

Clinical Study Report

AfyaPro/MOM Integrated Digital Health Solution Pilot in Kenya: Baseline Report

Note:

This report combines both FBO/NGO and Public Health Facility Sites

Protocol ID / Title:

ICBE - S – 000189 / AfyaPro – Mobile Obstetric Monitoring (MOM) Integrated Digital Health Solution Pilot Implementation Study in Kiambu County, Kenya.

This report concerns a Clinical Study or a Clinical Investigation that was performed in accordance with the International Standard: ISO 14155:2011 or ISO 14155:2020 (E).

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2. LIST OF ABBREVIATIONS & RELEVANT DEFINITIONS

Abbreviations

AMREF	African Medical and Research Foundation
ANC	Antenatal Care
CE	<i>Conformité Européenne</i> (Mark)
CFIR	Consolidate Framework for Implementation Research
CSP	Clinical Study Protocol
CV	Curriculum Vitae
DHIS2	District Health Information System version 2
EC	Ethics Committee
EE	Effort Expectancy
EHR	Electronic Health Record
EU	European Union
EU - MDD	European Union Medical Device Directive
EU - MDR	European Union Medical Device Regulation
FGD	Focus Group Discussion
FBO	Faith Based Organization
GCP	Good Clinical Practice
GDPR	General Data Protection Regulation
GoK	Government of Kenya
HIS	Health Information Systems
HMIS	Health Management Information System
HMT	Health Management Teams
HRIO	Health Records and Information Officer
ICT	Information and Communications Technology
IRB	Institutional Review Board
IS	Information System
IT	Information Technology
KEPH	Kenya Essential Packages for Health
KII	Key Informant Interview

M&E	Monitoring and Evaluation
Mcr	Core readiness mean
MeH	eHealth mean
Mlr	Learning readiness mean
MOH	Ministry of Health
Mpr	Policy readiness mean
Msr	Societal readiness mean
Mtr	Technological readiness mean
NCD	Non Communicable Diseases
NGO	Non-governmental Organization
OPD	Outpatient Department
PC	Personal Computer
PE	Performance Expectancy
PEOU	Perceived Ease of Use
PI	Principal Investigator
PLS	Partial Least Squares
PPE	Personal protective equipment
PU	Perceived Usefulness
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
ICBE	(Philips) Internal Committee for Biomedical Experiments

Definitions

Digital health	The use of information and communications technology in support of health and health-related fields. It is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery.
eHealth	eHealth is the use of information and communication technologies (ICT) for health (source: WHO)
Endpoint	principal indicator(s) used for assessing the primary hypothesis of a clinical study
IC	Informed Consent The informed consent is documented by means of a written, signed and dated informed consent form. The informed consent process is the process by which an individual is provided information and is asked to voluntarily participate in a clinical study.
Investigation site	institution or site where the clinical study is carried out
Investigator	individual member of the investigation site team designated and supervised by the principal investigator at an investigation site to perform critical clinical-investigation-related procedures or to make important clinical study- related decisions NOTE An individual member of the investigation site team can also be called “sub-investigator” or “co-investigator”.
Objective	main purpose for conducting the clinical study
Sponsor	individual or organization taking responsibility and liability for the initiation or implementation of a clinical study

3. SUMMARY

Title	AfyaPro – Medical Obstetric Monitoring Integrated Digital Health Solution Pilot Implementation Study
Introduction	For health management teams at various levels including county and national levels to realize the expected benefits from facility wide EHR systems deployment at health facilities, it is important that the system implementation is successful, the EHR system gains wide acceptance from the targeted users and there is an assurance that the solution is cost effective. A review of the literature indicates that one major factor leading to failure of systems deployment is the lack of adequate investment in the implementation process, the inadequate understanding of the socio-technical aspects of information technology, particularly the understanding of how people and organizations adopt IT (Kaplan, B., & Harris-Salamone, K. D, 2009). Further, the cost benefits that accrue from the use of EHR are required to inform policy, practice and advocacy for investments in digital health systems.
Purpose	To better understand the implementation of an integrated digital health system using Implementation Science, to adapt a technology acceptance model in predicting user acceptance, to evaluate the factors that affect acceptance and use of an EHR system by healthcare workers and patients in four sampled public and faith based /non-governmental organizations health facilities in Kiambu County, Kenya and to evaluate the care costing aspects related to the eHealth solution
Devices used	The device in use for this study is software, the Afypro-MOM integrated solution.
Subjects	The respondent in this study are the patients, facility management and healthcare workers
Investigation design	Observational study because the investigators are not acting upon study participants, but instead observing natural relationships between factors and outcomes.
Investigation procedures	The participants were taken through privacy notice and explanation of the objectives of the study and eventually asked to voluntarily sign informed consent forms. The participant did not undergo any form clinical procedure. They were however informed the importance of their participation in helping to understand the process of implementation of an EHR system in their facility. The patients who accepted to be part of the study were asked to voluntarily consent to allow abstraction of their medical records in their patient files over the past 12 months
Duration	This is a baseline, we will have a midline and an endline. All this will be between February and May 2022
Conclusion	The implementation of AfyaPro-MOMs integrated solution provides an opportunity to enhance healthcare outcomes by digitization of the facilities,

	improve data completeness and quality, enhance interaction between patients and health workers, and ultimately reduce the cost of healthcare for ailments. We will also be better informed on how to better implement EHR systems in similar settings.
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4. INTRODUCTION

According to the Kenya Health Policy (2014-2030), the Ministry of Health (MoH) envisions investments in digital health interventions as a means to the attainment of the highest standard of health for every Kenyan. This endeavour will ultimately impact on health outcomes (MoH, 2014).

While Kenya has a robust routine reporting system using the DHIS2 system, one of the frontiers that still requires considerable support for growth is digital health investments for patient-level systems, specifically, electronic health records (EHR). An electronic health record system is typically a facility wide system that facilitates the availability of a patient record throughout the entire facility. This differs from electronic medical records (EMR) that are often intervention specific. For instance, in Kenya, the *KenyaEMR* is largely a system that supports HIV AIDS patient care and would normally be available at the HIV clinic in a health facility. Kenya currently has more than 1,200 facilities using a HIV care EMR.

For health management teams at various levels including county and national levels to realize the expected benefits from facility wide EHR systems deployment at health facilities, it is important that the system implementation is successful, the EHR system gains wide acceptance from the targeted users and there is an assurance that the solution is cost effective. A review of the literature indicates that one major factor leading to failure of systems deployment is the lack of adequate investment in the implementation process, the inadequate understanding of the socio-technical aspects of information technology, particularly the understanding of how people and organizations adopt IT (Kaplan, B., & Harris-Salamone, K. D, 2009). Further, the cost benefits that accrue from the use of EHR are required to inform policy, practice and advocacy for investments in digital health systems.

This study will use an Implementation Science approach and apply the Technology acceptance Model (TAM) by Davis, F. D. (1989) to evaluate the individual, technology and organizational factors affecting user acceptance during the piloting of an EHR system, the *AfyaPro-MOM integrated solution*. In addition, optimization of the solution for health facility workflows will be established through the use of Petri Nets, a mathematical modelling methodology. This approach has been employed successfully by other researchers in information systems (Van Der Aalst, 1998).

We expect that this research study's approach to the implementation of a facility wide EHR solution in several health facilities of public ownership and faith-based/non-governmental organization (NGO) ownership will provide new insights in digital health implementations in countries with a similar profile as that of Kenya. Another key aspect of this study will be to establish the cost of care of this EHR solution post implementation using a health economics approach.

Findings from this study will inform policy makers as well as system designers and implementers on future approaches that will contribute to the successful implementation of digital health systems especially in developing countries.

1

INVESTIGATIONAL DEVICE and METHODS

1.1 Investigational device description

Device description	<The AfyaPro-MOM integrated solution comprises two solutions that complement one another to provide a unique solution. The AfyaPro integrated health solution is a facility wide implementation that covers all the departments and services in a typical health facility. It is modular in nature allowing for a facility to only use the modules that serve the services that facility provides. It runs on the Philips Vital Health Platform. Mobile Obstetrics Monitoring (or MOM), is a smartphone-based solution that supports mother baby care. MOM2.0 software is a Class 1 medical device as per global Medical Devices Directive (MDD) guidelines. >	
Intended purpose	<To study the implementation of the AfyaPro-MOM integrated digital health solution in Kiambu County. This will provide learnings on how to implement EHRS in similar settings and also analyse the healthcare costs.>	
Previous intended purpose	<N/A>	
Manufacturer:	<AfyaPro is developed by Africa eHealth Solutions International, while MOM is developed by Philips >	
Device model / type	<Cloud-based AfyaPro-MOM integrated solution software>	
Software version	<Version 2>	
Accessories	<Computing devices, tablets,..>	
Changes		
Changes to the investigational device during the clinical study or any changes from the IB:		
1.	raw materials	N/A
2.	software	N/A
3.	components	N/A
		N/A

4.	shelf-life	
5.	storage conditions	N/A
6.	instructions for use	N/A
7.	other changes	N/A

1.2 Study Protocol (SP)

Background: One major factor leading to failure of digital health systems implementation, is the inadequate understanding of the socio-technical aspects of information technology. The proposed study will apply a technology adoption model to evaluate individual, technology and organizational factors affecting user acceptance of the implementation of the AfyaPro - MOM integrated eHealth solution together. Also part of the study will be to provide ab

Objectives: To better understand the implementation of an integrated digital health system using Implementation Science, to adapt a technology acceptance model in predicting user acceptance, to evaluate the factors that affect acceptance and use of an EHR system by healthcare workers and patients in four sampled public and faith based /non-governmental organizations health facilities in Kiambu County, Kenya and to evaluate the care costing aspects related to the eHealth solution

Methodology: Baseline, midline and endline surveys will be conducted primarily through use of quantitative methods. Qualitative data will be collected to provide background and contextual information. Descriptive analysis of the variables will be performed using SPSS statistical analysis. Technology acceptability study analysis will be done through Structural Equation Modeling (SEM), specifically Partial Least Square path modeling (PLS). Research sample size is 290 and includes healthcare staff, leadership and patients. Study duration will be from November 2020 to February 2022. Ksh. 1,778,700 is donated by Philips Foundation to support this study.

Expected results: A technology adoption model will be adapted to explain the current situation regarding eHealth adoption in Kenya, using a case of public and private health facilities located in Kiambu County. The study will provide a significant contribution to scientific understanding of acceptance and use of technology in healthcare settings.

This paragraph contains a summary of the Study, including any subsequent amendment(s) with a rational for each amendment.

<p>Study objectives</p>	<p>< To better understand the implementation of an integrated digital health system using Implementation Science, to adapt a technology acceptance model in predicting user acceptance, to evaluate the factors that affect acceptance and use of an EHR system by healthcare workers and patients in four sampled public and faith based /non-governmental organizations health facilities in Kiambu County, Kenya and to evaluate the care costing aspects related to the eHealth solution.></p>
<p>Study design</p>	<p>Type of study</p>
	<p><Implementation Study></p>
	<p>Study endpoints</p> <p>< A technology adoption model will be adapted to explain the current situation regarding eHealth adoption in Kenya, using a case of public and private health facilities located in Kiambu County. The study will provide significant contribution to scientific understanding of acceptance and use of technology in healthcare settings.></p>

2 ANALYSIS AND RESULTS

Clinical study initiation date	The first subject was enrolled in the study on <2021-Feb-16>
Clinical study completion/suspension date	<N/A. This report relates to the baseline. This report has combined both the FBO/NGO and Public sites. The Public sites baseline was conducted 2 months after the NGO/FBO sites>
Disposal of subjects and investigational devices	<N/A>
Subject demographics	<The subjects comprised of the facility management, the healthcare works and patients>
CSP compliance	<The is study is conducted according to the study protocol>

Organization of this section: We have presented the key analysis and summary results for the technology aspects in section 2.1, the economic and clinical aspects of the study based on the data collection tools in section 2.2. The detailed data analysis tables are available in the appendix. We have also presented our observations before the discussions and Conclusion.

All the questionnaires were manually checked for completeness before data entry. The data was then cleaned to ensure consistency and accuracy prior to its importation to SPSS version 26.

2.1 TECHNOLOGY ASPECTS

An analysis of the health informatics (technology) study data is presented, followed by a short explanation in the section below.

2.1.1 e-HEALTH READINESS

Descriptive statistics was first used to describe the characteristics of the participants using frequencies. In addition, mean and standard deviation was used to determine participants' readiness levels towards the four EHR readiness domains: core, technological, learning, societal and policy. The statistical analysis was performed using SPSS. The overall readiness level was determined by calculating the mean scores for each readiness dimension. The study adopted the following mean score levels below as applied by (Aydın and Tasci, 2005) in their study on measuring e-Learning readiness. Using a similar 5-point Likert scale to our study, the authors applied the following mean score levels. Thus our study adapts the minimum 3.4 mean score as the required readiness level before implementation can start.

Table 2:1: Mean score Range (Aydın and Tasci, 2005)

Means Score Range	Meaning
1 >Mean score<2.6	Organization isn't ready and needs a lot of work
2.6>Mean score< 3.4	Organization isn't ready and needs small amount of work
Mean Score=3.4	Expected readiness level
3.4>Mean score< 4.2	Organization is ready but needs a few improvements
4.2>Mean score< 5	Organization is ready for implementation

2.1.1.1 Core Readiness

Appendix (Table 8:1) illustrates the overall mean score of the participants' responses and the mean scores of items related to each item. From the table it can be observed that the overall core readiness mean score is higher than the expected level of readiness ($Mcr=3.976 > MeH =3.41$). Based on this result, it can be inferred that faith based facilities are overall ready for eHealth implementation, although they required a few improvements. The improvements required include: creating more awareness about eHealth amongst the staff, more sensitization to enable the staff utilize ICTs as well as trust the ICTs. Similarly, from Appendix (Table 8:2), the public health facilities exhibited overall core readiness mean score ($Mcr=4.6117 > MeH =3.41$) which was higher than the expected level of readiness. This was a clear indication that the public health facilities exhibited a higher core readiness level compared to the faith based facilities. Therefore, public health facilities are ready for the implementation having met one of the core requirements for the successful introduction of the EHRs.

2.1.1.2 Technology Readiness

Appendix (Table 8:3) illustrates the mean scores of participants' responses on technological readiness towards the EHRs in regard to Internet speeds at the health facility, the availability of ICT support, availability of both hardware and software and internet availability. The results reveal that faith based facilities are below the expected level of readiness in terms of technological readiness ($Mtr=2.8000 < MeH=3.400$). As illustrated in Appendix (Table 8:3), the faith based facilities do not have a reliable ICT infrastructure necessary for the EHRs implementation. Therefore, prior to the implementation, the following needs to be undertaken: set-up hardware and software infrastructure, set up Internet infrastructure, avail ICT support and conduct ICT training to the staff. The findings denote that faith based facilities aren't technologically ready for the EHRs implementation and thus implementation shouldn't proceed unless the above has been sorted. However, from Appendix (Table 8:4) the public health facilities exhibited overall technological readiness mean score ($Mtr=3.8000 > MeH =3.41$) which was higher than the expected level of readiness. The public health facilities exhibited readiness in regard to: having quality and fast Internet, ICT support availability, hardware and software availability, as well as affordability of the ICTs. However, the staff do not have the required ICT training, a requirement that will need to be put in place prior to the implementation. Overall, the public health facilities are technologically ready for the EHRs implementation compared to the faith based facilities. This could

partially be explained by the county governments demand for monthly DHIS2 reporting necessitating the need for investment in ICT infrastructure as well as employment of ICT support personnel.

2.1.1.3 Learning Readiness

Appendix (Table 8:5) displays mean scores for learning readiness. The results reveal that faith based facilities are below the expected level of readiness in terms of learning readiness ($Mlr=2.7583 < MeH=3.400$). As illustrated in Table 8:5, prior to the implementation, the following needs to be put into consideration. First, the faith based facilities do not have human resources personnel who are experienced in technology based training. Also, they don't currently apply ICT to enhance their learning. However, the staff confirmed involvement in eHealth projects which is a good move for pre-implementation. Similarly, from Appendix (Table 8:6), the overall learning readiness means reveal that public health facilities are barely over the expected level of readiness in terms of the learning they have ($Mlr=3.4556 < MeH=3.400$). This analysis shows that the public health facilities too need more ICT training for its staff, more involvement of their staff in eHealth projects as well as sensitization on the use of ICTs for their education enhancing. Overall, though none of the facilities has strong learning readiness, the public health facilities exhibit a slightly higher learning readiness compared to the faith based facilities.

2.1.1.4 Societal Readiness

Appendix (Table 8:7) displays mean scores for societal readiness. The results reveal that faith based facilities are below the expected level of readiness in terms of societal readiness ($Msr=2.8220 < MeH=3.400$). As illustrated in Appendix (Table 8:8), the results denoted minimal application of ICTs in supporting communication links of faith based facilities with other healthcare institutions, minimal application of ICTs for collaboration with other health institutions in provision of care as well as in content sharing. Thus the faith based facilities providers will be required to find mechanisms to promote use of multiple mediums of communication both within and with externally, promote use of ICTs in provision of care in collaboration with other health facilities to make their societal readiness high as proposed by (Li, Land, Ray and Chattopadhyaya, 2010). Similarly, from Appendix (Table 8:8), the overall societal readiness means reveal that public health facilities are barely over the expected level of readiness in terms of the learning they have ($Msr=3.520 < MeH=3.400$). This analysis shows that just like the faith based facilities, they too need to find mechanisms to promote multiple mediums of communication both within and with externally, promote provision of care in collaboration with other health facilities to make their societal readiness high.

2.1.1.5 Policy Readiness

Appendix (Table 8:9) displays mean scores for the policy readiness. The results reveal that faith based facilities are below the expected level of readiness in terms of policy readiness ($Mpr=2.7958 < MeH=3.400$). According to this table, faith based facilities are neither aware of the ICT related policies that promote the use of EHRs nor policies that support reimbursement arising from EHRs investment.

FBO facilities aren't directly under the management of county government and thus the required political support for EHRs investment may not be applicable in their setting. However, there exists institutional awareness and support for EHRs. Therefore, it may be logical for enlightenment to the said institutions on the existing government policies regarding EHRs, draft a policy regarding the liability and licensure of the upcoming EHRs as well as how reimbursement may be undertaken. However, a major difference was noted in the public health facilities where policy readiness level was way above the expected level of readiness ($M_{pr}=4.1700 < M_{eH}=3.400$). These being public health facilities under the county governments, they are quick to adopt and the existing policy frameworks pertaining to use of EHRs, cost reimbursements, political support from the county governments as well as institutional support

Overall Readiness Findings (Public Health Facilities)

An overall assessment was undertaken to determine the readiness level of the public facilities for the EHRs implementation. The results are as shown below.

Table 2:2: Overall Readiness (Public Health Society)

Overall Readiness (Public Health Facilities)

	N	Minimum	Maximum	Mean	Std. Deviation
Core Readiness	5	4.33	5.00	4.6117	.26792
Technological Readiness	5	3.00	5.00	3.8000	.83666
Learning Readiness	5	1.17	4.89	3.4556	1.68298
Societal Readiness	5	1.70	4.60	3.5200	1.25910
Policy Readiness	5	3.40	5.00	4.1700	.66106
Overall readiness	5	2.99	4.59	3.9114	.69977
Valid N (listwise)	5				

The mean overall readiness was 3.9114 (SD = 0.70), mean core readiness was 4.6117 (SD = 0.26), mean technological readiness was 3.800 (SD = 0.84), mean learning readiness was 3.4556 (SD = 1.69), mean societal readiness was 3.5200(SD =1.259) and mean policy readiness was 4.17 (SD = 0.66). Using the average overall readiness score[M=3.40] as the cut-off for determining being ready and not ready for electronic health records, overall readiness mean was 3.9114 (SD =0.70) a clear indication that the public health facilities are ready for the eHealth implementation.

Overall Readiness Comparison amongst Facility Type

EHRs readiness comparison was undertaken to compare the extent of readiness between the public health facilities and the faith based facilities. The results are as shown below.

Table 2:3: Overall Readiness Comparison

Overall Readiness Comparison		
	Mean(Faith Based Facilities)	Mean(Public Health Facilities)
Core Readiness	3.9762	4.6117
Technological Readiness	2.8000	3.8000
Learning Readiness	2.7583	3.4556
Societal Readiness	2.82207	3.5200
Policy Readiness	2.7958	4.1700
Overall readiness	2.7941	3.9114

From the findings, the public health facilities achieved a higher mean core readiness score[M=4.6117]. This implies that for the public facilities, they have properly identified their needs and prioritization in respect to the proposed EHRs, are aware about the EHRs, have a higher level of comfort and trust on the technology, have undertaken proper planning and are satisfied with the EHRs in comparison with the faith-based facilities.

The public health facilities had a higher mean technological readiness score[M=3.800] compared to the faith-based facilities [M=2.800]. This clearly indicates that the public health facilities have network infrastructure that is slightly reliable enough to support the EHRs whereas the faith-based facilities have unreliable network infrastructure to support the EHRs.

The mean learning readiness score for public health facilities [M=3.4556] was slightly higher than for the faith-based facilities [M=2.7583]. This implies that more needs to be done on provision of programs and resources to provide training to health care providers in using the technology to ensure that they are ready for the EHRs implementation.

However, the public health facilities exhibited a higher mean societal readiness score [M=3.5200] compared to faith based facilities [M=2.82207]. This implies that the public health facilities have a slightly higher reliance on ICT for communication links and collaboration with other institutions compared to the faith based facilities.

The public health facilities had a higher mean policy readiness score [M=4.1700] compared to the faith-based facilities [M=2.7958]. This clearly indicates that the public health facilities are much aware of the existence of both government and institutional policies that will support the EHRs and have put them in place compared to the faith-based facilities.

2.1.2 CONSOLIDATED FRAMEWORK FOR IMPLEMENTATION

2.1.2.1 Intervention Characteristics

According to the results, the following constructs namely: **Intervention source, relative advantage, adaptability and complexity** were found favourable for possible successful implementation of the AfyaPro-MOM Integrated system in all the four study sites. However, **evidence strength and quality** was perceived as a potential barrier for successful implementation in the faith-based facilities. This could be attributed to the fact that the implementers may have failed to share examples of prior successful implementation of the system in other sites during the consultative meetings. On the other hand, evidence strength and quality was perceived as a facilitator for successful implementation in the public health facilities. This could have been attributed to the fact that the implementers shared the faith based implementations as examples of the sites where the system has been implemented.

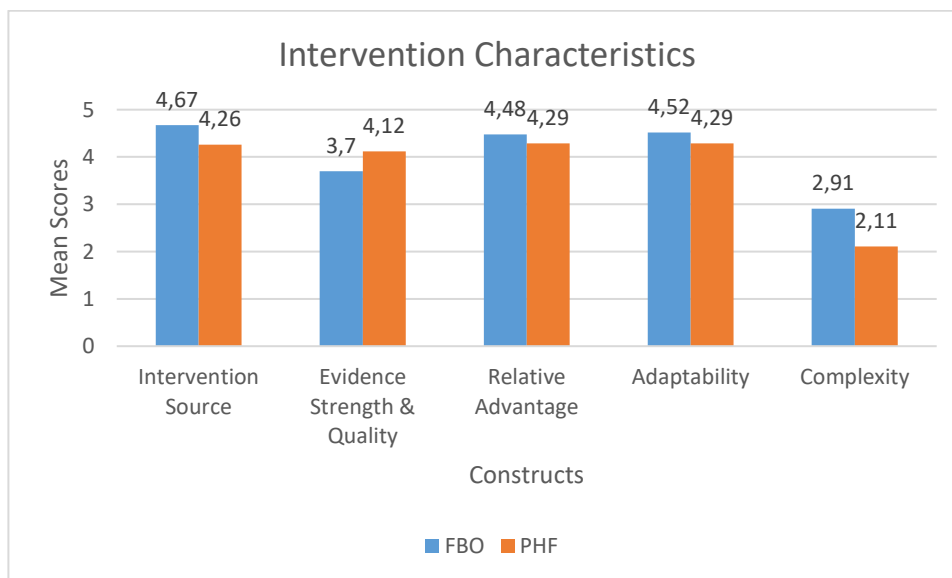


Figure 2.1: Intervention Characteristics results

2.1.2.2 Outer Setting

According to the results, only the patient needs and resources was found as an important outer setting construct that could motivate the successful implementation of AfyaPro-MOM Integrated system in all the four study sites. This could have been attributed to the participants' consensus on the fit between the system and their patients' needs. However, external policy and incentives wasn't found to be an important construct to motivate the successful implementation of AfyaPro-MOM Integrated system in all the four study sites. The higher margin in the public health facilities can be attributed to their possible alignment to the existing Kenya National eHealth Policy (2016-2030). A key observation was that none of the four sites acknowledged receiving incentives to facilitate implementation.

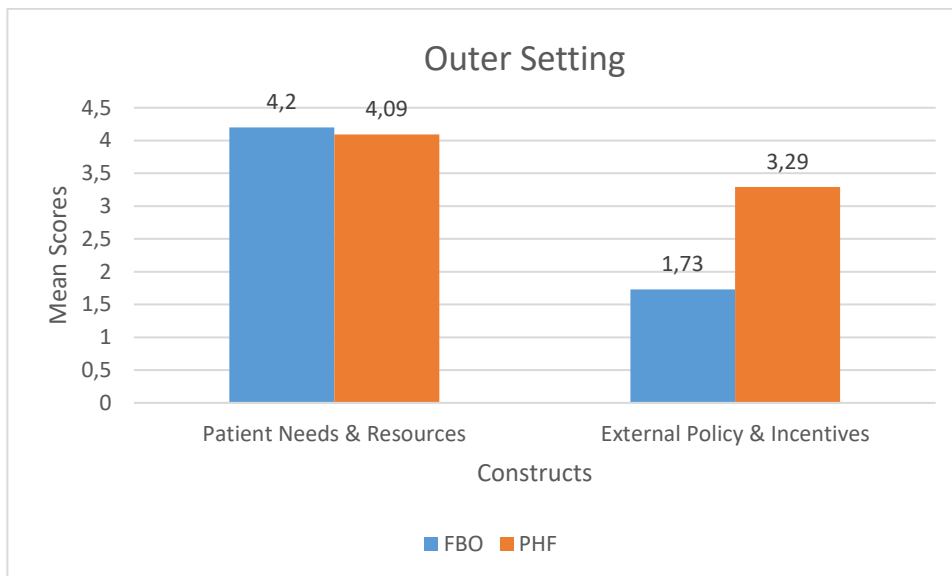


Figure 2.2:Outer Setting Results

2.1.2.3 Inner Setting

According to the results, the following inner setting constructs: networks and communications, culture and readiness for implementation were identified as potentially key to the successful implementation of AfyaPro-MOM integrated system in all the four study sites. However, the structural characteristics were found not influential for the successful implementation.

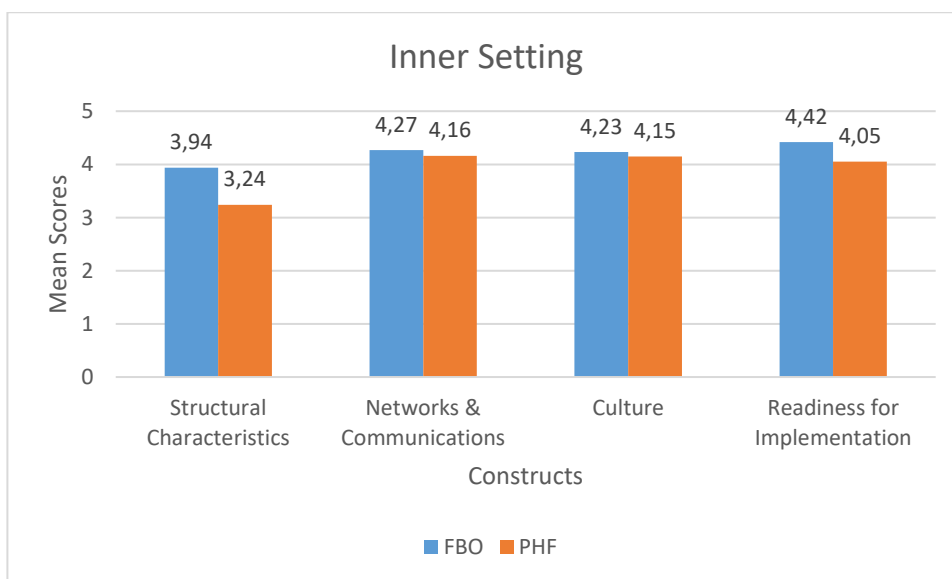


Figure 2.3:Inner Settings Results

2.1.2.4 Characteristics of Individuals

According to the results, the following individual characteristics constructs: knowledge and beliefs about intervention, self-efficacy were identified as key constructs that can motivate the successful implementation of AfyaPro-MOM Integrated system in all the four study sites. The respondents from all the four study sites expressed their confidence and competence to use the system upon implementation.

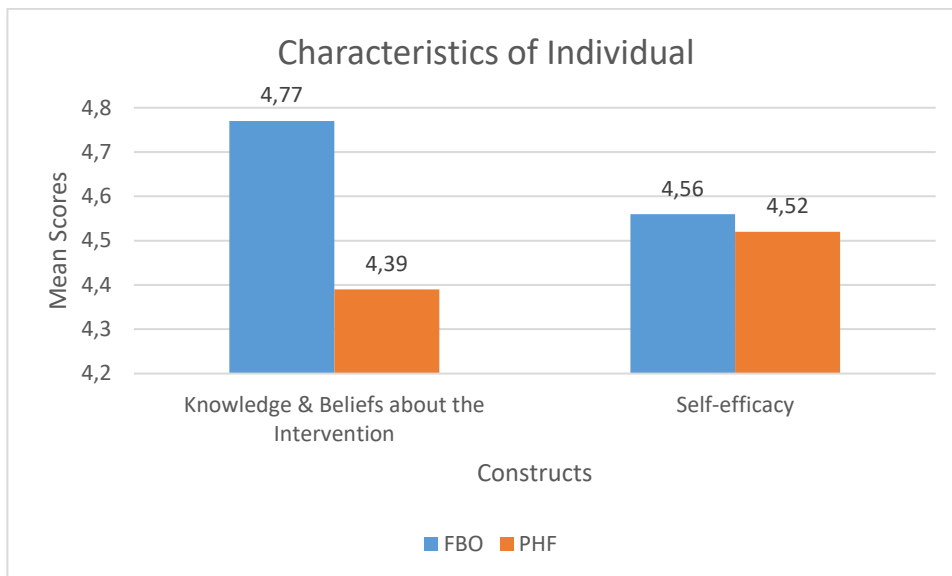


Figure 2:4: Characteristics of Individuals Results

2.1.2.5 Process of Implementation

As per the findings, the following implementation strategies constructs namely: engagement, execution, reflection and evaluation were identified as key constructs towards successful implementation of AfyaPro-MOM Integrated system in all the four study sites. However, though the findings indicate that planning was a facilitator, the respondents felt proper planning should have been undertaken with emphasis on staff training and time schedules for the implementations.

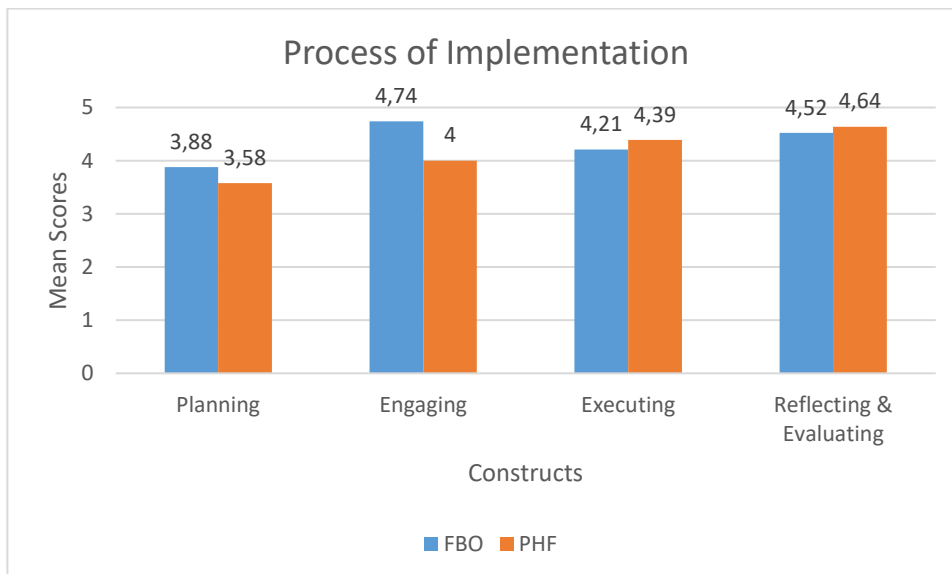


Figure 2:5: Process of Implementation

2.2 ECONOMIC AND CLINICAL ASPECTS

2.2.1 Antenatal Clinic

The results regarding the ANC are shown in the following table. In general, the number of patients seen in Mangu is 2-4 times greater than that seen in Ting'ang'a. Similarly, the number of ANC patients seen at Ruiru were almost twice those seen at Githunguri. This trend was evident for the clients registered for either 1st visit or revisit.

Table 2:4:ANC Services Utilization

Parameters	Mangu	Ting'ang'a	Ruiru	Githunguri
Total number of clients registered for 1st visit in the 12 months prior to the study	170	51	2640	1116
Total number of clients registered as revisit in the 12 months prior to the study	321	76	3548	1216
Total number of 1st visit clients with a recording of ANC profile in the 12 months prior to the study	155	48	2640	1116
Number of clients (1st visit and revisits) with an anaemia diagnosis in the 12 months prior to the study	16	9	1365	799
Number of clients (1st visit and revisits) with a high risk pregnancy diagnosis in the 12 months prior to the study	4	1	139	0
Number of clients (1st visit and revisits) referred out in the 12 months prior to the study	2	0	0	0

ANC Clients Recorded in 1st Visits vs ANC Profiles in 1st Visit

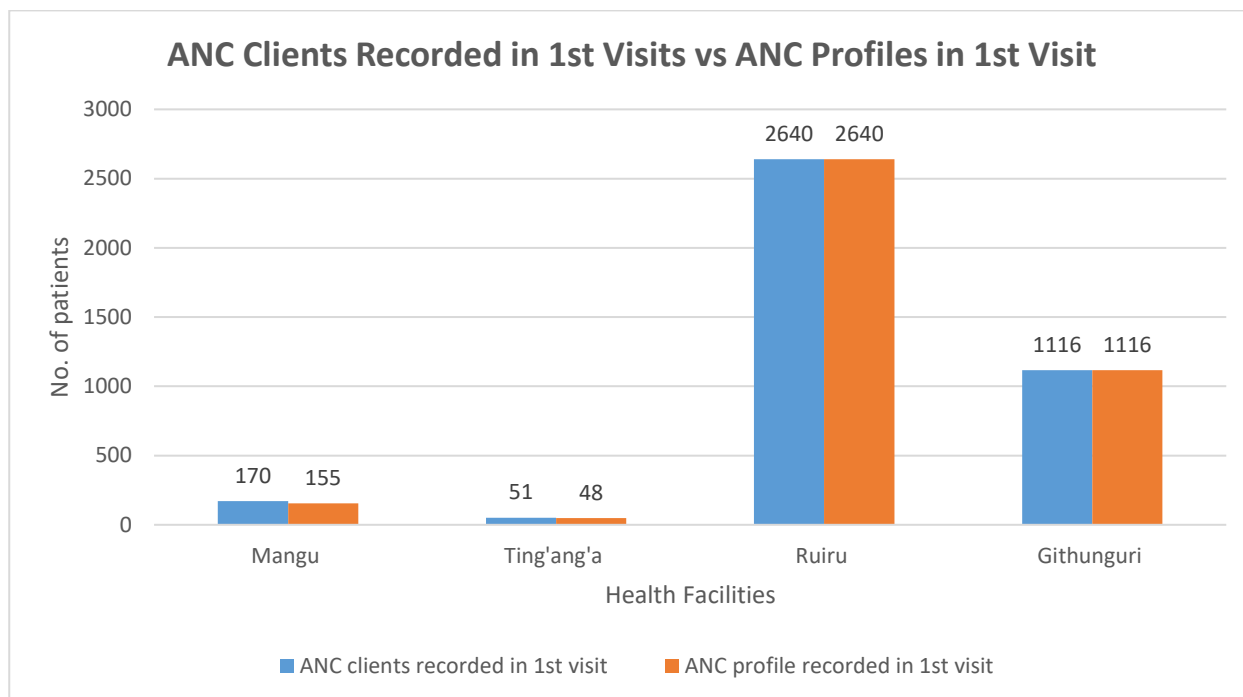


Table 2.5: ANC Clients Recorded in 1st Visits vs ANC Profiles in 1st Visit

Generally, the number of ANC clients recorded in the 1st visit for the public health facilities matched the total number of ANC profiles recorded during the 1st visits. However, the faith-based facilities exhibited some disparities between the total number of clients recorded in the 1st visit and the ANC profiles recorded.

ANC Profile vs High Risk Pregnancies

The results indicated that very minimal number of high risk pregnancies from the total ANC profiles recorded. Mangu was the only facility that recorded the highest number of high risk pregnancies (4) against the 155 ANC profiles.

Table 2.6: ANC Profile vs High Risk Pregnancies

Facility	Total ANC Profiles	High Risk Pregnancies
Ting'ang'a (ANC Profiles)	48	1
Mangu (ANC Profiles)	155	4
Githunguri (ANC Profiles)	1116	0
Ruiru (ANC Profiles)	2640	1

Comparison of 1st visits vs. Re-visits in FBO Facilities

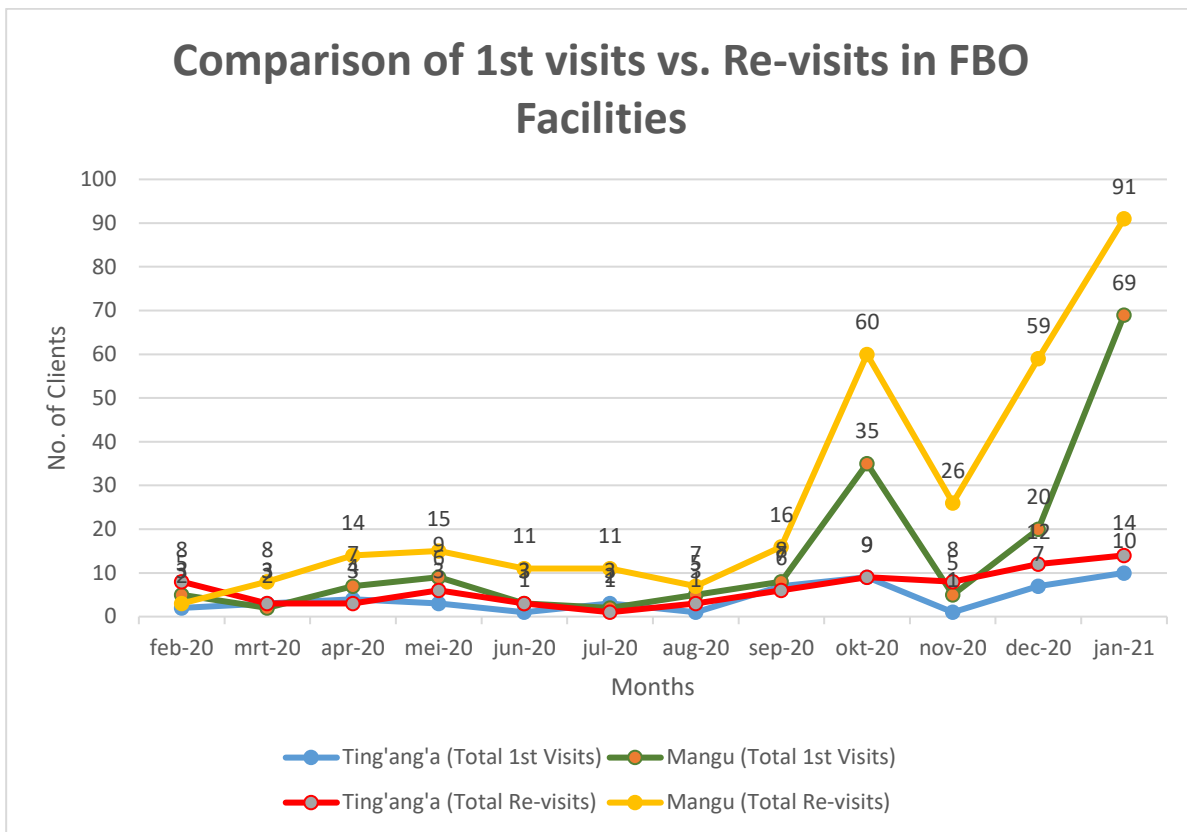


Figure 2:6: Comparison of 1st visits vs. Re-visits in FBO Facilities

The chart above denotes a comparison of total number of ANC clients in the 1st visits against the revisits at the FBO facilities. The trends appeared to be within the normal and steady ranges between February and August 2020. Interestingly, the number of clients seen in Mangu in the months of November 2020 and February 2021 was substantially greater than the numbers seen in other months. It has been stated that this phenomenon was largely caused by the COVID-19 pandemic. That is, the first case in Kenya was reported at the beginning of March 2020, which could explain the low numbers in the period from March-October 2020. However, the increase in numbers in November 2020 followed by a decrease in December 2020 requires further explanation. However, what is most important is whether the numbers of clients shown here reflect what is normally seen at these centres.

Comparison of 1st visits vs. Re-visits in Public Facilities

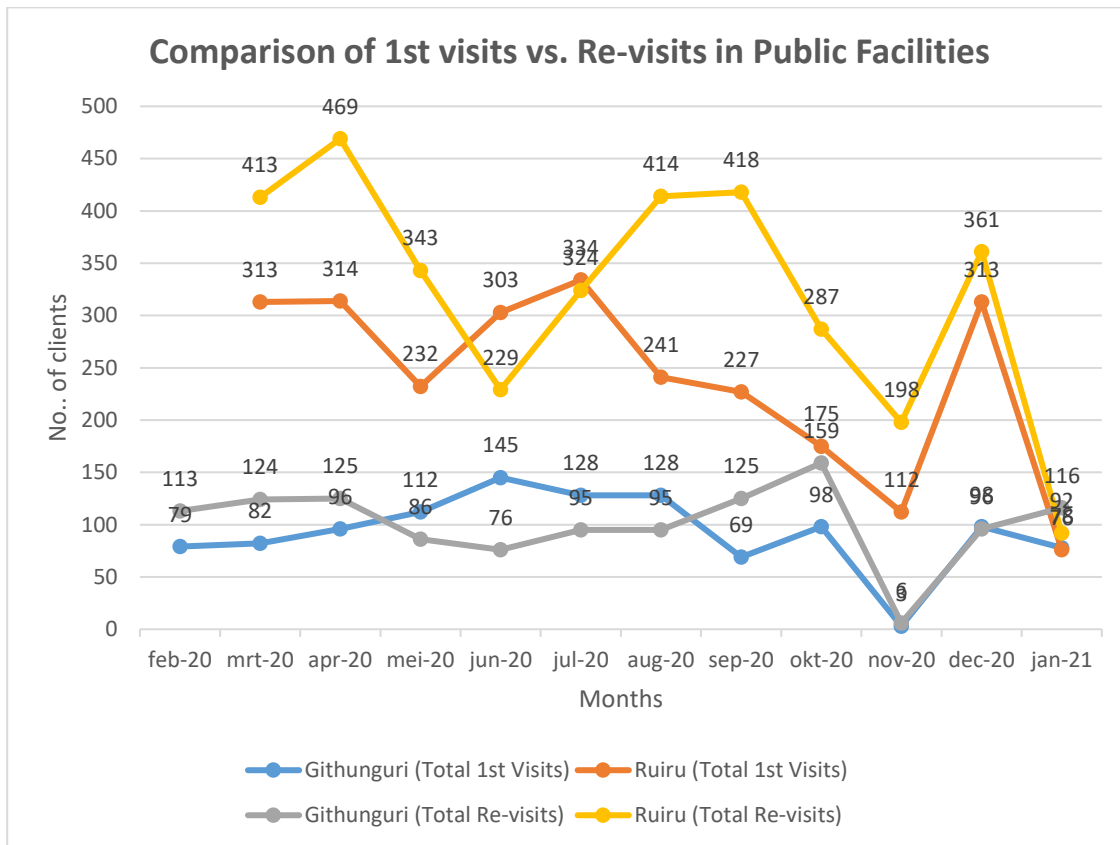


Figure 2:7: Comparison of 1st visits vs. Re-visits in Public Facilities

The chart above denotes a comparison of total number of ANC clients in the 1st visits against the revisits at the PHF. The trends appeared to be within the normal and steady ranges in Githunguri for the better part of the year 2020 with COVID-19 exhibiting minimal disruptions. However, in Ruiru, utilization of ANC services may have been affected by the COVID-19 lockdown which resulted into a drastic reduction of ANC re-visits from April to June 2020 and a similar reduction in the ANC 1st visit from July all the way to November 2020. During this period, it had been proposed to act as a COVID-19 isolation center and these changes may have created confusion amongst expectant mothers on the alternative facilities where they could seek ANC services. Moreover, the reduction in numbers may have been caused by the reallocation of resources and personnel meant for the maternal health services to combat COVID-19 pandemic.

Comparison of Number of Clients Diagnosed with Anemia

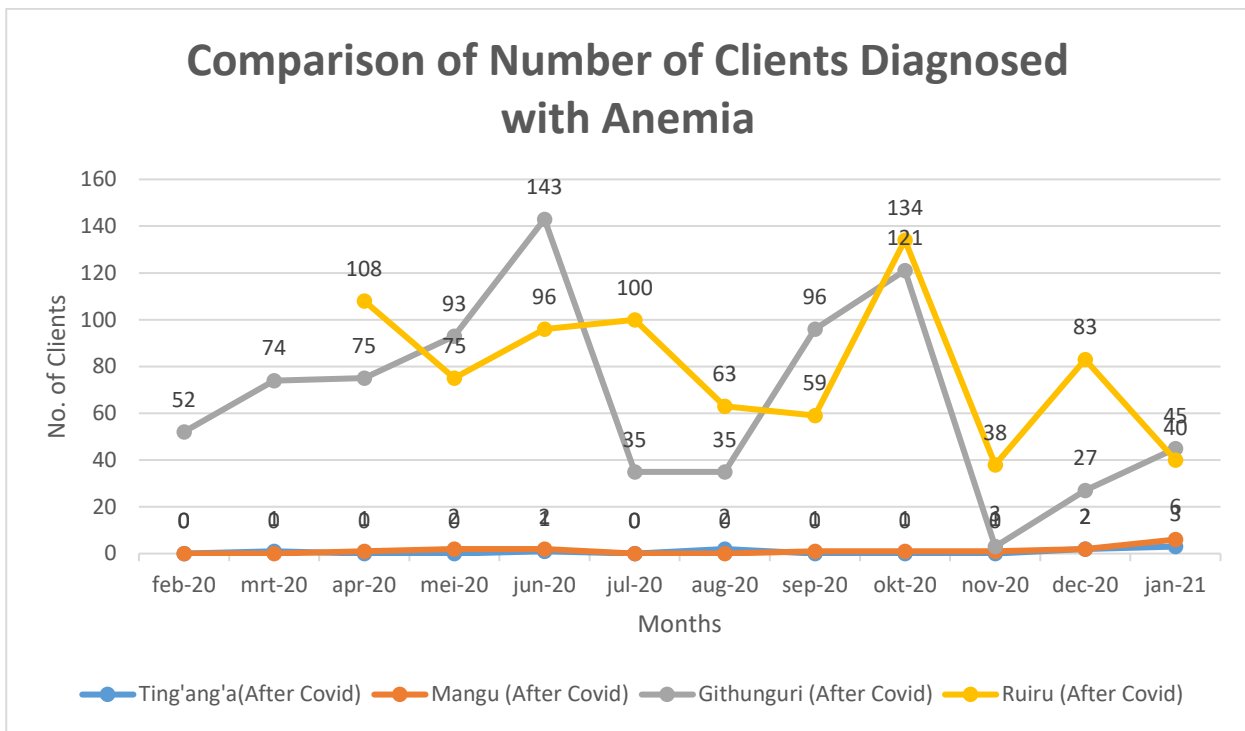


Figure 2:8: Comparison of Number of Clients Diagnosed with Anemia

The results show the anemia prevalence amongst the expectants mothers attending the ANC services in the four health facilities. The results indicate high prevalence of Anemia in the public health facilities. This could be attributed to the timing of the ANC 1st visit which literature terms as a predictor of anemia diagnosis. The late ANC 1st visits may have been attributed to COVID-19 interruptions. The low numbers of anemia diagnosis at the FBO facilities may be attributed to the low number of routine services and tests offered to mitigate anemia in pregnancies. The ANC registers did not provide evidence of such tests being carried out at the FBO facilities.

2.2.2 Service Utilization

The following figures show the variation in monthly service utilization in the 12-month period prior to the baseline study for four different parameters. Although it is uncertain how much these values reflect the numbers that were seen before the COVID-19 pandemic, certain observations can be made about the changes over the 12-month period.

Table 2:7:Service Utilization Results

	Ruiru (B4C)	Ruiru (AC)	Githunguri (B4C)	Githunguri (AC)
Total number of clients recorded at general outpatient department over the past one year under study	45,304	13,228	15,033	7,222
Total number of clients recorded at child welfare department over the past one year under study	21,084	7,183	11,585	3,855
Total number of deliveries recorded over the past one year under study	6,176	4,729	0	0
Total number of clients recorded at postnatal department over the past one year under study	3,195	2,520	1,321	2,160

We did a comparison of the total number of the total number of clients recorded at OPD at the public healthcare facilities one year before and one year after COVID-19 pandemic and noted that the numbers were higher before the pandemic with Ruiru and Githunguri recording 45,304 and 15,033 respectively. However, during the covid period, the numbers have gone down for both facilities with Ruiru and Githunguri recording 13,228 and 7,222 respectively. This is about a one third reduction for Ruiru and one half for Githunguri.

Total number of clients recorded at the child welfare clinic in Ruiru and Githunguri over the past one year under study were 21,087 and 11,585 respectively. Ruiru recorded 13,901 less clients in CWC in the one year after the pandemic while Githunguri healthcare recorded 7,730 less clients in CWC in the one year after the pandemic.

Total number of deliveries recorded in Ruiru and Githunguri over the past one year under study were 6,176 and none, respectively. Ruiru recorded 1,447 deliveries less than the period before COVID-19 pandemic. Githunguri healthcare facility did not have any deliveries either before or after the pandemic as they do not have a maternity department.

Total number of clients recorded at the postnatal department in Ruiru and Githunguri over the past one year under study were 3,195 and 1,321, respectively. Ruiru recorded 675 less postnatal clients one year after the pandemic while Githunguri recorded 839 less postnatal clients one year after the pandemic.

The first figure shows the number of visits recorded at the general outpatient departments at the four facilities over month 1 -February to month 12 -January . The number of visits in the NGO sites seems to be rather stable while the number of visits decreased in the two public sites. The drop seen in Ruiru is particularly drastic.

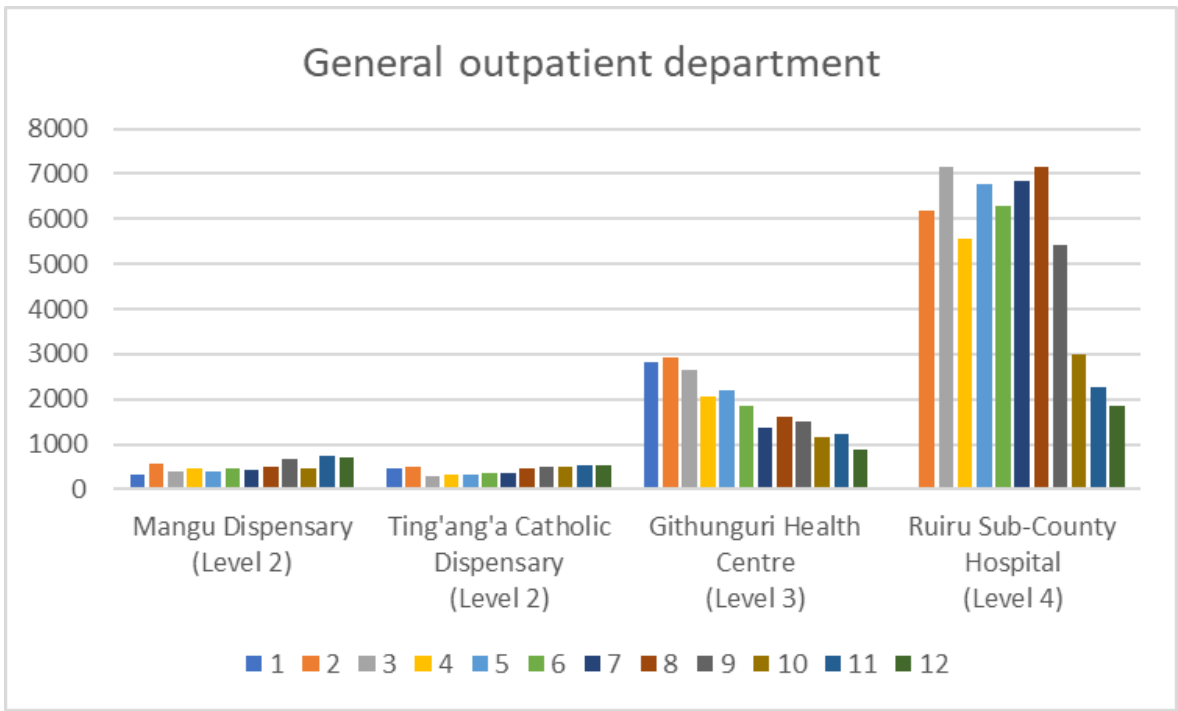


Figure 2:9:General Outpatient Results

The following figure shows the number of visits recorded at the child welfare department. The number of visits in the NGO sites seems to be somewhat stable, although the numbers per month go up and down in Mangu. Regarding the two public sites, the number of visits seen in the first two months seems higher than the later months, particularly with Ruiru.

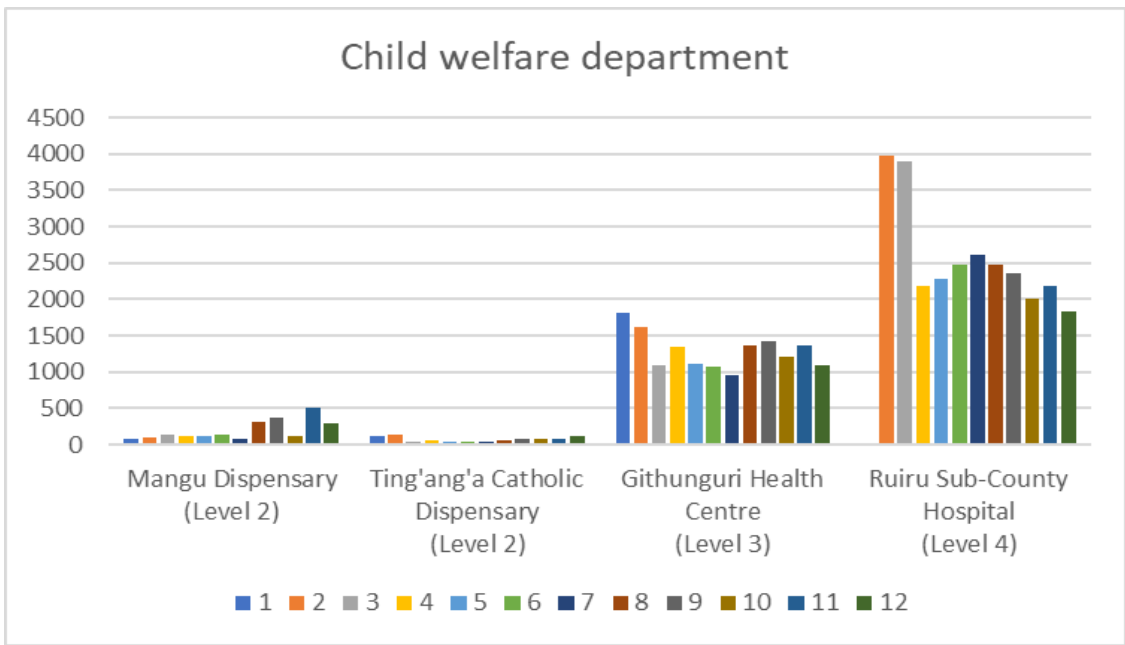


Figure 2:10:Child Welfare Visits Results

The following figure shows the number of deliveries recorded. The monthly number of deliveries in the Mangu was very low initially, although the numbers per month appear to have increased slightly towards the end of the period. Regarding Ruiru hospital, the number of deliveries seen in the first seven months is somewhat higher than the number in the later months.

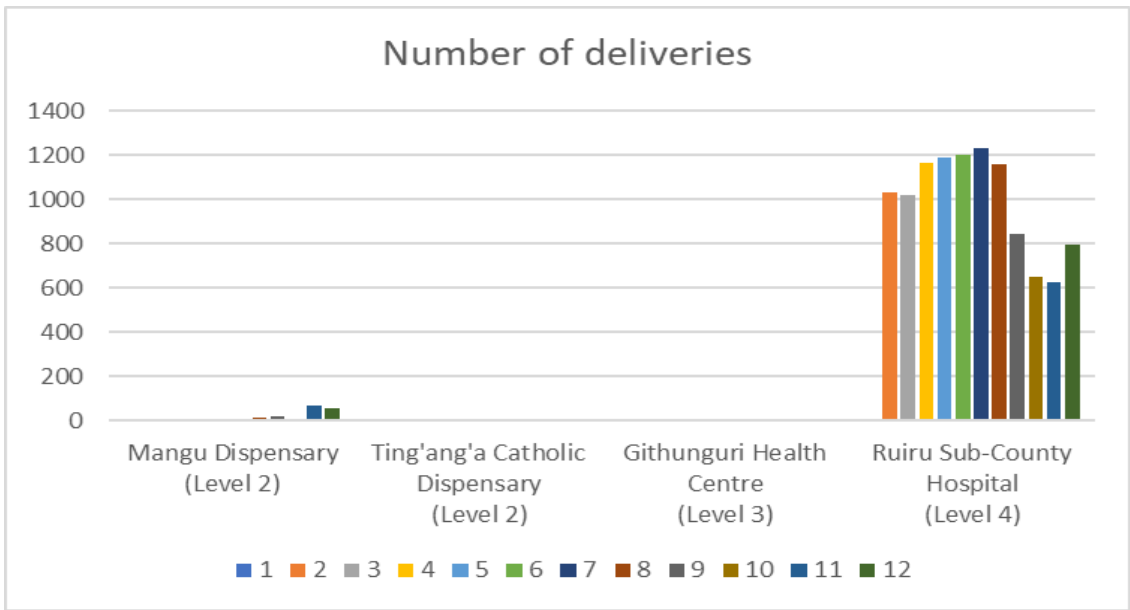


Figure 2:11: Number of deliveries results

The following figure shows the number of clients seen at the postnatal department. There are two striking results (one in Ting'ang'a and one in Githunguri), which are very likely to be typographical errors. If that is the case, then the monthly number in Githunguri shows a stable pattern, followed by a reduction to 50-70% in the last four months. Ruiru hospital shows a reverse pattern, since the frequencies in the first five months are actually lower than those in the last seven months.

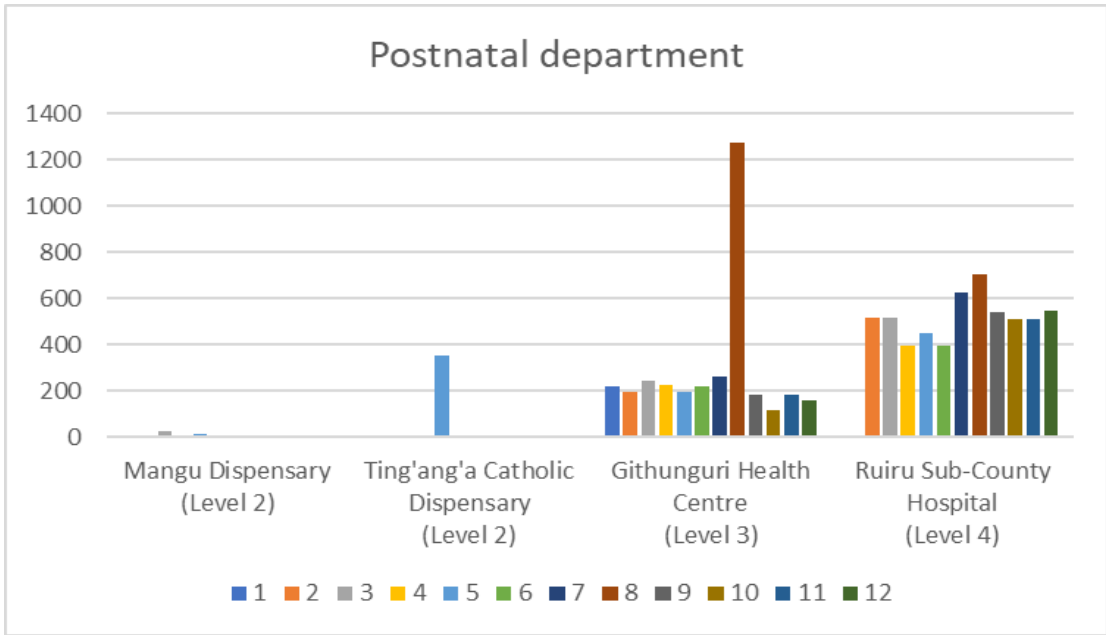


Figure 2:12: Client Numbers at Postnatal clinic

2.2.3 Patients with diabetes or hypertension

The demographics for patients with diabetes or hypertension are shown in the following table. Most patients in the NGO sites were 60+ years and most patients were female. In contrast, the patients seen in the public care facilities were younger and mainly male.

Table 2:8: Patients with Diabetes/Hypertension:

	Mangu Dispensary (Level 2)		Ting'ang'a Catholic Dispensary (Level 3)		Githunguri Health Centre (Level 3)		Ruiru Sub-County Hospital (Level 4)	
PATIENTS WITH DIABETES OR HYPERTENSION	N	%	N	%	N	%	N	%
N	15		18		10		42	
Age								
20-29 years	0	0%	0	0%	0	0%	2	5%
30-39 years	0	0%	0	0%	0	0%	3	7%
40-49 years	1	7%	1	6%	2	20%	11	26%
50-59 years	4	27%	2	11%	5	50%	13	31%
60 years and above	10	67%	15	83%	3	30%	13	31%
Male, %	7	47%	6	33%	10	100%	30	71%

2.2.3.1 Patients with diabetes

The table below provides some details about the patients with diabetes seen at the facilities. In the two FBO/NGO facilities, 17 patients with diabetes were seen. Most of them (14/17, 82%) were 60 years and above and most were male (10/17, 59%). Of these 17, 35% (6/17) had comorbidities and diabetes complications, which consisted of hypertension (n=5) and neuropathy (n=1).

At the two public facilities, twenty-two patients with diabetes were seen. These patients were generally younger than the ones seen at the NGO facilities. Thirteen of these patients (59%) had comorbidity or diabetes complications.

The table also shows the frequency of measurements in the past year. The overall pattern looks similar in the two types of facilities. Both blood pressure and random blood glucose tests were performed fairly often. However, fasting blood glucose and HbA1c tests were seldom performed. These low frequencies raise the question of whether the low frequency of an HbA1c measurement can be seen as a sign of inappropriate or suboptimal care in the different sites.

	Combined population (FBO sites)		Combined population (public sites)		Comments
PATIENTS WITH DIABETES	N	%	N	%	
N	17		22		
Age					
30-39 years	0	0%	3	14%	
40-49 years	2	12%	5	23%	
50-59 years	1	6%	12	55%	
60 years and above	14	82%	2	9%	
Male	10	59%	5	23%	
Comorbidity/diabetes complications	6	35%	13	59%	Faith-based sites: Five patients with hypertension, one patient with neuropathy.
Blood pressure measurement					
- 1st visit of past year, %	15	88%	11	50%	
- 2nd visit of past year, %	8	47%	6	27%	
- 3rd visit of past year, %	5	29%	7	32%	
- 4th visit of past year, %	7	41%	8	36%	
Random blood glucose measurement					
- 1st visit of past year, %	7	41%	9	41%	
- 2nd visit of past year, %	5	29%	7	32%	
- 3rd visit of past year, %	5	29%	2	9%	
- 4th visit of past year, %	5	29%	1	5%	
Fasting blood glucose measurement					
- 1st visit of past year, %	1	6%	0	0%	
- 2nd visit of past year, %	0	0%	1	5%	
- 3rd visit of past year, %	1	6%	0	0%	
- 4th visit of past year, %	0	0%	1	5%	
HbA1c measurement					
- 1st visit of past year, %	0	0%	0	0%	
- 2nd visit of past year, %	0	0%	0	0%	
- 3rd visit of past year, %	1	6%	0	0%	
- 4th visit of past year, %	1	6%	1	5%	
Foot and eye exams not shown here.					

Table 2:9: Profiles for Diabetic Patients

	Mangu		Ting'ang'a Catholic		Combined		Comments
PATIENTS WITH DIABETES	N	%	N	%	N	%	From report (version April 1, 2021)
N	7		10		17		
Age							
40-49 years					2	12%	
50-59 years					1	6%	
60 years and above					14	82%	
Male					10	59%	
Comorbidity/diabetes complications					6	35%	Five patients with hypertension, one patient with neuropathy.
Blood pressure measurement							
- 1st visit of past year, %					15	88%	
- 2nd visit of past year, %					8	47%	
- 3rd visit of past year, %					5	29%	
- 4th visit of past year, %					7	41%	
Random blood glucose measurement							
- 1st visit of past year, %					7	41%	
- 2nd visit of past year, %					5	29%	
- 3rd visit of past year, %					5	29%	
- 4th visit of past year, %					5	29%	
Fasting blood glucose measurement							
- 1st visit of past year, %					1	6%	
- 2nd visit of past year, %					0	0%	
- 3rd visit of past year, %					1	6%	
- 4th visit of past year, %					0	0%	
HbA1c measurement							
- 1st visit of past year, %					0	0%	
- 2nd visit of past year, %					0	0%	
- 3rd visit of past year, %					1	6%	
- 4th visit of past year, %					1	6%	
Foot and eye exams not shown here.							

2.2.3.2 Patients with hypertension

At the two NGO facilities, twenty-nine patients with hypertension were seen. Most of them (28/29, 97%) were 60 years and above and most were female (19/29, 66%). The prevalence of comorbidities was small in this group (2/29, 7%); both of the patients with comorbidity had retinopathy.

At the two public facilities, twenty-eight patients with hypertension were seen. These patients were generally younger than the ones seen at the NGO facilities. None of these patients had any comorbidity that was documented.

The table also shows the frequency of measurements in the past year. Blood pressure was measured fairly often in both types of facilities. The fact that blood pressure was not assessed at every visit can raise questions about whether the quality of care is appropriate and whether it can be improved. Note that blood glucose was assessed more often in NGO facilities, likely because more patients in those facilities had both diabetes and hypertension.

	Combined population (FBO sites)		Combined population (public sites)		Comments
PATIENTS WITH HYPERTENSION	N	%			
N	29		28		
Age					
20-29 years			1	4%	
30-39 years	0	0%	0	0%	
40-49 years	0	0%	8	29%	
50-59 years	0	0%	8	29%	
60 years and above	28	97%	11	39%	
Male	10	34%	9	32%	
Comorbidity/hypertension complications	2	7%	0	0%	Faith-based sites: Two patients with retinopathy.
Blood pressure measurement					
- 1st visit of past year, %	23	79%	17	61%	
- 2nd visit of past year, %	24	83%	13	46%	
- 3rd visit of past year, %	20	69%	10	36%	
- 4th visit of past year, %	21	72%	5	18%	
Random blood glucose measurement					
- 1st visit of past year, %	9	31%	1	4%	
- 2nd visit of past year, %	10	34%	0	0%	
- 3rd visit of past year, %	7	24%	0	0%	
- 4th visit of past year, %	9	31%	0	0%	
Fasting blood glucose measurement					
- 1st visit of past year, %	0	0%	0	0%	
- 2nd visit of past year, %	1	3%	1	4%	
- 3rd visit of past year, %	0	0%	1	4%	
- 4th visit of past year, %	0	0%	0	0%	

Table 2:10: Profiles for Hypertension Patients

PATIENTS WITH HYPERTENSION	Mangu		Ting'ang'a Catholic		Combined		Comments
	N	%	N	%	N	%	From report (version April 1, 2021)
N	12		17		29		
Age - 60 years and above, %					28	97%	
Male					10	34%	
Comorbidity/hypertension complications					2	7%	Two patients with retinopathy.
Blood pressure measurement							
- 1st visit of past year, %					23	79%	
- 2nd visit of past year, %					24	83%	
- 3rd visit of past year, %					20	69%	
- 4th visit of past year, %					21	72%	
Random blood glucose measurement							
- 1st visit of past year, %					9	31%	
- 2nd visit of past year, %					10	34%	
- 3rd visit of past year, %					7	24%	
- 4th visit of past year, %					9	31%	
Fasting blood glucose measurement							
- 1st visit of past year, %					0	0%	
- 2nd visit of past year, %					1	3%	
- 3rd visit of past year, %					0	0%	
- 4th visit of past year, %					0	0%	

2.2.4 Economic and Financial Evaluation

An overview of different types of resource use for all four sites is provided in the table below. Here we can see that there was a very low frequency of hospitalization. Only two hospitalizations were seen, both in Ruiru; one of these was maternity-related, presumably for delivery of a baby.

Regarding outpatient care, almost all patients were seen at least once by a healthcare professional. In the NGO facilities and Githunguri, this was usually a Kenya registered nurse or clinical officer. In contrast, most patients at Ruiru Sub-county hospital stated that they had received 'other type of care' by a different healthcare professional, which turned out to be a 'physician' or 'clinician'. In fact, this seemed to be the case for all patients in all sites who stated that they had received 'other type of care'.

Regarding prescription medicines, most of the patients had taken prescription medicines in the previous months, only some of which were related to either diabetes (e.g. metformin) or hypertension. Patients occasionally received treatment for conditions other than hypertension or diabetes.

As noted in the clinical impact report, the team obtained more information regarding non-medical costs (e.g., transport costs) from the patients during a focus group discussion session.

Overview of resource use

Table 2:11:Economic and Financial Evaluation

	Mangu Dispensary (Level 2)			Ting'ang'a Catholic Dispensary (Level 3)			Githunguri Health Centre (Level 3)			Ruiru Sub-County Hospital (Level 4)		
	N	%	(missing values)	N	%	(missing values)	N	%	(missing values)	N	%	(missing values)
In-hospital care and daycare												
Hospitalised?	0	0%	0	0	0%	0	0	0%	0	2	5%	0
Number of hospitalisations (if hospitalised)	n/a			n/a			n/a			2	5%	0
Number of hospital days	n/a			n/a			n/a			4.5		
Number of days intensive care	n/a			n/a			n/a			n/a		
Number of tests												
Number of procedures (surgery)												
Emergency department visit?	1	7%	0	0	0%	0	0	0%	0	1	2%	1
Taken by ambulance to the hospital?	0	0%	0	0	0%	0	0	0%	0	1	2%	0
Daycare visit (yes vs no)?	0	0%	1	0	0%	0	0	0%	0	0	0%	3
Other care (e.g. rehabilitation)	0	0%	0	0	0%	0	0	0%	0	0	0%	0
Outpatient care												
Any outpatient clinic visit (yes vs no)?	13	87%	0	13	81%	6	9	100%	1	42	100%	0
Visit with a cardiologist (yes vs no)?	0	0%	0	0	0%	2	0	0%	1	2	5%	0
Visit with an endocrinologist (yes vs no)?	0	0%	0	0	0%	2	0	0%	1	1	2%	0
Visit with Kenya Registered nurse (yes vs no)?	2	14%	1	3	25%	6	0	0%	1	0	0%	0
- if yes, number of visits	2.0		1	2.0		6	-			-		0
Visit with Kenya Registered clinical officer (yes vs no)?	12	86%	1	9	75%	6	8	89%	1	7	17%	0
- if yes, number of visits	2.8		1	2.1		6	3.0			2.1		0
Any other type of care (e.g., GP, physiotherapist)?	14	93%	0	11	69%	2	1	11%	1	37	88%	0
- if yes, number of visits	2.6		1	2.4		7	3.0		0	2.1		0
Drugs												
Number of patients that took medication in the last 3 months	15	100%	0	15	83%	0	10	100%	0	42	100%	0
Metoprolol use (yes vs no)?	1	7%	0	0	0%	0	0	0%	0	0	0%	0
Furosemide use (yes vs no)?	0	0%	0	0	0%	0	0	0%	0	0	0%	0
Hydrocortisone cream use (yes vs no)?	1	7%	0	0	0%	0	0	0%	0	1	2%	0
Use of other medication (yes vs no)?	13	87%	0	15	83%	0	8	80%	0	39	93%	0

n/a = not available at this time.

3 OBSERVATIONS

Below we summarize the observations on various different aspects.

Facility Leadership

The leadership of the four facilities appeared to have been in charge of the running of the operations. Additionally, they involved their staff in the initial planning stages of the project. It was observed that the medical superintendent in Ruiru Sub county hospital held a number of regular meetings with staff from different departments with a view to keep tabs on activities in those departments. This was noted to be time consuming and hindering service provision at the facility. The AfyaPro-MOM integrated solution was seen as an opportunity to enable the medical superintendent to have immediate access to the records in all the departments just with a single click.

Who does this?

We also observed staff working on rotational basis in different service points more so in Mang'u dispensary and Ruiru Sub-county hospital. However, what wasn't clear is how the staff allocation to different stations is rationalized and how this is managed.

Health facility staff profile

At the FBO/NGO Facilities, we observed that the healthcare workers including the facility administrators were predominantly women and aged between 24 years and 40 years. Their educational training was diploma in their respective professions - nurses, clinical officers, lab technicians, health information and records officers, etc.. However, at the Public facilities and particularly at the Ruiru Sub-county hospital, some healthcare workers had university education, and others with a broad mix of specialization, while the age range was broader with many members of staff above 40 years of age.

Patient profile

We observed that the majority of the patients attending the clinics at both the Diabetes and Hypertension clinics were predominantly female, elderly - 60 years of age and above. On gender this is consistent with health seeking behaviour. In addition, an interesting observation is that a number of those in diabetes clinics cited eye-sight challenges. This we expected could have an impact on the mobile app uptake.

Patient data files:

Missing and incomplete data in patient records was observed at both FBO/NGO health facilities. In some cases, patients carried away their patient record books, meaning that the facilities did not retain complete patient records.

From these patient files we also observed the following:

- Their files were detailed and had more than four visits in the last one year and had most of the required data items captured on the patient record i.e weight. However, some were not captured e.g. height, blood sugar, etc
- Most of the medication had the prices indicated and most spent over Ksh 1,000 per clinic on prescription refills depending on the patient.
- A number of patients from our sample were attending both the Diabetes and the Hypertension clinics. However, we recruited a patient for only one of these conditions.
- We also checked from their files and found that the clinic nurse always indicates the next date they are supposed to come for their clinics on the form (a patient reminder module would cater for this need). In some cases, patients needed to be recalled to receive their test results (a mobile app could equally facilitate this, reducing the number of visits to the health facility).
- Abstracted data from the patient files at the PHFs was rich in terms of the variety of tests done on the patients as well as drugs prescribed as compared to the FBO/NGO facilities where some tests were missing e.g. weight and height measurements among others.
- Abstracted data from ANC and NCD clinics some tests were notably missing. For instance, in some cases where the service provider recommended some tests to be done on the NCD patients, their results were never indicated anywhere on the patient file. This raises questions as to whether the same tests were being requested more than once.

- In some cases, patients were referred outside the facility for tests on grounds that the reagents may have run out of stock which may not have been the case. There was a general feeling about monetary gains arising from referred patients. This can be addressed through the inventory module in the AfyaPro-MOM solution to reduce outside referrals

Long Queues:

Generally, both FBO/NGO and PHF witnessed long queues especially at the triage, cash offices, pharmacies and laboratories. At the Mangu dispensary, even longer queues were evident at the dental clinic due to large numbers of patients seeking dental services yet there was only one dentist serving. At the Ruiru sub county hospital, high queues were observed at the cash payment section, firstly due to the size of the operating space. Secondly as was later noted, the cashiers do the coding for drugs so as to bill and this process is tedious and time consuming. The coding of drugs is an opportunity for which AfyaPro-MOM solution can help in alleviating. Additionally, integrating mPesa and cashless payment into the AfyaPro-MOM solution

The Medical Superintendent at Ruiru Sub-County Hospital kept abreast with the client flows and would reallocate staff to the sections that appeared to be having long queues.

Infrastructural Layout:

Generally, the workflows at both FBO/NGO and PHF were designed around the current physical setup of the facility. For instance, Mangu the building had its rooms well labeled from 1 to 8 from which the different services were offered. Of key interest, the triage and patient registration were carried out at the waiting lobby with patient files remaining at the waiting lobby, thus compromising patients' privacy. Ting'ang'a on the other hand did not have sufficient space which forced the different services to be offered at the same service point, for instance the cash office and registry were in the same room. Githunguri health centre converted the security guard's office into a patient registration point as well as the records office. Ruiru sub-county hospital had services structured based on space availability which significantly had an effect on the clinical workflows. For instance, the registry was stationed far away from the other service points. Incidentally the hospital had completed building a new building block where all the services were to be transferred with exception of the maternity wing and theatre.

Of all the four study sites, only Ruiru sub county hospital had some level of ICT infrastructure in place. And this was majorly at the OPD.

Storage Space:

For all the facilities at this baseline, prompt availability and access to patient data is a major challenge. Challenges included space for storage of patient files and patients carrying home their patient records. Once the AfyaPro-MOMs integrated solution is put in place, we anticipate that patient clinical data will be readily available and accessible, including supporting referrals and this will lead to enhanced quality of care.

New Technology - cloud based solution

At one point in the discussion leading to implementation of AfyaPro-MOMs solution in the public health facilities, Kiambu county department of health team were uncomfortable with the solution's design that was provided as a cloud hosted service. Understandable concerns on data privacy, data ownership, access to the patient data almost derailed the project. To mitigate this, a system access and data management protocol was developed alongside an additional implementation that would manage regular database replication on a server within the hospital premises.

Workflows

The diagram below illustrates the current patient workflow for one process at the Mang'u Dispensary. This is also similar to that of Ting'ang'a Catholic Dispensary. At both facilities, we noted that several activities were handled by the same actor, e.g. a nurse was involved in patient clerking (registration) as well as triaging.

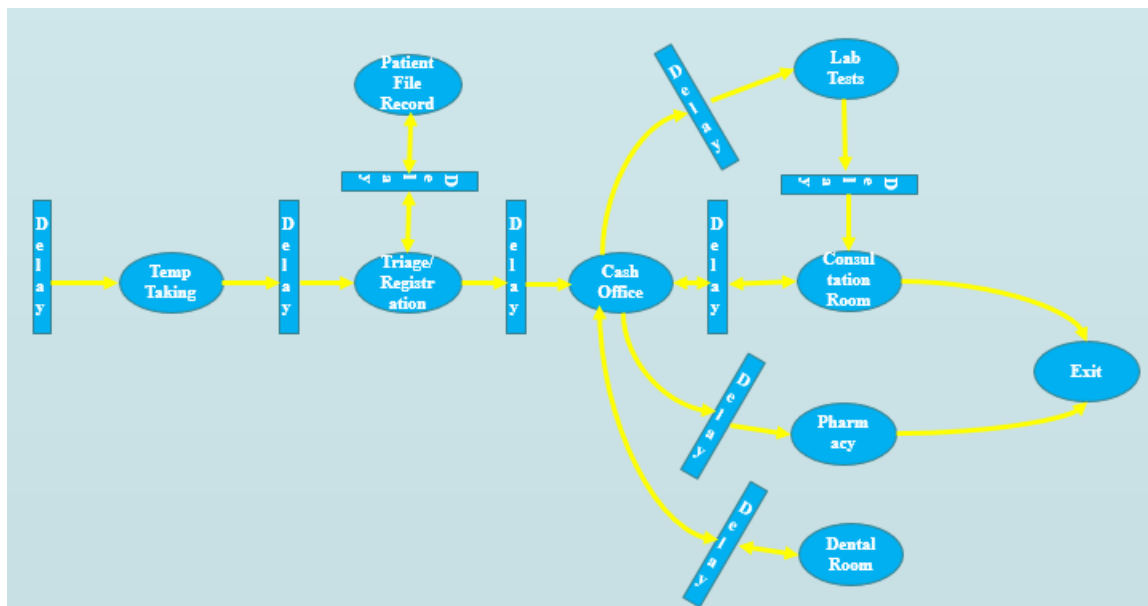


Figure 3:1:FBO Clinical Workflow

One observation is that some of the process nodes that exist in the manual system are bound to change due to the fact that the EHR system will automatically facilitate these processes. We will use Petri nets to model workflow and use system time stamps to create a replica of the patient workflow.

The diagram below illustrates the current patient workflow for one process at the Githunguri public health facility. This is different from the Ruiru level 4 district public health facility. At this facility, they don't have a cash office as all the services are provided free of charge to the patient (consultation, drugs, lab tests). However, after an interaction with some patients, they informed us that they indeed pay for the lab tests

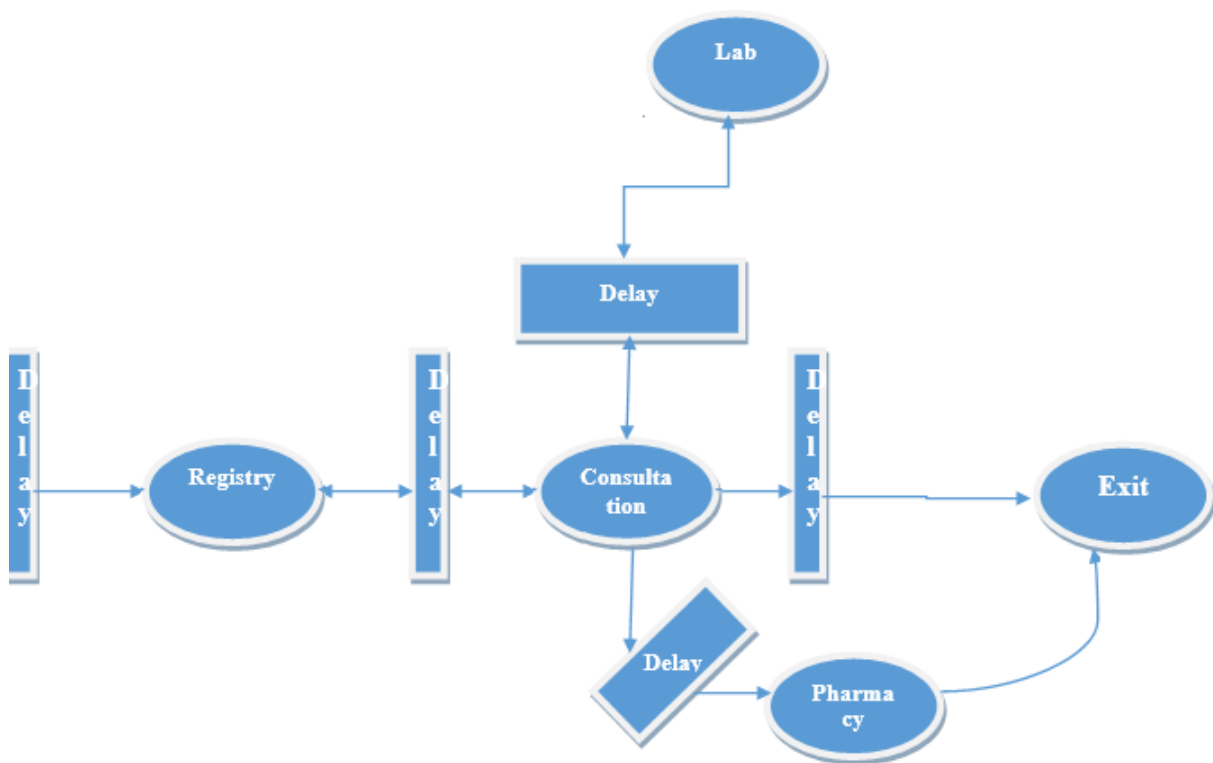


Figure 3:2:PHF Clinical Workflow

One observation is that some of the process nodes that exist in the manual system are bound to change due to the fact that the EHR system will automatically facilitate these processes. Additionally, the EHRs system might have to be slightly configured to accommodate the free service provision in this health facility. We will use Petri Nets to model workflow and use system time stamps to create a replica of the patient workflow

COVID-19:

It is clear that the onset of the COVID-19 case reports in March 2020 after the first case was reported in Kenya impacted negatively on client visits to all the four facilities. However, the clients' visits started to show a marked increase from October/November 2020 six months after. This resulted from the cessation of movement and curfew directives by the Ministry of Health and fears around contracting COVID-19 at facilities.

The COVID-19 lockdown may have caused some patients to stop clinic follow-ups at their primary facilities while others avoided the use of matatus (public transit) and instead opted to go to the nearest clinics.

4 DISCUSSION

The economic aspect of this report describes the baseline situation for all of the four sites (two NGO sites and two public facilities). A baseline situation, including the period prior to the baseline situation, will help to assess the economic and financial value of the AfyaPro-MOM solution. However, economic evaluations of any intervention require a comparison of two alternative ways to provide care. Therefore, this baseline report only describes the current way. The second way, using the AfyaPro-MOM solution, will be assessed later this year. The results of that second way will be described in the midline and endline assessments. Once the second way has been described, it will be possible to make comparisons of the two ways, including the differences in economic outcomes.

Regarding maternal care patients, the results shown above in section 2.2.1 strongly suggest that the COVID-19 pandemic affected the frequency of visits in the period from March to October 2020. The increase in numbers in November 2020 and February 2021 likely reflect variation in COVID-19-related health-seeking behavior and center-level operations rather than healthcare needs. It would be important to find out whether the numbers of clients seen in the 12 months prior to the baseline measurement reflect what is normally seen at both centers. Even an overview of the annual number of visits over the previous 3-5 years would be useful. On the bright side, we anticipate using the AfyaPro-MOM solution, it will be possible to identify when patients commence ANC initiation visits periods as the increase in numbers seen in November 2020 and February 2021 may be linked to maternal patients commencing their ANC visits near delivery time.

Regarding service utilization in general, certain fluctuations in utilization over the 12-month period prior to the baseline measurement can be seen. Currently, it is not yet known how much these are normal, seasonal fluctuations or COVID-19-related fluctuations. It will be important to determine the reasons for the variation to ensure a valid assessment of the impact of AfyaPro-MOMS on resource utilization.

Although this report only describes the baseline situation, certain comments can be made about the likelihood that the AfyaPro-MOMS integrated solution could have a beneficial economic and financial benefit in these sites, in particular for the patients with diabetes or hypertension. The observed results for patients with diabetes or hypertension may suggest that the AfyaPro MOMS integrated solution cannot lead to cost-savings. That is, the care intensity (and thereby costs) seen with these patients appears to be rather low. If this is correct, it would suggest that there is no room to reduce costs by

implementing any new system. However, there are at least two different reasons why that conclusion is premature. First, it is quite possible that the patients included in the baseline study are being undertreated; use of a new system (like AfyaPro-MOM) could ensure that patients receive appropriate care involving more effective, though perhaps more costly, therapies than what they currently receive. Additionally, through the use of MOM, patients can get an opportunity to receive remote care. This will enable the patients to save time and cost spent by the patient in travelling to the facility seeking care. More effective treatment, in this context, will mean better health outcomes and improved quality and quantity of life, particularly through the reduction in risk of diabetes-related disorders (microvascular and macrovascular complications) and hypertension-related disorders (like stroke). Second, and probably more important, the patients included in the baseline study may not reflect the actual population of patients seen at these sites. If that is true, then it will be important to find out more about the actual patient population and their care intensity under normal circumstances (i.e., what was seen before the COVID-19 pandemic).

One final note needs to be made about how cost-effectiveness relates to policy making. First of all, decisions about implementing new interventions should not simply be based on costs. One needs to consider the impact on health outcomes, for example. Ideally, we would like to see that a new patient management strategy, like the AfyaPro MOMs integrated solution, reduces costs without reducing the quality of care (or even improving it). In that case, it would likely be viewed as worth implementing. However, a new strategy does not have to reduce costs in order to be worth implementing. It's possible to achieve cost saving in particular instances, but in other instances i.e NCD patients better care may imply a longer life with the NCD and higher costs for the patient. Sometimes better care simply requires more healthcare activities (or medicines), which can lead to greater costs. The question then is, how much does the strategy improve the quality of care and how much will it increase costs? Therefore, it would be worthwhile to examine the quality of care (e.g., how many patients were treated according to local guidelines) in the baseline and endline studies. The true importance of any change in costs can only be assessed by knowing the accompanying change in quality of care. In other words, a complete economic evaluation considers changes in both costs and quality of care (e.g., clinical effectiveness or health outcomes).

The healthcare workers at faith-based facilities were relatively young with their ages predominantly being 20 to 35 years of age whereas in public health facilities their age range between 30 to 39+ years of age. This caliber of staff are generally tech savvy with a good appreciation of ICTs and technology use. As was expected the age profile at public health facilities was slightly different.

At the various clinics in faith-based facilities report generation was indicated as a task that took up a significant amount of time and effort. Having report generation modules in the AfyaPro-MOMs integrated solution would enhance its adoption by the various healthcare workers who must generate a wide range of mandatory reports while also reducing reporting errors. This would result in quality data.

At the public health facilities, management of outpatient department (OPD) data was identified as the nightmare for the medical superintendent in charge due to the high number of patients visiting the health facilities and the records being manual. The HRIO expressed optimism that having OPD via the EHRs would make it easier for the HRIOs who are required to provide different statistics to the county from time to time.

The predominant patient costs include cost of transport to the facility, cost of medicines and test. It was reported that occasionally patients miss their appointment due to lack of transportation to the facility, resulting in non-adherence to their regular treatment. In terms of costs, there are opportunities to reduce the operational costs of the facility through reduced staff time to generate reports.

The EHR will likely improve the care process if well adopted, well implemented and users supported judging from feedback from our questionnaires and general observations. Areas such as patient data completeness, data quality, data availability will be enhanced. This AfyaPro-MOM integrated digital health solution has the potential to provide value to the patient care process. This will include enhancing the patient workflow.

Some key features in the EHR such as patient reminders for follow up once automated on the systems will enhance patient care. In addition, relaying test results using the mobile apps would be of great value.

It was noted that some hypertension patients regularly took their own blood pressure readings at home and would report this to the clinician or nurse at the clinic. The AfyaPro MOMs integrated solution would facilitate an enhancement of this self-reporting using the mobile app.

5 CONCLUSION

In all the four facilities availability and completeness of patient records was a challenge. Even though the numerous facility registers were available, extracting information for routine reporting is a frequent and laborious task. Storage and archival of paper-based records requires lots of storage space and increases waiting time during record retrieval at the facilities. The implementation of a modular facility wide electronic health records (EHR) system would go a long way in resolving these challenges. The availability and access to patient data on demand has the potential of enhancing the quality of healthcare in all the four participating facilities. This would enable the clinician to make better consistent and quality decisions. Opportunities for benefiting from clinical decision support driven by the protocols, rules and patient data would further assure quality healthcare.

From the baseline data from the four facilities, healthcare services were disrupted by the COVID-pandemic. This pandemic has heightened the need for digital health solutions that can support the continuum of healthcare provision remotely (i.e. tele-consultation/diagnosis). EHRs that provide this functionality would be preferred.

From this baseline it is clear that for a successful EHR implementation, there is a need to establish and develop a checklist long before the implementation and deployment plans are put in motion. These include the following:

- establish the e-health readiness of the facility and the facility leadership. (This can inform on the facility and facility owner's commitment to invest, support and champion the implementation). Availability of clean and consistent electricity and internal network and internet are key enablers.
- establish the facility's leadership alignment and interest and value proposition for the digitization; assess the level of investment the facility and its management are willing to put in place
- identify if there are other competing (or complementary) digitization efforts in place or in the horizon
- establish a clear understanding of the technology and its configuration and articulate the risks, medico-legal ramifications, and (i.e. local server-based, cloud solution, hybrid solution, etc.)
- discuss, agree and jointly develop a user's and data management plan that is consistent with the Kenya Data Protection Act 2019
- discuss, agree and jointly develop a responsibility matrix that will address and assure the support, sustainability and change management of the solution.

The patient workflows in the public health facilities are likely to change with the implementation of the AfyaPro-MOM integrated digital health solution. It is important to evaluate this so as to ascertain that this solution does not introduce bottlenecks and reduce efficiency that would result in longer wait patient wait times and poor patient satisfaction.

6 ETHICS

We confirm that the study has adhered to the study protocol.

7 ANNEXES

No Annexes include in this report

8 REFERENCES

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Oketch, H. A. (2013) *E-learning Readiness Assessment Model in Kenyas' Higher Education Institutions: A Case Study Of University of Nairobi*. Thesis. University of Nairobi. Available at: <http://erepository.uonbi.ac.ke/handle/11295/58659> (Accessed: 1 April 2021).

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9 APPENDIX

9.1.1 Core readiness findings (Faith based Health Facilities)

Table 8:1 Core readiness results (Public Health facilities)

Core readiness					
	N	Minimum	Maximum	Mean	Std. Deviation
Identification of Needs for future changes, which the proposed e-health solution will address	4	4.00	5.00	4.5000	.57735
Dissatisfaction with status quo on the prioritized needs (related to the proposed solution)	4	1.00	4.00	2.6250	1.25000
Awareness about e-health in the organization	4	3.00	5.00	4.0000	.81650
Comfort with technology	3	3.67	4.33	4.0000	.33333
Trust on the use of ICT	3	2.67	5.00	3.8889	1.17063
Planning for the new e-health project	3	3.80	5.00	4.2000	.69282
Overall satisfaction and willingness	3	3.00	5.00	4.0000	1.00000
Integration of technology	3	4.00	5.00	4.5000	.50000
Overall core readiness	4	3.81	4.24	3.9762	.19245
Valid N (listwise)	3				

From the findings, majority of the respondents agree to a great extent that they have already identified and prioritized the needs that the proposed EHRs will address in their facilities [M=4.500], this mean score is above the expected readiness level of EHRs [M=4.500>MeH =3.4] as proposed by (Aydain and Tasci, 2005) and adopted by (Oketch, 2013) . Further, the respondents indicated that although they had not explored other solutions apart from the EHRs, they were generally dissatisfied with the current way of handling issues [M=2.6250]. In addition, majority of the respondents agreed to being aware of the proposed EHRs in the health facility [M=4.000], they indicated being comfortable with using technology [M=4.0000] and greatly trust the EHRs [M=3.8889].

Overall the healthcare providers at the faith based facilities rated their core readiness as generally high with the mean score being above the expected readiness level of EHRs[Mcr=3.9762>MeH =3.4]. This implies the presence of core readiness support for the EHRs.

9.1.2 Core readiness findings (Public Health Facilities)

The respondents were asked their core readiness in regard to their needs identification and prioritization in respect to the proposed EHRs, their awareness about the EHRs, their level of comfort and trust on the technology, the extent of their planning and satisfaction with the towards the EHRs. The mean score level of readiness was taken as 3.4 as proposed by (Aydin and Tasci, 2005) and adopted by (Oketch, 2013)

Table 8:2:8 Core readiness results (Faith Based facilities)

CORE READINESS

	N	Minimum	Maximum	Mean	Std. Deviation
Identification of Needs for future changes, which the proposed e-health solution will address	5	4.00	5.00	4.8000	.44721
Dissatisfaction with status quo on the prioritized needs (related to the proposed solution)	5	3.00	5.00	4.3000	.83666
Awareness about e-health in the organization	5	4.00	5.00	4.6000	.54772
Comfort with technology	5	4.00	5.00	4.6000	.43461
Trust on the use of ICT	5	4.00	5.00	4.6000	.43461
Planning for the new e-health project	5	4.20	5.00	4.6933	.33200
Overall satisfaction and willingness	5	4.00	5.00	4.7000	.44721
Integration of technology	5	4.00	5.00	4.6000	.41833
Overall core readiness	5	4.33	5.00	4.6117	.26792
Valid N (listwise)	5				

From the findings, majority of the respondents agree to a great extent that they have already identified and prioritized the needs that the proposed EHRs will address in their facilities [M=4.800], this mean score is above the expected readiness level of EHRs [Mcr=4.800>MeH =3.4] as proposed by (Aydin and Tasci, 2005) and adopted by (Oketch, 2013). Further, the respondents indicated that although they had not explored other solutions apart from the EHRs, they were generally dissatisfied with the current way of handling issues [M=4.7000]. In addition, the majority of the respondents agreed to being aware of the proposed EHRs in the health facility [M=4.600], they indicated being comfortable with using technology [M=4.6000] and greatly trust the EHRs [M=4.6000].

Overall the healthcare providers at the public health facilities rated their core readiness as generally high with the mean score being above the expected readiness level of EHRs [$M_{cr}=4.6117 > M_{eH} = 3.4$] implying the users are dissatisfied with the current status of healthcare provision that is largely manual and are ready to adopt and use the EHRs .. This shows the presence of core readiness support for the EHRs.

9.1.3 Technology Readiness Findings (Faith Based Facilities)

The study sought to find out the technological readiness of the participants towards the EHRS in regard to Internet speeds at the health facility, the availability of ICT support, availability of both hardware and software and internet availability.

Table 8:3: Technology readiness results (Faith Based facilities)

	N	Minimum	Maximum	Mean	Std. Deviation
Speed and quality of ICT/Internet at the institution	4	1.00	5.00	3.1250	1.75000
Service/Support for ICT	4	0.50	4.00	1.8750	1.54785
Hardware and software	4	1.00	4.00	3.0000	1.35401
Institutional access to ICT/Internet training	4	2.50	3.50	3.0000	0.40825
Availability and affordability of the desired ICT	4	2.50	3.50	3.0000	0.40825
Overall Technology Readiness	4	1.90	3.30	2.8000	0.62183
Valid N (listwise)	4				

From the findings, majority of the respondents were neutral as to whether the speed and quality of the Internet is appropriate [$M=3.1250$], this mean score is below the expected readiness level of EHRs [$M_{tr}=3.1250 < M_{eH} = 3.4$]. In addition, the respondents indicated that the current ICT support is not reliable to support the EHRs [$M=1.8750$]. This indicates a need for dedicated ICT support at the respective facilities. Further the respondents were neutral on the availability of hardware and software as well as accessibility to ICT training [$M=3.000$]. Moreover, the findings denoted unavailability of ICT within their facility [$M=3.000$]

Overall the healthcare providers at the faith based facilities rated their technological readiness as generally low with the mean score being below the expected readiness level of EHRs [$M_{tr}=2.800 < M_{eH} = 3.4$] implying the absence of technological readiness support for the EHRs. They identified the need

for ICT support, improvement in the speed and quality of the Internet, improvement of existing hardware and software infrastructure, improve institutional access to ICT training amongst the staff.

9.1.4 Technology Readiness Findings (Public Health Facilities)

The study sought to find out the technological readiness of the participants towards the EHRs in regard to Internet speeds at the health facility, the availability of ICT support, availability of both hardware and software and internet availability.

Table 8.4: Technology readiness results (Public Health facilities)

TECHNOLOGY READINESS					
	N	Minimum	Maximum	Mean	Std. Deviation
Speed and quality of ICT/Internet at the institution	5	3.00	5.00	4.3000	.83666
Service/Support for ICT	5	3.00	5.00	4.2000	.83666
Hardware and software	5	2.00	5.00	3.6000	1.14018
Institutional access to ICT/Internet training	5	.00	5.00	2.9000	2.24722
Availability and affordability of the desired ICT	5	2.00	5.00	4.0000	1.22474
Overall Technology Readiness	5	3.00	5.00	3.8000	.83666
Valid N (listwise)	5				

From the findings, majority of the respondents agreed that the speed and quality of the Internet is appropriate [M=4.3000], this mean score is above the expected readiness level of EHRs [Mtr=4.3000<MeH =3.4]. In addition, the respondents indicated that the current ICT support is reliable to support the EHRs [M=4.200]. Further the respondents agreed on the availability of some hardware and software [M=3.600] as well as accessibility to ICT training [M=4.000]. Lastly, the respondents acknowledged availability of ICT within their facility [M=4.0000], which was a score this mean score is way above the expected readiness level of EHRs [Mtr=4.0000>MeH =3.4].

Overall the healthcare providers at the public health facilities rated their technological readiness as generally high with the mean score being above the expected readiness level of EHRs[Mtr=3.800>MeH =3.4] implying the presence of technological readiness support for the EHRs. However, they identified the need to improve institutional access to ICT training amongst the staff and also improvement of the existing hardware and software within the facility.

9.1.5 Learning Readiness Findings (Faith Based Facilities)

The study further sought to identify from the respondents their learning readiness towards the EHRs.

Table 8:5: Learning readiness results (Faith Based facilities)

LEARNING READINESS

	N	Minimum	Maximum	Mean	Std. Deviation
ICT/Internet training for healthcare providers:	4	.00	5.00	2.0000	2.16025
Use of ICT/Internet to enhance education of care providers:	4	2.00	4.00	2.9167	1.06719
Involvement of healthcare providers in e-health projects:	4	3.00	4.00	3.6667	.57735
Learning Readiness	4	1.50	3.67	2.7583	1.08709
Valid N (listwise)	4				

From the findings, the respondents acknowledged non-existent programs for their ICT training [M=2.00], which is a mean score that's below the expected readiness level for EHRs [Mlr=2.000 < MeH =3.4]. Further the respondents were neutral on whether ICT is used to enhance their education [M=2.9167]. However, the respondents greatly acknowledged involvement in the EHRs project [M=3.6670], which is a mean score that's slightly above the expected readiness level for EHRs [Mit=3.6670 > MeH =3.4]. Overall the healthcare providers at the faith based facilities rated their societal readiness slightly above the expected readiness level of EHRs [Mlr=2.7583 > MeH =3.4] implying that more learning readiness support is needed for the EHRs. The respondents emphasized the need to use ICT related training amongst the healthcare workers. In addition, they raised the need for their involvement in both the planning and implementation of EHRs.

9.1.6 Learning Readiness Findings (Public Health Facilities)

The study further sought to identify from the respondents their learning readiness towards the EHRs.

Table 8:6: Learning readiness results (Public Health facilities)

LEARNING READINESS

	N	Minimum	Maximum	Mean	Std. Deviation
ICT/Internet training for healthcare providers:	5	.00	5.00	3.8000	2.16795
Use of ICT/Internet to enhance education of care providers:	5	1.00	4.67	3.0667	1.90613
Involvement of healthcare providers in e-health projects:	5	.50	5.00	3.5000	1.96850

Learning Readiness	5	1.17	4.89	3.4556	1.68298
Valid N (listwise)	5				

From the findings, the respondents acknowledged that programs had been set up for their ICT training [M=3.800], which is a mean score that's beyond the expected readiness level for EHRs [Mlr=3.800>MeH =3.4]. Further the respondents were neutral on whether ICT is used to enhance their education [M=3.0667]. However, the respondents slightly acknowledged their involvement in the EHRs project [M=3.5000], which is a mean score that's beyond the expected readiness level for EHRs [Mlr=3.5000>MeH =3.4].

Overall the healthcare providers at the public health facilities rated their societal readiness slightly above the expected readiness level of EHRs [Mlr=3.4556>MeH =3.4] implying that more learning readiness support is needed for the EHRs. The respondents emphasized the need to use ICT related training amongst the healthcare workers. In addition, they raised the need for their involvement in both the planning and implementation of EHRs.

9.1.7 Societal Readiness Findings (Faith Based Facilities)

This section asked the respondents their views in regard to; their use of ICT to communicate with other health facilities, how they share health related materials between facilities, how they collaborate to provide care to patients and the role of social cultural factors while accessing ICT.

Table 8:7: Societal readiness results (Faith based facilities)

Societal Readiness

	N	Minimum	Maximum	Mean	Std. Deviation
Communication with other organizations	3	.67	4.00	2.1111	1.71053
[For e-learning projects] Sharing of locally relevant content between healthcare institutions	3	3.00	4.00	3.5000	.50000
For service related projects] Providing care to patients and communities in collaboration with other healthcare institutions	3	2.50	3.00	2.7500	.35355
Considering sociocultural factors among staff	3	3.50	4.00	3.8333	.28868
Considering sociocultural factors among clients and communities:	3	1.00	4.00	2.6667	1.52753
Societal Readiness	3	2.27	3.82	2.8220	.86426
Valid N (listwise)	3				

The respondents disagreed with using ICT to communicate with staff from other health facilities[M=2.1111] but acknowledged slightly sharing of health related materials with other health facilities[M=3.5000]. Further, the respondents did not acknowledge collaboration with other health facilities in care provision[M=2.7500]. Though, the respondents indicated some level of support towards social cultural factors and barriers in access to technology[M=3.8333] and they too believe that the ICT will provide benefits to the different users[M=2.6667].

Overall the healthcare providers at the faith based facilities rated their societal readiness as generally low with the mean score being below the expected readiness level of EHRs[Mse=2.8220<MeH =3.4] implying the absence of societal readiness support for the EHRs. They identified the need to improve the communication with other health facilities as well as to consider the sociocultural factors amongst their staff as well as patients.

9.1.8 Societal Readiness Findings (Public Health Facilities)

This section asked the respondents their views in regard to; their use of ICT to communicate with other health facilities, how they share health related materials between facilities, how they collaborate to provide care to patients and the role of social cultural factors while accessing ICT

Table 8:8: Societal readiness results (Public Health facilities)

Societal Readiness

	N	Minimum	Maximum	Mean	Std. Deviation
Communication with other organizations	5	1.00	4.33	3.0000	1.68325
[For e-learning projects] Sharing of locally relevant content between healthcare institutions	5	1.00	5.00	3.3000	1.71756
For service related projects] Providing care to patients and communities in collaboration with other healthcare institutions	5	.50	4.50	3.4000	1.67332
Considering sociocultural factors among staff	5	1.00	5.00	3.0000	1.69558
Considering sociocultural factors among clients and communities:	5	4.50	5.00	4.9000	.22361
Societal Readiness	5	1.70	4.60	3.5200	1.25910
Valid N (listwise)	5				

The respondents denied the use of ICT to communicate with staff from other health facilities[M=3.0000] or for sharing health related materials with other health facilities[M=3.3000]. Further, the respondents denied the existence of collaboration with other health facilities for referral purposes[M=3.4000].

Moreover, the respondents indicated existence of gender barriers in access to technology[M=3.0000] and they slightly believe that the ICT will provide benefits to the different users[M=3.5200]

Overall the healthcare providers at the public health facilities rated their societal readiness slightly above the expected readiness level of EHRs[Mse=3.5200>MeH =3.4] implying that more societal readiness support is needed for the EHRs. Thus, there is a great need to further improve the communication with other health facilities, improve the sharing of relevant materials locally, reconsider the sociocultural factors amongst their staff as well as patients and improve on coordinated care.

9.1.9 Policy Readiness Findings (Faith Based Facilities)

The study further sought to establish from the respondents their awareness of ICT related regulations that promote EHRs, reimbursement policies by the government, ICT support and awareness by the government as well as by the health facility. findings, the majority of the respondents do not seem to be aware of the policies existing at government level and at health facilities level to promote the use of EHRs [M=2.333]. In addition, the respondents indicated nonexistence of government policies to handle liability issues arising from EHRs [M=2.5625]. However, the respondents indicated that there exists institutional mechanisms for reimbursement in their health facilities [M=4.0000], and that the policy makers are aware of the benefits and do support the use of EHRs in the health facilities [M=4.0000].

Overall the healthcare providers at the faith based facilities rated their policy readiness as below the expected readiness level of EHRs[Mpr=2.7958<MeH =3.4] implying the non awareness on the existence both government and institutional policies that will support the EHRs.They felt there's need for better policies on licensure, liability and reimbursement targeting faith-based institutions.Further, they felt there's a need to create awareness and support amongst the politicians at the institutional levels regarding EHRs.

Table 8:9: Policy readiness results (Public Health facilities)

POLICY READINESS

	N	Minimum	Maximum	Mean	Std. Deviation
ICT related regulations	4	.00	4.00	2.3333	2.08167
Policies regarding licensure and liability	4	.50	3.50	2.5625	1.39007
Policies regarding reimbursement	4	1.00	4.00	2.3333	1.52753
Awareness and support of ICT among politicians	4	1.00	4.00	2.7500	1.50000
Awareness and support of ICT among policymakers at the institutional level	4	2.00	5.00	4.0000	1.41421

Overall policy readiness	4	1.75	3.83	2.7958	1.07241
Valid N (listwise)	4				

Policy Readiness Findings (Public Health Facilities)

The study further sought to establish from the respondents their awareness of ICT related regulations that promote EHRs, reimbursement policies by the government, ICT support and awareness by the government as well as by the health facility.

Table 8:10:Policy readiness results (Public Health facilities)

POLICY READINESS

	N	Minimum	Maximum	Mean	Std. Deviation
ICT related regulations	5	4.00	5.00	4.6000	.54772
Policies regarding licensure and liability	5	3.50	5.00	4.3500	.60208
Policies regarding reimbursement	5	2.00	5.00	4.1000	1.24499
Awareness and support of ICT among politicians	5	2.00	5.00	3.4000	1.34164
Awareness and support of ICT among policymakers at the institutional level	5	3.50	5.00	4.4000	.65192
Overall policy readiness	5	3.40	5.00	4.1700	.66106
Valid N (listwise)	5				

From the findings, the majority of the respondents agree to a great extent that they are aware of the policies existing at government level and at health facilities level to promote the use of EHRs [M=4.6000]. In addition, the respondents indicated the existence of government policies to handle liability issues arising from EHRs [M=4.3500]. Moreover, the respondents indicated that there exists institutional mechanisms for reimbursement in their health facilities [M=4.1000], and that the policy makers are aware of the benefits and do support the use of EHRs in the health facilities [M=4.4000].

Overall the healthcare providers at the public health facilities rated their policy readiness as generally high compared to the expected readiness level of EHRs [Mpr=4.1700 > MeH =3.4] implying the greater

awareness of the existence of both government and institutional policies that will support the EHRs. However, they felt a need to improve such readiness amongst the politicians.

9.1.10 Consolidated Framework for Implementation Research Findings

9.1.11 Intervention Source Findings (Faith Based Facilities)

This section asked the respondents their view on the following; if there was consultation during the EHRs sourcing and if the EHRs was sourced from a legitimate source. The results are as stipulated below.

Intervention Source

	N	Minimum	Maximum	Mean	Std. Deviation
We as the stakeholders were consulted when this EHR system was being sourced for implementation.	11	1	6	4.73	1.272
This EHR system was sourced from a legitimate vendor/organization	11	3	5	4.36	.809
Intervention source	11	3.50	5.00	4.6364	.50452
Valid N (listwise)	11				

The results show that the majority of the respondents agree to have been consulted when the EHRs was being discussed for implementation [M=4.73] and they also perceive that the EHRs system was sourced from a legitimate source [M=4.36].

Overall the mean score for intervention source is above the expected level that may affect implementation success of EHRs [Mis=4.6364>MeH =3.4] implying that the EHRs implementation is likely to be successful.

9.1.12 Intervention Source Findings (Public Health Facilities)

The respondents were asked their view on whether they were consulted when the EHRs was sourced and if the EHRs was sourced from a legitimate source. The results are as stipulated below.

Intervention Source

	N	Minimum	Maximum	Mean	Std. Deviation
We as the stakeholders were consulted when this EHR system was being sourced for implementation.	22	0	5	4.18	1.435
This EHR system was sourced from a	22	0	5	4.23	1.307

legitimate vendor/organization					
I believe the vendor is capable of developing a good EHR system	22	0	5	4.36	1.217
ISOURCE	22	1.00	5.00	4.2576	1.07365
Valid N (listwise)	22				

The results show that the majority of the respondents agree to have been consulted when the EHRs was being discussed for implementation [M=4.18], that the EHRs system was sourced from a legitimate source [M=4.23] and that the vendor is capable of developing a good system[M=4.36]

Overall the mean score for intervention source is above the expected level that may affect implementation success of EHRs [Mis=4.2576>MeH =3.4] implying that the EHRs implementation is likely to be successful.

9.1.13 Evidence Strength Findings (Faith Based Facilities)

The study further sought to establish how the respondents perceived the evidence supporting the EHRs implementation and its expected outcomes. The results are shown below.

Evidence Strength

	N	Minimum	Maximum	Mean	Std. Deviation
Implementation of this EHR system is supported by concrete evidence from an organization similar to ours	10	0	5	2.30	2.452
Implementation of this EHR system conforms to the opinions of respected experts	9	4	5	4.44	.527
Implementation of this EHR should be effective, based on current scientific knowledge	10	4	5	4.60	.516
Evidence strength	10	2.00	5.00	3.7000	.94868
Valid N (listwise)	9				

From the findings, the respondents are unaware of a similar organization that had implemented such a system [M=2.30]. However, the respondents greatly agree on the existence of evidence both scientific knowledge [M=4.60] and opinions from experts [M=4.44] to support the EHRs implementation.

Overall the mean score for evidence strength is above the expected level that may affect implementation success of EHRs [Mes=3.7000 > MeH =3.4] an indication this strength of evidence will likely make the EHRs implementation to be successful.

9.1.14 Evidence Strength Findings (Public Health Facilities)

The study aimed to establish how the respondents perceived the evidence supporting the EHRs implementation and its expected outcomes. The results are shown below.

Evidence Strength

	N	Minimum	Maximum	Mean	Std. Deviation
Implementation of this EHR system is supported by concrete evidence from an organization similar to ours	22	2	5	4.36	.902
Implementation of this EHR system conforms to the opinions of respected experts	22	0	5	4.09	1.231
Implementation of this EHR should be effective, based on current scientific knowledge	22	0	5	3.91	1.716
ESTRENGTH	22	1.33	5.00	4.1212	1.02118
Valid N (listwise)	22				

Based on the findings, the respondents are aware of a similar organization that had implemented such a system [M=4.36], they agree on the existence of evidence both scientific knowledge [M=3.91] and opinions from experts [M=4.09] to support the EHRs implementation.

Overall the mean score for evidence strength is above the expected level that may affect implementation success of EHRs [Mes=4.1212 > MeH =3.4] an indication this strength of evidence will likely make the EHRs implementation to be successful.

9.1.15 Relative Advantage Findings (Faith Based Facilities)

The study further sought to establish how the respondents perceived the ability of the proposed EHRs to perform better compared to other alternatives. The results are shown below.

Relative advantage

	N	Minimum	Maximum	Mean	Std. Deviation
Implementation of EHR system appears to have many more advantages than disadvantages	11	4	5	4.55	.522
Implementation of EHR system is likely to be supported by staff because they believe that the advantages outweigh disadvantages	11	4	5	4.55	.522
Staff, in general, are not depressed by the prospect of change	11	3	5	4.36	.674
RADVANT	11	3.67	5.00	4.4848	.50252
Valid N (listwise)	11				

From the findings, the respondents perceive the EHRs implementation as having more advantages than disadvantages [M=4.55]. Secondly, the respondents agree to support the proposed EHRs as its advantages outweigh its disadvantages [M=4.55]. Moreover, the respondents are willing to adapt to the change being brought about by the proposed EHRs [M=4.36].

Overall the mean score for relative advantage is above the expected level that may affect implementation success of EHRs [M_{ra}=4.4848 > M_{eh} =3.4] an indication that the users believe the EHRs system will work better compared to alternatives and will likely make the EHRs implementation to be successful.

9.1.16 Relative Advantage Findings (Public Health Facilities)

The study sought to establish how the respondents perceived the ability of the proposed EHRs to perform better compared to other alternatives. The results are shown below.

Relative Advantage

	N	Minimum	Maximum	Mean	Std. Deviation
Implementation of EHR system appears to have many more advantages than disadvantages	22	0	5	4.14	1.521
Implementation of EHR system is likely to be supported by staff because they believe that the advantages outweigh disadvantages	22	0	5	4.32	1.211
Staff, in general, are not depressed by the prospect of change	22	3	5	4.41	.734
RADVANT	22	2.67	5.00	4.2879	.69233
Valid N (listwise)	22				

From the findings, the respondents perceive the EHRs implementation as having more advantages than disadvantages [M=4.14]. Secondly, the respondents agree to support the proposed EHRs as its advantages outweigh its disadvantages [M=4.32]. Moreover, the respondents are willing to adapt to the change being brought about by the proposed EHRs [M=4.41].

Overall the mean score for relative advantage is above the expected level that may affect implementation success of EHRs [M=4.2879 > MeH = 3.4] an indication that the users believe the EHRs system will work better compared to alternatives and this will likely make the EHRs implementation be successful.

9.1.17 Adaptability Findings (Faith Based Facilities)

The study further sought to establish how the respondents perceived the ability of the proposed EHRs to be adapted to their local contexts. The results are shown below.

Adaptability

	N	Minimum	Maximum	Mean	Std. Deviation
The EHR system has the likelihood of being tailored to fit the needs within our healthcare facility	11	4	5	4.64	.505
The EHR system can be tailored and retain its effectiveness within our healthcare facility	10	4	5	4.60	.516

The adaptation of the EHR system will be politically and ethically easy to achieve	11	3	5	4.36	.674
Adaptability	11	3.67	5.00	4.5152	.43111
Valid N (listwise)	10				

From the findings above, the respondents are positive that the proposed EHRs can be tailored to align to their facility needs [M=4.64], that even after being tailored, it will remain effective [M=4.60] and that it will be easy to achieve the adaptation [M=4.36].

Overall the mean score for EHRs adaptability is above the expected level that may affect implementation success of EHRs [Mad=4.5152 > MeH =3.4] an indication that the users believe that the proposed EHRs can be tailored to their local contexts and this will likely make the EHRs implementation to be successful.

9.1.18 Adaptability Findings (Public Health Facilities)

The study further sought to establish how the respondents perceived the ability of the proposed EHRs to be adapted to their local contexts. The results are shown below

Adaptability

	N	Minimum	Maximum	Mean	Std. Deviation
The EHR system has the likelihood of being tailored to fit the needs within our healthcare facility	22	2	5	4.41	.796
The EHR system can be tailored and retain its effectiveness within our healthcare facility	22	3	5	4.59	.590
The adaptation of the EHR system will be politically and ethically easy to achieve	21	2	6	3.81	.928
ADAPT	22	3.00	5.33	4.2879	.58459
Valid N (listwise)	21				

From the findings above, the respondents are positive that the proposed EHRs can be tailored to align to their facility needs [M=4.41], that even after being tailored, it will remain effective [M=4.59] and that it will be easy to achieve the adaptation [M=3.81].

Overall the mean score for EHRs adaptability is above the expected level that may affect implementation success of EHRs [Mad=4.2879 > MeH =3.4] an indication that the users believe that the proposed EHRs can be tailored to their local contexts and this will likely make the EHRs implementation to be successful.

9.1.19 Complexity Findings (Faith Based Facilities)

The study further sought to establish how difficult the respondents perceived the proposed EHRs to be. The results are shown below.

Complexity

	N	Minimum	Maximum	Mean	Std. Deviation
The implementation of EHR system is too complex and I don't believe it will be successful	11	1	6	2.45	1.753
Implementing this intervention will make it difficult for me to perform my duties	11	1	5	1.91	1.375
The leadership and the implementation team has explained the implementation process and benefits of EHR and it doesn't seem complex	11	2	5	4.36	1.027
Complexity	11	2.00	4.33	2.9091	.81773
Valid N (listwise)	11				

From the findings, the respondents do not perceive the EHRs system as complex or that it will fail [M=2.45]. In addition, the respondents do not perceive that the proposed EHRs will make it hard to perform their duties [M=1.91]. Further, the respondents are positive with the role played by the leadership and implementation team to explain the benefits as well as the implementation process of the EHRs [M=4.36].

Overall the mean score for EHRs complexity is below the expected level that may affect implementation success of EHRs [Mcomp=2.9091 < MeH =3.4] an indication that the users do not perceive the EHRs as complex and this will likely make the EHRs implementation to be successful.

9.1.20 Complexity Findings (Public Health Facilities)

The study further sought to establish how difficult the respondents perceived the proposed EHRs to be. The results are shown below.

Complexity

	N	Minimum	Maximum	Mean	Std. Deviation
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The implementation of EHR system is too complex and I don't believe it will be successful	22	0	3	1.41	.796
Implementing this intervention will make it difficult for me to perform my duties	22	1	3	1.41	.666
The leadership and the implementation team has explained the implementation process and benefits of EHR and it doesn't seem complex	22	0	5	3.50	1.596
COMPLEX	22	.67	3.67	2.1061	.71556
Valid N (listwise)	22				

From the findings, the respondents do not perceive the EHRs system as complex or that it will fail [M=1.41]. In addition, the respondents do not perceive that the proposed EHRs will make it hard for them to perform their duties [M=1.41]. Further, the respondents are slightly positive with the role played by the leadership and implementation team to explain the benefits as well as the implementation process of the EHRs [M=3.50].

Overall the mean score for EHRs complexity is below the expected level that may affect implementation success of EHRs [Mcomp=2.1061 < MeH =3.4] an indication that the users do not perceive the EHRs as complex and this will likely make the EHRs implementation to be successful.

9.1.21 Patient Needs and resources Findings (Faith Based Facilities)

The study further sought to establish to what extent the proposed EHR captures patient needs and priorities. The results are shown below.

Patient Needs and resources

	N	Minimum	Maximum	Mean	Std. Deviation
The proposed EHR implementation take into consideration the needs and preferences of our patients	10	4	5	4.50	.527
The proposed EHR implementation anticipates and is ready to receive and address patients' feedback and concerns.	9	3	5	4.22	.667
The proposed EHR implementation has considered the possible barriers faced by patients.	10	3	5	4.00	.816

The proposed EHR implementation seeks to improve patients' experience through patient portals	10	0	5	4.10	1.524
Patient Needs and resources	10	2.75	5.00	4.2000	.69522
Valid N (listwise)	9				

From the findings, the respondents agree that the proposed EHRs has put emphasis on the patient by considering the patient needs and concerns [M=4.50], that it can address arising patient concerns [M=4.00], that it has the ability to improve patients experiences.[M=4.10].

Overall the mean score for patient needs and resources is above the expected level that may affect implementation success of EHRs[Mpneed=4.2000>MeH =3.4] an indication that the users perceive the EHRs will address the patient needs and concerns and this will likely make the EHRs implementation to be successful.

9.1.22 Patient Needs and resources Findings (Public Health Facilities)

The study further sought to establish to what extent the proposed EHR captures patient needs and priorities. The results are shown below.

Patient Needs and resources

	N	Minimum	Maximum	Mean	Std. Deviation
The proposed EHR implementation take into consideration the needs and preferences of our patients	22	0	5	3.82	1.593
The proposed EHR implementation anticipates and ready to receive and address patients' feedback and concerns.	22	1	5	4.14	1.037
The proposed EHR implementation has considered the possible barriers faced by patients.	22	3	5	4.05	.785
The proposed EHR implementation seeks to improve patients' experience through patient portals	22	2	5	4.36	.790
PNEEDS	22	2.50	5.00	4.0909	.79637
Valid N (listwise)	22				

From the findings, the respondents slightly agree that the proposed EHRs has put emphasis on the patient by considering the patient needs and concerns [M=3.82], that it can address arising patient concerns[M=4.14] , it can address possible barriers faced by patients [M=4.05] and that it has the ability to improve patients experiences.[M=4.36].

Overall the mean score for patient needs and resources is above the expected level that may affect implementation success of EHRs[Mpneed=4.0909>MeH =3.4] an indication that the users perceive the EHRs will address the patient needs and concerns and this will likely make the EHRs implementation to be successful.

9.1.23 External Policies and Incentives (Faith Based Facilities)

The study further sought to establish how external policies and incentives influence the implementation of the EHRs. The results are shown below.

External Policies and Incentives

	N	Minimum	Maximum	Mean	Std. Deviation
This EHR implementation project has been influenced strongly by pressures from outside the organization.	11	0	5	1.73	1.272
This EHR implementation project has been motivated strongly by government (National/County) financial stimuli/incentives	11	0	5	1.18	1.401
This EHR implementation project has been motivated strongly by government (National/County) policies and regulations	11	0	5	2.27	1.679
External Policies and Incentives	11	.67	4.67	1.7273	1.10371
Valid N (listwise)	11				

From the results by the respondents, the EHRs implementation wasn't influenced by pressures from outside the health facility[M=1.73], neither was it motivated by financial incentives from the national/county government[M=1.18] nor motivated by the policies and regulations from the government.

Overall the mean score for external policies and incentives is below the expected level that may affect implementation success of EHRs[Mextpol=1.7273<MeH =3.4] an indication that the users do not perceive the external policies and incentives as a requirement to make the EHRs implementation to be successful.

9.1.24 External Policies and Incentives (Public Health Facilities)

The study further sought to establish how external policies and incentives influence the implementation of the EHRs. The results are shown below.

External Policies and Incentives

	N	Minimum	Maximum	Mean	Std. Deviation
This EHR implementation project has been influenced strongly by pressures from outside the organization.	22	0	5	2.59	1.817
This EHR implementation project has been motivated strongly by government (National/County) financial stimuli/incentives	22	0	5	3.36	1.465
This EHR implementation project has been motivated strongly by government (National/County) policies and regulations	22	0	5	3.91	1.306
EXTPOL	22	.00	5.00	3.2879	1.18320
Valid N (listwise)	22				

From the results by the respondents, the EHRs implementation wasn't influenced by pressures from outside the health facility[M=2.59]. However, we cant rule out that it wasn't motivated by financial incentives from the national/county government[M=3.36]. The policies and regulations from the government had an influence on the HER implementation[M=3.91]

Overall the mean score for external policies and incentives is below the expected level that may affect implementation success of EHRs[Mextpol=3.2879<MeH =3.4] an indication that the users do not perceive the external policies and incentives as a major requirement to make the EHRs implementation be successful.

9.1.25 Structural Characteristics (Faith Based Facilities)

The study further sought to establish how structural characteristics influence the implementation of the EHRs. The results are shown below.

Structural Characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
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We have the required human resource in our facility for EHR implementation.	10	1	5	4.00	1.247
We need to invest on infrastructural changes to meet the EHR implementation requirements.	11	1	5	4.00	1.549
Our healthcare facility has low staff turnover	11	1	5	3.82	1.328
Structural Characteristics	11	2.00	5.00	3.99	1.05217
Valid N (listwise)	10				

From the findings by the respondent's responses, there is agreement on existence of the required workforce for the EHRs implementation [M=4.00], there was agreement on low staff turnover [M=3.82] implying staff do not change jobs frequently and this is a good indicator for the implementation success. However, there was agreement on the need to invest on the required infrastructural changes to meet the EHRs requirements [M=4.00].

Overall the mean score for structural characteristics is slightly above the expected level that may affect implementation success of EHRs [M=3.9394 > MeH =3.4] an indication that though there is adequate staff for the EHRs implementation, there is need to address infrastructural changes as a requirement to make the EHRs implementation to be successful.

9.1.26 Structural Characteristics (Public Health Facilities)

The study further sought to establish how structural characteristics influence the implementation of the EHRs. The results are shown below

Structural Characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
We have the required human resource in our facility for EHR implementation.	22	0	5	3.09	1.571
We need to invest on infrastructural changes to meet the EHR implementation requirements.	22	0	5	3.55	1.535
Our healthcare facility has low staff turnover	22	0	5	3.09	1.630
SCHAR	22	1.00	4.67	3.2424	.97689
Valid N (listwise)	22				

From the findings by the respondents responses, the facilities do not have the required workforce for the EHRs implementation [M=3.09], they have high staff turnover [M=3.09] implying staff do change jobs

frequently and this is not a good indicator for the implementation success. Additionally, there was agreement on the need to invest on the required infrastructural changes to meet the EHRs requirements [M=3.55].

Overall the mean score for structural characteristics is below the expected level that may affect implementation success of EHRs [Mstrchr=3.2424<MeH =3.4] an indication that limited workforce to support the implementation, the high staff turnover , the infrastructural changes requirements are impediments that are likely to affect the success of EHRs implementation.

9.1.27 Networks & Communications (Faith Based Facilities)

The study further sought to establish how the social communication is facilitated within the health facilities as it influences the implementation of the EHRs. The results are shown below.

Networks & Communications

	N	Minimum	Maximum	Mean	Std. Deviation
Mechanisms have been developed to keep leaders informed and involved	8	2	5	4.13	1.126
We as staff have a cordial working relationship with influential stakeholders	10	2	5	4.40	.966
We normally hold regular staff meetings to address matters arising	10	4	5	4.50	.527
Typically, we get informed about new initiatives or accomplishments	10	2	5	4.20	.919
Networks & Communications	10	3.33	5.00	4.2667	.60578
Valid N (listwise)	8				

From the results, there was agreement on existence of mechanisms that ensure the leaders are kept informed and involved [M=4.13], that the staff enjoy a warm relationship with their stakeholders [M=4.40], that the staff hold regular meetings to address issues arising [M=4.50] and that they are always informed when new initiatives are introduced such as this EHRs [M=4.20].

Overall the mean score for networks and communications is way above the expected level that may affect implementation success of EHRs [Mncom=4.2667>MeH =3.4] which was a higher indicator of the good communications that exists and this is a good contributor for the EHRs implementation to be successful.

9.1.28 Networks & Communications (Public Health Facilities)

The study further sought to establish how the social communication is facilitated within the health facilities as it influences the implementation of the EHRs. The results are shown below.

Networks & Communications

	N	Minimum	Maximum	Mean	Std. Deviation
Mechanisms have been developed to keep leaders informed and involved	22	0	5	3.68	1.427
We as staff have a cordial working relationship with influential stakeholders	22	3	5	4.32	.780
We normally hold regular staff meetings to address matters arising	22	0	5	4.27	1.352
Typically, we get informed about new initiatives or accomplishments	22	0	5	4.36	1.329
NCOMM	22	2.50	5.00	4.1591	.77362
Valid N (listwise)	22				

From the results, there was slight agreement on existence of mechanisms that ensure the leaders are kept informed and involved [M=3.68]. However, there was agreement that the staff enjoy a warm relationship with their stakeholders [M=4.32], that the staff hold regular meetings to address issues arising [M=4.27] and that they are always informed when new initiatives are introduced such as this EHRs [M=4.36].

Overall the mean score for networks and communications is way above the expected level that may affect implementation success of EHRs [Mncom=4.1591>MeH =3.4] which was a higher indicator of the good communications that exists and this is a good pointer for the EHRs implementation to be successful.

9.1.29 Culture (Faith Based Facilities)

The study further sought to establish how the cultural norms are facilitated within the health facilities as it influences the implementation of the EHRs. The results are shown below.

Culture

	N	Minimum	Maximum	Mean	Std. Deviation
This EHR implementation project has been influenced by our mandate to provide quality healthcare services	10	3	5	4.40	.699

EHR implementation is most likely in our organization due to less bureaucracy and considerable flexibility enabling rapid changes	10	1	5	3.80	1.135
Staff members in our healthcare organization are willing to innovate and/or experiment to improve service provision	10	2	5	4.50	.972
Culture	10	3.33	5.00	4.23	.49814
Valid N (listwise)	10				

From the findings, there was agreement that the need to offer quality healthcare services is what influenced the proposal to implement the EHRs [M=4.40], agreement on ease of flexibility and less bureaucracy to facilitate the oncoming changes [M=3.80], agreement on their willingness to seek innovations that improve health care service delivery [M=4.50].

Overall the mean score for culture is above the expected level that may affect implementation success of EHRs [Mcult=4.2333>MeH =3.4] which shows the good cultural norms that exist and this is a good contributor for the EHRs implementation to be successful.

9.1.30 Culture (Public Health Facilities)

The study further sought to establish how the cultural norms are facilitated within the health facilities as it influences the implementation of the EHRs. The results are shown below.

Culture

	N	Minimum	Maximum	Mean	Std. Deviation
This EHR implementation project has been influenced by our mandate to provide quality healthcare services	22	3	5	4.55	.671
EHR implementation is most likely in our organization due to less bureaucracy and considerable flexibility enabling rapid changes	22	0	5	3.82	1.593
Staff members in our healthcare organization are willing to innovate and/or experiment to improve service provision	22	0	5	4.09	1.477
CULT	22	2.33	5.00	4.1515	.89518
Valid N (listwise)	22				

From the findings, there was agreement that the need to offer quality healthcare services is what influenced the proposal to implement the EHRs [M=4.55], agreement on ease of flexibility and less bureaucracy to facilitate the oncoming changes [M=3.82], agreement on their willingness to seek innovations that improve health care service delivery [M=4.09].

Overall the mean score for culture is above the expected level that may affect implementation success of EHRs [Mcult=4.1515>MeH =3.4] which shows the good cultural norms that exist and this will be a good contributor for the EHRs implementation to be successful.

9.1.31 Readiness for Implementation (Faith Based Facilities)

The study further sought to establish to what extent the leaders and managers are committed, their involvement in the implementation and the availability of resources as they influence the implementation of the EHRs. The results are shown below.

Readiness for Implementation

	N	Minimum	Maximum	Mean	Std. Deviation
Senior Leadership in this healthcare facility have endorsed the implementation project	11	4	5	4.64	.505
The leadership has committed time & resources to support the implementation project	11	0	5	4.27	1.489
Information about the implementation has been made available to all staff	11	0	5	4.36	1.502
READINESS	11	1.33	5.00	4.4242	1.07591
Valid N (listwise)	11				

From the results, there was agreement that healthcare leadership has endorsed the implementation of the EHRs [M=4.64], they have committed the necessary resources (time and personnel) that are needed to support the implementation[M=4.27], and agreement that the information about how to implement the system is readily available to all staff [M=4.36].

Overall the mean score for readiness for implementation is above the expected level that may affect implementation success of EHRs [Mri=4.4242>MeH =3.4] which shows the health facility readiness for implementation and this is a good contributor for the EHRs implementation to be successful.

9.1.32 Readiness for Implementation (Public Health Facilities)

The study further sought to establish to what extent the leaders and managers are committed, their involvement in the implementation and the availability of resources as they influence the implementation of the EHRs. The results are shown below.

Readiness for Implementation

	N	Minimum	Maximum	Mean	Std. Deviation
Senior Leadership in this healthcare facility have endorsed the implementation project	22	0	5	4.23	1.152
The leadership has committed time & resources to support the implementation project	22	0	5	4.14	1.246
Information about the implementation has been made available to all staff	22	0	5	3.77	1.572
READINESS	22	2.00	5.00	4.0455	.98290
Valid N (listwise)	22				

From the results, there was agreement that healthcare leadership has endorsed the implementation of the EHRs [M=4.23], that they have committed the necessary resources (time and personnel) that are needed to support the implementation [M=4.14], and slight agreement that the information about how to implement the system is readily available to all staff [M=3.77].

Overall the mean score for readiness for implementation is above the expected level that may affect implementation success of EHRs [Mri=4.0455>MeH =3.4] which shows the health facility readiness for implementation and this is a good contributor for the EHRs implementation to be successful.

9.1.33 Knowledge and belief on intervention (Faith Based Facilities)

The study further sought to establish whether the users perceive the EHRs implementation to be valuable to their work as this influences the implementation success of the EHRs. The results are shown below.

Knowledge and belief on intervention

	N	Minimum	Maximum	Mean	Std. Deviation
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I am knowledgeable about the benefits of implementing EHR system in this healthcare organization	10	4	5	4.80	.422
In my understanding, I believe that the EHR system will be effective in our setting	11	4	5	4.73	.467
I believe EHR implementation will be valuable to my work.	10	4	5	4.90	.316
KNOWL	11	4.00	5.00	4.7727	.41010
Valid N (listwise)	9				

From the results, there was agreement about the familiarity of the benefits that the proposed EHRs would offer the health facility [M=4.80, they believe that the EHRs implementation is the most effective for their setting [M=4.73], they perceive that the EHRs implementation will be valuable for their work [M=4.90].

Overall the mean score for knowledge and beliefs about the EHRs implementation is way above the expected level that may affect implementation success of EHRs [Mkn=4.7727>MeH =3.4] which shows the health facility users perceive the EHRs implementation as valuable and this is a good contributor for the EHRs implementation to be successful.

9.1.34 Knowledge and belief on intervention (Public Health Facilities)

The study further sought to establish whether the users perceive the EHRs implementation to be valuable to their work as this influences the implementation success of the EHRs. The results are shown below.

Knowledge and belief on intervention

	N	Minimum	Maximum	Mean	Std. Deviation
I am knowledgeable about the benefits of implementing EHR system in this healthcare organization	22	2	5	4.36	.848
In my understanding, I believe that the EHR system will be effective in our setting	22	3	5	4.45	.739
I believe EHR implementation will be valuable to my work.	22	0	5	4.36	1.177
KNOWL	22	2.67	5.00	4.3939	.73201

Valid N (listwise)	22				
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From the results, there was agreement about the familiarity of the benefits that the proposed EHRs would offer the health facility [M=4.36, they believe that the EHRs implementation is the most effective for their setting [M=4.45], they perceive that the EHRs implementation will be valuable for their work [M=4.36].

Overall the mean score for knowledge and beliefs about the EHRs implementation is way above the expected level that may affect implementation success of EHRs [Mkn=4.3939>MeH =3.4] which shows that the health facility users perceive the EHRs implementation as valuable and this is a good indicator for the EHRs implementation to be successful.

9.1.35 Self-Efficacy (Faith Based Facilities)

The study further sought to establish user's confidence to execute the EHRs implementation as this influences the implementation success of the EHRs. The results are shown below.

Self-Efficacy

	N	Minimum	Maximum	Mean	Std. Deviation
I am confident that I will be able to successfully implement the EHR intervention	10	4	5	4.80	.422
I am confident that I am competent enough and will be able to use the EHR intervention	10	4	5	4.60	.516
I have the requisite skills to implement the EHR intervention	10	3	5	4.40	.843
I am confident that my colleagues are/will be comfortable using the EHR intervention	10	3	5	4.50	.707
Self Efficacy	10	4.00	5.00	4.5750	.45720
Valid N (listwise)	10				

From the findings, the respondents exhibited confidence in their ability to execute the EHRs intervention [M=4.80], agreement that they are competent enough and will be able to use the EHRs [M=4.60], agreement that they possess the required skills to implement the EHRs [M=4.40], confidence of their colleagues' ability to use the EHRs[M=4.50],

Overall the mean score for self-efficacy about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mse=4.5750>MeH =3.4] which shows a higher self-efficacy indicating that the users will likely embrace and commit to the EHRs implementation and this is a good contributor for the EHRs implementation to be successful.

9.1.36 Self-Efficacy (Public Health Facilities)

The study further sought to establish user's confidence to execute the EHRs implementation as this influences the implementation success of the EHRs. The results are shown below.

Self-Efficacy

	N	Minimum	Maximum	Mean	Std. Deviation
I am confident that I will be able to successfully implement the EHR intervention	21	3	5	4.67	.577
I am confident that I am competent enough and will be able to use the EHR intervention	22	3	5	4.64	.581
I have the requisite skills to implement the EHR intervention	22	3	5	4.64	.581
I am confident that my colleagues are/will be comfortable using the EHR intervention	22	0	5	4.18	1.181
SEFFICACY	22	3.00	5.00	4.5227	.56119
Valid N (listwise)	21				

From the findings, the respondents exhibited confidence in their ability to execute the EHRs intervention [M=4.67], agreement that they are competent enough and will be able to use the EHRs [M=4.64], agreement that they possess the required skills to implement the EHRs [M=4.64], they are confidence of their colleagues' ability to use the EHRs[M=4.18].

Overall the mean score for self-efficacy about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mse=4.5227>MeH =3.4] which shows a higher self-efficacy indicating that the users will likely embrace and commit to the EHRs implementation and this is a good contributor for the EHRs implementation to be successful.

9.1.37 Planning (Faith Based Facilities)

The study further sought to establish whether proper steps have been undertaken to promote an effective implementation as this influences the implementation success of the EHRs. The results are shown below.

Planning

	N	Minimum	Maximum	Mean	Std. Deviation
Leadership and staff have carefully selected the EHR system for implementation	11	0	5	4.00	1.414
The plan for implementing the EHR system is precise and has realistic time schedule	11	4	5	4.45	.522
The leadership has facilitated staff training on the use of the EHR system upon implementation	11	0	5	3.18	1.779
PLAN	11	1.33	5.00	3.8788	.99189
Valid N (listwise)	11				

From the findings, there was agreement that EHRs was carefully selected by both the leadership and the staff [M=4.00], agreement that the laid out plan was precise and has realistic time schedule [M=4.45], however the respondents indicated that the leadership hasn't facilitated any staff training for the use of EHRs.

Overall the mean score for planning about the EHRs implementation is slightly above the expected level that may affect implementation success of EHRs [Mpl=3.8788>MeH =3.4] which shows a planning needs to be emphasized more indicating that the users will likely embrace and commit to the EHRs implementation and this is a good contributor for the EHRs implementation to be successful.

9.1.38 Planning (Public Health Facilities)

The study further sought to establish whether proper steps have been undertaken to promote an effective implementation as this influences the implementation success of the EHRs. The results are shown below.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Leadership and staff have carefully selected the EHR system for implementation	22	0	5	3.59	1.652
The plan for implementing the EHR system is precise and has realistic time schedule	21	0	5	3.67	1.653

The leadership has facilitated staff training on the use of the EHR system upon implementation	22	1	5	3.55	1.471
PLAN	22	1.67	5.00	3.5833	1.19716
Valid N (listwise)	21				

From the findings, there was slight agreement that the EHRs was carefully selected by both the leadership and the staff [M=3.59], slight agreement that the laid out plan was precise and has realistic time schedule [M=3.67], slight agreement about the leadership having facilitated any staff training for the use of EHRs [M=3.55].

Overall the mean score for planning about the EHRs implementation is slightly above the expected level that may affect implementation success of EHRs [Mpl=3.5833>MeH =3.4] which wasn't a good indicator for the implementation to be successful. This implies that more planning needs to be emphasized to enable the user embrace and commit to the EHRs implementation.

9.1.39 Engaging (Faith Based Facilities)

The study further sought to establish the presence of a project champion and their role in the EHRs implementation as this influences the implementation success of the EHRs. The results are shown below

Engaging

	N	Minimum	Maximum	Mean	Std. Deviation
The Project champion is very committed to making this project successful	11	4	5	4.91	.302
The Project champion has substantial influence on the implementation process	10	4	5	4.70	.483
The Project champion shows respect for the involved staff	11	4	5	4.64	.505
ENGAGE	11	4.00	5.00	4.7424	.31059
Valid N (listwise)	10				

From the findings, there was agreement that the project champion is committed to ensuring that the EHRs implementation is successful [M=4.91], agreement that the project champion has substantial influence on the implementation process [M=4.70], agreement that there exists respect for all the involved staff in the implementation [M=4.64].

Overall the mean score for engaging about the EHRs implementation is way above the expected level that may affect implementation success of EHRs [Men=4.7424>MeH =3.4] which shows strong championship of the EHRs project and this is a good contributor for the EHRs implementation to be successful.

9.1.40 Engaging (Public Health Facilities)

The study further sought to establish the presence of a project champion and their role in the EHRs implementation as this influences the implementation success of the EHRs. The results are shown below

Engaging					
	N	Minimum	Maximum	Mean	Std. Deviation
The Project champion is very committed to making this project successful	22	0	5	3.73	1.751
The Project champion has substantial influence on the implementation process	22	0	5	3.95	1.327
The Project champion shows respect for the involved staff	22	3	5	4.32	.646
ENGAGE	22	2.00	5.00	4.0000	.94281
Valid N (listwise)	22				

From the findings, there was agreement that the project champion is slightly committed to ensuring that the EHRs implementation is successful [M=3.73], agreement that the project champion has substantial influence on the implementation process [M=3.95], agreement that there exists respect for all the involved staff in the implementation [M=4.32].

Overall the mean score for engaging about the EHRs implementation is way above the expected level that may affect implementation success of EHRs [Men=4.0000>MeH =3.4] which shows strong championship of the EHRs project and this is a good contributor for the EHRs implementation to be successful.

9.1.41 Executing (Faith Based Facilities)

The study further sought to evaluate the execution of the EHRs implementation process as this influences the implementation success of the EHRs. The results are shown below.

Executing

N	Minimum	Maximum	Mean	Std. Deviation
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The implementation of this EHR system will be done according to the laid down plans and budget	11	0	5	3.82	1.401
The implementation progress will be continually monitored to ensure fidelity to the outline strategies	11	3	5	4.36	.674
Key stakeholders will be engaged in the implementation process	11	4	5	4.45	.522
EXECUTION	11	2.67	5.00	4.2121	.73443
Valid N (listwise)	11				

From the results, there was agreement that the implementation will be carried out within the identified plan and budget [M=3.82], strong emphasis that the implementation process will be continually monitored [M=4.45], and finally strong emphasis on involvement of key stakeholders during the implementation process [M=4.45]

Overall the mean score for execution about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mex=4.2121>MeH =3.4] which shows the high stakeholder expectation and involvement expected during the implementation process and this will be a good contributor for the EHRs implementation to be successful.

9.1.42 Executing (Public Health Facilities)

The study further sought to evaluate the execution of the EHRs implementation process as this influences the implementation success of the EHRs. The results are shown below.

Executing

	N	Minimum	Maximum	Mean	Std. Deviation
The implementation of this EHR system will be done according to the laid down plans and budget	21	1	5	4.24	.944
The implementation progress will be continually monitored to ensure fidelity to the outline strategies	21	2	5	4.38	.865
Key stakeholders will be engaged in the implementation process	22	3	5	4.50	.673
EXEC	22	3.00	5.00	4.3939	.64764
Valid N (listwise)	20				

From the results, there was agreement that the implementation will be carried out within the identified plan and budget [M=4.24], strong emphasis that the implementation process will be continually monitored [M=4.38], and finally strong emphasis on involvement of key stakeholders during the implementation process [M=4.50]

Overall the mean score for execution about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mex=4.3939>MeH =3.4] which shows the high stakeholder expectation and involvement expected during the implementation process and this will be a good contributor for the EHRs implementation to be successful.

9.1.43 Reflecting and Evaluation (Faith Based Facilities)

The study further sought to find mechanisms that can reflect and evaluate the EHRs implementation process as this influences the implementation success of the EHRs. The results are shown below.

Reflecting and Evaluation

	N	Minimum	Maximum	Mean	Std. Deviation
I believe the use of feedback to measure the implementation progress will be essential	11	4	5	4.55	.522
I believe the use of a forum for presentation/discussion of results and implications for continued improvements will be essential	11	4	5	4.55	.522
Progress of the project will be measured by developing and distributing regular performance measures to staff involved.	11	4	5	4.45	.522
REFLECT	11	4.00	5.00	4.5152	.50252
Valid N (listwise)	11				

From the findings, there was agreement that use of feedback would be a good option to measure the implementation progress [M=4.55], emphasis that use of forums for presentation and discussion of results would be essential [M=4.55], emphasis on the use of performance measures to measure project progress [M=4.45].

Overall the mean score for reflection and evaluation about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mre=4.5152>MeH =3.4] which shows the high expectation of the use of mechanisms to reflect and evaluate the implementation process and this will be a good contributor for the EHRs implementation to be successful.

9.1.44 Reflecting and Evaluation (Public Health Facilities)

The study further sought to find mechanisms that can reflect and evaluate the EHRs implementation process as this influences the implementation success of the EHRs. The results are shown below.

Reflecting and Evaluatio

	N	Minimum	Maximum	Mean	Std. Deviation
I believe the use of feedback to measure the implementation progress will be essential	22	4	5	4.73	.456
I believe the use of a forum for presentation/discussion of results and implications for continued improvements will be essential	22	0	5	4.50	1.102
Progress of the project will be measured by developing and distributing regular performance measures to staff involved.	22	3	5	4.68	.568
REFLECT	22	3.00	5.00	4.6364	.59012
Valid N (listwise)	22				

From the findings, there was agreement that use of feedback would be a good option to measure the implementation progress [M=4.73], emphasis that use of forums for presentation and discussion of results would be essential [M=4.50], emphasis on the use of performance measures to measure project progress [M=4.68].

Overall the mean score for reflection and evaluation about the EHRs implementation is above the expected level that may affect implementation success of EHRs [Mre=4.6364>MeH =3.4] which shows the high expectation of the use of mechanisms to reflect and evaluate the implementation process and this will be a good indicator for the EHRs implementation to be successful.

9.2 Facility Data Abstraction Tool – Diabetes (Report)

Number of participants

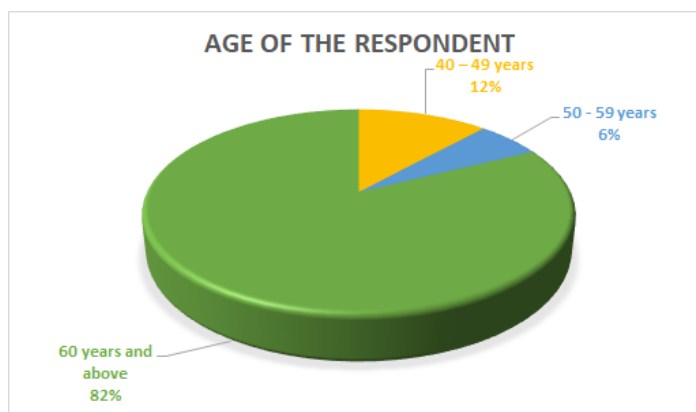
The total number of patients who volunteered to enroll and signed the consent form allowing for the abstraction of their data which is domicile at the diabetes clinics at the two FBO/NGO

healthcare facilities was 17. Mang'u Dispensary had 7 while Ting'ang'a dispensary had 10 participants - this is graphically represented below in a chart.



Age of the respondent

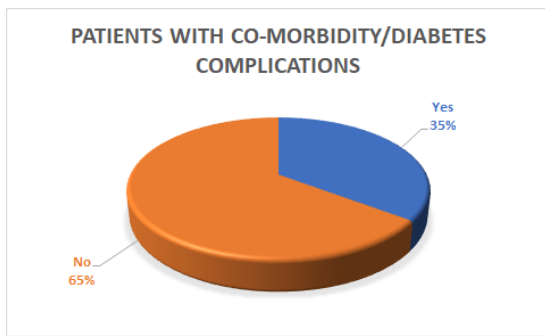
One of the inclusion criteria dictated that the participant should be 18 years old and above. We categorized the ages as follows; 18 – 19 years, 20 – 29 years, 30 – 39 years, 40 – 49 years, 50 - 59 years and 60 years and above. Below is the graphical representation of the participants.



Majority of the participants were 60 years and above - representing 82%. This is consistent with the general setting of both facilities' respective catchment areas being relatively rural where the population have a fairly active lifestyle rather than a sedentary lifestyle.

Comorbidity/Diabetes Complications

Patients with Co-morbidities/diabetes complication	
Yes	6
No	11


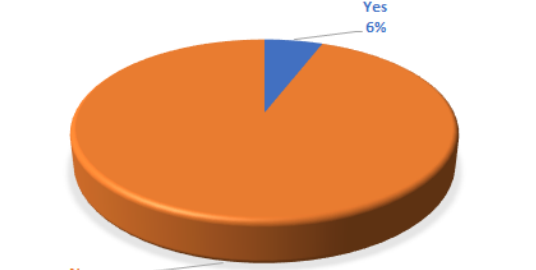
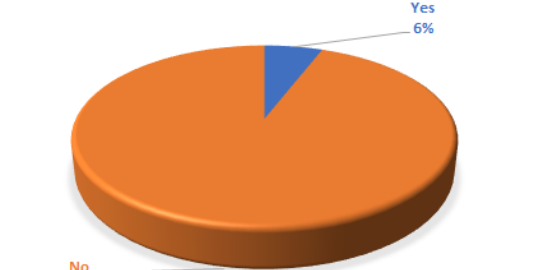
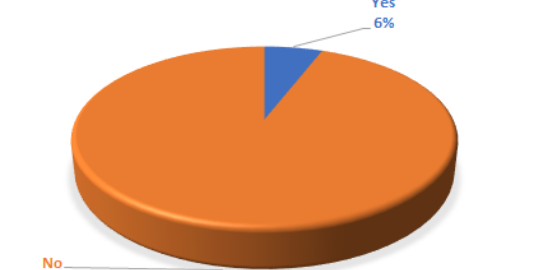


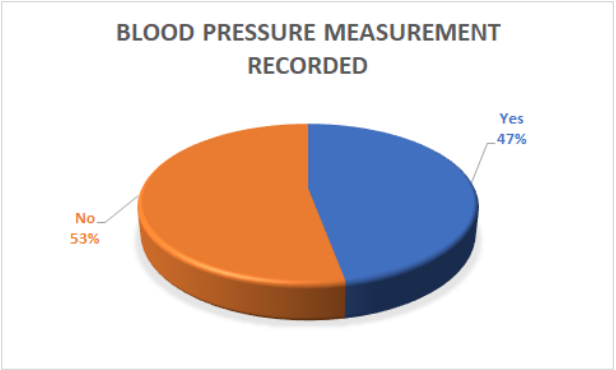
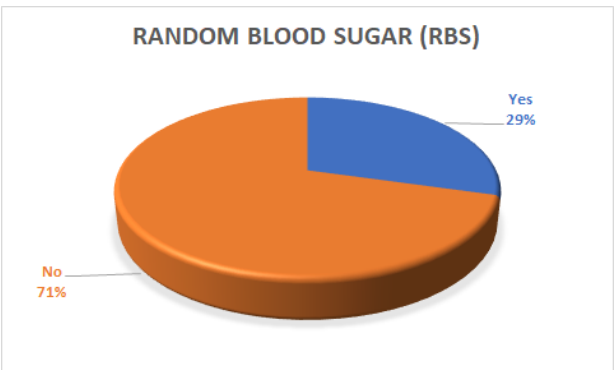
The baseline study revealed that 35% of the participants had co-morbidities and diabetes complications. Of those with the co-morbidities, 1 was identified to be having neuropathy while 5 had hypertension – representing 17% and 83% for neuropathy and hypertension, respectively.

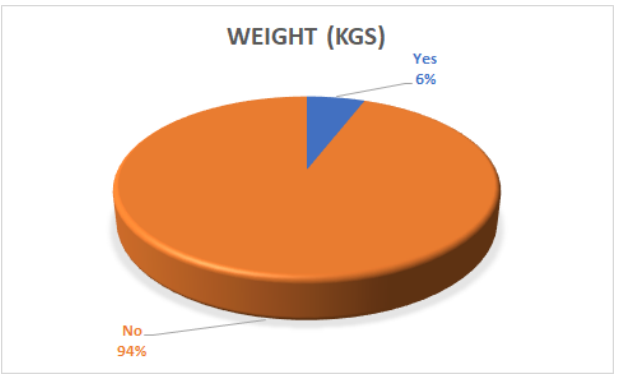
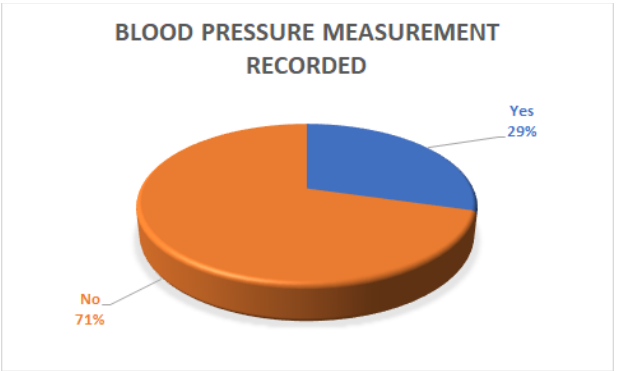
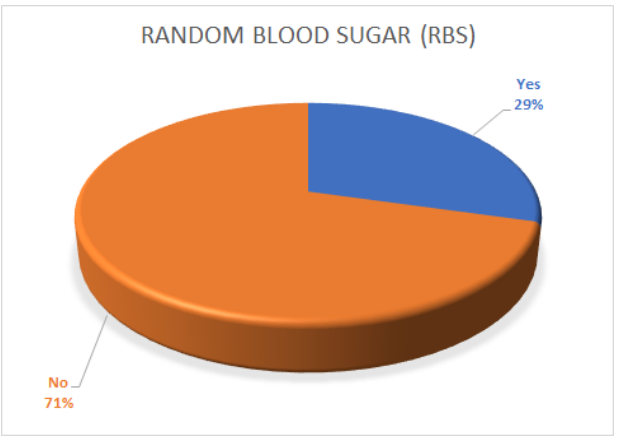
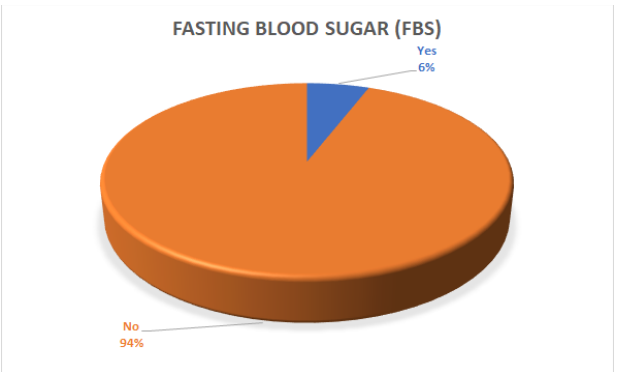
9.3 Facility Abstraction - Diabetes

Care processes and outcomes: 4 Visits in the past one year. Below we provide details of each of the visits.

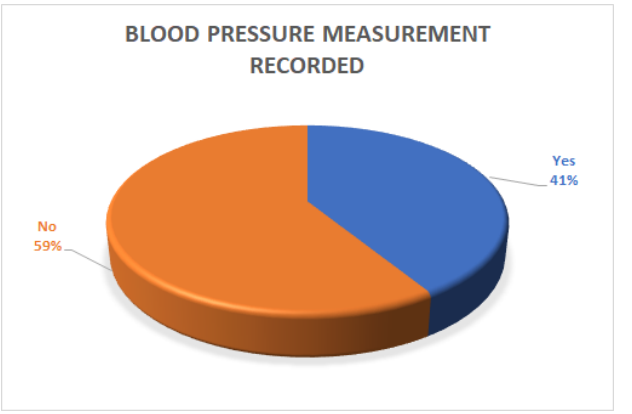
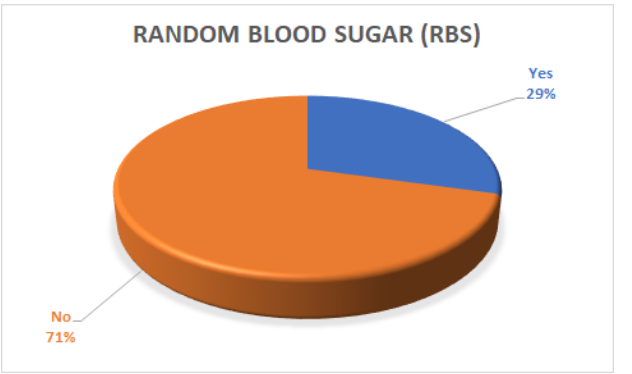
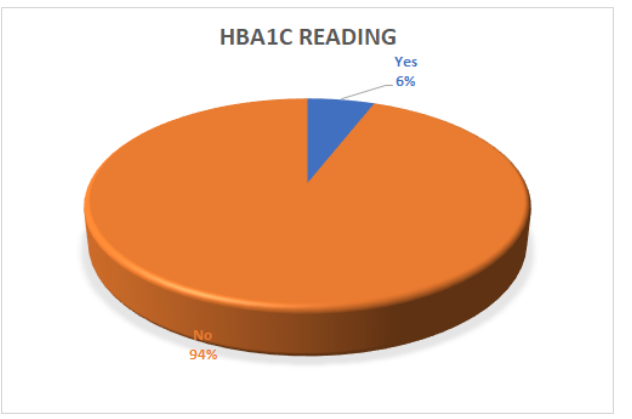
1st Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	None	None						
Height (cm)	None	None						
BP	15 patients, representing 88% of the total participants enrolled for the study from both FBO/NGO facilities. All the 7 patients from Mang'u had their BPs taken and recorded in the files while at Ting'ang'a 8 patients had their BPs taken and recorded. The 2 patients whose BPs had not been recorded in the files had indicated that their own self-monitoring BP machines at home and that they usually do self-measurements – suggesting that they only go to the health facilities to collect medication.	<p>A 3D pie chart titled "BLOOD PRESSURE MEASUREMENT RECORDED". The chart is divided into two segments: a blue segment representing "Yes" at 88% and an orange segment representing "No" at 12%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>88%</td> </tr> <tr> <td>No</td> <td>12%</td> </tr> </tbody> </table>	Response	Percentage	Yes	88%	No	12%
Response	Percentage							
Yes	88%							
No	12%							

<p>Random blood sugar (RBS)</p>	<p>7 out of 17 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 41%.</p>	<p style="text-align: center;">RANDOM BLOOD SUGAR (RBS)</p>  <table border="1" style="display: none;"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>41%</td> </tr> <tr> <td>No</td> <td>59%</td> </tr> </tbody> </table>	Response	Percentage	Yes	41%	No	59%
Response	Percentage							
Yes	41%							
No	59%							
<p>Fasting blood sugar (FBS) reading (mmol/l)</p>	<p>Majority of the participants did not have their FBS readings taken. These were 16 out of 17 patients, representing 94%.</p>	<p style="text-align: center;">FASTING BLOOD SUGAR (FBS) READING</p>  <table border="1" style="display: none;"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
<p>HbA1c reading</p>	<p>There was no HbA1c reading recorded</p>	<p>None</p>						
<p>Foot examination recorded</p>	<p>Only 1 out of 17 patients had foot examinations recorded, representing 6%.</p>	<p style="text-align: center;">FOOT EXAMINATION RECORDED</p>  <table border="1" style="display: none;"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
<p>Eye examination recorded</p>	<p>Only 1 out of 17 patients had eye examinations recorded, representing 6%.</p>	<p style="text-align: center;">EYE EXAMINATION RECORDED</p>  <table border="1" style="display: none;"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
<p>2nd Visit</p>								

Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	None	None						
Height (cm)	None	None						
BP	8 patients had their BP measurements recorded - 6 of whom were those from Mang'u dispensary while Ting'ang'a dispensary only 2 patients had their BPs taken and recorded. The remaining 9 patients didn't have their BP measurements recorded in their files.	<p style="text-align: center;">BLOOD PRESSURE MEASUREMENT RECORDED</p>  <table border="1" style="display: none;"> <caption>Blood Pressure Measurement Recorded Data</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>47%</td> </tr> <tr> <td>No</td> <td>53%</td> </tr> </tbody> </table>	Response	Percentage	Yes	47%	No	53%
Response	Percentage							
Yes	47%							
No	53%							
Random blood sugar (RBS)	5 out of 17 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 29%.	<p style="text-align: center;">RANDOM BLOOD SUGAR (RBS)</p>  <table border="1" style="display: none;"> <caption>Random Blood Sugar (RBS) Data</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>29%</td> </tr> <tr> <td>No</td> <td>71%</td> </tr> </tbody> </table>	Response	Percentage	Yes	29%	No	71%
Response	Percentage							
Yes	29%							
No	71%							
Fasting blood sugar (FBS) reading (mmol/l)	None of the patients had their FBS readings taken.	None						
HbA1c reading	There was no HbA1c reading recorded	None						
Foot examination recorded	None of the patients had foot examinations recorded.	None						
Eye examination recorded	None of the patients had eye examinations recorded.	None						
3rd Visit								

Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	1 patient from Mang'u dispensary had weight recorded	 <p>A 3D pie chart titled "WEIGHT (KGS)". The chart is divided into two segments: a small blue segment representing "Yes" at 6%, and a large orange segment representing "No" at 94%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
Height (cm)	None	None						
BP	5 patients had their BP measurements recorded - all of whom were patients from Mang'u dispensary while at Ting'ang'a dispensary none of patients had their BPs taken and recorded. Only 2 patients from Mang'u didn't have their BP recorded in their files.	 <p>A 3D pie chart titled "BLOOD PRESSURE MEASUREMENT RECORDED". The chart is divided into two segments: a blue segment representing "Yes" at 29%, and an orange segment representing "No" at 71%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>29%</td> </tr> <tr> <td>No</td> <td>71%</td> </tr> </tbody> </table>	Response	Percentage	Yes	29%	No	71%
Response	Percentage							
Yes	29%							
No	71%							
Random blood sugar (RBS)	5 out of 17 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 29%.	 <p>A 3D pie chart titled "RANDOM BLOOD SUGAR (RBS)". The chart is divided into two segments: a blue segment representing "Yes" at 29%, and an orange segment representing "No" at 71%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>29%</td> </tr> <tr> <td>No</td> <td>71%</td> </tr> </tbody> </table>	Response	Percentage	Yes	29%	No	71%
Response	Percentage							
Yes	29%							
No	71%							
Fasting blood sugar (FBS) reading (mmol/l)	1 patient had their FBS readings taken and recorded in their file.	 <p>A 3D pie chart titled "FASTING BLOOD SUGAR (FBS)". The chart is divided into two segments: a small blue segment representing "Yes" at 6%, and a large orange segment representing "No" at 94%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							

HbA1c reading	1 patient had the HbA1c reading recorded in the patient file	<p style="text-align: center;">HBA1C READING</p> <p>A 3D pie chart titled 'HBA1C READING' showing two segments: a small blue segment for 'Yes' at 6% and a large orange segment for 'No' at 94%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
Foot examination recorded	None of the patients had foot examinations recorded.	None						
Eye examination recorded	1 patient had eye examinations recorded.	<p style="text-align: center;">EYE EXAMINATION RECORDED</p> <p>A 3D pie chart titled 'EYE EXAMINATION RECORDED' showing two segments: a small blue segment for 'Yes' at 6% and a large orange segment for 'No' at 94%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
4th Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	1 patient had weight measurement recorded in the file	<p style="text-align: center;">WEIGHT (KGS)</p> <p>A 3D pie chart titled 'WEIGHT (KGS)' showing two segments: a small blue segment for 'Yes' at 6% and a large orange segment for 'No' at 94%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
Height (cm)	None	None						

BP	7 patients, representing 41% of the total participants enrolled for the study from both FBO/NGO facilities had their BP measurements recorded. Only 1 out of the 7 patients whose BPs were recorded was from Ting'ang'a dispensary.	<p style="text-align: center;">BLOOD PRESSURE MEASUREMENT RECORDED</p>  <table border="1"> <caption>Blood Pressure Measurement Recorded</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>41%</td> </tr> <tr> <td>No</td> <td>59%</td> </tr> </tbody> </table>	Response	Percentage	Yes	41%	No	59%
Response	Percentage							
Yes	41%							
No	59%							
Random blood sugar (RBS)	5 out of 17 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 29%.	<p style="text-align: center;">RANDOM BLOOD SUGAR (RBS)</p>  <table border="1"> <caption>Random Blood Sugar (RBS)</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>29%</td> </tr> <tr> <td>No</td> <td>71%</td> </tr> </tbody> </table>	Response	Percentage	Yes	29%	No	71%
Response	Percentage							
Yes	29%							
No	71%							
Fasting blood sugar (FBS) reading (mmol/l)	None	None						
HbA1c reading	There was only 1 patient whose HbA1c reading recorded. This was a patient at Mang'u dispensary	<p style="text-align: center;">HBA1C READING</p>  <table border="1"> <caption>HbA1c Reading</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>6%</td> </tr> <tr> <td>No</td> <td>94%</td> </tr> </tbody> </table>	Response	Percentage	Yes	6%	No	94%
Response	Percentage							
Yes	6%							
No	94%							
Foot examination recorded	None	None						
Eye examination recorded	None	None						

9.4 Facility Data Abstraction Tool – Hypertension

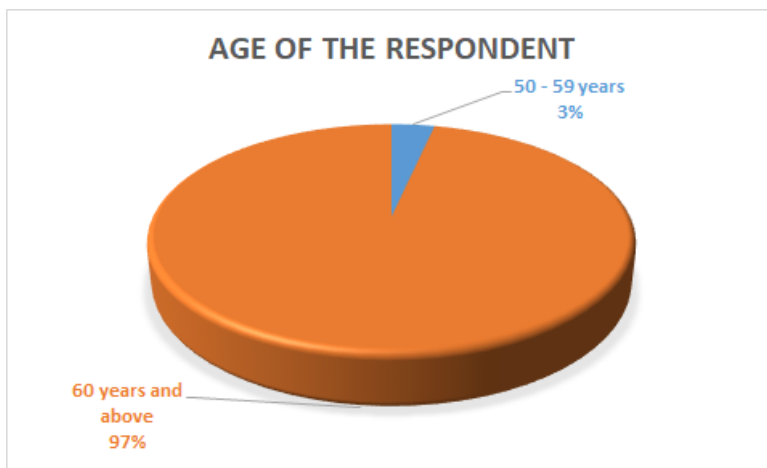
Number of participants

The total number of patients who volunteered to enroll and signed the consent form allowing for the abstraction of their data that was available at the hypertension clinics at the two FBO/NGO healthcare facilities was 29. Mang'u Dispensary had 12 while Ting'ang'a dispensary had 17 patients - this is graphically represented below in a Pie-chart.



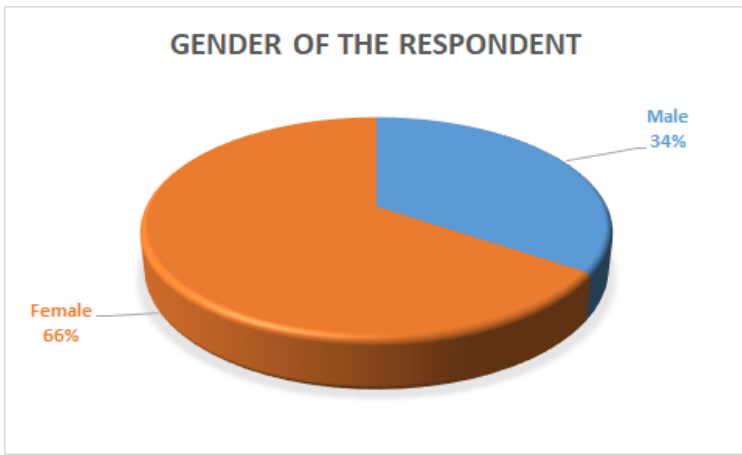
Age of the respondent

Majority of the patients whose data were abstracted were 60 years and above, this was followed closely by only one patient who was within the age group of 50 - 59 years.



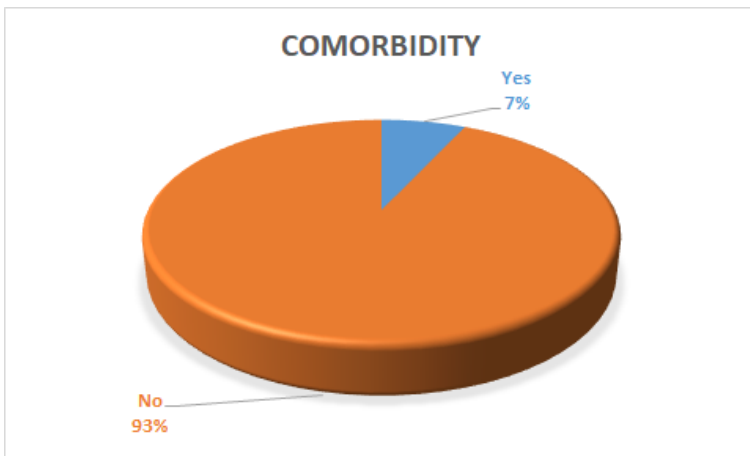
Gender of the respondent

As indicated in the pie chart below, female patients were more than male patients in the hypertension clinics at both FBO/NGO health facilities - 66% and 34% respectively.



Comorbidity/Hypertension Complications

We noted from the abstracted data that 93% (n=27) of the participants did not have any comorbidity. The remaining 7% (n=2) were captured to be having Retinopathy disease.

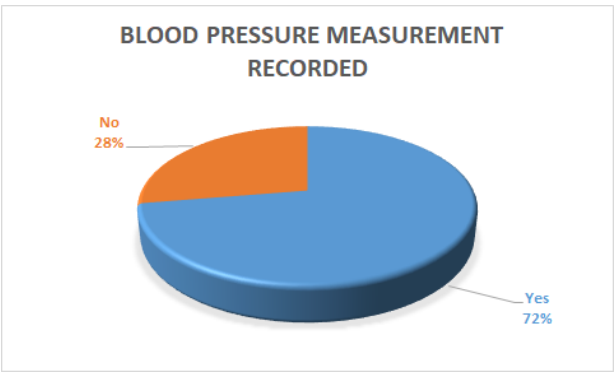
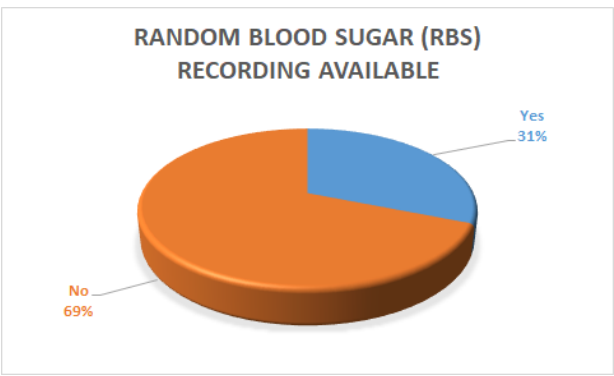


Care processes and outcomes: 4 Visits in the past one year

1st Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	93% (n=27) patients did not have their weight readings recorded in the files.	<p>A 3D pie chart titled "WEIGHT (KGS)". The chart is divided into two segments: a large orange segment representing "No" at 93% and a small blue segment representing "Yes" at 7%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>7%</td> </tr> <tr> <td>No</td> <td>93%</td> </tr> </tbody> </table>	Response	Percentage	Yes	7%	No	93%
Response	Percentage							
Yes	7%							
No	93%							
Height (cm)	None	None						
BP	23 out of 29 patients, representing 79% of the total participants who were enrolled for the study from both FBO/NGO facilities had their BP measurements recorded.	<p>A 3D pie chart titled "WAS A BLOOD PRESSURE MEASUREMENT RECORDED". The chart is divided into two segments: a large blue segment representing "Yes" at 79% and a smaller orange segment representing "No" at 21%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>79%</td> </tr> <tr> <td>No</td> <td>21%</td> </tr> </tbody> </table>	Response	Percentage	Yes	79%	No	21%
Response	Percentage							
Yes	79%							
No	21%							
Random blood sugar (RBS)	Only 9 out of 29 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 31%.	<p>A 3D pie chart titled "IS A RANDOM BLOOD SUGAR (RBS) RECORDING AVAILABLE?". The chart is divided into two segments: a blue segment representing "Yes" at 31% and a larger orange segment representing "No" at 69%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>31%</td> </tr> <tr> <td>No</td> <td>69%</td> </tr> </tbody> </table>	Response	Percentage	Yes	31%	No	69%
Response	Percentage							
Yes	31%							
No	69%							
Fasting blood sugar (FBS) reading (mmol/l)	None	None						
HbA1c reading	None	None						

Foot examination recorded	None	None						
Eye examination recorded	None	None						
2nd Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	1 patient had weight measurement recorded in the file - representing 4%							
Height (cm)	None	None						
BP	24 out of 29 patients, representing 83% of the total participants who were enrolled for the study from both FBO/NGO facilities had their BP measurements recorded.	<p style="text-align: center;">BLOOD PRESSURE MEASUREMENT RECORDED</p> <table border="1"> <caption>Blood Pressure Measurement Recorded</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>83%</td> </tr> <tr> <td>No</td> <td>17%</td> </tr> </tbody> </table>	Response	Percentage	Yes	83%	No	17%
Response	Percentage							
Yes	83%							
No	17%							
Random blood sugar (RBS)	10 out of 29 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 34%.	<p style="text-align: center;">RANDOM BLOOD SUGAR (RBS) RECORDING AVAILABLE</p> <table border="1"> <caption>Random Blood Sugar (RBS) Recording Available</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>34%</td> </tr> <tr> <td>No</td> <td>66%</td> </tr> </tbody> </table>	Response	Percentage	Yes	34%	No	66%
Response	Percentage							
Yes	34%							
No	66%							
Fasting blood sugar (FBS) reading (mmol/l)	97% (n=28) of the hypertension patients did not have their FBS readings recorded in their files.	<p style="text-align: center;">FASTING BLOOD SUGAR (FBS)</p> <table border="1"> <caption>Fasting Blood Sugar (FBS)</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>3%</td> </tr> <tr> <td>No</td> <td>97%</td> </tr> </tbody> </table>	Response	Percentage	Yes	3%	No	97%
Response	Percentage							
Yes	3%							
No	97%							

HbA1c reading	None	None						
Foot examination recorded	None	None						
Eye examination recorded	None	None						
3rd Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	None	None						
Height (cm)	None	None						
BP	20 out of 29 patients, representing 69% of the total participants who were enrolled for the study from both FBO/NGO facilities had their BP measurements recorded.	<p style="text-align: center;">BLOOD PRESSURE MEASUREMENT RECORDED</p> <p>A 3D pie chart titled 'BLOOD PRESSURE MEASUREMENT RECORDED'. The chart is divided into two segments: a larger blue segment representing 'Yes' at 69%, and a smaller orange segment representing 'No' at 31%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>69%</td> </tr> <tr> <td>No</td> <td>31%</td> </tr> </tbody> </table>	Response	Percentage	Yes	69%	No	31%
Response	Percentage							
Yes	69%							
No	31%							
Random blood sugar (RBS)	7 out of 28 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 25%.	<p style="text-align: center;">RANDOM BLOOD SUGAR (RBS) RECORDING AVAILABLE</p> <p>A 3D pie chart titled 'RANDOM BLOOD SUGAR (RBS) RECORDING AVAILABLE'. The chart is divided into two segments: a blue segment representing 'Yes' at 25%, and a larger orange segment representing 'No' at 75%.</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>25%</td> </tr> <tr> <td>No</td> <td>75%</td> </tr> </tbody> </table>	Response	Percentage	Yes	25%	No	75%
Response	Percentage							
Yes	25%							
No	75%							
Fasting blood sugar (FBS) reading (mmol/l)	None	None						
HbA1c reading	None	None						

Foot examination recorded	None	None						
Eye examination recorded	None	None						
4th Visit								
Vitals	Number of those whose measurements were taken and recorded	Graphical Presentation						
Weight (Kgs)	None	None						
Height (cm)	None	None						
BP	21 out of 29 patients, representing 72% of the total participants who were enrolled for the study from both FBO/NGO facilities had their BP measurements recorded.	 <p style="text-align: center;">BLOOD PRESSURE MEASUREMENT RECORDED</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>72%</td> </tr> <tr> <td>No</td> <td>28%</td> </tr> </tbody> </table>	Response	Percentage	Yes	72%	No	28%
Response	Percentage							
Yes	72%							
No	28%							
Random blood sugar (RBS)	9 out of 29 patients had their Random blood sugar (RBS) reading taken and recorded – this representing 31%.	 <p style="text-align: center;">RANDOM BLOOD SUGAR (RBS) RECORDING AVAILABLE</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>31%</td> </tr> <tr> <td>No</td> <td>69%</td> </tr> </tbody> </table>	Response	Percentage	Yes	31%	No	69%
Response	Percentage							
Yes	31%							
No	69%							
Fasting blood sugar (FBS) reading (mmol/l)	None	None						
HbA1c reading	None	None						
Foot examination recorded	None	None						

Eye examination recorded	None	None
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Summary Care processes and outcomes: 4 Visits in the past one year

Vitals Recorded	Visit 1	Visit 2	Visit 3	Visit 4
Weight (Kgs)	Yes = 7%	Yes = 4%	Nil	Nil
Height (cm)	Nil	Nil	Nil	Nil
BP	Yes = 79%	Yes = 83%	Yes = 69%	Yes = 72%
Random blood sugar (RBS)	Yes = 31%	Yes = 34%	Yes = 25%	Yes = 31%
Fasting blood sugar (FBS)	Nil	Yes = 3%	Nil	Nil
HbA1c reading	Nil	Nil	Nil	Nil
Foot examination recorded	Nil	Nil	Nil	Nil
Eye examination recorded	Nil	Nil	Nil	Nil