Zambia (CHAZ); private sector; traditional and alternative medicines sector; civil society and communities; the Cooperating Partners.

To ensure efficient and effective coordination of the partnerships with all these players, the e-Health initiatives will leverage on MOH's plan to strengthen the SWAp and inter-sector collaboration and coordination mechanisms at all levels. Emphasis will be placed on strengthening the leadership and governance systems and structures, so as to ensure the highest levels of participation, transparency and accountability at all levels.

8.3. Monitoring and Evaluation

The logic model presents a monitoring and evaluation mechanism that enhances the effectiveness of the e-Health strategy by establishing clear metrics to measure the performance of the e-health initiatives in delivering services to its stakeholders.

The logic model presented describes the actions expected to lead to the desired effects of the e-Health strategy by being a reference point for all stakeholders as well as identify the potential obstacles to the program operation.

The logic model will be used as a basis for evaluation, which will answer any question at any level of the monitoring and evaluation pipeline , that is, inputs, activities, outputs or outcomes.

9. Programme e-Health Logic Model

Objective:

Provide the people of Zambia with equitable access to quality, cost effective and affordable health services through an innovative ICT system.

Situation:

Development and implementation of an appropriate ICT framework has become an integral part of health care services delivery.

The demand for high quality health information, rising costs and demand for quality health care services at affordable and needed time, coupled with inadequate skilled human resources has all necessitated the need for eHealth in order to achieve equitable access to quality health services.

EHealth is critical to improving health service delivery as it cuts across barriers which are as a result of inadequate personnel, geographical barriers as well as physical inaccessibility to health facilities. It provides for essential infrastructure for information exchange between participants in health care system and driver for improved health outcomes.

In view of the above, it has become necessary to develop an eHealth strategy as it provides an opportunity for exploring effective ways to respond to the health care needs of individuals and communities.

Programme: e-Health Logic Model

Inputs	*Activities*	*Outputs*	Outcomes – Impact		
			Short	*Medium*	*Long*
1. Resources ·Funding · Staff 2. Stakeholders National Level			2014	2015	2016
Parliament	Review Annual progress and evaluation reports	Provide Checks and Balance, Budgetary support			
Office of the Auditor General	Undertake audits and value for money evaluations	Audit report			
Health Sector Advisory Group	Ensuring monitoring and evaluation findings are fed into sector planning and budgeting	Well planned and budgeted activities for the sector			
Ministry of Health	Coordinate and implement monitoring and evaluation processes	An efficient M&E system that provides feedback for informed decision making.			
Ministry of Community Development, Mother and Child Health	?????				

Central Statistics Office		Develop an integrated Intelligent Data warehousell for health data from all existing, diverse data sources into a Central repository	Intelligent Data warehouse		Central repository of all health related data developed	
University of Zambia		build capacity of academic and government institutions to analyze, interpret and utilize data for program planning to improve health outcomes	Increased number of courses and modules offered by UNZA	Capacity of academic and government institutions to analyze, interpret and utilize data built.		Capacity of local Zambian professionals to analyze, and use data compiled
National AIDS Council		Support Increase use of web- and computer based data systems	Web based data entry interface			
Provincial Level Provincial Development Coordinating Committee		Ensure monitoring and evaluation findings feed into provincial planning and budgeting processes	strategic guidance and a coordinated M&E perspective.			
Provincial Administration		undertake M&E activities and coordinated Management Information Systems in the provinces	M&E reports			
District Level District Development Coordinating		Ensure monitoring and evaluation findings feed into	a coordinated M&E perspective.			

Committee		provincial planning and budgeting processes						
District Administration		undertake M&E activities and coordinated Management Information Systems in the provinces		M&E reports				
Area Development Committees		Undertake monitoring and evaluation activities for project implementation in their areas.		M&E reports				
3. Planning ·Evaluation ·Program Sustainability								
Assumptions 1. Fulfillment of financial support to the program. 2. Continued goodwill and commitment from all stakeholders 3. External funds and well-placed change agents can facilitate institutional change.					Contextual Factors 1. Competing public health priorities			

The focus of the eHealth strategy will be on standardizing tools and methodologies, and improving coordination of Monitoring and Evaluation systems at national, provincial and district levels. The Directorate of Policy and Planning will ensure that the Logic model is adhered to by the various implementing institutions, including reporting requirements. Monitoring and Evaluation operational manuals will be developed according to the Government wide Monitoring and Evaluation System coordinated.

Notably, Parliament, the Auditor General's Office and District Councils have been incorporated into the Plan M&E Institutional Framework, as key institutions to provide oversight, on effective national and sub-national Monitoring and Evaluation Systems. Leveraging these institutions for adoption, guidance and implementation of the M&E framework will be essential

9.1. Monitoring Processes, Systems and Tools

The e-health strategy monitoring and evaluation will be undertaken through the following processes and systems:

a) Budget Execution Monitoring;
b) Project Spot monitoring;
c) Analysis of administrative data or Management Information Systems;
d) Benefits measurement
e) Impact assessments
f) Surveys; and
g) Research and Development.

The Plans will be monitored through Quarterly Progress Reports, Annual Progress Report, Mid-Term Review Report and Final Evaluation Report.

To effectively monitor and evaluate the implementation of sector programmes the output matrix and key performance indicator tables will be used (See Annex).

Annex

i. Key Performance Indicators

FOCUS AREA		INDICATORS
1.	**Information Systems**	• Number of facilities with capabilities to connect to services at central level • Integration of health systems into a common platform by 2018 • Number of information systems with Business Continuity Planning in place by 2015 • Number of Information Technology audits conducted by 2018 • Number of facilities using electronic health records • Number of electronic patients records
2	**Telemedicine**	• Usage of Telemedicine • **%** availability of telemedicine facility when required (downtime) in reporting period • **%** coverage of referral hospitals with telemedicine facilities by 2018
3.	**m-Health**	• Number of facilities using m-Health technologies annually • Number of initiatives using m-Health technology annually
4.	**e-Learning**	• Number of staff trained using e-Learning method • Number of facilities equipped to offer e-Learning
5.	**Capacity Building**	• Number of professionals trained in use of specific technologies per annum • Number of certified trainers in health information systems per annum • Number of ICT research conducted and published in a year • Number of ICT trainings conducted per annum
6.	**Health Promotions**	• Number of available ICT partnerships to disseminate health information • Number of people reached in facilities with ICTs • Number of IEC materials available for use • Number of IEC materials published using ICT

ii. Logical Framework

STRATEGIC OBJECTIVE PLANNED INTERVENTIONS		TIME FRAMES (YEAR 20xx)			RESPONSIBLE INSTITUTIONS	OUTPUTS AND PLANNED RESULTS
		14	15	16		
1. Information Systems						
1.1	**Objective:** To improve availability of relevant, accurate, timely and accessible health care data to support the planning, coordination, and monitoring and evaluation of health care services					
1.1.1	Strengthen Health Information Systems (such as HMISs, DHIS, SmartCare)	X	X	X	MOH; MCDMCH	HMIS and SmartCare integrated
1.1.2	Strengthen health research using e-health technologies	X	X	X	MOH; MCDMCH	Increased utilisation of e-Health data
1.1.3	Develop guidelines for design of e-health applications	X			MOH; MCDMCH	Guidelines developed
1.1.4	Strengthen harmonisation to enhance interoperability of different health management information systems among programmes	X	X		MOH; NAC; CSO	Standardised data formats for use with the data warehouse; Standard specifications for design and development of e-Health systems
1.2	**Objective:** Improve availability and access to essential health commodities for clients and service providers.					
1.2.1	Strengthen Logistics Management Systems for health commodities	X	X	X	MOH; JSI, MSL	Electronic Logistics Management Information System redesigned

1.2.2	Provide reliable and timely data for forecasting and quantification of national health commodity requirements	X	X	X	MOH; MSL; MCDMCH; CPs	Improved data access for planning
1.3	**Objective:** Enhance the efficient delivery and management of health facility support services and resources through e-health solutions.					
1.3.1	Maintain an updated catalogue of e-health system requirements.	X	X	X	MOH; MCDMCH; CDC	e-Health systems catalogue developed and up to date
1.4	**Objective:** Strengthen GISs and maintain comprehensive databases for efficient analysis of health information					
1.4.1	Maintain an updated health Facility Mapping database	X	X	X	MOH; MCDMCH	Health facility mapping database updated
1.4.2	Integrate GIS functions in existing and new information Systems	X	X	X	MOH; MOF	All new systems integrated with GIS functionality
2. Telemedicine						
2.1	**Objective:** To deliver expert skills in health care to all at a distance with the help of information and communications technologies (ICT)					
2.1.1	Enhance provision of telemedicine services by improving the infrastructure and formation of a technical working group.	X	X		MOH; MCDMCH	Ten additional facilities providing telemedicine Technical working group in place

2.1.2	Promote the use of telemedicine in the health sector by developing a comprehensive framework, and operational model and guidelines on the use of telemedicine.	X			MOH; MCDMCH	Framework, operational model and guidelines produced
3. M-Health						
3.1	**Objective:** To increase access to quality healthcare and health-related information through the use of mobile technologies					
3.1.1	Promoting the use of m-health by development of a framework, guidelines, procedures and protocols.	X	X		MOH; MCDMCH	Framework, guidelines, procedures and protocols developed
3.1.2	Expand the scope of m-Health applications and support health service delivery by creating linkages to Electronic Health Records Systems and associated systems	X	X	X	MOH; MCDMCH	Expansion to MC , ART adherence; EID scaled up to all facilities that conduct the service
4. E-Learning						
4.1	**Objective:** To Expand access to training institutions for all citizens at all levels through e-learning					
4.1.1	Develop e-learning standards and guidelines		X		MOH; MOE	eLearning standards and guidelines developed
4.1.2	Provide incentives to e-learning initiatives and projects		X	X	MOH; MOE	Incentive package developed
4.1.3	Promote the use of e-learning as an authentic mode of learning		X	X	MOH; MOE	Number of institutions offering eLearning facilities;
4.2	**Objective:** To Provide innovative and effective Learner support services					

4.2.1	Facilitate easy tracking , feedback and support for learners	X	X	X	MOH; MOE	Human Resource Information Systems implemented
4.2.2	Establish and/or encourage research and development in e-learning	X	X	X	MOH; MOE; UNZA; HPCZ	4 Research and Development programmes carried out
5. Capacity Building						
5.1	**Objective:** To strengthen Human Resources capacity in e-health service delivery					
5.1.1	Undertake a comprehensive change management	X	X		MOH; MCDMCH; CPs	Change Management plan developed
5.1.2	Develop a Human resource Development programme for e-Health	X	X		MOH; MCDMCH; MOE	Increased number of human resource skilled in e-Health
5.2	**Objective:** Improve management and effective training of staff					
5.2.1	Enhance the management, deployment and tracking of Health workers.	X	X	X	MOH; MCDMCH	Human Resource Development Information System implemented
6. IEC/Information, Education and Communication						
6.1	**Objective:** To provide efficient and effective IEC to empower communities with appropriate knowledge to develop and practice healthy lifestyles and stimulate access to appropriate health services.					
6.1.1	Support health communication research in health promotion programmes and services to generate evidence-based e-health information	X	X	X	MOH; MCDMCH	Six communication research programmes carried out

	and learning					
6.1.2	Ensure e-health information databases are effectively managed and updated	X	X	X	MOH; MCDMCH	IEC database implemented
6.1.3	To create a platform to effectively support publication of health documentations/publications and facilitate dissemination of e-health information	X	X	X	MOH; MCDMCH	Ministry web site updated
6.1.4	Increase awareness of e-health solutions among decision makers in the health sector.	X	X	X	MOH; MCDMCH	Commemorations and campaigns conducted
6.1.5	Lobby and advocacy promote e-health promotion policies to inform and increase awareness among decision-makers and senior officials	X	X	X	MOH; MCDMCH	Meetings and press briefs held

iii. Budget for Implementation of e-Health Strategy

PROGRAMMES	2014 Cost in KR'			2015 Cost in KR'			2016 Cost in KR'		
	GRZ	Donor Support	TOTAL	GRZ	Donor Support	TOTAL	GRZ	Donor Support	TOTAL
Information Systems	200,000	10,000,000	10,200,000	300,000	12,000,000	12,300,000	400,000	13,000,000	13,400,000
Telemedicine	500,000	2,000,000	2,500,000	500,000	5,000,000	5,500,000	600,000	10,000,000	10,600,000
m-Health	100,000	2,000,000	2,100,000	300,000	3,000,000	3,300,000	500,000	4,000,000	4,500,000
e-Learning	200,000	1,000,000	1,200,000	500,000	1,500,000	2,000,000	700,000	2,000,000	2,700,000
Capacity Building	100,000	500,000	600,000	300,000	1,000,000	1,300,000	300,000	1,500,000	1,800,000
Health Promotion	300,000	200,000	700,000	400,000	500,000	900,000	500,000	1,000,000	1,500,000
TOTAL	**1,400,000**	**15,700,000**	**17,300,000**	**2,300,000**	**23,000,000**	**25,300,000**	**3,000,000**	**31,500,000**	**34,500,000**

Glossary of terms

Ministry of Health
All the departments, statutory boards and institutions in this MoH e-health strategy will be referred to as MoH

Health Management Information Systems (HMIS)
HMIS is aggregate routine information system used for planning, monitoring and evaluation and decision making at all levels of the health sector.

SmartCare
An electronic health record system developed in Zambia.

Information and Communications Technology (ICT)
A generic term used to express the convergence of telecommunications, information, broadcasting and communications such as computers and the internet, fixed and mobile telephone, high frequency radio, radio and television and related applications such as email, voicemail and VoIP

ICT Infrastructure
A generic term to mean computer hardware and peripheral devices, communication equipment including networks

E-Health
E-Health is 'the combined use of electronic communication and information technology in the health sector'. In the MoHs practical use of e-Health, it means the use of ICTs to improve access to quality healthcare as close to the family as possible through the deployment and exploitation of ICTs and other modern technologies

Health Promotion
Health Promotion is a combination of activities aimed at empowering communities and individuals to take control of the social determinants of health thereby achieve improved health through multiple strategies and activities that include: Advocating for conducive and supportive environments including policies; empowering communities with information, education & communication and ease of access to facilities; mobilizing communities to participate in health issues through commemorations and campaigns and Reorienting health services cognisance of social factors impinging on health

Information Systems
These are systems used in the health sector which involve the receipt of data and transforming it into information, examples are Health Management Information Systems SmartCare, Supply Chain Manager and Integrated Financial Management Information Systems

Telemedicine
The use of modern audio and video telecommunication, computers and telemetry to deliver health services to remote patients and to facilitate information exchange between primary care physicians and specialists at some distance from each other

Tele-health
The off-set provision of a wide array of health related activities, such as professional continuing education, professional mentoring, community health education, public health activities, research and health services administration, as well as consultative and diagnostic health care.