The deepest hunger of a human heart is to feel understood, valued and respected.
Electronic Medical Records Systems in Malawi: A Decade Long Journey

LIN has learned that digital systems alone are not the solution to problems that may exist at the health system level. It is a long collaborative process in system strengthening working across sectors.

The trajectory of Luke International (LIN)’s work in Malawi closely follows the development of the Electronic Medical Records Systems (EMRS) in the country. The EMRS manage digital versions of a patient’s medical record. For more than 13 years, LIN’s technical and operational staff have been involved in the design, installation and maintenance of these systems.

Since 2019, LIN has been working with the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) to implement and support point of care (POC) EMRS and electronic registers in central and northern Malawi. Jointly, the organizations support the systems in more than 700 health facilities across the country. EGPAF is the prime recipient for the Health Information System (HIS) project funded by the United States Centers for Disease Control (US CDC). In the five-year period, major investments will be made in replacing and upgrading hardware, power backup and connectivity at high-burden health facilities.

LIN brings to the table combined expertise in medical informatics and public health. Many of LIN’s health information system officers have joined with prior experience working in HIV clinics and health facilities. LIN’s Malawi Country Representative, Rebecca Mtegha, was the first Malawian employee to join when the organization started its work in 2008. She started her career working with the Taiwan Medical Mission that supported operations of Rainbow Clinic, the antiretroviral therapy (ART) clinic at Mzuzu.

Central Hospital. With the growing number of patients requiring life-time follow up, the team saw the need to move from paper records to a computer system. TESMART, a touch-screen enabled system, was subsequently born.

Joseph Wu, LIN’s first Country Representative in Malawi from 2008, recalls the days when they first sat down together with the clinic staff to go through processes and clinical workflows. One of the reasons why the system was well accepted was that it was developed together with the users. With full support from the hospital director, the system was implemented and adopted within less than a year. With funding from the US CDC, LIN was able to deploy the system in additional health facilities in Mzuzu, Rumphi and Nhkatabay.
In 2010, LIN joined hand with Baobab Health Trust (BHT) and migrated the system to the now nationally implemented platform. As an organization, it was not an easy decision. However, LIN saw the bigger need for system harmonization and integration. As the National Electronic Medical Records System (NEMRS) began to take shape, the organizations were able to build on the foundation and explore different use cases. Notably, after the Ebola outbreak in West Africa, LIN and BHT assisted the Malawi government to build an electronic integrated disease surveillance and response (eIDSR) system. The eIDSR system was able to monitor disease diagnosis made from the EMRS and create alerts for notifiable diseases such as cholera.

With technical support from the Pingtung Christian Hospital (PTCH) and funding from TaiwanICDF, LIN introduced the Picture Archiving and Communications System (PACS) in Mzuzu Central Hospital and Rumphi District Hospital. This system is integrated with the NEMRS and enables digital X-Rays to be recorded, transmitted and viewed. The hospitals became the first in the country to completely migrate from the analogue to digital system. (Find out more from the interview with Mzuzu Central Hospital Radiographer Mr. John Manda).

What LIN has learned is that digital systems alone are not the solution to problems that may exist at the health system level. The digital interventions must accompany a long collaborative process in system strengthening working across sectors (including clinical, public health, ICT, logistics). LIN strongly believes that the ultimate goal of the EMRS is not to collect data or to make reports. The goal is to assist health services to deliver quality care to patients. Looking into the future, LIN envisions an EMRS that more closely mirrors the needs of healthcare providers that brings added benefits.
and incentives for the users.

**Interview with PACS User in the Radiology Department**

*The following interview was conducted by LIN’s Research Associate Sydney Kambalikena (SK) with Mr. John Manda (JM). Mr. Manda works at Mzuzu Central Hospital, Radiology Department. You can also watch the demonstration video here: [https://youtu.be/qFWkmtfsNgs](https://youtu.be/qFWkmtfsNgs)*

**SK:** What is your job title, and can you describe what you do in your daily work?

**JM:** I am a radiographer. I take images for patients using X-ray machines for the purposes of diagnosing various diseases. We are now in a digital world and things have changed. At first, we had analogue system where we would take images, produce films and those had to be taken to the doctors. But now, we have transformed to digital system in which we are using Computerised Radiography (CR) where PACS (Picture Archive and Communication System) comes in. With PACS, once an image is taken, we process and digitise it and send it through a system which is
interconnected to the whole hospital and the image goes to the server. There are many outlet points in this hospital where people can log in and view the images without having the patients physically carry the radiographs.

**SK:** How long have you been using the PACS and the electronic data system?

**JM:** It could be between 4-5 years now.

**SK:** What do you think about the system?

**JM:** I find it helpful because it has reduced the waiting time for patients. It’s more convenient because apart from patients not taking longer time on the waiting line, the system has high quality images as compared to the analogue. The processing itself is very unique in the sense that it just requires manipulation of the image right on the computer. You can manipulate the image and make it clear. In the past when we would repeat taking X-rays but that is history now.

**SK:** What do you dislike about it? If you could suggest areas for improvement, what could they be?

**JM:** The batteries have drained so if there is blackout, the system will shut down and when you try to restart it, it requires an IT expert to come and configure the system. The batteries for the backup power have to be replaced.

There is a limited capacity of number of pictures it can keep. Sometimes it happens that we need some pictures of about 2 years ago but we can’t access them.

We have limited ports where people can view the images. For example, eye department and antenatal have no ports and have to rely on radiography department to view images. They have to come to our department and we need to give them space to view the image.

In one room, we have the port that is working but we have another independent X-ray machine. If an integrated system can be put in place, so that other systems we have, including the Ultrasound machine, it can be better.

**SK:** Has the introduction of PACS changed the way you do your work? What is the biggest difference you have observed or experienced?

**JM:** Yes, it has changed the way I do my work. The biggest difference is that we stopped manual processing of the images where after taking an X-ray, we take the image, go into the dark room, process it and take another film, put in and then switch on the processes, mix 3 types of chemicals,
clean the processors almost every week ...all that is history now. That is the greatest difference I have noted. It’s been a very big difference.

**SK:** The other difference that I can capture from your earlier comments is that you don’t need to organise multiple session with patients to take X-rays as was the case before.

**JM:** For example, we use high exposures according to the part to take an X-ray on, sometimes it may come out too dark or too bright. With the old system, we needed to repeat the process with the patient. With the PACS, even if a picture is too bright or too dark, you can just adjust it and make it appropriate to still get the required information.

Another thing is storage space. We have more than 100 patients per day and we had to find space to store all their files. With the PACS, we don’t worry about this anymore. Looking for the X-ray files used to be an exhausting work. Now, we just punch in a name of a patient and we have the files ready. Archiving of the images has been so easier than the previous one.

**SK:** Do you have anything else you would like to say?

**JM:** Like I said, this system is very good and it has really helped. Maybe we might be the first one in this country who have completely migrated from analogue to digital. It has really been a good system and I wouldn’t imagine going back to the manual system.

**SK:** If I go around, are you sure I wouldn’t find patients carrying radiographs?

**JM:** You won’t. The only thing you can discover is that some people can be referred and we use compact disks (CDs). What we do is that we export the images to the CDs.

**SK:** Does that mean they have to pay?

**JM:** No, they don’t pay. They just bring their blank CDs and we copy the images into the CDs and they take the images like that.

**SK:** Thank you for granting me the opportunity to have an interview with you.