RHINO FORUM TRANSCRIPT

Moderators: Michael Edwards and Joy Kamunyori

Day 1| April 2, 2013

From: Michael Edwards

Greetings to all RHINOs,

This week we would like to hear from all of you about your experiences with using mobile technologies with Routine Health Information Systems (RHIS). Each day we will introduce a topic, and see where the discussion leads us. We will start with a general look at innovative applications, and then have a discussion about what you think are appropriate uses and limitations of mobile technology. Finally we will discuss the costs and other barriers to using mobile technologies with RHIS.

I'm really pleased that Joy Kamunyori has volunteered to co-moderate this forum, because I'm really not an expert at mobile technology. I recently got a SmartPhone, but that was because my teen-age son had to have one, so I got one too. He taught me how to use it and showed me all kind of cool apps (Angry Birds, Angry Birds Rio, Angry Birds Seasons, Angry Birds Space, Angry Birds Star Wars.......)

In my travels, I've noticed that cells phones have really taken off in all the countries I travel. At first, I noticed there were problems. For instance, one of my colleagues couldn't call another colleague because they were on different cellular networks. In another country, the cell phones didn't work so good because the cell networks were too overloaded. But lately, I've seen many improvements. My colleagues were video conferencing on Skype and finding my hotel for me on their phone's GPS. But then I thought they might be too attached to their phones when I went out to dinner and 2 of my colleagues spent their time sending text-messages to each other under the table.

So we'd like to hear from you about how you've used your cell phones and other mobile technologies to strengthen your Routine Health Information Systems. Please tell us about the innovative uses you've come up with. I know Joy will talk about using cell phones for data entry, using an app called EpiSurveyor. I also attended a presentation on a SmartPhone app that was an Executive Decision Support System. The app updated health managers as to the status of the reports submitted, and values for key indicators. We hope to hear more about this type of application as well.

Last week I saw on the Colbert Report an interview with Dr. Eric Topol, the author of "The Creative Destruction of Medicine". He talked about how the digital revolution will create better health care. He demonstrated an app that used a USB connected cable that strapped to a patient's thumb, and he could read their EKG, blood pressure, salt and glucose levels, etc. He then attached another cable that had an otoscope (ear examiner) and the image of the inner ear showed up on the cell phone, and could be saved, emailed, etc.

The email address for this forum is: rhinoforum@lists.jsi.com

From: Joy Kamunyori

Dear RHINOs,

I'm very pleased to be co-moderating this week's forum with MikeE, and look forward to lots of rich discussion about mobile technology for Routine Health Information Systems (RHIS). Here at JSI, we have integrated the use of mobile technology in several routine reporting systems. The End-Use Verification exercise, a quarterly survey that collects malaria case management and stock availability information from health facilities in the President's Malaria Initiative's (PMI) focus countries, has been administered using mobile phones running Magpi (formerly EpiSurveyor) by the USAID | DELIVER PROJECT in seven countries (Ghana, Malawi, Mozambique, Nigeria, Tanzania, Zambia, Zimbabwe) since 2009 (for more information about End-Use Verification, see here: http://deliver.jsi.com/dlvr_content/resources/allpubs/logisticsbriefs/MalLogHigh_ImpMonSupHFL.pdf).

In Tanzania, Malawi and Ghana, the ILSGateway, cStock and the Early Warning System (EWS) are all variations of a SMS-based stock reporting system where users send in their stock information from their own phones at regular reporting intervals, implemented by the USAID | DELIVER PROJECT (Tanzania), the Supply Chains for Community Case Management (SC4CCM) Project (Malawi), and the Focus Region Health Project and the USAID | DELIVER PROJECT (Ghana), in collaboration with the ministries of health in each country. These systems have seen great success, with the ILSGateway in Tanzania currently rolled out to over 2000 facilities nationwide and cStock in Malawi being used by over 1500 community health workers in 16 districts. To see how information flows in the individual systems, please click on the following links:
ILSGateway: http://snisnet.net/mHealth_infographic_EssentialMeds_withJSIlogo_1.pdf
cStock: http://snisnet.net/cStockProcess.pdf
EWS: http://snisnet.net/EWSprocess.pdf

We look forward to hearing from you about innovative ways in which you have used mobile phones, or have seen them used, to strengthen routine reporting systems in the places where you work. MikeE and I are both looking forward to a fun and informative week of exchanging ideas and learning from one another.

From: Tariq Azim <syed_azimus@yahoo.com>

In Ethiopia, under USAID's HMIS Scale-up project, we have developed a mobile executive Decision Support System (MEDSS). It is installed on Android mobile devices supporting decision making. We have given the mobile devices to executive & mid-level health managers for them to get quick updates on health program performance.

The mobile device stores a small amount of data and communicates to the Regional Health Bureau HMIS database server through a web-service. This allows updating of the database within the mobile devise whenever the manager wants an update of the HMIS indicators, master health facility list, and the personal contact information of the key health unit's staff.

Like the electronic HMIS (eHMIS) system, this MEDSS provides HMIS indicator performance by region, zone, district and by individual health facility for a specific time period.

This system helps the managers to get up-to-date program status information, especially when they are on supervisory visits. If she/he wants to explore further, she/he can do that by accessing the desktop version of Decision Support System (DSS) that's locally available at the health unit or manager's office.

The attached ppt. provides a few screen shots of the application.

Tariq Azim
HMIS Scale-up Project, Ethiopia

From: Sapirie,Steve" <ssapirie@msh.org>

We have done a number of lit searches and assembled evidence of so many mHealth projects across so many donor agencies and CAs, and as you suggest, practically all of them are pilot projects funded by one donor or another, which come to an end when the donor project closes down. As a result we have little evidence of mHealth applications that were successfully implemented across the country and for which the government has assumed the responsibility for funding and maintenance. That is what we are looking for, and then once found, to study more closely to see how the application was developed, expanded, maintained and adopted by the government.

Also, I notice that many of the mHealth projects are focused on information and IEC, and data reporting, rather than support for services. After conducting a feasibility study on mHealth in Afghanistan year before last, I am really excited about the potential of mHealth to support important service functions. The more important needs we identified were notification of cases and outbreaks of infectious diseases, requesting emergency transportation for cases of trauma and maternal complications, and notification of stock-outs of essential drugs.

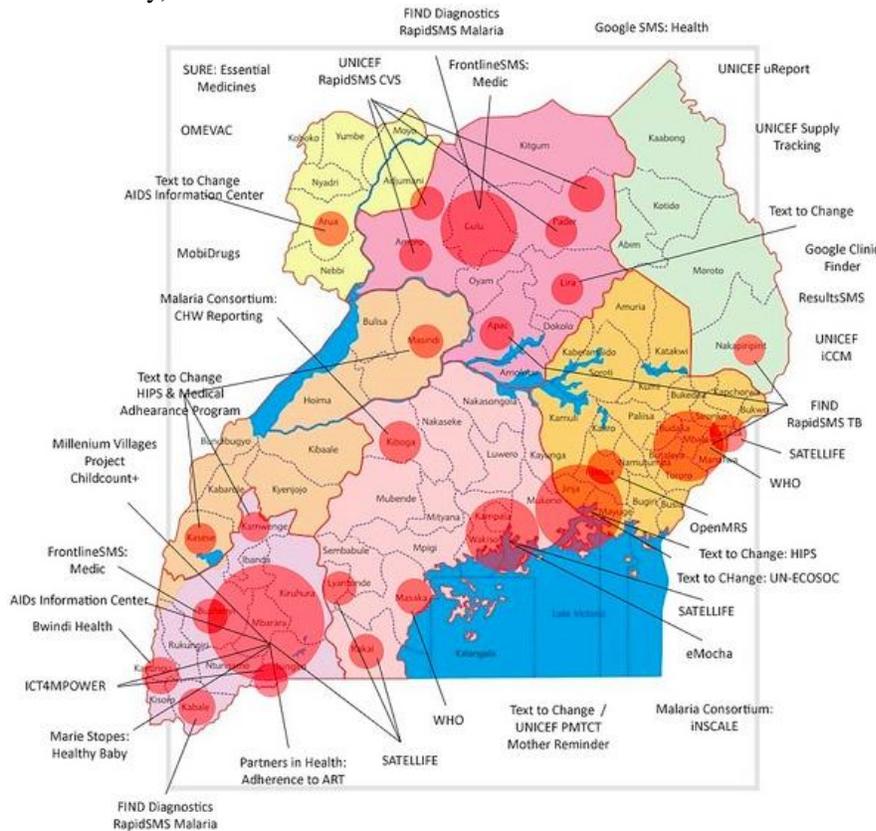I wonder if we can draw the attention of the forum to these questions, but I leave it in your hands.

Regards,

Steve

From: Lungi Lumumba Okoko <lungi.okoko@gmail.com>

Sorry if rhino forum participants have already seen this, but here is a great piece from ICTWorks related to some of the issues raised by Steve and Michael (i.e. pilots, going to scale, coordination and sustainability)

Recently Priya Jaisinghani, Teressa Trusty, and I brought together a few folks to have an informal Technology Salon around the pertinent question of how can the development community get technology to scale?

We all know we have a problem – just look at the map above. We say our work in ICT4D, M4D, mHealth, ICT4E, etc will reach "scale" and even (financial) sustainability, yet the reality is a profusion of similar software and technology applications around the world that never leave the pilot phase. We focus on responding to RFP's that ask for something new or innovative with limited, bespoke solutions that die the day after funding ends.

We keep reinventing the flat tire.

This problem isn't confined to one group – funders, implementers, techies, dev experts, we are all complicit. We all have sinned in the name of scale and sustainability. It is time for us to come clean, make amends, and seek a better way forward. To that end, we came to three key conclusions:

1. Have Buy-in From the Beginning or Walk Away

Too often both "scale" and "sustainability" means a vague paragraph in a long-forgotten proposal. We need to get serious about both.

For scale, we need to recognize is it relative to the project size. Some projects reach scale when 100% of a small community changes their situation, others when a majority of citizens in a country change their behaviours. Yet, not every project is going to be regional, national, or continental – and that's okay. "Scale" does not need to mean "global". This is a lesson that many funders can afford to learn.

At the same token, "sustainable" does not need to mean free from donation funding – as most religious organizations can attest. It does mean that as international actors, we need to have local buy-in to the intervention, where whomever we are working with agrees from the beginning to not only support the project long-term, but also have a clearly defined plan for that support.

Now this can be government adoption (and funding) of the activity as a new service to the community. Or it can be fee for service, a social enterprise, or even a for-profit service. The business model can take many forms, but as implementers, we have the responsibility to make sure there is a clear handoff that is expected and planned for.

For both of these parameters – scale and sustainability – all of us have to be braver. We must be willing to point out when either parameter is failing and be willing to walk away from a project if it's not corrected. Yes, that's easier said than done. So is real scale and sustainability.

2. A/B Test Everything

In web design, there is a concept called A/B testing, where you develop two (or more) version of a page and test to see which one has the better response rate. In fact, every Salon invite is an A/B test – 10% receive one email, 10% receive another, and the version that is opened more is sent to the remaining 80%.

What if interventions were A/B tested? Say the top two ideas were awarded pilot funding and the service that had the best intervention result received full funding to scale – something like USAID's [Development Innovation Ventures](). Or if proposals were written to be honest about the need for local consultations, and rather than prescribing a solution after a short bout of rushed research between RFP announcement and deadline, implementers won based on their post-award intervention research and solution design, in addition to actual implementation methodology.

A/B testing doesn't stop at project start. You can A/B test every step of the intervention process, constantly tweaking the project to make sure its optimized for the outcomes desired. Yes, you can say we do that now – but are you tweaking your formula hundreds of times every year like Google?

3. Stop Developing Software

The most contentious point that came out of our Salon was the idea that international development organizations should not be software development organizations. Specifically, with the reality that specialized software development organizations exist, and that they will be better than development organizations at software development, if you focus on health, education, agriculture, etc, you should focus on the intervention itself, not the technology that you use to achieve your goals.

In fact, we should have a registry of industry leading solutions – ranked software tools where we can all plainly see which are the few (3 to 5) tools that we should concentrate our efforts on. Like say this list of [mobile data collection systems]() that came out of a previous Salon.

Only then, when we are all bought into the same tool set, can we really get scalable solutions that are robust, with the longevity for our lengthy project life cycles.

Ideally, all these tools would be Open Source to allow everyone to build on the code base and use it freely. In fact, one participant was adamant that *all* software development funded by the international community should be Open Source. And really Open Source – licensed as such and on GitHub.

OpenMRS, the world's leading open source enterprise electronic medical record system platform, was put forth as a great example of this process. I personally think Tangerine should be next, becoming the leading electronic data collection software for early grade reading and mathematics skills assessments.

Yet even now, how many other medical records or education data collectin software exist? Do we really need more? Shouldn't the development industries – software and international – come together and focus on the proven tools instead of inventing more?

Or are we destined to see more mHealth moratoriums?

From: judy wawira <judywawira@gmail.com>

Hello All

My name is Judy Wawira from Kenya. I am a medical doctor and health informatician. I am working on implementing a point of care mhealth system for Tuberculosis care in chest clinics in Busia Kenya

The Kenya government already has a system called TIBU that is in use at the level of the district TB coordinators who enter patient data as they visit facilities and this feeds into a national reporting system

I will be demonstrating the use of mhealth for primary care with routine HIS monitoring as a case of secondary data use

My other experience in mhealth has been to conduct a scoping review for use of mhealth for leadership , management and governance. I made a word cloud from the article keywords and this is attached

I also supervise a HIV program in Kenya using mobiel for clinical decision support for HIV reminders

judy

From: Kagoya,Harriet" <hkagoya@msh.org>

Just thought of mHealth currently being implemented for MNCH (RCH) programs in Tanzania. They send sms reminders to pregnant women and their supporters who register their cellphone numbers. I think CDC provided support to the MoH there

Kind regards,

Harriet Rachel Kagoya
Senior Monitoring & Evaluation (M&E) Advisor: SIAPS / Namibia

From: "Elibariki Mwakapeje" <emwakapeje@yahoo.com>

Hello Harriet

You are very right that Tanzania has just launched the mobile technology in the RCH services where pregnant mothers receive reminder sms to attend their antenatal clinics.

The new mobile technology that I mentioned will be used in reporting of epidemics and routine surveillance data(IDSR) using the District Health Information Software (DHIS) for timely response, both systems are funded by CDC although there are other partners supporting the RCH technologies.

Kind regards,

Mwakapeje
Epidemiologist - Tanzania

From: Jonathan Mtaula <mtaulajona2010@gmail.com>

Hi All,

My name is Jonathan Mtaula and I have an IT background. I work with Clinton Health Access Initiative (CHAI) in Malawi as an mHealth Officer. I am responsible for implementing mHealth initiative and one of tasks i have been very much involved with is working with health workers in different health facilities training them on how to receive DNA-PCR test results on their phone and SMS printers.

UNICEF implement a rapid SMS system also known as Result 160. This is system is linked to a Laboratory Information System (LIMS) that is used by Lab technicians in managing the testing process in the PCR lab. When the testing is done, LIMS sends results to the Rapid System which then send the results to health facilities via mobile phones and SMS printers. I have travelled to almost all the districts in the country deploying SMS printers and training health workers on how use and receive the DNA-PCR results. I also provide the technical support to the LIMS in all the central labs in the country.

Thanks,
Jonathan

From: Mark Spohr <mhspohr@gmail.com>

We've just installed DHIS2 in the Solomon Islands. Along with being an excellent platform for routine and individual patient collection and reporting, it has a several good options for mobile data entry and reporting.

DHIS2 provides a range of options to allow data entry from mobile devices, including a dedicated GPRS/3G J2ME client, a SMS based client, and a version of DHIS2 which has been optimized specifically for mobile browsers.

Depending on the capabilities of your mobile devices and your network connections, you can run the appropriate interface. The most capable is the Mobile Browser interface which gives you the same data input and reporting capabilities as the desktop version with the screens optimized for mobile devices. If you have a "smartphone", you can use this version directly with no special setup.

If you have a less capable "feature phone", you can use the J2ME client which requires software to be installed on the phone but gives you an interface for data entry and one for program reporting. These allow offline data entry then reporting when a connection is available. They also support a legacy J2ME client with SMS reporting for the least capable phones and networks.

Since the entire DHIS2 system has been optimized for web input over "poorly connected" networks, they make minimal data demands on the network.

The DHIS2 also supports a full Web-API which gives access to all of the functions of the software through a web interface. You can use this for custom data entry or reporting interfaces on mobile devices or desktops.

Very capable software and highly recommended. Free and open source, of course and fantastic support from a worldwide network of users and developers.

www.dhis2.com

Kind regards,
Mark

From: Shalaudin Ahmed <ahmeds@dominica.gov.dm>

Dear All,

Dominica is the first country in the Caribbean to pilot mHealth (mobile health) project. Dominica is an English-speaking country, situated between 2 French Islands, Guadeloupe in the North and Martinique in the South. The project started in epiweek 46 (week ending November 17) 2012. It only focuses weekly syndromic and HIV data from all reporting sites. Initially, few had problems with the reporting format; however currently, all sites (7 health districts and 1 sentinel site) are reporting through SMS without any technical difficulties at the user-end. The pilot process ends sometime in May. We hope to expand the usage of mobile device in reporting other diseases like vector-borne diseases.

Sincerely,

Dr. Shalauddin Ahmed
Health Information Unit
Ministry of Health

From: William Lester <wlester@npoki.org>

FYI, my organization (NPOKI) in partnership with n-Village is going to do a series of webinars called Connecting the Dots. We'll focus on resources like DHIS2 which can be used with other tools like mobile phones as part of systems that manage programmatic and operational information. We're hoping to highlight some newer solutions that touch on monitoring & evaluation, information/knowledge management, program content, business intelligence, financial management, etc.

When we finalize the agenda, I'll share it through some of the various health and KM listservs.

Hope this info helps.

Bill

From: Moise Zanga TUHO <moisetuho@gmail.com>

Hi,
Sorry for the delay. I was working in Côte d'ivoire (Ivory Coast) at MOH National HIV Care and Treatment Program but now I'm in Belgium for MPH at Institut of Tropical Medicine. I'm very pleased reading informations about the topic. In my previous position we were implementing sms at community level data collection with SCMS. It was not national wide , just pilote and because of civil trouble we didn't finalize. But I think that it's a good way for availability of routine data at national level with good promptitude.

TUHO Zanga MOISE, MD

From: Mark Spohr <mhspohr@gmail.com>

I'm been using the ODK Collect / Aggregate software for a project and have found it to be very versatile and flexible for putting together surveys/questionnaires and collecting the results from mobile devices. ODK Collect runs on Android mobile devices (phones, tablets and also a web interface through Enketo). It allows you to put together a questionnaire with full qualifications (skip logic, bounds testing, repeating sections) and includes very useful functions like the ability to read bar codes and QR codes, GPS coordinates, audio, video and photos. Forms are stored on the server and downloaded. Each instance of the form can be entered and saved offline and then uploaded to the server when you have a connection. It uses the JavaRosa X-Forms standard.

Here are some resources for more information:
ODK Collect / Aggregate

From: Lawrence Wasserman

Greetings

As former WHO Asia Advisor (Health Services Research/Operations Research) and US Public Health Service Official (in house Evaluation Specialist) am engaged in mHealth for past number of years working with IT Health developers in promoting telemedicine solutions.

Having the benefit of over 25 years in Asia, Africa and Eastern Europe on whole wide sectors I commend RHINFO forum. The technology as social media etc. provides would have been AWESOME if available

15+ years ago but now institutions are inundated with apps, solutions, devices etc. Overkill to say the least and USAID, UN agencies, W Bank ADB are all rushing to get into the new technology age.

Sooner rather then later another flavor of the month will appear like KM and CoP was 15 years ago or operations research 30 years ago. Its hard to imagine but will technology chase same cohorts of institutions.

Unfortunately for 20 years I have voiced my opinion that capacity building of institutions at Ministry of Health at all governmental levels are needed to conduct project development, implementation and EVALUATION. I stress evaluation because little resource, time are given to perform this important task. Maybe the next 10 years there will be a recognition that without appropriate assessments we see the same type of project under different names reappear expecting different results (Einstein Theory).

We cannot solve our problems with the same thinking we used when we created them. Albert Einstein

Insanity: doing the same thing over and over again and expecting different results. Albert Einstein

I attach a program developed regarding telemedicine for urban and rural areas.

http://snisnet.net/FORTECH_SHORT_VERSION_AccessMyDoc-TelemedicinePresentation.ppt

I look forward to meeting all at the next event.

Regards,

Lawrence

From: "Mean Sambath" <msambath@pbhcam.org>

Now it seems facing more challenges on creating local languages (SMS Khmer script). Some works and mHealth Project have been done so far in Cambodia. Below are some reference on SMS in Khmer:
- Frontline SMS is open sources for worldwide including Cambodia, (by PACT) http://www.frontlinesms.com/2012/04/05/frontlinesms-user-community-connecting-across-the-world-next-user-meet-up-in-cambodia/
- KSMS is an application for SMS in Khmer: http://www.panl10n.net/english/Outputs%20Phase%202/CCs/Cambodia/MoEYS/Papers/2009/KSMSTR.pdf
- InSTEDD, an innovative humanitarian technology NGO, designed the system, utilizing SMS messages in Khmer script that interact with mapping software to generate maps on the World Wide Web for the locations of malaria cases reported by the VMWs: http://malariacontainment.wordpress.com/tag/mobile-phones/

Any good experience or open source tools for SMS text?
I like to share ICT/HMIS work in Cambodia as attached file.
Sambath

From: "de la Torre, Cristina" <Cristina.delaTorre@icfi.com>

ICF international, through the MEASURE Evaluation Project, has established a mobile reporting system for routine collection of malaria data from health facilities in Mali. The attached presentation describes the system. Thanks to this system, malaria data are available monthly (for the 2 regions where the system is fully operational) compared to a delayed annual report that regular HMIS is able to produce. It has proved very useful for remote areas where the transfer of paper forms is often delayed.

One challenge we face is how to use mobile technology to provide information feedback to the health centers. Our system enables users to view analyzed data and reports online. However, not all health facilities have access to the internet. We are interested in how others have used mobile technology for feedback of HMIS data.

Thanks for a very interesting dialogue.
Cristina

Cristina de la Torre, MPH, D.Sc.
Senior Evaluation Specialist |MEASURE Evaluation

From: Maya Tholondi

Text4baby is a US domestic program, however it has been scaled and is provided as a free service supported by over 700 partners in the US, including the US Centers for Disease Control and Prevention. Here is the program's website: https://www.text4baby.org/
A CDC link describing the program: http://www.cdc.gov/women/text4baby/

What is text4baby?

Text4baby is a free cell phone text messaging service for pregnant women and new moms. Text messages are sent three times a week with information on how to have a healthy pregnancy and a healthy baby. The text messages are timed to the pregnant woman's due date or the baby's date of birth.

The free text messages provide tips on subjects including breastfeeding, car seat safety, developmental milestones, emotional well being, exercise and fitness, immunizations, labor and delivery, nutrition, prenatal care, safe sleep, and stop smoking. The text messages also provide 1-800 numbers and other resources to learn more.

Launched in February 2010, over 281,000 had enrolled by the end of January 2012. Ninety-six percent of enrollees report that they would recommend the service to a friend.

How do women learn about text4baby?

Women can learn about text4baby from over 700 partners who have signed up to help promote text4baby. Partners include health plans, city and county health departments, telecommunication companies, federal and state government agencies, corporations, local and state and national nonprofit organizations,

federally qualified health centers, colleges and universities, tribal agencies, healthy start programs and coalitions, head start/early head start programs, hospitals, health delivery networks, professional associations, and clinics. Or visit text4baby.

Who leads text4baby?

Text4baby is an education campaign of the National Healthy Mothers, Healthy Babies Coalition (HMHB). HMHB works with a broad range of partners to encourage the women they reach to take advantage of this free service. CDC, as an agency of the Department of Health and Human Services, is one of over 700 partners supporting text4baby.

Who develops the text messages?

Text4baby pregnancy and infant messages are developed by HMHB in collaboration with federal partners, physicians and nurses and national medical organizations.

How can we become a text4baby outreach partner?

If you are interested in becoming an outreach partner to promote text4baby in your community, visit www.text4baby.org to learn more.

Are the text messages in English and Spanish?

Yes. The text messages are in English and Spanish. Participants can sign up for text4baby in English by texting **BABY** to 511411. They can sign up for text4baby in Spanish by texting **BEBE** to 511411.

How long will women receive free text messages?

Text4baby is designed for pregnant women through their pregnancy and the first year of their baby's life.

To stop receiving texts from the text4Baby service, users simply text the word STOP to 511411 from the same phone they use to get the messages.

More Information

Text4baby

Text4baby for Pregnant Women and New Moms

National Healthy Mothers, Healthy Babies Coalition

Maya Tholandi, MPH
Senior Monitoring & Evaluation Advisor

From: "Mabel Moti" <mabel@enhancesi.co.za>

Wow I am learning a lot from all of you guys. I am based in South Africa and it seems we are very much behind in terms of technology yet I had always thought South Africa was very much technologically advanced in Africa only to realise, already there is mobile communication for patients which is really useful. Especially the reminder messages for pregnant women I believe they are very useful indeed. I have an understanding that currently in South Africa we are still using DHIS 1 which has improved security features, from the look of things DHIS 2 presents more features that could be useful in the South African context for the Health Systems, and may contribute a lot towards reaching the goals set. Thank you all for sharing the different experiences in your areas, I feel this is very useful and an eye opener to some of us.

From: Dagmar Timler <dagmar@cell-life.org>

Hi

I am working at Cell-Life, in Cape Town, South Africa, and we are using DHIS2 in a project in conjunction with the DoH. I believe the DoH is using DHIS2 across the board.

We have finished a pilot (of about 900 phones) using openXdata mobile client in conjunction with DHIS2 and are ready to start implementing more projects.

Thanks
Dagmar

From: "Mabel Moti" <mabel@enhancesi.co.za>

This is interesting yet I thought we were still using DHIS 1 , so it is great news to know DHIS 2 has already been implemented here in South Africa. Where I am based they are using DHIS 1.40.1 though.

From: Dagmar Timler <dagmar@cell-life.org>
Hi Mark

Do you have any more information about your project? We, at Cell-Life, are using openXdata (under the brand name Capture) and I have recently finished developing an ODK Collect integration with OXD.

We're interested in using ODK Collect but have no experience with it yet.

Do your users find it easy to use - do you have to do a lot of training? Do you supply the phones, or do they install it on their own phones?

Also, have you any experience with capturing video/sound? How efficient is the Aggregate server at handling large volumes of data?

Thanks
Dagmar

From: Tariq Azim <syed_azimus@yahoo.com>

The text of the message follows:

In Ethiopia, under USAID's HMIS Scale-up project, we have developed a mobile executive Decision Support System (MEDSS). It is installed on Android mobile devices supporting decision making. We have given the mobile devices to executive & mid-level health managers for them to get quick updates on health program performance.

The mobile device stores a small amount of data and communicates to the Regional Health Bureau HMIS database server through a web-service. This allows updating of the database within the mobile devise whenever the manager wants an update of the HMIS indicators, master health facility list, and the personal contact information of the key health unit's staff.

Like the electronic HMIS (eHMIS) system, this MEDSS provides HMIS indicator performance by region, zone, district and by individual health facility for a specific time period.

This system helps the managers to get up-to-date program status information, especially when they are on supervisory visits. If she/he wants to explore further, she/he can do that by accessing the desktop version of Decision Support System (DSS) that's locally available at the health unit or manager's office.

The attached ppt. provides a few screen shots of the application.

Tariq Azim
HMIS Scale-up Project, Ethiopia

Day 2| April 3, 2013

From: "Michael Edwards" <michael_edwards@jsi.com>

Dear RHINO Forum participants,
I'd like to thank all the participants who contributed to an interesting first day of discussions. And I want to give a special "shout out" of appreciation to two original RHINOs (attendee's of the very first RHINO workshop in 2001) - Steve Sapirie and Mark Spohr. Your life-long dedication to strengthening routine health information systems is truly appreciated.

Here are some of the highlights.

- Joy Kamunyori discussed the SMS-based stock reporting systems used in Tanzania, Malawi and Ghana. Other SMS-based solutions were presented by

- Maheen Malik sent a powerpoint slide concerning the Greenstar Social Marketing Program in Pakistan. Elibariki Mwakapeje expressed an interest in more information about this application, as they are working towards implementing mobile technology in Tanzania for disease surveillance, and also Victor Aching would like more information.

- Steve Sapirie asked the question if anyone has a list of mHealth Solutions that have been implemented Nationwide. He has done a lit review and found mostly pilot projects. If anyone can answer his questions we'd love to hear from you. Steven Wanyee suggests that GSMA has a list, and Joy Kamunyori provides a link to a list develop by the mHealth Working Group.

- Harriet Kagoya mentions that mHealth is implemented in Tanzania for MNCH (RCH) programs. SMS reminders are sent to pregnant women. A more extensive overview of an application with similar functionality (dissemenation of information to clients) was presented by Maya Tholandi about the Text4Baby project. Text4Baby sends out to pregnant women information about how to have a healthy pregnancy and baby.

- Lungi Okoko discussed the problem where numerous mHealth solutions using different software were implemented in a country without any coordination. He presented an interesting map of Uganda that showed all the different mobile technologies in use, and also discussed some conclusions to resolve this situation.

- Judy Wawira is implementing a point of care mHealth system for TB in Kenya. He researched mHealth in leadership, management and governance, and came up with an interesting word cloud (Wordle).

- Mark Spohr discussed two open-source applications that he has used in his work. First, he discussed the feature-rich mHealth capabilities of DHIS2. He has recently implemented DHIS2 in the Solomon Islands. Moise Zanga mentions that there was an attempt to implement DHIS2 for Supply Chain Management, but was disrupted by the civil unrest. Later in the day he also introduced us to the ODK (Open Data Kit) Collect/Aggregate software for putting together surveys/questionnaires. Dagmar Timler requests more information on this project, and mentions he is using openXData (Capture). Another survey tool, was discussed by Joy Kamunyori in her opening email, where Magpi (formerly EpiSurveyor) is used in a quarterly survey that collects malaria case management and stock availability information in seven countries (Ghana, Malawi, Mozambique, Nigeria, Tanzania, Zambia, Zimbabwe).

- From the Western Hemisphere, we heard from Shalaudin Ahmed from Dominica. Dominica is the first Caribbean country to pilot an mHealth system that collects weekly syndromic and HIV data from 7 health districts and 1 sentinel site.

- Bill Lester's organization NPOKI is going to do a series of webinars called Connecting the Dots, which will focus on resources that use mobile phones as part of systems that manage programmatic and operational information. When he finalizes the agenda, he plans to share this with us through the RHINOnet.

- Lawrence Wasserman sent us a ppt presentation on the use of mHealth in promoting telemedicine. He brings up an important point about the need for capacity building of institutions at MOH and other

government levels to conduct project development, implementation and Evaluation. He also gives great quotes from one of my heros, Albert Einstein. :-)

- Mean Sambath presents 3 SMS systems in use in Cambodia, and mentions the challenges of creating apps in the local Khmer script.

- Cristina de la Torre sent a great ppt presentation about the mobile reporting system for the routine collection of malaria data from health facilities in Mali. She point out that their next challenge is in how to use mobile technology to provide feedback to the health centers, and is looking to see if others can weigh in on this.

- Tagmar Timler is also using DHIS2 and Capture in South Africa, and Mabel Moti, also from South Africa is surprised that DHIS2 is in use, as she is only aware of DHIS1 in use in South Africa.

- Tariq Azim sends us a great ppt presentation on the Mobile Executive Decision Support System that has been developed under the HMIS Scale-up project. This mobile app links with the electronic HMIS (eHMIS) and helps managers get up-to-date program status information when they are on supervisory visits.

We look forward to another exciting day of information sharing with the RHINO Forum.
best wishes, MikeE

From: Andrew Wyborn <andrew.wyborn@greenmash.com>

Hi Michael
Sorry to be so late in the day but I have been off over the Easter break. I'd like to add details of a number of activities that Greenmash is supporting using mobile technologies.

In Ghana and Kenya we work with the SMS for Life program. We have seen great results with high response and accuracy rates and significant reductions in stock outs of essential medicines. The Kenya evaluation can be seen here http://www.plosone.org/article/info:doi/10.1371/journal.pone.0054066 We use simple SMS messaging across all networks and a single free to use short code number. Data from the health facilities feeds in real time to update reports, charts and maps to enable real time and accurate decision making.

Both the Ghana Health Service and the Division of Malaria Control in Kenya have indicated that they want these pilot systems to scale nationally. In Cameroon we are about to begin a national roll out of the same program and will also be gathering data for disease diagnostics.
In Tanzania we use SMS reporting to support the notification and registration of Vital Events working with the Ifakara Health Institute. Also in Tanzania we work with PSI supporting their social marketing activities using SMS reporting. We also use our offline Android application to capture data from field surveys that is automatically uploaded to update reports, charts and maps whenever the user has an internet connection. This approach saves a significant amount of time and money and enables reporting to be virtually instant. The data validation tales place on the Android device which reduces errors to virtually zero without the need for user intervention.

In DRC we are working with the PMI Expansion Plan to support improved reporting for a Malaria program using SMS. http://www.fightingmalaria.gov/news/pressreleases/drc_expansion.html

All the data is gathered using the most appropriate mobile device and delivered in real time to the Mango platform supported by Greenmash. Mango is deployed as a service and is ideal for programs that need to be deployed rapidly, without the need for investment in hardware, software or developers i.e. where the emphasis is on the end result rather than the technology.

I hope this is useful
Best wishes
Andrew Wyborn

From: "Atuahene S. Kyeremeh" <katuahene@ghanaids.gov.gh>

Dear Andrew,
I was delighted to read your work in Ghana and other African countries. Results of these ground breaking initiatives are indeed fascinating. I wish you could provide more information on the Ghana project. Any weblink where I can pick a report or something?

Cheers!
Kyeremeh Atuahene
Director of Research, Monitoring and Evaluation
Ghana AIDS Commission

From: "Martin, Thomas" <tmartin@himss.org>

Hi All,

I just came across this post on Poltico about the growing use of "universal service funds" to begin to address- at least some- of the issues outlined below. http://www.politico.com/story/2013/04/universal-funds-can-help-bridge-digital-divide-89550.html?hp=r15
As a young economist in the mHealth space I would be curious to hear about approaches in other countries to increase access via USF type approaches. I have some suggestions on how the U.S. could revamp our own USF to be more inclusive of mobile health related services.
Best,
Tom

From: "Mike Frost" <mike_frost@jsi.com>

Thanks, Michael, this is an important topic. From my perspective, mobile technologies are particularly useful not solely for their computing power or their ability to capture data -- we've long had PDAs, laptops and computers that match or improve on these features, but that don't fit the same niche that mobile phones are beginning to occupy. Rather mobile technologies have become such a useful tool for at least three other reasons:

1 - **Ubiquity**. Network operators and mobile phone manufacturers have spent the last 10 years building cell phone towers and making cheaper and cheaper phones, and have done the hard work to ensure that a

wide and growing population in every country across the globe has access to a phone and a tower, even in places where there is no reliable electricity or fixed phone lines, let alone desktop computers.

2 - **Ease of use**. Phones are designed to be simple to use -- even smartphones, but especially lower end and feature phones. They've proven to be a technology that can be adopted and used regularly even by populations with no training or extensive familiarity with other computing technology.

3 - **Cost (hardware and software)**. Of course there are a wide range of phones, some much more expensive than others, but there are very capable phones on the market in every country that are priced at a point that many can afford. Also, focusing on the software side of things, the open-source and freeware movements that have come to the fore in the last decade have made mobile approaches much more feasible in many programs and countries than the prior wave of closed, proprietary and expensive solutions ever could be.

These characteristics of mobile approaches are driving the widespread interest in their applicability to public health programs, so any proposed mobile solutions should balance the ever-increasing computing power of mobile devices with these other characteristics. It is tempting to propose a solution that utilizes the latest and the most sophisticated technology, but doing so can often come with additional obstacles to success, by requiring extensive training on a new device; being cost prohibitive; or adding the complication of maintaining a supply of hardware or software.

I'd be happy to hear more about how other projects have made decisions about what level of technology is most appropriate for their needs. From JSI's experience, when creating cSTock, a mobile Logistics Management Information System (LMIS) to obtain routine stock information of medicines used by community health workers (HSAs) at the village level in Malawi, we chose to implement a solution that would leverage mobile phones that the community health workers already had. We registered a toll free number that allows HSAs to regularly report stock levels of 20 different medicines via SMS from their own mobile phones. In addition to saving costs that don't need to go to hardware or training on new devices, by relying on existing mobile phones in this instance we removed the burden of replacing broken/lost/stolen phones, as well as the responsibility for keeping phones charged or topped up with minutes, since the HSAs enrolled in the program already have a phone, and already seek to keep their phones charged and ready to use. This approach does not limit the amount of computing that can be done with the data, but just moves the location of the calculation to take place on the server side, rather than on the mobile device, kicking back alerts and responses to HSA and the facilities that they receive resupply from. The data is also analyzed and displayed on a website accessible to decision makers and supervisors throughout the system, who are better positioned to view it on a computer or laptop.

This approach with cStock has proven to be very successful, and with buy-in from the MOH and support from BMGF and WHO, cStock is currently used by 1553 HSAs, and 357 health facilities across 16 districts in Malawi, which represents about half of the country. We have seen matching success with similar systems in Tanzania (ILSGateway) and Ghana (EWS), where the focus was on lower level health facilities, rather than community health workers, and where we again were able to utilize existing mobile phones for routine reporting.

That said, there are clearly use cases where it is appropriate to provide more sophisticated mobile hardware, and train users on new devices. Under the USAID | DELIVER PROJECT, JSI has used mobile phones to carry out the PMI End-Use Verification survey on a quarterly basis in more than 10,000 health facilities across 7 African countries during the last three years. This is a fairly sophisticated survey, being implemented by a much smaller pool of higher-level data collectors, so we provide somewhat higher end mobile phones that run the EpiSurveyor (now Magpi) application, and we train data collection teams from ministries of health and local project staff.

From our experience, taking these characteristics of mobile technology under consideration when designing a mobile intervention has helped us to select the appropriate mobile technology for a given use case, which in turn leads to greater likelihood of scalability and sustainability.

Thanks,

Mike

From: "Atuahene S. Kyeremeh" <katuahene@ghanaids.gov.gh>

Dear Joy,
In 2011, Ghana AIDS Commission and FHI360 partnered to conduct integrated bio-behavioural surveillance survey among femal sex workers and their clients. We used mobile phones to collect and transmit the survey data. This activity was not routine data related but I find the innovation and results useful for future studies in Ghana. I hope members will find the brief information in the attachment useful.

My colleague, Sam Wambugu of FHI360 SWambugu@fhi360.org and I are available to provide further information to members who may be interested.

Cheers!
Kyeremeh Atuahene
Director of Research, Monitoring and Evaluation
Ghana AIDS Commission

From: Dagmar Timler <dagmar@cell-life.org>

Hi

From our experience of mobile data capture at Cell-Life, we recommend no more than 20-25 questions per form. Last year a client insisted on a form that had over 100 questions and I see they have not used the form - it simply cannot be feasible to answer so many questions on a mobile devise (even if it was a tablet).

For our data capture projects, we are generally able to recommend the phones that our clients must purchase for their community health care workers, and luckily the openXdata client is able to work on very low end J2ME phones (Nokia 2330c is one that has been used in the community). By ensuring that the phones are the same, or at least only a select few, it makes setup, training and support much easier.

If a requirement is that the general public must be able to use the app, we generally recommend the use of USSD. Although this generally restricts us to multiple choice and a maximum of 6 questions (due to timeouts), the quality of the data captured would be much superior to SMS.

Thanks
Dagmar

From: Mark Spohr <mhspohr@gmail.com>

I came across this interesting article recently which reviews 500 mHealth projects. It is somewhat critical in that it cites a lack of evidence. I think that have an overly strict view of what constitutes evidence. I'm not sure how one can review 500 studies and not learn anything but here it is:

PLoS Med. 2013 February; 10(2): e1001382.
Published online 2013 February 12. doi: 10.1371/journal.pmed.1001382
PMCID: PMC3570540
Scaling Up mHealth: Where Is the Evidence?
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3570540/

Summary Points

- Despite hundreds of mHealth pilot studies, there has been insufficient programmatic evidence to inform implementation and scale-up of mHealth.
- We discuss what constitutes appropriate research evidence to inform scale up.
- Potential innovative research designs such as multi-factorial strategies, randomized controlled trials, and data farming may provide this evidence base.
- We make a number of recommendations about evidence, interoperability, and the role of governments, private enterprise, and researchers in relation to the scale up of mHealth.

Kind regards,

Mark

From: Olusesan Makinde <sesmak@gmail.com>

Hello Mark and Rhino forum participants,

I think what many people like me are looking for are studies that will demonstrate the cost benefit and effectiveness of the interventions.

Certainly the authors of this article may have learned new methods for implementing mHealth projects but they may not have had a convincing evidence that justifies that these mHealth interventions are any better than other conventional methods of data collection/ information dissemination. We all know that the cost of mHealth systems are quite expensive and may be out of reach of many projects or financially unwise.

It will be nice to begin to see studies that will compare mHealth data collection methods/ information dissemination methods with other conventional methods and at the same time be able to show that these (mHealth) methods are a more financially wise option.

Thanks.

From: "Joy Kamunyori" <joy_kamunyori@jsi.com>

Dear RHINOs,

Thank you all for the continued rich discussion over the course of our second day. Some highlights of the discussion are below:

We continued to hear from participants about ways in which they have used mobile technologies to collect data:

- Andrew Wyborn of Greenmash shared his experience with the Mango platform in Ghana, Kenya, Tanzania and the DRC
- Kyeremeh Atuahene from the Ghana AIDS Commission told us about their work with FHI360 collecting survey data using mobile phones

We started to talk about appropriate uses of mobile technologies for data collection:

- Michael Edwards started us off by discussing some of the issues that come into play when considering applying mobile technologies to our work; namely the implementing environment, the quantity of data collected and functionality
- Mike Frost of JSI discussed JSI's experience with implementing cStock in Malawi and how the desire to make use of the phones that community health workers already had led to the decision to implement a SMS-based reporting system, and about similar systems at the health facility level in Tanzania and Ghana. He also spoke about the PMI End-Use Verification survey, which uses more sophisticated mobile phones
- Dagmar Timler from Cell-Life recommended having no more than 20-25 questions per form due to the feasibility of answering many questions on a mobile device. He also recommended using USSD for applications that need to be accessible to the general public, due to the data quality being superior to that of SMS although one is limited to multiple choice and a maximum of 6 questions

We also heard a little about the lack of evidence concerning mHealth projects in terms of the ability to inform the implementation and scale up of mHealth. Mark Spohr shared an article reviewing 500 mHealth projects and Olusesan Makinde expressed a desire to see more studies that showed both the feasibility and financial viability of mobile technologies for data collection/information dissemination

We look forward to another interesting day of information sharing with the RHINO Forum.

Best regards,
Joy

Day 3| April 4, 2013

From: Mark Spohr <mhspohr@gmail.com>

Hi Olusesan,
I do agree that their may not be convincing evidence demonstrating cost-benefit and effectiveness.
However, I am confused when they make this statement:

"Yet, after completion of these 500 pilot studies, we know almost nothing about the likely uptake, best strategies for engagement, efficacy, or effectiveness of these initiatives."

I just can't believe that they read 500 studies and learned "almost nothing" about strategies, etc. Surely there must be some lessons in these studies about what works and what doesn't work.

They also make this statement:
"Finally, no major investments have been made to create a robust platform for mobile phones that could be used by designers of applications and electronic medical records that will allow cross-fertilization or integrated systems to be utilized [32]. Thousands of small applications have been propagated on closed-source platforms (e.g., iPhone applications and others) that each major mobile phone provider appears ready to replicate at high cost. "

Again, they ignore the good open source work that has been done by such projects as OpenDataKit, JavaRosa, EpiSurveyor, etc. and which use open source and widely available platforms.

They do have a good set of recommendations for an academic approach to mHealth with which I can agree:
Box 1. Recommendations for Scale Up of mHealth

1. Existing standards for research should be reconsidered in order to provide guidance as t o when scale up is appropriate.

2. mHealth interventions should be guided by a plausible theory of behaviour change and should use more than one technique
depending on the targeted behaviour [38].

3. We need to establish an open mHealth architecture based on a robust platform with standards for app development which
would facilitate scalable and sustainable health information systems.

4. Implementation strategies such as factorial designs that are able to test the multiple features of interventions must be
explored, in order to provide the necessary evidence base.

5. Scale-up of mHealth in LAMICs should be preceded by efficacy and effectiveness trials so that they are founded on an
appropriate evidence base.

6. Governments,funders,and industry must cooperate in order to set standards to create a self-governing commercially viable
ecosystem for innovation.

However, these people are academics and clearly don't work in the real world where most of us have to deal with limited time, budgets and project priorities. I welcome a more rigorous approach and I think these people should get funding and develop one.

Kind regards,
Mark

From: "Sapirie,Steve" <ssapirie@msh.org>

Mark, thanks for sharing this study report and your views about it. I would like to share a question with everybody at this point, but first an observation.

As with other information and communications technology, it begins to appear that we have a general mobile telecommunications technology that is catching everybody's eye and they are rushing to find uses for it. No harm in pilot efforts to explore possibilities and prove the usefulness, even in small applications. That's how we learn.

But I wonder if it isn't time to come back to confirming the priority needs for such communications in support of the health system and services, and then once feasibility and effectiveness have been proven for filling those needs, begin to determine what is required to scale up the application to serve the entire country, and how the country can pay for it. Isn't that the development objective for our work in countries?

We carried out an mHealth/Telemedicine needs and feasibility study in Afghanistan about two years ago. There were a number of mHealth and TM applications already underway and we looked at most of them. But after a number of discussions at community, health center and provincial hospital level it became apparent that there were three priority needs that mHealth could help address: community-level notification of suspected infectious disease cases and outbreak, communications from communities and health centers to arrange emergency transport for trauma and maternal complications, and notification of stock-outs of essential drugs. (And these were determined by the CHSs, health center managers and provincial health offices and hospitals themselves.)

So what I wonder is whether Ministries cannot be the deciders of what should be the priority mHealth applications in their countries with an eye to rapid scale-up when the procedures are developed and proven, and self-funding assured, and the donors and CAs then pitch in to help make it a reality.

Lungi shared with us the result of unmanaged growth of mHealth applications in Uganda, and the situation is lamentable. Fortunately, or so I have heard, UNICEF is assisting the ministry in Uganda in creating a nation-wide plan of mHealth application development and implementation which will hopefully serve to assure planned development of the more important applications. Is that not something we as a network could support in more countries?

Just curious.

Steve

From: "Vikas Dwivedi" <vikas_dwivedi@jsi.com>

Hi all,
Thank you for the interesting examples and experiences from around the world. Very interesting to learn about what is done around the world.

I work in various countries on strengthening Routine Health Information Systems that may or may not be implementing mhealth interventions. We still try to make them functional on paper and use appropriate technology solutions and as Steve pointed out "Government owned". Mark also made an interesting comment that after review of 500 articles we could not learn anything. Does this mean that we are not measuring them right or not managing them right?

I would like to visit the issues that were highlighted for our discussion by MikeE this morning. What are the criteria to decide which application and level of sophistication should be used. Mike Frost gave an excellent example of Malawi of implementing cstock and make use of the best....but how do we decide and who?

Talking about Data quality and use, our common performance measure of Health Information System. In my work, the biggest challenge for improving performance of Routine Health Information System is the number of forms that are required to be filled by health workers at the lowest and remotest health facility and where there is no electricity. My recent experience in Timor Leste, health facilities are required to submit 4,000 data elements every month to the higher level. Namibia has some 60+ data collection and reporting systems with duplications and multiple entry systems. This and many more. The Uganda example is another excellent map showing so many different system within one country.

I hope that we all on this discussion can help define standards and criteria for development and implementation of future interventions and measure them so we can learn. I see the potential and want to do things right.
Look forward to learning from the experts.

Best regards,
Vikas

From: "Michael Edwards" <michael_edwards@jsi.com>

Greetings RHINO Forum participants,
I'd like to thank all the participants for their contributions to yesterday's informative discussion on the appropriate uses of mobile technologies with RHIS. Several important issues and questions emerged, and I encourage participants to continue to provide input into those topics.

Yesterday, Tagmar Dimler recommended that cell phone apps should only have 20-25 questions per form. In his experience, larger forms resulted in the lack of use of the cell phone for data entry. This is a perfect segue into today's topic of the limitations of mobile technologies for RHIS. As we saw in Vikas Dwivedi's email, the RHIS in Timor Leste requires health facilities to submit 4,000 data elements monthly to the higher levels. This is the case in the countries where I work in as well. Clearly this much data entry using even a smartphone would be cumbersome to say the least.

What are the other limitations to cell phone/mobile technology use that you have encountered?

What other considerations are necessary to implement a mobile technology solution?
I look forward to the today's discussion on this topic, and continued discussions on the issues already raised.

best wishes, MikeE

From: Michael Rodriguez <Michael_Rodriguez@abtassoc.com>

Greetings fellow RHINOs!

Regardless of the need for evidence that mHealth initiatives require to demonstrate long-term value and sustainability, in the near-term they still must be viewed as a means to an end. mHealth is about applying an appropriate solution to a particular problem, which should be about improving an aspect of the health system: reducing the time required to report test results in order to improve responses (for example, with TB), improving the accuracy of data being hand transcribed multiple times at different levels in the system, and so on. Each of these efforts also needs to be pursued in the context of a coordinated and actively managed effort to improve the overall health information system (preferably in the form of a national eHealth strategy). As noted in the Uganda dynamic and the Namibia dynamic, there is the need for a central coordinating mechanism that is empowered to ensure that a structured and standards-based approach to the development of mHealth solutions to specific health system problems takes place in each country where it is being pursued. Without that, there will continue to be a gold rush approach to being the first one to stake a claim in the field without regard to the 'environmental impact.'

Kind regards,
Michael

Michael P. Rodriguez| Director, International eHealth Initiatives | Abt Associates

From: "Mike Frost" <mike_frost@jsi.com>

Vikas asks the important question of how to decide what mobile intervention (if any) fits a program. In my experience, it is always best to start with an assessment to adequately define the problem. Too often a decision maker will say, "We want to create an SMS system for routine reporting," when in reality, it would be much more helpful to say something such as, "We have a problem with late reporting from health facilities in the Northern Region. What is causing this late reporting?" An appropriate assessment of late reporting from the Northern Region would include a review of the reporting processes already in place, including discussions with stakeholders, as well as interviews with the people in the Northern Region who are late with their reports. Once an assessment is completed that details the challenges that the Northern Region is facing with regards to reporting, then is the best time to determine what interventions are best suited to solve the problem. This is more of a business analyst approach than a technologist one, and mobile solutions should just be one option in a toolkit to address the problem.

As for the separate concern that Vikas mentions, where lower level health facilities are expected to report large amounts of data every month, through various mechanisms, it is crucial to keep in mind that good system design is good system design, whether there is a mobile component involved or not. When JSI has been given the mandate to design a mobile reporting system, we take it as an opportunity to also make recommendations about how to streamline and improve other related processes, removing redundancies, rewriting job responsibilities, and seeking to combine a (necessarily limited) mobile approach with a host of other system improvements. Mobile devices are not the cure all for all reporting needs, but neither would be a full desktop computer with a reliable internet connection, even if it were feasible to recommend. There are other problems to be addressed, including training, better report design, staff turnover, etc. Mobile approaches do not need to be the entire solution for them to be at least part of a solution.

Finally, with regards to the lack of evidence topic, while I think this is an important point, I think that it is also ill-defined. As anyone who has attended an mHealth conference can attest, mHealth is a very broad term that encompasses everything from EKG devices on iPhones, to phone calls between doctors and patients. When we say "there is not enough evidence for mHealth," what part of mHealth are we referring to? At least with regards to public health systems, there is a mountain of evidence showing that better data lead to better decision making, so those of us interested in mobile approaches for data reporting do not need to recreate that entire literature. The gap in evidence for mobile data reporting then seems to really boil down to cost analysis and quality of data. As long as it is affordable, and good data is coming in, then mobile reporting works, and these two questions seem to be as answerable through a thorough system assessment and design as they are through a randomized controlled trial.

Cheers,
 Mike

From: Andrew Wyborn <andrew.wyborn@greenmash.com>

This is a good question. As with any other type of solution the cost effectiveness of an mHealth project should be evaluated along with other measures to determine if it is an appropriate intervention. In theory a well thought out mHealth project should deliver a number of significant benefits including;
- o Much faster access to data i.e. virtually real-time as opposed to days, weeks or months
- o Better and more timely decision making due to the availability of that data
- o Lives saved and more appropriate treatment due to the availability of real-time accurate data
- o More accountability due to the visibility of the data
- o Improved reporting to donors to support / justify the funding
- o A reduction in the use of paper and printing materials
- o A reduction in staff time taken to prepare reports
- o A reduction in the need to travel which saves time, fuel, wear & tear on vehicles
- o Arguably an improvement in the environmental impact of reporting

Most if not all of these points also result in a reduction in costs. We are currently working on a cost-effectiveness model to enable us to provide some real $ numbers to put against these bullet points and I'd be happy to share that once we have something to show. In the meantime if anyone else already has something similar it would be great to see it.

Cheers
Andrew Wyborn
Chief Executive Officer

From: "Michael Edwards" <michael_edwards@jsi.com>

Dear RHINO Forum participants,
I want to again thank all the participants who contributed to the discussion. Here are some of the highlights:

- Mark Spohr continued to enlighten us in his reponse to Olusesan Makinde's desire to see more studies that showed both the feasibility and financial viability of mobile technologies for data

collection/information dissemination. Mark pointed out that the although the study of 500 mHealth projects, he agreed that there wasn't convincing evidence demonstrating cost-benefit and effectiveness, but he was incredulous that the researchers learned almost nothing about the likely uptake, best strategies for engagement, efficacy, or effectiveness of these initiatives. He felt that the researchers also ignored the good open source work (OpenDataKit, JavaRosa, Magpi) when they stated that no major investments have been made to create a robust platform for mobile phones. He did find useful the articles recommendations for an academic approach to mHealth:

1. Existing standards for research should be reconsidered in order to provide guidance as to when scale up is appropriate.

2. mHealth interventions should be guided by a plausible theory of behaviour change and should use more than one technique depending on the targeted behaviour [38].

3. We need to establish an open mHealth architecture based on a robust platform with standards for app development which would facilitate scalable and sustainable health information systems.

4. Implementation strategies such as factorial designs that are able to test the multiple features of interventions must be explored, in order to provide the necessary evidence base.

5. Scale-up of mHealth in LAMICs should be preceded by efficacy and effectiveness trials so that they are founded on an appropriate evidence base.

6. Governments, funders, and industry must cooperate in order to set standards to create a self-governing commercially viable ecosystem for innovation.

- Steve Sapirie responds to Mark with an observation that we now have mobile technology that is the flavor of the month, and so everyone is rushing to use it (as evidence of this observation, this RHINO Forum is by far the most attended forum in the history of RHINO Forums with over 250 subscribers). Although we can learn by all of these pilot studies, it is now time to come back to confirm the priority needs in support of the health system and health services. He sites an example from Afghanistan, where his team carried out a needs and feasibility study where it became apparent the three priority needs that mHealth could address were in community-level notification of infectious diseases, communication for emergency transport and notification of essential drug stock-outs.

Steve suggests that it should be the Ministries of Health that should be the deciders of what are the priorities for mHealth solutions, and then the donors can help to make these a reality. Otherwise will will have the unmanaged growth of mHealth applications as was shared by Lungi.

- Vikas Dwivedi pointed out the importance of making systems functional on paper and that it is important to use appropriate technology, and agreed with Steve as to the importance of making them 'government owned'. Concerning Mark's comment that the review of 500 mHealth articles didn't learn anything, he wonders if maybe the problem is that we aren't measuring them right or not managing them right. He then discusses the issue of appropriate use of mHealth, and presents examples from Timor Leste and Namibia where the systems are so complex and data extensive (forms and data elements too numerous and duplicative). He expressed the need to define standards and criteria for development of mHealth solutions and strategies for measuring them.

Michael Rodriguez brought up the point that mHealth initiatives should be viewed as means to an end. It is about applying an appropriate solution to particular problems. For instance, it can be used to reduce time required to report and to improve the accuracy of data that is hand transcribed. He stressed the need to pursue coordinated and actively managed efforts (National Health Strategy) to avoid the problems that we've seen in examples like Uganda and Namibia.

- Mike Frost gives a response to Vikas' question of how to decide what mobile intervention fits a program. He stresses the need to first assess the problem (ex. late reporting) and determine the causes of the problem before determining what interventions are best suited to solve the problem. Concerning the

reality of health facilities needing to report large quantities of data, it is crucial to improve the entire process, whether there is an mHealth component or not. Other problems that need to be addressed include training, better report design and staff turnover. Mobile approaches do not need to be the entire solution for them to be at least part of a solution. Mike also adressed the topic of lack of evidence for mHealth. He points out that mHealth encompasses a large variety of applications, and we should focus on the public health systems, where there is evidence that better data leads to better decisions. So we should be looking at effectiveness in terms of cost analysis and the quality of data - and these can be answered through system assessment and design.

- Andrew Wyborn expands of Michael Rodriguez's reason's mHealth could be applied to strengthen the RHIS, and that an mHealth solution should deliver a number of significant benefits including:
+ Much faster access to data ie. virtually real-time as opposed to days, weeks or months
+ Better and more timely decision making due to the availability of that data
+ Lives saved and more appropriate treatment due to the availability of real-time accurate data
+ More accountability due to the visibility of the data
+ Improved reporting to donors to support / justify the funding
+ A reduction in the use of paper and printing materials
+ A reduction in staff time taken to prepare reports
+ A reduction in the need to travel which saves time, fuel, wear & tear on vehicles
+ Arguably an improvement in the environmental impact of reporting
He points out that these benefits also will result in a reduction in costs, and is working on a cost effectiveness model.

I look forward to continued discussion tomorrow.
best wishes, MikeE

Day 4| April 5, 2013

From: Mark Spohr <mhspohr@gmail.com>

Clearly there are limits to what can be done with a mobile device.
Screen size and (lack of) a keyboard limit the endurance of even the most dedicated field worker. (Someone mentioned that they had 4000 monthly data elements. This is not possible on a mobile device... also probably cruel and unusual punishment even on a desktop.) I consider even the "standard" several hundred data elements for most monthly reporting to be the maximum under the Geneva convention and this is probably too many for a mobile device.

There are some things you can do to improve the experience. First, screen size. You can now get $200 tablets with 7" screens and this helps a lot. Most of these can also use a bluetooth keyboard and this also is a big improvement.

Data bandwidth is probably not a problem unless you are capturing photos or video.

Also, while strictly not in the "mobile" category but low cost and low power is the Raspberry Pi. At $35 for the computer and add a keyboard $5 and display ($100) you can have a low power data entry computer. I've done some tests on this running the Chrome browser doing data entry for DHIS2 and it is

quite acceptable. It will run reports no problem. Even the mapping functions work (but are slow). Since it's a Linux computer, you can lock it down to prevent all of your data budget being spent on Facebook. I put up a YouTube video of the performance on DHIS.

Kind regards,
Mark

From: Kalubi Simushi <kalubisimushi@gmail.com>

Rhino Forum Listeners

Greetings from Zambia.

As Ministry of Health, We have been following the discussion and have learnt alot from all the submissions shared so far. Thanks to all who have shared their experinces.

Below is the mHealth experince in Zambia.

In Zambia there are a number of mHealth initiatives currently at various levels ranging from pilot to scale-up. In the last two years the Ministry of Health and partners successfully piloted one such application at 31 facilities and is currently in scale-up mode. The mobile software system that was built for this Application utilises custom solutions built with the free and open source framework RapidSMS. This system is designed with three fundamental components:

1. End users who enter and receive data through their personal basic phones (Clinic Workers and Community Based Agents with SMS), their computers (Laboratory Workers over the telecom data network), or their printers (Clinic Workers with SMS printers in busy facilities)

2. A centralised server sitting in the Ministry of Health connected directly to the telecom providers which securely coordinates all the data that flows through the system directing it to the correct recipient

3. A password protected web interface for the Ministry of Health officials and approved partners, where they can view information, graphs showing how the system is performing in real-time. A mapping function has also been made available with additional programming enhancements.

This integrated system provides laboratory synchronisation, messaging services and national real-time reporting and utilises the telecom backbone of Zambia through mobile phone operators. The system is designed to work with any type of input device including some that are not currently being utilised such as Java enabled or Smart Phones. Additionally, the system was designed with the intent for relevant information to be automatically incorporated into any existing electronic patient record systems.

One component of the system addresses Early Infant Diagnosis (EID) of HIV. SMS messages are used to send the HIV results from the laboratories after being processed to clinic workers in facilities where the Laboratory samples were collected from. The results arrive on phones in smaller clinics and via SMS printers in high volume facilities. The system also tracks samples and provides real-time monitoring for the province and district activities.

RemindMi addresses Patient Tracing for post-natal care. SMS messages are sent to Community Based Agents who seek out caregivers and infants and ask them to return to the clinic for 6 day, 6 week and 6 month post-natal check-ups or special circumstances, such as results arriving at the facility.

Simushi Virginia, BSc, AIMIS, Dip
Ministry of Health/ Zambia

From: "Michael Edwards" <michael_edwards@jsi.com>

Dear RHINO Forum participants,

Our discussion topic for Day 4 is the costs and other barriers to using mobile technologies with RHIS. We've already seen in the discussion that different mHealth solutions have cost implications. Does the solution require special phones (certain software may only work on specific phones, or SmartPhones are required), so that the solution would require providing the phones to the users. Or is the solution something that will work on any phone? How much can we expect a user to pay in terms of service provision? What other barriers have been encountered in the implementation of mHealth solutions for RHIS.

My personal experience here in the USA is that mobile technology is expensive. As I mentioned before, I joined the SmartPhone legions when my teen-age son was chomping at the bit to have one. After that, my wife too needed a SmartPhone because all her girl friends had them. We found that the cost of SmartPhones is expensive when you just buy them, but they are much cheaper if your service provider allows you to upgrade from your current phone. Unfortunately, we weren't eligible for an upgrade at the time. So the salesman talked us into adding 2 phones to our family plan, and we'd get 2 SmartPhones for the cheaper price. Then, when the contract on our old flip-phones expired, we could take them off our plan. Unfortunately, that's not for another year or so. So, the bottom line, I pay $195 per month for 5 phones on our (unlimited use) family plan. And that's added to a telecommunications budget where there are expenditures for high-speed Internet, cable TV and a land-line phone. The good news is everyone is happy, my son can download games, watch YouTube in the car and text his friends to his heart's content. And my wife can even Skype her family in Morocco when she is out shopping and show them what's in the stores.

I look forward to today's discussion.
Best wishes, MikeE

From: "Joy Kamunyori" <joy_kamunyori@jsi.com>

In our experience, the costs of using mobile technologies are affected by several things:

Hardware: depending on whether your data collection system uses basic feature phones, smart phones, tablets, or anything in between, the choice you make will affect your costs. As much as possible, JSI tries to make use of mobile phones that the end user already has in hand in order to avoid providing hardware to users and incurring costs related to initial procurement and possible replacement costs if the provided hardware is lost or damaged. This of course comes with its own limitations - since we are mainly working with users at lower levels of the supply chain, the greatest common denominator in terms of the phones

users have is feature phones, which has limited us to implement SMS-based reporting systems. This comes with limits in terms of the number of data points that can be collected, as well as the costs of text messages.

In our end-use survey work, which Mike Frost mentioned yesterday, higher-end Java-enabled phones are used to run the Magpi (formerly EpiSurveyor) survey software, allowing for larger amounts of data to be collected. This has required an up-front investment in the phones which are typically given to data collectors for the specific data collection exercise and then returned to the country office and stored until the next time. Some of our offices use the phones for other one-off exercises, such as program assessments, thereby helping to offset their investment in the phones.

Training: whatever hardware you choose to use to implement your data collection, some level of training is required for those who are collecting/reporting the data. Even in cases where the users are using their own phones, they need to be trained on how to write the formatted SMS in the correct way for the database to understand the message. In some cases, users may not even know how to write an SMS, having used their phones mainly to make and receive calls. In situations where users are being provided with hardware, they will need to gain familiarity with the device itself, as well as receive training on the specific function that they will be performing on it.

Transmission: data collected on mobile devices must eventually be transmitted to a database. Data transmission costs vary depending on whether you are using USSD, SMS or GPRS/3G data. The relative costs of these data transmission modes vary from country to country, but SMS is generally the most expensive of the three. Whichever mode one uses, there is a need to factor these costs of data transmission into the initial and ongoing expenditures for your project. Oftentimes this is the largest ongoing cost.

One barrier we have encountered when implementing mobile projects in countries is establishing relationships with mobile operators with a view to decreasing the costs of data transmission. The argument for social corporate responsibility often doesn't work, and often our projects are not large enough to warrant discounts based on volume. Have others come across this barrier? If so, we would be interested to hear how you have dealt with it, or if you have any suggestions for the future.

What other costs and barriers to using mobile technologies have you encountered in your work?

Thanks,
Joy

From: Rosalind Carter <rcarter@unicef.org>

Dear Michael and RHINO forum members,

I am a mHealth neophyte, (though a seasoned shoe-leather epidemiologist!) and the RHINO forum could not have come at a better time to kickstart my education in this exciting field. I am considering using mobile technology in several countries in sub-Saharan Africa with the primary goal of increasing access to timely data to monitor progress towards goals to eliminate pediatric HIV where current systems are based on annual reporting.

My question for the group is: what validation processes are typically used for mHealth reporting? And how has the validation process been modified as a result of using mobile technology? For example, many

systems allow you to build in range and logic checks in the data entry program. But how does use of mobile technology impact the process of validation at district and national level and MOH approval of program reports. Has mHealth allowed you to streamline the validation process? Or does validation remain a bottleneck in speedy transmission of data for action? In your experience, is there more questioning/distrust of data entered using mobile devices vs. paper-based reporting?

Also, I would appreciate hearing about any good examples of community organizations using mobile technology to report on social issues such as stigma, quality of health services etc?

Thanks in advance for sharing your expertise!

Rosalind Carter

Rosalind J. Carter
UNICEF/NYC

From: "Vikas Dwivedi" <vikas_dwivedi@jsi.com>

Dear all,
I would start by thanking Mike Frost, Mark, Andrew and MikeE for providing some clear criteria and options of how projects/pilots are being implemented. I agree with Mark on collecting so many data elements but how do we control or keep them limited? I was impressed by some of approaches presented on building of existing systems and identifying problems and not just data collection. I wish someone would have done it for Uganda before we had so many interventions. Anyways, it is something to learn from.

To respond to today's questions. I personally do not have first hand experience in implementing a mhealth project for RHIS. However, i do get into arguments that it will reduce the paper cost of reporting. I would like to hear from some of the experiences if this is really true? can we really do away with paper? i feel not completely, we can minimize the use. Also, what would be the life of a mobile phone or a phase when one set of mobile phone will die (rough estimate) and we will have to replace them? How much would that cost? MikeE, thank you for your real life experience on $195 per month on data. I am not sure if any Ministry of Health will accept that budget.

As for Hardware, i am not the best person to comment but reading the post this morning from Joy, Lungi, Kalubi and others it seems that we need to build on what is available locally. This also echoes with Mike Frost's experience stated earlier. I like Joy's statement on CSR and how it does (NOT) work. Adding another Timor Leste example is after roughly 10 years or more of having only one service provider in the country there is a new provider and calls or msg from one subscriber are not allowed on another. Years back, this was the same situation in India for a long time. I would like to hear if there are any experience and what was done.

I was talking to a very good friend this afternoon and she pointed out if such interventions are helpful in increasing compliance of services. I have a similar/different query on use of data. We have touched on how it improves data reporting, it is faster and real time monitoring. Our work with RHIS focuses on data use at the place it is collected and this is the beauty of RHIS data that it is available with the health worker (facility/community) and they can make some decisions from it. Can the health worker collecting the data make decisions by using a mobile at her/his level. I do think that with the focus "re"-shifting on

Primary and Community based care there is a need for expanding service delivery and information system. I see an opportunity but I guess we need to clearly define the purpose. At some stage we should also talk about some advantage of mhealth for RHIS. I am sorry if am getting off-track by raising this question but i hope the moderators can address it during this discussion.

BTW, i saw these laser keypads. With the press of a button on a small device we can have a laser keypad for typing.....Captivating technology.

Look forward to learning more. Many thanks to all.

Best regards and have a great weekend.
Vikas

Day 5| April 8, 2013

From: "Michael Edwards" <michael_edwards@jsi.com>

Dear RHINO Forum participants

l hope everyone had a good weekend, and was able to use the time to catch up on all the excellent contributions to our discussion on the use of mobile technologies with routine health information systems. Today's discussion, we'd like to hear from you about what you think the future has in store for the use of mHealth with RHIS. Certainly in the last few years, the functionality of cell phones, tablets and other mobile technology have greatly increased beyond the basic function of making a phone call. And we've seen from our discussions how wide a range of uses of mHealth we already have acheived. So our task for today's forum is to examine what functionality of a present RHIS could be enhanced/improved/strengthened by the implementation of a mobile strategy.

As I mentioned before, I'm new to the functionality of mobile technology, and my work with RHIS definitely uses 'old school' technologies. My first experience with RHIS was in the late 1980's, where personal computers had just arrived in Ministries of Health. There were no networks, no Internet, no cloud storage, no cell phones. So we proceeded to build stand-alone data entry and reporting applications at the national level (anybody remember dBase III ?). We quickly realized that the manual data processing/aggregation that was occurring at the district level was problematic (we did supply calculators), time consuming and produced low quality, untimely information. So we decentralized data processing to the district level, where health facilities still submit their routine (monthly/quarterly) reports on paper. This was a big step forward, because it empowered the district health office to better monitor and supervise their health facilities and health services. But still, even with Districts taking more responsibility for managing their own data, a big weakness of the routine health information system was that it provided inadequate and untimely feedback to users at all levels.

At the same time, computers were advancing, and we had the arrival Windows and local area networks, so the data entry/reporting systems evolved to work in these environments. The next big development was the Internet. This allowed for better transmission of the data that was entered at the district level. At first, we didn't have fast connections (I remember gleefully upgrading from a 12 to a 24 to a 48-baud

modem), and distant districts couldn't participate, but we did begin to receive data through e-mail and through dedicated modems for data transfer (although we thought that 'www' meant world-wide-wait). We see now a great increase in speed of transmission with DSL lines, wireless routers, cable modems, fiber-optics, etc. We are also seeing technology in the hands of more user's than in the past. More health facilities are being computerized, health practitioners have laptops and cell phones (some think they spend more time entering info into laptop than they do examining their patients), and as Vikas discussed, it is more viable for information technology to move to solutions that would save on the use of paper, and thus save in costs.

With all this new technology, I think that the future of mHealth and RHIS can help resolve this age-old problem of insufficient and untimely feedback. I can imagine a time when a health practitioner can use mHealth solutions to provide feedback to patients/clients as to the result of their exams, lab tests, etc. Feedback from District managers to health facilities can be improved as well through mHealth solutions. I can envision a supervision app that a District manager would use on supervisory visits that would provide feedback to the health facilities he/she supervises. District manager, who through Internet connectivity can have instantaneous access to not only the data they have transmitted, but their data in comparison to data submitted by other districts in order to make comparisons. This feedback could be made available on mobile devices, so that the information could be used in the office or during supervisory visits.

I look forward to today's discussion. Feel free to also suggest your own topics for discussion as well.

best wishes, MikeE

From: Mark Spohr <mhspohr@gmail.com>

Predictions are always hard, especially about the future."

Nevertheless, I'm sure we will all jump in and predict fearlessly.
Michael, I think you raise a few good points about problems with RHIS of the very slow feedback and the potential of mobile technology to speed up the link and provide real time information. This is as much due to improved communication links as it is to having a mobile device to send and receive the data.

I also think that mobile devices have a great potential to automate data collection, thus removing the last "loose nut behind the keyboard" weak link in the data collection chain. Automatic data collection of patient and institutional data with immediate automatic reporting and feedback will finally provide a frictionless data loop. Consider the scenario where a patient visits a clinic with their own "health enabled" mobile device. The clinic can detect their presence automatically and the patient device has been preauthorized to share data so it uploads the latest biometrics which it has been collecting (heart rate, temperature, blood sugar, activity, etc.). The patient visit is automatically registered and their data is ready for the doctor to review. You could even insert some automated intelligence to look at the data and make some observations and recommendations. These could be uploaded to the patient's device and they are on their way. All of the details are automatically recorded in real time.

The future is here now, it is just not evenly distributed.

All the best,
Mark

From: Judy Wawira Gichoya <judywawira@gmail.com>

Joy

During the last health summit the telcos said that health cannot be free, make a business case for why they should be interested and they will listen. This is a disconnect between the practice of global health persons that are generally underpaid and work to do good, versus corporate mentality

Also in Kenya, i think USSD is the most expensive option not SMS (can't locate the reference article)

To the whole group , do you have any frameworks and toolkits for evaluating mhealth in regarding costs and can these be shared?

Moreover , beyond PRISM and REAIM frameworks , what have other people used for system evaluation?

Thank you

Judy

From: Kalubi Simushi <kalubisimushi@gmail.com>

Thanks Judy for your Questions.

Attached are two documents that will answer your questions in detail.

Warm Regards.

From: Diego Rios <drios@dimagi.com>

Hi,

My name is Diego Rios and I work based in Guatemala for Dimagi (www.dimagi.com). I would just like to share our toolkit for evaluating mhealth projects. We base our cost analysis on a Total Cost of Ownership: include full cost of program (hardware, training, data plans, etc.).

Below is the link and can be accessed for free by everyone:
https://confluence.dimagi.com/display/commcarepublic/How+to+Plan+a+CommCare+Project

Diego Rios
Field Manager
Guatemala City, Guatemala

From: "Michael Edwards" <michael_edwards@jsi.com>

Dear RHINO Forum participants,
I'd again like to thank all the participants who have contributed to the discussion, and I'd also like to thank all the non-respondents who took the time from their busy schedules to read all of the discussion. We hope that it was informative. This is the last day of the forum, but if you still would like to contribute comments, feel free to continue to sent them. Later in the week we will send out a transcript of the discussion, and post the transcript to the RHINONet website as well.

- Mark Spohr was the sole respondent to my call for ideas for future uses of mHealth with RHIS. He supported my (MikeE's) point about the need for solutions to the problem of slow feedback, and that mHealth could help to resolve this. He also attributes improvements in communication links as key to resolving the lack/delay in feedback problem as well.
He sees that mobile devices have a great potential to automate data collection. He envisions a world where a patients visits a clinic with their own health enabled mobile device. The stored biometric data on the device is automatically uploaded, the patient registered, and the information is ready for the doctor to review. There could also be automated intelligence that can look at the data and make recommendations that are then downloaded back to the patient's device. The details of the (virtual) visit are recorded in the EMR at the clinic.
Mark's final comment is that of equity - "The future is now, it is jut not evenly distributed".

- Judy Gichoya comments that the telecomm's aren't going to just provide free/discounted services. That we should make a good business case for why their services should be discounted, and there is a general disconnect between the underpaid global health practictioner and the corporate mentality of the telecomms. She mentions that in Kenya, she thinks that SMS is a cheaper than USSD. She is also asking participants for recommendations of frameworks and toolkits for evaluating the costs of mHealth.

- Kalubi Simushi responded to a question that Judy Gichoya had on Tuesday concerning the mHealth initiatives in Zambia that address Early Infant Diagnosis of HIV. Kalubi attached 2 documents about the system.

- Diego Rios shared a link to a toolkit for the evaluation of mHealth projects, based on the analysis of the total cost of ownership.

From: "Vikas Dwivedi" <vikas_dwivedi@jsi.com>

Dear Mike and all,

Apologize for the delay in responding due to a busy start this week. I would like to add my two cents on how i see the future of mhealth in improving RHIS.

I do feel that mhealth has a lot that it can offer and this would go back to day 1 of the discussion, "what is the criteria and purpose". This will also differ to the country or region that this is being planned for.

For most of the development work, in my experience, use of mhealth in priority disease reporting or surveillance, is very effective, reporting of a selected tracer commodities on availability and supply is another opportunity. Tablets have been used in surveys and it is fast and effective as it is used by small number of people who are trained properly. Similarly, use of mhealth tools for reporting small number of data elements can be of help in supporting RHIS.

Given the available technology and tools our support focuses on building systems and people who work with these system. I have seen in many places the definition of indicators or the indicator itself have not been clearly defined. Health workers are not clear on what should be reported. We always try to think what are the essential elements, what are the strengthening interventions and how best we can support Ministries of Health on USE of data in effective delivery of services.

Thank you very much MikeE and Joy for organizing this discussion!!

Best regards,
Vikas

From: Kilonzo,Henry'' <hkilonzo@fanikisha.org>

Dear Mike and all,

Community Health care workers play a key role in delivery of key community based health services in Kenya. They are a key link between government/health facilities and the community. My experience working with CHWs in Nyanza province especially in Nyando division proves the need for use of Mhealth in reporting – collecting and transmitting data. Nyando division is known as a flood zone and mobility is always a challenge.

CHWs based at the community level, have no offices to store the many forms and booklets they carry across the villages – client referral forms, household mapping forms, monthly data collection forms on different indicators ranging from immunization, malaria, nutrition, deaths etc.

These tools are heavy to carry, there are no special bags for carrying them, they risk being spoilt in case of rains and also they have no special storage facilities in their homes/villages. Mhealth could solve most of these challenges.

Investing in Mhealth and rolling it to the CHWs level, with their participation is critical.

Thank you once again for this valuable discussion.

Regards

Henry Kilonzo

THE END