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TOPIC: ASSESSING THE EFFECTIVENESS OF THE SMARTCARE RECORDS MANAGEMENT SYSTEM IN HEALTH SERVICE DELIVERY

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APPROVAL

This report is approved in partial fulfillment of the requirements for the award of the Bachelor’s degree in Library and Information Science by the University of Zambia.

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ABSTRACT

The advancement of information technology in the health sector has given rise to demand for timely, reliable and accurate medical and health information to treat and manage patients. One of the ways to provide timely, reliable and accurate information is through the use of Electronic Health Records systems (EHRs). Zambia has adopted EHRs called SmartCare since 2005. However, in places where the roll out has taken place, only a few health facilities are using the system fully. The study was undertaken to assess the effectiveness of the SmartCare records management system in health service delivery. In order to make the assessment the study had to determine the type of records managed by the SmartCare records management system, establish the benefits that accrue to the SmartCare records management system and examine the challenges—if any, faced in the application of the SmartCare records management system. The study used a case study design by centering on Kalingalinga Clinic. The clinic is adequately typical of pioneering health facilities that have migrated to using the SmartCare EHRMS in Zambia. A total of 27 respondents participated in the study 20 of whom were clients exiting the clinic and 7 were members of staff that routinely interact with the system. A qualitative approach used warranted fertility of the data to which thematic analysis was applied and the following were the findings; three broad categories of records were identified to be hosted by the smartcare system the three being Client registration, Clinical and Clinical support services records. The study also established that the benefits that accrue to the use of smartcare are twofold a class of them benefit the staff through facilitating information retrieval, patient tracking, treatment adherence support and space maximization. To patients data security and privacy was held as a key benefits with continuity of care in case of mobility also being given prominence. The study established that smartcare is an effective tool in enhancing health service delivery in Zambia. However, the programme despite having been piloted 14 years ago some challenges still manifest among them lack of funding, lack of appropriately qualified staff to handle and maintain the system and power outages. These challenges have resulted in the maintenance of both electronic and paper based records management system hitherto. The study recommends establishment of local funding lines and incorporation of the smartcare system in the para-medical curriculum.

Keywords: SmartCare, Electronic Health Record System, Paper record system, Information Communication Technology, Records Management
DECLARATION
We are hereby declaring this report submitted to the University of Zambia in partial fulfillment of the award of the Bachelors degree of Library and Information Science is our own work and has not been submitted either wholly or in part for another degree to this University or any other or Institute for Higher Education.
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We thank God for giving us the strength to endure sleepless nights, long days, stress and the fatigue that came with it in days leading to the production of this piece of work.

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<td>Acquired Immunodeficiency</td>
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<tr>
<td>Syndrome</td>
<td></td>
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<td>CDC</td>
<td>Centre for Diseases Control and Prevention</td>
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<td>CSO</td>
<td>Central Statistical Office</td>
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<td>EMR</td>
<td>Electronic Medical Record</td>
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<td>HMIS</td>
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CHAPTER ONE

1.0 Introduction

Record keeping in an institution is one element that can help develop or bring it down (Ash et al, 2004). Records management is the supervision and administration of digital or paper records, regardless of format. Records management activities include the creation, receipt, maintenance, use and disposal of records. In this context, a record is a content that documents a business transaction (ibid).

In an attempt to foster effective and efficient records management in health service delivery, the Ministry of Health (MOH) introduced the Health Information Management System (HIMS), which is a computerized records management and patient information tracking system. The patient information tracking aspect is contained in a module called SmartCare. Whereas the Health Information Management System (HIMS) is used country wide in Zambia by Health Information Officers for reporting purposes, the SmartCare module is meant for use by medical personnel in patient care (WHO, 2006).

SmartCare is an Electronic Health Records Management System which is tailored to use a microchip on a portable card (care-card) and carries an encrypted copy of a patient’s entire medical history. A soft copy of the health record is saved in the SmartCare database of every health facility that the patient visits. Smart Care’s main purpose is to enable electronic data entry of patient health information so that health facility staff do not have to manually collect and aggregate data (Ministry of Health, 2011).

According to Msukwa (2011) SmartCare system is viewed as crucial to effective health service delivery as it assists in decision making and efficiency in operations. To this effect, many governments are being encouraged to adopt similar systems. Over the years, smart card use in the Zambian healthcare sector is being rolled out into clinics and hospitals called ‘E-First facilities’ in which all aspects of the operations of these institutions become paperless.

The portability of records from one health facility to the other on the care-card is one of the perceived benefits, whilst migration to technology is always perceived as a progress, this study aims to interrogate the effectiveness of SmartCare technology in health service delivery using a case study of one of the pilot facilities in Zambia – Kalingalinga Clinic.
1.1 Background
Kalingalinga clinic is a government owned institution running under the Ministry of Health (MOH) with the help from donor organizations such as the United States Agency for International Development (USAID) through the Centre for Infectious Disease Control and the Churches Health Association of Zambia (CHAZ) which helps with the supply of medicine and laboratory equipment as well as general capacity building.

Kalingalinga clinic is situated off Alick Nkata road in Kalingalinga compound in the capital city of Zambia, Lusaka. The clinic was built in 1987 with a target population of 10,000 covering an area of 10.4km² and as of the year 2015, the population had increased to 39,139 (CSO, 2015).

Up until 2005, Kalingalinga clinic had been using the Browne system (pen and paper) to manage all their records. In 2005, the SmartCare system was introduced with the help of Churches Health Association of Zambia (CHAZ) to only manage and improve the continuity of care and provide timely data on maternal and child health, HIV/AIDS, tuberculosis and malaria interventions. Currently, as of July, 2018, the SmartCare system has been rolled out to be used to manage records for all services offered at the clinic in a program called e-first care which seeks to make medical facilities paperless.

The goal of the smart care mission in Zambia was to promote the delivery of cost effective, confidential and high quality health care for everyone, everywhere and every time, by improving the management of health records and related health information. The SmartCare record management system was precisely developed to improve the continuity of care and provision of timely data on maternal and child health, HIV/AIDS and tuberculosis. These represent only a fraction of the services offered at the clinic therefore, the performance of the SmartCare system in those areas cannot be generalized as representative of the programme warranting it to be rolled out to all departments of the clinics.

Smart Card Alliance (2007) listed some benefits perceived to accrue from using the smart card by health care providers which include; instant patient identification, accurate link between patients and institutional medical records, elimination of duplicate and overlaid records, faster care in emergency settings, rapid accessibility to patient medical history, potential reduction in adverse events and medical errors due to lack of patient information, reduction in unnecessary or duplicate diagnostic tests or procedures by showing results from other medical providers. Secure and
portable health records, Personal ownership and control of access to medical records as well as easier and faster registration.

Whilst the perceived benefits seemed plentiful, the SmartCare system is a novel innovation that was not part of the architecture of the Zambian health care system. Information technology is not an integral part of the curriculum for paramedics (nurses and clinical officers) and the infrastructure as well as organogram was built around the manual systems (pen and paper). The patients are also being exposed to paperless technology for the first time after years of using pen and paper for many years.

Revelations from across the globe suggest that electronic health records management systems are not immune to failure and can have unintended and catastrophic impacts on health service delivery. Fry and Schulte (2019 p.1) commenting on the electronic health records management system in the united states of America stated; “The U.S. government claimed that turning American medical charts into electronic records would make health care better, safer, and cheaper. Ten years and $36 billion later, the system is an unholy mess”. They highlighted incidences in this investigative article that directly associates the EHR management system to patient deaths in American hospitals.

Presenting a case for the importance of conducting a study on the Effectiveness of Electronic health records management in health service delivery, the medical fraternity is divided on the effectiveness of EHR. There exists an argument that Evidence linking electronic health record (EHR) adoption to better care is mixed (Mikkelsen and Aasly, 2001).

In Zambia, it was important therefore to investigate if any noteworthy improvement in the quality of health care service delivery had been recorded with the coming of SmartCare program. Patients were still seen spending a lot of time standing in long queues before they could be attended to and sometimes went back home without being attended to at all. Therefore, whether the intended objective of the SmartCare records management system had been achieved was yet to be seen.

Consequently, this made it difficult to establish the effectiveness of the SmartCare records management system in health service delivery. Thus, the study intended to assess the effectiveness of the SmartCare records management system in health care service delivery using Kalingalinga clinic as a case study.
1.2 Statement of the Problem
According to MOH (2013), “even though there has been substantial investment into information systems in the health sector; it has been characterized by some challenges.” Key among them is the maintenance of electronic health records management initiatives, limited human resource capacity and insufficiently developed or underutilized infrastructure which has resulted in the sluggish pace of rolling-out the Electronic Health Records Management System (SmartCare) across the country (Zambia). These challenges if not factored in, compromise the effectiveness of the SmartCare electronic records management program. This study therefore aimed to assess the effectiveness of the SmartCare electronic records management system in health service delivery by focusing on one of the pioneering facilities in Zambia -Kalingalinga clinic.

1.3 OBJECTIVES
The objectives of the study were categorized into general and specific objectives.

1.3.1 General Objective
➢ To assess the effectiveness of the SmartCare records management system in health service delivery at Kalingalinga clinic.

1.3.2 Specific Objectives
➢ To determine the type of records managed by the SmartCare records management system at Kalingalinga clinic.
➢ To establish the benefits that accrue to the SmartCare records management system.
➢ To examine the challenges faced in the application of the SmartCare records management system in the delivery of health care services.

1.4 Research Questions
This research posed the following questions that arose from the objectives;

1. What were the types of records managed by the SmartCare records management system at Kalingalinga clinic?
2. What were the benefits that accrue to the SmartCare electronic records management system?
3. What were the challenges faced in the application of the SmartCare records management system in the delivery of health care services at the clinic?
1.5 Significance of the Study
It was expected that this study would provide some valuable additional information to the existing body of knowledge on the use of Information Communication Technologies in managing patient records specifically in the implementation of the SmartCare records management system. It was hoped that the study would identify the gaps that had not been adequately addressed before implementing the program, thus be a valuable resource to inform both policy makers and planners for future endeavors to roll-out the SmartCare program. It was further hoped that results of this study would be a vital information resource to enhance the sustainability of future strategies aimed at migrating from paper to paperless records management systems in Zambia. The study was also significant because it was undertaken in partial fulfillment of the requirements for award of the Bachelor of Arts degree in Library and Information Science (BA. LIS) at the University of Zambia.

1.6 Ethical issues
Ethical considerations are important in ensuring a professional research and are non-intrusive in accomplishing a research objective. For this study, the researcher asked for permission to carry out the study from relevant administrative authorities in the Ministry of Health permanent secretary whose authority was conveyed to Lusaka province medical office, Lusaka District Medical Office and Kalingalinga Clinic in the mentioned order. The researcher assured and ensured confidentiality to the respondents and confirmed that the study was for the purposes of accomplishing academic goals only. The researchers committed to acknowledge all additional sources of information from other scholars to avoid unlawful to claim to authorship of non-original ideas.

This was a sensitive study which bordered on a basic human need (health) in a sector that survives on donor funding for most of its activities. Interrogating aspects that are donor supported might have been perceived as pouring scorn on aid. Patients that seek services at the clinic might have been reluctant to give information of their perception on the effect of this system on the quality of health care delivery for fear of later being victimized by clinic authorities. In order to reduce the likelihood of this happening, we shunned using focus group discussions though arguably would have yielded richer information. Respondents were assured of their privacy and confidentiality in that no titles or names will be reflected in the one to one interview guide and questionnaire.

In a similar manner, members of staff who felt have a legal obligation to support government efforts might have been misconstrued by their supervisors as being unpatriotic if they express
sentiments which were not viewed as favorable about the system. This might result in them being transferred to departments where they would interact less with SmartCare and in the end might lose the incentives that came with the positions they were currently occupying. Thus, the researchers ensured that interviews held were deemed convenient and secure. The researchers also explained to the participants that the data collected would not involve respondents private or personal life stories and life experiences but basically focused on system factors.

The findings of the study hence are reported using thematic codes to avoid identifying participant information or position. In terms of the benefits of this study to the participants, a copy of the research findings (report) shall be given to the clinic so that they can use the information to better the SmartCare medical records management systems of its improvement would benefits both the workers and the clients as it will result in better health service delivery. For this reason, we did not simply use the institution to satisfy our academic requirements.

Most importantly, participants gave verbal consent to participate in the study whilst reserving the right to withdraw their participation at any point during the study had they felt the need to do so for reasons they wouldn’t want to disclose.

1.7 Definition of Key Concepts

Unless were specified or context may warrant deviation from popular etymological usage and clarity of the deviation provided; to enhance and broaden the understanding of the study, the following concepts used are defined as follows:

HEALTH is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (World Health Organization, 1946).

RECORDS refer to all documented information, regardless of its characteristics, media, physical form, and the manner it is recorded or stored. Records include accounts, agreements, books, drawings, letters, magnetic/optical disks, memos, micrographics. Generally speaking, records function as evidence of activities, whereas documents function as evidence of intentions (Biruk et al 2014).

RECORDS MANAGEMENT is the administration of records and documented information for the entirety of its lifecycle, which includes creation, maintenance, use, storage, retrieval and disposal (Nguyen et al, 2014).
SMART CARE refers to an Electronic Health Record system that has been developed and deployed by the Zambia Ministry of Health in collaboration with the MO and many other implementing partners (Ministry of Health, 2012).

ELECTRONIC MEDICAL RECORD (EMR) systems is an electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization, have the potential to provide substantial benefits to physicians, clinic practices, and health care organizations (The National Alliance for Health Information Technology [NAHIT], 2008).

1.8 Summary
Therefore, this chapter gives an introduction of the study that assess the effectiveness of the Smart Care records management system in health service delivery at Kalingalinga clinic. It further gives the background of the study and states the problem and the objectives of the study as well as giving justification of the study, ethical considerations and definitions of key terms.
CHAPTER TWO
LITERATURE REVIEW

2.0 Overview
In an attempt to provide a holistic theoretical and practical perspective, this literature review focused on the following themes; Types of records managed by the SmartCare electronic health records management system, the use of the SmartCare electronic health records management system, benefits that accrue to the SmartCare electronic health records management system in health service delivery and challenges faced in the application of the SmartCare electronic health records management system in the delivery of health care services. SmartCare being a relatively new system not much literature is available on the subject thus, this literature review included reviews of related literature on Electronic Health Records Management Systems not necessary restricted to the SmartCare program.

2.2 Types of records managed by the SmartCare system
Noraziani et al., (2013) confirms that electronic medical records can be crucial in curtailing medical errors due to paper-based systems. The EMRs are expected to replace paper-based medical records as the primary source of medical history for each person seeking health care, while still complying with all clinical, legal and administrative requirements (Janusz and Grzegorz, 2003).

Ives et al (2015) in a study to measure user satisfaction in Electronic Records Management systems, summarized the main types of records in the SmartCare program as follows; Registration -this module captures the demographic and biometric data of the patient. Biometric records refer to information that denotes a persons’ measurements such as age, height, weight, sex, whilst demographic records in SmartCare relates to information about the patient which is not related to their biology. This information includes such details as occupation, residential address, and next of kin, and objective data from the examiner about the patient.

Other types of records managed by SmartCare are the patient management records. these are segregated in terms of Out-patient department (records for patients who are receiving treatment whilst domicile at home) and In-patient (to admit, follow, and discharge patients in wards), other records of note in the SmartCare are; Tuberculosis, Pediatrics, HIV/AIDS (to manage patients in antiretroviral therapy clinics), Antenatal care, postpartum, pharmacy, drug stock control, laboratory (to store and send laboratory results to the requesting clinic), Electronic Health
Management Information Systems (to generate monthly, quarterly, and annual reports), and finance (Menachemi and Brooks, 2006).

In as much as Ives et al (2015) and (Menachemi and Brooks, 2006) in the studies highlighted above identified the types of records managed by a SmartCare, it is not a guarantee that all health centers use the SmartCare system to manage all types of electronic records mentioned. Therefore, the purpose of this study was to find out the types of records managed by the SmartCare system at Kalingalinga clinic.

2.3 Benefits of using the SmartCare records management system

A close look at the benefits seem to indicate that the benefits are context based and less generalizable due to the existence of none homogeneous conditions.

Chao et al. (2013) conducted a study on the benefits and challenges of electronic health records system on stakeholders: A qualitative study of outpatient physicians in New York City. Semi-structured interviews were conducted with 32 physicians who worked in the outpatient department. The results showed that 78 % physicians interviewed used EHRMs frequently during their daily practice despite individual preferences of documentation methods. They agreed that systemic health records offered by EHRMs allowing smooth communication was beneficial to the health institutes, patients and physicians.

Menachemi and Collum (2011) carried a study by reviewing and summarizing the literature on the benefits and drawbacks of electronic health records (EHR) systems in the United States of America (USA).The results of the study described the potential benefits of EHRMs that included clinical outcomes such as (improved quality, reduced medical errors), organizational outcomes such as (financial and operational benefits), and societal outcomes such as (improved ability to conduct research, improved population health, reduced costs).

JMIR Med Inform (2017) conducted many studies on the cost-effective benefits of using EHRMs in Health care facilities in 2017 and it evaluated quantitatively that the studies conducted around the world from 288 facilities presented mixed and inconclusive results, leaving us unable to draw a definitive conclusion about cost-effectiveness. The analysis of costs was more limited than the evidence on quality and efficiency. This called for a sober reflection as to whether the benefits of EHRMS were overrated if no significant effect on quality of health care was recorded in relation
to quality. Bearing in mind that electronic health records management systems are a means to an end, the end being improved health service delivery.

The JMIR Med Inform (2017) studies concluded that cost-effectiveness was mainly on time as follows; EHR reduced charting time, Electronic surveillance achieves equal or better sensitivity than manual surveillance. Several studies also reported time savings of 60% to 99.9% or a reduction in chart reviews of 40% to 90.5%. Increased time spent on direct patient care and reduced the occurrence of errors (medication errors, intravenous and ventilation incidents) thereby improving clinical outcomes. Such outcomes improved accuracy, legibility, data accessibility, and decision support.

Ken Choi (2017) in his study stressed that there are short term benefits and long term benefits of using EHR in a health care facility such as the following; Short Term Cost-Benefits are; Reduced employee time spent on filing, retrieving, and organizing physical charts and documents, Reduction in the amount of physical space used to store filing cabinets and other storage areas for papers, time saved with information exchange between medical professionals and insurance companies (information is sent instantly instead of mailed).

Long term cost-benefits included; Significantly reduced risks of data breach and data loss, transferring large amounts of data is simpler and faster when changing locations, less physical papers are needed, along with the reduced necessity for paper products (printers, copiers, office supplies), easier to adopt new regulations in the future with a technologically-appropriate system, handwritten charts can be difficult to comprehend by future healthcare providers, making EHRMs more efficient for future users.

In Zambia, studies have been conducted to look at the benefits of SmartCare, of note is Mweebo (2014) and More recently Mutale (2017). Mweebo focused on the security issues related to the operationalization of SmartCare, at the time it was only used to manage Human Immunodeficiency Virus (HIV) health information in Zambia. The study found that some benefits of EHRMs smart-care included: supporting quick access to patient records, which saves physicians time; sharing of patient HIV records is made easier through integrated national databases and updated patient smart cards; and the presence of national, provincial and district databases has made monitoring and evaluation of HIV programs easier. It is however important to highlight that this study was
conducted in the urban portion of Zambia whose dynamics significantly differ from those obtaining in rural areas especially in western province.

Mutale (2017) whose study focused on personnel experiences with the use of SmartCare for decision making in selected health facilities of Mongu and Limulunga districts of the western province. His findings indicated that; SmartCare helps organize, retrieve patient records faster than the paper record system. Basically, the health workers only see the SmartCare system as a good tool for data storage than a tool for decision making. All the 16 respondents interviewed, perceived the SmartCare to be reliable when it comes to data storage than the paper record system. They strongly felt that paper is always lost, tear off and some health workers hand writing are not legible making it difficult to follow patient history. While his sample size is too small to be generalized, it is clear from comparing the two studies that the benefits that accrue from the use of SmartCare are not uniform yet they should.

This study was therefore, helpful in gauging if the functional as well the latent benefits that were supposed to accrue to health workers as well as the clients of Kalingalinga clinic are being actualized, if not to understand why maximum benefits are not being realized.

2.4 The challenges faced in the application of the SmartCare record management system

According to Azubuike and Ehiri (1999) a greater challenge in the management of SmartCare facility could be “the patients’ unwillingness for their clinical data to be shared”. Some patients may want to withhold certain information from doctors, such as a history of mental illness or sexually transmitted diseases., Physicians like Dr. Adrian Gropper, CTO of the non-profit Patient Privacy Rights, are concerned that current systems are interfering with physician-patient and physician-physician relationship. Mweebo (2014) in his findings also discovered that the EHRs lacked privacy and security, because at the time, the types of record that was recorded was for HIV/AIDS and tuberculosis hence the patients withheld some of the information.

Bramson and Liebovitz (2010) identified ‘failure to use human factors design principles’ as a major factor that impeded usability and user satisfaction in their use of EHR. According to them, management, designers and vendors of EHR systems often fail to apply human and social factors when designing the system, rather they just concentrate on the technological aspect. This results in little time dedicated to appreciating the context of use. Designers of the system thus focus on workflow (for instance, click here to fill a data or open here to access this file) at the neglect of
what Schumacher et al. (2010) described as “less obvious, but often more important, ‘thought flow’ the review and thinking which physicians inherently do before finishing a task”. They also identified other challenges to the use of EHRMs such as “Physician's attitudes that they want a computer system to mimic a paper system as closely as possible as well as Information Technology staff’s attitudes that technology solutions are more important than the purpose of the solution and the problem it was intended to solve”.

In Fuji, a study was conducted by Ravindra et al., (2015) whose focus was on the status of electronic medical records and health information systems in Fijian hospitals and health centers. Here, grounded theory using exploratory approach was used for the study. The study started by trying to understand how users of information systems in Fijian Hospitals felt towards their information management practices, and to learn if they are currently using any EMR. Among the findings included: the lack of computers makes it difficult for most staff to do data entry or check records of the patient's medical history; therefore, they continued to use manual systems of folders and files.

Maxwell et al. (2011) conducted a study on the use of electronic health records in sub-Saharan Africa: Progress and challenges. It was found that 91% use of open source healthcare software, with open MRS being the most widely used. Challenges to adoption of EHRMs included high cost of procurement and maintenance, poor network infrastructure and lack of knowledge and comfort among health workers with electronic medical records.

Menachemi and Collum (2011) carried a study by reviewing and summarizing the literature on the benefits and drawbacks of electronic health records (EHR) systems in the United States of America (USA). The results of the study described the potential benefits of EHRMs that included clinical outcomes such as (improved quality, reduced medical errors), organizational outcomes such as (financial and operational benefits), and societal outcomes such as (improved ability to conduct research, improved population health, reduced costs). However, regardless of these benefits, the study highlighted drawbacks associated with EHRMs, which included the high upfront acquisition costs, on-going maintenance costs, and disruptions to workflows that contribute to temporary losses in productivity that are the result of learning a new system. The study concluded that, EHRMs are associated with potential perceived privacy concerns among patients as Electronic Records are vulnerable to unauthorized access (hacking). Therefore, the study recommended that
experts and policymakers should implement policies that optimize the benefits to patients, professionals and society when EHRMs are adopted.

A case study conducted by Rozenblum et al., (2011), to assess the effectiveness of the Canadian e-health plan and identifying ways of increasing adoption of electronic health records found that despite Canada Health Infoway’s investment of almost $1.6 billion toward more than 280 e-health projects in the past 10 years, Canada continues to lag behind other Western countries in adopting a system of electronic medical records. As of 2009, only 36% of Canadian physicians were using electronic medical records, as compared with more than 90% of physicians in Australia, the United Kingdom, New Zealand and the Netherlands (Ibid).

In this study, participants identified two main aspects of the e-health plan that were viewed as less successful namely; the absence of an e-health policy and non-implementation of the national infrastructure for electronic health records. The lack of a national policy to guide investment and adoption was seen as a problem coupled with inadequate attention to clinicians who are the key users of electronic health records. Furthermore, the aspect of the e-health plan viewed as being less successful and participants commented that stronger leadership was needed to implement national standards to address the challenges of migrating away from existing legacy systems. The above study focused on the policy and implementation framework established by senior leadership to enhance the adoption and use of electronic health records.

The study was to be an eye opener in the implementation of the smart care system in Zambia, as it has been demonstrated that putting an electronic records management system in place does not guarantee its effective utilization. It was important that a study be conducted to assess the effectiveness of the SmartCare system as the country might have been spending a lot of resources on a system that is not being utilized fully as intended so that adjustments to either policy of practice are made to ensure that the expenses incurred is not a waste.
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Overview
This chapter covered the research design which was used in this study; the total population of the study area; the sample size and sampling procedure; the data collection instruments and the data analysis method.

3.2 Research Design
According to Mengesha (2015:4) a research design “is a blueprint or recipe for the study and determines the methods used by the researcher to obtain participants, collect data, analyze the data and interpret the results.” A research design allowed the researchers to effectively meet the purpose of the study in a logical and unambiguous manner as possible because research design provides an operational plan on the various steps required for the study, which helped to narrow down a broad field of research to ensure the procedures outlined have the adequate answers to complete the study (Nguyen et al., 2014).

The researchers used a case study design. According to Yin, case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. This method was suitable for this kind of study because it is specific and its findings can be generalized to be a representation of the entire total population.

The study used qualitative research method to assess the effectiveness of the SmartCare records management system in health service delivery. The main instrument that was used to collect field data was an open ended questionnaire and interview guide. The interview guide used open-ended questions to allow the key informants to provide a lot of explanations when responding to the questions which were framed after taking into account the objectives of the study.

According to Phiri (2016) Qualitative methods are those research techniques that employ non-mathematical, naturally occurring, and non-experimental research practices in order to uncover the meanings and significance of the wide variety of evidence that social researchers collect. A case study is defined as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context especially when the boundaries between phenomenon and context are not clearly evident. Therefore, based on the above definitions the researchers’ choice of the research design over other designs was influenced by the research topic, the target population, instrument of data collection among other things. The qualitative approach helped to bring out and explain the
feelings, views and ideas of the informants. The main strength of a case study method is in-depth
detail about the unit being studied, collection of facts and studying the relationships of one set of
facts to another and be able to likely produce quantifiable rich, and complete data and make
relevant generalizations about the issue under investigation provided the context is similar (ibid).

3.3 Total Population
Kalingalinga is a compound located within Zambia’s capital city, Lusaka. Kalingalinga is a high-
density, low-income community which is representative of the general characteristic of the
population of Lusaka in terms of poverty and income inequality which is estimated to 56% and 0.7
respectively. The population of interest were the users of Kalingalinga clinic who included the
workers at the clinic and those living near Kalingalinga who use the health facility. The Clinic was
built in 1987 with a target population of 10,000 covering an area of 10.4km². At present the
population of Kalingalinga is over 39,139 residents, many of which are under 18 years of age
(CSO, 2015).

3.4 Sample Size
The sample size of the research was 27 participants, of which 20 were members of the community
(Kalingalinga community/compound) who seek medical services at the facility and 7 health
workers. The members of the community were sourced from the clinic premises as they sought
medical services. It was proposed that in this research, 7 health workers and 20 members of the
community with age groups ranging from 18 years and above were to be included and the findings
would generalize the entire community.

3.5 Sample Procedure
Two sampling methods were used in this research, these were purposive sampling and simple
random sampling. Frerichs (2008 p.11) states that, “A simple random sample is a subset of a
statistical population in which each member of the subset has an equal probability of being chosen”
Subjects in the population are sampled by a random process, using either a random number
generator or a random number table, so that each person remaining in the population has the same
probability of being selected for the study and the findings would be generalized to the entire
population being studied.

Purposive sampling on the other hand refers to a sampling method in which respondents are
selected because they satisfy a criteria viewed by the research relevant to the study. In this case,
two groups of people were relevant to this study firstly the workers at the clinic from departments
that work directly with the SmartCare. Secondly people who receive health services from Kalingalinga Clinic. After these groups were identified, each member of the groups stood an equal chance of being interviewed through a random selection. Randomly selecting respondents ensured scientific rigor in the study whilst purposive selection ensured that respondents are relevant. Sampling of the participants was done as follows; assistance of the head of the facility was sought to identify potential participants who are workers at the facility from departments that interact with the SmartCare (ERMS). As for the clients, they were randomly selected from among those exiting the facility after being attended to.

3.6 Data Collection Instruments

Accurate and systematic data collection is critical to conducting scientific research. Data collection allows us to collect information that we want to collect about our study objects. Depending on research type, methods of data collection included: documents review, observation, questioning, measuring, or a combination of different methods. A Data collection instrument is a tool used to collect data. It is used to measure knowledge, attitude and skills. It is used to obtain data from participants with different experience and prevents information biasness and thus increasing credibility regarding the information collected.

In this research, questionnaires and Interview guides were used for data collection. A questionnaire is a data collection instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. (The Free Encyclopedia, September 2012.) A questionnaire is simply a tool for collecting and recording information about a particular issue of interest. It is mainly made up of a list of questions, but should also include clear instructions and space for answers. Questionnaires should always have a definite purpose that is related to the objectives of the research, and it needs to be clear from the outset how the findings will be used. Respondents also need to be made aware of the purpose of the research wherever possible. In this research, questionnaires were used to collect data from the members of the community.

An interview guide helps a researcher to engage in a conversation with subjects of a study for the sole purpose of gathering data for the study. It is the researcher who asks questions and respondents responds to those questions. Interviews can be conducted face to-face or over the telephone. In this case, face-to-face interviews will be conducted. The advantages of using interviews for this study are that; Interviews are a quick way of obtaining data from respondents within a short period of
time since answers are given promptly. It is also advantageous because clarifications are given there and then where questions are not clearly understood. In-depth interviews shall be used to collect data from 10 health workers who are actively using the SmartCare in delivering health care services. These interviews must be done with the aid of an interview guide (Merriam, 2009)

### 3.7 Data Analysis

Data analysis is a means to organize, provide structure and elicit meaning. Analysis of qualitative data is an active and interactive process, it is the process of bringing order, structure and meaning to the mass of collected data. The study used thematic data analysis to code the data and Microsoft excel to analyse the coded data.

This being a qualitative study, we used thematic data analysis to report patterns or themes captured within the data to be collected. Thematic data analysis is a way of analyzing qualitative data that significantly organizes and describes a data set in rich detail. Thematic analysis helps to organize and code diverse responses from open ended questions into coherent and underlying themes that answer to the objectives of a study (Monette, 2011). Thematic data analysis also aids a researcher to code responses so that as to establish an inclination that can be presented by use of graphic and quantitative tools such as Microsoft Excel.

Once the responses were coded, researchers used Microsoft excel to collate and further analyse the responses. Microsoft Excel is one of the top tools for data analysis and the built-in pivot tables are arguably the most popular analytic tool. In addition, Excel formulas can be used to aggregate data to create meaningful reports (nd).

A research design is an overall strategy that one chooses to integrate the different components of the study in a coherent and logical way. In order to assess the effectiveness of the SmartCare records management system in health service delivery, research will be carried out at Kalingalinga clinic targeting the clients who receive medical services at the clinic. In coming up with useable findings, 40 respondents were co-opted, 30 of whom were clients existing the clinic premises and 10 health workers of Kalingalinga Clinic. From the two purposive groups of participants Simple Random sampling method was used to select participants whilst a questionnaire and interview guide was used as data collection tools.
3.8 Summary of Chapter

This chapter presents a comprehensive research methodology for the study. Research methodology documents cardinal elements such as the target population, sample size, data collection methods, the data collection tools as well as the methods to be used for Analyzing the data. To collect data from the participants Purposive and Simple Random Sampling method will be used, questionnaires and interview guides will be used as data collection tools.
CHAPTER FOUR

STUDY FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter starts with a brief description of the study participants followed by thematic analysis of the findings then the recommendations.

4.1.1 Description of the study participants

The study had 27 participants and all gave verbal consent to participate in the study. The study was done at one health facility in Lusaka district namely Kalingalinga Clinic. Table 1 below summarizes the description of participants that took part in the study.

Table 1: General description of the study participants

<table>
<thead>
<tr>
<th>District</th>
<th>Health center</th>
<th>Clinic Staff</th>
<th>Clients</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lusaka</strong></td>
<td>Kalingalinga Clinic</td>
<td>7</td>
<td>20</td>
<td>27</td>
</tr>
</tbody>
</table>

The study included health members of staff who interact with the smart care system on a daily basis in the execution of their duties as well as clients (patients) who are at the receiving end of the services as summarized in table 2 below;

3.1.2 Table 2: social demographic characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>41%</td>
</tr>
<tr>
<td>Female</td>
<td>16</td>
<td>59%</td>
</tr>
</tbody>
</table>

Among the participants of the study 11 (41%) were males and 16 (59%) were females.
3.2 Findings
The study findings have been categorized into major themes, categories and codes as they emerged from the in-depth interviews with the respondents.

3.2.1 Types of records managed by the SmartCare records management system at Kalingalinga clinic.

Registration records
The study found that in SmartCare when a patient first visits the clinic, they are signed up into the registration module which captures biometrics and demographic details “unlike paper registers, the demographic details in the smart care are used to locate the patient when we need to make follow ups” remarked a member of staff. The program has a facility to link the same record to any other service at the clinic that the patient may need. In effect, SmartCare only maintains a single record of the patient in a single entity class called patient, whilst subsequent visits come as attributes of the same record. In effect the system ensures integrity of records in that a person’s data is linked to the same primary key.

Clinical Records
The respondents gave an analogous perspective on the types of records managed by the SmartCare system, they were of the view that the health centers have not fully migrated to the use of the SmartCare as it is used hand in hand with the old paper record system. The respondents identified different types of health records managed by the SmartCare system. They stated that SmartCare manages the all types of clinical records such as Tuberculosis records, HIV records, family planning, Antenatal, voluntary male circumcision records maternal and Child health as well general Out Patient Records. The respondents reported that, in spite of implementing the SmartCare to manage all records, the old paper system is still being used hand in hand with the SmartCare.

According to the findings of the study, the SmartCare has been integrated to manage all types of patients’ health records. In spite of the SmartCare being adopted to manage all the records, similarly, a study by Ives et al (2015) which measured user satisfaction in Electronic Health Records Management systems, found that the main types of records in the SmartCare program were the same. Our study found that the only pseudo-clinical or none clinical module is
Registration. This module captures the demographic and biometric data of the patients. Biometric records refer to information that denotes a persons’ measurements such as age, height, weight, sex, whilst demographic records in SmartCare relates to information about the patient which is not related to their biology. This information includes such details as occupation, residential address, and next of kin, and objective data from the examiner about the patient.

While we found (Ives et al, 2015) consistent with how the software is built in Zambia, but in terms of Practice the medical personnel at Kalingalinga indicated that they do not segregate records in terms of biometrics or demographic but they do not use classification by subjects such as HIV/AIDS, Tuberculosis (TB), Male Circumcision (MC), Maternal and Child Health (MCH) and General Out Patient Department Visits. But rather, this clinical information often is created in relation to the service that the patient comes for on a particular day. This in effect means that clinical records are not self-existing such that when a patient comes on day 1 with a headache, he/she does not end up with two records cumulatively in the SmartCare system the next time they visit for male circumcision.

Clinical Support Services Records
The SmartCare system also follows the classification by structure of the organization creating the record in this case, a health institution has support (facilitative) services that aid the core functions of; clinical diagnosis, treatment and care. Therefore, the respondents acknowledged two of the key support service records contained on the SmartCare system that play a supportive role is the Laboratory and Pharmacy records.

In this case, Pharmacy records relate to prescriptions, dispensary and refills of medicines for each patient. These are held on the system to aid in continuity of care and view the prognosis in relation to the type of medicine prescribed at the earlier visit. The SmartCare program has a provision for on-screen pop ups to remind staff about a patient who is due for refilling of their provision of Anti-retro viral drugs

The system also has a seamless ability to send notifications for requests for lab tests from clinicians straight to laboratory on the server. This is a back and forth system that alerts both the Laboratory about the request for a particular test and alerts the system after the test has been done and results of the test filed in. Unlike the manual based system remarked a member of staff “the request cannot
be ignored for a number of reasons” among them is the fact that the data of personnel who generates reports are able to monitor your response rate to requests and the system has an audit trail of your efficiency in clearing requests. Secondly the system is configured to suit basic treatment protocols such that when a patient is being suspected for a specific condition to complete the diagnosis the system automatically requests a mandatory laboratory test and the Pop-ups on your screen will not go until the issue has been attended to.

3.2.2 Benefits that accrue to the SmartCare records management system

The respondents in the study reacted to this part of the inquiry in the context of a comparative analysis between the SmartCare and the manual -paper based records management practice. Suffice to mention that the benefits that accrue to the SmartCare are appreciated differently by the staff and the clients (patients), thus thematic coding and data analysis had to conform to this inclination.

Benefits to Staff

Records retrieval: From the in-depth interviews conducted at Kalingalinga Clinic, one of the major benefits expressed by the members of staff is that the SmartCare system has enhanced records retrieval. “Before the SmartCare we had incidences where a patient comes to the hospital and the registry staff cannot locate the patients file” stated a respondent. Kalingalinga as a first level clinic handle a lot of patients, managing these records was a very big challenge. Respondents applauded the SmartCare system to be a good record keeping system provided the data entry is up to date. The SmartCare program keeps data on a chip in the care card which a patient is given to keep whilst the same record is backed up on the clinic saver. This ensure that the trouble of running around trying to locate a patient’s file has been eliminated from the picture.

Office Space Usage: The SmartCare has also been lauded for reducing clutter and Maximization of usage of office space. “Our offices are looking smart as the health facility looks organized as we are creating less paper records but soon you will find no papers here”. The health workers also appreciated the SmartCare in terms of being more convenient for the health facilities considering the inadequate space that exists in the health facilities. In terms of paper records, respondents categorically stressed that registers, tally sheets, cards and other paper record systems easily tear off and makes it more difficult to organize data. It therefore noted advantage or
improvement brought by SmartCare in managing health records, it does not require a big physical space as all the medical history of patients is loaded on the smart card.

Reporting: The study learnt that the SmartCare system has a fully customizable reports module. This functionality seemed to thrill the member of staff interviewed more than any other. Paper records are not user friendly because of the way patient registers are made, some papers come out” they can make you look much disorganized when trying to consult the record to answer a simple question. They indicated that simple routine reports like counting the number of deliveries in a month required you to bend down and start counting one by one. The SmartCare generates reports by simply pressing a few keys “It becomes easier for the one in charge to make reports”.

Treatment adherence Support: “It becomes easier to trace defaulters”. In this context defaulters are patients who have been enrolled for anti-retro viral therapy then stop showing up for subsequent appointment to collect drugs and checkups of viral load. It helps the health workers to follow up those who are late for medical checkups and it also becomes easier for the clinicians to check for more information about the clients, they simply open the SmartCare other than looking for a file manually. SmartCare is a date driven system by simply checking from reports module you can produce a list of the patients that you are expecting to show up for appointments on a particular day and what service they are due for, it could be either for viral load checkup or for drugs refill. Any patient that does not show up you are alerted and able to use the information in the system to locate them through the Community Based Volunteers.

SmartCare has improved health records management when compared to the paper record system. This is because the SmartCare has made it quick and easy to locate and retrieve patients’ records and follow up those who have missed clinical appointments.

Benefits to Patients
Nearly all the clients that participated in the study put Confidentiality as the top benefit of the SmartCare system. “when you carry papers to the hospital anyone can read your book to see that you have a Sexually Transmitted Disease not this card it’s only the nurse with a computer” the respondents specified that SmartCare ensures data security and confidentiality. “Like on the part of the clients according to my experience, my clients were happy because that card is different from the hard copy”. Someone can just see the information which is confidential but with the card
there is security and confidentiality. Paper records are also good but they can be lost, imagine if you dropped your medical record book in the market and someone picks it for you it’s clear they have finished studying your medical history by the time they give it back. Human beings have this inherent curiosity which you cannot blame anyone for, but the SmartCare has found a way of making sure only the right people have access to it.

Reduction in service time: the patients also brought out the fact that after the first visit to the clinic and the card has been issued to you, the registry loses importance to you. We used to waste time waiting for files to be retrieved from the registry, and sometimes they could find the file of someone who came in later than you faster. The card allows you to go straight to where you will be attended to.

Continuity of Care: The study revealed that the SmartCare card facilitates continuity of care in cases where patients have to relocate from their usual health facility. “There are different types of ARVs so if you have an illiterate patient carrying no file relocated from a district or province to another and needs an urgent refill, it will be a disaster as to what medication to give them. Wrong medication can botch the treatment which can be fatal”. With SmartCare the patient travels with his/her medical history on a chip, the card contains laboratory tests and results, treatment regime and medication prescribed by the last clinician who attended to them and any other information relevant to their treatment. To the most part the conversation is between the clinician and the card so language barrier between the patient and the care-giver will have little or no effect on the quality of care they will receive.

The above findings are similar to what Msukwa (2011) found in his study on user perception on the effectiveness, efficiency, satisfaction, challenges and training of electronic data system in Malawi. The study showed that despite the challenges with EMR use, they prefer using the EMR than paper based records; they also indicated that EMR is worth the time, effort and investment. One of the common reasons respondents gave for ranking the EMR higher than the paper based records was that with the ever-growing number of patients being enrolled in ART clinics and still facing the human resource challenges in the health sector, there is need for an efficient way of collecting data than the current paper based system. This will facilitate easy tracing of patients and quick to make decisions on clients missing out on appointments.
3.2.3 Challenges faced in the application of the SmartCare records management system in the delivery of health care services.

Inadequate Number of computers: Respondents stated that “there are few SmartCare computers, therefore workers have to wait for one another to use the SmartCare computers”. This is related to the fact that computers are expensive to purchase. All the computers found at the clinic were bought by cooperating partners notably the Center for Infectious Diseases Control. Therefore, partners donate in line with their own budgets not according to the needs of the Clinic. Further probing revealed that at the moment, the SmartCare program is being sustained by cooperating partners of the Ministry of Health. This put the sustainability of this programme to be unpredictable as the donors who are currently sustaining the programme can withdraw support at any time.

Intermittent System Malfunction: According to the findings of this study the system server sometimes breaks down resulting into health workers reverting to the paper record system. In addition, integrated SmartCare system uses the internet and the speed of workflow is affected when the internet is slow. One of the respondents stated that “using an integrated system, many clients’ computers put pressure on the system server thus making the workflow slow and the system sometimes freezes”. When a server is down health workers are made to stop using the system and wait for technicians from the medical district office to come and work on it and this takes long.

Cost of Replacing Cards: other findings were that some clients come claiming that they do not have an account when in fact they have just lost the card causing the creation of multiple accounts. When a patient loses a card they are required to get a police report and pay a certain amount in order to replace it. Clients, that participated in the study submitted that it was expensive and time consuming for one to replace a lost SmartCare card. A patient who loses the card is asked to pay k60 to replace it, an amount which may be too much for an average citizen. There are also required to produce a police report, a process which may be time consuming and hectic for a patient. However, the staff also indicated that incidences of clients loosing cards are so rare that I have not had such a case in the past 9 month and was quick to that “patients take care of the cards like their lives hang on them”

When probed on the effect of power supply on the SmartCare, the study revealed that shortage of power supply in health centers is no longer a challenge because Kalingalinga Clinic is exempted
from being load shaded in case of a serious power cut, Kalingalinga has been supplied with generators. This picture is not representative of the situation obtaining in other parts of the country.

Frequency of System Upgrades: The other challenge is that the SmartCare system receives new updates (patches) every six months to suit changes in treatment protocols and national guidelines. This ever changing environment has also been sighted as a challenge in that even those that interact with the system on a daily basis require re-orientation with every update. These re-orientations take the form of on-site trainings which interfere with workflow and are never exhaustive due to time limitations as the person conducting the re-orientation has to leave at a specified time due operating on fixed budgets. The inadequacy of these on-sight re-orientations only serve to worsen the already wobbly skills base.

Inadequate training by the clinical staff to operate the SmartCare system. A lot of clinicians interviewed were of the view that dedicated staff to handle data entry should be employed. They look at the Electronic records management system as a foreign concept because their curriculum does not use information technology. In fact, it was established that a lot of nurses at the clinic are reluctant to use computers due to lack of basic computer skills.

Similarly, a study by Ravindra et al., (2015) found that the lack of computers makes it difficult for most staff to do data entry or check records of the patient’s medical history; therefore, they continue to use manual systems of folders and files. These findings are similar to that of this study due to fact that both studies were conducted in less developed Countries’
CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion
The study concluded that it is over simplification of reality to imagine that an Electronic Records Management System can create impact in isolation. A successful electronic records management system is multidimensional.

It is a policy issue. This means that a regulatory environment that supports both its establishment, implantation and guarantee its sustainability for the foreseeable future is a pre–requisite. The existence of a dual system where an Electronic Health Records Management System being implemented alongside a paper system 14years after being piloted is an indicator of a policy vacuum where no clear direction is the order of the day.

The researchers also concluded that it’s a training issue. Having established in the findings that some of the para-medical and medical staff look at Smartcare as a foreign and an unwelcome addition to their substantive business, it therefore occurs that this lack of appreciation of a system that has been glorified by many others at the same clinic speaks to unfamiliarity of the functionalities of the system. It was the researchers’ view that those who had sufficient training in the use of smartcare welcomed it with affection and hailed it as a tool that makes work easier.

The researchers also concluded based on the finding that the smartcare system gets adversely affected by power outages, that the success of an Electronic Health Records Management System is an Infrastructure Issue. The existing infrastructure cannot fully support a fully automated system office environment. To imagine the results of load shedding in a fully automated environment is a torment. Implementation does not end at buying computers. It involves building networks, sever rooms, logical topologies and uninterruptible power sources (UPS).

The study also concluded that it’s an administration issue. At the moment the smartcare programme could have been doing far much had they been convergence of administration. At the moment they seem to an information system running parallel the administration system. Most of the smartcare related aspects are being managed by cooperating partners whilst the medical staff are being managed by the Government of the Republic of Zambia. This situation gives the medical staff latitude to sometimes treat the smartcare as interruption to the normal order.
The study also concluded that many benefits accrue to the use of SmartCare such as quick location and retrieval of medical documents when needed, these are fundamental principles on which the efficiency a records management system is always based other benefits include enhancing the efficient utilization of office space by reducing clutter. Other benefits include enhanced patient data security, privacy and confidentiality.

Based on the findings of the study, there was unanimity in the respondents both clients and staff in expressing satisfaction in how the SmartCare EHRMS has impacted the provision of health services at Kalingalinga clinic this research is therefore on firm ground to conclude that the SmartCare programs at Kalingalinga Clinic is indeed effective. However, like anything else that is a creation of man, it has areas of improvement that if taken care of has the potential to make the SmartCare program more effective in aiding the provision of health services at Kalingalinga Clinic and by extension elsewhere where similar condition exist.

5.2 Recommendations
The study makes the following recommendations segregated in terms of recommendations for Policy intervention and for further research.

5.2.1 Recommendations for policy
The study makes four recommendations for Policy advancements to help improve the efficiency of the SmartCare programme;

Firstly, in order to enhance the capacity of frontline staff (nurses and Clinical Officers) to use SmartCare, a component of electronic records management must be including as a core component of their college training curriculum.

Secondly the SmartCare system must be powered by Solar or any other reliable none interruptible but cost effective energy sources

Fourthly in-house technicians should be employed to be located at every clinic that is using the SmartCare system so as to reduce the extended periods which staff have endure as the long hours that they have to endure when the system is down.

Lastly, the Ministry of Health must take steps to assert its ownership of the programme by employing dedicated staff such as technicians and to procure equipment using national budget lines not relying on donor funds in order to allay fears of lack of a long term sustainability capacity.
5.2.2 Recommendation for further research

The conditions existing at Kalingalinga clinic are not easily generalizable due to the fact that most of the clinics are smaller than Kalingalinga Clinic and the clinic is situated right in the capital city of a predominantly rural country. It’s therefore important that a quantitative study covering a large number of clinics across the country conducted to establish the percentage frontline staff that have capabilities to use EHRMS, the disparity between the number of clients who visit clinics and those that are recorded on the SmartCare system.
REFERENCES


Mutale (2017). Health workers experience and perception on the use of SmartCare in Zambia. Hillstate Printers: Denver


Appendices 1 (questionnaire for clients of Kalingalinga Clinic)

THE UNIVERSITY OF ZAMBIA
SCHOOL OF EDUCATION

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE
LIS4014: RESEARCH AND PROJECTS IN DEVELOPMENT INFORMATION SYSTEMS
QUESTIONNAIRE

Research Topic: Assessing the effectiveness of the SmartCare records management system in health service delivery at Kalingalinga clinic

Dear Respondent

We are fourth year students carrying out a research to assess the effectiveness of the SmartCare records management system in health service delivery at Kalingalinga clinic. You have been randomly selected to participate in this research. Your co-operation will be greatly appreciated. You are kindly requested to answer all the questions and take note of guidelines to some question which you may require to skip or justify. Please note that each section of the questionnaire has separate guidelines. We request you to answer honestly and to the best of your knowledge. Be assured that the information you will provide will be used purely for academic purposes. Your confidentiality is guaranteed as the questionnaire does not require you to include your identity.

INSTRUCTIONS
1. Read and understand the questions carefully before answering
2. Tick [✓] the most appropriate responses in the spaces provided
3. Where appropriate, fill in the blank spaces provide
SECTION A:

Please indicate your responses by ticking in the far right corner in the table below

<table>
<thead>
<tr>
<th>SN.</th>
<th>Question description</th>
<th>Tick your response.</th>
<th>For Official Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>What is your sex?</td>
<td>(1) Female.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) Male.</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td>Which area do you stay in?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td>For how long have you been coming to this clinic?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td>What category of a client are you?</td>
<td>1. In-patient</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Out-patient</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Routine visitation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Other (specify);</td>
<td></td>
</tr>
</tbody>
</table>

SECTION B

Use of the SmartCare Electronic Health Records Management System

Please Answer or questions as requested by the related instruction

1. Do you have a care card? If yes when was it issued to you?
   ................................................................................................................

2. Why don’t you have a care-card? (If you answered yes to question 1 above skip) ........................................................................................................
3. Have you ever had to replace your card? (If yes explain why)………………………………………………………………………………
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4. Have you ever been sent back home to go and collect your card? …………………………………………………………………………………
5. Do you have any condition that requires you to visit the clinic at fixed intervals?
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6. Between paper records and the SmartCare card which one do you find user friendly and why?
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SECTION C

Benefits that accrue to using the Smartcare EHRMs

7. How do you think the introduction of the use of cards has impacted the quality of service delivery at this clinic?

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Section D
Challenges faced by clients in as a result of use of SmartCare cards

10. What change if any have noticed in the amount of time you wait to be attended to since the introduction cards?

11. How has the current load shedding of electricity affected you as a patient when you come to the clinic?

Section E
Recommendations for improvements to the use of SmartCare in health service delivery

12. What do you think needs to be done to improve in order for SmartCare to effectively positively impact the quality of health service delivery at this clinic?

End of the questionnaire

Thank you for your participation
Appendix 2 (interview guide)

Interview Guide

(For Members of Staff of Kalingalinga Clinic)

Research Topic: Assessing the effectiveness of the SmartCare records management system in health service delivery at Kalingalinga clinic

Dear Respondent

We are fourth year students carrying out a research to assess the effectiveness of the SmartCare records management system in health service delivery at Kalingalinga clinic

You have been randomly selected to participate in this research. Your co-operation will be greatly appreciated. You are kindly requested to answer all the questions. We request you to answer honestly and to the best of your knowledge. Be aware that you reserve the right to withdraw from participating for any reason which you are under obligation to justify to us at any point in the course of the interview. Your confidentiality is guaranteed as the questionnaire does not require you to include your identity.
Questions

1. What type of records do you manage using the SmartCare records management system at Kalingalinga clinic?

2. What other method of managing records do you use apart from SmartCare record management system
   a) How do you decide which method to use?
   b) Which method do you use frequently?

3. In your opinion has the SmartCare (EHRMS) helped you to deliver health services better to the community of Kalingalinga?

4. What benefits to either yourselves or patients have come with SmartCare?

5. What are the new challenges are you faced with when doing your job as a result of introduction of SmartCare cards? The application of the SmartCare record management system in the delivery of health care services.

6. What do you think should be done to make SmartCare an effective tool in health service delivery at Kalingalinga clinic?

Thank you for your participation
Appendix 3 (Work Plan)

WORK PLAN

<table>
<thead>
<tr>
<th>ACTIVITIES No.</th>
<th>ACTIVITY</th>
<th>PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Selection of research topic</td>
<td>27th March 2019</td>
</tr>
<tr>
<td>2</td>
<td>Writing of the research proposal</td>
<td>29th March to 14th, 2019</td>
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<tr>
<td>3</td>
<td>Submission of proposal for marking and approval</td>
<td>17th June, 2019</td>
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<td>4</td>
<td>Field research begins</td>
<td>July, 2019</td>
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<tr>
<td>5</td>
<td>Data analysis and writing of research report</td>
<td>September, 2019</td>
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<tr>
<td>6</td>
<td>Completion of draft of the report and submission of the final report</td>
<td>November, 2019</td>
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Appendix 4 (Activity Budget)

ACTIVITY BUDGET

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<th>UNITY COST (ZMK)</th>
<th>TOTAL IN KWACHA</th>
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<td>2. Printing</td>
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<td>150</td>
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<tr>
<td>3. Pens</td>
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<td>2</td>
<td>10</td>
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<tr>
<td>4. USB flash (1GB)</td>
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<td>60</td>
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<tr>
<td>5. Food and refreshments</td>
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<td>500</td>
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<td>6. Airtime</td>
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<td>7.</td>
<td>Binding (report and Proposal)</td>
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<td>8.</td>
<td>Miscellaneous</td>
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**TOTAL =** 1080