Adaptation of Mobile Application to Improve Flow of Birth Information from the Community to the District Level

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Abstract. This paper presents current practices used by village health workers, traditional birth attendants, health facility workers and district health managers in collection, recording, storing and transferring birth information in the health information system. Envisioned potentials of using mobile application as a tool for data recording, transferring and strengthening the weak support structure have been foreseen to bring improvements in the flow of birth information in the Health Information System.

Keywords: Village health workers, Traditional birth attendants, Health managers, Mobile phones, Supportive supervision, Feedback and Medical birth registration.

1 Introduction

In sub-Saharan countries, studies have pointed out under-reporting of maternal health data; and the data reported indicates a high rate of maternal and child mortality [1, 2]. This situation is prominent in rural communities where many women deliver their children at home assisted by traditional birth attendants. In Tanzania, 46-60 % of births take place in the community [1, 3]. The information about these births may neither be recorded nor reported in the Health Information System (HIS) and these children may live without a trace of their existence. Hence the availability of accurate and complete information on all births within the community is one of the main concerns within the HIS.

Registration of new born children which is the main concern of this study, is done in health facilities where details of a child's birth and his/her medical condition if any or death, and the parents' vital information and medical conditions of the mother if any are captured. This data is useful for epidemiological purposes such as monitoring surveillance of birth defects and other prenatal health problems and for analysing quality assurance on health services related to pregnancy, childbirth and the neonatal period. As such, these records can provide the best answers on the rate of maternal/child/neonatal mortality for a health facility, a community and a country population at large.

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The objective of this study was to find ways of improving birth registration in the community through facilitating communication of birth information between community health workers in the community, health facility workers in the health facilities and district health managers in the district. To attain this objective, this study will answer the following questions: 1. What are the current practices used by village health workers, traditional birth attendants, health facility workers and health managers in collecting, recording, storing and transferring birth information? 2. What are the opportunities provided by the envisioned mobile application to communicate birth information from the community to the district level?

1.1 Research Context

This is an ongoing research study taking place in Tanzania and Malawi as part of a project aimed at improving the availability and quality of maternal health data in the HIS. The study is taking place in Kibaha and Bagamoyo districts which are located in the Coastal region of Tanzania. This paper presents findings from Kwala ward which is one of the nine wards of Kibaha district. The Kwala ward consists of four villages and it has one dispensary and one health center.

HIS Information Flows. In the health information system, data is collected routinely as well as non-routinely from communities, health facilities (health centers and dispensaries) and hospitals (district, regional, national and referral hospitals). The flow of routine data reporting is bottom-up from the community to the ministry, while provision of support and feedback is from top-down. Figure 1 presents hierarchy of data reporting and provision of support and feedback in the HIS.

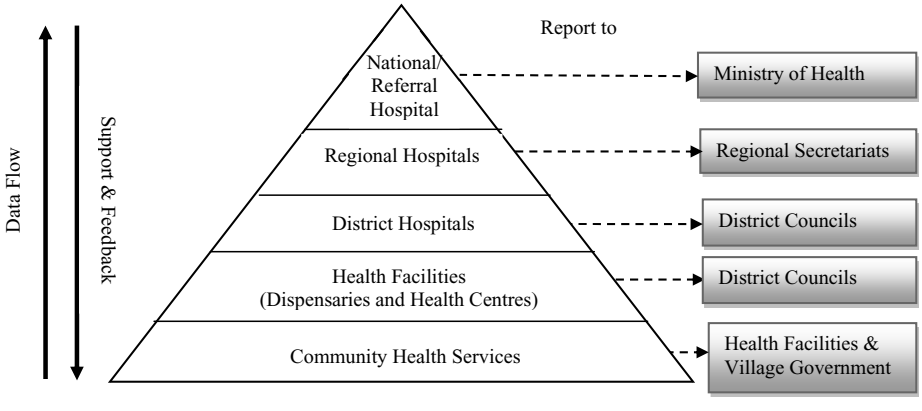

Fig. 1. Hierarchy of Health Information System [4]

Mother and Child Health (MCH) Services. At all levels of the HIS, MCH services provided include antenatal care, delivery, postnatal care, child health management, immunisation and family planning with different intensities of specialisation. These services are provided by various groups of health professionals such as nurses, midwives, MCH aides, medical doctors, and clinical officers. Some MCH services are

also provided as part of community health services by non-medical professionals such as trained and untrained traditional birth attendants and village health workers. Data on maternal (mother and child) health is collected and recorded hand in hand as the services are provided.

Maternal health data collected at the community level was individual-based data which could be traced back to a particular individual however the identifications used were not unique. The data is then aggregated at the end of the month and/or quarter and reported to the health facility in an aggregated format. At the health facilities individual-based data is also collected and reported in an aggregated format together with the data reported from the community. The aggregated data contains combined sums of individual data; it eliminates presenting data in individual-based format.

This study concentrated on the registration of births/new born babies at the community and health facility levels which is highly related to the process of capturing delivery outcomes for both the child and the mother. In this paper, Community Health Worker (CHW) is used as a group term referring to village health workers and traditional birth attendants.

2 Literature Review

This section presents literature and theoretical concepts on HISs in developing countries in order to show existing practices in data collection, recording and transferring. Theoretical concepts on ways of motivating performance of CHWs in order to improve data reporting are also presented in this section. Furthermore, we present opportunities for using mobile phone applications in HISs.

2.1 Health Information Systems in Developing Countries

In most developing countries, HISs do not function properly especially at the community level which is the main source of data while the main goal of the HIS is to collect complete and accurate data, report it on time and utilise it. To achieve this goal at the community level, Lippeveld [5] argues that, health managers need to find ways of involving CHWs and improving their performance. According to Rowe et al. [6], health managers can promote certain practices among health workers by first understanding "*the existing and often evolving influences that promote desirable and undesirable practices.*" Studies conducted in developing countries indicate that CHWs' performance on desirable practices can be improved by motivating them [7-11].

2.2 Motivating the Performance of CHWs

Motivation is "*an individual's degree of willingness to exert and maintain an effort towards organisational goals*" [9]. For the HIS to be able to collect and report information on births taking place in the community, CHWs need to be highly motivated to fully participate in this exercise because they are closer to the community than health facility workers are. Empirical studies present different approaches that can be adapted to motivate performance of CHWs such as provision of supportive supervision, feedback, incentives, training etc.

Supportive Supervision. Supportive supervision is one of the determining factors of CHWs' success as it provides a way of reducing/avoiding mistakes and updating their knowledge and skills [8, 9, 12]. It is a system whereby supervisors can provide guidance on the technical aspects of the services by going through a checklist. As a way of improving the quality of data collected, HIS need to set up a strong support structure that will ensure provision of reliable and timely support to CHWs in accomplishing their tasks.

For instance, health workers in Kenya and Benin who were rarely and irregularly supervised indicated that "*supervision provides the feeling of being cared for and of appreciation*"[9]. Furthermore, Franco et al. [9] add that good supervision should include "*adequate technical support and feedback, recognition of achievements and good communication.*" These attributes will make supervision a way of motivating health workers and improving desirable work practices in the HIS.

Meaningful Feedback. Provision of meaningful feedback to health workers is a way to showing appreciation and it is one the most important motivating factor [10]. However most CHWs received little or no feedback from their supervisors. In the study conducted in Kenya and Benin, Mathauer & Imhoff [8] indicated that when health workers received feedback, it was based on shortcomings and mistakes on the different aspects of service provision. This kind of feedback was like a punishment to health workers, instead of improving their performance, it demotivated them.

2.3 Mobile Applications in the HIS

The use of mobile applications for health services and information transferring and sharing is rapidly growing in developing countries mainly due to a high diffusion of mobile phones [13, 14]. The use of mobile applications has proven to be beneficial in several areas of health service delivery such as: capturing and transmission of health data on public health programmes and routine epidemiological data from remote clinics to regional health centres [15]; submission of child nutrition data via mobile phone SMS for monitoring children nutrition [16]; capturing patient-level data when providing home-based care to HIV/AIDS patients [17]; and improving cooperation among hospitals [18].

Additionally, another interesting area of mobile application use is the collection and transmission of child birth data for vital statistical purposes. In Kenya a Nokia data gathering application was used to collect child birth data from the community and to send it to the ministry of home affairs for vital registration [19]. Similar applications have also been implemented by PLAN International in Thailand, Sri Lanka and Cambodia.

Opportunities for using Mobile Applications. The use of mobile phones in the HISs in developing countries has been observed to present opportunities in data transfer from remote communities and opening up communication channels between CHWs and their coordinators/supervisors in the districts [20]. Through these communications, mobile phones can be used for calling and sending text messages (SMS) for the purpose of supporting, supervising and giving CHWs feedback on their activities.

According to Chetterjee et al. [20] "*the extent of temporal mobility of the user will positively affect the use of a mobile device within the healthcare context.*" Contrary to the paper-based system where transfer of data and communication need a physical presence of both parties in a fixed location, users of mobile phones can transfer data and communicate in a timely manner from different places. It is therefore no surprise that Iluyemi and Briggs [21] indicate that supporting CHWs with mobile applications should be considered as a top priority in developing countries.

Regardless of these various mobile application implementations, there is, however, limited research on the use of mobile phone by CHWs for reporting birth information in the HIS. Thus our research aims to fill this gap as it explores the adoption of mobile applications to support and improve medical birth registration.

3 Research Methodology

In this study, qualitative research methodology was employed and data was collected using detailed interviews, document reviews and observations. These are presented in this section.

3.1 Interviews

Structured and unstructured interviews were conducted to six village health workers, seven traditional birth attendants, two health facility workers and three health managers from the district. Six village health workers interviewed were among the eleven in the Kwala ward. They were interviewed in groups of two to three using structured questions. Among twenty traditional birth attendants in the Kwala ward, seven were interviewed using one-to-one interview where the questions were open-ended. Interview sessions conducted to village health workers and traditional birth attendants were tape recorded at an average of thirty minutes each. Objectives of the interviews were to understand information they collected in the community regarding births, how and where it was reported and challenges they faced in collection, recording, transferring and storing the information.

Interview sessions conducted to health facility workers at the Kwala health center were one-to-one and open-ended questions were used. These health workers were the two personnel in-charge of the health center. The objective of interviewing this group was to get an understanding on how health facility workers worked together with CHWs (Village health workers and Traditional birth attendants) and how they supported CHWs in their daily activities.

Health managers, from Kibaha district were involved in one-to-one interview sessions which had open-ended questions. They were interviewed with the objective of understanding how they perceived, valued and supported the contribution of CHWs in reporting births taking place in the community. Another objective was to assess procedures used for providing feedback and supportive supervision.

3.2 Observations

Observations and participatory observations were conducted in this study. Participatory observations were done during training sessions, formal and informal

discussions and meetings. The objective of the participatory observations was to acquire an understanding of how CHWs performed their activities and the challenges they faced. The other objective was to understand CHWs' perspectives on using a mobile phone application in reporting data they collected.

This research also participated in training conducted to CHWs by health managers from the district by engaging in several discussions. The training had the objective of improving CHWs' skills and knowledge on data collection, recording and storing. The training took eight days where twenty traditional birth attendants and eleven village health workers participated.

Several observations were made at the health center during Antenatal, Postnatal and children clinic sessions. The objective was to understand the practices of health workers in interviewing mothers, recording data while providing services and referring mothers and/or children to hospitals.

3.3 Document Reviews

To further improve the richness of data collected from the interviews and the observations, this study reviewed several documents. These included epidemiology reports, country demographic survey reports, Ministry of Health curriculums for training CHWs and data collection tools including different village registers.

4 Findings

This section presents findings on current practices in birth registration and the involvement of different stakeholders in data collection, recording, transferring and storing.

4.1 Stakeholders and Activities

This study identified five different stakeholders that were involved in communicating birth information directly and indirectly from the community level to the district. These were village health workers, traditional birth attendants, health facility workers (Nurse Midwife and MCH aid), district health managers (village health workers' coordinator and traditional birth attendants' coordinator) and village government. All the stakeholders were directly involved in the HIS except the village government. This paper presents findings on directly involved stakeholders. Table 1 shows activities of each stakeholder in communicating birth information from the community to the district level.

The main goal of traditional birth attendants in the HIS was to ensure that records were available when their coordinator from the district went to supervise them. They recorded individual-based data in standardised registers on deliveries including the name of the mother, father and village head, gender of the baby, condition of the baby and the mother if any, and reasons for death (Mother, Child) if any. Although traditional birth attendants could not read and write, they used village health workers or anyone close to them to write for them in the registers. Despite of all the information collected and recorded, six out of seven traditional birth attendants

Table 1. Activities Done by Each Stakeholder

Activity	Stakeholder			
	Traditional Birth Attendant	**Village Health Worker**	**Health Facility Worker**	**District Health Manager**
Data Collection	- Assist deliveries in their home or client's home	-Household visitations -Observations -Gather observations from traditional birth attendants	-Health center client visitations -Outreach Activities -Gather reports from village health workers	-Gather paper based reports from health facilities and traditional birth attendants
Data Recording	-Record data on Paper-based registers	-Record data on Notebooks	-Record data on Paper based registers, Report forms and Tally forms	-Enter data into District Health Information Software (DHIS)
Data Transfer	-Nowhere	-Present a quarterly report to health facility nurse in-charge	-Present quarterly reports to the district	-Manually and electronically through DHIS to the region
Data Storing	-in home cabinets	-Personal files at home	-File reports, tally forms and registers in cabinets	-Electronically in the DHIS database

indicated that no one had read nor supervised their data recording in their registers since they were given the registers in 2006. The recorded data was therefore not transferred anywhere.

Health managers as one of the stakeholders had to ensure that complete and accurate data was collected from traditional birth attendants and health facilities every quarter and entered into the DHIS. This research found out that collection of data from traditional birth attendants had never been done with the exception of one traditional birth attendant who could read and write, and whose work was supervised over mobile phone communications. Health managers worked with only aggregated data.

Village health workers were driven by two main goals. The first goal was the same as that of traditional birth attendants, to ensure the availability of records when they were supervised. The other goal was to present monthly and quarterly report on all births that took place in the community to the health facility nurse in-charge and the village government. Village health workers did not use standardised registers for data collection and reporting, they used notebooks. Data was recorded in individual-based format then it was aggregated every month and quarter for reporting. Unlike most of the traditional birth attendants who were aged women (40 – 80 years) and could not read, write and use mobile phones, village health workers could read, write, use a mobile phone and owned one. Furthermore, findings indicate that data reported by village health workers to the health facility was not incorporated in the health facility reports all the time. The nurse in-charge explained that sometimes the information was not complete. As a result this information remained in the village health workers' notebooks. Health facility workers also indicated that they provided support to village health workers on how to go about different observations. Most of this support was provided using their mobile phones.

Health facility workers who were medical professionals, worked in health centers and dispensaries collectively named health facilities. Their main goals were provision of health services, recording and reporting complete and accurate data timely. Reports were sent to the district and sometimes the district health managers picked up reports from health facilities. At the health facilities, data was collected and reported using standardised tools such as registers, tally forms and report forms.

4.2 Supportive Supervision and Feedback Provided to CHWs

This study also aimed to investigate how CHWs were motivated by health managers to improve their performance in the provision of health services, and in data collection, recording, storing and transferring, by looking at the provision of feedback and supportive supervision. According to the ministry of health and social welfare regulations, CHWs were supposed to be supervised by their coordinators from the district at least once every quarter. This supervision was meant to collect reports and ensure that they were accurate and complete, to distribute supplies (medical and stationary), to present reminders and announcements on mobilisation activities prevailing at that time and to ensure that everything was in order. However the supervisors did not have a checklist on what to supervise, they only checked what they remembered to check. Health managers also indicated to be constrained by budget allocated for supervision and many responsibilities which hindered them to provide regular supervision. One said,

"*We only supervise them when there is a budget supporting that*"

Due to the constrained budget and unmet needs of village health workers such as sufficient skills, adequate supply of stationeries (notebooks, forms, standardised registers, pens, calculator and folders), technical support on provision of services and sufficient means for transportation to all households; village health workers faced difficulties in data collection, recording, storing and transferring. One village health worker said,

> "*Households in my village are far from each other and others are very remote and I don't have a bicycle to use but I walk anyway to make sure I collect accurate data in all my households*"

However this was not the case for traditional birth attendants, with the exception of one, because they operated as private providers. Nevertheless, the health managers at the district provided them with registers for recording data on delivery outcomes for the mother and the baby. The health manager who was the traditional birth attendant coordinator did not provide attention on the data recorded and supervision provided to traditional birth attendants was highly neglected.

As long as there were few or no supervisions and support provided to CHWs, there was also few feedback given. Village health worker indicated that they never received feedback on their performance in data they had collected and reported based on maternal health. They received feedback on other activities they performed for parallel programs. Traditional birth attendants indicated that the only feedback they received were warnings when they did something wrong. However one traditional birth attendant indicated that she was receiving feedback based on her performance in reporting of data and provision of services through her mobile phone.

5 Analysis

Analysis of the findings reveals that, at the community level, individual-based data was collected and recorded by village health workers and traditional birth attendants.

Village health workers recorded the data in notebooks and aggregated it at the end of the month and quarter and reported it upwards to the health facility where it was compiled in health facility's reports and further reported to the district. Data from traditional birth attendants, which was recorded on standardised registers, was reported to the district in individual-based format. However only one out of seven traditional birth attendants was reporting the collected data. Figure 2 presents a visualization of the sequence of activities in the flow of birth information among different health stakeholders from the community to the district level.

The diagram depicts a weak link (dotted arrows) in the flow of maternal health data from the community to the district level. Despite the fact that the data were not properly reported, they were recorded in traditional birth attendants' registers and village health workers' notebooks. The state of under-reporting was led by several practices among stakeholders in the HIS. These practices included a poor support structure as indicated in the findings that CHWs received unreliable support, supervision and feedback on their work performance from district health managers and health facility workers.

To improve the state of poor reporting, this study has perceived the use of mobile phones at the community level as an opportunity to bridge the gap in data flow in the HIS and to strengthen the weak support structure. Looking at the mobility nature of work of village health workers' activities and the capability of a mobile phone to support this as presented by Chetterjee et al. [20], this study proposes a mobile phone application infrastructure that could be implemented to support the work practices in the HIS. Figure 3 presents the envisioned mobile phone application infrastructure.

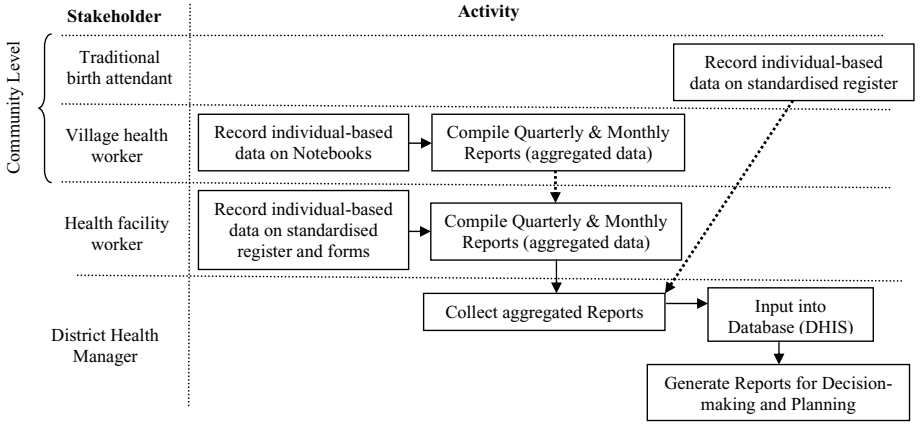

Fig. 2. Sequence of Activities in the flow of birth information from the community to the district level

With this infrastructure in place, the broken link in the flow of information as indicated in Fig. 2 between the community and the health facility levels would be bridged. Village health workers would be reporting data they recorded and data from

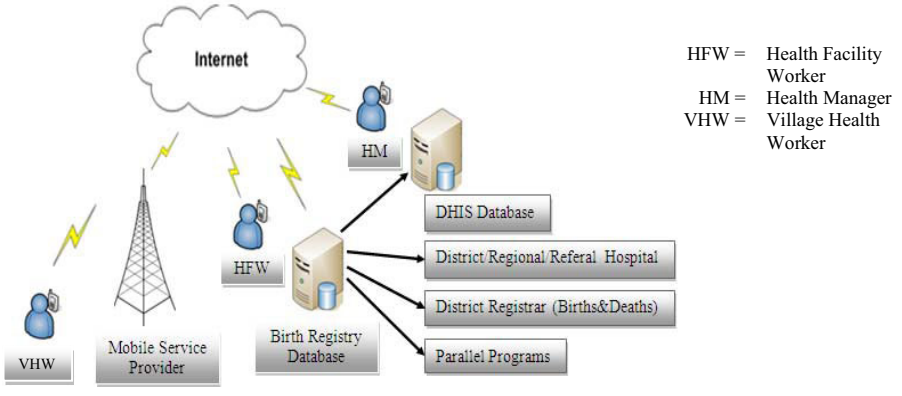

Fig. 3. Envisioned Mobile Phone Application Infrastructure

traditional birth attendants' registers to the health facility through the mobile application. This application would also present opportunities for health managers and health facility workers to support, supervise and present feedback to community health workers remotely, without travelling to meet them in remote areas as was done with one of the traditional birth attendants. This might promote desirable practices in collecting, recording, storing and transferring maternal health data in the HIS.

6 Discussion and Conclusion

This section presents the discussion based on the findings and theoretical reflections, and concluding remarks on answering the research questions.

6.1 Current Practices

As presented in the findings, current practices indicate lack of backward flow of information in the form of feedback with the exception of one traditional birth attendant whom health managers could communicate with through a mobile phone. Village health workers and traditional birth attendants were also provided with very little support and this went hand in hand with provision of little or no feedback. This situation has also been observed in other developing countries [8, 10] and it created reluctance in reporting and thus hindered the flow of information.

Desirable and Undesirable practices. This section presents current practices among stakeholders categorised as desirable and undesirable practices as presented in Table 2.

Table 2. Desirable and Undesirable Practices

	Stakeholder	Desirable Practice	Undesirable Practice
Data Collection	Village Health Worker	-Eager to go house to house to get complete and accurate data	-Remote households could not be reached on time
	Health Facility Worker	-Gathered reports from VHWs which contained community data	-No feedback provided to VHWs on the data gathered from their reports
	Health Manager	-Gathered reports from health facilities and traditional birth attendants	-Provided no transport mechanisms to VHWs for household visitations and reports presentation to the health facility -Irregular supervision provided to VHWs and TBAs on data collection -No collection of data from TBAs' registers
Data Recording	Village Health Worker	-Noted all observations possible -When they needed assistance they called the HFWs (using mobile phones and/or physically meet) for support	-When out of stationary data was recorded later sometimes the observations were forgotten -Using un-standardised register – VHWs recorded what they thought was necessary
	Health Manager	-Provided technical support to a TBA through a mobile phone	-Provided VHWs with inadequate stationeries for recording the collected data -Little/No supervision was provided to VHWs and TBAs on data recording -No checklist for provision of supervision -Provided negative feedback only
Data Transferring	Village Health Worker	-Ensured the completion of monthly and quarterly reports	-Late reporting to the Health facility
	Traditional Birth Attendant		-Not reporting the data recorded
	Health Facility Worker	-Ensured the completion of monthly and quarterly reports	
	Health Manager	-Provided feedback on reports to a TBA through a mobile phone	-Providing no transport means to VHWs to send reports to the health facility
Data Storing	Village Health Worker		-Not keeping reports for their own data utilisation or further reference
	Traditional Birth Attendant	-Stored their registers	
	Health Manager	-Stored data electronically where it was readily accessible and sharable	

Findings indicated that current practices which were undesirable among village health workers, traditional birth attendants, health facility workers and health managers in the HIS fuelled challenges in data collection, recording, transferring and storing. Undesirable practices also contributed in creating the gap in the flow of birth information from the community to the health facility and further to the district level. Furthermore, the weak support structure was often provoked by the way supportive supervision was conducted without having a checklist of what to supervise and low/no budget allocation for supervision, transportation and stationeries necessary for data recording, reporting and storing. Rowe et al. [6] indicate that, health managers need to understand these practices and this will give them an insight on which practices to enforce and which to abolish among health workers. In light of studies conducted in developing countries [7-11], motivation has been used to enforce desirable practices.

6.2 Adaptation of a Mobile Application

The communication gaps in communicating birth information in the HIS can be bridged by the use of mobile applications as the case in other studies in developing countries [16-21]. According to Chatterjee et al. [20] the adaptation of mobile

applications can support communication because of the mobility characteristic of using devices such as mobile phones. The use of mobile phones has also been observed to be beneficial in resource constrained areas [22]. Despite the fact that CHWs are accustomed to work in a paper-based system (using paper, pencils, pens, erasers) [23], findings indicated opportunities in using mobile phones to improve communication in the HIS that would enhance provision of reliable and timely supportive supervision and meaningful feedback.

Support in Collection, Recording and Transferring of Information. Provision of support has been observed as one of the factors for motivating CHWs to improve their performance in many developing countries including Kenya, Benin, Vietnam and Mali [7-11]. Support also offers health workers a helping hand in the completion of their tasks by improving knowledge and skills in performing tasks which may lead to avoidance and/or reduction of mistakes [8, 9, 12]. Rowe et al. [6] further indicate that in most developing countries provision of supportive supervision to CHWs offers a connection link between the community and the rest of the formal HIS. Findings indicated the possibility of using mobile phones to provide support and supervision to CHWs who had mobile phones. If this practice could be formalised and improved, there would be improvements in accuracy and completeness of data collection and recording from the community. In this regard, a mobile phone could be adopted as a tool to strengthen the present weak support structure in the HIS and this would motivate CHWs to collect and report accurate and complete information [9].

Support also includes the provision of meaningful feedback to CHWs. Health managers and health facility workers could use mobile phones to send feedback to CHWs as a way of enforcing desirable practices. Provision of feedback also open doors for good communication between CHWs and their supervisors and this would motivate CHWs because it would create a feeling that their achievements are recognised [9] and appreciated [10].

Envisioned Mobile Application. This section presents the envisioned mobile application (as presented in Fig. 3) which will be implemented in a later stage of this research. Based on the current practices and the infrastructure in the HIS, this application is perceived to improve flow of birth information from the community to the district level by providing opportunities for fast and timely transfer of information and by creating communication channels between health managers, health facility workers and village health workers for provision of supportive supervision and meaningful feedback to provoke desirable practices in data collection, recording, storing and transferring.

For data collection and recording, mobile phones will be used by village health workers to record individual-based information on births collected in their notebooks and traditional birth attendants' registers and send it to a database (medical birth registry) placed at the health center through the internet. The data will be recorded in standardised registers on a mobile phone and every individual will be uniquely identified in the system. Upon the reception of the information, the database will automatically send a feedback (notification of receipt) through SMS. All the information sent to the medical birth registry will be approved by the health facility nurse in-charge before it is committed to the database. At this point the health facility

nurse in-charge will use a mobile phone to call or send an SMS to the respective village health worker for further clarification if needed.

From the medical birth registry, the information will be compiled (aggregated) monthly and a report will be sent electronically to the DHIS database at the district. The aggregated reports will also be given (as a print out) to individual village health workers based on the data they reported to the health center in that particular month and/or quarter. At the district, the information will be approved by health manager and then saved into the DHIS database. At this point, the information will be readily available to be shared by different stakeholders such as district health workers, district and referral hospitals, district registrar of births and deaths for vital registration, and parallel programs.

The undesirable practice of late reporting of data collected by village health workers, as observed in the findings, will be eliminated because data will be transferred to the database right after recording it and there will be no need of manual preparation of monthly and/or quarterly reports. This will also reduce the transportation costs for transferring data from the community to the health facility.

Furthermore, in the envisioned system, the weak support structure in the HIS will be strengthened whereby instructive support on technical aspects in the provision MCH services which affects in one way or the other, data collection, recording, storing and transfer, will be provided to village health workers by health managers and health facility worker whenever needed through calling and/or sending SMS. Health managers and health facility workers will also be urged to provide meaningful (constructive) feedback after the completion of tasks and on the performance of village health workers and traditional birth attendants on monthly bases and whenever necessary. To facilitate supportive supervision, the mobile application will also provide health managers and health facility workers checklists to be used for providing regular supervision.

The envisioned use of mobile phones as a tool to facilitate communication of birth information between community health workers in the community, health facility workers in the health facilities and district health managers in the district, is perceived as a rewarding mechanism [24] which will promote desirable work practices in the HIS.

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