Engaging Communities in Commodity Stock Monitoring Using Telecommunication Technology in Primary Health Care Facilities in Rural Nigeria

Ugo Okoli¹, Chioma Oduenyi¹, Nonso Onwudinjo¹, Chukwuebuka Ejeckam¹, Femi Adegoke², Marcus Holmlund³, Pedro Rosa Dias⁴, and Emily Crawford²

Abstract

Background: With several efforts being made by key stakeholders to bridge the gap between beneficiaries and their having full access to free supplies, frequent stock-out, pilfering, collection of user fees for health commodities, and poor community engagement continue to plague the delivery of health services at the primary health care (PHC) level in rural Nigeria.

Objective: To assess the potential in the use of telecommunication technology as an effective way to engage members of the community in commodity stock monitoring, increase utilization of services, as well as promote accountability and community ownership.

Methods: The pilot done in 8 PHCs from 4 locations within Nigeria utilized telecommunication technologies to exchange information on stock monitoring. A triangulated technique of data validation through cross verification from 3 subsets of respondents was used: 160 ward development committee (WDC) members, 8 officers-in-charge (OICs) of PHCs, and 383 beneficiaries (health facility users) participated. Data collection made through a call center over a period of 3 months from July to September 2014 focused on WDC participation in inventory of commodities and type and cost of maternal, neonatal, and child health services accessed by each beneficiary.

Results: Results showed that all WDCs involved in the pilot study became very active, and there was a strong cooperation between the OICs and the WDCs in monitoring commodity stock levels as the OICs participated in the monthly WDC meetings 96% of the time. A sharp decline in the collection of user fees was observed, and there was a 10% rise in overall access to free health care services by beneficiaries.

Conclusion: This study reveals the effectiveness of mobile phones and indicates that telecommunication technologies can play an important role in engaging communities to monitor PHC stock levels as well as reduce the incidence of user fees collection and pilfering of commodities (PHC) level in rural communities.

Keywords: community, commodity, stock monitoring, telecommunication, WDC, OIC, PHC, stock-out, user fees, pilfering

Background

The United Nations Secretary-General’s Global Strategy for Women’s and Children’s Health highlights the inequitable access to life-saving medicines and health supplies suffered by women and children around the world and calls on the global community to work together to save 16 million lives by 2015.¹ Essential medicines are intended to be available within the context of functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with

¹ National Primary Health Care Development Agency—SURE-P MCH Project, Abuja, Nigeria
² World Bank, Abuja, Nigeria
³ World Bank Group, Washington, DC, USA
⁴ University of Sussex, Sussex, England, United Kingdom

Corresponding Author:
Chioma Oduenyi, National Primary Health Care Development Agency—SURE-P MCH Project, No 1 Mubi Close, off Emeka Anyaoku street Area 11, Garki-Abuja, Abuja, Nigeria.
Email: chiomaoduenyi@gmail.com

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assured quality and adequate information, and at a price the individual and the community can afford.\textsuperscript{3} Community participation has been widely acknowledged by health planners to be the key to the successful implementation of the primary health care (PHC).\textsuperscript{5}

Community participation was institutionalized in Nigeria through the creation of District Development Committee and the Village Development Committee.\textsuperscript{4} Despite sustained government and nongovernmental efforts toward achieving commodity security for program beneficiaries, in many PHC centers in Nigeria, essential drugs remain out of stock, even where drug-revolving fund schemes are being practiced.\textsuperscript{5}

In 2012, The Federal Government of Nigeria established the Subsidy Reinvestment and Empowerment Programme on Maternal and Child Health (SURE-P MCH) which builds on the preceding Federal Government Midwives Service Scheme setup in 2009 to address the Human Resource for Health needs in rural primary care.\textsuperscript{6} Part of SURE-P MCH demand side interventions focused on reactivating the ward development committees (WDCs) for effective coordination of community-based activities. The WDCs serve as gate keepers to all PHC facilities throughout Nigeria and consist of influential persons in the community with a representation from all social groups. They also provide linkage between the community and the primary health facility. Their immediate roles and responsibilities are to liaise with the officer-in-charge (OIC) of the PHC facility to ensure smooth running of the facility and promote community participation and ownership. The SURE-P MCH project invested heavily in the supply of essential maternal, neonatal, and child health (MNCH) drugs and health commodities to all 1000 SURE-P supported primary health facilities, and the project was poised to ensure that no program beneficiary is required to pay any user fees when accessing services.

Information communication technologies (ICTs) have become the major catalyst for information and knowledge which can create development opportunities and choices for rural communities. Mobile phone which is an integral part of ICT has become one of the most important media of information communication of our time.\textsuperscript{7} Surveys have shown that Nigeria has a high mobile access percentage, with urban mobile access at 91.5\%, rural access at 77.7\%, and an average national average at 83\%.\textsuperscript{8}

**The Problem**

- **Stock-out**: Persistent stock-out owing to poor accountability of drugs and commodities supplied to the PHC facilities.
- **Pilfering**: A pilfering window is created following this lack of accountability as OICs across Nigeria reserve the right to store and dispense health commodities/medicines including commodities freely supplied by the government.
- **User fees**: It is believed that when some commodities are pilfered possibly by health care workers, they either find their way to the open market and/or are dispensed to beneficiaries at a cost even when the commodities have been supplied at no cost.

In response to these challenges, a pilot study was initiated to answer the question: Is there potential that the use of telecommunication technology can be an effective way to engage members of the community in commodity stock monitoring, increase utilization of services, as well as promote accountability and community ownership? This article, therefore, presents the outcome of this investigation.

**Methods and Procedures**

**Study Design**

The pilot study utilized a cross-sectional survey of 3 subsets of respondents predicated upon the use of telecommunication technologies.

**Study Participants**

Eight PHCs were selected from 4 locations through a cluster sample of facilities with good access roads and strong telecommunication signal and a systematic random sample of high- and low-performing facilities from each location. Two facilities (1 low and 1 high client load) within 3 states and the Federal Capital Territory (FCT) participated. Twenty WDC members from each of the 8 facilities totaling 160 WDC members; 1 OIC from each facility, totaling 8 OICs; and 383 beneficiaries participated in the study. In summary, a total of 551 persons participated in the study.

**Locations and Duration**

This pilot study was carried out in Enugu, Kano, and Lagos states including the FCT Abuja. Two primary health facilities were selected from each state, and the pilot study spanned for 3 months from July to September 2014 (Figure 1).

**Procedures and Processes**

- **Call Center (Using Telecommunication Technology)**: A call center made up of 3 table phones and 3 toll-free lines acquired from MTN Telecommunications Nigeria was established at the SURE-P MCH headquarters. Data were collected by 3 trained call operators who administered 3 sets of study questionnaires over the phone to each category of participants in 3 languages (Hausa, Ibo, and Yoruba) predominantly spoken in the pilot states as follows:
  - beneficiary questionnaire and contact tools,
  - OIC monitoring tools, and
  - WDC monitoring tools.
- **Number retrieval system**: Beneficiaries telephone numbers were retrieved from the communities through the community health extension workers (CHEWs), village health workers (VHWs), and WDCs after obtaining consent and transmitted to the call center. Beneficiaries were called at regular intervals by call operators depending on their
preferred best time to call, and all responses were handled with utmost degree of confidentiality.

- Ward development committee: The 20 WDC members from each health facility were as follows:
  - trained and empowered to be present whenever the PHCs received stocks from suppliers;
  - provided with stamps to brand all drugs supplied by SURE-P MCH for easy identification;
  - granted unrestricted access to the health facility drug/commodities store for physical checks and counting of available drugs and new supplies; and
  - trained to identify, obtain consent, and retrieve telephone numbers from pregnant women in the community who may have used the PHC.

Data Collection

The following indicators were established to guide the data collection process over a period of 3 months from July to September 2014.

- level of WDC participation in physical inventory taking of commodities;
- type of MNCH services accessed at the facility by beneficiary; and
- cost of MNCH services provided at the facility.

Data on stock and consumption levels of (tracer) drugs and commodities were retrieved from the WDC chairman and OICs biweekly, while beneficiaries data primarily verified commodities received, user fees paid, and satisfaction checks on services received (Table 1).

Data Management and Analysis

A data recording template was developed on Excel spreadsheet to record data collected by call operators from each participant, and analysis was done using Microsoft Office Excel. Data were entered and analyzed for each category of respondents along with the key indicators being assessed by the study. Descriptive statistics were employed in reporting the findings.

Results

Figure 2 shows that WDC members were given full access to the drug stores, and OICs participated in the monthly WDC meetings 96% of the time. Figure 3 shows that WDCs actively participated 70% of the time in taking inventory though Mafoluku, Badore, and Kwachiri PHCs participated more actively. This is a sharp increase from the near-zero participation prior to the study.

Figure 4 showed that of the 383 women who participated, approximately 43% visited the facility for ANC. Figure 5 shows that 74% of beneficiaries who participated in the study received free services as opposed to 26% who paid for the services. The cost of services ranged from N30 (0.15 USD) to N1300 (6.66 USD) with an average cost of N165.3 (0.85 USD).
USD) per visit. Beneficiaries in Kano State and the FCT recorded the highest percentage of free Ante-Natal Clinic (ANC) Services.

Figure 6 shows that 72% of 18 beneficiaries accessed free delivery services at the facilities during the prepilot stages. Figure 7 indicates that 82% of 33 beneficiaries interviewed accessed free delivery services. This shows a 10% spike in access to free delivery services when comparing the 2 periods.

Figure 8 shows monthly trend in beneficiaries paying for their visits during the pilot study, indicating a sharp decline in the collection of user fees from women beneficiaries at the last month of the study.

**Discussion**

This study provided real-time information sharing between the SURE-P MCH program and the communities served through the toll-free phones. This ease and efficiency of information flow demonstrated the use of telecommunications technology as not only highly cost effective but also efficient in conducting surveys in Nigeria. The ICTs have the potential to impact almost every aspect of the health sector. As established by the
During this study, about 70% of the service providers globalstrategy/en/. Accessed June 11, 2022 (including the 12th Model List of 66. Free visit 97 of 100 of the General, Global Strategy for 56. Women paying for delivery and other 21 22 18 15 56 66 7 fees were charged for delivery and other 10 8 2 0 services at the PHCs and by extension 97% of the time, WDCs participated actively in taking inventory which represented a sharp increase from the near-zero participation prior to the study. Through the biweekly physical checks done by the WDCs, stock-out frequencies for (tracer) drugs were established, and these were used for procurement planning and supply management. Furthermore, a strong cooperation existed between the OICs and the WDCs as WDC members were given full access to the drug stores throughout the pilot period and the OICs participated in the monthly WDC meetings 96% of the time. This cooperation is capable of bridging the gap between service providers and communities served with the ability of improving PHC management systems. Evidence, therefore, from this study confirms the potential for community-based monitoring to reduce stock-outs of drugs and other important health commodities, increase utilization of services, as well as promote accountability and community ownership.

Over 30% of women were charged for delivery and other services at the pre-pilot stage, but by the month of September 2014, no woman paid for delivery at the PHC facilities. The sharp decline in the collection of user fees can be attributed to the heightened awareness within participating communities, as service providers perceived that they were being monitored and therefore were more careful. This apparent carefulness and change in the perceived attitude of the service providers resulted in the availability of stocks provided by SURE-P MCH and disappearance of user fees at the PHCs.

Limitations
- The first limitation of this pilot study was the small sample size, however the states selected to be part of the study were representative of both the North and the South of Nigeria.
- Retrieval of numbers was done by WDC members, VHWs, and CHEWs, and most of the numbers received were ineligible and incomplete, therefore most beneficiaries’ numbers could not be reached.

Conclusion
The pilot study provided a feedback loop between the community and the SURE-P MCH program, and its benefits are significant as it positions community members to become drivers of change within their communities. Following the awareness created within the pilot communities through the telephone calls, more women assessed services at these facilities. The pilot study significantly reduced the incidence of pilfering and user fees collection at the PHC facilities and by extension addressed stock-out challenges. These findings, therefore, sets an agenda for further research and/or scaleup of this laudable intervention to inform logistics management at the PHC level and explore these inherent potentials discovered for the benefits of participating communities and the larger PHC community.

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**Author Biographies**

**Ugo Okoli** is Fellow Faculty of Public Health Medicine UK. National Primary Health Care Development Agency – SURE-P MCH Project, Abuja, Nigeria.

**Chioma Oduenyi** is Master of Public Health- Staffordshire University, United Kingdom. National Primary Health Care Development Agency – SURE-P MCH Project, Abuja, Nigeria.

**Nonso Onwudinjo** is BSc Biochemistry/Microbiology- University of Nigeria Nsukka. National Primary Health Care Development Agency – SURE-P MCH Project, Abuja, Nigeria.

**Chukwuebuka Ejeckam** is MSc Epidemiology- University of Ibadan, Nigeria. National Primary Health Care Development Agency – SURE-P MCH Project, Abuja, Nigeria.

**Femi Adegoke** is Master of Public Health. World Bank, Abuja, Nigeria.

**Marcus Holmlund** is Master of Arts, International Relations (International Development; International Economics, Johns Hopkins University School of Advanced International Studies (SAIS). World Bank, Washington DC, USA.

**Pedro Rosa Dias** is PHD in view -Economics, International Development. University of Sussex, UK.

**Emily Crawford** is Master of Public Health - The Johns Hopkins University. World Bank, Abuja, Nigeria.