Tools and Tips for Mobile Data Collection in Nutrition Surveys

An Operational Guideline from Practical Experiences in West and Central Africa

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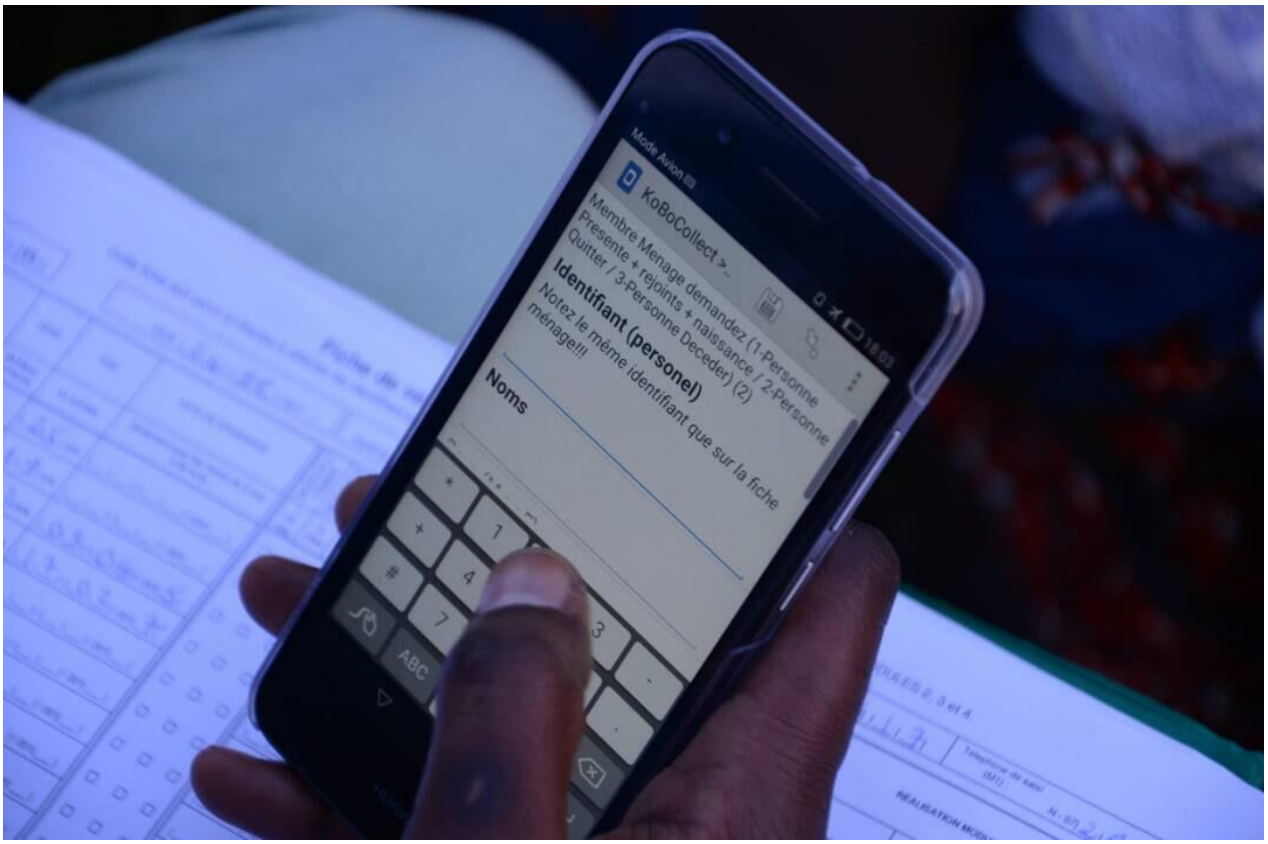

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Summary

Introduction and rationale

Every year, 8 to 15 countries in the West and Central Africa region[1] conduct nutritional surveys using the SMART methodology[2]. Since 2006, the year in which this methodology was generalized in the region, nearly 300[3] SMART surveys were carried out in this region.

[1] The target geographic area is covered by the UNICEF's West and Central Africa Regional Office (24 countries).
[2] www.smartmethodology.org

These surveys are mainly conducted on a large scale (national) and on a regular basis (annual for 6 countries). The quality of surveys, the use of data and the ownership of the methodology by governments have positively evolved steadily over the years, with less reliance on international consultants for survey coordination[4]. Today, the surveys are conducted under the coordination of government bodies empowered to manage nutrition and statistics issues at national level and/or national statistics institutes, with financial and technical support from international technical and financial partners, including UNICEF.

The SMART methodology was developed in the early 2000s, with the technologies available at the time: easy-to-use software (ENA for SMART[5]), running on a computer, to enter, analyze and check the quality of the data collected every day through paper questionnaires. Since anthropometric measurements errors in young children are frequent and their consequences on estimates of nutritional prevalence are significant, the ENA software for SMART includes a sophisticated verification system allowing rapid identification of measurement errors entered, in order to be corrected as soon as possible. The following day by the enumerators (during a new visit with the children concerned).

In recent years, survey data collection technology witnessed huge leaps forward with the introduction of hand-held tablets as an alternative to paper questionnaires. The use of tablets allows for faster questionnaire completion, reduces the risk of errors and prevents tedious and time-consuming step of entering paper questionnaires on computer. However, ENA software for SMART is not compatible with these tablets.

While some countries have therefore continued to use paper questionnaires for SMART data collection, others have decided to adapt the SMART methodology on tablets as much as possible. These initiatives were a great success, but some challenges were noted.

Currently, there is a need for harmonizing methods used and a need for sharing good practices and lessons learned in the region. This will improve the SMART data collection system and therefore the quality of the data itself.

Main objective and target user

Based on experiences reported in some West and Central Africa countries, this report aims to describe the different options available for the use of the digital tool in nutritional surveys with the collection of anthropometric measurements.

This document targets national actors involved in survey coordination and eager to implement for the first time the mobile data collection system for SMART or other nutritional surveys. But also those who already use mobile data collection systems in their nutritional surveys and who would like to improve the already existing system.

1. Methodology

This document is based on a review of existing and documented technologies and software, via Internet research. These researches were supplemented by experiences of the countries of the

[3] 298 nutritional surveys, according to the UNICEF WCARO database (December 2019)
[4] In 2019, only xx out of xx countries recruited an international consultant as part of their SMART surveys, while all of the countries used to do so when the methodology was introduced.
[5] ENA for SMART January 2020 release downloadable HERE

region in using mobile technologies, collected through protocols and final reports from a total of 9 surveys implemented in the countries of West and Central Africa region. Information collected was validated and deepened during interviews or email exchanges with the relevant actors of the countries.

2. Technical guidance for designing mobile data collection (MDC) surveys

2.1. Features and choice of collection equipment

Mobile data collection can be carried out using two devices: (1) smartphone or (2) tablet. Both options are comparable Moreover the same data collection can be done both on smartphone and tablet (the only difference being the screen size).

Table 1 below presents the advantages and disadvantages of both devices. The main points of comparison are: the cost of purchase, reading comfort, energy consumption and discretion in the field, keys elements depending on the security context, standard of living and acceptability.

Table 2 provides technical features to consider when purchasing digital media for mobile data collection (MDC). These features are proposed based on the nutritional survey collection experiences conducted in the region using MDC and capitalized by the UNICEF office for West and Central Africa region.

Moreover, a post by *KoboToolbox support*[6] makes recommendations on the choice of equipment and gives indications on the choice between tablet and telephone.

[6] http://support.kobotoolbox.org/en/articles/592390-recommended-devices-for-data-collectionh

Table 1.: Comparison between smartphones and tablets

Material Comparison	SMARTPHONE		TABLET	
	For	Against	For	Against
Size	*More discreet	*Less reading comfort	*Larger - provides better reading comfort	*Less discreet (greed, theft)
Power	*Consumes less *Faster to load			*Consumes more *Slower to load
Questionnaire	*Perfectly suited for questionnaires with one question to display at a time	*Limit size for questionnaires with several questions displayed at a time (group of questions)	*Perfectly suited for questionnaires with several questions displayed at a time (group of questions)	*Too large for questionnaires, 1 question displayed at a time
Price	*Cheaper: 80-150$ per unit			*More expensive: 100-250$ per unit
Solidity/ Degradation	*Generally stronger *Better grip			*More fragile *Less good grip
Weight	*Lighter *One-handed operation			*Heavier *2-handed operation

Table 2 : Summary of the features recommended according to the available literature and the experiences of the countries for the choice of equipment

MATERIAL	SMARTPHONE	TABLET
Screen size	4-6'	7-10'
Brand	Mid-range (sufficient)	
Price per unit	80-150 $	100-250$
System	Android (mandatory)	
Wi-Fi	Yes (mandatory)	
3G	Yes (mandatory)	
4G	Yes (preferable)	
GPS	Yes (mandatory)	
Camera	2Mpx sufficient	
Processor	2.3 GHz (sufficient)	
Internal memory	8Go (sufficient)	
RAM	2Go (sufficient)	
Internal battery	2500 mAh (sufficient)	

ACCESSORIES ASSOCIATED WITH MOBILE DEVICES	
Protective cover	Essential
Screen protection glass	Preferable
External battery	8/10 000mAh (necessary)
Car charger	Preferable
Solar charger	Not recommended (since you have to leave the phone to charge during the day)
External memory	Micro SD (often unnecessary, internal memory often sufficient)
3/4G SIM card	Essential
Internet credit	2-5 GB per survey
Phone credit	No (reserved for collection, no call)

2.2. Mobile data collection application

Several software are available for mabile data collection and get regularly updated. Most commonly used for nutrition mobile data collection are Open Data Kit[7] (ODK), Kobotoolbox[8], ONA[9]. Functionalities and features could significantly change between the time this document is written and the time you are planning your survey. For this reason, it is advised to discuss with your IT colleagues when you are planning a survey using mobile tools.

The Central African Republic launches its national nutritional survey by collecting mobile data using KoboToolBox

The Central African Republic, with the support of UNICEF, launched the annual national nutritional surveys in 2018 by innovating with a mobile data collection (MDC) system. To meet this dual challenge of national SMART survey and transition to MDC, the Central African Republic has chosen an ODK solution based on the KoBoToolbox platform. Questionnaires were created on the online interface as well as their deployment using free servers. The collection was made on KoBoCollect application and a person from the coordination team was especially dedicated to MDC implementation. Insecurity guided the choice towards more discreet phones than tablets. In addition, accessibility and communication means challenges compelled teams to some autonomy in the resolution of the issues related to MDC. Enumerators had to demonstrate prerequisite skills and received enhanced training on MDC. All the phones had a 3G SIM card configured on the network offering the best national coverage and allowing field teams to regularly send collected data to the server.

In 2019, the Central African Republic conducted its second national nutritional survey according to the SMART methodology using MDC. This time, questionnaires were created in XLSForm format in Excel, then imported to the server, which offers a greater range of options than creating the questionnaire directly online.

[7] https://docs.getodk.org
[8] https://www.kobotoolbox.org
[9] https://ona.io/home/

Mali is developing its system using CS-Pro and microcomputers for mobile data collection

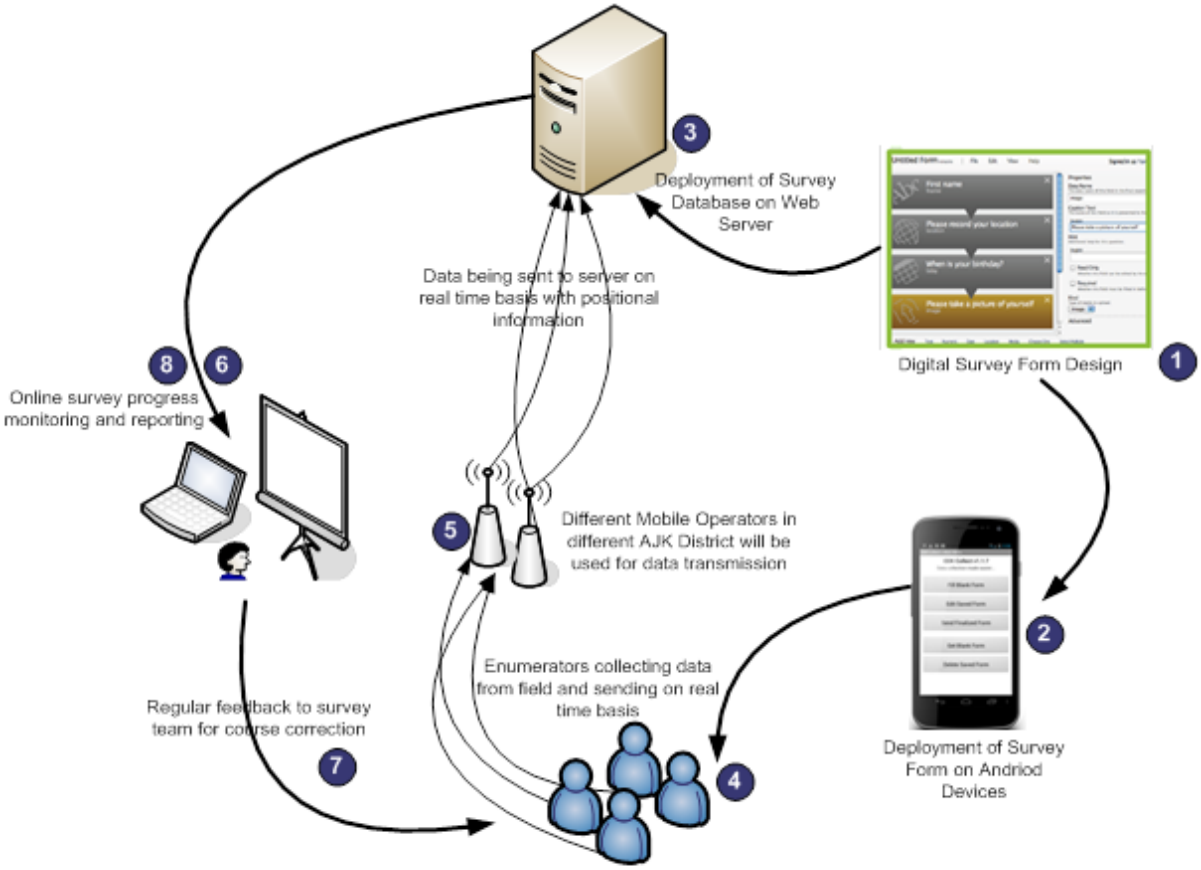
Mali proposed an innovation on the national SMART in 2017 developed by INSTAT (National Institute of Statistics) supported by UNICEF with data collection on netbook or mini-laptop operating under Windows. An application was created by the INSTAT developers to link different applications (CS-Pro and ENA application) to allow for systematizing offline data collection and analysis in the field. The various collection questionnaires are directly entered into the CS-Pro application during the interviews on notebooks. At the end of the day, the children's anthropometry questionnaires are automatically extracted from CS-Pro and imported into ENA with automatic generation of plausibility reports which allow correction of possible input or measurement errors before leaving the cluster (all off-line). The teams can then connect to mobile networks or via Wi-Fi and synchronize data on the servers set up by INSTAT. This new application using CS-Pro for collection and ENA for analysis is very easy to use, and based on the principle of one step = one click appearing on a user-friendly dashboard. This system has the advantage of keeping the analysis of anthropometric data in ENA in the field and reducing the processing time of data after field collection. However, it is more expensive and less comfortable using netbook (instead of phone/tablet). In addition, the use of CS-Pro requires expertise present in the country's statistics/census services and therefore implies their commitment throughout the survey.

Senegal creates a mobile data collection application for its national food and nutrition security survey

Senegal, with the support of UNICEF, carried out the joint national (one-off) Food Security and Nutrition and Resilience Survey (ENSANR) baseline survey in January/February 2019. On this occasion, the developers of SECNSA (Executive Secretariat of the National Food Security Council) created the SAP Mobile application (based on JAVA). This application consists of three independent layers: a presentation/interface layer for off-line entry, an application layer for synchronization and data processing and a secure data storage layer. It allows you to keep full control over this data. It also allows for off-line, encrypted and secure collection on Android or IOS tablets or smartphones. This system, equivalent to ODK-based systems, has the advantage of full and secure control over the entire CDM process. However, it requires advanced computer skills, it is much more expensive (need for support and development) and has the disadvantage of its novelty compared to already existing ODK-based solutions.

2.3. Synchronization server and data storage

Day-to-day data synchronization and centralization allows for both data availability and securing in real time. This ensures accurate monitoring (completeness of the sample) and quality control (anthropometric measurement score) of the data collection.



Three possible choices for servers are selected by UNICEF WCARO, based on the experiences of West and Central African countries, to ensure this synchronization:

1. Creation and configuration of a local server: this is a secure option but it requires computer skills for configuration and monitoring throughout the survey.

2. The possibility of renting storage space on an online server: a web server that will synchronize and secure data online. It is a solution that requires IT skills for configuration and monitoring throughout the survey.

3. The solutions presented above (part 0) offer ODK-compatible web platforms (free or paid depending on the platform). These integral solutions make it possible to conduct a good part of the survey steps via CDM (design of online questionnaires, deployment of questionnaires on phones, monitoring of data collection, pre-analysis of online data, securing online databases, sharing and extraction of databases before analyzes). The latter solution offers the advantage of being able to be managed with basic IT skills (see table 3 comparisons of the 4 main solutions, above).

However, if there is no Internet access possible for a long time during the collection, there are two options:

4. Data collected in the phones will be downloaded to laptops using a USB cable thanks to the ODK Briefcase application installed on a laptop. Once the databases are recovered on the computer, a work-function for extracting and importing data to ENA will make it possible to check data quality before leaving the data collection site of the day (work cluster), more details on the cartoblog[10].
5. For small surveys, when the collection teams work together and can meet up in the evening after work, it is possible to install KoBoToolbox on a laptop and connect data collection phones to a local Wi-Fi network created by the computer in order to transfer data from the phones to the laptop which will store it on a local server. Finally, data collected can be checked directly in order to assess their quality on a daily basis. For more details, see the article on *Help Center* of KoBoToolbox[11]. Moreover, SMART-SENS[12] surveys developed by UNHCR were totally designed offline with synchronization on a local server via a laptop. See the explanatory paper[13].

2.4. Additional mobile applications to support collection work

Some mobile phones features can be useful during data collection, beyond filling out questionnaires. Below is a non-exhaustive list of useful applications for data collection work.

Phone setting application:

Language, Date and Time

Upon phones or tablets grip and before MDC work, it is important to set up:

- The language of the telephone can be adapted (French, English, Portuguese, Spanish or Arabic) depending on the country of work. However, it is important to choose only one language for the survey, a language understood by interviewers as well as supervisors and coordinators.
- Define and set up a standard and unique date and time format, preferably DD/MM/YYYY and 24H
- Define the same standard and unique time zone in which the collection work takes place (for example: Brazzaville GMT+01:00 for Central Africa)
- Set time and date either manually or by synchronization with the network (3G/4G). Note that this step is very important. The age of the children is calculated from the survey date entered automatically by the telephone (on current date) and the date of birth (when available) during the interview. Also, it is advisable to test the questionnaires until imported into ENA to ensure that there is no issue with date format before data collection.

Battery management and usage restriction:

[10] https://blog.cartong.org/2016/03/11/migration-odk-platforms/
[11] https://intercom.help/kobotoolbox/en/articles/592393-installing-on-a-local-computer
[12] http://sens.unhcr.org/about-us/a-smart-core/
[13] http://sens.unhcr.org/mobile-technology/setting-up-the-system/

The telephone is becoming the central collection tool. It is important to use it exclusively for mobile data collection. Therefore, teams should be made aware, during training, that it is prohibited to use the telephone for any purpose other than data collection. Beware of connection sharing, which consumes mobile data bundle dedicated to data transfer, using phone for music/video entertainment on YouTube, radio, etc. as using phone for than data collection may cause loss of collected data.

In order to optimize the phone's battery capacity, it is important to:

- Screen brightness: Set the screen brightness to minimum, (possibility to activate the brightness option which adapts to the ambient light)
- Airplane mode: Systematically activate airplane mode to prevent the battery use to connect to the network or other. In addition, when it is necessary to geolocate the household or the cluster using GPS, the airplane mode can be temporarily deactivated and reactivated once the geolocation carried out (this procedure can appear in a message in the questionnaire intended for enumerators with a verification variable to check when the airplane mode is reactivated at the end of the geolocation).
- Clear the home screen: only applications required for your work should appear on the home screen to prevent opening useless applications
- APP LOCK Application (Do Mobile Lab - free[14]): This application that allows you to restrict the use of the phone to just useful applications for your work. Be careful to provide all useful applications for the survey (camera, GPS, etc.).

Synchronization and mobile networks

As the collection work takes place offline, the questionnaires collected are not immediately validated and synchronized. Therefore, it is necessary to collect all the data of a cluster/work day before being able to check the forms and validate them, when the absentees and missing data seem permanent. It is only after this step that the collection team will search for the network in order to synchronize the questionnaires of the day on the server using connection to the 3/4G network or via WIFI.

- Choice of 3/4G Mobile Data network: the network choice should be made on based on the network coverage, in particular, coverage in rural areas. It is better to have an operator providing 3G with good coverage, than an operator offering 4G with limited coverage in urban areas. The evolution of operators' infrastructures and offers requires a quick market study before each survey.
- Chip identification: It is important to ensure that the chips purchased are compatible with the phones (micro/mini chip) and with the mobile network. Furthermore, it is important to check that the chips are properly identified to prevent service interruption during the data collection work.
- Mobile data bundle: It is recommended to charge all phones for a sufficient volume of data and a validity time greater than that of the collection (5 GB of data valid for 1 month). It is also important to reference all chip numbers to facilitate charging procedures by the operator at both central and decentralized levels.

[14] https://play.google.com/store/apps/details?id=com.domobile.applockwatcher&hl=fr

Note: transferring an ODK form from phone to server consumes very little mobile data (unless videos or photos are integrated into the forms)

- WIFI: Connecting to a WIFI network (field office of a partner NGO or others) in the field can be an alternative for synchronizing collection forms in case mobile data network is not available in some areas.

Document and facilitate data collection

Phone is a tool which makes it possible to improve data collection by digitizing questionnaires. But its other functions prove to be useful for improving quality control and facilitating all the steps of data collection for a nutritional survey.

- GPS: GPS variables make it possible to geolocate the collection work in order to check that the teams visited planned village/neighborhood. Some surveys geo-reference each household (more accurate), others only the work cluster (only once a day, faster).
- Photos and videos: It is important for the team to document the collection work using photos. Several key and complex steps can be photographed. For example, identification of a SAM case, diagnosis of nutritional edema (Kwashiorkor), national identity card of the community relay who receives an incentive at the end of the working day, etc.

  Note: the transfer of photo variables increases the weight of the questionnaires and slows down data transfer to the server; this should be considered depending on the performance of the networks.

- Calculator: Calculator can be used by the team, especially in the steps of calculating the sampling pitch to respect a random selection of households.
- Random Number Application (UX Apps - free[15]): This application allows you to draw a number in a defined interval between 1 and X (identical to the sampling with ENA, planning tab).
- Screenshot: by pressing the On/Off and Volume buttons simultaneously - for a few seconds. This function allows you to share a bug or blockage with the supervision or technical support team.

Note: This list is not exhaustive and other applications can be used to facilitate the collection work.

2.5. Data collection form

2.5.1 Form creation solutions

Adaptation of a questionnaire already used in a nutritional survey in another country:

An anthropometric data collection questionnaire compatible with ODK applications was developed and improved as adaptations and additions were made by the different countries (see box for Niger). This questionnaire has the advantage of producing advanced quality control, it generates SMART flags in real time and automatically asks the field teams to resume anthropometric measurements of a child if these do not seem plausible.

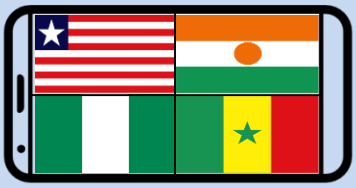
Design of a questionnaire in XLSForm format

[15] https://play.google.com/store/apps/details?id=ru.uxapps.random&hl=fr

When computer coding skills are available to assist with the creation of forms and collection tools, several tools can facilitate the creation of functional questionnaires adapted to field needs. In particular, this Open Data article[16] which presents two tools ODK XLSForm Offline[17] and XLSForm Online[18].

Design of a questionnaire via an ODK-compatible web platform: KoBoToolbox example

For the design of a form without coding skills of XLSForms, it is possible to use the KoBoToolbox platform which allows to build a questionnaire via a web interface. A tutorial in French developed by the KoBoToolbox support team helps you get started with the online questionnaire creation platform[19].



The UNICEF West and Central Africa Regional Office developed a first questionnaire in 2014 in XLSForm format compatible with applications based on ODK (accessible HERE). This questionnaire reproduces the calculation of the weight-for-height, height-for-age and weight-for-age indexes according to the WHO 2006 international growth reference. This questionnaire helps to detect outliers and extreme values that can be automatically suspected under ODK (such as data flagged in purple in the ENA input mask). In this case, the form asks to systematically resume the child's measurements made during data collection within the household. This questionnaire made it possible to compensate for the fact that ENA does not exist on Android system and was first piloted in Liberia, Senegal, Nigeria, and Niger and more widely in the region during the following years.

The region adapts the ENA input mask and flags in XLSForm questionnaire compatible with ODK

2.5.2 Supervision or quality control form

Beyond the data collection questionnaires, it is possible to digitize all the worksheets and forms, so that the enumerators can refer to them whenever necessary in the field. This prevents from carrying bulky paper sheets. Forms that can be scanned include:

- Anthropometric data calibration form
- Cluster control form
- Referral form for a malnutrition case
- Etc.

3. Practical tips for data collection

The MDC involves to rethink the organization of the collection teams and their work in the field. The supervision system should adapt to the new data chain from a tablet/phone to a central server.

[16] https://opendatakit.org/xlsform/
[17] https://github.com/opendatakit/xlsform-offline/releases/tag/v1.11.1
[18] https://docs.opendatakit.org/xlsform/

Furthermore, it is important to dedicate a full-time person for the management of the server to provide systematic control of transmitted data in order to timely detect any anomalies.

3.1 Development of the collection system from variable definition to data analysis

Depending on whether separate or cross analyzes are planned, and depending on the data processing software that will be used, it is important to think about the structure of the collection questionnaire following its setup on the mobile device. There are as many alternatives as there are surveys; two options are presented below and in Table 3 to guide reflections.

Option 1: single questionnaire "more structured and more centralized"

For each household, a single questionnaire will be completed with sub-sections for each of the sub-modules (for example, the sub-module grouping questions on women, that of IYCF questions, the sub-module of household questions or that of children aged 0-59 months). As many subsections will be automatically created. This type of questionnaire minimizes the risk of forgetting, since once all the members of the household are entered with their gender and age, the sub-modules will be automatically generated and will be filled in one after another. However, this doubles the collection time by requiring the use of only one phone per household, resulting in longer waiting times for team members who do not handle the phone (measurers and assistant measurers).

This will result in a single database, which will require significant restructuring if we wish to isolate each data set (in particular to generate the plausibility report of ENA on anthropometric data for 0-59 months). This makes this option more time consuming than the next.

Option 2: independent modules, "faster and more flexible"

This option consists in separating the sub-modules of the questionnaire (for example, the sub-module grouping the questions on women, the sub-module corresponding to 0-59 months, or the one for IYCF questions vs anthropometric questions). These independent modules in ODK can be entered in parallel by two different team members on two different phones. This makes it possible to mobilize the whole collection team on different modules to reduce the collection time and avoid waiting times. Or split the team into two sub-groups to recover the absent, for example, and adapt to the unforeseen events of the collection. In addition, each sub-module is synchronized in an independent database which can be controlled, analyzed, without restructuring.

This implies that each member of the team has mastery of the telephone; several phones are also

In Cameroon, digital mobile data collection with two phones per team

Cameroon moved to MDC in 2017 on ODK using the KoBoToolbox web servers. By drawing on local expertise from field teams (SMART and SENS nutritional survey among Central African refugees), the technical coordination of the Ministry of Health was able to test and adapt the data collection system during a 2-day pilot, integrated to enumerators' training. Two telephones per team were provided in order to allow enumerators to split into two sub-groups and to be able to collect different independent modules in parallel (Modules: M1-Households; M2-Woman15-49y; M3- IYCF0-23m; M4-Child0-59m). The coordination teams have also opted for a digital solution by digitizing the different work forms (equipment calibration, supervision sheet, collection report). However, for more security, a paper household control sheet was kept to ensure the completeness of the work, to avoid omissions during collection.

required per team. Also, the control of module completeness was not automatic since it was not linked to the household structure.

Table 3: Comparison of 2 collection options with a single questionnaire or independent forms for mobile data collection.

MDC Comparison	SINGLE QUESTIONNAIRE		INDEPENDENT MODULES	
	For	Against	For	Against
Organization /Completeness	*Completeness of data facilitated…. *Facilitates the interviewer's work *Minimizes the risk of forgetting	*Measurers wait for questions about them to arrive *Collects only one phone per household *Rigid collection organization	*Flexible organization of the team *Possibility of collecting several modules in parallel on 2 phones and therefore 2 respondents from the same household at the same time *Makes flexible the collection order of the different modules to adapt	*A questionnaire module may be more easily forgotten in a household *Requires good team organization and more rigor
Collection time		*Extends significantly the interview duration (2 x more time/household)	*Keeps all team members occupied at the same time *Reduces collection time by half	
Validation /Field control	*Data validation by households *Only 1 form per household *Automated questionnaire completeness check	*More time to find data in the questionnaires since they are very long	*Faster to find data in a form entered.	*Several forms per household are generated, so you have to manually check if each respondent has a duly completed module and in which phone
Database /Quality control		*1 single database with a lot of manipulation to extract the 4 databases per target population *Several steps before quality control of anthropometric data in ENA	*1 database per target population *Analysis and rapid quality control of anthropometric data in ENA	*Need to cross-check household data with data from target sub-populations (for example to verify that a mother who declared 3 children has 3 associated child questionnaires)
Human resources /Skills	*Only the interviewer requires skills in handling the telephone. *Shorter training	*Collection is only based on one person (the interviewer) *Non-interchangeable team member	*Team members are interchangeable *Quality control and intra-team support for the fact that all are trained	*All team members should be trained in phone use *Longer training
Budgetary implications	*1 phone per team	*Less households per day, more time in the field with strong budgetary implications	*Less time in the field and budget optimization	*2 (or more) phones per team

3.2 Quality control, supervision and skills required

The automation of quality controls made possible by mobile devices requires rethinking the steps of questionnaire validation. The daily review of paper questionnaires by supervisors is indeed replaced by other methods, essential to guarantee the quality of data collected.

Data monitoring and validation

With the transition from paper collection to mobile data collection, data is transmitted directly and on a daily basis from the teams' telephones to the central databases. The validation of the questionnaires and transmission to the servers should be done by a permanent member of the team, the team leader or the integrated supervisor.

Data control and management

Daily quality control, performed at central level on all data sent by field teams, is essential. Several key elements will be reviewed:

Completeness of data collected by team and by stratum:

- Number of clusters covered along the collection. At least 90% of the planned clusters should be reached;
- Number of children surveyed: at least 80% of the children planned in the master sample size should be reached;
- Each of the target individuals members of the household should have a completed form (children aged 0-59m, IYCF 0-23m, women aged 15-49 years [Applies only to questionnaires by independent module 3.1];
- Cluster supervision form: monitoring of SAM management of children diagnosed during data collection, etc.

Quality of data collected by team and by stratum:

- Extraction of anthropometric data from children aged 0-59 months for import into ENA [20] in order to generate the plausibility report; the score should be lower than 25
- Random verification of databases to check data consistency and completeness (the survey dates correspond to reality, all data in the same cluster have the same location information/date/team/number of complete households, a team collects a cluster per day, etc.)
- Monitoring of information from the daily calibration forms for anthropometric equipment (scales, measuring rods, MUAC tapes are well calibrated each morning before work)
- Mapping of the households surveyed using geolocation data, in order to check if the teams are moving to the right places and that the distribution of the households surveyed is random in the community (cluster)
- Verification of the average collection time per household per team (using metadata present in all the questionnaires, start time of the questionnaire and finalization time, etc.)

Sometimes, data control teams work late in the evening to check data collected during the day and provide a feedback to the collection teams before the next morning.

[20] https://smartmethodology.org/survey-planning-tools/smart-emergency-nutrition-assessment/

The coordination team may make some decisions based on the quality control information received, in particular the use of reserve clusters or the strengthening of some teams whose data collected is of poor quality.

Skills required for MDC

Those invited to take part in the training should demonstrate a minimum of skills in the use of smartphones or tablets in order to quickly take control of the work tool.

In addition, the training should provide for 2 additional days compared to the classic agenda of a SMART nutritional survey training (especially during the first editions of SMART by MDC):

A day of theory for getting started with mobile devices:

- ½ day: presentation of devices, applications, each one's responsibility and the mode of operation/synchronization of collection.
- ½ day: presentation of the questionnaires and practical completion exercises in pairs with real cases (SMART questionnaires completed during previous surveys can be used)

A pre-survey day for questionnaire completion:

- ½ day: pre-field survey with questionnaire completion
- ½ day: debriefing and possible adaptation of the collection system and questionnaires.

In Burkina Faso, the Ministry of Public Health mobilizes its internal services for the transition to MDC

Burkina Faso planned at the end of 2018 to switch to mobile data collection (MDC) for the 2019 edition of the national SMART. The support of an international expert seemed necessary, until the Ministry of Public Health realized that it already had such expertise internally (MDC via ODK). Therefore, the Directorate of Statistics and Health Information (DSIS/MSP) was mobilized to support the Directorate of Nutrition (DN/MSP) for the introduction of the MDC during the edition of SMART 2019.

Two DN members were in charge of coordinating the preparations for the survey, training enumerators and supervising data collection; two other persons from DSIS were in charge of developing the questionnaires, their tests and piloting, training enumerators on the aspects relating to mobile data collection and monitoring data collection (server and quality control of data collected); in addition, a general technical coordinator (DN) was in charge of making the link between both teams as well as the central level and the field.

4. Ongoing projects and additional resources

4.1. SMART-SENS

SENS surveys (*Standardized Expanded Nutrition Survey*) were born from the desire of the UNHCR to adapt the SMART methodology to the needs and realities of refugee camps (Health, WASH, Food Security, NFI, etc.). SENS surveys have, since their inception in 2013, accompanied Mobile Data Collection tools under ODK with the support of the NGO CartONG (for IT support to UNHCR MDC in the field). In addition, the organization recently translated all its training modules and collection tools into French (see HERE).

4.2. SMART Plus

The SMART project is starting its "all digital" transformation by piloting until 2021 a solution inspired by the ENA software for smartphones with a web platform for centralizing results and a dashboard (more details HERE).

4.3. Additional resources

- Git Hub of creation of the first SMART tutorials and questionnaire adapted under ODK.
- SMART-SENS methodology and some resources of interest:
    - Data management procedures

It is important to note that improvement of nutritional data collection using mobile devices is continuous and initiatives presented in this document are far from exhaustive. Progress is constant and requires continuous information. You are strongly encouraged to share with us any relevant experiences help us improving this document.

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