

Africa: Mobile Technology Revolutionizes Healthcare

Cindy Shiner
18 November 2010

INTERVIEW

The use of mobile technology to help improve health in both the developed and developing world is rapidly gaining momentum. A recent summit on mobile health technology, or [mHealthSummit](#), was recently held in Washington, DC, drawing some 2,500 participants.

*Among them was **Holly Ladd**, vice president and director of [AED-SATELLIFE](#) Center for Health Information and Technology. Ladd has worked on solutions for health information needs in Uganda, Kenya, Ethiopia, Nigeria, South Africa, Tanzania, Mozambique and elsewhere. She recently spoke with allAfrica about the possibilities of using mobile technology to support better health in Africa.*

You have been described as a pioneer in the use of mobile technologies in remote health settings. Can you tell us about some of your most successful projects in Africa?

We started using PDAs (personal digital assistants) back in 2001 to collect data in the field to determine the efficacy of the outreach effort for measles immunization campaigns. What was unique about that was we had the data overnight. So the Red Cross in Kenya could figure out during the course of a week-long measles campaign how to maximize their outreach efforts while the campaign was going on, instead of looking at that data three to five months later to figure out what didn't work. That was an immediate return on the intervention that everybody was very pleased with.

We went from there to providing both content and data collection services to health centers in Uganda. That's a project that's been going on for seven years now and is funded by the Canadian International Development Research Centre. We have trained well over 500 nurses and clinical officers at over 175 health centers serving more than a million [people].

They are using the systems both to report all of their weekly and monthly utilization disease surveillance and supply data into the district health system and to download content three times a week on continuing education on disease-specific and treatment-specific issues. It was very successful in both reducing the cost of the health information system by 25 percent, just for the data transfer, and reducing the time it took to get information - down from four weeks to one week.

We replicated that to some degree in Mozambique and are now doing a project primarily focused on disease surveillance and reporting with similar results in terms of cost savings. Diseases are being reported overnight instead of waiting weeks to get the information to the capital.

With a little bit of technology intervention, folks on the ground really do have the capacity to figure out how to use this for their own purposes, and to really make demands on the system for additional services and information in a way that shows it's not only an accepted practice but also a welcome practice.

For instance [a rural hospital in Uganda] wanted to convert their forms to an electronic format, to the PDAs, and set up their own wireless network within the hospital so they could use the data locally. That kind of take-off on our original project was extremely rewarding.

Thus far we've done projects in over 20 countries doing data collection and survey work, and are 100 percent convinced about the efficacy of using electronic data collection for surveys. But these longer-term installations really allow healthcare workers to configure the systems to meet their needs.

Did you use some of the new technology for training?

We did. Obviously, they were familiar in the instances where you're talking about an ongoing health center HMIS (health management information system) process. They're familiar with the forms, familiar with the data that you're collecting, so you're not only training them on how to use the new system for reporting but also for downloading and continuing education and so on. You can use the system itself to generate additional training.

How about your project in South Africa?

Rather than going out to rural health centers we focused on a hospital setting in Port Elizabeth. There were three hospitals that were separated - a vestige of apartheid - sitting on the same campus area but with very different social services for supporting the nurses in terms of information accessibility in each of the hospitals.

So we gave 50 nurses smartphones and had them loaded with treatment guidelines and hospital procedures. At the nurses' request we added more information about different disease-specific treatment guidelines and diagnosis guidelines. The nurses used the system for a year and were able to download updates on their cell phones.

But the unique thing about it was the content they were getting, like a 365-page treatment book from the Ministry of Health. Those things, when printed on paper, had diagrams and charts and graphs pen and ink drawings. We were able to develop a program that enables them to actually preserve all of the original formatting so they get not only the text but also the [important] graphics that come along with it, which makes a lot of material accessible to people of varying degrees of skill. The nurses have been using this system with great success and the department of health for the Eastern Cape [region] would like to take this to scale.

The other project that we've been involved in for the last year is developing an open source solution for data collection. We were originally using PDAs and exchanging data over the cellular network using an access point. Because of a development in the cellular technology in the capability on the ground, and cost factors, we're moving to doing all cell phone-based data collection and reporting, as well as information dissemination now.

How would you characterize this mobile technology revolution in terms of how it can help improve health in Africa?

What's phenomenal is that at the summit last year there were 250 participants or thereabouts and one corporate sponsor, who really wasn't a corporate sponsor - it was the research division of Microsoft. We all knew each other and 80 percent of the projects that were being presented were projects happening in developing countries.

This year there there are 2,500 people here. There's every telecom you can think of and there's an awful lot of focus on developed world applications. So it is moving very, very quickly, it's moving into adoption very, very quickly.

I think for places like Africa, South America, Southeast Asia, just simply the ability to communicate by voice or text message to different sectors of the health delivery system is revolutionary. It can identify and prevent a disease outbreak, it can mobilize resources in much smarter ways, it can help prevent stock outs, it can ensure that your staffing is appropriate to your service need and it can really save a tremendous amount of time and money for healthcare systems.

When you start adding to the basic voice capacity and SMS capacity the ability to do smart data collection and reporting and to do it wirelessly, you start saving tremendous amounts of money on healthcare systems and really enabling people to plan and execute in ways that we haven't been able

to do before. And then you ultimately start moving from a facility-based, aggregated, unspecified way of tracking what's going on in your healthcare system right down to patient-specific data collection.

Tell us about your experience in Mozambique and how mobile technology is helping communicate what is happening on the ground.

The system that we've put in place - and I know other people are doing similar work - can now tell you what health center is reporting what degree of increase in malaria and can tag a GPS coordinate to that health center.

So you can now map down to the ground exactly what's going on. And if you know where in the province a particular disease outbreak is occurring, if you know what shortages are occurring in a particular geographic location, specifically, and if you can unpeel that aggregated data you can make sure that your resources are being used appropriately and that you're addressing the emergent issues of a community.

It's tremendously powerful for healthcare systems with limited resources. I think that's the most powerful thing that's happening right now.

It's great to have this mobile technology, but how does a lack of traditional infrastructure impact potential success? For example, calling for or sending an SMS for help when a woman is in the midst of a difficult birth - there still needs to be adequate health personnel and proper means of transportation to bring the assistance to the person in need.

If you look at the projects they had in Bangladesh, they had people on call so that when a woman went into labor they could send a message and they dispatch somebody. Because they had a geographic mapping system and were able to allocate services accordingly, they could actually get somebody on the ground to attend to that birth while the woman was still in labor. Most deaths in childbirth occur because it's an unattended birth. If you can get somebody with some basic knowledge down on the ground during labor and delivery you can save a life.

You can actually set up a system where you can anticipate what's going on and make sure that you have resources available. A combination of system changes are currently underway in Africa that [are helpful in this regard]. [They] include task-shifting, skill building down at the lower cadre level of community healthcare worker, communications that enable people to move systems and personnel when they are needed.

You are tracking the fact that there is a woman who is pregnant and you know she's pregnant before she's going to deliver because you've got data at a health center level, and you're doing outreach and you're doing messaging to people in the community about safe pregnancy and delivery.

It's not a panacea. It's never going to work as perfectly in real life as it does on paper, but if you can even get a percentage of births attended as a result of this kind of system you save a percentage of lives over what we're currently able to do. Ultimately that's the bottom line, can you save lives; can you improve health outcomes?

We're new enough into the mobile health revolution that we don't have enough evidence yet in a systemic way that's obviously the next step.

We're maturing to where we're now doing cost effectiveness. And obviously if we run them long enough we can start getting some solid evidence on health outcomes.

Is there anything else that you would like to tell us?

I think a big sea change [is coming] in terms of what's going to be happening, particularly in Africa, in the next couple of years with mobile technology. We need to be sure that we're measuring carefully what we're doing and that we have some metrics to take a look at outcomes, that we are building systems that are respectful of what's going on and what exists in ministries of health so that they're



inter-operable. We're looking at open source applications that can be both cost efficient for country projects but they can also be sustained.

At this moment we're kind of in the cowboy era of this. There's a lot going on, there are a lot of small projects. We're going to start to see some winnowing out and cream rising to the top very, very shortly. The skepticism we all have to maintain at this point is that not every good idea is going to be an

implementable idea and we're going to have to start sorting out what ideas we're going to make some serious investments in.

The other thing is we've got to start to see the commercial sector come in line on the ground in Africa. The emergence of the cell phone as a device for folks helps us because we know we have to buy cell phones and we have a place to get cell phones repaired. But we're going to have to see some models that will tell us about mixing different kinds of services together on a device to make it affordable.

What would you say is the biggest challenge to implementing any of these changes?

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Going to scale. Finding a way to up-front the cost of going to scale. We still have power challenges. I think we're all pretty comfortable using solar chargers and building that into the budget. We still have cell phone companies that tell us they have coverage everywhere in the country and you get out there and you can't rely on it. All of those things will be fixed on the commercial side but going to scale is still a challenge.

We are seeing the multi- and bilateral donors come to understand that they have all these programs out in the field that they're paying for, with very little information about impact and quality and they need data for monitoring and evaluation. I think that's probably the way that we're going to get some of the stuff to scale.

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