Establishing Health Management Information System for Integrated
HIV and Primary Health Care Services at Reach Out Kasaala

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Declaration

I Okiria Alfred Geoffrey do hereby declare that, this programmatic activity report entitled ‘Establishing Health Management Information System for Integrated HIV and Primary Health Care Services at Reach Out Kasaala’ has been prepared and submitted in fulfillment of the requirement of the MUSPH-CDC HIV/AIDS Fellowship Program and has not been previously submitted for any other academic qualifications.

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Dr Juliet Babirye
Academic mentor
Dedication

To my mother Akello Melda, father the late Okiria Alfred, daughter Akello Melly and wife Akol Naume.
Acknowledgement

My gratitude goes to the SPH-CDC Fellowship program, its leadership for the support and for offering me the opportunity to undertake this program. This has developed me in the various aspects especially I gain skills and competences in management, leadership, programming and communication. I also gained a lot in terms of capacity building, scale up of HIV services, health systems as well as monitoring and evaluation of programs.

I am indebted to my host institution mentors more especially Dr. Stella Alamo for always being there for me and tirelessly guiding me through the program. I awe my success to you. I also appreciate Mr. Elly Ssebyatika and Dr. Charles Namisi for their unwavering, continuous support and guidance that enabled me get the right direction in the program.

My Academic Mentor has been there for me even when she was out of the country she always supported me. I am very grateful for the support she provided for me.

The staff of Reach Out Mbuya and Reach Out Kasaala have always been together in supporting me accomplish my tasks and as a team they have given me the opportunity to learn by doing.

My family has always been supportive and endured my irregular presence at hope. May Almighty God bless you.
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### List of abbreviations and acronyms

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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>AMREF</td>
<td>African Medical and Research Foundation</td>
</tr>
<tr>
<td>ART</td>
<td>Anti-retroviral Therapy</td>
</tr>
<tr>
<td>ARV</td>
<td>Antiretroviral drug</td>
</tr>
<tr>
<td>CATTS</td>
<td>Community ARV TB Treatment Supporter</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control and Prevention</td>
</tr>
<tr>
<td>DISH</td>
<td>Delivery of Improved Services for Health</td>
</tr>
<tr>
<td>HCT</td>
<td>HIV Counseling and Testing</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>HMIS</td>
<td>Health Management Information System</td>
</tr>
<tr>
<td>HMN</td>
<td>Health Metrics Network</td>
</tr>
<tr>
<td>ICD</td>
<td>International classification of Diseases</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Monitoring and Evaluation</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health.</td>
</tr>
<tr>
<td>OPD</td>
<td>Out Patient Department</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary Health Care</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Mother to Child Transmission</td>
</tr>
<tr>
<td>ROM</td>
<td>Reach Out Mbuya HIV/AIDS Initiative</td>
</tr>
<tr>
<td>ROK</td>
<td>Reach Out Mbuya HIV/AIDS Initiative-Kasaala.</td>
</tr>
<tr>
<td>SPH</td>
<td>School of Public Health (Makerere University)</td>
</tr>
<tr>
<td>SQL</td>
<td>Structured Query Language</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>VCT</td>
<td>Voluntary Counseling and Testing</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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Operational definitions:

Client: In this context is HIV infected and affected persons receiving care, treatment and support from Reach Out Kasaala.

Patient: In this context will mean any person who is HIV negative/unknown status with any other illness receiving care.

System: A collection of components that work together to achieve a common objective.

Information System A system that provides information support to the decision-making process at each level of an organization.

Health Information System A system that integrates data collection, processing, reporting, and use of the information necessary for improving health service effectiveness and efficiency through better management at all levels of health services.

Health Management Information System An information system specially designed to assist in the management and planning of health programmes, as opposed to delivery of care.
Abstract.

Background: Health Management Information System (HMIS) is the basis for Monitoring and Evaluation of health programs and service delivery. Reach Out Kasaala’s HMIS was characterized by lack of: standardized reporting tools, data storage, backup facilities and computerized databases. This was worsened by lack of trained staff in data management; hence the need to put in place integrated HMIS in the facility. The objective was to establish a computerized HMIS for integrated HIV and primary health care services at Reach Out Kasaala by end of March 2010.

Methods: A Participatory review of the existing tools to make them relevant to the data needs of the facility was undertaken. The outpatient and inpatient admission forms and registers were developed as well as the pharmacy dispensing log to track drug utilization and use for projections.

Results: All the relevant forms have been standardized and printed. Registers and dispensing logs have been printed and are in use. All computers networked with server installed in M&E section. Computerized databases have been developed with key modules of registry, outpatient, inpatient, immunization, antenatal, laboratory, medical follow up, counseling and pharmacy. All client records were entered into the registry. Staff were trained in data management and the M&E budget takes into consideration the maintenance costs for the system.

Conclusion: Computerized HMIS is very critical component in the Monitoring and Evaluation of service provision in the organization. We have demonstrated that all sites can be networked and centralized to ease data retrieval and report writing.
1.0 Introduction and Back ground

1.1 Introduction

Health Management Information System (HMIS) is specially designed to assist in the management and planning of health Programmes, as opposed to delivery of care only (WHO 2005). It is a system to collect, process, and store, transmit and disseminate data. And can be automated or manual. Human resources, materials, machines and methods are required for it to function. The activities involved include inputting data from standard tools; processing data into information, storage of data and information, and production of outputs such as management reports. HMIS forms the basis of monitoring and evaluation of health programs.

Health management information systems are set up to provide programs with data for Patient and facility management. Key is the aspect of planning, monitoring service delivery (Gething et al., 2006), evaluating programs, resource mobilization and allocation, advocacy and lobbying, patient tracking and follow up, research, policy formulation, initiate intervention and measuring their effectiveness and accountability to donors and other stakeholders. Therefore the health management system is very robust and it is the backbone to the success of any health program.

With regard to the patients accurate information can be used for patient monitoring ensuring that information about the patient can be retrieved easily hence improving patient follow up. And subsequently the quality of care provided.
For new programs defining the necessary tools and data requirements are very important at the start but should be undertaken in a consultative way involving the end users of the tools. For programs scaling up, modification of the tools should reflect the data requirements and reporting needs while taking into account the human resource issues.

To effectively provide the necessary data required, the system should be automated with sub systems interconnected to allow centralized processing, management, manipulation, and storage of data. This improves the quality of the data for planning purposes and enhances accurate decision making including accurate projections.

1.2 Background
Reach Out Mbuya (ROM) parish HIV/AIDS Initiative is a faith based Non-Governmental organization founded in 2001. It provides holistic care and support to people infected and affected by HIV. Through a network of community volunteers who are clients themselves and using a task shifting approach, trained nurses take the lead in patient care and treatment.

With increasing access to HIV care services including the life saving ARVs, Reach out has expanded its catchment area in a bid to reach more vulnerable populations. In January 2009, HIV services were initiated in an existing but underserved, under funded and underutilized Health centre III in Kasaala- Luwero. There was an existing pool of 500 patients in need of HIV services.
Primary health care services offered at the health facility include the following: general outpatient consultations, inpatient admissions, antenatal and postnatal care, immunization, laboratory tests, outreaches and general health education for the patients. The facility has been utilizing the routine HMIS reporting format. Reports are generated by the cashier from the daily information gathered at the cashiers’ office and the few record books that are available from the inpatient and outpatient. Reports are submitted to the Ministry Of Health through the district and to Catholic Medical Bureau through Kasana Luwero Diocese. Data is collected and processed manually weekly, monthly and quarterly. Annual reports are also produced manually. Data is filed as hard copies and kept in cabinets. The records are inconsistent and HIV clients do not have any files. Clients are provided with medical form 5 which captures both clinical notes and treatment. The forms are retained by the patients who may not necessarily keep them for the next clinic visit affecting continuity of care.

With the introduction of ART, the patient numbers are increasing from the monthly 200-300 patients/month over 600/month. Each encounter of the patient with the clinician, a record is generated and this information needs to be captured, processed, stored, transmitted and analyzed for meaningful decision making. This process is vital in any facility providing care to the patients. Tools needed to be developed and for the existing tools, standardized in order to capture vital information needed for patient care. This information needs to be captured in a database to enable easy retrieval and processing whenever need arises.
2.0 Literature Review.

2.1 HMIS

Health management information system incorporates all the data needed by policy makers, clinicians and health service users to improve and protect population health. Few countries in the world today have effective and comprehensive systems in place to gather this data (WHO 2004). A robust Health Information System is the core of any successful public health system. (Abou Zahr, 2005; 2).

2.2 Why HMIS

As the world focuses towards attaining and meeting the Millennium Development Goal targets, and as resources become available for high burden diseases such as HIV and AIDS, Tuberculosis and Malaria, decision-makers need to be able to measure whether policies and programmes are working, and whether progress is being made towards achieving the set goals. Donors are also placing more emphasis on performance, linking the release of funds to performance based measures (WHO 2004). Public health decision-making is critically dependent on the timely availability of sound data (Abou Zahr, 2005; 1). Therefore the system that captures this information is key in the sustainability of programs.

The World Health Organization (WHO) argues that investing in health management information systems (HMIS) can have multiple benefits, including:

• Helping decision makers to detect and control emerging and endemic health problems, monitor progress towards health goals, and promote equity;
• Empowering individuals and communities with timely and understandable health-related information, and drive improvements in quality of services;

• Strengthening the evidence base for effective health policies, permitting evaluation of scale-up efforts, and enabling innovation through research;

• Improving governance, mobilizing new resources, and ensuring accountability in the way they are used.

While Cibulskis and Hiawalyer (2002) suggest that there are four main ways that good health management information system can contribute to the efficiency, effectiveness and responsiveness of health related programmes:

• Helping managers to align health system resources with the needs of service users.

• Increasing accountability within an organization, while also allowing the public, political representatives and donors to assess whether they are achieving value for money.

• Marketing of health programmes in order to get adequate funding levels, from public and non-state sources;

• Monitoring of health-related activities- help assess what works and what doesn’t over periods of time.

So far, the most successful information systems are those developed at a small scale, where the data needs have been well defined and the end-users closely associated with those doing the data collection. (East African Policy Forum 2005)
2.3 Progress in HMIS

In recent years there has been noticeably more attention on building capacity in health systems as a means to improving health outcomes. In addition, development partners including the World Bank and others have stepped up their efforts in this area. However, there have been shortcomings of focusing solely on vertical disease programmes within a health system, at the expense of not addressing the “root causes” of poor health delivery, such as information systems, weak governance, infrastructure, implementation planning or human resource challenges.

In Africa, excellent work on health systems strengthening is currently under way, including health worker training by the African Medical & Research Foundation (AMREF) or the drive to capture reliable health data by the Health Metrics Network (HMN). However, additional support at the system level is needed for governments in Sub-Saharan African countries to effectively access new and utilizes current funding towards achieving the health-related Millennium Development Goals (MDGs). These efforts have been seen in many African countries, East Africa, Malawi, Zambias and many others. These have demonstrated the importance of improving the HMIS.(WHO, 2004)

In Uganda in 1994, the ministry of health began improving the HMIS and utilizing the information for the planning and decision making. The health facilities use the HMIS 105 for reporting purposes. In 2000, the ministry undertook to review the HMIS with all the stake holders. This was prompted by the draw backs in the HMIS especially poor
reporting, inadequate stationary, supplies, insufficient training and lack of motivation of the health workers to collect quality data. The MOH through the Delivery of Improved Services for Health (DISH) Project addresses some of the problems by improving the quality of data collected by the health facilities, developing and computerizing the data bases in some districts in Uganda. (MOH DISH, 2001)

2.4.0 Constraints to HMIS

2.4.1 Measurement and coding
Health decision makers need to agree what diseases and what resource management issues they wish to monitor on a regular basis. It is not only about reporting the diseases but rather the ability of the clinicians to arrive at a correct diagnosis. The WHO has created the International Classification of Disease (ICD) to try and standardize disease reporting across the world. This are internationally accepted codes for main diseases and it is important that this are incorporated into the HMIS right from the source where the data is generated (WHO 2005).

2.4.2 Human resource capacity
One of the most important aspects of improving HMIS is ensuring that the people filling in the forms at clinic level are skilled enough to report accurately, whether on diseases diagnose or resources used. This should therefore be a priority training area. so as to improve the quality as well as the consistency of the data generated (WHO 2005). Staff directly involved in the generation of the data should be informed of the importance of having accurate information as this will enable proper planning and accountability.
Organizations that have interest in training health service managers also recognize the need for more skills in HMIS (Gladwin, 2000)

2.4.3 Tools, data storage and use

One of the temptations in HMIS has been to get carried away with the technical aspects of data storage and analysis, rather than focusing on the more fundamental issues of making sure the data is correct in the first place. This entails having in place correct tools for capturing data first. There is no doubt that computerization of data storage and analysis has sped up data handling considerably, but it has also drawn attention away from other more critical, and more challenging aspects of HMIS, such as coding and personnel capacity. In terms of data use, countries have been consistently poor at supporting health workers who are collecting data to use it locally for planning and management purposes. Some observers speculate that facilitating greater local use of data could improve data quality overall, as those doing the data collection should. The developing countries and organizations should take action to strengthen the HMIS using the available ICT. Though this due to poor economic and communication infrastructure, have been limited to the national and higher levels, there should be effort to extent this to the lower level health workers and facilities (Simba, 2004).
3.0 Problem statement and Justification.

3.1 Problem statement.

There was no integrated system in place to collect data on HIV and PHC services in Reach out Kasaala. Yet there were an increasing number of clients accessing both services. In a month in OPD over 600 consultations were made and introduction of HIV services especially HIV testing, prophylaxis for opportunistic infections, ART, support services on the existing PHC services increased the data needs. The paper based system being used then hindered timely and accurate reporting. Furthermore, the HMIS reporting form that was used for routine data collection was not comprehensive enough to capture all the required information. Below was a summary of status of HMIS in Kasala which the baseline assessment identified: Inadequate forms/tools to capture; outpatient and inpatient information, referral and follow up information and investigations requests. PHC drugs were not tracked; no forecasts were made, and no re-order levels were available. The Cashier doubled as the unit data records Clark and HMIS officer. The unit had one very old computer with extremely slow processing speed and had very limited memory. None of the staff had had training in data management including the in charge whose main function was programmatic and financial accountability. Clients and patients carried home with them medical records making continuity of care a challenge.

3.2 Justification

With integration of the PHC and HIV services, tools for capturing data needed to be developed and the existing tools redesigned and made simple and relevant to the
information needs of patients. Furthermore, the data collection, processing, storage and processing were fragmented as HIV and PHC services. There was need to integrate the two components into one central data base for improved reporting and patient and facility management. This would improve the quality of care of the patients as well as the management of the facility in general.

3.3 Critical areas of concern

The major areas of concern were:

Registry for all outpatient patients and HIV clients,

Inpatient admissions.

Pharmacy

Adherence Support Section (ASSECT)

Counseling

Laboratory

Stores

M&E section
4.0 Project aim

The project aimed at establishing a computerized health management information system that would improve Monitoring and Evaluation of integrated HIV and PHC services in Reach Out Kasaala by the end of March 2010.

4.1 Goal

To contribute to improved quality of care of patients and clients in Uganda through improving the health management information systems.

4.2 General objectives

To establish health management information system for integrated HIV and PHC services at Reach Out Kasaala by March 2010

4.3 Specific objectives

To improve data collection through development of tools.

To establish computerized HMIS in reach Out Kasaala.

To improve the capacity of the staff to utilize the HMIS through training.

4.4 Outputs:

The already existing tools were reviewed and standardized while the non-existing tools were developed to enable accurate capture of the data at the facility. (See Appendix 2&3 for tools developed)
• OPD cards for PHC patients developed.
• Inpatient admission cards for all patients developed.
• Inpatient monitoring charts for all patients developed and in use.
• Medical follow-up forms are in use now.
• Counseling forms standardized.
• Client enrollment forms standardized.
• Pharmacy drug dispensing log developed and printed.
• The primary health care outpatient and inpatient registers developed, printed and in use.
• Networking of the site and installation of the server was done.
• Work stations in the following places have been installed: M&E, counseling, pharmacy, registry, clinic, ASSECT, stores, Laboratory, community and accounts

The following modules were developed:

Primary health care with the following interfaces: outpatient, inpatient, antenatal, immunization, deliveries and postnatal

HIV modules with the following interfaces: Adult and paediatric baseline and follow up, PMTCT, counseling, TB, laboratory, pharmacy and stores.

23 staff have been trained in computerized HMIS.

We have in place 500GB External hard drive for Data storage/back up in case of disaster.
5.0 Methodology

5.1 Data collection tool development.
These focused on improving the HMIS for the facility to be able to capture all the information for HIV and PHC services and involved the following:
Development of the outpatient forms for the PHC patients.
Development of both outpatient and inpatient registers in ministry of health format.
Development of inpatient form for both PHC and HIV clients. This included the development of the inpatient monitoring charts like temperature chart, fluid balance chart as well as treatment monitoring chart.
Pharmacy dispensing log for the drugs was developed.
A participatory approach was used. All draft tools were pre-tested and revised where necessary. The final drafts were presented to management for the final approval.

5.2 Networking and computerizing the site
The various work stations with the computers were networked and linked to the server housed in the M&E section. This was to enable all the work that will be input at the various sections to be stored and backed up in the server at the M&E section. (See Appendix 1 for the diagram)
Figure 1 Diagram of workstations link to server

The computers from the various sections and the server were purchased and networked.

5.3 Process of Module development.

An electronic relational database was developed with tables that store the data and interfaces were developed using Visual Basic to access data from MYSQL database. The developed tools formed the basis of the inputs into the databases which was installed on the server linked through the network to workstations from where data captured. The database has different functions separated into modules.
5.4 Registration module

Demographic and socioeconomic data was captured and each client given a unique identifier. The CDC registry version 2.0 was used in order to ensure consistency of the data captured. For the PHC patients, a simpler form was developed to capture the essential information. Given that the PHC patients are inconsistent in attendance, this forms are filed and retrieved when the client comes for review or with other complaints. The data base was developed and installed in the server. This enables the system to track the re-attendances and missed appointments.
5.5.0 Primary Health Care

5.5.1 Out patient module

This module captures the patients’ demographics. Given that the PHC patients are inconsistent in attendance each patient who comes for the first time is entered as new. However, if he/she comes the second time that month the system will be able to capture this patient as reattendance and the previous visit details can be retrieved. This helps the clinicians in the management of the patients in OPD.
Figure 4 Primary Health Care OPD Interface

Figure 5 PHC Patient management interface
5.5.2 Inpatient Module

All the in patient admissions for both the PHC patients and the clients were captured and all the interventions while in admission were captured.

Figure 6 PHC Inpatient interface
Figure 7 PHC Inpatient treatment interface

Figure 8 PHC Inpatient discharge interface
5.5.3 Antenatal Module

Figure 9 Antenatal Interface

This interface captures data from ANC attendances. Through this mother’s appointments and any investigations done are inputted and can be retrieved during the next visit. We are able to determine the missed appointments for follow up.

5.5.4 PMTCT Module

All the data of mothers under the PMTCT program is captured through this interface and this enables close follow up of the mothers in the program. At 28 weeks we refer the mother to the collaborating centers for further management. The use the mother to mother supporters to follow up this mother thereafter.
Figure 10 PMTCT Interface

5.5.5 Immunization

This interface captures all the immunization data about the child and this is used to generate reports at the end of the week and monthly. We are able to determine the dropout rates and completion for vaccination.
5.6.0 HIV component

5.6.1 Medical follow-up module

For the clients during the regular follow up of the clients, the review information is captured at each visit. This information captured on medical forms for each clients visit is entered into this module. Data entered into this module is used to monitor clients in terms of diagnosis and treatment and basic variables required like WHO ICD code for the diagnosis, weight, WHO Staging. Most common diseases were loaded into the Database and clinicians are only required to pick the list loaded and not typing entire diagnosis into the database. The referral information whether internal or external and reasons for the referrals are all captured on this module. This enables tracking of the referral of patients in the facility. Below are the various interfaces for capturing the information.
Figure 12 Adult evaluation interface

Figure 13 Paediatric Evaluation interface
Figure 14 Adult follow up interface

Figure 15 Paediatric follow up interface
5.6.2 Counseling module

The modified counseling form is used to capture data. The initial counseling information is input in the interface of counseling and testing while the information on the ongoing counseling is input in the interface of ongoing counseling shown below. This is also useful for the follow up of especially the HIV negative clients and the issues of disclosure.

![Counseling and Testing Interface](image)

**Figure 16 Baseline counseling and testing interface**
Figure 10 Ongoing counseling interface

5.6.3 TB module

Apart from the registration of the TB patients this module has follow up as well as the treatment the patient is on. It also has the treatment outcome and the sputum results section. This makes it possible to follow up the patients on treatment. We are also able to track the TB/HIV co infected patients.
Figure 11 TB interface

5.7.0 Pharmacy module

Data from the dispensing log was regularly captured into this interface. Particulars of drugs dispensed to each client and patient are captured both to monitor clients’/patients medication and facilitate accountability for drugs issued to pharmacy.
5.8.0 Stores management module

The stores module is incorporated into the pharmacy and enables tracking of drugs and stock in both the pharmacy and the stores.
Drugs dispatched to other stores like from Mbuya to Banda or Kasaala are also tracked closely through this module. Hence stock control is now made easier than before.

Figure 14 Store management interface

5.9.0 Laboratory Module

This is one of the most important modules in terms of the patient day to day care. The request is generated from the clinic and this are input at the clinic and then this request can be received and retrieved in the laboratory.
Figure 15 Lab investigation interface

The results are input directly to the system and this can be accesses by the clinician who requested for it.
5.10 Staff training.

Twenty three staff were trained HMIS during which they were given an overview of all the modules. Intensive training is now underway at the respective work stations and data inputting is being done as a hands on training. *Below is one of the M&E staff (standing) taking ROK staff though the modules.*
5.11 Ethical issues

Approval was sought from the Makerere University School of Public Health Institutional Review Board and from the Uganda National Council of Science and Technology for the implementation of the program.

5.11.1 Client and patient Identification

All patients and clients are assigned unique identification. KHI 00001 for the clients (up to 99,999 clients can be registered using this 5 digit number) and KPC 000001 for the PHC patients. The interface below indicates the list of clients with the

![Figure 17 Client Identification](image-url)
5.11.2 Data entry and integrity.

Data entry is done by the respective staff in the various sections. However, this is supported by the data clerks. This minimizes the errors at entry since the end user understands the variables to be inputted better than the data clerk. Data Entry screens are interactive with obvious errors being flagged at input time and messages displayed on how to rectify the errors. All records are stamped with usernames to facilitate auditing and accountability. The system captures all the staff involved in the patient care and support and this have identification numbers. The system therefore is able to capture the respective staff that is inputting the data and any errors can be traced to the staff inputting. This enables authentication of the information captured.

Below is the interface that captures the staff details and employee identification.

![Figure 18 User Entry and Identification](image-url)
5.11.3 Reporting.

Reports are generated according to the laid down protocols. The information requirements for the various levels are taken into account. For example, more detailed information is needed at the point of generation while at the higher level summaries of the key indicators is sufficient. The system allows reporting on all the variables captured – can be made over a specified period of time. The structured query language is used to generate reports like “SELECT”. For the client registry we use the Client registry table and for the HMIS we use the database. Below is the interface that shows the query run to select the top 1000 clients.

**Figure 19 Report generation**
The output is as indicated below with each variable of interest displayed.

Below are the command (script) SELECT top 1000 rows. It indicates the variables selected.

**SELECT TOP 1000 [ID]**

- [ClientNumber]
- [LegacyNumber]
- [RegistrationDate]
- [Surname]
- [FirstName]
- [Initial]
- [OtherNames]
- [DateOfBirth]
- [EstimatedDateOfBirth]
- [NextOfKin1]
- [NextOfKin2]
- [MedicalCompanion]
- [RelationshipToClient]
- [FathersName]
- [MothersName]
- [GenderID]
- [NationalityID]
- [EthnicityID]
- [ReligionID]
FROM [ClientRegistry].[ClientRegistry].[TBL_Client]

The output from this command can be exported to any analysis software in order to do more detailed analysis. It can be exported to Excel.

5.11.4 Security and control of quality at user level.

Backups are made weekly to secure the data in case of a disaster. Each user is assigned a username and password and a security level specifying the functions he/she is supposed to carry out. The interface below indicates the prompt that is displayed each time the staff accesses the data base for data entry. The staff has to enter his/her user name and the password to be able to log in. This ensures the security of the data base.

![Login interface](image)

Figure 20 Security and login in
5.11.5 Confidentiality of Data Collected.

Unique numbers are allocated to patients such that names of patients can be hidden when sensitive data like diagnosis is being accessed. All users are assigned roles and privileges while accessing the data depending on administrative responsibilities. Every member of staff is created as user on the system before he or she can have access to the database and must have a password. The interface below shows the window for assigning the privileges to the staff and specifying the extent to which the staff can use the system.

![Image showing the window for assigning privileges](image)

**Figure 21 Assigning privileges**

5.12 Dissemination

Dissemination has been done to Reach Out Kasaala, the entire Reach Out staff, School of Public Health, other Stakeholders through meetings and workshops.
5.13 Sustainability of this project

The M&E staff have been involved in all the stages of this project and underwent the necessary training in order to gain the competences to manage the system. These are the personnel that are responsible for the sustainability of this project. Further, the budget for the M&E section has items on the maintenance of the system and this has been incorporated in the overall budget of the organization. Hence the system has a budgetary allocation each financial year.

5.14 Benefits of the system

Computerized HMIS enables easy data capture at the source of generation. This ensures that all data is captures as it generated. This simplifies the work of the staff in terms of minimizing the back log that could be passed onto the data clerks.

Errors at data entry are minimized and data accuracy improved (user inputs data). As data is entered by the end user who is in most cases technical in that area e.g. the clinicians are technical in medical language and prescriptions, spelling errors can be minimized and this therefore improves the accuracy of the information captured.

Reports generation is made easier. Even at the end user level however depending on the privileges assigned.

Improved clients service delivery. The clients appointments are printed the day before the clinic is to run and this are passed on to the registry. On the day of the clinic the clients
that turn up are ticked and at the end of the day it is very easy to determine who didn’t turn up and this list is passed onto the community for the CATTS to follow up.

Service integration and client tracking possible. This is more important for the PHC where the patients are inconsistent.
6.0 Conclusions and recommendations

6.1 Conclusions

HMIS is a vital component of the monitoring and evaluation. The data collected is useful for monitoring the organization activities and evaluating its objectives and goals.

End user training is very critical in ownership of the system. This ensures the staff have the necessary experience.

HMIS improves data management in terms of data capture, cleaning, analysing, report generation as well as storage.

6.2 Recommendations.

M&E section to continue phased training to enable all the staff in the various section acquire hands on skills in using the system.

ROM management to link all the four sites to main server at Mbuya. This will enable easy access of the data at Mbuya and improve on the monitoring of the program.

MOH consider simple integrated databases for lower health facilities. This will improve on the data management at these lower health facilities.
References

Available online at: http://www.who.int/entity/bulletin/volumes/83/8/578.pdf


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Advance Access publication, September 2005

East Africa Policy Forum Health Management Information Systems Dar es Salaam
Forum Report 23rd -24th May 2005


WHO Practical principles on building and improving health management information systems. Regional Office for the Western Pacific / WHO Regional Office for the Western Pacific (WHO-WPRO) (2004)

WHO Improving the use of information for health care decision-making: what is needed World Health Organization / World Health Organization (WHO) (2005)
Appendices

Appendix 1: Work stations at Kasaala.
KEY:
M&E-Monitoring and Evaluation- Server installed here.
A-ASSECT Adherence Support Section (ART, TB, and PMTCT)
C- Clinic work station
P- Pharmacy
R-Registry
V-Counseling
S- Stores
T-Team leaders-community and HR (two work stations)
M- Accounts
L-Laboratory
O-Medical coordinator
Appendix 2: PHC Out patient form

REACH OUT MBUYA HIV/AIDS INITIATIVES- KASAALA
OUT PATIENT FORM

Out Patient Number:  **KPC/…………………..** WEIGHT……………..Kgs  DATE……………………

**DEMOGRAPHICS.**

NAME………………………………………………. ……………AGE IN YEARS…………………………

SEX:  MALE             FEMALE  *(Circle the appropriate)*

SUB-COUNTY……………………………………..PARISH………………………………………..

VILLAGE……………………………………..LCI NAME………………………………………..

RELIGION…………………………MARITALSTATUS……………………OCCUPATION……………..

TRIBE…………………………HIGHEST LEVEL OF EDUCATION……………………………..

Next of Kin……………………………………..…Relationship……………………Tel……………………

For Females:  Para………+………   Number of children alive……………………

**PRESENTING COMPLAINT.**

**REVIEW OF SYSTEMS**

<table>
<thead>
<tr>
<th>Central Nervous System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular System</td>
</tr>
<tr>
<td>Respiratory System</td>
</tr>
<tr>
<td>Gastrointestinal System</td>
</tr>
<tr>
<td>Genito Urinary System</td>
</tr>
<tr>
<td>Musculoskeletal System</td>
</tr>
<tr>
<td>Ear Nose and Throat</td>
</tr>
</tbody>
</table>

**PAST MEDICAL HISTORY**

Admissions/hospitalization:
Medications and supplements taken:

Treatment for TB in the past: Yes/No    If yes date:…/…/……Outcome……………………………..

PAST SURGICAL HISTORY:……………………………………………………………………………………………………
…………………………………………………………………………………………………………………………

FAMILY SOCIAL HISTORY
Familial diseases:………………………………………………………………………………………………
Alcohol use:………………………………………………………………………………………………………
Smoking:…………………………………………………………………………………………………………

EXAMINATION
General examination
General condition………………………………………………………………………………………………
Fever: Yes/No    Temperature………..°C    Pallor of mucous membranes ☐    Jaundice☐
Pedal oedema ☐ lympnodes ☐ Oral thrush☐    Finger clubbing☐ Other ……………………………
Vital signs: Pulse…….. (Beats/min).Blood Pressure……../……..mmHg.
Respiratory rate………(Breaths/min)
Level of consciousness: Conscious/Semiconscious/unconscious -GCS………………

Systemic Examination:

<table>
<thead>
<tr>
<th>Working Diagnosis</th>
<th>Final Diagnosis</th>
<th>WHO code</th>
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<tbody>
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<td></td>
<td></td>
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</table>

Investigations:

Treatment:

Other Services
HIV Counseling &Testing (HCT): Done Before [ ] Date:……/…/…….(if not done before offer HCT)
Accepted [ ] Declined [ ] Undecided [ ] Comments:…………………………………………………………

For Children:  Immunization: Up To Date [ ] Not Up To Date [ ] Reason……………………………………
Deworming and Vitamin A (Child days): April Yes/No  October Yes/No

Mothers in reproductive age (15-49) FP information: Method on…………………………………………
Comment:……………………………………………………………………………………………………

Referral: Internal…………………………………………………External……………………………………

Review date:……/…/……
GCS-Glascow Coma Scale

CLINICIAN’S NAME_____________________________Signature_________
Appendix 3 Inpatient form

REACH OUT MBUYA HIV/AIDS INITIATIVE/ ST. MARY’S HEALTH CENTRE-KASAALA.

INPATIENT FILE

Inpatient Number…………….. Bed Number…………….. Date……………..

Note: All patients for admission should have full history taken and complete medical examination done.

| SURNAME | OTHER NAMES | OPD NUMBER
<table>
<thead>
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<tbody>
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<td>RELIGION</td>
<td>OCCUPATION</td>
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<table>
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<th>TIME</th>
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<th>RUN AWAY</th>
<th>DAYS IN WARD</th>
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<tr>
<td>TIME ADMITTED</td>
<td>....................</td>
<td>....................</td>
<td>....................</td>
<td>....................</td>
</tr>
<tr>
<td>NEW / RE-ADMISSION DATE</td>
<td>....................</td>
<td>....................</td>
<td>....................</td>
<td>....................</td>
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</tbody>
</table>

OFFERED HIV COUNSELLING AND TESTING – HCT (ROUTINE) YES/NO If no reason……………………………………………………..

INFECTIOUS DISEASE NOTIFIED YES NO

PROVISIONAL DIAGNOSIS: INVESTIGATIONS OFFERED:
<table>
<thead>
<tr>
<th>FINAL DIAGNOSIS:</th>
<th>WHO CLASSIFICATION</th>
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<table>
<thead>
<tr>
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<th>2=IMPROVED</th>
<th>3=NO IMPROVEMENT</th>
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<td></td>
<td></td>
</tr>
<tr>
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<tr>
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<table>
<thead>
<tr>
<th>CLINICIAN’S NAME:</th>
<th>SIGNATURE:</th>
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</thead>
<tbody>
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