THE RAPID SMS EXPERIENCE IN 2009
NUTRITION SURVEY IN MAURITANIA

The “Working document” series is a knowledge management tool sharing results, experiences and best practices leaded in the country with the assistance of UNICEF-Mauritania within the framework of partners. Feedbacks are welcome.
Mauritania has a coherent nutritional surveillance system based on (i) a routine nutrition monitoring system integrated in the health information system; and (ii) biannual nutritional surveys that illustrate the nutritional situation of children in two periods of the year (lean season and post-harvest). Consequently the country has a variety of information on the situation nutrition (stunting, wasting, underweight, anaemia, young infants and children feeding practices and households consumption of iodized salt...)

Nutrition surveys reports are available from 2006 on annual basis and from 2008 with a regularity of twice a year. These descriptive studies snap the nutritional situation of children in two periods of the year: lean season (July) and post-harvest (December). Trends showed on intra and inter annual basis remain the core issue to decision making.

The main challenge faced at the beginning of the process of nutrition surveys was to improve regularly the quality of the data and to build a national consensus on the results of these surveys. Along with this process two majors actions were undertake to improve the quality of the data. The introduction of SMART (Standardized Monitoring & Assessment of Relief & transitions) methodology, in 2008, guaranteed improvement of technical capacity and in a standardized manner the reliability of the data. In 2009, with OFDA-Office of Foreign Disaster Assistance-USAID funding, another innovation, was introduced by using Rapid SMS application.

**SHORT MESSAGES SERVICE TEXTS TO ENHANCE QUALITY; THE ADDED VALUE**

Rapid SMS is an open-source framework for data collection, logistics, coordination and communication allowing any mobile phone to interact with the web via SMS text messages (www.rapidsms.org). This system allows the data collectors to send data directly to a central base to review. The data examined for their validity and a response was immediately returned. The analysis identified common errors in the data and requested the interviewer teams to return to the households for corrections.

The purpose of Rapid SMS-innovation for entering and checking rapid nutrition information- can help identify potential problems (improper measurement techniques, age or birth date non-coinciding,) and to ensure:

- Reliability form data manipulation and bias possibilities
- Rapidity and flexibility in data collection
- A preliminary report even if field surveyors are in the field
- Return to households to check, verifies and get concise information if needed.
- Availability of information in the central data base on “real time”. The data’s easy accessibility and legibility facilitates the identification of data-entry errors.
- Localization of teams and monitoring of survey :”on line” in a website data base
RapidSMS is most effective when it does not seek to replace or alter existing systems, but integrates as seamlessly as possible into existing systems by directly addresses key challenges while leaving everything else that already works in place.

**A PILOT RAPID SMS NUTRITION SURVEYS IN MAURITANIA**

Coverage of the telephone network is acceptable amongst population (75%) by the existing of 3 mobile operators (total over 2 million subscribers), and the universalization of the use of mobile phones as a usual channel of communication have supported this choice.

The surveyors and team leaders sent quick anthropometric information by SMS to a central database in Nouakchott with immediate reply on the quality of data before living the surveyed household.

Regular reviews of the most important steps of the surveys were realized by the Steering Committee of the nutrition surveys. The steering committee was created by the ministry of health. Also dissemination workshop were organized for the first survey of 2009 including the nutrition regional managers, managers of other departments (rural development and food security Commission) partners and NGOs, and representatives of UNICEF, WHO-World Health Organization, FAO and WFP-World Food Program. Donors as USAID-US Embassy, and the AECID (Spanish Cooperation Agency), and programs as the Fewsnet, CILSS, etc. were also represented. These activities improved the dissemination and ownership of government partners.

**A PROCESS IN THREE KEY STAGES**

1. **CONCEPTION AND DEVELOPMENT**

The technology behind RapidSMS is the simple part. However, deploying RapidSMS successfully as a key component of larger communications or data collection systems takes careful planning and good coding. It is generally recommended that a field program manager with RapidSMS implementation experience work closely with software developer(s) to ensure applications are appropriately designed the first time around. RapidSMS is designed to run on any standard computer paired with a standard GPRS modem or certain models of cell phones.

<table>
<thead>
<tr>
<th>Table 1: Technical specifications and relevant process issues</th>
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<tbody>
<tr>
<td><strong>Computer.</strong> 2 computers as computer server (#1) and back up (#2)</td>
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<tr>
<td><strong>Operating System.</strong> Linux.</td>
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<td><strong>GSM Modems or Compatible Phones.</strong> GSM modems are recommended for larger scale deployments of RapidSMS. RapidSMS also supports a number of standard cell phone models.</td>
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<td><strong>Mobile phone companies.</strong> Special unlimited SMS recharge prepaid cards were delivered to reporters. Specials agreements with all mobile operators are encouraged</td>
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<tr>
<td><strong>Power and Security.</strong> Computer Server needs to be connected to a reliable source of energy for the whole collecting data period.</td>
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<td><strong>Internet Access.</strong> Permanent Internet access is required to get RapidSMS dashboard accessible via the internet to monitor teams in the field sending information by SMS. Incoming and out coming messages were saved.</td>
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<td><strong>Backup.</strong> It was recommended to routinely backup the RapidSMS database on an external hardrive or flash drive.</td>
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<td><strong>Customization.</strong> Adaptation and integration of coded apps (applications- processes messages from the router, extends the data-model, - authentication and permission control) and translation is needed.</td>
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<td><strong>Technical expertise.</strong> Initial technical assistance tasks can include: setting up the server though customizing RapidSMS, writing specific code based on scope and technical work flow, testing for errors and fitting, usability testing via small groups with different mobile operators and creating specific training materials.</td>
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TRAINING AND STRENGTHEN CAPACITIES.

As in other survey preparation processes, training was critical: information must be provided and anthropometric measurements (weight, height, MUAC-Middle Upper Arm Circumference) standardized. A new module was introduced: how to use Rapid SMS and survey pretest. Training materials were created and registration process of all teams in the rapid SMS server assured. Practical training testing was relevant and gave key information to orient teams in an efficient manner.

Managing systems which employ real-time data are sometimes complex. The opportunity to improve effectiveness and efficiency was created but survey supervisors and team leaders needed to deployed new skills. A RapidSMS deployment should not be thought of as a single piece of software, but rather as a collection of several pieces of software that work together to fulfill the requirements of a deployment. Each deployment requires specific, custom functionality, but general functionality often needed for SMS services can be easily shared and reused.

Nutrition survey exploitation needs a way for users to register their identification and display information on the web. User friendly 'dashboards' will provide with spatial mapping of the data collection points and basic tools for data analyses.

ACHIEVEMENT

Implementation of the innovative approach in Mauritania was an asset. 11 teams surveyed sampling sites and sent SMS to the central server database after each filling questionnaire in households.

The SMS message per child contains information on:

<table>
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<tr>
<th>Number of surveyors</th>
<th>cluster ID</th>
<th>Sex</th>
<th>birth date</th>
<th>age in months</th>
</tr>
</thead>
<tbody>
<tr>
<td>child</td>
<td>household</td>
<td>Sex</td>
<td>birth date</td>
<td>age in months</td>
</tr>
<tr>
<td>weight</td>
<td>Height</td>
<td>Oedema Middle Upper Arm Circumference</td>
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</tbody>
</table>

The central database in the server, site transcribed the information received and answer automatically to each investigator recorded and identified with feedback on the validity of the data giving advices. Error writing, lack of figures and anomalous figures are found and announced with an SMS instantly back to the investigator. If a row of data is considered to be ambiguous or invalid suspect status remains in standby until the team leader sends the correction. The database allows an online and continuously tracking of all flow of information.
2 surveys zones were chosen for piloting innovation in Rapid SMS: Nouakchott Zone and the North zone. On average, each team have sent 50 SMS per day which enabled timely corrections and judging information as accurate. 75% of messages sent had accepted data. System could help to identify team leaders with less percent of accepted data. Supervisors focused on them.

Commonly feedback messages received:
- Please register your phone
- Thank you, samba. Well received
- You must put X for missing age data
- ‘33’ is not a valid date of birth
- Please verify age and measures and resend

One the information was collected, data was store in the ENA system and then after analysis the information was ready to disseminate as a final report.

**PROGRESS**

**LIMITS**
1. **No feedback if phone is out of coverage area**
The low coverage of the telephone network and its quality in some rural areas is an additional stress to teams in surveys. In a few cases information is not as “in real time”: as in normal conditions. The main causes are:
   - Lack of mobile network coverage
   - problem of phones autonomy;
   - slowness of typing entry in the telephone keypad; (high risks of errors while entering data, and repetition in sending texts

2. **Time consuming process of exporting survey data into ENA for review** (must facilitate review of data daily)
3. **Data entry of standardization not yet included**
4. **System could be more user-friendly for set up and utilization**

**ALTERNATIVES:**
- to use of internet for one connection keys sends fast data;
- to use modem to keyboard more suitable for input from the telephone (palm despoke);
- to extend the collecting data period
LESSONS LEARNT

- Cost estimations must be taken into account in the implementation of the Rapid SMS in surveys, especially regarding SMS cost: as they are not always affordable for reporters and in some place without coverage, trip expenses increases.
- One or two week’s scope before survey would be desirable to assimilate new acquisitions to consolidate the process of implementation for the first time.
- System was highly appreciated, it is faster, flexible and easier (less heavy that carrying laptops)
- Establishing specials accords with all mobile operators could be a key factor to improve coverage of networks.

CONCLUSION & PERSPECTIVES

The RapidSMS Survey application improved data quality by facilitating immediate identification and feedback on erroneous or out-of-range measures and daily feedback to team leaders and the survey coordinator on survey progress and data quality issues.

The operational technology SMS is viewed as a key component on the collection system includes precision and dynamic communication and exchange that bring important benefits for nutrition surveys. The Rapid SMS was used for collecting and pre-storing nutrition information. Analysis and interpretation was made with ENA software. Both systems complemented and ensured quality by prevention (implementing actions to avoid the dysfunction and non-conformity).

The innovation provide some evidence on process capability and control and suggest that the SMS communication and technology approach may play a relevant role in quality improvement in nutrition surveys and in a potential continuous surveillance system.

FUTURE PERSPECTIVES

- Develop Nutrition Surveys with SMART methods on smart phones (handheld computers)
- Integrate GPS coordinates for each household
- Automate daily reporting of data quality and coordinator follow-up
- To integrate the Rapid SMS into the routine information system-National Health information system- and establishing links with nutrition surveys, to consolidate, thought the nutrition surveillance system.