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Assessing e-health policy development process using policy process network approach

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ASSESSING E-HEALTH POLICY DEVELOPMENT PROCESS USING POLICY PROCESS NETWORK APPROACH

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Abstract

The use of information and communication technologies in health care system can enhance equitable access to health care services and health information, even for the most marginalised communities in South Africa. The effective implementation of such applications in the health care system is dependent on the inclusive e-health policy development process bringing together the views of all the different role players.

This research paper is a qualitative case study which looks into the extent to which the e-health policy development process in the Republic of South Africa has involved the active participation of all the relevant role players. The policy process network (PPN) approach introduced by Parag (2005) has been utilised to guide the methodology employed, the selection of the participants in the study, the design of the research instrument and the analysis of the results. The research study has looked at the extent to which the assessment of the e-health development process is aligned to the policy process network (PPN) approach.

This policy assessment has not followed all the elements employed in the PPN as the policy under investigation is still in its infancy stage. However, the PPN approach employed has assisted in detecting the weaknesses of the e-health policy and the e-health policy process. If applied correctly, the framework can contribute to the formulation of a policy that is more effective.

In view of the research findings, it emerges that there is a centralised approach into e-health policy development process. The centralised approach has shown its own weaknesses as highlighted in the limited participation of local government, communities and the healthcare implementers.

The recommendations are important for the National and Provincial Department of Health policy makers to note the complexity of e-health which requires a sophisticated and encompassing coordination and collaboration system of all the networks. Without such a system the role players would just wield their power instead of working together in the e-health policy development process.

Declaration

I declare that this report is my own, unaided work. It is submitted in partial fulfilment of the requirements of the degree of Master of Management (in the field of Public and Development Management) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

_____

Ncedisa Mafani

February, 2013

Dedication

To my children, Siviwe-Sanda and Zinathi, thank you for your understanding during this project.

To my mother, late father and siblings

To my family in Pretoria, thank you for your understanding and support during this long journey. It hasn't been easy, I know.

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Befitting also is that I thank the sampled participants who made this research study to materialize. The National and the Eastern Cape Provincial Department of Health, the healthcare staff at the Tsilitwa community clinic, the experts on e-health, the community leaders and informants and the implementers of the e-health solutions from various healthcare institutions in the Eastern Cape who willingly participated in this study.

I am also grateful to Bongiwe and Thembinkosi Majali for looking after my daughter during this project. Sincere thanks to my friends, Lindelwa Komna and Ntomboxolo Currie for their support in the early stages of this research. My classmates, Lebogang Jiya, Monde Mbanga, Mandla Ngcobo thank you for being part of this long journey.

Lastly, I wish to humbly acknowledge with sincere gratitude, my friend, my mentor, Advocate Bantubonke Regent Tokota “SKULU”, who has made this project possible. Your unconditional support is immeasurable. You believed in me and you gave me a life line. God will bless you even more.

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Acronyms

CSIR	Council for Scientific and Industrial Research
DOC	Department of Communication
EHRs	Electronic Health Records
GOE	Global Observatory for e-Health
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HPCSA	Health Professions Council of South Africa
GPRS	General Packet Radio Service
HRD	Human Research Development
ICT	Information and Communication Technology
ISAD	Information Society and Development
ITU	International Telecommunications Union
MDGs	Millennium Development Goals
NDoH	National Department of Health
NHIS/SA	National Health Information System of South Africa
PACS	Picture Archiving and Communication System
PC	Policy Cycle
PDAs	Personal Digital Assistants
PDOH	Provincial Department of Health
PN	Policy Network
PNC	Presidential National Commission
PPN	Policy Process Network

SITA	State Information Technology Agency
SMS	Short Message Service
USALs	Under-serviced Area Licenses
SOPA	State of the Province Address
UKZN	University of Kwa-Zulu Natal
UN	United Nations
WHO	World Health Organisation
WSU	Walter Sisulu University

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Chapter 1: Participating in e-health policy development process

Introduction

This research paper is a qualitative case study which assesses the e-health policy development process in the Republic of South Africa. The policy process network (PPN) introduced by Parag (2005) was employed to examine how the various networks participate in the e-health policy development process through a case study of tele-radiology in the Eastern Cape.

Scott (2002), emphasises the importance of a coherent national e-health policy and strategy that are in line with the national development plans, national information and communication technology (ICT) policies and most importantly, with the buy-in from national health care workers who are the implementers and end users of these technologies in health care delivery. The PPN analysis framework by Parag (2005) affirms Scott's notion and contends that different role players' networks participate in the different stages of the policy development process and influence each other as well as the stages' outcomes. For the e-health initiatives, such as the tele-radiology to be adopted fully and become effective in bringing equitable health care access closer to the patient's first point of contact, all the different networks that are participating in the same policy process need to be considered.

While the process of e-health policy development started in 2006 in South Africa, there have been e-health initiatives introduced as early as the 1990s in the country's health care system environment (Mars & Scott, 2010). These include 28 tele-medicine sites in 6 of the 9 provinces such as the tele-radiology piloted in the Eastern Cape. Using the digital subscriber line (DSL) and 3G mobile connectivity for the rural health care facilities, 23 hospitals (private and public) were linked to the main centre in East London (Gulube & Wynchank, 2001). However, despite the good intentions to bring the rural communities closer to health care, these initiatives have been criticised for lack of scalability, under-utilisation by the public health care facilities in particular and sustainability problems. Although there are a number of known challenges regarding these programmes, the presence or absence of an

effective e-health directive and guidance that is inclusive of all the networks in the form of a policy to control and oversee these initiatives has never been documented as one of the factors that can improve or impede the functioning of these initiatives. It is from this view that this study has investigated e-health policy development process and the inclusive participation of all the role players and interests in the same policy process.

Following the qualitative method of enquiry and the logic of the PPN perspective, this research paper is presented as follows:

Chapter 1 – Participation in the e-health policy development process. This chapter provides the background and an introduction to the research and states the research problem and the objectives of the study.

Chapter 2 – Relevance of the policy process network model (PPN) to e-health policy. This chapter reviews the literature studied on e-health policy development process and implementation. It also serves as a guide to possible approaches taken in the subject matter. The policy process network (PPN) framework introduced by Parag (2005) has been adopted in this study to guide the methodology to this research, the selection of participants as role players and networks in the e-health policy development process, the development of the research instrument and the interview schedule. The PPN framework has also been employed in guiding the analysis and interpretation of the study.

Chapter 3 – Constructivist, qualitative research design and methodology. This chapter provides an overview of the research design implemented by the researcher. It then applies this research design and methodology on data collection and analysis. The chapter basically looks into the roadmap taken by the researcher from the sampling method, instrument design, data collection methods to how the data analysis has been conducted.

Chapter 4 – e-Health policy development process and the various networks participation. This chapter presents the results of the study based on the qualitative methodology as outlined in the research design and methodology in Chapter 3. The

research findings are presented according to three themes that have emerged after data analysis. The process further discusses each theme and its categories and gives an overview of the emerging issues from each theme. Observations and still photos are presented in this chapter as part of the findings to give visual information to augment the qualitative results.

Chapter 5 – Discussions and reflections on e-health policy process design. This is the chapter that discusses the research results and looks at these results in relation to the literature review and research questions, the philosophy underpinning this research where the results demonstrate how the study has embraced the social construction of reality theory. It further looks on whether the results accept or reject the PPN framework model.

Chapter 6 – Provides the recommendations and conclusion based on research findings. But first, the research study shall give the background and context for the investigation of an inclusive e-health policy development process in a typical rural setting.

1.1 Background: e-Health policy in South Africa in the 1990's and 2000's

Access to equitable health care is a basic human right. The Constitution and the Bill of Rights of the Republic of South Africa Section 27 (1) (a) stipulate that: "everyone has the right to have access to …health care…services" and section 27 (2) states that the government must "take reasonable legislative and other measurements…to achieve progressive realisation of that right". The use of ICTs in health care makes it possible to deliver medical care to people who are located some distance away from health care practitioners (Mars, 2011).

The South African government has recognised ICT as a tool that can assist in addressing health care challenges in developing countries. The country being a committed member of the World Health Organisation (WHO), has initiated a policy process that would lead to appropriate legal framework, infrastructure and a process that encourages public and private partnerships to ensure successful implementation

of e-health. Despite the commitment the country has made as the member of WHO, on cursory observation one could not miss that South Africa, after six years since the White Paper Draft has been in place still has no legislation to provide guidance, support and control of e-health initiatives that are being implemented around this country.

Advances in information and communication technologies (ICTs) have raised expectations for health worldwide. These are high expectations to overcome the barriers of distance and time, cost and efficiency and to ultimately bring equitable health care to all. It is important to realise that the use of ICTs in health care is a crucial tool to eliminate the vital time lag between diagnosis and treatment for the rural people of South Africa. By all means it notably includes women and children, people living with disabilities and the aged.

Wireless technologies have the potential of bringing closer to health care even the rural communities that previously could not be part of the world community due to the geographical set up of their terrain (Olukunle, 2008). These people may include women and children, people living with disabilities and the aged.

The World Health Organisation (WHO) defines e-health quite simply as the use of ICTs for health with the core principle that e-health represents a commitment for networked, global thinking, to improve health care locally, regionally and worldwide by using ICT (WHO, 2006).

In the South African context, e-health is defined as the utilisation of ICTs to generate, capture, transmit, store and retrieve digital data for clinical, educational and administrative purposes (Department of Health, 2006). E-health is envisaged as a tool that enhances health status of all South Africans including e-systems in the areas of delivery of health care; the surveillance of diseases and services; health emergencies and hazards; the management of health care institutions; access to repositories of knowledge, applications and literature; education and research (Molefi, 2011).

The South African health information systems have been characterised by fragmentation, lack of coordination with the nine provinces using different systems that are not able to talk to one another (Department of Health, 2012). The lack of interoperability and standardisation of the different systems may also have contributed to the snail's pace of the delivery of an equitable access to health care.

The effective implementation of e-health solutions in linking up the rural health care in South Africa to a specialist health care system would reduce the number of vital patient information loss; promote sharing of information by health care professional regardless of where they are, reducing the transportation of the already sick patient to another health care facility, etc.

The South African government acknowledges that policy should be the integral part of its e-health implementation. This is to create an enabling environment for successful implementation of e-health in the country subsequently to improve access to health care especially in the rural remote areas (PNC, 2008). The inclusive participation of all the relevant and key stakeholders in all the policy development process stages has to be recognised as the crucial role towards any successful e-health initiative.

The starting point in adopting e-health is the development of an effective e-health policy that is a foundation as alluded to in Scott's research on e-health policy formulation. Scott advocates an e-health policy foundation from which all the interests of the role players involved can be channelled, directed and guided in an equitable manner to maximise impact and the effective use of ICTs in healthcare as an enabling tool for supporting health systems. What Scott (2002) suggests is that without an equitable e-health policy in place, e-health programmes are bound to become ineffective and subsequently die a natural or artificial death. As has been noted earlier on, the focus of this study is the investigation of the e-health policy development process in Republic of South Africa as the crucial and important element to ascertain the extent of the participation of all the networks in this process. This is the focal point of this study because the inclusive participation of all the key role players and networks could be one of the key determining factors leading to the success or failure of any public policy development process (Parag, 2005).

The e-health policy development process as any public policy process is a complex on-going exercise. It is a process that stretches over a long period of time and involves many interests and participants, which may vary along the course of time (Parag, 2008). The role players involved would want to construct the policy under discussion according to their reality of life, sense of service, their subjective perception of reality.

The PPN analysis approach is a framework employed in this study to assist in investigating the e-health development process in the Republic of South Africa. It is a framework that also helps the researcher to understand how the e-health policy development process in South Africa is being shaped and implemented. In this process the framework enables the detection of the strengths and weaknesses of this policy development process. All elements considered, the overall analysis of this policy development process will help in coming up with a policy that can bring effective change on how the country's health care system (using ICTs) can be improved.

The PPN framework informs and guides the study on how to select participants as role players and networks in the e-health policy development process as mentioned above. The framework has an impact on how and what instrument to develop for the empirical data collection. It also guides the interview schedules and data analysis.

If the e-health policy development process has to involve the rural people it may be necessary to understand e-health in a typical rural context.

1.2 Eastern Cape socio-economic status

The Eastern Cape is one of the nine provinces of the new democratic Republic of South Africa since 1994. The Eastern Cape Province is divided into seven district municipalities (see Figure 1). The Nelson Mandela municipal district (greater Port Elizabeth) and East London are classified as metropolitan areas. The remaining district municipalities are Cacadu, Chris Hani, Ukhahlamba, Alfred Nzo, OR Tambo and Amatole (Demarcation Board, 2011).

Figure 1: *District municipalities in the Eastern Cape*



Source: *Demarcation Board (www.demarcation.org.za).*

Although Port Elizabeth and East London are the two largest cities in this Province, Bhisho has been officially the capital of this Province since 1994.

The Eastern Cape Province which is the focus area of this study has had the most difficult task of reconstruction and is still faced with the worst consequences of the apartheid era. It had to unify two under-developed, densely populated so-called Independent States (the homeland of Transkei and Ciskei) with the wealthy well serviced areas of the cities and extensive commercial farming, in the former Cape Province. The government is the major employer in the province and most of the people are dependent mostly on the state social grant for food, school fees, health care, etc. According to the Statistics SA (2010) report over 65 per cent of people in the Eastern Cape Province live in poverty with the unemployment rate of 52.6 per cent as Table 1 below indicates (highest in the country) and a GDP per Capita of 2.856. Approximately 87 per cent of the province's population has no medical insurance and relies heavily on the state for health care services (Department of

Health, 2011).The population distribution is Urban: 36.6% and Rural: 63.4%.The majority reside in the former homelands where poor infrastructure is reflected in poor health indicators.

Table1: *Socio – Economic status of the Eastern Cape Province*

DISTRICT	Population Estimates	Size of Area (p/km)	People in poverty (%)	Poverty Gap (Rand Million)	Urbanization Rate (%)	Unemployment Rate (%)	Literacy (%)
Alfred Nzo	436777	6866	87.8	765	5.5	77.3	62.7
Cacadu	419337	58272	43.2	284	70.5	31.1	84.0
Chris Hani	866474	36723	75.5	1159	31.1	63.3	57.6
Amathole	1856381	23593	62.5	1899	39.1	53.3	70.9
Nelson Mandela Metro	1140710	1942	35.8	666	93.7	41.1	87.6
Ukahlamba	337230	25687	82.6	596	28.4	55.6	58.0
OR Tambo	1833964	15982	75.2	2599	7	67.8	48.4
EASTERN CAPE	6890873	169063	64.4	7967	38.1	52.6	65.5

Source: *Department of Health Eastern Cape, 2010*

The O R Tambo district is second largest to the Amathole district in terms of the number of population with an average number of 114 people per square kilometres and accounts for approximately 9 per cent of the provincial surface area. The Eastern part of the Eastern Cape (Alfred Nzo and OR Tambo districts) is strongly affected by unemployment.

The Eastern Cape is the home to many freedom fighters that successfully fought the white minority rule, yet 18 years after apartheid has gone, the Eastern Cape remains

trapped in structural poverty that negatively affects the Province's health and socio-economic profile (HSRC, 2012). More young people (especially men) of the working age are migrating to other provinces looking for better opportunities. This hereby results in more females as family heads in the province, the HSRC report revealed.

1.3 The Health Profile of the Eastern Cape

The Eastern Cape, being one of the poorest provinces in South Africa has a very low average life expectancy at birth (51.3% for males and 53.1% for females). The Eastern Cape Province has 49 district hospitals with 18 Community Health Centres and 817 clinics to serve this population of approximately 7 million people with the majority of these facilities concentrated in urban areas especially the two Metropolitan areas (Nelson Mandela and Buffalo City Metros). With the high levels of TB and HIV/AIDS the province is struggling with specialised institutions to treat the heavy strain of TB.

Although there are e-health initiatives such as tele-ophthalmology, tele-radiology, tele-dermatology, etc. services operated in the province, there is no e-health legislation framework to guide such initiatives. This e-health infrastructure as indicated in Molefi (2011) is under-utilised and fails to achieve the intended goal of improving access to equitable health for all the people of this province. The provincial Department of Health's failure to develop, attract and retain medical staff (nurses, doctors, pharmacists, radiographers, etc.) especially to the rural health care is crippling the health care system where over 80% of the population has no medical insurance and relies on public health care. In 2010/11 the province had a total PHC expenditure per capita of R1 183, with a steady increase since 2005/06 in real terms (SAMRC, 2012).

The 2012 State of the Province address by the Eastern Cape Premier Noxolo Kiviet revealed that there are more than 27 000 medical vacant positions in the provincial Department of Health. More than half of these vacant positions are nursing positions found in the rural health care facilities and over 1200 are medical practitioners including specialists. The province needs R9 billion a year over and above the 15.1 billion budget allocation for 2012-2013 financial year to fill these positions (SoPA, 2012).

1.4 ICT in the Eastern Cape Province

The province has a fixed telephone line tele-density of 9.8 per cent with most of these lines concentrated in the two Metropolitan areas and towns. The mobile penetration of the province is 81.9 per cent and Eastern Cape enjoys GSM network coverage of over 70 per cent. The number of computer ownership is 11.9 per cent and internet access of 24.1 per cent. The radio coverage is 61.1 per cent and there are certain parts of the former homeland of Transkei that have no television coverage (Statistics SA, 2011). In 2004 the O R Tambo and Amathole districts were among the first license holders of the Under-Service Area licenses (USALs) which are, according to the license condition granted to the areas where telecommunication penetration is less than 5 per cent (USAASA, 2006). The granting of USALs to these areas promised to improve the ICT penetration to generate more development to improve the economy of this province.

There are innovative telecommunication initiatives by communities that involved a development and implementation of communication infrastructure that support sustainable economic developments including health care in some of the rural remote areas of the province. The community of Mhlontlo Local Municipality in the district is one of the community initiatives which entered into a partnership with the CSIR, HSRC, and Technikon Pretoria in an integrated rural community development project to build a network infrastructure that supports ICT applications for education, small business, agriculture, and e-health. South Africa is faced with an extreme shortage of clinicians in the state health care system and the use of ICTs in health can be an imperative tool for the rural health care facilities to seek medical services from other state institutions.

1.5 Tele-radiology in the Eastern Cape

Of all the tele-medicine specialisations, the tele-radiology applications in South Africa have been regarded as the most successfully integrated into health systems (Van Dyk, 2011). In South Africa, most private hospital groups, and some networks of

public hospitals, have fully functional tele-radiological services. Van Dyk (2011) describes tele-radiology as a tele-medicine process whereby the digital radiological images are uploaded to a picture archiving and communication system (PACS) that is linked with existing health information or previous images taken from a specific patient. This information can then be viewed and shared amongst radiographers, radiologists and other clinicians irrespective of the location of the users.

The means of electronically transmitting a patient's radiographic images from one location to another with its consultative text has been part of the e-health initiatives that have been run in the province of the Eastern Cape. An initiative was introduced by the State Information Agency (SITA) linking the main centre placed in East London with other provincial hospitals and some health centres. A technology company that is driving this project supports remote diagnosis over the internet connectivity with a high availability data centre.

There has been some research conducted on the e-health technology implemented in this province. Hauman (2010) in particular, has conducted an assessment of the implementation of tele-radiology in the Eastern Cape. Hauman's focus was to ascertain the implementation barriers with regard to the technology, economics, and organisational impact and how to handle behavioural changes associated with the implementation of the tele-radiology in this province. While Hauman's assessment of the tele-radiology in the province has focused on these areas, this research report's focus is on understanding the e-health policy development process and using the tele-radiology implementation challenges (some of which have been identified in Hauman's research) in the province to look into the extent to which the key networks have participated in all the policy development stages of e-health.

1.6 The Research Problem

An e-health public policy development process that is not inclusive of all the key relevant networks in the same policy process makes it difficult for the e-health initiatives to be sustainable, escalated and to be fully adopted by the clinicians for instance (Khoja, 2008). Although South Africa has experienced e-health

interventions such as the tele-radiology initiative in the Eastern Cape Province from as early as the 1990s, some of these initiatives have failed to make it beyond the pilot stages.

On cursory observation, referral institutions such as Cecilia Makiwane and Frere Hospitals in the Eastern Cape Province still experience long waiting list of patients from the rural facilities for a simple procedure such as the barium swallow or a CT scan. These are procedures which a radiographer can perform and communicate with the central diagnosis and reporting area via a tele-radiology link, and have the x-rays reported within minutes. Tele-radiology would eliminate the need for transportation of a sick or frail patient over hundreds of kilometres. Bookings for such procedures could span weeks and having an effective tele-radiology system in place would eliminate the time lag between diagnosis and treatment.

Anecdotal evidence shows that clinicians are sometimes reluctant to fully take advantage of e-health platforms. This could be for the fear of not knowing who would be responsible and accountable should anything go wrong when the diagnosis is made and treatment prescribed over the cyberspace platform without physically examining the patient. The Health Professions Council of South Africa (HPCSA) as the watchdog to the health sector sets as a general rule that health care practitioners are required to do a physical examination of the patient in order to make a correct and proper diagnosis (Mars, 2011). Addressing the challenges of health practice adaptation to new technology (ICT) requires a policy change that embraces new e-health solutions.

Although much research has been conducted on the challenges and problems that inhibit successful implementation of e-health solutions in the South African health care system, little is known about how the active participation of the relevant networks (role players and interests) in the e-health policy development process can promote or impede the delivery of advanced health information and services at the first point of care for the rural communities in South Africa.

Mars (2009) and Gulube & Wynchank (2001) argue that the use of ICTs in health care often disregards the importance of interdependence between technology, stakeholders' characteristics and the dynamic elements of the socio-economic

environment, resulting in e-health solutions that have a low impact and are under-utilised. Khoja et al. (2012) contend that there is a need for distinct policies and strategies that promote the high involvement and participation of role players and distinct interests of networks for the proper implementation and integration at national and international levels.

Investigating and understanding the extent to which the various role players participate in e-health public policy development process in South Africa may lead to recommendations to improve some of the implementation challenges that are faced by these e-health initiatives. This is the research problem to be investigated.

1.7 The Purpose Statement

The purpose of this study is to explore the e-health policy development process using the PPN framework for the rural communities in the Eastern Cape, using a qualitative case study design method of enquiry (Baxter & Jack, 2008). The study is to enrich, in an evidence-based manner, the knowledge of the policy-makers and regulators from all tiers of government in the Republic of South Africa. It is aimed at bringing to their attention the critical importance of an active participation role of the various networks in the e-health policy development process. There is an existing e-health policy development process taking place in South Africa which started in 2006. For this reason it is anticipated that this policy examination would lead to appropriate recommendations that will influence this process towards the development of an effective policy. Important to realise is that such a policy could create an enabling environment for equitable access to quality and efficient health care for all the people of South Africa including the rural areas in the Eastern Cape Province.

1.8 The objectives of the Study

1. To provide a better understanding of how the e-health policy is developed, the reason for its existence and who the role players participating in the process are.

2. Detecting the strengths and weaknesses of the e-health policy development process.

3. To provide a policy development framework for e-health policy development that can improve effective implementation of the use of ICTs and bring equitable health care to the rural people of Republic South Africa.

1.9 The research Questions

The following research questions were guided by the policy process network in Parag (2005):

Main Question:

To what extent does e-health policy development process involve the active participation of the various networks in different stages of the policy process to enrich e-health implementation in South Africa?

Sub-questions:

1. How does an e-health policy fit within the Health Policy and Act?
2. What steps have been taken in developing e-health, what are the obstacles and how can these be resolved?
3. To what extent have stakeholders been engaged in finding a way forward for e-health policy development?
4. To what extent have communities been engaged regarding the implementation of e-health programmes and policy development?

1.10 Limitations to the Study

Although this research focuses on the examination of e-health policy development process with respect to rural communities such as the Eastern Cape, what is learnt in the Eastern Cape may not be directly applicable elsewhere but lessons can be drawn for some developing country contexts.

The researcher would like to caution that this study was confined to responding to its problem statement and any recommendations that result from the researcher‘s conclusions should be implemented with this in mind.

1.11 Conclusion

This chapter has given an introduction and general background to the study while a brief background about the e-health policy development process and the e-health initiatives implementation in South Africa is outlined as well. The chapter also introduces the research problem, identifies the objectives of the study, the importance of the study, the research questions used for the study and offers an outline of the chapters that will be discussed.

Chapter 2: Relevance of policy process network (PPN) model to e-health policy

2.1. Introduction

The overall starting point for this research is the investigation of the e-health public policy process as an inclusive and active participation of all the relevant networks in different stages of the policy process. This literature review is conducted against this background.

The review of the literature is explained as a systematic account of what has been published on the research topic by accredited researchers, scholars and practitioners (Fink, 2005). The purpose is to convey what knowledge and ideas have been established on inclusive participation of relevant networks on e-health public policy development process (Baxter & Jack, 2008), and what their strengths and weaknesses are (Baxter, 2005). The path of prior research builds a foundation to demonstrate linkages, illustrate trends and provide an overview of the concept, theory or literature base (Rocco & Plakhotnik, 2009).

Although the literature covers a wide variety of theories of what can enhance inclusive policy participation to make e-health initiatives implementation a success, there is little theory documented on how an inclusive e-health policy process can improve the uptake of e-health initiatives in rural areas such as the Eastern Cape.

This review will focus on four themes: (1) The e-health integration within the existing health system; (2) the e-health policy development as the basis and inclusive participatory process of all relevant networks; (3) the e-health readiness assessment tool that this policy process should enhance in increasing chances of success in implementing e-health programmes; (4) review the policy process that are primary in the policy development process.

In addition, this literature is done to develop a conceptual framework that will connect the other parts of this study together (Merrian & Simpson, 2000 in Rocco & Plakhotnik, 2009). The study aims to focus on the application of these themes and conceptual framework to the rural areas such as the Eastern Cape. But first, the literature will try and dispel the fog around the concept e-health and the scope it covers in this context.

2.2. E-health: Definition and scope

2.2.1. Brief history and definition

The development and implementation of the e-health strategy and policy are regarded as key factors to the improvement of the overall health systems by proponents of ICT for development. These elements are particularly important for strengthening service delivery, health financing and health information and key building blocks of a strong health system (Healy, 2008).

Although e-health is a relatively recent term for health care and medical information practice, e-health can be traced back to the 1990's where its potential has been the subject of discussion globally (Coleman, 2011). In contrast with this notion, Healy's observation is that e-health phenomenon could already be found in the latter part of the nineteenth and early twentieth century. This is the time where medical applications were quick to derive benefits from the progress being made in the field of analogue telephony. These were the early days where health care could be delivered remotely. However, as Healy states, this era was characterised by bandwidth limitations. These limitations could only allow a low rate of data transfer over the copper wires with some interference and noise which resulted in hindering any expansion on the analogue techniques. However, the boom in data digitisation and the convergence of technology in recent times has enabled, among other things, the exchange of health care and administrative data transfer of medical images and laboratory results over long distances within a short space of time (WHO, 2008).

Different definitions have been used overtime to designate the use of ICTs in health care services and information. Healy in particular traces e-health back in the 1970s, where "medical informatics" considered at the time to be the state-of-the-art technology, was used to refer to the processing of medical data by computers. However, Healy explained, the importance of "information processing" was to be rapidly superseded by that of "information communication" as seen in the extremely rapid development of the internet. Health applications then became known as "health telematics" and now "e-health".

In a broader sense, the term "e-health" characterises technical development but also a state-of-mind, a way of thinking, an attitude, and a commitment to networked,

global thinking. The term also refers to the process of improving health care locally, regionally and worldwide by using ICTs (Mars & Scott, 2012).

On the other hand, the WHO provides a more precise definition of e-health: “e-health is the transfer of health resources and health care by electronic means. It encompasses three main areas: The delivery of health information, for health professionals and health consumers, through internet and telecommunications, using the power of IT and e-commerce to improve public health services, e.g. through the education and training of health workers; the use of e-commerce and e-business practices in health systems management”.

In the South African context, e-health is defined as the utilisation of ICTs to generate, capture, transmit, store and retrieve digital data for clinical, educational and administrative purposes (White Paper Draft, 2006). E-health is envisaged as a tool that enhances health status of all South Africans including e-systems in the areas of delivery of health care; the surveillance of diseases and services; health emergencies and hazards; the management of health care institutions; access to repositories of knowledge, applications and literature; education and research (Molefi, 2011).The South African Department of Health has adopted the notion that for e-health to be effective, a patient-centred approach must be used. This approach must reduce the waiting time to access health care services and avoid the waste of resources. It should be an approach that enables health care to be equally available to all the people living in South Africa regardless of where they live (e-Health Strategy SA, 2012).

The use of ICTs in health care delivery has been practised for more than a few decades without being realised by those involved in it. The use of telephones within institutions to verify a patient’s information by doctors is one of the examples of tele-medicine in practice.

Van Dyk (2011) argues that the e-health services are inevitably cutting across epistemic communities and as a result stakeholders should be involved throughout the development process, to ascertain if the technology fits its context. By involving the right stakeholders in the process, they can contribute their domain knowledge for solution creation. The involvement of the right stakeholders in such a process shall

contribute to greater stakeholder acceptance and buy-in. If the participation of the relevant role players and networks is important to make the e-health implementation a success, there is a need to identify who the key role players in this environment are. There is a need to understand how the relevant stakeholders construct the reality of their situation with regard to the e-health information and service.

2.2.2. The main players in the field of e-health

According to Healy (2008), in contrast to the traditional health care system, e-health care solutions require a more coordinated environment. It is an environment that involves a variety of role players from different backgrounds with different interests. Healy identifies the following main role players which slightly vary according to unique situations in each country:

- ***The United Nations (UN) agencies such as International Telecommunications Union (ITU) and the World Health Organisation (WHO)***

  The overall mandate of the UN agencies is to show the way and assist the member countries on how to bring peace and prosperity in the world through the coordination of meaningful development. Each agency has its own specific mandate to cover and maintain within a specified period and framework (UN, 1999). ITU and the World Health Organisation (WHO) established cooperation mechanisms in 1995 to facilitate the provision of health and medical services supported by ICTs. The two UN organisations then established the need for greater collaboration between the Ministries of Health and Telecommunications and to establish partnerships between telecommunication operators and tele-medicine experts, equipment suppliers and service providers (ITU-D, 2010). This partnership recognised the disseminating of information on pilot projects in rural areas as a means of raising awareness on potential approaches to tele-medicine and their relative cost-effectiveness.

- ***Government authorities, health and telecommunications decision-makers (at the national and regional levels)***

  Greater cooperation and collaboration at the regional, national and local levels of governance is required. This is to create synergy in the planning and implementation of the e-health policy and initiatives. Healy emphasises the importance of adopting the e-health solution with the local context in mind and build the e-health solution with the understanding of the unique national and regional challenges.

- ***Academics and research institutions***

  - Academics and the research institutions are the drivers of the evidence-based knowledge hub from where the e-health initiatives can draw strength. The informed e-health initiatives that are based on scientific evidence stand a better chance of succeeding when implemented.

- ***Health professionals role players and their associations***

  By involving the right stakeholders in the process, they can contribute their domain knowledge for solution creation and, in so doing, contribute to the validity of the solution to be implemented (Van Dyk, 2012). As a consequence, greater stakeholder acceptance is achieved. The input of the medical professionals and their associations in all the stages of policy development and product implementation process will surely and steadily increase the user buy-in of the e-health solutions.

- ***Consumers, patients***

  The aim of the e-health implementation is to increase equitable health care access to all the people regardless of whom they are and where they live. The patient's needs and circumstances, the perception of their plight as the consumer on how they see their situation has to be taken into consideration. The service is supposed to be inspired by their situation as a matter of fact.

- ***Donors***

  Donors may have specific interests in terms of what they fund and how they want the fund to be managed. These are the areas that Healy cautions the policy makers to be sensitive to when they do their planning and implement these solutions. The extent to which the donor fund can cover the project costs must be ascertained in advance. Is the donor paying for research or the connectivity leg for instance?

- ***Non-governmental organisations***

  With their highly diverse reasons that may be of political, economic, religious nature, it is important to be familiar from the outset on what their interests are. NGOs have been, and more often than not, continue to be the driving force behind e-health initiatives in developing countries (Healy, 2008). Their contribution may of course be financial, as Healy explains, but also and above all, takes the form of invaluable human and technical resources. Together with general logistical assistance, this ensures that projects are not carried out in isolation but are interconnected by veritable networks of solidarity. This contribution, which allows for the exchange of problems and solutions, is essential.

- ***The private sector***

  The private sector will surely want to be certain about getting a return on their investment. To see the project taking off, serving the purpose, and supported by all role players can come as the relief that the project's life circle can be sustainable and be able to bring in profit on their investment.

- ***The national regulatory organisations***

  Mars (2011) assets that an enabling regulatory environment is required if South Africa wishes to realise the goals of improved access, service delivery and quality of care for the rural communities of South Africa through ICTs. Subscribing to the same notion Kekana, Mkize & Noe (2010) considers the challenges that e-health presents to regulatory authorities and state the need for discussion on the subject. In the South African scenario the regulatory institutions may include those that are overseeing the health sector such as the HPCSA and in the ICT sector it is the ICASA.

2.2.3. Conclusion

Given the greater diversity and heterogeneity of the players in the e-health Healy suggests a global perspective in tackling e-health. The one perspective is the one that accommodates all the interests of the global role players without being less sensitive to their respective global political agenda.

Secondly, the focus should be on convincing health professionals as the end users of the e-health product. This group will be open to the opportunity to improve the quality of health care by means such as second medical opinion, on-going training and easier access to laboratory results. The overall benefit should be to show the reduction of costs on the health care service delivery. The results to this would be the ICT applications in health care that shall convince the potential funders to see the economic sense in the proposed e-health solutions.

2.3. The framework for the development of e-health policy

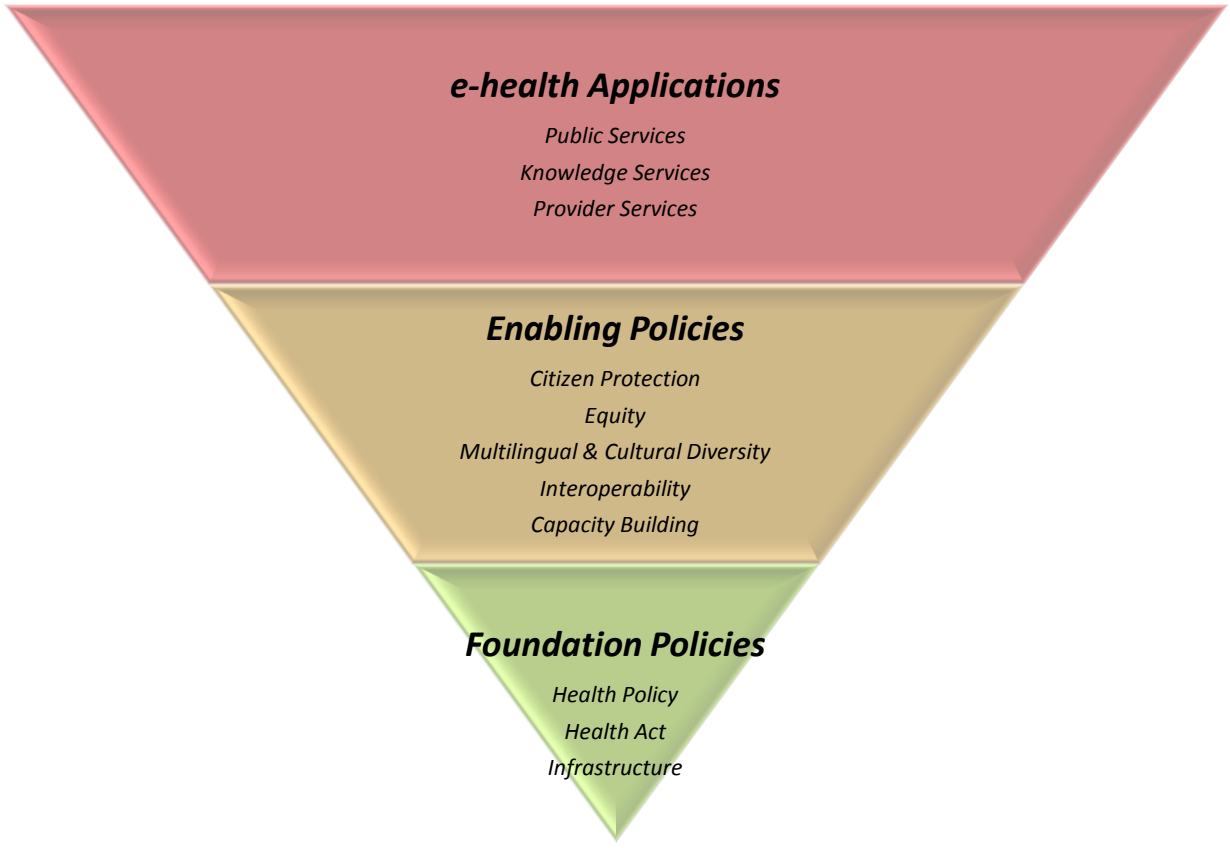
The introduction of the use of ICTs in health care system brings with it new methods of providing information and health care to the population. It is a new method that has a potential to break the barriers of access to equitable health information and care by the marginalised groups (Drury, 2005). Mars and Scott (2010) contend that, for the e-health to be effective, e-health policy must become fully integrated into existing local, national, and global health related structures in both a process and in a policy sense. As in other sectors of the economy, e-solutions and e-health solutions are intended not merely to resolve an ad hoc issue but to serve as the instruments for changing and improving the health system itself (Healy, 2008). Healy advocates systematic and regular collaboration with the local authorities and leaders in health care as an essential tool in identifying and defining the problem as the local people see it, what the owners of the problem propose to do about their situation, and what their priorities are. This scholar describes this move as the global vision of the country's current and future health situation and sees it as the basic prerequisite for any action.

The e-health policy development process is a multi-disciplinary approach to a public policy that has to embrace interaction between institutions, interests and ideas to the policy process (Walt et al. 2008). However, practical implementation of e-health in the local or national context is proving to be difficult (Scott, 2002). The practice of e-

health in South Africa, for instance, may be solving the shortage of clinicians to rural areas but posing a challenge to regulatory authorities such the Health Professions Council of South Africa (HPCSA) and the ICT sector regulator ICASA (Kekana, Mkize & Noe, 2010) and the international level, it would be the World Health Organisation and the International Telecommunications Union (ITU).

Literature identifies some of the policy issues that must be considered to embrace the numerous and diverse role players and interests to make the policy development process and e-health solutions work and be integrated into the health care system. The Global Observatory for e-Health (GOe) adapted a structured framework of e-Health Development Model which was implemented by the European Union health system (WHO, 2008). This study will only look at the following issues that may have a direct impact on policy development in rural settings as depicted in the diagram below:

Figure 2.1: *e-Health Development Model*



Source: *The Global Observatory for e-Health (2008).*

2.3.1. The foundation policies

The foundation policies include methods for transparent and responsive e-health governance, strategic policies and funding approaches supporting e-health and promoting infrastructure development (WHO, 2008).

Governance: Scott (2002) describes governance as: "Governance concerns the actions and means adopted by society to promote collective action and deliver collective solutions in pursuit of common goals". The successful implementation of the e-health systems and services require a collaboration of the multiple stakeholders which exist in the complex health care and ICT technology environment. These are stakeholders that are characterised with a diverse range of interests and agendas to come together in pursuit of making equitable healthcare access for all (WHO, 2008). The World Health Organisation finds it critical that governments should establish sound governance mechanisms to manage this complex process of collaboration and make e-health initiatives a success. Good governance requires government officials to be accountable for government decisions and actions; allow the participation of society in both consultation and planning; put in place equitable and consistent policy, legislation relating to health; and transparency of information on policies, regulation and decisions to all stakeholders and the general public (WHO, 2008).

Good governance systems in place would make the collaboration of the complex multi-stake from the ICT and health sector, the government and non-government role players, etc. much easier to manage the diverse interests and work towards a common goal of bringing equitable health care and information to the population.

Policy framework: WHO identifies three multi-sectoral policy areas that set the foundation for appropriate development and handling of data and information, in particular, digital information and they include the following: National information policy; National e-Policy that sets the trend for any other e-policy to be established that could assist in the acceleration as a national guide for the uptake of such policies; and National e-health policy which is the most specialised within this framework, and it takes a tune from the broader policies. The e-health policy framework would take the tune from the national e-Policy that is informed by the country's broader policy.

Funding approaches: National e-health vision requires the support of a funding framework to realise e-health capabilities (WHO, 2008). An adequate funding environment is important in ensuring that e-health policies and action plans can be carried out in a sustainable way. Healy emphasises a proper business plan covering all aspects of the project including results expected by all participants in the value chain has to be developed. According to Healy, risk involved should be analysed not only from the technicians' and doctors' views but with the professional input from economists and accountants about the project.

The GOe survey results proved that public funding has been the most common source of financing e-health in the European region. Although private funding is gaining recognition in this region, care is taken to ensure that social good is not superseded by profit making interests. In the case where public funding is involved, it provides political administration and legal framework, securing the best possible health solution for the population, issue of employment, economic growth and development. The private sector looks out for the profit while the international donors have strict guidelines on how to donate their money and under which conditions imposed by their donors.

Infrastructure: One of the key foundation actions in the e-health development model is the connectivity, the hardware and software required to deliver and process digital content (GOe, 2008).

The inter-sectoral and non-governmental cooperation including business, aid agencies has been the strategy adopted by the European Union. This was done to promote infrastructural development; the national roadmap for the use of ICT infrastructure in health systems plan; and most importantly, the affordability policy that looks into the reduction of the cost for the purpose of deploying ICT infrastructure in health care.

The local ICT infrastructure development is a prerequisite for the deployment of e-health application that the networks, high speed transmission, access facilities and the associated costs are dependent on. This may not be a challenge in the European countries however; countries that are struggling to meet the basic needs to their

citizens would have put greater effort for their economies to support the implementation of a competitive e-health infrastructure.

2.3.2. The enabling policies

The GOe describes enabling policies as those which focus on the protection of citizen data and confidentiality, promote equity of access throughout society, and promote multilingualism and cultural diversity in cyberspace. It is also explained as the mechanism to facilitate the development of e-health standards to ensure diverse systems can communicate with each other, as Drury puts it, and build human resources capacity so that health professionals are well trained in the use of the many e-health applications.

Equitable policy: One of the promises made by e-health is to make health care more equitable, be that as it may, Drury cautions, there is a considerable threat that e-health will actually deepen the digital divide. People who do not have resources and technological skills cannot access and use these technologies effectively. As a result, these 'have-not' populations who would have the most to gain from e-health are those who are the least likely to benefit from advances in ICTs. Political will and effective implementation of policies, therefore, are required to fulfil the promise of equitable access for all. This has been of serious concern for the developing nations where e-health is weighed against other national priorities such as access to clean water, food, proper sanitation, etc. Equitable access to health care is one of the objectives of the e-health policy stated in the White Paper on e-health (White Paper, 2006). However, the high levels of poverty and unemployment coupled with the high prices to broadband inhibit the chances of making access to equitable health care realised.

Multilingualism and cultural diversity: The vast majority of the people living in poor countries are illiterate and for those who can read and write the language used in these websites is foreign. In some countries, women are not allowed to be seen in the internet access points. South Africa has 11 official languages and many people who are literate in one may not be literate in others. People find it difficult to look for information as they lack the knowledge to do so (Coleman, 2011).

According to the GOe survey report (2008), multilingualism and cultural diversity is the least developed area of any country examined in the European Union survey results. This is an area where the translation of policy into action seems problematic.

The report draws some critical conclusions about the lack of development of this area in the European region. It concludes that, if the language and cultural issues continue to be ignored and are not addressed (which directly affect citizens' access to information), in the current agenda of many governments the vast majority will be excluded from e-health services, If this trend continues, the report cautions, many citizens may continue to be excluded from e-health services due to language barriers. The lack of access to digital information by cultural and ethnic groups within nations contributes directly to fragmentation and inequality of access to resources, enhancing the digital divide within countries.

Interoperability: Interoperability is used to describe systems and services that are connected and can work together seemingly and effectively, while maintaining patient and professional confidentiality, privacy and security (WHO, 2008). As the term implies, interoperability is involved in all aspects of e-health. Considering the fragmented nature of the health information system in South Africa, interoperability is an important consideration (Mars & Seebregts, 2006). There are different systems used by the 9 provinces that need to talk to one another. The National Electronic Record tender was issued to create a single system for the whole country.

Standards form the spine of interoperability, and the development of common standards requires input and collaboration from both technical and political points of view. Standards allow for interoperability between health system operations within an institution, a region, a country and internationally. The greater the standardisation, the greater the freedom of choice a user has when working within a particular system. Examples include the exchange of messages between various health-care facilities and their numerous applications; electronic health records (EHRs); patient identifiers; coding terminology; clinical guidelines and documentation; and business processes of health care institutions.

Capacity building: The World Health Organisation maintains that health professionals (in practice and in training) need to develop ICT competencies to

ensure they can maximize the benefits from the technological solutions becoming available through e-health. Once the foundation policies have been established to implement e-health effectively, the work force must be trained to use the e-health applications being developed and deployed. The WHO organisation recommends this capacity building measure to be conducted at the following two levels:

ICT training for health sciences students - offering ICT skills courses as part of university curricula (undergraduate or postgraduate) for health sciences students.

Continuing education in ICT - providing ICT skills programmes in the on-going training of health professionals.

2.3.3. The e-health applications policies

The first two tiers of the e-health Development Model as prescribed by the WHO in the global observatory for e-health need to be well developed to ensure that the third and final tier, e-health applications, delivers reliable and high quality services. It is these services that will ultimately shape how e-health is used and perceived by citizens, health practitioners and policy-makers. This section as prescribed by the GOe examines developments in three broad areas of e-health applications including:

Public services: information services provided to the citizen, usually via the Internet. The European Region is relatively advanced in making efforts to enhance the accessibility, quality and reliability of health information content. That being said, governments and content providers need to become more aware of international resources that assist health-content owners with guidelines on quality assurance. By familiarising themselves with such organisations, governments can form partnerships with them and incorporate these best practices into the development of their own information products.

Knowledge services: For the e-health implementation to be a success in all spheres of governance and be able to have recognition in the international markets, it will need to have proper knowledge networks and technologies in place to make it possible to share information with the international medical fraternity. This could be the electronic information and education services aimed at health-care professionals in training and practice.

Provider services: e-health tools and services used in the provision of health care to citizens. Providing health care education to health care professionals for the purpose of training and empowerment of those professionals could be extended to the use of this tool for learning purposes for the provision of education i.e. e-learning.

e-Learning in health sciences

e-Learning is a rapidly growing field within e-health. Its use in the education and training of students and professionals of the health sciences makes cost-effective delivery of courses possible to large numbers of people throughout the world. For example, developing countries are progressively adopting such learning techniques as a way of redressing the critical shortage of health professionals in their countries.

Healy (2008), suggests that the implementation efforts for use of ICTs in health care are to be based on a clear appreciation of the country's current and future public health and health care issues and opportunities, with a definition of the corresponding national priorities; subsequently, on a medium- to long-term action plan for the use of e-health technologies to meet health care priorities, with gradual renovation of the health systems themselves. Healy recommends that this plan must:

· bring together role players from the public sector, not-for-profit organisations and the private sector;

· be structured in the form of a business plan, approved by the stakeholders;

· be backed by a strong commitment on the part of all role players;

· include a comprehensive plan for on-going education and communication with the partners.

If these conditions are met Heavy (2008) argues, the chances are more realistic for rapid returns on investment, successful long-term impact, and significant benefits for all concerned.

What we need today is coordinated support from international organisations, donor agencies, other international sources and the private and public sectors. This is the

prerequisite if we are to achieve success in overcoming the digital divide, reducing poverty and, ultimately, securing e-health for all the people living in South Africa.

2.3.4. Conclusion

What this section has provided are the fundamental policy development measures to be put in place if the implementation of the e-health is to be successful. One element that has taken the centre stage is the coordination, collaboration of the relevant stakeholders from all levels as part of the overall policy development process. In an effort to investigate or understand the e-health public policy development process, the participation of the relevant role players and their interests has featured prominently in this section.

The policy development framework discussed above may have been implemented, tested in the developed economies environment. It could be argued that this is a framework that was not without challenges in wealthy economies and is sure to fail if applied in developing and poorer countries. Be that as it may, there are valuable lessons that can be learned from the misfortunes of the rich economies and when these frameworks are applied with relevance to the local context they can have greater impact in improving equitable health care access to the people.

2.4. Policy development process

The decisions made in the policy development process are not a prerogative of a single individual. This a fundamental observation made by Garret & Islam (2009) where the two scholars note the pluralistic nature of the public policy process. It is interesting to note that, what has been observed by Garret and Islam and other proponents of policy development (Walt et al., 2008), is that around the world, new spaces and opportunities are emerging for citizen engagement in policy development processes, from local to global levels. Another important key point in support of the pluralistic nature of the policy development process is that which is made by Walt et. al., (2008) significantly to health policy analysis, is that: “health policy analysis is a multi-disciplinary approach to public policy that aims to explain the interaction between institutions, interests and ideas in the policy process” (Walt et al., 2008, p.

308). In the light of these views it would be safe to say the e-health policy development process is a public policy process and involves a complex and on-going process. It is a process that stretches over long periods of time, which sometimes gets messy (Parag, 2008). It is in this process that various interests and participants which may vary along the course of time are involved (Gaventa, 2006). Parag articulates that public policies do not exist in a vacuum. On the contrary they are context influenced and are embedded in national, economic, political, cultural and social structures and context.

Some experts argue that although this may be true (stakeholder involvement and the greater consideration of content and context), that in recent times there has been a paradigm shift in policy making where there is greater participation by non-government role players, the new terrain does not represent a real shift in power Gaventa (2006). Gaventa does not see the participation and citizen's voice as enabling the people to have any meaningful influence or opening up any space for the ordinary people to have much of a significant role to play in the policy development process.

In understanding the e-health public policy development process which may improve some of the challenges that are faced by the e-health initiatives such as the tele-radiology implemented in the rural areas in the Eastern Cape, this study has adopted the policy process network (PPN) policy framework introduced by Parag (2005).

Parag argues, different role players' networks participate in different stages of the public policy development process and influence each other as well as the stages' outcomes. The PPN is explained as the framework that has been borne out of the strengths of the policy cycle (PC) and the policy networks (PN) approaches with the systems' thinking ideas of dynamic process and interdependences. Following Walt et al.'s notion regarding different 'role players' network in the same policy process, Parag argues, in order to explain and understand public policies, as well as to design an effective policy, all the networks involved within the same policy development process should be considered. The evolving manner of the policy development process movement could be likened to an "amoeba" in which the process can move

backward and forward and according to Parag it becomes important to examine the network's interdependency.

This policy development process exploration is grounded on the belief that the stakeholder's participation (both as state role players and non-state role players) in the e-health policy making process could lead to a better policy that is more responsive to the communities' needs. The development of e-health policy is therefore crucial in identifying the strengths and weaknesses that may have a direct impact for successful implementation of the e-health solutions in the rural health care. The e-health policy like any other public policy introduces change in society and alters individual and collective behaviour. Therefore, in analysing the process through which the policy is shaped and implemented affords an opportunity to detect its strengths and weaknesses and it is the very first step towards understanding how we may design a policy that would bring in an effective change (Parag, 2005).

Parag also identifies and makes a distinction on four policy analysis frameworks that can be used in public policy analysis namely: (1) policy cycle framework (2) policy network (PN) and (3) policy process network (PPN) with (4) the systems thinking ideas of dynamic processes and Interdependencies. The complex nature of the e-health policy issues that involve many stakeholders and multiple coexisting interests requires a policy analysis that is on-going, dynamic and is contextualised (Van Bueren, Klijn & Koppenjan, 2003). An examination that enables in a systematic manner to observe the various networks operating in the same policy process. It must be a public policy analysis that does not ignore the existence of the interests, interaction and the nature of the relations between the actors in such a crucial process. The paragraphs which follow present the different policy analysis approaches that have, to some extent influenced the PPN framework. The strengths and weaknesses of these frameworks are to be discussed in an attempt to demonstrate why they cannot be the framework of choice to examine the e-health development process in the Republic of South Africa.

2.4.1. Policy cycle (PC) framework

The policy cycle process disaggregates the complex phenomenon of policy development into manageable steps. Within the sequence stages, it examines what happens in each stage separately while assuming that one stage influences the following stage. This framework has been criticised by various scholars for its top down approach and the notion that public policies are led by administrators rather than role players and it disregards the content and context issues and intergovernmental relations (Everett in Parag, 2005). Despite his criticism, Everett affirms that this concept is useful in disaggregating the policy process into separate stages to enable a more systematic examination of the policy. Howlett and Ramesh (2003) acknowledge the policy cycle as a widely accepted framework from which every reality curves away. It is from this reality that the e-health policy development process is broken down into separate stages. In observing the different stages separately Parag observes the framework allows the process of scrutinising the activities taking place in each stage, the expertise required, and the procedures that govern these activities in each stage. The other important insight contributed by the framework is the understanding that different stages provide different sets of outcomes. The interests are shaping each stage's outcomes. The stage's framework will allow the observation of the different role players' networks in the same policy process, the activities that are taking place, the power sharing, the different interests and how they are influencing the stage's outcomes.

2.4.2. Policy network (PN)

The policy network process focuses on the cluster of interests (government and non-government role players) and relationships between the role players. It puts its focus and emphasis on the importance of government agencies, the private sector and civil society role players together with the economic characteristics and market changes as the elements that influence the policy process. However, this framework is criticised for the lack of capturing the dynamics that motivates role players within the network (Peters in Parag, 2005). The PN framework tends to explain the policy outcomes by focusing on the dominant network and fails to differentiate between policy stages, where the participating role players weave different alliances, cooperation practices and networks in each stage according to their interests and the

power they hold. This framework, as explained in Parag, also tends to neglect the shift in power amongst the different networks. It neglects the fact that different role players have different access to policy making forums in the various stages. The PN approach would allow the researcher to identify the different role players' networks and how these actors may not necessarily be a different set of role players in each stage but wearing different caps determined by the interests and the power they may hold.

2.4.3. Systems thinking ideas of dynamic processes and interdependencies

This framework suggests that the dynamic aspect of the policy process and the interdependency of the networks and the different stages of the policy process, do not really mean a different set of role players but a shift in roles, interests and power sharing in different stages.

2.4.4. Policy process network (PPN)

The policy process network for policy analysis has been employed in this study for examining and understanding the e-health development process which started in 2006 in the Republic of South Africa.

The policy process network (PPN) framework for policy analysis designed by Parag, tackles the weaknesses identified in the policy cycle, policy networks, and incorporates the dynamic networks with the systems thinking ideas of dynamic process and interdependencies. According to Parag the policy process network (PPN) framework encompasses all the strong points captured in both the policy cycle and the policy networks. In other words its relevance in analysing complex public policy matters like e-health policy cannot be underestimated.

There is much compelling evidence that the PPN framework for policy analysis can assist in making the e-health policy process succeed in its development and implementation. Firstly, success for its reliance on the policy cycle strong points wherein systematic sequence stages are broken down. Secondly, for each policy stage Parag delineates the following: the essential resources must be explained;

outcomes detected; stakeholders identified and examined; the outcomes explained by the unique stages' network characteristics and; the network characteristics are viewed and explained with reference to content and in the context of the other stages' networks.

The PPN approach embraces this study in a number of ways. Firstly, it guides the research on the selection of participants as role players and networks on the different stages of the e-health policy development process. Secondly, this framework assists with the development of the research instrument that will be discussed in detail in the methodology chapter. It guides the analysis of the study on how the analysis supports or rejects policy process network approach.

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2.4.5. Conclusion

This has been the logic of the systems' perspective that calls for the examination of a complex phenomenon, such as the public e-health public development process in its context while considering the relations between different elements composing and affecting this e-health policy. It has been argued that in the same policy development the process is actually governed by different policy process networks, which operate in the context of the other and by influencing one another in that process.

Breaking down the process into its stages while considering the context, could reveal some of the issues that may not be noticed if this process is not followed. This could bring some important insight and explanation regarding who shapes the e-health policy, the how and why. The proposed framework also guides the researcher on the methodology to be used. It guides the selection of the participants, research instruments, the interview schedule and the analysis of the study as it will be explained in Chapter 3

2.5. Analysing the state of readiness for e-health policy process

The developing nations have sought to employ the use of ICTs in health care to widen access, improve quality and increase service efficiency of health care

information and services to its population (Mair et.al, 2012). This is done in the hope of gaining from what e-health has more or less achieved for the developed countries. However, enthusiasm for technological innovation among policy-makers and health officials, Mair et al. observed has not always been matched by the uptake and utilisation in practise in both developed and developing economies. Drury (2005) identifies five different elements that face e-health in developing nations when applied in their health care systems, which can hinder the use of ICTs to work in this environment if these elements are not addressed.

To increase the chances of effectiveness and success of the use of ICT in health care service delivery, it is important to assess the readiness of the communities where these solutions are to be implemented. The models of e-health have been developed in the context of wealth, in the developed economies where national and local well-developed ICT infrastructure is already in place (Drury, 2005). To examine the effectiveness of e-health in rural areas like the Eastern Cape must be strongly influenced by all the factors that could promote or hinder the success of such initiatives. The rural communities in poor countries face unique challenges in accessing health care service delivery in addition to what is faced by their urban area counterparts (Olukunle, 2010). Olukuhle identifies a range of barriers that hinders the rural people of Africa from accessing affordable quality health care including provider shortage, topographical conditions, lack of access to basic amenities and utilities like electricity, a telephone line and proper roads and transport, long travel distances. Eastern Cape rural areas suffer from all of these elements.

A number of factors can inhibit the introduction and successful application of ICTs in the health sector in rural areas. The critical success factors for the implementation and management of e-health services may include but are not limited to the ones discussed here:

2.5.1. Context

Policy development and implementation are processes that take place in a context. Walt et.al (2008) contends that these processes and contexts can change the substantive policy content.

The existing e-health models have been developed and tested in the wealth context of the developed nations, where the national ICT infrastructure has been well established to enhance efficient and affordable service delivery to all citizens. Drury (2005) identifies poverty as a major obstacle to the developing nations to make use of such models to enhance service delivery. In addition to the poverty barrier, rural communities in these poor countries suffer even more setbacks than their urban counterparts within the same country (Olukunle, 2009).The accessible quality health care for all should be a priority for every nation however, most ICT intervention to enhance health care tends to be at the high end of the technology while reality commands a need for the developing economies to begin with what is available in their particular context. Okpaku urges the African continent to take ownership of her problems and to be able to come up with effective solutions.

2.5.2. Community Development

The communities where these technologies are to be implemented must be ready to receive, adapt and incorporate the use of ICTs in health care into their everyday activities.

The ability of the end-user to effectively utilise these applications on health care delivery to consumers is crucial (Olukunle, 2009). Health workers on the ground collate and interpret data in order to take action and may from time to time require consulting with the authorities at the health care facility about their findings. Therefore it is important to empower members of the entire community involved in order to make them critically aware of the ICT use in health care and the potential impact on their day to day activities.

2.5.3. Connectivity

E-health with all the benefits that come with it may not be effective without proper governance, policy framework, funding and globally competitive infrastructure to make that connection with other health institutions locally, nationally and internationally.

The lack of relevant policy and regulatory environment to enable connectivity, electricity, and insufficient infrastructure could cripple any chance of e-health to be effective for instance. There is a need for connectivity within and between health care facilities to support the transmission of health knowledge and management information and provide an entry-level health information infrastructure (Drury, 2005). The lack of an enabling telecommunications policy and regulatory environment to facilitate issues of interconnections, tariffs (Chetly in Drury 2005), inhibits the escalation of the e-health models.

2.5.4. Capacity

Providers including the beneficiaries of the health care services require appropriate skills to effectively make use of this technology in health care. Statistics attest to the fact that developing countries suffer from the high turnover of health care professionals in rural areas who are looking for greener pastures from the cities and rich countries. Attempts to use ICTs to strengthen health care delivery in such rural areas require proper training to capacitate health care workers to effectively and efficiently use ICTs (Olukunle, 2006). The introduction of ICTs to the everyday activities of a rural health worker may be perceived as an additional load of work to their existing volume of work (Drury, 2005). The health professionals are the first to be concerned by changes brought about by e-health solutions (Healy, 2008). In many instances, Healy observed, they are ill-prepared for such a change particularly as training accompanying such changes is lacking. The lack of capacity to incorporate these technologies fully in their daily routine could result in the insignificant utilisation of e-health and failing to accomplish its ultimate purpose of delivering equitable health care to the population.

2.5.5. Content

There is a need to ensure that the health content delivered to any group or population is contextually appropriate and relevant to the needs of that particular population (Drury, 2005). The context has the ability to influence the content (Walt et. al., 2008).

The ICT applications implemented with an objective which improve lives of the people must put the needs of the local people at the centre of the proposed project. The information content available should be relevant to the local needs and must be in a language easily understood by the targeted audience (Khoja, 2008). This is common with internet sites which are mostly English. Coleman (2011) observed that people experience difficulties when trying to access local information from the public internet terminals (PITs). It is a struggle for the communities to use the PIT facilities and language hinders them to access the information they need. Health information is a very important part of the health care and service delivery. The information transferred to the locals must be relevant to their needs, easily understood, timely and be channelled through a relevant medium. Although the literature presents these themes in a variety of contexts, this paper will focus on their applications to the rural community in the Eastern Cape Province.

2.5.6. Conclusion

South Africa has what it takes to build a globally competitive information and communications technology industry with all its collations such as e-health (Okpaku, 2000). But for that to happen, South Africa will have to find the courage to take its destiny into its own hands and execute strategies for success. The readiness assessment has to be made to deliver e-health infrastructure which could talk to the different health and socio-economic challenges that are unique to South Africa. The following section looks at the strengths and weaknesses of the use of ICTs in the health care system when applied in a typical rural area in a developing economy. Dr Okpaku, (2000) looks at all the odds and puts forward some controversial ideas about telecoms in Africa.

2.6. The strengths and weaknesses of e-health policy process

This section discusses the primary policy issues because they are relevant to an understanding of policy formulation. The use of ICTs in health care has been recognised by the World Health Organisation (WHO) as an important tool in accelerating the achievement of the health Millennium Development Goals (MDGs) (Scott, Faruq, Chowdhurry & Varrghese, 2009). These are the development goals

that all the 193 United Nations (UN) member states and at least 23 International Organisations have agreed to achieve by the year 2015 (Info Dev, 2006). Although there is some evidence shown that the introduction of ICTs in health care delivery in developing countries brought about positive results (Khoja, 2005), there is also a fear that e-health could widen the digital divide between the information haves and have-nots (Scott, 2000). This is a situation where those who are literate have the resources and stand more of a chance to access health care information that will improve their livelihood. Meanwhile those who are at the bottom of the economic scale suffer even more.

The primary motivators in adopting the use of ICTs in health care have been observed by several proponents of e-health including Scott, Faruq, Chowdhurry, Varrrghese (2009) and others, to include the expectations that e-health will reduce costs, expand services to under-serviced areas and population, facilitate the change to more public orientation, and improve people's health, nutrition, knowledge and standards of living. Adesina (2007) argues that the introduction of ICTs in health care service delivery in the developed economies brought positive results. Adesina (2007) has also noted that the rich nations where these models have been implemented are living proof that e-health benefits are not only in monetary value but show improvement in quality of health care to the consumer, better access to health care, user satisfaction, and the improvement of the overall health care status for all. However, Adesina (2007) has critically cautioned the developing nations that while ICT is generally accepted to have a key role to play in health care delivery, the actual process through which e-health development is influenced remains a much debated issue, especially when it comes to poor and developing nations.

Okpaku (2000) maintains that the explosion in telecoms and information technology, which is reflected in the new scramble for Africa as one of the last emerging markets, does not bequeath to Africa any of the benefits the technology has created for the industrialised and intermediate economies. This scholar expresses concern in the role played by Africa in identifying her problems, taking ownership of such unique problems and finding solutions to these problems. The approach Africa employs in solving problems such as an inequity to health care information and services may

disadvantage and impoverish the continent even further and widen the knowledge gap. The argument for e-health, to the extent that it is built on the exclusive capacity of the industrialised world to invent, produce and sell e-health solutions, and the compulsion, by whatever means, for developing economies to only applaud and buy, and marvel at the ingenuity of others, would be to commit suicide, without even the respectable effort at self-preservation and dignity to deliberate on how to own and solve these problems argues Okpaku.

This section of the review looks into some of the strengths and weaknesses of e-health if and when applied within the context of tele-radiology in a typical developing rural health care system such as the Eastern Cape. The particular focus of this review will be on cost, distance, skills development, and disease management and how these may benefit developing economies when the participation of all role players is well considered.

2.6.1. Cost

Electronic health records have long been identified by the European Union and other developed economies as a sure-fire way to lower health expenditure. When doctors have easy electronic access to a patient's records, proponents of e-health argue, they are less likely to order the duplicative and unnecessary tests that drive up the cost of health care (GoE, 2008). Diagnosis at the first point of care can facilitate faster access to treatment, save lives and cut the time and cost of transporting an already sick patient over hundreds of kilometres to have X-rays or a CT scan procedure performed for instance. The successful implementation of e-health infrastructure and subsequently the provision of equitable health care service in such communities was built on the basis of a good e-health policy foundation wherein all the interests of those who could be affected, have to some extent been accommodated (Healy, 2008). The health care and technological challenges that are faced by the developing nations, Healy argues, may significantly differ from those that are tackled by these wealthy nations in more ways than one.

The rural people in developing countries find it difficult and costly to access health care information and services. Although the introduction of ICTs could drop the price

of providing the health care services and information (as it has done for the wealthy economies), the enabling environment, the connectivity to the rural areas could prove to be very expensive, the limited access to hardware like computers, maintenance of the e-health infrastructure and training of health care professional could cost more to provide health care service and information to the rural people (Oladosu, 2009). The electronic health care delivery would be given a thumbs-up if and when the cost of seeking and accessing health care from the patient's side is reduced.

2.6.2 Distance

The mobile nature of the ICTs enables information recall and collection whenever it is needed. In Kenya, the smart hand held computers carried by health workers proved to be convenient to deliver electronic information where and when it is needed in a correct and relevant form (Drury, 2005). In Tsilitwa village in the Eastern Cape Province, South Africa, a health professional is able to post the images of symptoms of a patient through the internet and get a response from a panel of experts within a reasonable time and be able to give proper treatment to the patient without having to go through the referral process that could take several weeks before the patient could be seen by a specialist (Ruxwana, 2009). While the developed countries make greater use of mobile health (m-health), evidence shows how there is the potential to even make a significant difference in the developing countries (GoE, 2008). Millions of people living in the rural areas in South Africa use mobile phones to send and receive short messages and telephone calls. The GSM network coverage could allow the rural people access to health care and health care information such as the medical education and training for health workers.

When an ICT enabled health care facility is in place coupled with the right technology and expertise to make use of this technology, the vital distance and time lag between diagnosis and treatment when rural people decide to seek professional medical assistance can be considerably reduced.

2.6.3 Skills

The shortage of health professionals in the rural areas mostly caused by the migration of health professionals to urban areas and richer countries is forcing governments to train the available current staff closer to their places of work using online training methods. ICTs' ability to enable the sharing of knowledge online helps the health professionals to keep contact with the specialists in other parts the world. A nurse in a rural area where there is an efficient broadband technology connection can get an urgent online consultation from a specialist in a referral hospital who would otherwise be hours away by car. Based on the symptoms seen and heard down the line, the specialist may decide not to take any chances and recommend that a patient be transferred to a referral hospital fairly urgently or give a diagnosis and prescribe treatment immediately. The shortage of medical professionals to service the rural areas can make it difficult for the personnel to acquire new health care skills. According to Drury, one innovative approach to capacitate rural health care workers is to do the training via e-learning.

2.6.4 Disease Management

The health care systems in the developing countries are faced with a number of challenges including the budgetary constraints, growing shortage of the workforce, high burden of diseases, technological innovations that are not fulfilling the dream of improving the health care systems coupled with regulatory and policy issues (Info Dev, 2006). One of the promising features of e-health tools is its ability to improve the health care delivery through better diagnosis, better mapping of health threats, better training and sharing of information among health workers and the support it can provide to health workers on the field (Khoja, 2011). Cell-life in South Africa, for example, is a mobile multi-platform system for the therapeutic and logistics management of HIV/AIDS population built on mobile devices. Using cellular phone and personal digital assistances (PDAs) with 3G/GPRS/SMS networks is set to enable community health workers to assist patients living with the disease to take their treatment and manage their condition better (Olukunle, 2010). Kenya also introduced hand held computers (PDAs) for widespread access to information that assists health workers in delivering health care in the rural areas of Kenya (Benjamin, 2003). The health workers are able to raise awareness on how to live

healthier and manage chronic diseases, by supplying central offices about the status of any outbreak of disease on the ground.

The active full participation of all the stakeholders in health care is crucial. The attempt made by the WHO to integrate traditional and conventional health models is one of many solutions that can yield good results in the management of the spread of disease.

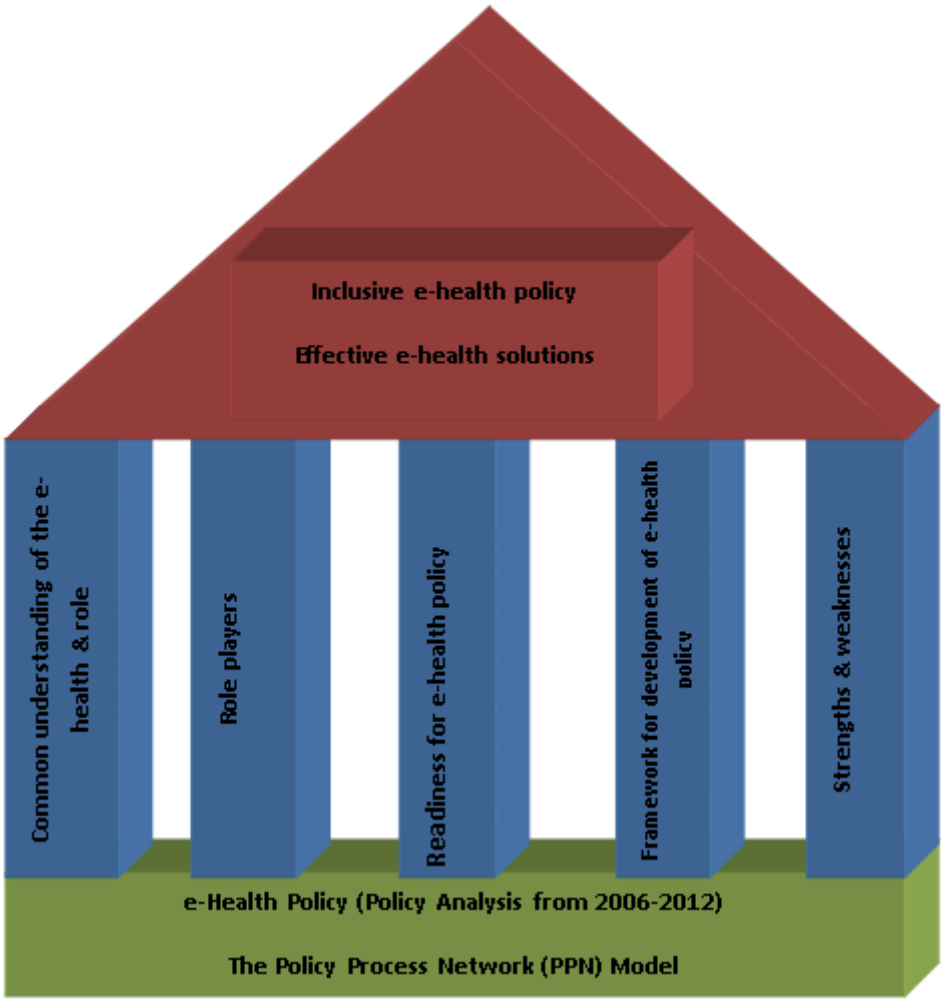
2.6.5 Conclusion

All things being equally considered, these benefits have been tested in the work done elsewhere and therefore are not based on the scholastic assessment of the ICTs in health care service delivery either in the Eastern Cape or any other rural areas of South Africa. Therefore, this study will employ these measurements of the benefits used by these scholars to measure the benefits of e-health to find out whether those benefits are also appropriate or not in the Eastern Cape.

The overall starting point for this research has been mentioned in the background of this study. The investigation of the public policy development process framework and the participation of the relevant role players in the process form the background against which this review has been conducted.

2.7 Conceptual framework

Figure 2.2: Conceptual framework



Source: Researcher's own diagram

2.7.1 E-health policy development process that is inclusive of all key various networks

In understanding the e-health public policy development process which may improve some of the challenges that are faced by the e-health initiatives such as the tele-radiology implemented in the rural areas in the Eastern Cape, this study has adopted the policy process network (PPN) policy framework introduced by Parag (2005). The PPN model in this study acts as the foundation for assessing the e-health development process in South Africa from 2006 to 2012. The inclusive participation enables all the networks under the same umbrella to have a common understanding

about e-health; who are other role players in the same policy process; what are other existing policies that may affect and influence this policy; what benefits could be derived from this policy development process; and what are the factors to be considered in this policy process in preparing the communities where the e-health solutions are to be implemented.

This policy development process exploration is grounded on the belief that the stakeholder's participation (both as state role players and non-state role players) in the e-health policy development process could lead to a better policy that is more responsive to the communities' needs. The development of e-health policy is therefore crucial in identifying the strengths and weaknesses that may have a direct impact for successful implementation of the e-health solutions in the rural health care. The e-health policy like any other public policy introduces change in society and alters individual and collective behaviour. Therefore, in analysing the process through which the policy is shaped and implemented affords an opportunity to detect its strengths and weaknesses and it is the very first step towards understanding how we may design a policy that would bring in an effective change (Parag, 2005).

2.7.2 e-Health definition

According to Mars (2010), policy development process requires a clear and careful definition of what is to be legislated. A common understanding of what e-health is all about, what it encompasses would inform who should be participating in the policy development process. All participants within the same policy process, coming from different networks would at least share a common vision and are encouraged to work towards a common goal. The goal would be to develop a policy that is inclusive of all role players and various interests that can make e-health solutions to improve equitable access to healthcare services and information.

2.7.3 The main players in the field of e-health

As Healy (2008) correctly puts it, in contrast to the traditional healthcare system, e-health solutions require a more coordinated environment. It is an environment that involves a variety of role players from different backgrounds with different interests. All of these role players and different interests must be well defined and

accommodated within the e-health policy development process. Well-coordinated stakeholder participation can achieve a more inclusive e-health policy

2.7.4 The framework for the development of e-health policy

Literature identifies some of the policy issues that must be considered to embrace the numerous and diverse role players

What this section has provided are the fundamental policy development measures to be put in place if the implementation of the e-health is to be successful. One element that has taken the centre stage is the coordination, collaboration of the relevant stakeholders from all levels as part of the overall policy development process. In an effort to investigate or understand the e-health public policy development process, the participation of the relevant role players and their interests has featured prominently in this section.

2.7.5 Analysing the state of readiness for e-health policy

The developing nations have sought to employ the use of ICTs in health care to widen access, improve quality and increase service efficiency of health care information and services to its population (Mair et.al, 2012). This is done in the hope of gaining from what e-health has more or less achieved for the developed countries. However, enthusiasm for technological innovation among policy-makers and health officials, Mair et al. observed has not always been matched by the uptake and utilisation in practise in both developed and developing economies. Drury (2005) identifies five different elements that face e-health in developing nations when applied in their health care systems, which can hinder the use of ICTs to work in this environment if these elements are not addressed.

To increase the chances of effectiveness and success of the use of ICT in health care service delivery, it is important to assess the readiness of the communities where these solutions are to be implemented. The models of e-health have been developed in the context of wealth, in the developed economies where national and local well-developed ICT infrastructure is already in place (Drury, 2005). To examine the effectiveness of e-health in rural areas like the Eastern Cape must be strongly influenced by all the factors that could promote or hinder the success of such

initiatives. The rural communities in poor countries face unique challenges in accessing health care service delivery in addition to what is faced by their urban area counterparts (Olukunle, 2010). Olukuhle identifies a range of barriers that hinders the rural people of Africa from accessing affordable quality health care including provider shortage, topographical conditions, lack of access to basic amenities and utilities like electricity, a telephone line and proper roads and transport, long travel distances. Eastern Cape rural areas suffer from all of these elements.

All these factors have to be considered when there is an e-health policy development process taking place.

2.7.6 The strengths and weaknesses of the e-health policy process

The primary motivators in adopting the use of ICTs in health care have been observed by several proponents of e-health including Scott, Faruq, Chowdhurry, Varrrghese (2009) and others, to include the expectations that e-health will reduce costs, expand services to under-serviced areas and population, facilitate the change to more public orientation, and improve people's health, nutrition, knowledge and standards of living. Adesina (2007) argues that the introduction of ICTs in health care service delivery in the developed economies brought positive results. Adesina (2007) has also noted that the rich nations where these models have been implemented are living proof that e-health benefits are not only in monetary value but show improvement in quality of health care to the consumer, better access to health care, user satisfaction, and the improvement of the overall health care status for all.

The e-health policy like any other public policy introduces change in society and alters individual and collective behaviour. Therefore, in analysing the process through which the policy is shaped and implemented affords an opportunity to detect its strengths and weaknesses and it is the very first step towards understanding how we may design a policy that would bring in an effective change (Parag, 2005).

The e-health policy development process must have these benefits as an ultimate goal and the reason enough to have all relevant key role players included in this process.

2.7.7 Conclusion

In this chapter the review of the existing literature on e-health policy development process has been conducted. The study has identified the following key themes from the literature: (1) The e-health integration within the existing health system; (2) the e-health policy development as the basis and inclusive participatory process of all relevant networks; (3) the e-health readiness assessment tool that this policy process should enhance in increasing chances of success in implementing e-health programmes; (4) review any strengths and weaknesses the policy development process may have when appropriately applied in a typical rural context; (5) Who are the role players in this policy process and; (6) Developed a common understanding of the e-health concept and its benefits.

In addition, this literature has been conducted to develop a conceptual framework that connects the other parts of this study together to be a home to the e-health policy development process. The PPN model has been employed to house and guide the literature on what elements to be considered when reviewing on e-health policy development. The following chapter is looking at the methodology employed in collecting data, analysing data and interpreting results as guided by the PPN model.

Chapter 3: Constructivist, qualitative research design and methodology

3.1. Introduction

The previous chapter focused on specific themes in providing an overview of the literature. These are the themes on what has been published on the study by accredited researchers, scholars and practitioners. The PPN framework is explained and how it informs this study.

In this chapter the theories that underpin the research design and methodology in this study are discussed in detail. The purpose is to provide an overview of the research design implemented by the researcher to answer the research questions and test the PPN theoretical framework adopted and how it informs the methodology in this study.

The detailed research process employed by this study is explained including data collection and data analysis methods adopted. The chapter further explains why specific approaches and methods have been employed.

The development of the research instrument and the sampling methods used are discussed and justified with the commentary of the limitations of the study design. Finally, the issues of observer influence are covered and the summary of this chapter presented.

In an attempt to achieve the objectives of this study, the research design overview that is applied in this research study is adopted from Saunders, Lewis and Thornhill (2005:85). The chapter will capture the design in detail first before it demonstrates the road map taken by the researcher in applying this methodology.

The policy process network (PPN) has been the guiding framework in informing the study on how the research instrument should be designed and subsequently played an influential role in identifying the sample. The PPN policy analysis seems to be a stronger policy analysis as alluded to in the literature review. The PPN argues and demonstrates that the same policy development process could be governed by different PPN, which operate in the context of the other, influencing one another at

the same time. The selection of a sampling methodology adopted in the examination of the e-health development process has been influenced by this.

The ethical approval letter was obtained from the University of the Witwatersrand research unit.

3.2. Methodology

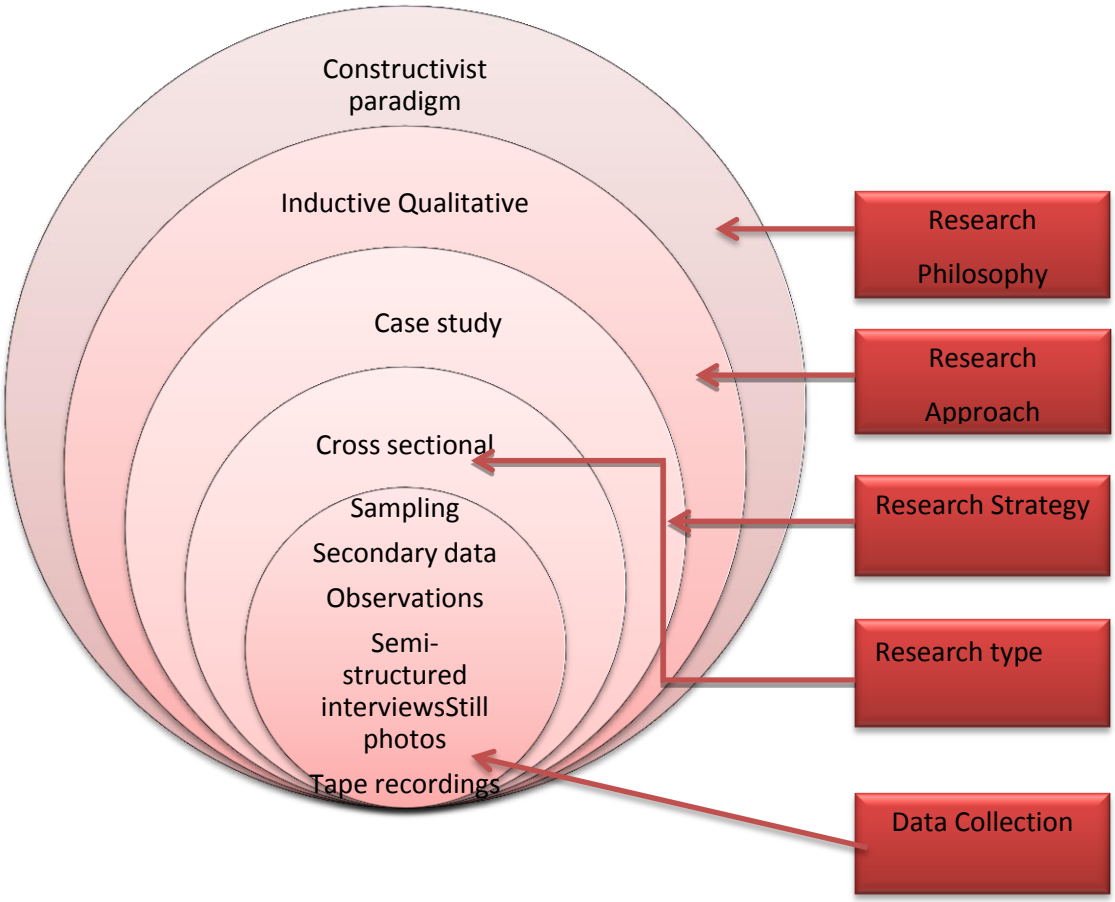
In an attempt to achieve the objectives of this research study, a research design overview by Saunders, Lewis and Thornhill (2005:85) is adopted. Figure 3 below depicts a research “onion” illustrating the research design overview adopted in this research study which is later discussed in detail in the sub-sections that follow below.

3.2.1 Background

The policy process network (PPN) has been the guiding framework in informing the study on how the research instrument should be designed and subsequently had an influential role in identifying the sample. The PPN policy analysis seems to be a stronger policy analysis as alluded to in the 2.4.4 sub-section in the literature review. The PPN argues and demonstrates that the same policy development process could be governed by a different PPN, which operates in the context of the other, influencing one another at the same time. The selection of a sampling methodology adopted in the examination of the e-health development process has been influenced by this.

Underpinning this study is the research design model by Saunders and Thornhill (2000, 85). The research onion model as presented in figure 3 below is applied to the study.

Figure 3: *The research process onion*



Source: *Saunders, Lewis and Thornhill (2000:85)*

The research onion depicts the research design as an onion made up of different layers that comprises the research philosophy, research approach, research strategy, time horizon, and the data collection methods.

The proponents of the onion model approach compare the research process to the peeling of the different layers of an onion until the centre is reached. The collection of the data is at the centre and the focal point of this model (Saunders et al., 2003). According to these experts, decisions taken in one layer influences the direction of the research, the options and decisions made in other layers in the process of conducting the study.

The subsequent paragraphs explicitly define and explain each of the elements in the research process. Using layers that are pictorially described in figure 3 as a guide to the process, these research scholars start by defining the most crucial element to a qualitative case study. It is commonly known as the research philosophy and it influences the entire research study.

3.2.2 Research philosophy

According to Saunders et al. (2000), the research philosophy depends on the way the development of knowledge is conceived. It is described as that aspect of the research process that influences from how the evidence is collected to how the results are interpreted (Walsham, 1995). Although there are a number of available philosophies that can be used, this research study is embraced within the social construction of reality framework as a home for further exploration of the e-health policy development process. This serves to ascertain the extent to which the various networks and their interests have participated in the e-health policy development process as experienced by them in real life. This is a philosophical underpinning which claims that the truth is relative and that it is dependent on one's perspective (Stake, 1995 & Yin, 2003 in Baxter & Jack, 2008).

Baxter & Jack (2008) further explain that researchers from a constructivist persuasion adopt interpretive methods which explore the world by investigating meaning as understood by social actors themselves. To do this, interpreters employ qualitative methods which have an emphasis on language. This approach assists the investigation to have an in-depth holistic understanding of the phenomenon studied.

3.2.3 Research approach

The quantitative and qualitative methods are the two main research approaches that can be used in a research study. The quantitative methods attempt to gather data by objective (statistics and numerical) methods with the intention to provide information about relations, comparisons, and predictions. It is an approach that attempts to remove the researcher from the investigation (Leedy & Ormrod, 2010). In Baxter &

Jack (2008) the qualitative method in a case study is explained as an approach that facilitates exploration of a phenomenon within its context using a variety of data sources. The quantitative approach has been considered but was not adopted because of the small sample size and the need to produce more in-depth, comprehensive information and understanding about the entire situation. This research study has adopted an inductive approach. A number of factors contributed to this decision and are discussed in detail in the following section.

3.2.4. Qualitative research

Hussey and Hussey (1997:12) define qualitative research as an approach that is more subjective in nature. It is an approach that involves examining and reflecting perceptions in order to gain an understanding of social and human activities. The qualitative or inductive approach has a potential to inform the e-health public policy development process by looking at the process from the viewpoints of the role players and networks' participation in all the stages of this policy process. As the respondents this approach allows the role players to say what they do and express their views about the situation. The qualitative approach allows the researcher to test the PPN theoretical framework by allowing data collection that is not to be limited to predetermined categories (Leedy & Ormrod, 2010). There are research strategies that are applicable to qualitative research. They include ethnography, case study, grounded theory, and content analysis amongst others. However, for the purpose of investigating the participation of the relevant stakeholders in the e-health public policy development process, the case study strategy is adopted.

3.2.5. Research strategy

The research strategy adopted in this research study is a single case study. Creswell (1998) explains a case study as "An exploration of a 'bounded system' or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context." The study has employed a case study to learn from the current existing situation in real life. Case study as a qualitative approach involves the investigation of a specific phenomenon within its real life context (Olivier, 2004). The strategy allows the researcher to probe deeper and come up

with in-depth details about the particular case under investigation. The case study of the tele-radiology in the Eastern Cape can be worthwhile in exploring and applying the PPN as an adopted existing theory in the research study. The case study has presented the researcher with an opportunity to explore the e-health policy development process in the Republic of South Africa from 2006 to 2012. Investigation of a specific phenomenon within its real life context has allowed the researcher to identify any weaknesses and strength that this policy process might have.

3.3. Research Methods

The study used a qualitative case study approach and gathered data through in-depth interviews. This approach is relevant for the study because of its ability to enable the researcher to explore the e-health policy development process in a typical health environment with the key relevant role players who take effect and are affected by this policy process. An in-depth interview method was applied to afford the researcher to get as close as possible to the world of relevant actors in this policy process. In this way, the researcher was able to look into this process as seen and experienced by the policy makers, experts, health practitioners and communities at various levels. This is a qualitative research methodology that has enabled the researcher to produce fewer incomplete or unanswered questions. The objective of the in-depth interview protocol was to acquire the perspective of the key various networks regarding the importance of stakeholders' participation in the e-health policy development process.

3.3.1. Data Collection

For the research questions to be answered, the information should be gathered from the phenomenon of study to either accept or reject the existing theories. There are various methods that can be employed to collect data in a qualitative case study research. These methods may include but not limited to the following: Interviews, observations, tape recordings, still photographs, document analysis, etc. (Leedy & Ormrod, 2010). But before we can discuss these methods the research shall look into the sampling process.

3.3.1.1. Sampling

In the sampling of participants a judgemental sampling method was used based on knowing the centres that are involved Leedy & Ormrod, 2010). The sampling was multi-staged and clustered as the first stage of the sampling process whereby national office, provincial office and district office were sampled. Inside these offices the second stage of judgemental sampling was conducted, meaning that only those participants who are involved in tele-radiology were involved in the study. The third unplanned sampling method was snowball sampling as people referred the researcher to other people who the participant believed had information on the phenomenon under observation (Babbie, 2005). Regarding the sampling method of community participants a snowball sampling was engaged as suggested by the district office.

The research was conducted in four of the tele-radiology public health institutions out of the 23 sites that are linked to the central diagnosis and reporting area in East London in the Eastern Cape Province. Only health care institutions involved in some type of tele-radiology activities were identified and chosen for this study.

The population in the study was selected on the basis of their direct and indirect involvement in the e-health policy development process, their direct involvement in implementing the e-health initiatives and as the representatives of communities and patients who are the consumers of health care service. Table 3.1 below shows characteristics of all the categories of the institutions and the individuals participating in the in-depth interviews.

Table 3.1: *Characteristics of the participants in the in-depth interviews*

Characteristics	Managers (n=4)	Experts (n=2)	Implementers (n=5)	Academic (n=1)	Community (n=3)	TOTAL N=15
Provincial/National	3/1	1/1	5/0	1/0	3/0	13/2
Type of institution	ECPDoH office National Department of Health	KZN Provincial Office	CMH Frere Hospital NMA Hospital St Barnabas	Walter Sisulu University	ORTDM King SabataDalindyebo	
Gender M/F	Males=3/ Female=1	Males=2/ Females=0	Males=2/ Females=3	Male=1/ Female=0	Males=2/ Female=1	10/5
Average Age						
Level of Education	Post Grad.	Post Grad.	Post Grad.	Post Grad.	Post Grad	
Experience	10.5yrs	Over 10yrs	6.5yrs	10.5yrs	10.5yrs	
Date Interviewed	01/08/12 03/08/12 29/08/12 28/09/12	27/09/12 28/09/12	31/07/12 01/08/12 09/08/12 19/08/12 27/08/12	10/08/12	27/08/12 28/08/12 28/08/12	

Source: *Researcher's own tables*

3.3.1.2. Instrument Design

This case study has employed an in-depth semi-structured interview instrument as its primary source of data collection. This is a qualitative research methodology that has enabled the researcher to produce fewer incomplete or unanswered questions. The objective of the in-depth interview protocol was to acquire the perspective of the key various networks regarding the importance of stakeholders' participation in the e-health policy development process. The interview schedule is designed in seven different sections.

Section A is designed to elicit the demographics details about the participants. Section B is designed for the national policy makers to ascertain what steps have been taken in developing the e-health policy and the challenges that are faced by policy makers in this process. This section also looks into how the e-health policy can fit within the National Health Policy and Act. Section C seeks to elicit the opinion of the policy experts on how best the policy development process can actively engage all the key stakeholders. Section D is aimed at the medical institutions such as the Walter Sisulu University (WSU) in the Eastern Cape and is directed on how such institutions are implementing e-health initiatives in the absence of a legislation

or policy in place; how the research expertise of the institutions such as WSU can influence an important policy development process. The approach in Section E focuses on the local communities where the e-health initiatives are directed. The section brings to light the extent to which these communities have been actively encouraged to take part in the e-health development process as consumers of these services. The provincial role in the e-health policy development process and how the e-health initiatives are implemented in the absence of a national policy is the focus in Section F. The implementers or clinicians of the e-health solutions and the perception that they have about the e-health solution in their everyday activities is addressed in Section G.

The still photographs were taken to depict the rural nature and terrain where these e-health facilities are being deployed. Personal observations have been noted of the distances, bad gravel roads between the primary health care facilities and the district hospitals.

There were fifteen interviews conducted to target various but specific networks as outlined in Table 3.1 above. Each interview took approximately 45 minutes to an hour.

The interviews at national level were conducted with the Manager for e-health and telemedicine programmes solicit his views on the extent in which the various role players and interests have participated in the e-health development process.

There are various methods employed to collect data in a qualitative case study research. For the purpose of this research, the following instruments have been utilised:

3.3.1.2.1. Interviews (semi-structured)

The interviews as the research instrument are developed to be utilised in an oral or verbal participation between the respondents (group or individual) and the researcher (Leedy & Ormrod, 2010). These scholars also point out that interviews in qualitative studies are mostly open-ended or semi-structured. The semi-structured interview questions framework meanwhile guiding the researcher in the process, they also allow for additional comments to be noted and more avenues explored (Kohlbacher, 2005).

In this study a semi-structured qualitative interview schedule was developed for the interviews to be conducted with tele-radiology sites in the province. The interviewees were purposefully selected with regard to their relevance to the research questions. The interviews therefore included provincial e-health policy makers, clinicians and management as the implementers of the e-health initiatives, the community leaders and informants, the national e-health policy makers and the e-health policy experts.

The interviews as a research instrument were selected with the purpose of allowing the researcher to get as close as possible to the world of the key role players keeping the e-health policy development process in mind. Leedy & Ormrod observed that interview instrument as the research tool allows the researcher to interpret the phenomenon being studied and its challenges as seen and felt by the role players at their various points and levels. All the interviews were captured using a tape recorder, written notes and observation and were later to be transcribed and interpreted.

3.3.1.2.2. In-depth interviews with identified participants

As part of this study, the in-depth interviews were conducted with the following categories: the health care providers (clinicians) as implementers who make use of these technologies in enhancing health care delivery to the local communities; the managers from the National Department of Health who are at the centre of policy planning and implementation; the Eastern Cape provincial managers who have a mandate to ensure that communities access effective equitable health care; the hospitals and primary health care institutions at the level where the use of ICTs in health care is implemented and together with the community leaders and informants where the use of these technologies in these health facilities have a direct impact. The community leaders and informants that have participated in the study have been identified from the areas where the local health care institutions' tele-radiology system is linked with the East London central diagnostic centre. In addition, an interview was held with two experts who were involved in the planning and designing of the national public e-health development process.

The interviews at the national level were conducted with the Manager for policy on e-health and telemedicine programmes. The purpose of this interview was to gain insight into the extent to which the various key stakeholders and interests have been engaged in the policy development process that is taking place in the Republic. How the e-health policy fits within the existing National Health Policy and Act.

The Deputy Director General (DDG) as the Provincial Clinical Head to oversee all the Eastern Cape hospital complexes and regional hospitals was interviewed to gain insight into specific e-health implemented programmes such the tele-radiology. The aim was to investigate how these initiatives fare in the absence of a relevant policy in place. What are the challenges and how are the practitioners covered when an incident of malpractice occurs?

The acting senior Manager who is also the coordinator of tele-medicine and e-health was interviewed. This was with the intention to assess what steps have been taken to bring in the local communities and make them part of the policy process, where these e-health initiatives are implemented.

The interview with the tele-medicine Manager in the district hospital interview was aimed at shedding light on the level of acceptance of these technologies by the end users and their willingness to incorporate e-health into their daily duties.

The visit to Tsilitwa Clinic, in the rural village of Qumbu was made to establish how tele-medicine technology functions in a typical rural context. The Nursing Operation Manager detailed the challenges, obstacles and benefits of having utilised the technology since 2001. The involvement of the community in the programme was tabulated showing tele-medicine has saved lives when it was functioning well.

The chief radiographer at Cecilia Makiwane Hospital, who was also involved with the tele-radiology program when it was started in the province, gave the researcher the insight to look into tele-radiology from the eye of the user.

The senior traditional leader shed light on how the hospital board platform has been a tool of channelling information between the Provincial Department of Health and the local communities regarding health-related issues.

There are various methods employed to collect data in a qualitative case study research. For the purpose of this research, the following instruments have been utilised:

3.3.1.2.3. Observations

Coombes (2001) describes observation as a technique that involves observing, selecting and recording people's behaviour and characteristics or materials or a phenomenon being studied within a certain period and enables or allows a researcher to deduce a particular outcome. The observation technique as a scientific tool to qualify to be utilised in a research enquiry should be employed to answer the research questions that are systematically planned and executed (Cooper & Schindler, 2003). These scholars further caution the researchers to employ proper control and a reliable valid account of what happened to be provided when adopting this technique. Some advantages of using the observation technique as one of the research tools are identified in Coombes (2001) as the following:

- They provide the researcher with the inside view of events;
- They are the only way to gather information in some instances;
- Original data are collected at the time they occur; and
- The participant observer is able to discover the priority details needed for the benefit of resources.

During the site visits in the Eastern Cape, the researcher was able to observe some elements related to the participation of the key actors in the development of the e-health policy. The participants as well as the ICT technologies that are available in some of the clinics and hospitals selected were also observed. Personal observations have been noted of the distances, bad gravel roads between the primary health care facilities and the district hospitals.

3.3.1.2.4. Tape recording

The tape recording of the interview process affords the researcher with an opportunity to observe the non-verbal cues and subtleties that the interviewer would ordinarily miss out on when relying on note taking. (Leedy & Ormrod, 2010). Given the reasons mentioned above, tape recording has been utilised as the tool to capture the interviews.

3.3.1.2.5. Still photographs

Schulze (2007) has noted with interest that photographs can make a valuable contribution to research practice and presentation. Photographs taken in the area where the study has been conducted could evoke more interest in the report. For its ability to convey the emotions, mood, narrative, ideas and messages, all of which can be the most important elements in a qualitative case study approach, photographs can be related to or compared with other data to make a meaningful analysis. In the case of this study, the photographs of the e-health sites visited in the province were captured during the data collection process.

3.3.1.2.6. Document analysis

The study has used a qualitative case study approach in collecting data from written sources of literature (secondary sources), scholastic and government sources. The literature review has been used to identify a range of factors that could play a role in the e-health public policy development process e.g. Readiness. The document analysis was used to gather information about the national and Eastern Cape provincial government policies regarding the e-health policy development process, the e-health initiatives implemented in the province. This includes:

- The plans in place to take action at the highest level to strengthen e-health policy,
- Specific measures involving the financing and the creation of the basic infrastructure to implement e-health initiatives,
- The legal framework under which these initiatives are operated.

The documents include published and unpublished sources, reports, letters, faxes newspaper articles and draft policies that have been looked at.

3.3.2. Data analysis and processing

A quantitative research case study approach analysis when explained in simple terms, it is a non-numerical examination and interpretation of observation for the purpose of discovering underlying meanings and patterns of relationships of the investigated phenomenon (Babbie, 2005).

According to Mouton (2001), this kind of analysis involves the disintegrating of the data collected into manageable parts, trends and relationships. Mouton further delineates this picture by stating that the aim to conduct data analysis is to understand the various constitutive elements of data. This is done by inspecting the relationships between concepts, constructs or variables and determining whether there are any elements that can be isolated or establishing the themes within the data.

Putting it in simple terms, data analysis involves sorting out data by grouping related information, showing the relationship between the groups and finally figuring out the meaning of the relationships. According to Creswell (1998) & Stake (1995) in Leedy & Ormrod (2010), there are certain common steps involved in analysing and interpreting data in a case study and they encompass some of the following:

- Organising the data for analysis;
- Reading through the data to get the meaning of results;
- Classifying or categorising individual data coupled with some kind of retrieval system;
- Figuring out relationships between concepts; and
- Interpreting and summarizing data for the readers.

Many experienced researchers consider it a mistake to continue accumulating data without examining it from time to time to see if any major themes or patterns are emerging. This notion advocates the frequent analysis of data as it appears. Analysis therefore starts right away with primary analysis and as the data collection progresses, in interaction with the primary data analysis, a second stage occurs with the category and concept formation. Depending on the objectives of the study, the proponents of this methodology believe you may stop at this stage or the aims may propel you to go to the third stage.

The interpretation of the data means relating one's findings to existing theories. It then goes on and compares the outcomes with results and takes into account the rival explanations (Mouton, 2001). This is the data analysis and interpretation approach to be adopted in this current research study.

3.3.2.1. Data Analysis

The analysis of the data was based on the recording and notes that were transcribed and captured on a computer MS word. The analysis was then conducted in three steps:

- Identification of pertinent themes. This is a systematic search for words, phrases and concepts that were developed into themes;
- Arranging of the similar themes together. Looking at similarities and;
- Pattern recognition among the themes.

Recurring themes from data were identified and grouped according to similarities and differences. The themes were analysed further in order to check for patterns and trends in the data.

3.3.2.2. Inductive Analysis

The themes and categories of analysis that emerged from the study were then analysed further by observing the natural variation of data. Particular attention has been paid to the similar and different ways in which participants have responded to different aspects of the inclusive participation of various networks in the e-health

policy development process. This included observation patterns and categories that have not been effectively articulated by the participants. Terms for these patterns and categories were developed inductively in order to generate meaning and draw inferences from data categories.

3.4. Limitations of the study

The following are the limitations to this study as some more challenges experienced in the field.

The purposefully selected sites and individual participants who took part in this study have been identified as the participants who would be able to best assist the researcher understand the problem and the research questions. For this reason, the reader should note with caution that the sample in this study does not necessarily represent the general population as a whole.

3.4.1. Fieldwork Experiences

- The process of conducting interviews has been a daunting task where appointments are confirmed and an interviewee pulls out at the last minute.
- The availability of the relevant people to be interviewed and a junior official who is sent to represent the manager do not have much knowledge about the subject at hand.
- The industrial action at WSU during which the researcher was scheduled to conduct the interview made it impossible to talk to the people who are currently running the tele-medicine programme at the University.
- The OR Tambo ANC political conference during the first week of August had a direct impact on securing interviews with the key community leaders and informants in that particular week.
- The unwillingness of the government officials to make time outside working hours for the interviews.

- The other institutions that were identified as success stories of tele-radiology in the province could not be visited by the researcher due to budget constraints.

3.5. Conclusion

This chapter has looked into the theories and roadmap taken by the researcher from the data collection methods adopted in the study to the data analysis in trying to understand the extent in which the various networks have actively participated in the same policy development process. In this chapter it has been stated how the PPN has influenced the sampling methodology, the research instrument, data collection and the analysis of the data.

Chapter 4: E-health policy development process and networks participation

Introduction

This chapter presents the results of the study based on the qualitative methodology as outlined in the previous chapter. The chapter is divided into sections with three themes, sub-themes, namely: (1) participation of relevant role players and different interest groups in the e-health development policy process; (2) e-health policy in the context of other health policies and Act; (3) understanding of e-health and its benefits among policy developers, implementers and users. The research findings are presented according to these three themes that have emerged after data analysis has been done. Table 4 below depicts all three themes and sub-themes as they have emerged from the data collected and analysed. The process further discusses each theme and its categories and gives an overview of the emerging issues from each theme. Observations and photos are presented as part of the findings as they give visual information to augment the qualitative results. Lastly, the chapter concludes by giving an overview of what has been discussed in this chapter.

It is important to indicate that the report is not based on first person approach but on summaries of what people commented and reported on. None the less, in areas where exact words of participants are needed these are provided to express reality context.

Table 4: *Themes and the issues emerging from the data*

Themes	**Emerging Issues**
1. Participation of the relevant role players and interests in the e-health policy development process	1.1. Local government participation 1.2. Strategists & technical experts 1.3. Community involvement 1.4. The drain of health professionals 1.5. Lack of strategic guidance 1.6. Inclusion of the use of ICTs in the academic curriculum
2. The e-health policy in the context of other existing health policies and Act	2.1. White Paper Draft since 2006 2.2. Change of administration & staff 2.3. Common standards, security, confidentiality 2.4. The e-health strategy 2.5. Capacity/expertise to develop the provincial policy 2.6. Coordination of medical schools with government
3. The understanding of e-health and its benefits in the context of health care delivery	3.1. Different ways of referring to e-health 3.2. The need for a legislation to put the right people in the right places 3.3. The waste of resources 3.4. Lack of direction & understanding of the bigger picture 3.5. Power turfs

Source: *Researcher's own table*

Below is the description of each of these themes and the emerging issues. As indicated earlier, (Chapter 3) a total of fifteen (15) qualitative interviews were conducted. The interviewees were selected based on the experience they have with the e-health programs and projects and the policy development process. Below is the presentation of findings and discussion of the issues raised by the interviewees according to the three themes, integrated with data obtained from document analysis and the researcher's personal observations.

4.1. Participation of the relevant role players and interests in the e-health policy development process

The participants at all levels were asked to explain the landscape of key relevant role players and interest groups that are represented in the process of e-health policy development. This enquiry was necessary to identify the role players as this is important in informing future e-health policy development process. The participants at national level indicated that there are various role players within the government sector.

Table 4.1: *Inclusive participation and emerging issues*

Theme 1	**Emerging issues/Actors**
Participation of the relevant role players and interest groups in the e-health policy development process	*4.1.1.* Local government participation *4.1.2.* Strategists & technical experts *4.1.3.* Community involvement *4.1.4.* The drain of health professionals *4.1.5.* Lack of strategic guidance *4.1.6.* Inclusion of the use of ICTs in the academic curriculum

4.1.1 NHIS/SA as the central point and lack of local government participation

The Interview at National Department of Health (NDoH) revealed that there was a lack of participation of local government in the NHIS/SA structure. NHIS/SA is a formal structure established by the NDoH since 1995. NHIS/SA is responsible for all e-health related activities including: e-health strategy and policy. The national policy makers have acknowledged that there are municipalities which, from their own budget, have in some provinces come up with brilliant e-health solutions. According to the NDoH such solutions, if adopted can benefit the entire country. Regarding participants in NHIS/SA, the data shows that participation of clinicians, ICT technicians, strategists and experts are represented in the NHIS/SA committee. However, while the NDoH suggests that local government is playing an important role in e-health development, these results were not validated. It appears from the results that NHIS/SA is regarded as the driving force in the development of e-health. In view of these findings, it emerges that NHIS/SA is the nexus of e-health policy. This indicates that there is a centralised approach into the e-health policy development process.

4.1.2 Strategists and technical experts' participation:

An interview with strategists, technical experts, ICT specialists and implementers within e-health were conducted. These interviewees in particular have put forward a view and a concern that any changes in patient-care should happen only through peer review. One clinician commented: *"Any changes in patient-care should happen only through peer review in the hands of clinicians and as per the needs of patient care and safety and as seen fit by clinicians".*

This is based on the concept that a larger and more diverse group of people with relevant expertise pertaining to e-health will usually find more weaknesses and errors even before the technology is incorporated into health care. This view is supported by implementers of e-health, where they view e-health legislation in this regard as a guiding legal framework that can put the right people in place who can understand what e-health is all about. Implementers strongly believe that the imposition of the e-health initiatives that may force a clinician to make substantial changes to their processes to suit the tool could be nothing but a failure on the part

of the tool maker. The experts on e-health advocate the inclusive participation of key relevant stakeholders such as the technicians and clinicians at a strategic level in designing the e-health tools.

It has emerged from the data that implementers are not actively involved in the e-health policy development process. The lack of knowledge about the current and existing e-health policy development process on the part of the implementers is an indication of the extent of their involvement in this process. There seems to be a lack of active collaboration and coordination among health professionals and the technological experts. This is a concern because, the literature has identified that the coordination between technical experts, IT specialists and clinicians is an essential component in the successful implementation of e-health solutions. Therefore, it becomes clear that representation and active participation of the clinicians and technological experts at the policy development process level is one factor of many that supports successful e-health implementation. The fact that such collaboration does not exist may indicate that e-health in South Africa will struggle towards reaching its maturity state. The findings further demonstrate the fact that health professionals are the first to be concerned by changes brought about through e-health solutions. In many cases they are ill-prepared for such changes, particularly as training programmes are often rudimentary or totally lacking. Furthermore clinicians indicated that there is a fear of change which is brought about by e-health. One clinician said “clinicians are now required to make substantial changes to the way they deliver patient care to use the said tool. The way I see it, is a case of the tail wagging the dog”.

After the interviews with health professionals and experts it was necessary to find out the views of community members regarding their participation in policy development. It was necessary to assess whether these stakeholders are engaged in the development of the policy that is geared towards serving them.

4.1.3. Community involvement

Interviews at all levels of the e-health policy development process have revealed a concerned approach to community participation in e-health policy making. Interviewees were unanimous in their views that engaging communities in joint decision-making would bring benefits to the e-health policy process. As a positive spin off, interviewees at the provincial and district levels noted that community participation would enable crafting of innovative solutions to e-health initiatives while empowering people as the end users of these solutions, with communities learning more in their involvement with government processes.

The interview with community members revealed that there is a concern coming from the community representatives that government only consults with communities when they want to rubberstamp what has already been decided on. There is a strong view on the part of the community informants that the government should be meeting with the hospital boards more often to listen to the concerns raised by the communities through this structure. One community member said: *"There are burning issues that require the immediate intervention of the provincial government such as the death of the boys when they go for circumcision for instance".* Although this comment was not related to e-health it is reported here as one of the examples of poor interaction between community members and policy makers. There were not many views regarding e-health from communities since such a service is not significantly popular and known by community members. This alone suggests that e-health is at its infancy stage in the country.

However, the analysis of the concerns brought forward by community leaders and informants reflects that government tends to seek community input into already formulated policy responses or to disseminate information on existing government programs. This was confirmed during the interview with the experts when asked what they think about involving communities. The response was that: *"Yes we always wish to involve communities. However, experience in setting up public hearings has shown some reluctance from the communities to attend such hearings. This leads to the dragging out of this process. There is not enough effort put into motivating individuals, groups and communities to partake in such meetings.*

Sometimes the language is too complicated and technical for the ordinary people on the ground".

While policy makers acknowledge the importance of the active participation of communities in the e-health policy development process and implementation, there seems to be little effort applied in making patients critically aware of how the work of the e-health services can benefit them. This may include the lack of an explanation on confidentiality regarding their personal information residing or being stored in the technology used for e-health services. This case is important as the country does not have any legal framework regarding the use of personal data.

The provincial office expresses a need for the road shows to create awareness and surveys to give communities a platform to express their views and concerns about the introduction of e-health services and how this could affect the way health care service is delivered to the patient. The Tsilitwa (health clinic in the Eastern Cape) tele-medicine implementation seems to have taken a different approach where the community itself made the first move in showing an interest in tele-medicine used in their local clinic. Their approach involves community updates every Monday at the local clinic and the use of any community platform to share the successes, challenges and benefits of this community's initiative. The health professional in this clinic confirmed that while there is community involvement that activity does not translate into providing information for e-health policy development. This situation is caused by the reality that neither health professionals nor community members were requested to provide information in this regard. The health professional stated: *"There is not much that is forcing the Department to support this program as this was an initiative of the community. I believe a policy in place would force the government to support and sustain this project".*

The literature review has uncovered that ordinary people who are affected by the implementation of the e-health initiatives have the right to participate in the policy making process that impacts their lives, and that an informed policy making process leads to a better policy that is most responsive to community needs. There seems to be a discrepancy between the ideal environment and the actual environment

regarding e-health in the country. These findings indicate that there are numerous issues that need to be considered if e-health is to be successfully implemented as an alternative health care service.

The literature review has uncovered that as new ways of delivering health care are introduced into public health care space and medical practice, there are ethical, legal, and social concerns that must be considered and embraced. However, the findings show that there is a long road ahead before such considerations can be made. The issue of brain drain was reported during interviews as one of the major challenges related to e-health.

4.1.4. The drain of health care professionals

The interview in the Eastern Cape provincial office reflected on the need for a solution to deal with the challenge of not having the right expertise required to implement e-health services particularly for rural facilities. Such lack of expertise results in the influx of level 1 patient to tertiary hospitals to access better medical care. As the provincial policy maker interviewee said: *"The major challenge faced by the Eastern Cape Provincial Department of Health is the drain of health care professionals from the rural health facilities to the more developed urban centres. Professional isolation from their peers contributes to the difficulty in attracting and retaining qualified staff in rural areas to manage and implement e-health".*

One of the experts indicated that the ICT application such the e-health is often seen as additional work for the overworked medical personnel. This expert revealed that in many instances this attitude towards technology–based health care service is compounded by lack of proper training of clinicians on e-health. This lack of training was alluded to by a clinic manager (in Tsilitwa Clinic). The manager in the clinic stated: "*Training the clinic staff on how to correctly take the pictures of the patient, store them and send them in the correct form to the doctor on the other side to make a diagnosis is critical"*. She continued: "…*staff members do take these pictures but training is essential to provide the required angles".*

The results suggest that there is an urgent need for capacity development in e-health at all levels. Many health workers do not have any computer training during their basic training and those from rural schools may never have used a computer. The health professionals that have the skill and knowledge are leaving the province to more affluent provinces. Migration of medical health care professionals from the rural provinces such as the Eastern Cape and countrywide to more affluent provinces or to more developed countries has become a major concern. This brain drain worsens the already depleted rural health care resources and facilities in poor provinces and widens the gap in health inequities nationwide. When health professionals migrate to urban areas the poor may be forced to rely only on the medicine of traditional healers for treatment, whilst the wealthy may travel to urban areas and more affluent provinces for their routine medical check-ups; this aggravates the inequity in access to health care services in such rural areas.

The e-health policy framework is a much needed solution to address the issue of brain drain that is experienced by the Eastern Cape and perhaps other rural provinces as well. Such a policy must come up with solutions related to staff retention and incentives for people to work within e-health services. It seems that such a policy is not available. A serious concern is the finding that there is no e-health legal framework in the country. This makes life even difficult for e-health practitioners. The e-health practitioner (doctor) said: *"The misreading of the scans, over radiation of the patient because the doctor does not have the skill to read the scan and the subsequent misdiagnosis of the patient is the result of not having the e-health policy framework in place. This would require a policy that would put the scarce radiology skill at the centre to be accessed by all public health institutions in the province".*

The absence of such a legal framework has resulted in too much time and resources being wasted.

4.1.5. Lack of strategic guidance towards implementation of e-health

During the interview the provincial office has revealed that there is still no clear policy or strategic direction from the NDoH. The provincial government commented: "*There has been, on numerous occasions, some guidance from the Medical Research Council (MRC) conferences regarding e-health policy development but nothing is forthcoming to date".* It continued: "*The lack of capacity and authority regarding e-health in the province and nationally stems from the fact that only junior staff members attend these conferences and this is the reason recommendations have not been carried out which is really frustrating for all of us".* As a result there is a lack of strategic direction from authorities and leadership.

The frequent and constant change of staff in strategic positions to provide leadership and guidance has also featured frequently in the national and provincial level responses as another possible reason for e-health not being given the attention it deserves. The e-health as a program could be more of a clinical operation application. However, with the Eastern Cape Provincial Department it is just a sub-directorate under the Human Resource Research and Development (HRD) with no budget but relying on the mercy of grants. The provincial policy- maker interviewee expressed concern on how the program is not viewed and treated as a priority by the provincial and national office. The participation of the executive at a senior level can give the program the necessary voice it deserves rather than being treated as a mere unit. The findings are shocking in revealing that e-health is not part and parcel of provincial budgets. The question that arises is: how does government expect to take health care services to rural areas if technological innovations are not funded and exploited for the purposes of addressing inequities in the country?

4.1.6. Inclusion of the use of e-health in medical and nursing curriculum

An interview with academics both inside and outside the research institutions revealed that they are of the opinion that both the medical and nursing faculties at universities should be the drivers' e-health initiatives by educating both student doctors and nurses on e-health. One interviewer indicated that KZN University once received funding for e-health education but at the end of such funding there was no further funding provided to pursue e-health education. The interviewer in one

institution said: "*There was a discussion with medical schools 10 years ago to include health informatics and e-health as part of medical education but such persuasion fell onto deaf ears".*

The literature has also revealed some deep-rooted concern from the proponents of e-health that the e-health program has to be incorporated into the school of medicine as part of the curriculum. Also, the Eastern Cape Province expressed the frustration about the academic partners who are not willing to come to the party in introducing e-health into their curriculum. There is a general view amongst provincial policy makers and implementers of e-health that if the use of ICTs in health care is somehow encouraged at the health academic institutions while practitioners undergo their training, this could alleviate any fears to apply the technology into their everyday duties.

The theoretical and practical public health research focusing on the upgrading of health systems nationwide through the use of ICTs would be extremely useful and of immediate benefit.

4.2. The e-health policy in the context of other existing health policies and Act

The appropriate administrative, legislative and regulatory frameworks are essential for the implementation of any national e-health initiatives. As the literature attests to this, their absence is sure to provoke some difficulties in the immediate or long term as indicated earlier.

The respondents at all levels were asked to explain how e-health fits in with the existing health policy and Act and whether it is possible to revise the e-health Act and amend it to include an e-health component. The objective here was to map out the specific contribution that e-health policy can make within the context of other health policies and Act. This enquiry was necessary because the related policies and regulations are bound to be part of the e-health policy as e-health cannot be implemented in isolation from the health services system. The laws that govern the health system are also most relevant in governing e-health and how the e-health

policy development process is pursued as a supportive tool for the quality and cost effectiveness as well as access to health care services.

Table 4.2: *E-health policy in the context of other policies and emerging issues*

Theme 2	**Emerging issues**
The e-health policy in the context of other existing health policies and Act	4.2.1. The 2006 White Paper Draft 4.2.2. Change in administration and staff 4.2.3. Common standards, security and confidentiality 4.2.4. The e-health strategy 4.2.5. Capacity/expertise to develop the provincial policy 4.2.6. Coordination of the medical schools with government

4.2.1. The 2006 White Paper draft

White Paper as a government document, acts as a participatory democratic tool in presenting firm government policies while at the same time invites opinions about them. The White Paper usually follows the consultative document of introducing and creating awareness about a new legislation but comes before the actual legislation. The 2006 e-health policy White Paper Draft could have been preceded by a consultative document as this could not be validated in the data collected. The presence of a White Paper Draft is an indication that there was a policy development process that started before 2006.

What was revealed by the e-health experts and participants at national level was that the e-health policy development process seems to have stalled many times after the first draft came out in 2006. The e-health initiatives introduced had to be implemented without a legal binding document to guide these programmes. The data reveals that this policy process has been marred by a number of challenges. The

interviewee at the NDoH when asked about the reason for not having a policy in e-health replied: *"The process stalled in 2006 and I can safely say that the process was abandoned. Barbra Hogan tried to revive the process and hired a consultancy to take stock of the policies we had in our area of e-health but after the Minister left the consultants had to stop their investigation".*

It also emerged from the data that e-health initiatives that are in place are not governed or guided by any specific or direct policy. Provinces are implementing any internal or in-house policies as they see fit. This was confirmed by one of the provincial policy makers who stated: *"We only have a tele-medicine strategy for 2010-2015 that we use to implement the tele-medicine programmes that are in place and there is an e-health strategy on the way that would partly cover all e-health practices".*

There is a clear indication that there is a national e-health policy development process that started prior to 2006 that culminated in this draft e-health policy of 2006. However, since the draft policy was in place, there is no evidence that shows any significant progress made regarding any administrative, legislative and regulatory framework that can allow for the normal use of ICTs within the health sector. This may have a bearing on the fundamental rights of the end-users and consumers of health care services, the implementation of e-health services by health professionals, inhibiting the acceleration of equitable health care to all including the rural communities.

4.2.2. The rapid change of the administration and executive staff

Some interviewers at national and provincial offices are of the view that the e-health policy development process in South Africa has been marked by the ever-changing of personnel in key political and senior strategic levels. The NDoH made a special reference to the case of Minister Hogan, who in her short stay in 2008 with the Ministry of Health tried to give this policy development process a lifeline. The process suffered a big blow when the political leadership had to be changed shortly after Hogan set the process of reviving the e-health policy. The process suffered a further massive blow when its mandate was returned to the Deputy Minister who was

also new in the Department without any significant powers to give the process much needed authority and a political boost. The progress of the e-health development process has been marred by a number of challenges since it started. The constant change of administration and staff has been fingered as one of the reasons that e-health has not made much anticipated progress in the province. One interviewee in the provincial office said: *"In 2010-2011 e-health was under Doctor Wagner and had a budget of its own, enough to run the program. However, when the program failed to produce any tangible results, the money was taken away and we had to rely on the HPTD grant".* The e-health programs in the province seem to have suffered a great deal due to lack of efficient administration and proper guidance issues as mentioned earlier.

4.2.3. Common standards, security and confidentiality

Although provinces are keen to implement e-health initiatives, the need for legislation policy, norms, standards and guidelines from the NDoH has been identified by provincial policy makers as a necessity to lay down a legal binding framework to be adopted by provinces in running with e-health. The NDoH has, in the interviews acknowledged that if provinces wish to develop their policy with regard to the running of e-health, they have to follow the tune from the national department. To enforce compliance with the standard issues in the absence of legislation, the provincial office seems to be relying on other ICT policies that are not covered well enough for e-health. This issue kept on recurring quite often during the interviews with the provincial policy makers who feel that although the tele-medicine strategy has been used to regulate the e-health programmes, there should be an overall e-health legal framework to guide these initiatives.

Interviewers at provincial office indicated that there has been a call from the provinces for the NDoH to lead the way in coming up with a policy and legislation to guide these initiatives. Implementers and experts believe that a relevant policy would be able to put the right people in the right places to lead and guide these initiatives. In the absence of the e-health policy, clinicians encounter serious challenges of uncertainties of how their actions are protected when they examine and prescribe to a patient over the ICT platform.

Expectations of the e-health policy from the academic fraternity generally regarding this policy should cover among other things, the common standards of quality of the images, for instance, interoperability, technology that is reliable and which incorporates the training of practitioners to be able to operate these applications without fear. The e-health policy must ensure that the ICT environment operates with precision to avoid fatal outcomes.

The lack of strategic leadership by the national department in providing guidance on common standards and terminologies to promote interoperability has emerged strongly in this regard. Also, the lack of policy and regulatory framework for e-health is regarded as the failure of the NDoH to provide guidance. The lack of coordination between implementers and educators regarding e-health is regarded as a spanner in the works.

4.2.4. The e-health strategy 2012-2016

The interview at NDoH revealed that there is a national e-health strategy for the public health sector that has been launched in 2012. Having read the strategic document it is evident that the strategy envisions an e-health environment that enables a long and healthy life for all South Africans. According to the e-health strategy document (2012) the overall aim of the strategy is to provide a single, harmonised and comprehensive e-health strategy that amongst other key objectives is to do the following:

- Support the medium-term priorities of the public health sector
- Pave the way for future public sector e-health requirements and
- Lay the requisite foundations for the future integration and coordination of all health initiatives in the public and private sector.

The e-health strategy (2012) identifies and outlines ten strategic priorities for e-health out of which stakeholder engagement comes second from that list. The strategy also talks to specific fields of e-health which highlight the key things the department wants to achieve by implementing these applications and the challenges encountered thus far. The applications include m-health that promises to revolutionise healthcare by providing health information even to the deep rural areas like O R Tambo district in the Eastern Cape; Telemedicine that would allow a nurse in a rural healthcare facility to take pictures of a sick patient and post symptoms to a hospital for the doctor to prescribe or summon the patient to the hospital; The implementation and use of these applications requires e-health capacity building, extensive

research and common e-health standards adopted by the National Health Information systems to enable these systems to talk to one another.

Leveraging e-health to support the NDoH's strategic aims, the strategy adopted a framework on which to set out how e-health will contribute to the realising the department's medium term priorities by looking at some but not limited to the following areas:

- Strengthening Health Information systems
- Decreasing maternal and child mortality
- Combating HIV/AIDS and decreasing the burden of diseases from TB

The ICT for Health Conference hosted by the South African Medical Research Council in 2011 and 2012 highlighted some of the key issues with regards to e-health policy development. While the e-health conference in 2011 highlighted the need for more innovative, scalability viable business models and sustainability in ICT for health, the 2012 conference was an important milestone on the stakeholder's calendar. In this conference the NDoH shared information about progress made in the e-health space and plans going forward.

4.2.5. Coordination of the medical schools with government

The provincial Department of Health has strongly criticised the academic partners for not coming on board to make e-health implementation a success. The academic partners on the other hand feel their capacity is not exploited enough by government. There is a national e-health strategy that has just been signed by the Minister of Health. Policy makers at the national office seem to be pinning their hopes on this strategy as internal policy to revive the e-health policy development process.

Of concern is that although the e-health White Paper Draft Discussion has identified the lack of human capacity as a problem, the National Human Resources for Health Plan does not include Health Informatics capacity development and planning. The National DOH states: *"must work with the Department of Education in developing a curriculum at school and tertiary level on computer literacy" and that, "every health worker and administrator in the health system must be computer-literate and develop high level computer skills to be able to manipulate data to provide information for managers and decision makers".*

The field study shows no strong link between government and the academic fraternity, yet this is crucial in making sure that the use of ICTs in health is part of the training and education of the health professionals. In more ways than one, the absence of the e-health legal framework seems to have contributed to the snail's pace of these initiatives to take off and stay afloat. While it is documented that any form of regulation does not guarantee appropriate action but its presence shows commitment and demands accountability. It appears there is a lack of coordination and collaboration between government and the academic partners.

4.3. The understanding of e-health and its benefits in the context of health care delivery

The participants at all levels were asked to throw light upon how they understand the e-health concept and disentangle the benefits of using ICT to deliver health care services as they perceive them. This enquiry was necessary to solicit common or different views of the participants on how they understand e-health and its benefits in the health care delivery. Most importantly, how the policy development process can accelerate the deployment of the e-health initiatives. The Table 4.3 below shows the emerging issues from the data and these are discussed in detail in the paragraphs which follow.

Table 4.3: *Understanding e-health and emerging issues*

Theme 3	**Emerging issues**
The understanding of e-health and its benefits in the context of health care delivery	*4.3.1.* Different ways of referring to e-health *4.3.2.* The appropriate legal framework *4.3.3.* The waste of resources *4.3.4.* Lack of direction & understanding of the bigger picture *4.3.5.* Power turfs *4.3.6.* Creating awareness *4.3.7.* The unpredictability of the network *4.3.8.* A little extra job to the daily activities

4.3.1. Different ways of referring to e-health

The NDoH has acknowledged that provinces have different ways of referring to the concept of e-health and define it through its sub-components such as tele-medicine, m-mobile, e-learning, etc. It appears that there is a lack of understanding of what e-health and its benefits are all about. The NDoH indicated: "…*some provinces like the provincial KZN health have covered a lot of ground on tele-medicine and they wouldn't want to hear a thing about changing this into another concept".*

On commenting on the same issue implementers' views have affirmed this notion that e-health is only referred to its sub-components: *"E-health is foreign to us. The NDoH perceives this as the computerization of information where most of the time we are only referring to health electronic records and hospital information. Yet, this is not a new phenomenon. It has always been there".*

It appears that there is lack of coordinated effort in addressing relevant issues of standards from the NDoH. From the simple issues of common understanding of the

basic concepts there seems to be a problem of uniformity. The NDoH seems to be lacking in defining e-health and setting standards that should be followed by the provinces. The common standards have to be defined by the national office with the assistance of the provinces as the key and relevant stakeholders. The lack of common standards in the e-health understanding seems to have spilled over from the issues of awareness of the common terms to the lack of interoperability of the health systems.

4.3.2. The appropriate legal framework

The question that was put forward to the implementers was whether they have been informed about any e-health policy development process taking place. There has been a general consensus among the implementers of the e-health initiatives that the appropriate legal framework is what is needed to enable the efficient and successful deployment of the e-health programs. They believe that e-health legislation would enable the right people to be put into the right places with the ability and capability to understand and execute e-health solutions. They feel e-health implementation in health care is an inevitable and a necessary move to bring equitable health care to the marginalized people in this country. However, a proper legislation and policy framework must be in place to protect and police these initiatives.

Their understanding of the e-health policy is that it must guide and protect how these initiatives are run. They see it as a policy that should be able to guide how they can address the serious critical shortage of radiologists in the public sector. The first implementer said: *"The legislation would place the radiologists at the central position in the province to be accessed by all the health care facilities who require and when they require such a service. That legislation would ensure that scans are read by qualified doctors and who would make the right diagnosis the first time".* The lack of such a legal framework with regard to e-health implementation continues to render the practitioners helpless in saving lives that could have been otherwise saved.

4.3.3. The wasted resources

The serious and critical shortage of radiologists in the province can lead to the wrong diagnosis about the patient. Such a shortage may result in more lives that could have been saved to be compromised all the time. One interviewee noted: "*By the time somebody out there realises the importance of having a tele-radiology system that is in place and working we would have basically lost too much, too many lives".*

To allay these fears practitioners have expressed the need for government to lend the necessary support to ensure that the infrastructure that is already in place is put to good use. They are pleading with government to do what is necessary to alleviate the fears of the practitioners to embrace these technologies. They call for training, uninterrupted connectivity with the hospitals where they can expect assistance from radiologists.

They view tele-radiology as a tool that can accelerate diagnosis and save the lives of patients as opposed to some who believe that there are more pressing needs such as the shortage of medicine, consulting equipment, hospital beds, etc. than ICT applications. One interviewee stated: "*It is a platform that can be used to spread the critical radiology skill we need to be accessed by every health facility in the province".*

The NDoH has expressed the frustration of failing to stop the provinces from sourcing the e-health services of different standards from different suppliers that are not compatible with the required standards. Apart from standardisation and issues of interoperability, buying new technology has cost implications, including implementation and maintenance costs.

E-health is an international phenomenon that requires governments to adhere to a certain prescribed set of harmonised standards, profiles and technical specifications to be used to ensure cross border e-health interoperability. To avoid waste of resources the policy should firmly put in place the guidelines as to how to implement e-health initiatives.

4.3.4. Lack of direction by NHIS/SA & understanding of the bigger picture

Change of administration, the NHIS/SA was not meeting as regularly as it was supposed to. Lack of direction and the bigger picture have been a concern to both the provincial and national policy makers. Experts have identified this as being caused by ever-changing personnel in the positions of power and the lack of frequent meetings of NHIS/SA as indicated earlier.

4.3.5. Power turfs

The findings reveal some form of power struggle and turfs issues. At the national level, e-health has been described as a victim of power turfs in more ways than one and these are some of the issues raised: 1.) e-health is allocated under the deputy minister who does not necessarily have much authority or the power to influence much needed progress on the program; 2.) administratively e-health is not given the attention it deserves. It is just a mere sub-directorate; 3.) Every time a new political administration comes into power, everything changes and the process suffers even more; 4.) There seems to be some level of influence on who can benefit out of this program in terms of the tenders and the list goes on.

On provincial level, e-health seems to be the last thing on the minds of the management members as there are other pressing issues such as staff drainage, equipment needed by doctors to consult with patients, medicine and other supplies. Within the provincial department e-health is not a priority. This is demonstrated by the level of the people who are running the program. A deputy director is running the program as a sub-directorate to Human Resource Development directorate which falls under corporate services yet in some instances the program is regarded as a clinical service. As if this is not enough, the program has no budget of its own and has to rely on HPTD grants, as indicated earlier. One interviewee (provincial policy maker) said: *"the fact that we do not have a senior person in this unit is a problem. No one listens to our views and concerns. In meetings where serious issues of this nature are raised, we are not taken seriously and there isn't much support from the National Department".*

The province has expressed the need to get the buy-in from top management, for a budget to be allocated specifically for e-health to stop depending on the mercy of grants, and above all else, clear direction from the national office. It appears as if e-health programs in the Eastern Cape and the national office have been the victims of power turfs and struggle.

4.3.6. Creating awareness

The province recognises the need for a full campaign to change the mindset and involve more people to understand e-health and its benefits. This awareness could alleviate any fears to make use of this technology and address any patient's concerns about the security and confidentiality of his/her information.

"There must be a conscious effort to make people critically aware about the benefits of e-health to alleviate any fears about this platform".

Walter Sisulu University reiterates the importance of creating awareness and the training of the clinical staff on how to apply e-health technology into their day to day activities. The University advocates a policy that will ensure that the quality of service that is given to the patient is not compromised, the provision of an e-health policy that could allay the fears regarding security, confidentiality and the privacy of the patient.

4.3.7. The unpredictability of the network

Tsilitwa is one rural health facility that has embraced some form of e-health technology in the Eastern Cape, raising concerns over constant network interruptions after heavy storms. The wireless connection that has been implemented in this brilliant community initiative is an example of an e-health project in a typical rural area. With almost all the characteristics of a rural health facility, Tsilitwa with a population of 2000 people is connected to other nearby villages by several kilometres of poorly developed dirt roads and suffers from a high unemployment rate and low penetration of public services. The population is

dependent on social grants and with no medical insurance they depend on the public health facility for their health care needs.

The network interruptions become a heavy blow to the community as the heavy storms constantly affect the communication line.

Picture: *A nursing sister takes a picture of a patient at rural clinic of Tsilitwa at Qumbu Eastern Cape*



These interruptions have adverse effects on the clinic to access doctors at the neighbouring health facilities online. The rural facility would be off-line for days, weeks or even for months sometimes. Technology has some serious maintenance issues which require constant support from the Department of Health.

The quality, reliability and the unpredictability of the network has also been identified as one of the problematic areas by the provincial office. There is a general fear amongst practitioners on what the outcome would be if the system fails to provide timely access to health care. The lack of support from both national and provincial office to service and to bring Tsilitwa back on-line soon enough, leads to interruptions to continue saving lives is evidence enough to show how e-health initiatives continue to suffer in the absence of a policy.

4.3.8. Little extra job to the daily activities

The Tsilitwa rural health personnel view tele-medicine as a little extra on the day to day job, finding what was alluded to by the provincial office. This is based on their experience in the use of this platform. As the rural health facility which is staffed only by nurses with limited capacity to treat anything other than basic health care needs, they have to rely on the ICT platform to connect with the doctors from the neighbouring health care centers. Despite the long queues, they have to take photos, store and send images to the doctor on the other side to get advice on what treatment to prescribe or receive the go-ahead to refer a patient.

Picture: *The rural clinic of Tsilitwa at Qumbu Eastern Cape*



One nurse said: *"On top of your normal duties, you take images, send e-mails. This requires that you to have a special skill to take images by using a digital camera and be able to load and send these images in the correct form. This is apart from taking blood pressure and performing other basic services to administer to a patient. Without any basic training to handle this technology and do your daily duties at the same time can be a daunting task."*

This view was also echoed by the Walter Sisulu University where personnel underlined that the lack of incorporating and inclusion of e-health in the medical curriculum and training at the workplace may continue to discourage practitioners to fully adopt the technology into their day to day activities.

The picture below was taken at the rural Tsilitwa Health Care Clinic where the rural nurse put the use of ICTs in health care into practice.

Picture: *A queue at the rural clinic of Tsilitwa at Qumbu Eastern Cape*



Source: *Daily Dispatch Newspaper*

4.4. Conclusion

A number of issues and views have emerged from the data collected and analysed in this chapter. Out of the three major themes namely: participation of relevant networks; e-health in the context of other existing policies and Act; and the understanding of e-health and its benefits; the following issues stand out and will be discussed in the following chapter:

- It appears that there is a need for legislation to put the right people in the right places to enable e-health to make a meaningful contribution in assisting to deliver equitable health care to all people living in South Africa.
- There is a serious lack of direction and understanding of the bigger picture when it comes to e-health.
- There seems to be lack of continuity whenever the new personnel and political leadership changes.

- Issues of costs and budgetary constraints. Although there is an e-health policy under discussion, there are, however, major challenges such as the low broadband penetration in the rural areas where equitable health care services are required the most; bandwidth in South Africa is still very expensive; many health workers are not computer-literate and see the application of e-health as an additional load of work on their already strenuous job of taking care of their patients; there is not a culture of data acquisition and analysis, there are too few people with the capacity to advocate e-health and not many medical practitioners with e-health experience.
- There is a lack of activists and champions to lead this evolution and create awareness.

Chapter 5: Discussions and reflections on e-health policy development design

5.1. Introduction

The present study has attempted to provide a better understanding of how the e-health policy in South Africa is developed, the reason for its existence and how various role players have participated in this process. The main research question was to determine the extent to which the e-health policy development process involved the active participation of the various networks in the different stages of this policy process to enrich e-health implementation in South Africa. The main purpose of this chapter is to discuss the research results from the previous chapter and to look at these results in relation to the literature reviewed and the research questions raised.

As highlighted earlier, this study has been embraced within the social construction of a reality theoretical framework as the home for further exploration of this policy development process. This is a philosophical underpinning which claims that the truth is relative and that it is dependent on one's perspective (Stake, 1995 & Yin, 2003 in Baxter & Jack, 2008). According to these scholars, this approach creates a close collaboration between the researcher and the role players and it allows the latter to tell their stories and describe their views of reality and this, in turn, provides the researcher with a better understanding of why role players act in a certain way. The interviews have taken into consideration how people as the role players in the public policy development process would want to construct this policy regarding their reality of life, their experience with health care system, sense of service, etc. Secondly, as discussed earlier in the literature review and the research methodology chapters, the PPN supports active participation of all institutions and procedures that govern the stages and the interaction between role players who have interests in a specific stage. The first step is to understand how we may design an effective policy that can improve the health care status for all. Also, it is to examine the process through which this policy is shaped, detecting its strengths and weaknesses. This chapter further reflects on whether the results support or reject the PPN framework model and it also takes the tune from the conceptual framework. In discussing the results some themes from the chapter on results and the conceptual framework are

used as topics under discussion, however, not all of the themes are used. The first discussion below falls under networks that participate in e-health policy as depicted in the conceptual framework.

5.2. Various role players participating in the public e-health policy development process

The issues emerging from the discussion within the participation of the various networks in this policy process highlight the complex and the multi-dimensional nature of the e-health policy development process. Numerous and sometimes diverse responses were provided by the participants regarding their involvement in the policy development process as alluded to in the previous chapter.

The results reveal that the NHIS/SA committee is the primary stakeholder in the e-health policy development arena. This committee is challenged by limited recognition regarding its representativeness of stakeholders. This committee is constituted in such a manner that it excludes key players such as local government and IT specialists. From this point of view it becomes clear that this committee is not fully legitimate especially if the results are examined within the PPN framework which suggests that all stakeholders must be represented in the policy development process. Therefore, NHIS/SA is just a bureaucratic entity which the National Department uses as a proper shield for not having organised a proper representative committee for e-health. The NHIS/SA committee has just developed an e-health strategy according to these results, but one wonders how such a strategy will be implemented if the clinicians are not part of this process. The National Department of Health needs to be serious about forming a representative forum that will assist with the proper implementation of the strategy. If this is not done this strategy will become another shelf item in the library.

Furthermore, the results show clearly that the communities as consumers of such a policy are not represented in the NHIS/SA committee. It is not surprising to find that communities are not involved at all. One would not expect their involvement when clinicians are not involved hence NHIS/SA is considered as just one of the bureaucratic entities for government. An interesting observation and closer analysis of the results is the discovery that NHIS/SA is a national committee with no sub

committees at provincial and local levels that could influence a policy development process. This reflects on how this process is way out of tune when examined within the PPN framework. While the PPN Framework is considered the model on policy development in reality such a model does not seem to be understood or followed. This discovery suggests that there is incongruity between what is meant to be done from a theoretical point of view and what happens on the ground relating to e-health policy development process. The question that follows is how do we make PPN Framework to be the framework of choice in any policy development process in government in general? One wonders whether policy developers and policy makers are aware of this model and its good intentions. If this framework is used surely issues of service delivery in the country would not be violent as they are because community members would have been part and parcel of policy development and the implementation process.

It is a matter of concern to find that local government is not part of the NHIS/SA, because local government is responsible for the delivery of the health services at the municipal level as stipulated in the National Health Act (National Health Act no.61, 2003). Local government has direct contact with the local communities. Therefore, local government participation is the key to understanding how the communities perceive and construct the reality of their situation. The implementers of the health care services have a practical knowledge of how the health care system works including the challenges in line with their duty.

An interview with one of the implementers reveals that: *"Any changes in patient care should happen only through peer review in the hands of clinicians and as per the needs of patient care and safety and as seen fit by clinicians".* The health care professionals' awareness and acceptance can only be gained through their active participation and engagement in the policy process.

In view of these findings, it emerges that there is a central approach into e-health policy development process. The central approach that has its own weaknesses as highlighted in the limited participation of local government, communities and the health care implementers. Lack of cognitive participation by the various key relevant networks hinders any chance to "buy into" the new e-health system by the potential users.

The same is true of the other policies that have the bearing on the ICTs and the health care system as a whole, which leads these findings into revealing how the e-health policy development process has looked into this policy in the context of these other policies.

5.3. The e-health policy in the context of other existing health policies and Act

As highlighted in the literature review chapter and demonstrated in the conceptual framework, e-health policy issues should be dealt with in the context of the health care systems as a whole, where e-health policy is viewed and developed in the context of other existing health policies and legislations on the local, national and international levels for that matter. This exercise should assist in determining and establishing whether we need e-health policy separate from the existing health policy or to just amend the existing health policy and have a component of e-health within this policy. In this regard the results reveal that the Presidential National Commission (PNC) on Information Society and Development (ISAD) has identified the lack of e-health policy to ensure the coordination and well regulated e-health environment as the main challenge in the execution of e-health initiatives in South Africa. However, a development of any public policy initiative must not take place in an isolated manner as this could jeopardise the potential of e-health to be fully realised. Literature review informs us that the decisions made in one related public policy or jurisdiction could hinder or even prevent any e-health opportunity in another (Scott, 2002). This study reflects that policies are not necessarily developed in such a manner that accommodates other relevant projects. This alone reflects the silo mentality of government in conducting its business.

The PPN perspective advocates a policy development process that is systematic, multi-stakeholder, inter-disciplinary in approach and that is susceptible and sensitive to the economic and market changes. According to the PPN framework all of these elements are interdependent and are the contextual aspects that a public policy development process should not neglect if it is to be effective. The literature review has identified the two important United Nations Organisations (ITU & WHO) that are crucial keys to the implementation of e-health. At a national level one would expect to see a strong collaboration and coordination of similar institutions. Although the

NDoH has made mention of the inter-sectoral partners in this policy process, nothing much is said about their active involvement. The Department of Communication as the custodian of the ICT policy in South Africa is the central key and relevant player on matters of ICT policy relating to health. The ICASA as the watchdog to the industry is crucial in enforcing the regulation of such an application into health care and the USAASA would be ensuring that universal access obligation of rolling out right bandwidth in the rural areas by the service providers is accomplished, to mention but a few stakeholders. The involvement of so many stakeholders as mentioned above reflects the complexity of e-health which requires a sophisticated and encompassing coordination and collaboration system. Without such a system these stakeholders are just wielding their powers instead of working together towards a common goal which is e-health in this case. This poor coordination can be defined as a reflecting power struggle between them. The issue of power struggle is reflected on what participants' lower levels of government said about the e-health policy being made the responsibility of national department only while implementation is taking place at lower levels.

The e-health strategy 2012-2013 has been identified by the NDoH as the relevant internal policy document to provide the roadmap for achieving a well-functioning e-health system in South Africa. However, having read the e-health strategy document, although it puts the patient at the centre of this policy, there is no clear indication that all key relevant role players have been actively involved in the development of this strategy. The lack of participation of the relevant stakeholders has been evident on the key points coming out of the interviews with community informants, implementers and the provincial policy makers. The lack of knowledge about the existing e-health strategy and the reference to the telemedicine strategy instead by the provincial policy maker is evidence enough that this strategy never adopted any consultative process with regards to crucial stakeholders.

The strategy document identifies ten priorities that must be addressed in order to leverage e-health to strengthen healthcare and stakeholder engagement comes second to that list of priorities. However, the issue of stakeholder engagement in the strategy document is trivial, displaying lack of thoroughness in displaying their active participation from the designing stages of this strategy.

The strategy was published in between the ICT for Health Conferences held in 2011 and 2012 neither conference was utilised to get the vital contribution from the key stakeholder to part.

Regarding participants in the e-health strategy the data shows lack of knowledge from the implementers, communities and provincial e-health officials about the existence of this strategy.

Issues ranging from common standards, security and confidentiality to issues of development of suitable skilled and trained people to police and implement these initiatives have emerged throughout the study. This causes concern because any programme that is not based on any clear standard is bound to be chaotic in its implementation process. E-health needs common standards as discussed below.

5.4. Readiness for the e-health policy including Standards and interoperability

For the effective and successful implementation of the e-health initiatives in South Africa, systems in place must be able to talk to one another. A patient from the Gauteng Province must be able to walk into a health care facility in the Eastern Cape or anywhere in the country for that matter and when he gives out his unique identification number the system should be able to call up the patient's medical record. To make this possible the technical standards are required to ensure national compatibility, interoperability, etc. Interoperability of the health care systems was identified as a major issue to be addressed by the NHIS/SA.

The NHIS/SA committee on behalf of the NDoH has to provide guidance on common standards and terminologies to promote interoperability. The data results pointed out that there is a need to promote uniform ICT standards at national and provincial levels. NHIS/SA has been in place since 1995, it is very shocking to discover 17 years later that the Committee has not developed any form of standards for e-health. The question is why is there a structure in government that is not doing its work? Why there are government nursing structures that are not productive is very difficult to comprehend.

Although there has been an effort made by the Department of Health to ensure systems are talking to one another, the data results reveal that the health information systems in South Africa are still fragmented in nature. In the nine provinces there are

five different systems in use and there is little integration between them. In the absence of any e-health policy, legislative or regulatory framework in place, the provinces (as noted by both the national and provincial policy makers) seems to be relying on other ICT policies that are not adequately covered for the e-health practice.

These findings reveal that there is a lack of guidance from the national office which can compel the provinces to adhere to national prescribed standards and implement compatible e-health technologies. The provinces are running the e-health initiatives by enforcing a “patchwork” of legislation, policies and regulations. The e-health policy development process has taken more than six years from the White Paper Draft policy. Although the e-health strategy is in place, there is little hope that the proposed e-health policy could achieve the goal of a policy because of some of the reasons highlighted in the PPN Framework and others that are discussed in the following sub-heading.

As discussed in the literature review, providers including the beneficiaries of the health care services require appropriate skills to effectively make use of the ICTs in health care (Drury, 2005). Statistics attest to the fact that developing countries suffer from the high turnover of health care professionals in rural areas who are looking for greener pastures from the cities and rich countries. The same is true about the Eastern Cape Province where health care professionals from the rural communities move to more developed urban centres. The ever-changing of personnel at the key political and senior strategic levels has hit the health care system even harder. There seems to be a lack of continuity from where the previous administration has left off and this has resulted in the disruption of any progress made by the previous administration.

The poor handover creates discontinuity in any progress that has already been made that can lead to the misuse of already scarce and limited resources and result in the subsequent suffering of the very patient that the program intends to serve.

Academics and research institutions can be the drivers of the evidence-based knowledge hub when effectively engaged as the participants in the e-health policy development process (Healy, 2008). Providing evidence-based input and research

and encouraging the promotion of e-health benefits can enhance chances of acceptance and awareness among health professionals and the patient community. In addition, the literature review has pointed out the importance of empowering all the health care professionals with ICT skills as this will ensure their efficient use of the digital tools (Drury, 2005). This can be achieved by promoting inclusion of e-health in the medical curricula and training at the workplace. Even basic skills of taking a good quality photo is a challenge as reflected by nurses in the clinic and reported on in the previous chapter.

The data reveal a very weak link between government and the academic fraternity. The lack of coordination and collaboration between government and academic partners could be one reason that the e-health initiatives fail to progress beyond the pilot stages in this country. As stated before, a knowledgeable society relies heavily on human capital. It is therefore necessary to promote e-health with specific training programs as part of the health care professional education and provide continuity on the job training. Making the most of e-health opportunities requires collaboration and coordination among many different networks in the same policy development process. The inherent challenges of working together are made even more complex by the absence of a policy, legislation or regulatory framework that should compel these institutions to be working together.

5.5. Common understanding of e-health and its role and benefits in the context of health care delivery

The lack of a standard or uniform identification of the use of the ICTs in health care delivery and information seems to have added more confusion on the interpretation of e-health. Data reveal different views on how provinces refer to the use of ICTs in health care. The definition of e-health could be better explained by the benefits of the proper use and implementation of the e-health innovations. As stated in the literature review, e-health can help reduce the problems encountered by the health care system by: reducing costs and increasing efficiency; enhancing access to health care remotely; and making information readily available to make decisions and improve personal and community well-being. The e-health policy development

process with the full participation of all key various networks in the same policy process is vital in setting up the common standards, interpretations of the e-health definition as it relates to the unique South African environment. It is understandable that there is no common definition of e-health in the country. It is good to challenge the lack of common standards in the e-health arena as indicated. The subsequent paragraphs are the discussions looking at the emerging issues regarding this theme.

The terms “tele-medicine”, “tele-health” “e-health” and the most recent term “m-health”, the researcher has observed, have often been used as interchangeable during the process of collecting data. Tele-medicine seems to be the most common term used. As the NDoH states,“…*some provinces like the provincial KZN health have covered a lot of ground on tele-medicine and wouldn’t want to hear a thing to change this into another concept”.*

The provincial policy makers have also, in more cases than one, when talking about e-health policy or strategy referred to the tele-medicine strategy 2010-2015. This is the policy that is enforced in some cases to oversee the e-health initiative in the Eastern Cape Province.

Referring to the e-health initiatives in different ways may seem to be harmless at face value. However, the interchangeable use of these terms may have serious repercussions if and when malpractice occurs for an example. The terminology that relates to the use of the ICTs in health care seems to be suffering from lack of clarity and an absence of an agreement about the definition and use of such concepts. The common standards that play part in this field have to start with the common interpretation of terminology from the national office down to the local level. For these standards to be enforced there needs to be an appropriate legal framework in place.

5.6. The appropriate legal framework

The general consensus among the implementers of the e-health initiatives, as the data findings reveal, is that an appropriate legal framework is what is needed to

enable the efficient and successful deployment of the e-health programmes. This view is enough evidence that implementers have not been part of this e-health public policy development process. Suppose the implementers were part of the NHIS/SA committee, this emerging issue would be an adequate indication to conclude that decisions taken by this committee are not widely spread amongst all networks. Lack of knowledge about such decisions demonstrates the absence of active involvement and participation (power and access to the forums to influence the processes) of some of the networks in this policy process. There seems to be a lack of awareness and participation of any e-health policy development process taking place among key relevant networks that should be the direct beneficiaries of these initiatives.

There has been a call from both implementers and policy makers at the provincial level for a full campaign to change the mind-set of the users and patients to understand e-health and its benefits. The awareness could alleviate any fears to make use of this technology and address any patients' concerns about the security and confidentiality of their private information. The data show that the academic fraternity advocates an investment in educative and training programmes for citizens and e-health as a lifelong learning program incorporated into the university curricula.

Having highlighted these issues, what emerges is that any change that is introduced into a system such as health care has to be properly managed and properly monitored. However change can be unsettling if people feel they have been part of a concerted effort to usher in such change. They can take responsibility for the outcomes and this could save limited available resources.

As the data reveal the serious and critical shortage of radiologists in the Eastern Cape Province, health practitioners are forced to send patients for X-rays without any readings from the radiologist. Doctors have to make intuitive decisions on what they see or resend the patient for more X-rays and in that process a wrong diagnosis could be made and too much time and resources are wasted. An inclusive policy development process on e-health would put the radiology skills and resources at the centre of the province to be accessed by all public institutions in the province. Data further revealed that the tele-radiology system that is in place only worked a few times and is now gathering dust. The implementers blame this on the lack of direction of the bigger picture and power turfs that are discussed in the following sub-category.

As discussed in the literature review, e-health takes specialists to the primary health care level. By connecting primary health care centres electronically to the hospitals where there are specialists, makes things easier to get professional opinions, exchange data, make referrals and save lives by cutting the long process of diagnosis. However, the effective implementation of such initiatives is affected by the lack of the necessary support required to run with the use of these technologies to health care.

The Tsilitwa tele-medicine community project is one good example of reducing the need for patients to attend hospitals, saving both time and money. The lack of training and support from the Department is rendering the project ineffective. Although the project has been a community initiative, cutting the effort of getting the "buy in" from the crucial networks (the community), the Department has been failing to support the nursing staff when the network connection is down and making sure new staff is trained to use the system effectively.

The community took the initiative to have the village health care centre connected to the neighbouring hospitals and access health care resources they do not have. The nursing staff is keen to employ the technology to serve the community better. Yet, despite the significant strides taken by this network (community, clinic staff, the sponsors and the other participating health care institutions) in embracing this technology and make it work, the government (provincial & national) does not seem to be willing to participate. Government is an important role player and network that should be governing and giving its support towards successful implementation of such an initiative.

Whatever reasons for the poor implementation of such e-health initiatives, it is obvious that the absence of a definite policy framework makes it difficult to place the right people at the right places. The absence of a policy as a guiding framework to run with the e-health initiatives has resulted in some form of power struggle which further deters e-health initiative to go beyond the pilot stages.

As highlighted earlier, data reveal some form of power struggle and turfs issues. At the national level, e-health has been described as a victim of power turfs in many ways more than one and these are some of the issues raised: 1.) E-health is allocated under the deputy minister who does not necessarily have much authority or the power to influence much needed progress on the program; 2.) Administratively e-health is not given the attention it deserves. It is just a mere sub-directorate; 3.) Every time a new political administration comes into power, everything changes and the process suffers even more; 4.) There seems to be some level of influence on who can benefit from this program in terms of the tenders; and the list goes on.

At a provincial level, e-health does not seem to be a priority as there are pressing issues such as staff drainage, equipment for doctors to consult with patients, medicine and other supplies. This is demonstrated by the level of the people who are running the program. A deputy director is running the program as a sub-directorate to the Human Resource Development Directorate which falls under corporate services, yet in some instances the program is regarded as a clinical service. As if this is not enough, the program has no budget of its own and has to rely on HPTD grants, as indicated earlier.

One interviewee (provincial policy maker) said: *"the fact that we do not have a senior person in this unit is a problem. No one listens to our views and concerns. In meetings where serious issues of this nature are raised, we are not taken seriously and there isn't much support from the National Department".*

The province has expressed the need to get the buy-in from top management, for a budget to be allocated specifically for e-health to stop depending on the mercy of grants, and above all else, a clear direction from the national office. It appears as if e-health programs in the Eastern Cape and the national office have been the victims of power turfs and struggle.

In order to promote the use of ICTs in health care and to resuscitate the e-health policy development process the key relevant role players in health care should

cooperate among themselves, campaign aggressively and take this to the PNC on ISAD to give this program political power and the attention it deserves.

5.7. Conclusion

In this chapter the discussions and the reflections on the e-health policy development design has been presented. The study has attempted to provide a better understanding of how the e-health policy in South Africa is developed, the reason for its existence and how various role players have participated in this process. The main research question was to determine the extent to which the e-health policy development process involved the active participation of the various networks in the different stages of this policy process to enrich e-health implementation in South Africa. The main purpose of this chapter has been to discuss the research results from the previous chapter and to look at these results in relation to the literature reviewed, the conceptual framework and the research questions raised.

Chapter 6: E-health policy development process needs understanding of local and provincial realities

6.1. Introduction

The main research question in this study is to determine the extent to which the e-health policy development process involved the active participation of the various networks in the different stages of this policy process to enrich e-health implementation in South Africa. The results have demonstrated lack of participation of the key role players such as the local municipalities, communities, academics, etc. in this policy development process.

As stated in this research earlier on, the problem is an e-health public policy development process that is not inclusive of all the relevant networks in the same policy process makes it difficult for the e-health initiatives to be sustainable, escalated, and to be fully adopted by the clinicians. Although South Africa has experienced e-health interventions as the tele-radiology initiatives from as early as the 1990s, these initiatives have failed to make it beyond the pilot stages. Investigating and understanding the extent to which the various role players participate in e-health public policy development process in South Africa may lead to recommendations to improve some of the implementation challenges that are faced by these e-health initiatives.

Exploring the e-health policy development process using the PPN framework and using the Eastern Cape as the case study this research is to enrich, in an evidenced-based manner, the knowledge of the policy makers and regulators from all tiers of government in the Republic of South Africa. It is aimed at bringing to their attention the critical importance of an active participation role of all the various networks in the e-health policy development process.

For the e-health policy development process to be effective, it must be inclusive of all the relevant key role players that are affected by the introduction of ICTs into healthcare

The literature review has provided the study with a conceptual framework that puts the PPN model in this study the foundation for assessing the e-health development

process in South Africa from 2006 to 2012. The inclusive participation enables all the networks under the same umbrella to have a common understanding about e-health; who are other role players in the same policy process; what are other existing policies that may affect and influence this policy; what benefits could be derived from this policy development process; and what are the factors to be considered in this policy process in preparing the communities where the e-health solutions are to be implemented.

A number of various and views emerged from the data collected and analysed. The issues emerging from the discussion depicts the importance of looking at the e-health policy development process from the angle of the networks and how they want to construct their reality concerning this policy. Based on the PPN perspective, the construction of reality, the literature reviewed, and the results from the data collected the following recommendations have been made.

6.2. Recommendations

From the research findings, it is imperative that the National Department of Health as the custodian of the e-health policy must ensure that the following recommendations are taken into consideration:

6.2.1 PNC on ISAD raising the e-health profile

The network nature of e-health does not make it to be a national or regional but a global phenomenon, where the policy development process of such a tool has to consider local, national and global contexts. In order to promote e-health and its related benefits, the pro-e-health stakeholders must raise its profile in the national agenda. Using Public Relations, health activists and champions, e-health should get the attention it deserves from the politicians and force government to act hereupon. If the profile is raised, the need for e-health solutions and the absence of a legislative framework that should be policing e-health activities would surely be discussed and open much needed debate in the media, in local authorities and in Parliament. The National Department of Health would then take caution on how the NHIS/SA committee is formulated.

6.2.2 HPCSA regulatory role in the digital economy

It is important and necessary to have an enabling regulatory environment to realise the goals of improved access, service delivery and quality of care for the rural communities of South Africa through e-health. For the e-health initiatives to be implemented successful require enabling regulatory and a policy development process that is inclusive of the key relevant role players in the health environment. This includes the need for the inclusive participation of the HPCSA as the health care profession watchdog in the development of the e-health policy process.

The HPCSA is a statutory body established in terms of the Health Professions Act No. 56 of 1974. Some of the council's major functions are to promote the health of South Africa's population and setting and maintaining fair standards of professional practice. It also maintains a list of registered practitioners.

There is no evidence of the inclusive participation of the HPCSA as a role player in the NHIS/SA structure in the data collected. Yet, as stated in the problem statement, the HPCSA as a watchdog to the health sector sets as a general rule that healthcare professionals are required to do physical examination of the patient in order to make a correct and proper diagnosis. If there are any changes in the provision of healthcare to patients, such a regulatory body must come to party and give guidance and a proper direction on how to apply ICTs in healthcare rather than imposing punitive measures. HPCSA is an important regulatory body in leveling the playing field for both health consumers and health practitioners to access and provide healthcare through the use of ICTs. Therefore, the participation of HPCSA in the e-health policy development process is imperative for the successful implementation of e-health initiatives in South Africa.

6.2.3 Provincial NHIS/SA structure/Implementation committee

- **Proper representative committee for e-health**

The National Department of Health should seek the views and opinions of the most powerful role players that affect e-health to shape these initiatives as their input can also improve the quality of the e-health policy development process. The

representation at the NHIS/SA level would now have to change. The NDoH has to identify all the key role players now that have to be won over and to carefully build on their support.

The representation of other ministries that have an effect on e-health policy must now be active participants in this structure. All three spheres of government must now be represented including active role players in this network especially the local government. The implementers' input and active participation of the technology partners must be the dominant network in the committee. Their network brings the cognitive knowledge and expertise on how this technology can be successfully integrated into the health care system.

- **Community facilitators**

The community facilitators as the champions and activists on e-health, should go out there, reach out to communities, implementers of e-health solutions, consumers of these e-health services and products, etc. and increase awareness of the benefits and opportunities of e-health, and empower relevant stakeholders including citizens, patients, and health care professionals.

- **Provincial NHIS/SA structure**

The NHIS/SA committee as the primary stakeholder in the e-health policy development arena must have sub-committees at the provincial and local levels that could influence this policy development process.

- **Implementation Committee**

The implementation committee must be appointed and this committee should be a component of the NHIS/SA structure to determine implementers' views of factors which promote or inhibit successful implementation, embedding, and integration of e-health initiatives. This committee must sit at all three spheres of governance where they would work closely with the projects. The implementation committee position would give the NHIS/SA body a powerful and useful tool to access the views of these

networks. Incorporating all the views and interests of all the relevant role players in the same policy development process is what the PPN model is advocating for.

6.2.4 Shared vision on e-health policy and implementation

If the e-health initiatives can get the political attention they deserve and are embraced within the Parliamentary agenda, it would be easier for the policy development process to flow down and embraced by the right ministries and influence the strategy taken by the NHIS/SA committee. If this is implemented properly, there will be a shared vision on e-health policy and implementation issues. A shared vision on these issues among all stakeholders would surely benefit all state health care facilities. People living in South Africa will have equitable access to health care and in that process the economy would benefit from a healthy working force. However, for such a vision to work for e-health there must be a national e-health policy in place that talks to other policies that have a direct impact on e-health.

6.2.5 The importance of a coherent national e-health policy development process

The health issues must be dealt with in the context of the entire health care system. Firstly, the e-health policy must be aligned with the Health Policy and the National Strategic Health Development Plan Framework as the key documents upon which any work towards developing the e-health policy should be based. The two policy frameworks would ensure that the e-health policy is aligned with the strategic priorities of the health sector.

Secondly, e-health is the use of ICTs in health care with the intention to enhance equity in health care delivery, it is therefore, important to look at the ICT policies and regulatory issues and how these policies can affect the implementation of e-health initiatives. With the cooperation and collaboration of the Department of Communication and the Ministry of Health as the key role players we are sure to get the right tune from the international e-health community.

Thirdly, the other regulations impacting on e-health may include some of the following: Promotion of access to Information Act; The Minimum Information Security Standard; The National Archive and Record Service of South Africa. The diverse

(when all these role players become participants to NHIS/SA) expertise within NHIS/SA can establish if we need a policy that is separate from the National Health Policy or we just need to revise the existing health policy to incorporate a component e-health system.

6.2.6 E-health as the component of health policy development process

With all the diverse views and opinions within NHIS/SA, we can with certainty decide if the e-health policy development process should be a separate policy from the existing health policy or establish the possibility of revising the health policy by adding a component of e-health.

6.2.7 E-health research and capacity building

There is a need for evidence-based health systems that are based on the views and opinions of how the role players' networks want to see their circumstances change. If this is done correctly, it would surely strengthen any initiative that is introduced to health care. E-health should be integrated into the curriculum of medical/health training institutions in the country. The academic fraternity must provide research skills to ensure e-health systems work.

6.3 Conclusion

This research has shown the weaknesses that can arise in policy and strategy implementation when the PPN approach is not applied. Evidence seems to suggest that implementing the e-health policy and strategy is going to be very difficult if the participation of the key relevant stakeholders is not taken into account right from the beginning.

It is evident that the participation of the different role players' networks in the e-health policy development process is imperative for the success of the e-health initiatives implemented in the health care system. The use of ICTs in health care is a tool that can enhance equitable access to health care for all South Africa including those who live in rural areas. This has been a qualitative case study approach to assess the e-

health policy development process using the tele-radiology initiatives in the Eastern Cape.

This research study followed the PPN framework that calls for the assessment of a public policy, such as the e-health policy development process to be examined in their context while considering the relations between different elements composing and affecting the policy. The PPN framework has been explained and how it informs the study.

For the e-health initiatives, such as tele-radiology to be adopted fully and become effective in bringing equitable healthcare access closer to the patient's first point of contact, all the different role players' networks that are participating in the same policy process need to be considered.

It was argued and demonstrated here that the e-health policy development process is actually influenced by different role players' networks, which operate one in the context of the other, influencing one another. Applying the PPN framework in the e-health development process while considering the context, reveals few previously unnoticed important insights and explanations regarding who shapes the e-health policy in South Africa. PPN enables better detection of strengths and weaknesses of the process, which in turn may lead to policy capacity improvement and to an effective implementation of the e-health initiatives. The assessment uncovers some constraints, which hinder problem solving and impede decision-making. More specifically, it points at the weaknesses in the lack of active participation of the key role players' networks such as the implementers, communities, the local government and the academic fraternity in the NHIS/SA committee which is the central body for e-health policy development. The Nod needs to rethink the NHIS/SA in terms of structure, participation rules, power distribution and resource distribution in order to improve e-health policy outcomes and to enhance its effectiveness in the implementation of the e-health initiatives. The National and Provincial Departments of Health may find the PPN Framework useful when thinking about a new policy or policy revision. The PPN Framework when applied correctly could enable the role players' networks to have a shared vision on the initiatives at hand and the successful use of available resources.

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Appendices

Annexure A: Interview Schedule

Introduction

My name is Ncedisa Mafani. I am a final year Masters of Management in ICT PR student at the University of the Witwatersrand. This interview is being conducted as part of a research report concerned with the assessment on e-Health Policy Development process in the Republic of South Africa. The research report forms part of the requirements of my Masters in ICT PR Degree and please be advised that it is conducted entirely in my personal capacity for academic purposes only.

Please be advised that the interview will be conducted in a time that is convenient for you.

I am interested in understanding the extent to which the e-health policy development process in South Africa encourages the involvement and participation of the various role players and their interests in the different stages of the e-health public policy development process.

This interview is designed to elicit responses from the various role players on their perception in relation with the topic being studied.

I believe the findings of this research will be beneficial for the e-health development process currently taking place in the Republic in the following manner:

- In coming up with a policy that will accommodate the needs of all the key relevant stakeholders;
- Improve the effective implementation of the e-health initiatives; and
- Enrich the policy makers in an evidence-based manner at all spheres of governance on the importance of active participation of all relevant stakeholders in all the policy stages.

Please be assured that all your responses will be held in the strictest confidence, findings will be presented in aggregate, and no statements used in the report will be attributed directly to you. Your participation is voluntary, and you may decline to answer any question or end the interview at any point.

The interview will take approximately 30-45 minutes and with your permission the proceedings will be recorded.



Assessment of the e-Health Development Process using PPN Approach

INTERVIEW SCHEDULE

There are **SEVEN** categories of Questionnaires divided into sections

Section A is for the Demographic details of the participants

Section B is for National policy makers

Section C is for experts in the policy development process

Section D is for the Tele-medicine Centres such as the Walter Sisulu University of Technology

Section E is for the Community Representatives and Informants

Section F focuses on Provincial Questions

Section G is for implementers of the e-health services

SECTION A

1. **Demographic Details of the Participants**

1.2. Province----------

1.3. Occupation: _____

1.4. Gender F: _____ M: _____

1.5.Institution/Organization: Hospital
WSU
EL Tele-med Centre
NDoH
PDoH
Expert

1.6.Length of time at Institution/organization: Just under 5 years
5-10 years
10-15 years
Over 15years

1.7.Age Group 18-21 years
21-30 years
30-40years
Over 50 years

1.8.Education Levels Matric
Post Matric
Post Graduate

1.9. Community Key Informants:
_____

1.10.Email and contact numbers:
_____

1.11. Date(s) of interview:
_____

1.12. Issuing body/institution:

_____

_____

1.13. Date officially approved if applicable:

_____

_____

_____

1.14. Policy goal (as stated in the policy):_____

_____

_____

1.15. Policy objectives (as stated in the policy):

_____

_____

_____

1.16. Policy timeframe (as stated in the policy):_____

_____

_____



SECTION B*:* National Department of Health

2. Assessing the understanding and availability of an e-Health Policy

2.1. Is there any e-health Policy?

2.2. What is your understanding of an e-health?

2.3. Is there any reason for not having a Policy in e-health?

2.4. Now that there is an e-health strategy that has been recently launched, do you think the strategy will work without a policy?

2.5. What has happened to the e-health policy process?

2.6. When did the process start?

2.7. At what point is that process now?

2.8. What approach did you follow?

2.9. Who was involved in that process which failed?

2.10. What are the plans to revive this process?

2.11. In reviving this process what approach are you going to take?

2.12. Who do you think should be involved this time round?

2.13. Do you have a problem if provinces in the absence of a national e-health policy start developing their own e-health policy?

2.15. How are they covered regarding the practice? In terms of what may malpractice be referred to in the absence of an e-health policy? What would you advise them to do?

2.16. Is it impossible to revise the Health Act and amend it to include an e-health component?

2.17. Also, is it difficult to review the health policy so that e-health can be included? Is it really absolutely necessary to introduce a different e-health policy from the health policy that is currently in place?



SECTION C: Experts in e-Health Policy

An Approach to the e-health Development Process

3.1. Explain how you started the e-health policy.

3.2. Why not the e-health policy at a Provincial level?

3.3. What were the focus areas in the e-health development process?

3.4. Why do you think that these areas were important?

3.5. Did you think about involving communities?

3.6. What frustrated the e-health development process?

3.7. Do you notice any power struggles?

3.8. Did you involve practitioners in that group?

3.9. As an afterthought: what made this process fail?

3.10. If you are given a second chance to resuscitate this process what would you do?

3.11. Have you ever thought of involving communities as consumers?

3.12. Is there anything else you would like to add to this subject?



Section D: Provincial Questions

4. White Paper on e-Health and e-Health Strategy

4.1. Is there an e-health Policy in place?

4.2. What is your understanding of an e-health policy?

4.3. Is there any reason for not having a policy in e-health?

4.4. Now that there is an e-health strategy that has been recently launched, do you think the strategy will work without a policy?

4.5. What happened to the e-health policy process?

4.6. When did the process start?

4.7. At what point is that process now?

4.8. What approach did you follow?

4.9. Who was involved in that process which failed?

4.10. What are the plans to revive this process?

4.11. In reviving this process what approach are you going to take?

4.12. Who do you think should be involved this time round?

4.13. Do you have a problem if provinces in the absence of a national e-health policy start developing their own e-health policy?

4.14. How are they covered regarding the practice, in terms of what may malpractice be referred to in the absence of an e-health policy? What would you advise them to do?

4.15. Is it impossible for provinces to develop an e-health policy?

4.16. How do you function in the absence of an e-health policy?

4.17. What dangers or risks do you notice or have you seen in practicing in an environment that does not have an e-health policy?

4.18. If the province decides to start off a process of developing an e-health policy, what steps should they take?

4.19. Is there a barrier in doing this?

4.20. Who do you think should be part of this process?

4.21. Have you ever considered involving the communities as consumers in this process?

4.22. What is your general approach to policy development process?

4.23. What is the way forward from here?

4.24. Is there anything else you wish to add?



Section E:

5. Tele-medicine Centers Such as Walter Sisulu University of Technology

5.1. Have you heard about the National e-health strategy?

5.2. Have you been informed about any e-health policy development process?

5.3. What is your understanding of an e-health policy?

5.4. What would you like to see in the e-health policy?

5.5. How do you function in absence of an e-health policy?

5.6. Do you have any internal policy guidelines regarding practices in the e-health environment?

5.7. What are your worst fears in the practice?

5.8. What do you think should be done to allay these fears?

5.9. How did you develop the internal policy guidelines?

5.10. How has the absence of an e-health policy affected you directly in your practice?

5.11. What do you think should be done regarding this policy?

5.12. Is there anything else you wish to add?



SECTION F:

6. Community Representative and Informants

6.1. Is the health district board still active?

6.2. If not, what happened to this entity?

6.3. When it existed/if it existed have you been consulted regarding health policy development processes?

6.4. Do you know about this service that is called tele-medicine?

6.5. Are there any centers of telemedicine within your reach?

6.6. Regarding health policies what do you think should be done in their development process?

6.7. Do you think you have been consulted before on this matter?

6.8. Who else in your environment do you think may have more knowledge regarding these matters?

6.9. Is there anything else you wish to add?



SECTION G

7. This section will be talking to the implementers of the e-health initiatives.

7.1. Have you heard about the National e-health strategy?

7.2. Have you been informed about any e-health policy development process?

7.3. What is your understanding of an e-health policy?

7.4. What would you like to see in the e-health policy?

7.5. How do you function in the absence of an e-health policy?

7.6. Do you have any internal policy guidelines regarding practices in the e-health environment?

7.7. What are your worst fears in the practice?

7.8. What do you think should be done to allay these fears?

7.9. How did you develop the internal policy guidelines?

7.10. How has the absence of an e-health policy affected you directly in your practice?

7.11. How are you covered regarding the practice, in terms of what may malpractice be referred to in the absence of an e-health policy?

7.12. What do you think should be done regarding this policy?

7.13. Is there anything else you wish to add?

Thank you for your time and your contribution.