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MAKING MHEALTH SOLUTIONS COUNT IN DCS AMIDST THE LOOMING CHALLENGES

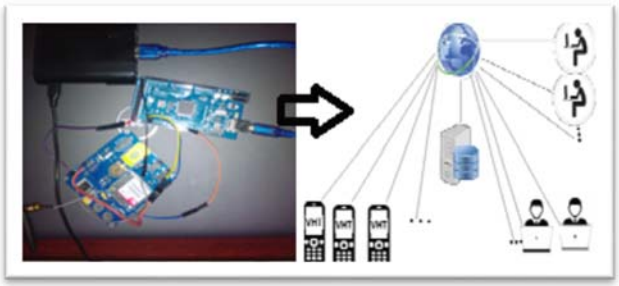
By Dr Lorna Muhirwe – Associate Director Health & HIV and Joel Fred Nsumba – mHealth Coordinator, World Vision Uganda

mHealth refers to the use of mobile phones and other wireless technologies in health care! As health practitioners are still grappling with appreciating the need to switch from the term mobile Health "*mHealth*" to "*digital health*" in describing these array of interventions, which indeed seems to be befitting considering the convergence of the digital and genomic revolutions; we now table a recount of a mHealth journey worth the travel.

Figure 1: Health center In-charge in North Rukiga-Kabale mastering efforts to relay HMIS data with collegues shifting and raising the phone positioning since it was the sole source of connectivity[1]

World Vision's AIM-Health project in Kabale and Busia is funded by Irish Aid through the WV Ireland office. It uses the timed and targeted Counseling (ttC) strategy through a MoTECH suite enabled mHealth application to improve maternal, newborn and child health. The mHealth project, with support from World Vision US, has outfitted VHTs with MoTECH suite ttC application enabled feature phones to address MNCH issues in the project catchment area. This scale of the mHealth deployment is one of the largest in the World Vision mHealth portfolio with over 896 VHTs. Results forthcoming are indicative of the good progress and potential impact of the mHealth application as an efficient, quality guaranteeing resource for community health system's strengthening.

Challenges encountered on this journey are not unique to many technology based interventions conducted by World Vision or any other development partner. Due to the poor infrastructural development that characterizes developing countries; poor network connectivity and a weak signal strength are the order of the day. The enormous high costs of running the intervention almost dragged us the drain of "pilotitis[1]". The high costs are related to internet access, mobile phone maintenance, user training, support supervision and mentoring due to the high illiteracy rates among the communities and the VHTs. Characteristic of many pilot applications, is the challenge of lack of real-time dashboard interfaces for key stakeholders to ably track performance of VHTs/CHWs, close referral loops and support health service delivery decision making and reporting. Innovations: The USAID Global



Mobile data distributor innovation. The sim-module is linked to the web to provide access and enable data distribution to various VHTs at the same time.

[1] A new issue of public concern in Uganda which has seen many mHealth solutions suffocate and die off at the pilot level

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development lab is the model for the 21st century development that encourages open, evidence-based and iterative innovation, planning for scale and sustainability, and using enabling tailor made technology while leveraging partners. Drawing from this model, the team at World Vision set to work to surmount the challenges and obstacles sited above. Shown is an illustration of the cost effective internet data bundle distributor that was locally designed to manage the exorbitantly high costs of availing connectivity to the vast number of VHT phones. It shows the module and its application advantages.

ost effective-wise, this previously cost approximately C$8,000 per quarter on only internet data bundles but the innovation helped to change all this to about $700 per quarter with guaranteed results. The web based data bundle and purchase interface has guaranteed the effective utilization of internet data bundles since VHTs receive the bundles only in areas where they are able to synchronize the data. VHT phone numbers can be preloaded into the interface by uploading files in excel, word or text which saves a lot of time for a process that was previously a manual. It decreased delays in negotiations with MNO service providers since there are now various purchase and distributor options for internet bundles. It also gives a faster through-put during the synchronization process as we can do it as and when we wish to. Other innovations included the internet-based CommCare-DHIS2 interface that enabled all stakeholders to monitor and track performance while empowered to make decisions in real time.

Successes: here we let the numbers speak. By and large the dashboards speak volumes on the trend of indicators tracked and shown above. The facilities equipped with solar and DHIS2 enabling environments have seen a significant shift in their reporting volumes. Phones, desktop computers, technological modules, solar systems, laptops, cloud hosting and scheduler interfaces are now combining synergistically into a cost-effective product that demonstrates an mHealth solution for low resource settings.

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THE ROLE OF E-HEALTH IN THE JOURNEY TOWARDS UNIVERSAL HEALTH COVERAGE IN UGANDA

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INTRODUCTION

Universal Health coverage has been defined as "Ensuring that all people can use the promotive, preventive, curative, rehabilitative, and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship." The clarion call for Universal Health coverage has been taken up by member states of the UN General Assembly as part of its resolutions in 2012. The commitment by the countries to achieve UHC is clearly demonstrated by its inclusion in the Sustainable Development Agenda for the next 30 years (the SDGs). This is because *inter alia*, UHC is essential to inclusive growth, health security, and sustainable economic development.

The World Health Organization has identified Health system strengthening as a key endeavor that is required for attaining UHC in Low Income Countries like Uganda. The need to build resilient Health Systems became much clearer in the wake of the Ebola epidemic that ravaged the Western part of Africa in 2014/15. While the WHO report of 2010 highlights the need for sustainable financing in order to ensure fairness in financing as countries provide health services and the WHO 2013 report highlights the importance of research for UHC, very little has been said with regard to

ehealth and health financing

Sustainable health financing is critical for financial risk protection within the context of UHC. In order for effective financial risk protection, it is important that the health financing mechanisms and indeed the financial risk protection systems are embedded or anchored within a broader social protection framework. The Government of Uganda has a National Social Protection policy as well as a health financing strategy that both indicate the development of a National Health Insurance scheme consisting of a social health insurance scheme for formal sector

the role that information and in particular, e-health plays in ensuring UHC in countries. This article explores the role that e-health can play in ensuring attainment and monitoring of UHC in Uganda. It also sets the stage for what needs to be done to harness the potential of this important resource to achieve and measure UHC in Uganda.

The first section explores the role ehealth can play in health system strengthening while the second section explores the role that ehealth can play in the attainment of health system goals and the measurement therein. The last section contemplates what should be done to ensure that as a country we are able to harness the potential of ehealth with regards to UHC in Uganda.

eHEALTH AND HEALTH SYSTEM STRENGTHENING IN UGANDA.

The WHO report 2000 identifies 6 building blocks of the health system including governance and leadership, financing, human resources, service delivery, logistics and lastly, health information. It is the framework that will guide the discussion of the role of ehealth in health system strengthening.

ehealth and Governance and leadership for health

Ehealth platforms provide the promise of improving accountability and transparency across the board. They provide a useful platform for storage of policies, guidelines and standards. The information systems discussed below also provide a mechanism for increasing transparency and accountability.

workers and informal sector workers, community based health insurance for the larger informal sector and subsidy for the indigents.

A key component critical for the success of this venture is a patient level information system exploiting, for instance, the unique identifiers such as the National Identification Number (NIN) for the individual that enables tracking of patient visits and other pertinent information. Such information could be used for enrolling clients, verification for claims processing thereby mitigating fraud and other perverse behaviors and ensuring efficiency. In light of the recently concluded national Results Based Financing Framework, such a system would be critical in enabling the requisite verification procedures.

In addition, the information system using could be useful for linking the NHIS information system to the broader Social protection information system thereby creating better scope for integrated planning and monitoring for social protection in Uganda more broadly.

ehealth and strengthening Human Resources For Health

Despite the recent efforts by the GOU to increase the numbers of Health workers, there still exist some gaps in the HRH in terms of numbers and skills set. ehealth can contribute to strengthening the planning, recruitment and distribution of health workers with the help of a regularly updated Human Resources for Health Information System. Currently, the HRIS in Uganda has not been fully incorporated into the Health Information Management system and not completely rolled out to all districts in the country. As such, there is inadequate real-time information on the numbers of health workers in post by cadre at all levels of the health system, the relative distribution of critical health workers and understanding of where the gaps are. This has both equity and efficiency implications in case of maldistribution of health workers. It is therefore expedient that the country moves to ensure complete roll out of the HRIS and build the requisite capacity for utilization of this tool.

More recently, the government with the support of the World Bank developed an e-recruitment system for health workers in the country. The web-based system is meant to enable the Health Service Commission and the District Service Commissions be able to advertise vacancies and expedite the process of recruitment for the vacancies. If well utilized such a tool can improve the oft slow process of recruitment and would therefore go a long way in helping to close the HR gaps seen.

ehealth and service delivery

The scope of ehealth applications in improving service delivery at all levels of the system is huge. This article cannot exhaustively explore the different options that have been piloted and implemented in various settings. However, this is

ehealth and improving access to medicines

Undoubtedly, in Uganda, this is one of the areas that the contribution of ehealth has been really felt. The mTrac project implemented by the GoU together with WHO and UNICEF has been very instrumental in ensuring tracking of medicine stock outs in malaria medicines, vaccines and other essential medicines. This project that has been scaled up nationally uses a mobile short messaging system to provide real-time updates of the medicines stock status.

However, the potential that ehealth offers is not limited to tracking medicines. It is possible to use ehealth systems to build strong logistics management systems that enable the sector to know the overall medicine stock status, medicines shelf life for proper planning, monitoring for the PSM chain, building in efficiencies in the PSM chain and lastly ensuring transparency. Many such systems like the ERP can be used to create a well-integrated LMIS for managing medicines.

an area that can greatly benefit from investment in innovative, cost-effective ehealth solutions.

The patient level information systems discussed above provide a good platform for sharing patient information between physicians that enables effective follow-up of the patient, prevents misdiagnosis, over or under prescription of

medicines for the patients and ensures compliance to medicines. In addition clinical decision making tools are available that can be used to avail doctors real-time information on patient diagnosis and care which have improved quality of care in different settings.

Mhealth applications using SMS services can also be used to follow-up patients that have missed appointments through regular reminders to the patient of the appointment. They can also be used to deliver some important health messages to clients and therefore serve as a useful platform for health promotion and prevention.

The concept of telemedicine, which is common in more developed countries, has been used to reach some underserved areas. This greatly increases efficiency and cuts down on costs of reach people in hard to reach areas while addressing equity concerns raised by these geographical issues.

ehealth and information, surveillance and monitoring for UHC

This is undoubtedly the pillar that benefits the most from the eHealth innovations. As is evident in Uganda, options such as the DHIS 2 and mTRAC have been used to improve Integrated Disease Surveillance and Response (IDSR).

The DHIS 2 platform and mTRAC have certainly improved health system reporting in terms of timeliness and completeness of reporting. Platforms like this can therefore be used to ensure data integrity for monitoring for UHC.

Many nations including Uganda have developed dashboards for Disease Specific monitoring of trends. In Uganda this has been used for malaria, maternal and Child Health as well as HIV/AIDS.

In countries like Bangladesh and Rwanda, UHC monitoring Dash boards have been developed that provide up-to-date information on the progress towards achieving the goals of UHC. This is something that can help Uganda in monitoring for UHC and enable the country to re-purpose where necessary in order to expedite attainment of UHC.

EHEALTH AND HEALTH SYSTEM GOALS

It is clear from the discussion above that ehealth can help the system achieve its performance goals. The Health system, as described by WHO report of 2000, has the three main goals of improving health (absolute and distribution-wise), increasing financial risk protection and lastly responsiveness of the system to the client's needs. In addition, it has the intermediate objectives of improving efficiency and equity.

With regard to efficiency as has been highlighted above, the different information systems are able to increase transparency for the user, regulator and the consumers. As such, areas of wastage, corruption or mismanagement of resources can be identified and dealt with. This is most likely to happen if interoperability is a core aspect of the ehealth framework in Uganda. **(Continue to page 8)**

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STRENGTHENING EHMIS THROUGH USE OF ELECTRONIC PATIENT MEDICAL RECORDS SYSTEMS (EMR) IN UGANDA

By: Jonathan Mpango & Samuel Lubwama – Makerere University School of Public Health, METS Program

UgandaEMR training at Virika Hospital in Kabarole district in April 2016.

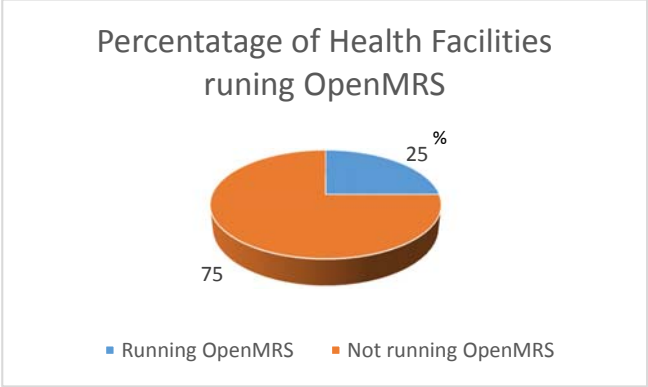
The Uganda National eHealth Policy has electronic medical records (EMR) management as a cornerstone for improving the quality of care provided to all Ugandans. The Ministry of Health (MoH), working closely with World Health Organization (WHO) and Centers for Disease Control and Prevention Uganda (CDC) piloted and adopted OpenMRS in 2011 as a national EMR to manage patient records.

The Ministry of Health, Division of Health Information (M0H-DHI) in collaboration with Makerere University, School of Public Health, Monitoring and Evaluation Technical Support (METS) and line MoH departments have customized the OpenMRS[2] to suit the updated MoH tools and as well to run on the latest version (1.11.6) which caters for more robust technological features on identifying and monitoring patients.

The latest OpenMRS version customized for Uganda branded as "**UgandaEMR**" has HIV, HTC, SMC, MCH modules automated and ready to be scaled up across the country. Ongoing works on the System upgrades includes incorporating other service areas including TB and Malaria

Coverage:

OpenMRS is currently operational in about 425 (25%) health facilities all over the country and the national scale up plan aims to increase the number of facilities to 1000 by 2017.



Scale up of the UgandaEMR is spearheaded by MoH in collaboration with Implementing Partners.

Achievements

- Revamping of the Uganda OpenMRS community with about 230 members
- Conducted the 1st national UgandaEMR (OpenMRS) training of trainers (TOT)
- Adopted as the EMR to be used for MoH Base Case Surveillance program in Kabarole and Hoima district.

[2] OpenMRS is an open source medical records system

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- Massive country scale-up have been initiated with all IPs training their sites with guidance from MoH and METS.

Challenges

Following the MoH ICT readiness assessment that was conducted in 2015, the following gaps were identified and these effect the effective use of EMR

- Lack of ICT infrastructure for HMIS
- Stock-outs of data collection tools
- Understaffing – some health facilities had no staff to handle HMIS
- Lack of power and data backup in some health facilities
- Limited ICT knowledge in HMIS staff at low level facilities

Road map and Next steps:

Building upon the achievements to date, the METS program in collaboration with MoH Division of Health plans to further strengthen HMIS by means of EMRs through the following activities

- Provide technical UgandaEMR support to end-users
- Support MoH in customizing UgandaEMR
- Support MoH in scaling up UgandaEMR

The METS UgandaEMR with guidance from MoH-DHI plan to implement the following

- Add PMTCT & TB data entry forms
- Add DHIS2 OpenMRS Module connector
- Add Fingerprint technology for patient identification
- Support the 2016 International OpenMRS Conference (visit http://bit.ly/ugaomrs16)

"It is now easy to generate the 106a HIV report from the system. No more counting numbers from the registers"

- **Records Ass, Kijura HC III -**

Description of UgandaEMR

UgandaEMR is an OpenMRS based electronic medical record system customized for Uganda. The MoH officially flagged off the Scale up and Upgrade of the system

Current features of UgandaEMR:

- Location based login for Point of care system
- OpenMRS Atlas for mapping facilities using UgandaEMR
- HMIS 106a 1A and 1B
- HMIS 105 EID section

The system is currently capture data on HIV, SMC, HTS and MCH (Maternity and Antenatal)

UgandaEMR Useful links

Online demo:	http://aijar.mets.or.ug
Web portal:	http://portal.mets.or.ug
Community email	uganda-openmrs@googlegroups.com

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WHAT SHOULD BE DONE TO HARNESS THE POTENTIAL OF EHEALTH IN UGANDA

At the moment the country has taken huge steps in developing a policy for Ehealth. This goes a long way in creating an enabling policy environment for the implementation and scale-up of Ehealth in Uganda. However, there is need for a National Strategic Plan for Ehealth in Uganda. This strategy should stipulate the cost-effective and innovative interventions and strategies that should be implemented to scale-up Ehealth for UHC. It should also spell out the mechanisms for setting in place an enabling legal environment, governance structures and the implementation arrangements.

A multi-sectoral approach is needed for the planning, coordination and implementation of the Ehealth strategy. This is because of the fact that investment and implementation of the strategy will involve other sectors like Ministry of Information and Communication Technology, Ministry of Finance Planning and Economic Development. In addition, public private partnerships for Ehealth are necessary for sustainable financing, innovation, and implementation and scale-up of Ehealth in the country.

Lastly, a comprehensive and sound resource mobilization strategy targeting partners in different sectors should be developed. This is because, Ehealth investments are likely to be costly in the beginning. A clear mechanism for collecting and pooling funds across sectors as well and purchasing of the EHealth Products is needed.

WHO defines EHealth as the use of information and communication technologies (ICT) for health. In its broadest sense, Ehealth is about improving the flow of information, through electronic means, to support the delivery of health services and the management of health systems.

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