Kenya National e-Health Strategy 2011 - 2017

MINISTRY OF MEDICAL SERVICES MINISTRY OF PUBLIC HEALTH & SANITATION

NATIONAL E-HEALTH STRATEGY 2011-2017

April, 2011

TABLE OF CONTENTS

FOREWORD

The development of the E-Health Strategy comes at an important time when the health sector is implementing far reaching reforms to achieve universal coverage. The E-Health Strategy is anchored on the achievement of Vision 2030, whose overall goal in health is to have an "equitable and affordable healthcare at the highest achievable standard" to her citizens. It is informed by the strategies and results emanating from the implementation of the Kenya Health Policy Framework, 1994-2010, the health sector strategic plans and the e-Government and Shared Services Strategies implemented through the e-Government Directorate and the ICT Board respectively.

The implementation of the e-health strategy will accelerate the ongoing reforms that are geared towards consolidating and strengthening the gains witnessed in the sector since 2003, when a reversal of health indicators started to be seen. The strategy will also address some of the key challenges experienced during the implementation of the Kenya Health Policy Framework, 1994-2010 and the health sector strategic plans, that include disparities in access between the urban and rural areas and especially the hard to reach areas; the inadequacies of the health infrastructure across the country; the shortages of the human resources for health; the high cost of accessing health for majority of the Kenyans and the limitations in the availability of financial resources. It will accelerate the decentralisation of quality health services to rural areas, a factor that will also be reinforced through the implementation of the New Constitution and devolution.

The e-health strategy will also facilitate the strengthening of partnerships on the provision of quality healthcare and specialised services. It will not only promote partnerships with the private sector, but will also enable the sector tap into the skills and knowledge on healthcare that exist in the more established institutions both within and outside the country. Towards this end, Kenya will be able to build capacity among its key health personnel through technology transfer and training at minimal cost. The wide use of e-health will open new opportunities for multi-skilling, business and employment.

The e-Health Strategy will make use of the already available national ICT infrastructure; conducive policy and legal environment and local expertise to harness ICT for improved healthcare delivery in addition to other ongoing efforts. Efforts will also be made to fundamentally change the way information is accessed and shared across the health system. The implementation of the e-health strategy is expected to transform operations in the sector and facilitate the country into becoming a hub for accessing specialized health services and achieve universal coverage by 2030.

In order to have a strategy that is holistic and inclusive, the development of the strategy used a participatory process. First, the consultative process included taking into account results from the 1st Ministerial meeting on e-Health in East, Central and Southern Africa held in Mahe in October 2008. The meeting brought together key stakeholders from the region to share their experiences in the implementation of e-Health interventions and discuss and agree on a plan of action. This meeting was the first country-level stakeholders' consultative meeting in November 2008. It included representatives from Government Ministries and Departments, Universities, private sector players including those from hospitals, civil society organizations and development partners. This meeting was followed by other consultative meetings at both technical and policy level. A draft strategy was shared in July 2009. The process benefitted greatly from expert input that took into account information from other sectors and

countries. Using the draft shared in 2009, a second version of the strategy was, following stakeholder review, drafted in May 2010.

In late 2010, MOH and the World Bank Group through its Health in Africa Initiative (HiA) and Kenya Investment Climate Program partnered to prioritize the strategic interventions and develop an implementation framework. This partnership resulted in a stakeholder workshop in Naivasha in February 2011; the stakeholders in the workshops prioritized the health information systems pillar, divided it into five functional domains and adopted the notion of enterprise architecture as implementation framework for the Strategy.

Hon. (Prof.) P. Anyang' Nyongo, EGH, MP

MINISTER FOR MEDICAL SERVICES

Hon. Beth Mugo, EGH, MP

MINISTER FOR PUBLIC HEALTH AND SANITATION

PREFACE

The National e-Health Strategy presents a set of interventions that the health sector plans to use to facilitate the efficient and effective delivery of services. It reviews how the sector has performed over time in terms of the policies, strategies and plans that have been in use. It identifies the strengths and opportunities that exist and which can be leveraged to fast-track e-Health. With the National ICT policy and e-Government strategy already in force, it is recognized that critical success factors in the implementation of the strategy will include political will; the availability of skilled manpower and high standard health institutions as well as the availability of ICT infrastructure. Challenges to the effective implementation of e-Health include the lack of an e-Health Policy; inadequate infrastructure and equipment; insufficient human resources and skills as well as low funding to the sector; low awareness; insufficient/unreliable power supply as well as inadequate legislation.

Through e-Health, the health sector in Kenya envisions efficient, accessible, equitable, secure and consumer friendly healthcare services enabled by ICT. In order to actualize this vision, there will be need to promote and deliver efficient healthcare services to Kenyans and consumers beyond Kenya's borders, through the use of ICT. Additionally, measures will be taken to support informed policy, investment and research decisions through access to timely, accurate and comprehensive reporting on Kenyan health system activities and outcomes; improve the quality, safety and efficiency of clinical practices by giving care providers better access to consumer health information, clinical evidence and clinical decision support tools; enable the Kenyan health sector to more effectively operate as an inter-connected system overcoming the current fragmentation and duplication of service delivery while promoting health research and information technology.

It is recognized that for the sector to overcome challenges and meet the overall strategic objectives of e-Health, it will be necessary to capitalize on the strengths of the sector while taking programmatic steps to mitigate its weaknesses. Measures will also be taken to leverage emergent opportunities while concurrently addressing extant and emergent threats.

The strategy is based on five pillars or strategic areas of intervention and contemplates seven principles as key success factors for its implementation. An appropriate governance structure to steer implementation of the Strategy has been recommended and will be enacted via applicable legislation or ministerial gazette.

Ngari W. M (Ms), CBS

PERMANENT SECRETARY
MINISTRY OF MEDICAL SERVICES

Mark K. Bor, CBS

PERMANENT SECRETARY
MINISTRY OF PUBLIC HEALTH AND SANITATION

ACKNOWLEDGEMENTS

The realization of this strategy has been achieved through tremendous effort and commitment of Hon. Prof. Peter Anyang' Nyong'o, Minister for Medical Services who not only called for the development of the strategy, but made sure he was present and opened most of the workshops that developed the National eHealth Strategy to give advice. The contribution of Hon. Dr. O. Gesami, Assistant Minister for Public Health and Sanitation and Hon. Danson Mungatana, former Assistant Minister for Medical Services are highly appreciated.

Special thanks also go to Ngari, W. M (Ms), Permanent Secretary, Ministry of Medical Services under whose leadership and guidance this Strategy was finalized. Mr. Mark K. Bor, Permanent Secretary Ministry of Public Health & Sanitation also gave great support to the process. Prof. James L. Ole Kiyiapi, former Permanent Secretary, Ministry of Medical Services was responsible for all the initial work that led to the development of the Strategy.

Dr Francis Kimani, Director of Medical Services and Dr S. Sharif, Director, Public Health & Sanitation ensured that there was full participation of the Ministry staff and stakeholders in the process. Their personal support and contribution was critical to the success of this work. Great support and guidance was also received from Dr. Judith Bwonya, Snr. Deputy Director of Medical Services from the beginning to the end of this process.

We also wish to acknowledge the contributions of the Ministry's Heads of Department and Division and Provincial Directors of Medical Services for their inputs. In particular, the contribution of Mr. Elkana Ong'uti, Chief Economist; Mr. Wycliffe Kisongochi, former ICT Officer in-charge; Dr Hellen Mbugua and Rachael Wanjiru from the Ministry is highly appreciated.

The process received tremendous technical and financial support from the Commonwealth Secretariat, London through Dr. Joseph Amuzu and Tom Jones. The Italian Cooperation supported the e-Readiness Assessment which preceded the development of the strategy, a critical stage that informed the process. We are grateful to DFID and WHO for funding part of the e-Readiness Assessment as well as facilitating the development of the Strategy. We also thank The World Bank Group through the Health in Africa Initiative (HIA) and the Kenya Investment Climate Programme for facilitating the February 2011workshop in Naivasha. This enabled the prioritization, by stakeholders, of e-Health strategic areas of intervention and the adoption of an implementation framework.

The process also involved many organizations including NGOs, Private Sector; institutions of middle and higher learning; Government Ministries and Departments, among others, whose contributions were invaluable.

Special thanks go to Dr Esther Ogara who steadfastly coordinated the development of the National e-Health Strategy in constant consultation with MOH's e-Governance Consultant, Owino Magana.

Since we are not able to mention everyone, we wish to sincerely thank all those who in one way or another participated in the development of this National e-Health Strategy 2011-2017.

LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
BEOC	Basic Emergency Obstetric Care
CDF	Community Development Fund
CGH	County General Hospital
CHC	County Health Care
CHMT	County Health Medical Teams
CPD	Continuing Professional Development
DMO	District Medical Officer
DSS	Decision Support Systems
ECG	Electrocardiogram
FP	Family Planning
GLR	Great Lakes Region
GoK	Government of Kenya
HIS	Health Information Systems
HIV	Human Immune-Deficiency Virus
HIV/AIDS	Human Immune-Deficiency Virus / Acquired Immune Deficiency Syndrome
HMIS	Health Management Information System
ICT	Information and Communication Technologies
IT	Information Technology
ITN	Insecticide Treated Net
IMR	Infant Mortality Rate
KCAA	Kenya Communication Amendment Act
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supplies Agency
KHEA	Kenya e-Health Enterprise Architecture
KMTC	Kenya Medical Training College
KNBS	Kenya National Bureau of Statistics
MDG	Millennium Development Goals
MMR	Maternal Mortality Ratio
MOH	Ministries of Health
MOMS	Ministry of Medical Services
MOPHS	Ministry of Public Health and Sanitation
MTP	Medium-Term Plan
NeWG	National e-Health Working Group
NeHS	National e-Health Secretariat
NeHSC	National e-Health Steering Committee
NGO	Non-Governmental Organization
NHSSP I	First National Health Sector Strategic Plan
NHSSP II	Second National Health Sector Strategic Plan
NS	Not Specified
PPP	Public Private Partnership
STI	Sexually Transmitted Infections
SWOT	Strengths Weaknesses Opportunities Threats
TCR	Treatment Completion Rate
UFMR	Under-Five Mortality Rate
WRA	Women of Reproductive Age

EXECUTIVE SUMMARY

The Kenyan health system is currently struggling to cope with the rising cost and demand for quality health care services, against the backdrop of a shortage of skilled health care professionals. This is a long shot from the health sector vision(s) quoted in the policy context annex. There is therefore a compelling need to devise ways and means of closing the gap between vision and reality. This e-Health strategy seeks to set in motion the process of closing this gap by harnessing ICT for improved healthcare delivery in addition to other ongoing efforts.

In order to have a strategy that is holistic and inclusive, the development of the strategy used a participatory process that started in October 2008 and concluded in February 2011 with stakeholder workshop where the implementation framework was developed. Therefore the Strategy includes the views of multiple groups and sectors and is the result of many hours of debate and deliberation.

Vision

Develop efficient, accessible, equitable, secure and consumer friendly healthcare services enabled by ICT.

Mission

To promote and deliver efficient healthcare services to Kenyans and consumers beyond our borders, using ICT.

General Objectives

- To Support more informed policy, investment and research decisions through access to timely, accurate and comprehensive reporting on Kenyan health system activities and outcomes.
- To improve the quality, safety and efficiency of clinical practices by giving care providers better access to consumer health information, clinical evidence and clinical decision support tools.
- To Enable the Kenyan health sector to more effectively operate as an inter-connected system overcoming the current fragmentation and duplication of service delivery.
- To create linkages between health research and information technologies.

Strategic Areas of Implementation

1. Telemedicine
2. Health Information Systems
3. Information for Citizens
4. M-Health
5. E- Learning

Principles:

1. Strong leadership and governance;
2. Collaboration and partnerships for shared information and services among stakeholders;

3. Leveraging on available human, financial and technical resources;
4. Safeguarding healthcare service integrity, client confidentiality and secure information interchange;
5. Harmonizing and coordinating Kenya's disparate health and information technology expertise;
6. Phased implementation of prioritized e-Health initiatives in line with the strategic framework;
7. Redundancy in mission critical aspects of e-Health systems.

Governance

The strategy will be jointly implemented by a secretariat located within the Ministries of Health and a stakeholder driven working group formed by a multidisciplinary team organized in pillar and functional domain sub-committees. The secretariat and working group will be guided by a high level Steering Committee chaired at the ministerial level that will perform the functions of a board of directors for the strategy.

Implementation

The stakeholders prioritized the implementation of the Health information Systems Pillar and divided it into the following five functional domains:

1. Patient Centric Information
2. Pharmacy and Medical Supply Chain Information Management
3. Financial Information, including Insurance and Payments
4. Health Workforce Management and Training
5. Regulation

Furthermore, the stakeholders adopted the notion of Enterprise Architecture as the implementation framework for the National e-Health Strategy and identified the development of interoperability standards both among and within functional domains as a key implementation milestone.

1. THE CASE FOR A NATIONAL e-HEALTH STRATEGY

The Kenyan health system is currently struggling to cope with the rising cost and demand for quality health care services, against the backdrop of a shortage of skilled health care professionals. This is a long shot from the health sector vision(s) quoted in the policy context annex. There is therefore a compelling need to devise ways and means of closing the gap between vision and reality.

This e-Health strategy seeks to set in motion the process of closing this gap by harnessing ICT for improved healthcare delivery in addition to other ongoing efforts.

Additionally, the latent capacity of consumers to play a more active role in the protection and management of their personal health outcomes must be leveraged. For this to happen there will need to be a fundamental shift in the way information is accessed and shared across the health system. It is therefore necessary for healthcare stakeholders to shift from a reliance on tools such as pen, paper and human memory to an environment where consumers, care providers and health care managers can reliably and securely access and share health information in real time across geographic and health sector boundaries. E-Health provides a practical, tried and tested way to achieve this end.

Kenya is the world's 47th largest country with an area of 582,646 km^2. The Kenya National Bureau of Statistics (KNBS) places its current population at 38.6 million people (results of 2009 census) with approximately 6 million living in the urban areas. The population is diverse, comprising 42 ethnic groups. Its annual population growth rate is about 3%. 42% of the population is under 15 years while 28% are aged between 15 and 35 years. Only 30% are over 35 years, making Kenya a young population.

Recognizing the importance of good health in support of human capital development, the Government of Kenya (GoK) strives to provide quality healthcare for all its citizens in a bid to enable them lead economically and socially productive lives.

The provision of Health services in Kenya is liberalized. There are Public and Private Hospitals. The provision of Healthcare services in Government Hospitals is either free or subsidised on a cost sharing basis.

Kenya has qualified and competent healthcare workers whose services have gained recognition throughout the Great Lakes Region (GLR). Indeed, Kenyan medical professionals serve patients from all over the GLR, giving rise to the phenomenon now dubbed "medical tourism".

1.1 Context

Situational analysis[1]

Kenya's health care system is structured in a step-wise manner so that complicated cases are referred to a higher level. Gaps in the system are filled by private and church run units. The structure comprises:

Dispensaries and private clinics

Health centres

Sub-district hospitals and nursing homes

[1] Extract from *Library of Congress, 2000 – Country profile: Kenya, June 2007*

District hospital and private hospitals

County Referral hospital

National referral hospital

Kenya had a total of 5,129 health facilities in 2006, of which 75% are dispensaries and 12% health centres. Hospital level institutions make up the rest at 13%.

Major causes of morbidity and mortality

HIV/AIDS

Tuberculosis

Malaria

Respiratory tract infections

Road accidents

Factory accidents

Gastroenteritis

Diabetes mellitus

Major killer diseases apart, Kenya has a serious problem with accidental death, especially those arising from motor vehicles. Kenya has the highest rate of road accidents in the world, with 510 fatal accidents per 100,000 vehicles (2004 estimates).

Kenya's status with respect to the Millennium Development Goals (selected indicators for health industry) [2]

MDG No Target	**Baseline MDG 1990**	**Baseline NHSSP I 1999/00**	**Output NHSSP I 2003**	**Current estimates 2007***	**Target MDG 2015**
Kenyan population (millions)	21.4		28.7		NS
MDG 4: Child health					
Prevalence underweight children < 5 yrs (%)	32.5	33.1	28	11	16.2
Reduce IMR by 2/3 between 1990 and 2015	67.7	73.7	78	52	25
Reduce UFMR by 2/3 between 1990 and 2015	98.9	111.5	114	74	33
Proportion 1-year-olds immunized against measles (%)	48	76	74	80	90
Number of orphans due to AIDS	27,000	890,000	1.2 M	1.8 M	
MDG 5: Maternal, sexual-reproductive health					

[2] Extract from MOMS Strategic plan 2008 - 2012

Reduce MMR by 3/4 between 1990 and 2015 Proportion births attended by skilled health staff % Coverage of basic emergency obstetric care (BEOC) % WRA receiving FP commodities HIV prevalence among 15–24-yr-old pregnant women	590 51 — 5.1	590 42 24 — 13.4	414 37 10 10.6	488 42 100 43	 NA 70 NS
MDG 6: Disease control					
Malaria prevalence of persons five yrs and above Malaria inpatient case fatality rate* Pregnant women/children <5 sleeping under ITN (%) TB case detection rate (%) Treatment completion rate (TCR, smear+ cases) (%)	NA NA NA NA 75		30% 26% 4/5 47 80	31 37/52	NA NA 65/65 60 90
MDG 7: Access to safe water					
(National) (%) Access to good sanitation (%)	48 84	55 81	48 50	57 85.2	74 NS
Key: IMR= Infant mortality rate; ITN= Insecticide treated net; MMR= Maternal mortality ratio; TB= Tuberculosis; TCR= Treatment completion rate: UFMR= Under-five mortality rate; WRA= Women of reproductive age *This includes all fever cases treated as malaria. Malaria sentinel surveillance report of 2002 estimated it at less than 5%. Source: Adapted from the NHSSP II (2005–2010), and the Midterm Review of NHSSP II (2007). ***Estimates for 2007 adopted from MOMS Facts & Figures on Health and Health Related Indicators, 2008.***					

Human Infrastructure

People living in rural and remote areas struggle to access timely, quality specialty medical care. Residents of these areas often have substandard access to specialty healthcare primarily because specialist physicians are usually located in urban areas, reaching only 20% of the population i.e. **80% of clinicians serves 20% of the population.**

Therefore Kenya's healthcare infrastructure suffers from urban-rural and regional imbalances, lack of investment, and a personnel shortage. Following is a summary of the situation:

[3]Personnel in Health sector (2006)	Number	Approx. Ratio (personnel per patient)
Doctors	1,513	1:26,438
Dentists	169	1:236,686
Pharmacists	283	1:141,343
Clinical Officers	2,104	1:19,011
Nurses	16,227	1:2,465
Other Health Personnel	9,720	1:4,115
Non Health Personnel	5,615	1:7,124
Total	**35,631**	

Kenya's low physician density demands new solutions for improving doctor communication and maximizing available human resource capacity. Because of innovations in computing and telecommunications technologies, many elements of medical practice can today be accomplished even when the patient and health care provider are geographically separated.

Physical Infrastructure[4]

Currently there are two Referral Hospitals in Kenya: Kenyatta National Hospital in Nairobi and Moi Teaching and Referral Hospital in Eldoret. There are also well equipped County hospitals in eight Counties Kenya, with 39 more likely to be upgraded or constructed to reflect Kenya's new constitutional dispensation to cater for each of the 47 newly created counties, following Kenya's promulgation of a new national constitution in August 2010. There are also District Hospitals in virtually all the 254 Administrative Districts and Health centers located in various parts of the country.

In total, Kenya has over 6150 health care facilities. Public facilities, or those that are owned and operated by the government, make up approximately 41% of these. Private, for profit facilities make up 44% of the facility total. The remaining 15% of facilities are non profit; these include NGOs and Mission-based facilities. Nineteen (19) districts out of two hundred and fifty four (254) reporting indicated that they had no computers available at the district level for health staff. Fourteen (14) or 20% of districts reported that they had facilities where both computers and internet were available to health staff.

Approximately 23% of DMOs report that neither computers nor internet services are available to their health staff. The majority of districts reported that fewer than half of their facilities had access to electricity 100% of the time. No district had uninterrupted access to electricity in all of its facilities, and 17% reported that none of their facilities had constant access to electricity.[5]

[3] Source: MOMS Human Resource Department

[4] Extract from http://www.kenya.go.ke/ under Health Care and Medical Services

[5] *Challenges of implementing Telemedicine initiatives in Kenya* by Dr. E.A Ogara and Dr. G.W. Odhiambo-Otieno, Ministry of Health, March 2003

SWOT Analysis

STRENGTHS	WEAKNESSESS
1. Political will by GoK to progress healthcare reforms 2. Availability of highly skilled medical personnel in significant numbers and with a wide variety of skills relevant to the entire spectrum of the medical sector 3. Availability of advanced health institutions (referral institutions) capable of carrying out complex medical procedures 4. Competent health training institutions at all levels 5. High level of awareness of ICT among the general population 6. High awareness of the existence of e-Health technologies among health practitioners 7. Well developed mobile telecommunications infrastructure 8. Alternative sources of electrical power infrastructure & non-grid based power solutions 9. National ICT policy promoting use of ICT in public service 10. National e-Government Strategy recognizes e-Health as a national priority	1. Absence of a National e-Health policy & strategy to guide implementation of e-Health projects/initiatives 2. Immobility of existing health information/records among health providers (little or no capacity to share information between health service providers) 3. Inadequate ICT infrastructure (high speed data communications) 4. Low penetration of computer equipment 5. Scarcity of Funds 6. Insufficient human resource on e-Health 7. Limited expertise on medical informatics 8. Training in e-Health skills not integrated into existing health professional's training curricula 9. Inconsistency of staff deployment in the Public Health Sector
OPPORTUNITIES	**THREATS**
1. Availability of affordable, reliable bandwidth (internet access) through mobile phones, fiber optic infrastructure 2. Enormous goodwill from development partners and private sector (possible PPP) 3. High penetration of GSM mobile phone handsets 4. Low cost and ease of access to GSM mobile communications services (m-Health) 5. Availability of competent health training	1. Project implementation delays due to government procurement bureaucracy 2. Under funding of the Health sector by the government. 3. Low awareness of e-Health 4. Data security and communication threats e.g. through cybercrimes 5. Insufficient/unreliable supply of electricity 6. Lack of e-Health framework legislation 7. Lack of a national data protection policy

institutions at all levels (incorporate and integrate e-Health training) 6. Availability of local ICT and medical expertise to develop locally relevant and workable e-Health solutions 7. National ICT policy and Act (KCAA 2009) in place 8. Availability of Digital Villages 9. ICT equipment is currently zero rated - reduced cost of equipment Kenya's geographical location and emerging role as a regional medical services hub	8. Uncompetitive remuneration for medical personnel leads to brain drain 9. Lack of expertise in project management in the public service

Global Trends

Increasingly, governments all over the world are turning to ICT to enhance service delivery in the so-called knowledge economy. Financial services are particularly well represented when it comes to automation of processes using ICT. Indeed, Kenya boasts a few firsts in this regard such as the M-PESA mobile money transfer service which has successfully managed to leverage Kenya's 20 million-strong mobile telephone handset penetration to provide convenient financial services via mobile phone, especially to the unbanked. Other big winners are online supermarkets such as Amazon (www.amazon.com) and e-bay (www.e-bay.com) who have found their pride of place and made a fortune while at it by marketing their wares over the internet and receiving payment via e-commerce.

By contrast, Kenya's healthcare players have not emulated their financial sector counterpart's rapid uptake of technology to enhance their service delivery options and reach. It is, however, noteworthy that Kenya, Uganda, Tanzania and Rwanda have already taken bold strides to implement various pilot projects towards telemedicine.

Challenges

The challenges in the Kenyan health sector are similar to those of other developing countries. These include:

A shortage of health care professionals that threatens to limit the supply of health care services and further extend wait lists ; limited capacity development and sharing of knowledge within the Health system

Emerging threats to public health like H1N1 and H5N1 flu, cholera, polio that require a robust health surveillance system to provide critical information to support a rapid and effective response; increasing incidence of communicable and non communicable diseases

Equivalent services expected in both urban and remote locations where citizens are increasingly expecting the same consistent and equitable health care access across remote regions as in densely populated urban centres; Significant differences between the health outcomes for advantaged and disadvantaged Kenyans (rural/urban disparities, rich/poor, literate/illiterate, etc.)

New treatments and technologies whose higher costs strain health care budgets;

Silos of care that fail to provide patients and providers with timely and seamless access to the information they require, causing delays and needless duplication; undeveloped Health Management Information Systems and capacity

Inadequate health infrastructure and equipment

Collectively, these challenges are driving increased health care service demands, costs and complexity, testing the limits of the financial, infrastructural and human resource base of the Kenyan health system.

Perhaps the most critical challenge relates to the way information is stored, shared and used across the health system. Health is a knowledge industry with information being central to all aspects of care planning, management and delivery. Despite this, the primary information tools used to manage health care in this country still revolve around pen, paper and human memory. The use of such fallible tools to manage a sector as complex and critical as health care is a cause for concern in Kenya today, given that ready availability of information is the primary driver of effective and timely interventions.

1.2 Background

The E-Health Strategy is anchored on the achievement of Vision 2030, whose overall goal in health is to have an "equitable and affordable healthcare at the highest achievable standard" to her citizens. It is informed by the strategies and results emanating from the implementation of the Kenya Health Policy Framework, 1994-2010, the health sector strategic plans and the e-Government[6] and Shared Services Strategies implemented through the e-Government Directorate and the ICT Board respectively. A detailed overview of the framework that informed the development of the strategy is provided in Appendix A.

In order to have a strategy that is holistic and inclusive, the development of the strategy used a participatory process. First, the consultative process included taking into account results from the 1st Ministerial meeting on e-Health in East, Central and Southern Africa held in Mahe in October 2008. The meeting brought together key stakeholders from the region to share their experiences in the implementation of e-Health interventions and discuss and agree on a plan of action. This meeting was the first country-level stakeholders' consultative meeting in November 2008. It included representatives from Government Ministries and Departments, Universities, private sector players including those from hospitals, civil society organizations and development partners. This meeting was followed by other consultative meetings at both technical and policy level. A draft strategy was shared in July 2009. The process benefitted greatly from expert input that took into account information from other sectors and countries. Using the draft shared in 2009, a second version of the strategy was, following stakeholder review, drafted in May 2010. The May 2010 draft contained the mission, vision, objectives as well as five Strategic Areas of Intervention and 7 principles of implementation.

In late 2010, MOH and the World Bank Group through its Health in Africa Initiative (HiA) and Kenya Investment Climate Program partnered to prioritize the strategic interventions and develop an implementation framework. This partnership resulted in a stakeholder workshop in Naivasha in February 2011; the stakeholders in the workshops prioritized the health

[6] www.e-government.go.ke

information systems pillar and adopted the notions of enterprise architecture and interoperability strategy as implementation framework.

The Health Information Systems pillar was further divided in five functional domains:

1. Patient Centric Information
2. Pharmacy and Medical Supply Chain Information Management
3. Financial Information, including Insurance and Payments
4. Health Workforce Management and training
5. Regulation

It was deemed that developing the enterprise architecture for each of these thematic areas as well as a strategy for interoperability both within and among the five areas would allow not only implementation of the Health Information Systems pillar but would also represent a necessary prerequisite for progress in the remaining four pillars of the Strategy.

1.3 What is e-Health?

The World Health Organization defines e-Health as 'the combined use of electronic communication and information technology in the health sector.' In practical terms, e-Health is the means of ensuring that the right health information is provided to the right person at the right place and time in a secure, electronic form to support the delivery of quality and efficient healthcare.

e-Health should be viewed as both the essential infrastructure underpinning information exchange between all participants in the Kenyan health care system and as a key enabler and driver of improved health outcomes for all Kenyans. Central to the achievement of this will be an ICT driven health information management system which more effectively responds to the health care needs of individuals and communities.

2. Strategic Framework

2.1 Vision

Develop efficient, accessible, equitable, secure and consumer friendly healthcare services enabled by ICT.

2.2 Mission

To promote and deliver efficient healthcare services to Kenyans and consumers beyond our borders, using ICT.

2.3 General Objectives

- To Support more informed policy, investment and research decisions through access to timely, accurate and comprehensive reporting on Kenyan health system activities and outcomes.
- To improve the quality, safety and efficiency of clinical practices by giving care providers better access to consumer health information, clinical evidence and clinical decision support tools.
- To Enable the Kenyan health sector to more effectively operate as an inter-connected system overcoming the current fragmentation and duplication of service delivery.

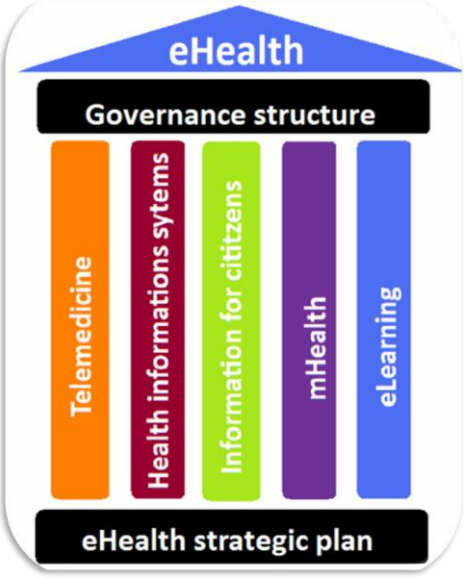
- To create linkages between health research and information technologies

2.4 Specific Objectives

- To establish a governance structure to implement, support and coordinate the implementation of the e-Health strategy;
- To improve the referral system by way of Telemedicine and address the issue of non availability of health specialists in some localities;
- To automate the operations of HMIS in the Healthcare facilities to enhance evidence based decision making and improve emergency response;
- To establish a National e-Health portal to avail Health promotion information to the public;
- To establish an efficient, easy-to-use data collection, transmission and analysis system to ensure quick response to emergencies;
- To develop a system for targeted health information messages to Health workers and the general public;
- To provide support for the overall health sector goals as set out in the ministries of health strategic plans and enable a safer, higher quality, more equitable and sustainable health system;
- To use ICT as a strategic tool at all levels in the healthcare sector so that healthcare resources are utilized more efficiently and effectively;
- To ensure that all health professionals have access to efficient, interoperable e-Health solutions that guarantee patient safety making it easier for them to carry out their day-to-day tasks; and
- To support Continuing Professional Development (CPD) via e-learning.

2.5 Strategic Areas of Intervention: the five pillars

Figure 1 – The Five Pillars



The five key strategic areas of intervention that form the pillars of the e-Health Strategy are:

1. Telemedicine
2. Health Information Systems
3. Information for Citizens
4. M-Health
5. E- Learning

Telemedicine, Information for Citizens, M-Health and E-Learning represent areas where technology allow health systems to develop interventions that previously were not possible, while the Health Information Systems pillar encompasses technology enabled transformations to what health systems already do, such as keeping medical records and supplying medicines and supplies to facilities. The five pillars represent a conceptual framework but the Strategy recognizes that in

practice there will be overlaps and interventions might cut across more than one or even all pillars.

2.6 Principles

In order to overcome the challenges identified in alignment with the stated general and specific objectives, Kenya's healthcare industry would be well advised to capitalize on its strengths while taking pragmatic steps to mitigate its weaknesses. The industry must also put in place deliberate plans to leverage emergent opportunities identified, while concurrently addressing extant and emergent threats.

In this regard, the following principles have been identified as key factors of success in the implementation of the Strategy: towards:

1. Strong Leadership and Governance Mechanism

Collaborative leadership is to be provided through a proposed National e-Health Steering Committee (NeSC). Day to day management of The Strategy implementation will be handled by a secretariat (NeHS) which may later be transformed into a Directorate of e-Health. The National e-Health Working Group (NeHW) composed of a team of multidisciplinary stakeholders will implement the strategy under the guidance of NeSC and the support of NeHS.

2. Collaboration and partnerships for shared information and services among stakeholders

Collaboration between the health authorities and MOH is fundamental to the successful implementation of the National e-Health Strategy 2011-2017. It is imperative to mobilize all possible resources in the most effective way. Participants in developing and implementing the various e-Health projects will be leaders in some cases and collaborators in others. Individual health care providers are critical to the delivery of e-Health and are essential partners in improving health outcomes for Kenya.

e-Health implementation can only be successful if a wide spectrum of health care providers stakeholders, comprising managers, providers and consumers are engaged constructively and their knowledge and expertise positively harnessed to impact the implementation of e-Health projects. Wherever appropriate, bulk procurement of e-Health information systems infrastructure will be undertaken to ensure economies of scale and unlock maximum benefits for stakeholders.

3. Leverage Available Human, Financial and Technical Resources

Government resources, decentralized funds (e.g. CDF, LATF etc) are available and may be channeled to support the community level development of e-Health in Kenya.

4. Safeguard Privacy and Security

Adhere to/put in place applicable legislation to protect consumer confidentiality as a mandatory part of the regulatory environment governing procedural or systems development processes to support e-Health. In addition, to providing basic system security and protect against unlawful access or malicious damage to information, every effort must be made to ensure that access is absolutely restricted to authorized persons in accordance with their rights and permissions profile.

5. Harmonize disparate Health and Technological Expertise

Kenya's approach to implementing e-Health will, to the extent possible, seek to create harmonious synergy between those with Health expertise and those with ICT expertise while building on the technology infrastructure, systems and data repositories already in place. This may be accomplished through the adoption of common standards and a collaborative approach to e-Health delivery and uptake.

6. Phased implementation of prioritized e-Health initiatives in line with the strategic framework;

Recognizing the ambitious goals of the Strategy and the breadth of interventions, a phased approach will be followed by which interventions will be carried out as prioritized by stakeholders.

7. Redundancy in mission critical aspects of e-Health systems

This entails putting in place appropriate business continuity mechanisms such as data security and other disaster recovery mechanisms.

3. Governance

3.1 Structure

In order to progress the national e-Health agenda, it is necessary that a National e-Health governance mechanism be established. In the short run, this will be the **National e-Health Secretariat (NeHS)** housed at MOH. In the long-term, NeHS is expected to transform into a fully fledged **Directorate of e-Health (DeH)**. The proposed directorate would report to the **National e-Health Steering Committee (NeSC)** which is already in place and currently chaired by the Minister for Medical Services with the permanent secretaries of the Ministries of Public Health and Information and Communications Technologies serving as alternate co-chairpersons. The DeH, with administrative support from the Directorate of e-Government (DeG), based at the cabinet office in the Office of the President would work with and through the already existing multidisciplinary **National e-Health Working Group (NeWg).** The DeH will be headed by a **Director of e-Health**, who will be responsible for the day to day coordination and management of e-Health implementation activities under the general direction of NeSC. The ideal candidate for director would be one with a good grasp of Kenya health sector policy and strategic priorities, in addition to understanding how ICT can help deliver the same.

NeHSC will serve as the 'Board of Directors' and work through the NeHS. The secretariat will work in consultation with the NeWg and e-Health sub committees to be established in various parts of the country as NeWg representatives. It is envisaged that a director, reporting to the board, will serve as chief executive officer (CEO) of the DeH. The CEO will oversee the ongoing review of the national e-Health Strategy and the formulation of the annual e-Health operational plans, investment management, standards and harmonious execution of all the components of the national e-Health program. The final design of the Institutional arrangements arrived at will reflect the devolved governance structures stipulated in the Constitution of Kenya, 2010 with appropriate representation at county level.

DeH will work in collaboration with the healthcare industry through a Public Private Partnership (PPP) arrangement that will leverage appropriate industry linkages via the broad based NeWG comprising stakeholders in Health. DeH will also forge a strategic working relationship with Development Partners. A Public Private Partnership (PPP) is the collaboration between the public and private sectors to provide facilities and services based on synergies between the different sectors to provide optimal solutions and services to the public. The partnership may include ministries, private hospitals / companies, donor agencies, civil society, telecoms operators, public healthcare providers and other e-Health stakeholders. PPP frameworks are increasingly seen as an acceptable and standard means of public institutions delivering services to the people. In order to maximize the opportunities available through PPPs, the Ministries of Health may consider adopting the GoK's PPP framework as a model to mobilize the potential benefits associated with broad based stakeholder collaboration.

Proposed key areas of collaboration between NeHS/DeH and the NeWG in relation to the e-Health regulatory framework include:

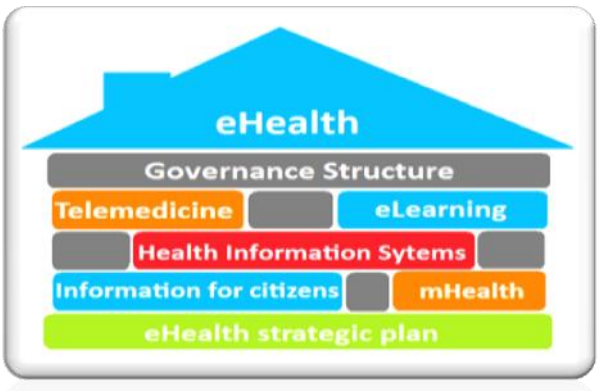
- Coordination and regulation of e-Health activities;
- Setting ethical standards in e-Health access to data by authorized persons;
- Setting standards and procedures on procurement/design of e-Health infrastructure;
- Ensuring Quality of services and equipment;
- Determining content and security of all e-communication to the public;
- Regulating e-Waste disposal;
- Developing a universal curriculum on IT training for users, administrators and technical team – incorporated in Medical Training Colleges, Universities and all relevant tertiary training institutions; and
- Capacity Building (including blended e-learning) and change management
- Monitoring and Evaluation of implementation.

Key roles of the National e-Health Secretariat:

- Support e-Health policy development and annual operational plans for strategy implementation, supervised by the Director of e-Health under NeSC oversight;
- Build criteria for identification and selection of e-Health facilities in the context of KHEA;
- Assess and Identify start-up and subsequent e-Health projects and sites;
- Identify opportunities for collaboration with key e-Health partners (PPP);
- Coordinate M & E activities during implementation of annual operational plans.

National e-Health sub committees whose function will be to implement and enforce national e-Health regulatory policy in selected areas of intervention, such as counties, will be established with guidance from the DeH in collaboration with NeWg. The sub committees will also be responsible for the identification, establishment and implementation of unique health care identifiers for individuals, care providers and care provider organizations. They will also enforce compliance with standards for integrity, privacy and security of personal health care information as well as the licensing conditions and compliance arrangements for e-Health operators.

Figure 2 schematic diagram of e-Health Governance Structure



3.2 Legal Issues

Areas to be addressed via legislation and other legal mechanisms in order to foster smooth transition to e-Health include:-

- Institutional framework for NeSC, DeH, NeWG, etc;

- The rules governing the responsibilities in the functional domains;
- Laws and Guidelines for interoperability, data interchange and security
- Laws and Guidelines for Business Continuity, Emergency and Disaster Preparedness;

3.3 Regulatory Issues

The ICT regulatory environment in Kenya is governed by various legal instruments including the National ICT policy 2005, the Kenya Communications Act 1998; the Kenya Communications Regulations 2001 and the recently enacted Kenya Communications Amendment Act (KCAA 2009). The health workers are bound by their regulatory bodies such as the Kenya Medical Practitioners and Dentists Board (KMPDB) and related acts (e.g. the Health Act that is currently under review) concerning the use of ICT in health.

It is acknowledged that the regulatory environment could act as an enabler for the delivery of e-Health strategies / programs and related activities. The secretariat, working with stakeholders in the National e-Health Working Group (NeWg) will, in liaison with appropriate regulatory authorities, oversee compliance to existing laws and policies, as well as those to be developed.

4. IMPLEMENTATION

4.1 Framework

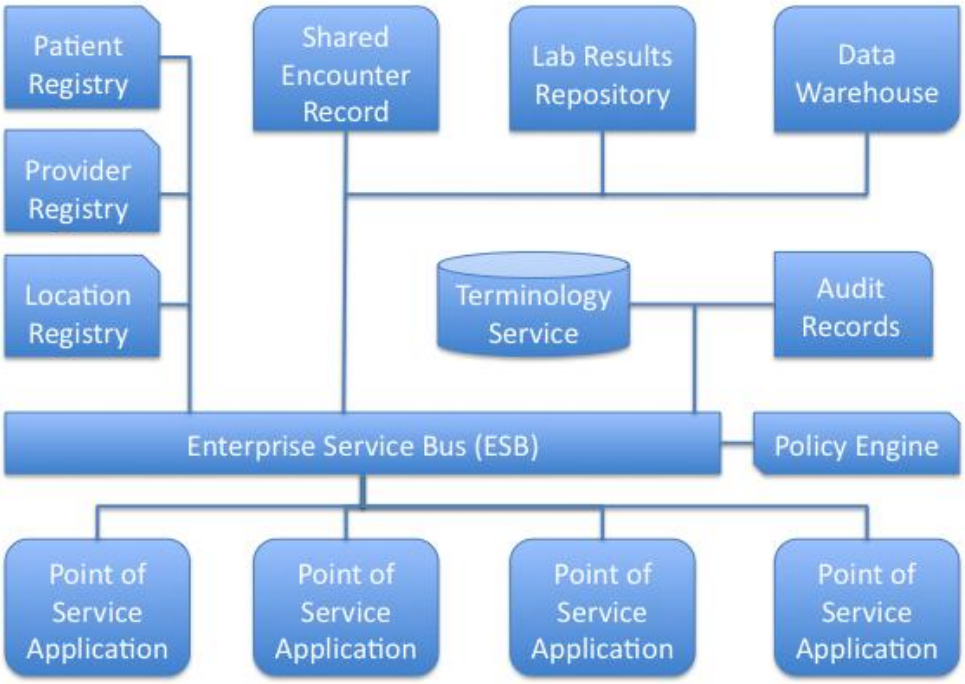
In February 2011, a broad range of stakeholders representing government, private sector (including non-governmental and faith-based organizations) and academia gathered in Naivasha to prioritize the strategic areas of intervention and device an implementation framework for the Strategy. The executive summary of the National e-Health Strategy Implementation Workshop Report can be found in the Appendices and the full report will be made available together with this Strategy.

The stakeholders prioritized the Health information Systems Pillar and divided it into the following five functional domains:

1. Patient Centric Information
2. Pharmacy and Medical Supply Chain Information Management
3. Financial Information, including Insurance and Payments
4. Health Workforce Management and Training
5. Regulation

Furthermore, the stakeholders adopted the notion of Enterprise Architecture as the implementation framework for the National e-Health Strategy and identified the development of interoperability standards both among and within functional domains as a key implementation milestone.

Figure 3 Graphic Representation of an Enterprise Architecture for the health sector[7]



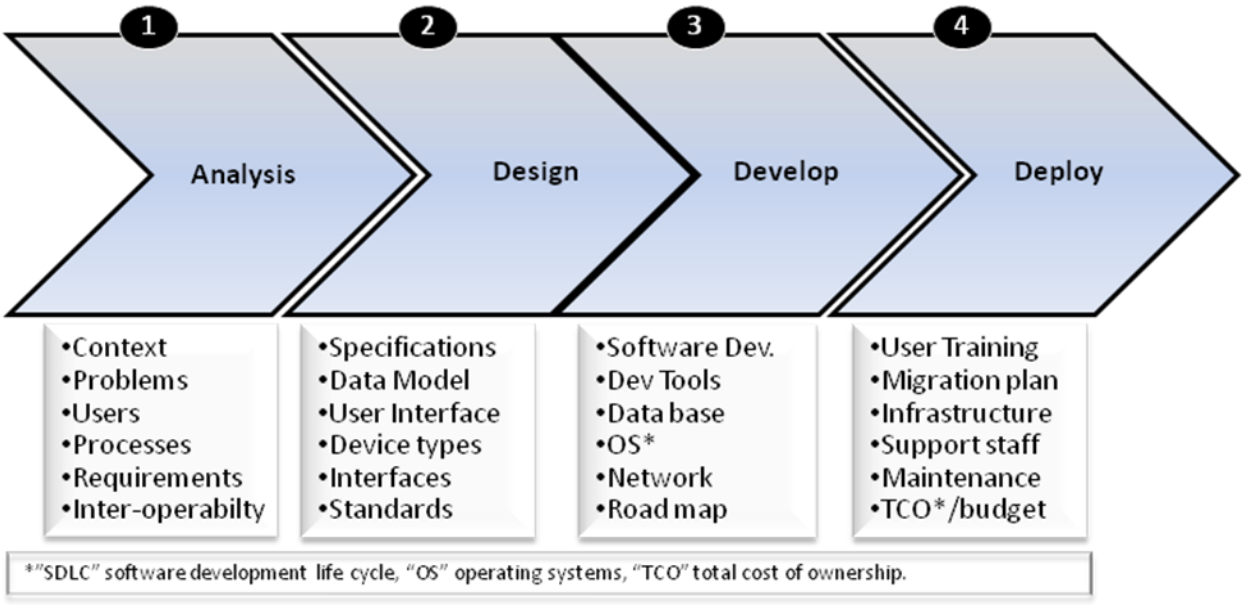
Enterprise architecture (EA) is a comprehensive description of all of the key elements and relationships that make up an organization[8]. It is used to define the alignment of an organization's mission, goals and objectives with information systems[9]. EA can be used to describe the methods for designing health information systems in terms of a well defined set of building blocks, and showing how the building blocks fit together and how the communication between the building blocks can be achieved. Since its development in 1984 the EA approach has been applied by many companies, governments and other institutions worldwide in order to improve their business process, e.g. US Department of Defense, Massachusetts Institute of Technology, commercial firms like BP (British Petroleum), Intel and Volkswagen. Global organizations like The World Bank are viewing EA as an enabler to broad reforms in the public sector[10]. An EA approach to health information systems development allows for important interrelationships to be identified, including which components need to be aligned to which parts and in so doing reduce the risks and incentives of fragmentation, and duplication, and lack of interoperability[11]. One of the objectives of the EA exercise and

[7] Fourie, Carl, Presentation at National e-Health Strategy Implementation Workshop
[8] 4 Braa J, Humberto M. Building collaborative networks in Africa on health information systems and open source software development - Experience from the HISP/BEANISH network. 2007.
[9] 9 Harmon P. Developing an Enterprise Architecture White paper. 2003. Business Process Trends.
[10] The World Bank Webcast on Enterprise Architecture as an Enabler of Public Sector Reform April 17, 2008, viewed on 31 May 2008.
http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/EXTEDEVELOPMENT/0,,contentMDK:21708035~pagePK:210058~piPK:210062~theSitePK:559460,00.html.

[11] Stansfield, S., Orobaton, N., Lubinski D., Uggowitzer, S., Mwanyika, H., The Case for a National Health Information System Architecture; a Missing Link to Guiding National Development and Implementation.

interoperability framework is to enable the MOH to better coordinate the future contributions of development partners, both identifying key priorities for support as well as ensuring that donor-supported initiatives can be sustained by the Ministry after donor exit and that the technologies deployed will be interoperable with the rest of the ICT infrastructure.

Figure 4 Enterprise Architecture development [12]



4.2 Timeline

Following Principle 6 and in line with the recommendations from the implementation workshop, the implementation will be conducted in the following phases:

Phase 0

Period: by the end of June 2011.

Objectives:

- Define, establish and institutionalize the governance structure to support implementation of the e-Health Strategy.
- Promote broad based and coordinated stakeholder dialogue and engagement towards operationalization of the e-Health strategy.

Key Milestones:

1. Formal adoption and launch of National eHealth Strategy by NeHSC.

[12] Dai, Hozumi, Presentation at National e-Health Strategy Implementation Workshop

2. Establishment of NeHS and NeWG.

Phase 1

Period: July 2011- June 2012

Objectives:

- Design Enterprise Architecture for e-Health Strategy Implementation.
- Build capacity in the critical skills areas to support implementation of e-Health strategy.

Key Milestones:

1. Execution of the analysis and design stages of the EA for each of the health information systems functional domains.
2. Implementation by MOMS of the "e-Health to improve healthcare" pilot project for deployment of ICT in health facilities (see appendices).
3. Refinement and implementation of the Master Facility List to serve as a key building block for sharing facility level information among stakeholders and across functional domains.

Phase 2

Period: July 2012 onwards

Objectives:

- Implement Kenya Health Enterprise Architecture.
- Develop implementation framework for telemedicine, mHealth, e-Learning and Citizen Information pillars.

Key Milestones:

1. Execution development and deployment stages of EA for the Health Information Systems functional domains.
2. Stock-taking exercise and development of functional domains for telemedicine, mHealth, e-Learning and Citizen Information.
3. Rolling out of "e-Health to improve healthcare" at national and county levels.

5. MONITORING AND EVALUATION

Monitoring and Evaluation will be carried out to enable:

- Enforcement of compliance with the legal and regulatory regime
- Maintenance of quality standards in service provision
- Improved surveillance – based on agreed service delivery indicators
- Effective management of project and budget execution

5.1 High Level Monitoring & Evaluation Framework

APPENDIX A: POLICY FRAMEWORK

VISION 2030

Kenya's national development agenda is elaborated in the Kenya Vision 2030 document. In it, is articulated the vision of a globally competitive middle income Kenyan economy with a high standard of living by the year 2030.

Kenya's vision for health, articulated in Vision 2030, is to provide "equitable and affordable healthcare at the highest affordable standard" to her citizens. The document goes further to state, "Under the Vision, Kenya *will restructure the health delivery system and also shift the emphasis to "promotive" care in order to lower the nation's disease burden."*

Vision 2030 has three main objectives for the health sector:

1. Revitalize the healthcare infrastructure.
2. Strengthen healthcare service delivery.
3. Develop equitable healthcare financing mechanisms.

In order to achieve the healthcare goals of Vision 2030, the health sector requires continued key reforms. Among these are an enhanced regulatory framework and the creation of an enabling environment to ensure increased private sector participation and greater community involvement in service management. This will be followed by increasing financial resources to the sector and ensuring efficient utilization of resources.

NATIONAL HEALTH POLICIES & STRATEGIES

Kenya Health Policy Framework[13]

The overall goal of health sector policy until the year 2010 will be:"To promote and improve the health status of all Kenyans through the deliberate restructuring of the health sector to make all health services more effective, accessible and affordable". The strategic imperatives which have been identified are:

1. Ensure the equitable allocation of government resources to reduce disparities in health status;
2. Increase the cost effectiveness and the cost efficiency of resource allocation and use;
3. Continue to manage population growth;
4. Enhance the regulatory role of the government in all aspects of health care provision;
5. Create an enabling environment for increased private sector and community involvement in health sector and community involvement in health service provision and finance; and
6. Increase and diversify per capita financial flows to the health sector.

Therefore to meet the goal of strategic health policy as set out in this policy framework and to respond to the future health needs of Kenyan people, the Ministries of Health are committed to act and to implement the following reforms of the health sector:

[13] Kenya's Health Policy Framework, November 1994

1. Strengthening the central public policy role of the Ministries in all matters pertaining to health;
2. Adoption of an explicit strategy to reduce the burden of disease among the Kenyan population and definition of those cost effective and essential curative and preventive services which will be provided for by the Ministries of Health;
3. Reinforcement of the County level to permit effective superintendence of the districts and further decentralization of planning, management and resource creation, control and use to the districts;
4. Strengthening of NGO, local authority, private and mission sector health service providers;
5. Generation of increased levels of financial resources for the provision of cost-effective services through widely accepted cost sharing and alternative health financing initiatives;
6. Shifting part of the financial burden of curative care from the Ministries of Health (MOH)budget to insurance schemes;
7. Further reduction in the rate of construction of new government facilities and a focus on consolidation, rehabilitation and maintenance of existing ones based on need and their cost effectiveness in delivering health care;
8. Increasing the level of adequate human, financial and organizational resources to properly maintain and repair facilities and equipment;
9. Reorientation, retraining and redeployment of health manpower to meet manpower demand projections and resource availability;
10. Prevention and control of Aids, HIV infection and sexually transmitted diseases;
11. Adoption and implementation of a National Drug Policy;
12. Consolidation and strengthening of key health management information systems (HMIS) to support the policy making role of the Ministries of Health in budgeting, planning and management functions in the districts;
13. Institutionalization of management tools for cost containment and cost control particularly for the hospital and curative sector;
14. Strengthening of health research; and
15. Reorientation of the organization structure and function of the MOH to meet the proposed reforms

This Kenya Health Policy Framework (KHPF) is currently under review. The Health Act is also under review.

NHSSP I (1999 -2004)[14]

NHSSP I re-stated the KHPF's strategic imperatives and articulated a large number of strategies and activities to continue and strengthen the reform process. These included:

strengthening governance;

[14] Adapted from MOMS strategic plan and NHSSP II (2005 -2010)

improving resource allocation;

decentralizing health services and management; and

Shifting resources from curative to preventive and CHC services.

They also specified provision of autonomy to county and national hospitals and enhancement of collaboration with stakeholders under a sector-wide approach.

The shortcomings of NHSSP I may be attributed to a set of inter-related factors, such as:

Absence of a legislative framework to support decentralization;

Lack of well-articulated, prioritized and costed strategies;

Inadequate consultation amongst MOH staff themselves and other key stakeholders involved in the provision of health care services;

Lack of institutional coordination and ownership of the strategic plan, leading to inadequate monitoring of activities;

Weak management systems;

Low personnel morale at all levels; and

Inadequate funding and low level of resource accountability.

As a result, efforts made during NHSSP I did not contribute to the improved health status of Kenyans. Rather, health indicators showed a downward trend.

Eight important suggestions and recommendations for the development of NHSSP II (2005 – 2010):

1. NHSSP II should strengthen the implementation of a sector-wide approach (SWAP) and define the resource envelope needed to implement the next plan, including a financial mobilization plan as part of a strategy that focuses on achieving specific targets and programme outputs;
2. NHSSP II should provide a specific timeframe for reviews and monitoring, as well as midterm and final evaluations, to ensure adherence to the strategic plan, based on the agreed benchmarks; M&E frameworks already developed need to be entrenched into current programmes and their respective indicators need to be harmonized and coordinated by a central unit at MOH headquarters;
3. All MOH departments should prepare individual departmental medium-term strategic plans based on the new NHSSP II targets and objectives. Furthermore, their respective divisions' operational plans and implementation need to be guided by the departmental targets and priorities. This management practice will not only facilitate integration and strengthen operational linkages amongst the MOH service delivery programmes, it will also enhance monitoring and evaluation, hence promotion of efficiency and effectiveness in health sector performance;
4. An institutional review is necessary to realign the current organizational structure and (re-) position new emerging core functions. NHSSP II should develop organizational structures with clear roles and responsibilities for each department/division. Support services should create an enabling environment and provide general backstopping. All units of policy, planning, budgeting/finance, human resource development and other support services need to link their activities directly to service delivery programmes;

5. NHSSP II should explicitly address the issue of coordination and come out with improved internal and external coordination mechanisms. This should allow for external resource negotiations and avoid the existing functional overlap of mandates between various departments;
6. A national training policy is needed to guide and integrate training and capacity building on the basis of needs. Next, a national training plan should be developed for all different cadres of staff. The provincial and district level training plans should be guided by the national training plan and reflect the national objectives;
7. A national policy for health infrastructure, equipment and waste management should be developed from the reports of national infrastructure audits and inventory records, which should be reviewed annually. Capital budgets need to have adequate provision for operation and maintenance (O&M); and
8. The preparation of NHSSP II should be developed through a participatory process at all levels of MOH and stakeholders. The current working teams for the preparation of NHSSP II should invite provincial and district inputs and views through active participation of County Health Management Teams (CHMTs), District Health Management Teams (DHMTs) and other stakeholders.

NHSSP II (2005 – 2010)

This second National Health Sector Strategic Plan (NHSSP II) is formulated with the aim of reversing the downward trends in health indicators observed during the implementation of the first strategic plan (NHSSP I, 1999–2004), applying the lessons learned and searching for innovative solutions. NHSSP II will re-invigorate the Kenya Health Policy Framework (KHPF) elaborated in 1994.

The goal of the NHSSP II therefore is to contribute to the reduction of health inequalities and to reverse the decline in the impact and outcome indicators. These health inequalities exist between urban and rural populations, between districts and provinces (compare Western Province having 68% of the population below the poverty line with Central Province at 46%).

The achievement of the NHSSP II outputs will need the contribution of all actors whose primary purpose is to promote, maintain or restore health.

These actors are:

The public sector, represented by MOH and other government institutions

The private health sector (being private for-profit and private not-for-profit)

Traditional healers, providing traditional medicine

Individuals and households that ensure care and support for their families and the communities they live in

Development partners

NHSSP II has five broad policy objectives:

Increase equitable access to health services.

Improve the quality and responsiveness of services in the sector.

Improve the efficiency and effectiveness of service delivery.

Enhance the regulatory capacity of MOH.

Foster partnerships in improving health and delivering services.

Improve the financing of the health sector.

HEALTH MINISTRIES VISION, MISSION & RESPONSIBILITIES

Ministry of Medical Services (MOMS) Vision and Mission

According to the MoMS Strategic Plan 2008 -2012, "The overall vision of the Ministry of Medical Services is to have an efficient and cost effective medical care system for a healthy nation".

Its mission is "to promote and participate in the provision of integrated high quality curative and rehabilitative medical services to all Kenyans". It seeks to attain this through direct provision of medical services, and building necessary linkages and partnerships with other service providers and development partners as needed.

MOMS's central leadership role is to ensure that Medical Services are provided to contribute to the attainment of the medium-term development goals as outlined in NHSSP II and the first Medium-Term Plan (MTP) 2008–2012.

According to Presidential Circular No. 1 2008, the core functions of MOMS are:

1. Medical services policy
2. Curative services
3. HIV/AIDS and other sexually transmitted infections (STI) treatment and management
4. Maternal services
5. Rural medical services
6. Clinics and hospitals
7. Registration of doctors and paramedics
8. Nurses and midwives
9. National Hospital Insurance Fund
10. Clinical laboratory services
11. Kenya Medical Training College (KMTC)
12. Kenya Medical Supplies Agency (KEMSA)
13. Regulatory bodies for pharmacy and medicine
14. Member of KEMRI board

Medical Services aims to ensure that essential medical care is made available where needed, when needed and in appropriate amounts.

Ministry of Public Health and Sanitation (MOPHS) Vision and Mission

The vision of the MOPHS is "***A nation free from preventable diseases and ill health***"

Its mission is "***To provide effective leadership and participate in the provision of quality public health and sanitation services that are equitable, responsive, accessible and accountable to all Kenyans***"

According to Presidential Circular No. 1/2008 the Ministry of Public Health and Sanitation is responsible for ensuring that public health policy objectives are realized. They do this by providing:

1. Oversight in all sanitation services
2. Preventive health programme including vector control
3. National public health laboratories
4. Government Chemist
5. Dispensaries and health centres
6. Kenya Medical Research Institute (KEMRI)
7. Radiation Protection Board (RPB)
8. Member, KEMSA Board
9. Member , KMTC Board

In order to realize these goals, serious consideration is being given to Information and Communication Technologies and systems as cross-cutting enablers towards the provision of the envisaged health priorities.

APPENDIX B: NATIONAL e-HEALTH IMPLEMENTATION WORSKHOP REPORT EXECUTIVE SUMMARY

Background and Objectives

In May 2010, the Kenya National e-Health Strategy was developed through a consultative process involving the government, private sector and development partners. The Strategy aimed to harness information and communication technologies (ICT) for improved healthcare delivery through four broad objectives:

- To Support more informed policy, investment and research decisions through access to timely, accurate and comprehensive reporting on the Kenyan health system activities and outcomes;
- To improve the quality, safety and efficiency of clinical practices by giving care providers better access to consumer health information, clinical evidence and clinical decision support tools;
- To enable the Kenya health sector more effectively operate as an inter-connected system to overcome the current fragmentation and duplication of service delivery;
- To create linkages between health researchers and service providers using information technologies.

Around the same period, the World Bank Group's Health in Africa Initiative was helping bring together the public, private sector (including NGO and FBOs) and development partners on reforms intended to foster a better business environment for private sector health operators.

In late 2010, as part of the PPP process, the World Bank Group and the Ministry of Medical Services agreed to fast-track the implementation of the National e-Health Strategy 2010-2017. The Ministry established the National e-Health Steering Committee and e-Health inter-ministerial Working Group and sought WBG support in mobilizing financial and technical resources to expedite the process.

The objective of this collaboration was to lay the foundation of an enterprise architecture for the rationalization of ICT applications in the health sector, in order to promote interoperability and facilitate the exchange of patient, supply chain, financial, health workforce and regulatory information between the public and private sector, national and county governments as well as different segments of the health system.

In line with this, the Ministries of Health, MOH (MOMS and MOPHS) and the WBG decided to host a workshop on the implementation of the National e-Health Strategy on 23-25 February 2011 at the Great Rift Valley Lodge in Naivasha.

Workshop Proceedings

A high level outline of the workshop agenda follows:

Day 1

1. National health priorities
2. International Case Studies
3. Plenary Discussion

Day 2

1. Kenyan Context and Experience
2. Plenary Discussion
3. Breakout Sessions

Day 3

1. Breakout Sessions
2. Workshop Resolutions

Session Highlights

National health priorities

- All the 8 United Nations Millenium Development Goals (MDGs) have a direct or indirect bearing on health which is a key cross-cutting priority straddling all the 3 pillars of Vision 2030 - political, economic and social
- Effective implementation of the National e-Government Strategy could enhance health service delivery to citizens, government, non-governmental organizations, parastatals and the private sector by enabling healthcare service providers effectively and promptly serve patients in any part of the country, by accessing online patient data
- WHO member states are well advised to consider e-Health as a new strategy for supporting health-Care service delivery and, in particular, ensure the provision of ICT Infrastructure by government to promote equitable, affordable and universal access to health-care
- Collaboration between Public and Private sector Partners(PPP) in ICT should be fostered to enhance healthcare service delivery through improved access to medical care at lower cost while meeting the MDGs
- It is necessary to establish policy coordination and technical support frameworks by government and national centres and networks of excellence for sharing e-Health best practices.

Lessons from International Case Studies

- EA design and implementation is painstaking, resource intensive and cannot be successfully undertaken without political will and leadership at the highest level
- Coordinated stakeholder input is key to EA implementation planning and execution. It is, therefore, important to establish a multi-stakeholder secretariat for this purpose. A team with the appropriate technical and managerial expertise bringing together health sector stakeholders, developing partners and consultants via a PPP is necessary.

Kenyan Context and Experience

On day 2 of the workshop, various resource persons made presentations based on research and specific first hand ICT for health experience in Kenya. These gave way to plenary discussions and to the highlight of the workshop - breakout group sessions. Key issues and recommendations emerging from the resource persons, breakout group presentations and plenary discussions follow:

Emerging Issues

The stakeholders identified a need for:

- An e-Health Policy
- An overarching Health Regulatory Authority needs to be institutionalized to streamline the sector, and in particular, with regard to training and continuing professional development (CPD)
- Blended e-learning program to enhance CPD
- Ministries to be compelled by law to focus on providing policy leadership and not be involved in the procurement as this is a conflict of interest
- Standards for EMR to be agreed as quickly as possible with relevant authorities such as the Kenya Bureau of Standards to enable sharing of patient information as necessary in the envisaged Enterprise Architecture
- The Master Facilities List to be updated and accessible online to support decision making and inform policy priorities
- An ongoing capacity building program, which emphasises organizational culture change to support CPD for all staff
- Promote the use of appropriate ICTs in health information management leading to collection of more reliable health data in the community
- Use ICTs to empower the community, CHWs and health staff to improve the management and use of health information
- Apply ICTs for promoting community knowledge and behavior change through information generation and use

Day 3, the final day of the workshop, saw a continuation of the popular group breakout sessions. Group deliberations and plenary discussions identified the following key issues:

- Establish an apt policy and regulatory framework to guide e-Health Implementation;
- Streamline the pharmaceutical supply chain;
- Integrate the financial and payment system, including insurance;
- Establish an independent accreditation body for training, supported by e-learning;
- Post all revelant sector information on an e-Health portal. (An example was given of the Kenya Dentists Board which displays the names of licensed practitioners online).

The above issues were summarized into an 8-point resolution to guide the next steps, as shown on the following page.

Workshop Resolutions and Post Workshop Action Plan

The stakeholders endorsed an 8-point resolution committing themselves to:

1. Define, establish and institutionalize the governance structure to support implementation of the National e-Health Strategy 2010-2017;
2. Promote broad based and coordinated stakeholder dialogue and engagement towards operationalization of the e-Health strategy;
3. Design, develop and implement an enterprise architecture to actualize the e-Health Strategy;
4. Build capacity in the critical skills areas to support implementation of the National e-Health Strategy;
5. Establish appropriate standards for infrastructural interoperability and information sharing;
6. Enforce the established standards across the entire health sector
7. Lobby and advocate for appropriate policy and legislative frameworks to support e-Health implementation;
8. Establish a stakeholder driven secretariat to progress the implementation of the resolutions agreed.

APPENDIX C: Proposal for using e-Health to improve healthcare delivery

Introduction

Kenya's vision for health, articulated in Vision 2030, is to provide "equitable and affordable healthcare at the highest affordable standard" to her citizens. "Under the Vision, Kenya *will restructure the health delivery system and also shift the emphasis to "promotive" care in order to lower the nation's disease burden."* Vision 2030 has three main objectives for the health sector:
Revitalize the healthcare infrastructure.
Strengthen healthcare service delivery.
Develop equitable healthcare financing mechanisms.
The government has endorsed the use of ICT to support health service delivery. For this reason eHealth is a strategy being employed to support service delivery. The Ministry of Medical Services will pilot an integrated Hospital Management Information Systems in **Kayole District Hospital- level 4**, **Mbagathi- level 4, Nyanza PGH – level 5**, **Gatundu District Hospital - level 4** and **Machakos district hospital-level 5**. Upon successful implementation the system can be replicated in other counties.

Problem Statement

The Kenyan health system has several challenges, among them the rising cost and demand for quality healthcare services. Healthcare policy has traditionally focused on free or subsidized services to increase access to healthcare without addressing the other service delivery needs. There is therefore an urgent need to identify and implement solutions that can effectively improve health delivery. This can be achieved by executing strategies that close the healthcare service delivery gap by harnessing ICT as a key driver for improved healthcare outcomes.
The Government of Kenya recognizes the role that ICT in general and e-Health and m-Health in particular, can play in improving communication, document digitization and electronic storage and retrieval as a way of reducing transaction costs and improving service delivery 4
eHealth is a globally proven method of achieving this transformation, and its successful implementation would provide a unique opportunity for the Ministry of Medical Services to provide improved medical care with the potential for long term benefits and sustainability.

Goal

To implement a fully integrated e-Health program covering **Kayole District Hospital- level 4**, **Mbagathi- level 4, Nyanza PGH – level 5**, **Gatundu District Hospital - level 4** and **Machakos district hospital-level 5**.

Specific objectives

a) To automate the operations in the selected Healthcare facilities as follows:

i. Install ICT hardware in the selected healthcare institutions

ii. Install ICT connectivity infrastructure and end user equipment

iii. Install Health Information Systems application software

iv. Train medical and technical staff

v. Have a fully functioning easy to use electronic health management platform

b) To implement an m-Health system and telecare centre:

i. To develop a mobile phone application system for messaging of health information to all stakeholders in the health system and to the general public

c) To implement a medical savings program using Smart Cards, so as to enable consumers have control over their health financing needs

General objectives

(a) To empower consumers to have easy access to their personal health records in order to be able to make decisions on managing their health.

(b) To reduce the cost of health provision by better control of the supply chain

(c) To improve the efficiency of health provision by allowing data-driven analyses of the treatments used by providers, their outcomes and their costs; also by enforcing the use of standard drugs and protocols.

To capture and maintain an electronic health database as a reference pool for quality and speedy decision making by health providers

(e) To enable the health providers in the network to operate more effectively as a single system due to easy access to patient records and data.

(f) To operate an m-Health platform that offers health tips and messages to consumers as well as telecounselling for a range of non-communicable diseases

ACTIVITIES		No	No of selected facilities	Total	unit cost Ksh.	Total cost Ksh.
INFRASTRUCUTRE						
Acquire ICT infrastructure	Procure Minimum hardware					
	Servers	1	5	5	3,000,000	15,000,000
	Server software + Licenses	1	5	5	500,000	2,500,000
	desktop computers with Licenses	10	5	50.00	100,000.00	5,000,000
	Antivirus Software	30	5	150.00	(150000X5 years)	7,500,000
	Printers	2	5	10	120,000	1,200,000
	Scanners	2	5	10	70,000	700,000
	Copiers	2	5	10	150,000	1,500,000
	LCD projector	2	5	10	80,000	1,500,000
	UPS systems	10	5	50	50,000	2,500,000
	Laptops with Accessories	2	5	10	80,000	800,000
	Teleconferencing /Telepresence equipment/facilities	1	5	5	1,500,000	7,500,000
	Digital cameras		5	25	15000	375,000

NETWORKING						
	Provide connectivity to all sites (Fibre for facilities within Nairobi and major towns)		5	5	3,000,000	75,000,000
	Procure routers	5		5	350,000	1,750,000
	Switches	5	5	25	300,000	7,500,000
	Cabling			5	5,000,000	25,000,000
	Cabinets	5	5	25	40,000	1,000,000
						-
ACQUISITION OF INTEGRATED HOSPITAL MANAGEMENT INFORMATON SYSTEM, INCLUDING TRAINING OF THE SYSTEM						
Modules						
	Patient Administration					-
	Billing					-
	Appointment management					-
	Ward management					-
	HR					-
	Doctor/Nurse Workbench					-
	Pharmacy					-
	Lab system					-
	Operation Room					-
	Pathology lab					-
	MIS					-
	Platform usage					-
	Feedback					-
	Microbiology system					-
	Infection control system					-
	CSSD					
	Blood Bank					

						200,000,000
CAPACITY BUILDING						
	Training staff on change management & Team building		(For 5 days @5000/= per day)	20	25,000	500,000
	Training on ICT skills (ICDL)		(for 25 days)	20	40,000	800,000
	Management		(3 days @5000/=per day)	20	15000	300,000
	Accommodation, Transport + allowances		(=28days * 10,000 * 20 pax)	560	10000	5,600,000
	Recruit 5 IT Managers to manage the acquired System	5	5managers*5sites*150,000 per month*12			45,000,000
PROJECT MANAGEMENT						
	Quarterly Project Management Oversight visits	5	5 persons*8,000/=*per 4 visits*5 days			800,000
	Fuel for Quarterly Supervision	4	4 trips @ 30,000/=			120,000
	Driver	2	Per-diem for 2 drivers*3000/=*5days*4 trips			120,000
					TOTAL	**409,565,000**

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