

Mobile phone technology for collection of monthly service statistics in Family Planning Clinics: Experience from NURHI High Volume sites in Oyo and Kaduna States

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Abstract

Background: As the NURHI 2 project goes to scale, it became more expensive and inefficient to routinely collect service statistics on family planning (FP) from its high-Volume sites (HVS) through in person visits. Based on this, the NURHI team piloted and implemented the use of mobile technology to transmit data from its HVS to a central server.

To assess the effectiveness of the approach, the RM&E team carried out an evaluation of the pilot. The results from our qualitative and quantitative analysis showed that the use of mobile phone technology using DHIS2 data collection application for android phones with cloud storage system is a potentially viable means of collecting routine monitoring data from service delivery points in Oyo and Kaduna states.

Objectives/Main research question/Hypothesis and program area: The objective of this pilot is to explore the feasibility of, identify possible challenges that can affect the delivery of a proposed technology-based solutions aimed at improving the routine data monitoring flow in a timely and accurate manner from NURHI supported HVS.

Methodology (location, study design, data source, time frame, sample size, analysis approach): Participants were trained for two days on the newly designed data collection system. After reviewing the existing routine data collection system, participants were familiarized with the system to be piloted. The training included basic but important trouble shooting technics that may be required during the course of using the application. These included how to set up and download the DHIS2 apps on the device, how to collect data and how to upload data into the server. Trouble shooting tips were provided to the participants so that they can solve problems that may arise on their own.

Two months after the pilot of the phone based routine data collection system, the RM&E team evaluated the pilot system in order to know whether the approach is viable or not and if viable, learn how the approach can be improved upon based on lessons learnt.

Same set of participants that were trained and piloted the model were interviewed after twelve sessions of experience with the use of the device including two months of actual routine data collection. The RM&E team assessed the experiences of the participants during the data collection period as well as the different segments of the data collection process including use of android phone, enabling the data option of the device, entering data into DHIS2 and uploading of same into the cloud storage. We also asked questions on their experience about the use of the model and the challenges they had, it also included capturing their overall though on the model.

Over the phone, Key informant interviews (KII) using KII guide (Appendix A) were conducted with the study participants in the two states

Results/key findings: The results from our qualitative and quantitative analysis showed that the use of mobile phone technology using DHIS2 data collection application for android phones with cloud storage using the "ona.io" is a potentially viable means of collecting routine monitoring data from service delivery points in Oyo and Kaduna states.

Conclusion: The participants in the two states generally agree with most of the positive statements on the operations and use of the technology, although Kaduna participants generally have a lower ranking when compared with participants from Oyo states. While our findings showed promising potentials for this approach for the collection of routine monitoring data from the family planning service delivery points, it is also necessary to carry out minor tweaks in the design of the system especially in the type of phones to procure and use for scale up as well as the type of internet provider

to subscribe to. The pilot showed that the internet network cannot be a “one size fit all”, but rather should be determined by geography and by what works best in the different locations.

Summary

As the NURHI project goes to scale, it became more expensive and inefficient to routinely collect service statistics on FP from its High-Volume sites (HVS) through in person visits. Based on this, the NURHI team piloted the use of mobile technology to transmit data from its HVS over a period of two months. To assess the effectiveness of the approach, the RM&E team carried out an evaluation of the pilot. The results from our qualitative and quantitative analysis showed that the use of mobile phone technology using Open Data Kit (ODK) data collection application for android phones with cloud storage system is a potentially viable means of collecting routine monitoring data from service delivery points in Oyo and Kaduna states.

Introduction

Availability of routine monitoring data from service delivery points in a timely manner is very important for planning the delivery quality FP services. In the phase one of NURHI, there were less 66 High Volume Sites (HVS) in Kaduna and Oyo states. In this scale up phase, the number of HVS has far more than doubled (147) in these two states, as this number increased, it has become more expensive and inefficient to continue to conduct monthly in-person visits to these health facilities to review and retrieve the NURHI monthly summary sheet where all service statistics are summarized, from the family planning register. The RM&E team therefore is exploring other cost-effective options of getting routine data from its HVS on an on-going basis and in a cost effective and efficient manner. Based on this the team developed a mobile-phone based approach for collecting routine monitoring data and piloted the approach in Kaduna and Oyo states.

Description of the phone – based system

The mobile phone based routine data collection approach makes use of Open data kit (ODK) platform for data collection and transfer. This platform offers ways of collecting health data through mobile phones. Data were transmitted from all pilot sites and aggregated into a web-based cloud storage platform known as **ona.io** and downloaded for onward analysis and use by the NURHI RM&E staff at the NURHI state levels. This model was piloted in Kaduna and Oyo states from May to June 2016.

The objective of this pilot was to assess the feasibility of using a mobile phone–based technology and to identify possible challenges that can affect the delivery of the proposed technology-based solutions aimed at improving the routine data monitoring flow in a timely, accurate and cost-effective manner from NURHI supported HVS. In Oyo state twenty providers were invited from 14 HVS facilities while in Kaduna state, 19 health care providers were invited from fourteen HVS.

Training of participants for the pilot

Participants were trained for two days on the newly designed data collection system. After reviewing the existing routine data collection system, participants were familiarized with the system to be piloted. After this was done, the group had a detailed discussion to explore their perceptions and views about the phone-based approach. After the group expressed a strong view about the usefulness of the system, they were then trained on how to use an android phone to collect data from the NURHI monthly summary form (that they normally complete) using the ODK, and how to transmit this data through a dedicated cloud storage server known as “ona.io”. The training included basic but important trouble shooting technics that may be required during the course of using the application. These included how to set up and download the XLS forms in the device, how to collect data and how to upload data into the server. Trouble shooting tips were provided to the participants so that they can solve problems that may arise on their own. Below is the list of key topics covered in the two days training:

- Overview of NURHI routine monitoring and data collection system

- Overview of the use of mobile phone technology for routine monitoring and data collection at NURHI HVS
- Introduction to Basic Functions of Android OS Phones
- Application of the Android phone on the NURHI routine data collection
- Focus group discussions – Perceptions of participants on mobile data collection approach
- Hands on practice on the ODK application
- Trouble shooting problems with the ODK – downloading application (ODK), downloading form, checking connections, uploading data
- Application of the Android phone on the NURHI routine data collection

Evaluation of the pilot phase

Two months after the pilot of the phone based routine data collection system, the RM&E team has evaluated the pilot system in order to know whether the approach is viable or not and if viable, learn how the approach can be improved upon based on lessons learnt.

Specific objectives of this evaluation are:

- Gather feedback information from the experience of FP providers that piloted the use of mobile phone for monthly routine monitoring and collection of FP statistics and to;
- Document the challenges of the providers with the implementation of the tools and the device.

Same set of participants that were trained and that piloted the model were interviewed after twelve sessions of experience with the use of the device including two months of actual routine data collection and transmission to the NURHI on.a.io server. The RM&E team assessed the experiences of the participants during the data collection period as well as the different segments of the data collection process including use of android phone, enabling the data option of the device, entering data into ODK and uploading of same into the cloud storage. We also asked questions on their experience about the use of the model and the challenges they had, it also included capturing their overall though on the model.

Over the phone, Key informant interviews (KII) using KII guide (Appendix A) were conducted with the study participants in the two states. In Oyo thirteen participants and 14 in Kaduna who piloted the technology were interviewed. All KII sessions were audio recorded and transcribed verbatim in English language to ensure that no part of the discussion session was left out during the analysis of findings. Also, participants were asked to rank their level of agreement with some statements about the use of the technology. Results for these sections are presented in the results section below.

Main findings

In this section, we present the main findings of this pilot phase. The results from the KII's and the ranking of statements about the pilot system are presented in this section under different sub-sections.

Ability to operate the phone

Almost of the participants across the two states reported that they found the operation of the phone easy and smooth. Demonstrated ability to navigate through the phone is consistent across participants in the two states and across the rural and urban geographies. They attributed their navigation skills to the training received on using the phone – organized by the RM&E team. A few of them with no prior experience with smart phones explained the training opened them up to use of smart phones.

Some of these findings are captured in what some of the participants says as shown below:

It is good. That is what am using and working with now to send the report of June and July to the NURHI M&E officer. (URBAN KII Participant, Ibadan)

As for me, I'm successful to use it because I have practicalize all we were asked to do and I noticed that I got it all, even when they trained us then I got it all, and all the data given to us to input and send I did it all. But for it to send is what is difficult at times. I feel it's the phone or network (RURAL KII Participant, Iseyin)

Except for MTN that use to debit my line. But there is nothing wrong with the phone, the other problem is the battery drains quickly (RURAL KII Participant, Okeho)

This platform is very good, the training was also very useful. When I lost the ODK form, I was able to retrieve it back on my own (Urban-Kaduna KII, Badarawa)

Apart from the MTN sim network problem, the use of phone for sending data is very easy to operate. This is very convenient for me (Urban-Kaduna KII, Zakari Isa)

Using the phone was very easy for me because of the training instructions we received from NURHI. Other NURHI training videos on the phone was useful. (Rural-Kaduna KII, Gangara)

Ability to use the features of the phone – internet, ODK application, entry section (key pads)

Across all states, participants reported high level of access to the phone features while majority reported the phone run smoothly and they find it very easy to use.

... No issues, it runs smoothly but sometimes when we want to send messages it could say the phone is out of 3G coverage and once we get to another location it sends (RURAL KI Participant, Akinyele)

... No I didn't have trouble accessing any of the phone features. It's all good. It runs smoothly, it is okay (URBAN KI Participant, Ibadan)

... I think you have done well. The only thing is that if you can improve us in the area of training, but pertaining to data, there is no problem. (URBAN KI Participant, Ibadan)

I did not have any trouble accessing the features of the phone (Urban-Kaduna KII, 44 Military Hospital)

I did not have any trouble accessing the features of the phone, the only issue is it sometimes takes time for the data to send (Rural-Kaduna KII, Kudan)

Ability to use the sending features completed data

Significant number of the informants at rural and urban settings could use the phone internet without major challenge(s). Providers will like to see an improved internet connection which should be faster because it takes time for the phone to open applications. Opportunity for training directed on the subject will also be welcome.

...It does well when data connection is on, only if you forget to put it on then it won't work. But once it is on, before typing the message it goes through (URBAN KI Participant, Ibadan)

No problem with the internet connection. (Urban-Kaduna KII, Barnawa)

I sometimes have challenge with the network because of the MTN sim (Rural-Kaduna KII, Giwa)

Participants rating of the phone-based routine data collection system - design, process and implementation

All pilot participants were asked to rank their experience with the design, process and implementation of the pilot exercise. Overall, thirteen statements were read to all the participants and they were asked to rate how they agree or disagree with the statements. Strongly agree was ranked 5 while strongly disagree was ranked 1. Responses were computed and average score for each of the statements were computed.

In Oyo state, the phone-based technology was well rated across all the statements. For example, participants ranked the statement "I like each step of sending data through the via mobile phone" 4.54 on a 5.0 scale, which is between agreeing and strongly agreeing. Also, the statement "After hands on practice, I feel comfortable sending data via the phone-based technology" was ranked 4.46 on a scale of 5.0.

When participants were asked to rank the statements that relates to interference of the phone-based technology with their day to day work, an average of 1.46 was obtained, which lies between disagreeing or strongly disagreeing – which means that participants did not believe that us application can interfere negatively on their time.

The participants generally agreed that the application will improve the quality of data and that every provider can you the technology if trained.

The pattern of these results is similar for participants in Kaduna, although slightly lower when compared with that of Oyo.

Table 1. Average rating of participants on the design and implementation of the phone-base technology in Kaduna and Oyo states on a scale of 5

	Ibadan Means	Kaduna Means
I like each step of sending the monthly data via mobile phone	4.54	4.36
After weeks of hands on, I feel comfortable sending data via the phone	4.46	4.14
The phone technology is easy to use for data transmission	4.62	3.93
The phone technology will disturb the services we provide to FP clients	1.46	1.64
This technology will fit into my regular work day	4.31	3.86
Providers would benefit the most from this technology	4.77	4.29
I find the mobile phone helpful to my work	4.69	4.07
This technology will improve data quality	4.85	3.79
This technology will improve timeliness of reporting	4.69	4.14
Some important/useful fields are missing on the phone application	1.62	2.64
The use of this approach should be adopted for all health facilities	4.77	4.0
I believe every provider can use the device if trained	4.69	3.64
Something needs to be changed before it is put to full use in facilities	3.15	3.21
The phone can be maintained by the hospital	3.46	3.21

Scale up plan

To ensure a hitch free scale up of this technology based on the success of the pilot, the NURHI team needs to do this in a phased manner. In each of NURHI states, the scale-up should be carried out in five LGAs and rolled on to other LGAs until all intervention HVS are covered.

Conclusions and recommendations

The results from our qualitative and quantitative analysis showed that the use of mobile phone technology using Open Data Kit (ODK) data collection application for android phones with cloud storage using the “ona.io” is a potentially viable means of collecting routine monitoring data from service delivery points in Oyo and Kaduna states.

The participants in the two states generally agree with most of the positive statements on the operations and use of the technology, although Kaduna participants generally have a lower ranking when compared with participants from Oyo states. On the statement about whether every provider can use the technology if trained, participants in Oyo ranked the statement 4.69 while those in Kaduna rated it 3.64 on a scale of 5.0. The ranking for Kaduna though relatively high as well will require some attention in the area of training to ensure that participants leave the trainings feeling very capable.

While our findings showed promising potentials for this approach for the collection of routine monitoring data from the family planning service delivery points, it is also necessary to carry out minor tweaks in the design of the system especially in the type of phones to procure and use for scale up as well as the type of internet provider to subscribe to. The pilot showed that the internet network cannot be a “one size fit all”, but rather should be determined by geography and by what works best in the different locations.

References

- [1]. A qualitative study of the attitudes of patients and staff to the use of mobile phone technology for recording and gathering asthma data - Jennifer Cleland, Jan Caldwell, Dermot Ryan. 2007.
- [2]. Challenges in Using Mobile Phones for Collection of Antiretroviral Therapy Adherence Data in a Resource-Limited Setting; - Santosh Kumar PhD a Wendy J. Nilsen PhD b Amy Abernethy MD f Audie Atienza PhD c et al 2010.
- [3]. EpiCollect: Linking Smartphones to Web Applications for Epidemiology, Ecology and Community Data Collection - David M. Aanensen, Derek M. Huntley, Edward J. Feil, Fada'a al-Own, Brian G. Spratt; 2009.
- [4]. Fertility, Family Planning, and Reproductive Health of U.S. Women: Data From the 2002 National Survey of Family Growth, 2005. Handbook for family planning operations research design. - Fisher, A.; Laing, J.; Stoeckel, J., 1983.
- [5]. Inferring friendship network structure by using mobile phone data- Nathan Eagle, Alex (Sandy) Pentland, and David Lazer; 2009.
- [6]. Mobile phone technology in chronic disease management - Blake, Holly (2008).
- [7]. Phone Interviewing as a Means of Data Collection: Lessons Learned and Practical Recommendations- Lisa A. Burke & Monica K. Miller, 2001.
- [8]. The use of mobile phones as a data collection tool: A report from a household survey in South Africa. - Mark Tomlinson, Wesley Solomon, Yages Singh, Tanya Doherty, Mickey Chopra, Petrida Ijumba, Alexander C Tsai and Debra Jackson; 2009.
- [9]. Web-Based GIS System for Real-Time Field Data Collection Using a Personal Mobile Phone- Ko Ko Lwin, Yuji Murayama Graduate School of Life and Environmental Sciences, University of Tsukuba, Tsukuba, Japan. 2011.