

Proposal

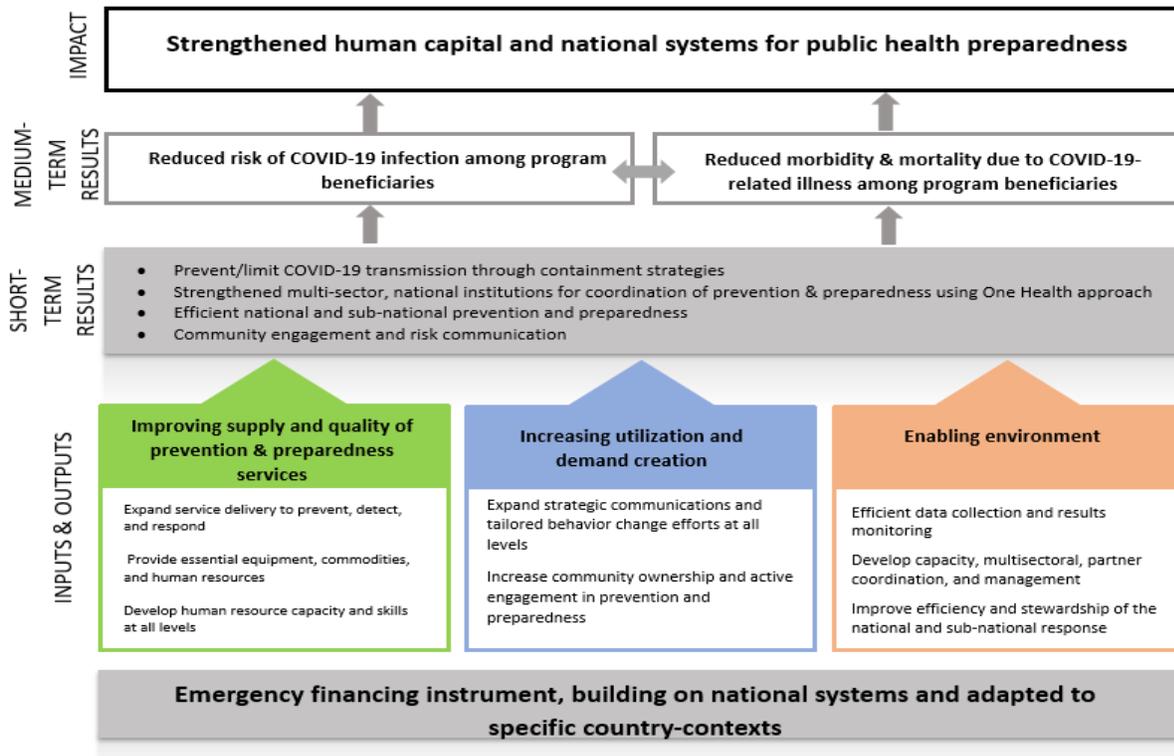
Capitalizing on the World Bank LSMS-ISA Program for High-Frequency Phone Surveys on COVID-19

Contacts: Calogero (Gero) Carletto (gcarletto@worldbank.org) and Talip Kilic (tkilic@worldbank.org).

1. Background

In response to the rapid escalation of the spread of COVID-19 throughout the globe, the World Bank Group is providing dedicated financing of up to \$14 billion on a fast-track basis. Complementing the emergency financing measures, the WBG will provide policy advice and technical assistance to client countries that are ramping up measures to respond to the pandemic. Figure 1 provides an overview of the theory change that underlies the WBG COVID-19 emergency response.

Figure 1: Theory of Change for the World Bank Group COVID-19 Emergency Response



In pursuing a short- and longer-term agenda towards strengthened human capital and national systems for public health preparedness, there will be several components of the WBG COVID-19-related support to client countries. Component 1 focuses on the design and implementation of (short-term) prevention and containment strategies as part of the first wave of emergency response. Components 2, 3 and 4 will

in parallel focus on the design and implementation of (long-term) measures to, respectively, strengthen multi-sector and national institutions; support national and sub-national prevention and preparedness; and promote community engagement and participation.

In the short-term, under Component 1, the focus of the WBG-financed projects will be (i) case detection, confirmation, contact tracing, recording, reporting, (ii) social distancing measures, (iii) health system strengthening, (iv) communication preparedness, and (v) social and financial support to households. As the WBG and client countries move at an unprecedented pace to respond to the global pandemic, access to timely, policy-relevant, general population-representative information regarding knowledge of, responses to and impacts of COVID-19 and related restrictions will be key to effectively design, target and evaluate the policy interventions.

Since government-imposed social distancing practices are increasingly becoming common to fight the spread of COVID-19, these measures severely limit the use of traditional, face-to-face interviews in population-based surveys to address the data needs. Phone surveys, on the other hand, do not require face-to-face interactions and could elicit information from individuals and households rapidly and at low cost. And these platforms offer flexibility to alter sampling and/or questionnaire design in response of evolving information needs. There are, however, drawbacks associated with phone surveys, including (i) selection bias driven by a large, yet selected segment of the population owing a mobile phone, (ii) non-response bias (that often worsens throughout the life a phone survey), (iii) heterogeneity in mobile phone coverage, across geographies and population groups, and (iv) a limited scope for verifying accuracy of answers.

Despite these drawbacks, phone surveys emerge as a key part of the arsenal aimed at tracking the responses to and impacts of the pandemic. As daily life in our client countries is grinding to a halt, the window is closing for operationalizing phone survey systems that could meet the (likely-evolving) COVID-19 data needs. Therefore, we need to move fast in select settings with the right preconditions for developing and operationalizing systems that are anchored in harmonized designs and protocols – ultimately for the purpose of informing WBG-supported phone surveys set up elsewhere in the immediate future.

In rolling out the first wave of phone surveys, we need to consider all available opportunities and explore at least two potential approaches to identify phone survey subjects: (1) using as a sampling frame recent nationally-representative sample surveys that have elicited phone numbers for household members and, potentially, reference contacts, and (2) random digit dialing. These surveys could be implemented by national statistical offices (NSOs) or private firms, following a country-specific or a regional approach. Here, we focus on the idea of:

- a. a phone survey system that would be set up across several countries with the right enabling environment and that would select its subjects from households that had been interviewed by recent, country-owned, nationally-representative household surveys;

- b. partnering with the NSOs as the phone survey implementing agencies - in view of the confidentiality of the phone numbers, the established relationships between the NSO and sampled households, and the existing NSO phone survey experience (if exists); and
- c. developing and operationalizing harmonized phone survey designs and protocols to inform the design of similar WBG-supported efforts elsewhere.

As such, this proposal details a plan to leverage the ongoing World Bank Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) initiative and its infrastructure as a contribution to a broader effort to scale up the implementation of phone surveys across as many client countries as possible.

Specifically, it describes how to develop and implement prototype phone surveys that build on the experience and national longitudinal household surveys in a number of LSMS-ISA countries, namely Ethiopia, Nigeria, Malawi, Tanzania and Uganda, as an integral part of a larger, coordinated effort to implement, in the first phase, approximately a dozen WBG-supported high-frequency phone surveys across the globe, including in other countries in Sub-Saharan Africa (SSA), Middle East and North Africa (MENA), South Asia (SA) and East Asia and Pacific (EAP).

The proposed high-frequency phone survey (HFPS) in each of the 5 LSMS-ISA countries will track the responses to and economic impacts of COVID-19 in a general population-representative fashion by conducting monthly phone interviews with a national sample of households that had been interviewed during the latest round of the LSMS-ISA-supported national longitudinal household survey and/or an alternative, recent nationally-representative cross-sectional survey that may also be available.¹

This model has three major advantages.

First, it ensures cost savings in operationalizing an emergency response survey that would capture the dynamics of interest among general population – moving beyond the select segments of the population that could be reached through alternative means, including web surveys and social media, and including also poor households in less-served/rural areas, a focus of LSMS-ISA surveys. The HFPS could be operationalized without the need for face-to-face interviews given the readily-existing relationship with

¹ The latest rounds of LSMS-ISA-supported surveys include: Ethiopia Socioeconomic Survey (2018/19), Malawi Fifth Integrated Household Survey (IHS5) 2019/20 and Integrated Household Panel Survey (2019), Nigeria General Household Survey – Panel (2018/19), Tanzania National Panel Survey (2014/15), and Uganda National Panel Survey 2019/20. The attractive features of these surveys are that (a) they are owned by the country and integrated into the national statistical system; (b) they are designed to be representative at the national, urban/rural and regional-levels; and (c) they administer a rich set of multi-topic questionnaire instruments to a national sample of households (and individuals) that are tracked over time to study dynamics in agricultural productivity, employment, income and consumption, among others. The alternative recent nationally-representative cross-sectional surveys that can also be considered for informing the sampling frame of the phone numbers include the Nigeria Living Standards Survey and Tanzania Household Budget Survey. Sub-national Feed-the Future (FtF) Surveys that have been fielded in Nigeria and Tanzania and that have leveraged the LSMS-ISA platform may too be considered for FtF-oriented monitoring efforts.

the sampled households and the availability of household contact information that had already been solicited to facilitate future longitudinal tracking efforts.

Second, this model would leverage a decade of investments in the NSO capacity to design and conduct longitudinal household surveys. In doing so, it also promotes sustainability by enabling the partner NSOs to respond to the emergency data needs by re-orienting the existing longitudinal surveys, as opposed to building new, parallel systems of data collection. The investments in NSO phone survey capability could in turn enable future high-frequency phone survey efforts oriented around non-COVID-19-related topics. And in the case of Nigeria and Malawi, the NSO has experience with the implementation of phone surveys.

Third, this model would create a powerful longitudinal dataset that spans the period prior to, during, and following the pandemic and that would enable rigorous empirical research on the short- and longer-term effects of the pandemic - with the investigation of the latter being possible thanks to the future longitudinal survey rounds that would be fielded upon the easing of COVID-19 restrictions. Furthermore, the pre-COVID-19 information that had been collected in past LSMS-ISA survey rounds on the same survey subjects could be leveraged to counteract the potential selection and non-response biases that often plague phone surveys.

The overarching goals of the first wave of high-frequency phone surveys, including those leveraging the LSMS-ISA program, will be to:

- a. set up systems that are country-owned and versatile to meet the rapidly evolving data needs (through possible modifications/addition/rotations to the questionnaire, frequency of follow-up and/or target sample); and
- b. develop and validate harmonized instruments and protocols that would be promoted among the NSOs and/or contractors tasked with the implementation of similar phone survey systems elsewhere.

In designing and implementing the first wave of WBG-supported high-frequency phone surveys, Development Data Group (DECDG) and Poverty and Equity Global Practice (GP) has already established a strong coordination mechanism to avoid duplication of efforts and ensure harmonization of methodologies. Towards this end, five working groups have been established, namely (i) coordination, (ii) sampling, (iii) questionnaire design, (iv) implementation, and (v) innovations and opportunities. The working groups are meeting regularly to converge on a first set of recommendations to ensure as much harmonization as possible in each facet of survey design in all upcoming activities.

As of March 29, 2020, in each of Ethiopia, Malawi, Nigeria, Tanzania and Uganda, the existing LSMS-ISA country team has been augmented by the associated poverty economist(s); the respective NSO has been engaged to secure buy-in and start preparations for implementing the phone survey; and all activities are being in coordination with, and clearance from, the respective country management unit, with the goal of commencing the first round of interviews by April 15.

2. Sampling Design

In each LSMS-ISA country, the HFPS sample selection will begin with the complete set of enumeration areas (EAs) that had been visited during the latest round of the reference household survey. In each EA, as a function of budget availability, all or a random sub-sample of households will be selected out of the households that had provided a phone number for at least one household member or a reference contact/non-household member.² In the case of Malawi, Nigeria and Tanzania, where recent cross-sectional and longitudinal surveys are both available, the sampling design will explore building a frame of phone numbers that cut across both surveys.

As a point of reference, Table 1 presents the distribution of LSMS-ISA sample households according to phone number availability. For these LSMS-ISA surveys, the share of households with contact information (for household members or a reference person) ranges from 79.2 to 99.2 percent. The initial target sample of successfully completed interviews for each round of the HFPS is envisioned to be approximately 1,500-1,800 households. Based on preliminary power calculations, a sample of this size will be sufficient to track month-to-month changes in the key indicators for this survey (COVID-19 knowledge and behavior, labor market outcomes) at the national-level.³ While the sample will be stratified across urban/rural areas, the precision of estimates will be reduced for this subnational analysis. However, given the greater concerns regarding the spread and impact of COVID-19 in urban, high-population-density areas, a disproportionately share of the sample will be drawn in urban areas on a country-by-county basis.^{4,5}

The full sample of households with contact information will serve as the frame for the survey in each country. Given the likelihood of high nonresponse rates common in telephone surveys, an adaptive sampling approach will be implemented whereby interviewers are given an initial pool of households to contact and additional households randomly selected to replace those they are not able to successfully interview. Additional households will continue to be drawn from the frame until the required number of successful interviews is reached or the pool of the households to contact is exhausted. Therefore, the number of households that are contacted/attempted will be higher than the ultimate sample of successfully interviewed households. Based on recent similar follow-up phone surveys conducted in Nigeria, the rate of successful contact could be 75 percent or lower. This would imply that to achieve a sample of 1,800 successfully interviewed households would require contacting 2,400 households.

² To aid in the tracking of households and individuals as part of longitudinal follow-ups, the LSMS-ISA-supported surveys have been eliciting phone numbers for head of household, other household members and reference individuals from outside the household.

³ This sample size will at a minimum be sufficient to detect a 10-percentage point change between rounds of the survey (with a power of 90 percent and confidence of 95 percent).

⁴ In order to achieve this, the possibility of leveraging samples from other recent household surveys in the country (that collect phone numbers of respondents) will be considered.

⁵ The sampling design may also be dynamically adjusted over time to bring in additional households in specific geographies that see a rapid increase in confirmed covid-19 cases – again depending on the operational need.

Another major concern with telephone surveys is the potential for sampling bias due to nonresponse. Households without contact numbers are automatically excluded from the sample and likely have a different profile of characteristics than households with contact information. Even among households with phone numbers, those that are not successfully interviewed could potentially differ from those that were successfully interviewed in a systematic way. One advantage of drawing the sample from existing in-person surveys is that full information is available for all households from the in-person survey. The multi-topic data that had been collected in the reference survey will be leveraged to (i) understand the degree to which the initial target sample exhibit differences vis-à-vis the population that would not be covered by the HFPS, and (ii) ultimately, compute a propensity score adjustment in each country that would seek to counteract the effects of potential (initial) selection bias and (eventual) attrition among the HFPS target households – in an attempt to be as representative of the general population as possible.

Following the baseline interview and using the updated household roster vis-à-vis the latest LSMS-ISA round, a more targeted approach will be explored to select the adult household member for individual-level questionnaire modules - as opposed to administering the questionnaire modules in full to the initial respondent for the phone interview.

3. Questionnaire Design

The HFPS core questionnaire is designed in view of the corporate priorities that are underlying the emergency COVID-19 financing effort as well as countries' priorities. However, the core questionnaire may be adapted and complemented at the country-level. Each month, the HFPS households will receive a core set of questions to primarily capture the economic impacts of COVID-19, and these questions will be complemented by rotational questions on select topics that will be introduced each month and kept to agreed length. Within the core set of questions administered in each country, there will be a core that will be cross-country comparable.

The monthly interview with each HFPS household will not exceed 20 minutes, with an allowance of a few extra minutes in the baseline interview to allow for a proper introduction of the program and the updating of the household roster that will be fed forward from the survey that is serving as the sample frame for the phone numbers.

The first round of HFPS will cover topics including (1) knowledge of the existence of and channels of transmission of COVID-19 (likely to be rotated out after the initial round); (2) knowledge of and compliance with preventive measures with specific emphasis on social distancing and self-isolation; (3) prices and access to food and non-food necessities; (4) employment; (5) food insecurity; and (6) subjective wellbeing – with a focus on understanding the dynamics of economic impacts.

The HFBS questionnaire design is being refined by the questionnaire design working group, composed of select DECDG and Poverty and Equity GP staff members. The working group is eliciting inputs from the partner NSOs and the wider Bank community at the Headquarters and country-level, including staff from the Poverty and Equity GP, Health, Nutrition and Population GP, and Education GP.

4. Computer-Assisted Telephone Interviewing (CATI)

The World Bank *Survey Solutions* software and the readily-available Android Tablets that meet Survey Solutions specifications will be used for HFPS data collection and survey management. This offers several advantages. **First**, the software is well known to NSOs, from survey management to field interviewers. This allows for rapid deployment, with minimal need for staff training and remote technical support. This is a critical virtue for rolling out a survey that provides timely policy-relevant information in the face of a rapidly evolving emergency context. **Second**, the software supports the anticipated survey workflow. While initially designed and most often used for face-to-face computer-assisted personal interviewing (CAPI) surveys, Survey Solutions has successfully been used for CATI surveys in several contexts, from high-frequency agricultural surveys in Malawi to emergency response surveys in Somalia and Yemen. Should existing features fall short of a more extensive set of CATI-specific needs, there are two strategies. In the short-term, R Shiny applications that interact with Survey Solutions can be developed to extend the functionality of the platform. In the long-term, new Survey Solutions functionality can be developed to accommodate a broad range of CATI-specific needs. **Third**, Survey Solutions provides a robust platform for effective work of distributed teams. For the NSO data collection teams, it offers a mechanism for distributing and tracking survey work. For the World Bank teams, it allows a means both to track and to support data collection underway in each country.

Please refer to the **Annex** that describes the current thinking on the design and use of the Survey Solutions-based CATI platform.

5. Implementation Modalities

In each country, the HFPS will be implemented by the respective NSO, with support from the WB team. The HFPS interviews will be conducted by 20 to 25 selected NSO field staff that had been working on the LSMS-ISA-supported surveys. A total of 5 to 10 replacements will be recruited and trained. Each interviewer will be assigned to one of 2 to 4 NSO supervisors that will oversee their work program. The distribution of spoken languages among the interviewers will be aligned with the language distribution among the selected sample.

Over the years, the LSMS team has built capacity of NSOs in different areas, including phone surveys. For instance, in Nigeria, the National Bureau of Statistics (NBS) has a well-resourced call center that has been used to conduct several rounds of phone surveys in recent past. Similarly, the Malawi NSO participated in the World Bank Listening to Africa project and ran a small call center as part of a methodological experiment on measuring crop production in collaboration with the LSMS team in 2015/16. This has provided the staff at the office some experience in running a call center. Thus, the proposed phone surveys will rely on existing infrastructures in these countries, where possible and in accordance with local restrictions on social distancing and travel.

Given the likely suspension of fieldwork operations carried out by the NSOs, the potential unavailability of desired HFPS interviewers is a negligible risk. However, NSO staff may too transition to home-based

work. In that case, the HFPS interviewers will be provided with the necessary logistics, including mobile phones, SIM Cards and air time, to allow them to conduct the interviews from their homes. Where necessary, interviewers may be requested to use their personal phones to conduct the interviews at home and shall be reimbursed for phone credits/airtime. The interviewer selection will also consider their access to electricity and whether they have a reliable connection to the cell phone network for phone calls and mobile data use.

In each country, 3 days of training and piloting will be conducted prior to the implementation of the baseline interviews. A follow-up one day training will be carried out on a monthly basis before the start of each round of data collection. If social distancing measures do not allow us to set up centralized training activities, we will set up remote training sessions with the HFPS interviewers. It is possible that each training session may focus on a subset of the HFPS interviewers to ensure adequate attention to each interviewer.

Furthermore, appropriate measures will be taken to protect the safety of enumerators and supervisors during all HFPS activities. If there are centralized training activities prior to the commencement of the survey or if the NSO ends up relying on an existing call center, the current country guidelines regarding personal hygiene and social distancing will be enforced.

Each supervisor will allocate interview assignments to their assigned HFPS interviewers on a daily basis through the Survey Solutions platform. Each interviewer is estimated to interview 15 households per day, working 8 hours per day, and will make multiple call attempts to a household over a 3-day period. If an interviewer is not able to reach an assigned household over this duration, that household will be replaced. Replacement will be encouraged at baseline, except when there is an overhaul of the questionnaire in a particular survey round. Given the high likelihood that interviewers will conduct some of the interviews at home and in order to ensure quality control, random call-backs of selected households will be conducted. The survey will be monitored daily through the Survey Solutions platform by the NSO survey management and the LSMS teams. Data quality control will be managed through the Survey Solutions platform, over email, and on WhatsApp for real-time discussions of the survey experience.

Following the initial interview, the households will be called on a monthly basis (and if required, more frequently in select periods depending on the operational need), for a minimum of 12 months. In each month, the data collection will be completed in the first two weeks. Following each interview, each respondent will be provided free mobile airtime in exchange for their participation. The NPLS will explore the use of bulk text messaging to contact, schedule interviews, and keep in touch with respondents, as a strategy to reduce non-response. The baseline interviews are expected to start on or around April 15, 2020.

6. Outputs

The data and knowledge products that will be generated as part of the HFPS in the initial countries are “public goods” that will directly inform activities planned in countries beyond the initial dozen “early

adopters”, cutting transaction costs associated with the set-up of similar systems elsewhere. The idea of developing an online dashboard that could consolidate and disseminate insights from the first wave of WBG-supported high-frequency phone surveys will be discussed with the internal stakeholders. A full set of outputs and deliverables, and their specific format, will be discussed in the coming days with the WBG colleagues, partner countries and other potential users. But, at a minimum, the following two sets of products will be produced in almost-real time.

a. Data Products

The anonymized, unit-record microdata from each HFPS round will be made publicly available on the World Bank Microdata Library immediately after completion of that round, with the anonymized unit-record data being made available to the broader country-specific task team in real time. This will allow the widest possible use of the data. Each dataset will be accompanied with the questionnaire instrument and the basic information document. These datasets and related documentation will be disseminated under a single record that will be created for the HFPS and that will be updated on the World Bank Microdata Library on an on-going basis. The Survey Solutions CAPI questionnaire instruments will be made publicly available on the Survey Solutions Designer Platform, in sync with the public dissemination of the data.

b. Knowledge Products

Each round of HFPS data collection will be an input to a cross-country report that is produced with respect to an agreed tabulation plan, ideally within one week of completion of that round. Furthermore, a document will be prepared summarizing the experience in the initial set of countries and drawing lessons for other data collection efforts.

Table 1. Distribution of LSMS-ISA Samples According to Phone Number Availability

	Ethiopia - ESS 2018/19			Malawi - IHPS 2019			Nigeria - GHS-Panel 2018/19			Tanzania - NPS 2014/15*			Uganda - UNPS 2018/19		
	Urban	Rural	Overall	Urban	Rural	Overall	Urban	Rural	Overall	Urban	Rural	Overall	Urban	Rural	Overall
Sample Size in Latest LSMS-ISA-Supported Survey	3,659	3,129	6,788	785	2,160	2,945	1,592	3,384	4,976	1,368	1,984	3,352	803	2,371	3,174
Distribution of Households According to Phone Number Availability															
% with phone number for at least one household member	87.1	41.9	66.3	96.2	63.6	72.3	96.4	86.3	89.5	94.5	68.5	79.1	87.9	90.3	89.7
% with phone number for a reference contact (otherwise without a phone number for any household member)	6.1	20.8	12.9	1.4	1.2	1.2	3.5	12.6	9.6	2.2	9.7	6.6	8.2	5.1	5.9
% with no phone numbers	6.8	37.3	20.8	2.4	35.3	26.5	0.1	1.1	0.8	3.3	21.8	14.3	3.9	4.5	4.3

* Subsequent surveys utilizing a sub-sample of the NPS14/15 may be utilized to update contact information.

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Annex

Design and Use of HFPS Survey Solutions Platform

Overview of the CATI survey process

- Create assignments for the survey
- Make assignments to interviewers as a function of:
 - Interviewer's availability
 - Respondent's availability
 - Other relevant considerations (e.g., language, region, gender, etc.)
- Make attempts to contact the respondent household
- If successful,
 - conduct the interview, to the degree possible
 - record the outcome of the interview
- If not successful, record the result of the attempt (e.g., wrong number, no answer, asked to call back, refusal, etc.)
- Send the assignment back to survey management
 - Completed assignments will be removed from the pool of remaining assignments
 - Incomplete assignments that have exhausted allowed contact attempts will be removed from the pool
 - Incomplete assignments will be available for later assignment (e.g., make another contact attempt)
- Make additional attempts to contact the household, as needed
 - Stop if interview successful
 - Stop if exhaust survey protocol's max number of attempts

Detailed approach

Create survey assignments

Assignments consist of information about survey targets. At a minimum, assignment data provide the minimum information for contacting and identifying the survey target. For example, this could be a phone number to call and the name of a person with whom to speak. Ideally, assignment data provide information about the target that could help interviewers ask questions or survey managers match interviewers to respondents. For example, prior information could include the names, ages, and contact details of all members of the target household, and information on the language(s) spoken by the respondent and their likely availability (e.g., an occupation that might imply availability only in the evenings).

At the beginning of the phone survey, this information would be created based on information from prior surveys. For each LSMS-ISA-supported longitudinal household survey, the data available might differ

slightly. In some cases, phone contacts may have been collected for each household member. In others, phone contacts may have been gathered for only one key household contact. In still others, contacts may be available, in addition, for key contact(s) outside of the household (e.g., a neighbor or community leader).

As the survey progresses, this information will be supplemented with new information. If the target household is successfully contacted, one will learn when respondents are available. For example, the assignment may require calling back after 4PM on weekend days. If the target household is not successfully contacted, one will learn that other contacts—and perhaps some creativity—may be needed in order to track the household. For example, the assignment may require working through all contact numbers for the target household, and maybe even using contacts in the community in order to locate the target household.

Allocate survey assignments

CATI surveys typically have three modes of allocating assignments. The first is based, principally or exclusively, on the interviewer's availability. In this mode, survey management has a list of assignments, and allocates them to interviewers as interviewers are available. This approach arises in the least sophisticated CATI survey operations.

The second mode is to match interviewers and respondents based on attributes of the respondent known before any call attempt—attributes drawn from past data such as the respondent's language, region of origin, or gender. In this mode, survey management queries the overall list of assignments for those that are the best matched for a given respondent. This approach requires a bit more technological and managerial sophistication.

The third mode, a variant of the second, involves making allocation decisions based on information learned about target households during contact attempts. In this approach, survey management matches interviewers and respondents based both on previously known attributes (e.g., language) and on newly learned attributes (e.g., periods of availability). This approach requires even more technological and managerial sophistication.

Attempt to contact the target household

Once interviewers receive assignments, they will try to contact target households in order to interview them. To contact them, they will rely on preloaded contact details.

If successful in contacting the household, the interviewer will attempt to interview the household. This entails:

- Confirming that person on the phone is an eligible respondent
- Confirming the respondent's willingness to participate
- Communicating the expected time required for the interview (e.g., 10-20 minutes)
- Confirming the respondent's availability to participate in the survey right now

If the interview can continue, the interviewer will first record the attempt to contact the household in the questionnaire and then conduct the interview, asking all relevant questions. At the close of the interview, the interviewer will mark the interview as complete and send it to the server for storage.

If the interview cannot continue, the interviewer will record the interview attempt in the questionnaire (e.g., called the household at 6PM on Friday), the outcome of the interview (e.g., respondent not available/rescheduled), and any next steps (e.g., call back on weekend days after 2PM).

If the interviewer is not successful in contacting the household, the interviewer will record the contact attempt in the interview. The details of the attempt will include the time of attempted contact (e.g., Monday at 2:30PM) and the outcome of the attempt (e.g., no answer).

Continue contact attempts until stop rule reached

Attempts to contact target households will continue until either the interview is successfully completed, or the survey protocol dictates that the contact attempts cease (e.g., contact attempts exhausted, respondent refuses, etc.). The survey management system must be able to differentiate between cases where contact attempts should continue and where contact attempts must end.

Technical requirements

Create a CATI questionnaire

To be useful for a phone survey, assignments need to contain both initially known information as well as information gathered during the survey. For that reason, the Survey Solutions questionnaire needs two features. First, the questionnaire should contain fields for preloading information learned from the last LSMS-ISA-supported longitudinal household survey. While the scope and richness of information may vary across LSMS-ISA-supported longitudinal household survey, the minimum data package will contain a contact number for the household and the name of the household head. Where more information is available, more information will be preloaded. Second, the questionnaire should contain a section for capturing a log of all attempted (and successful) contacts with the household—for example, when the attempt was made, what number was called, what was the outcome of the attempt, what are the next steps for the assignment.

Preloaded contact information

The preloaded information will serve two functions. First, it will provide interviewers with contact details for all call attempts—materially, a phone number to call and a person’s name to request. Second, it will provide information to select when populating the call attempt roster—for example, which number was called (if there are multiple contacts for the household) and who initially answered the phone.

This information may need to be preloaded in two ways. To be useful for contact attempts, the information will need to be in “flat” human-readable format—for example, a comma-separated list of phone numbers with useful contextual information embedded (e.g., “55 55 55 55 (Moussa - head), 66 66

66 66 (Fatima - spouse)". To be useful for the contact attempt roster, the information will need to be in a structured machine-readable format—for example, a list of names and a tabular data set of people and contact numbers, such that names and numbers, respectively, could be selected in a linked question to record which number was called and who answered.

Contact attempt roster

The call attempt roster will work as follows. The roster will be designed to contain up to a certain number of contact attempts, the number of attempts being dictated by the survey design. The roster will contain the following questions:

- **When the contact attempt was made.** This will be a date-time question.
- **Which number was dialed.** If the number is one known from the last LSMS-ISA-supported longitudinal household survey, the potential answers will be drawn from numbers associated with the household. If the number was discovered during earlier attempts to contact the household, this number will be drawn from another source in the questionnaire.
- **Whether anyone answered the phone.** This will be a yes/no question.
- **Why no one answered.** Answers will include: invalid number, no answer.
- **Who answered.** Answers will be drawn from the household roster.
- **Outcome of the attempt.** Answers will include: answered and available, answered but unavailable, no answer, wrong/invalid number,
- **When to call back.** Through several questions, the interviewer will record when contact the household next.
- **Notes.** This text question will provide the interviewer to record any other useful information to facilitate the scheduling or conduct of future contact attempts.

Questionnaire content

TBD. See CN for more details

Create CATI assignments

Compile contacts from data

This is data management task that involves identifying variables with contact details and compiling them into a single file for all target households.

Evaluate whether contacts are adequate

Globally, this involves determining whether contact details appear adequate for each target household. At the level of each phone number, a script needs to determine whether the phone number appears valid—for example, whether it has the required number of digits, follows the expected pattern for known service providers, etc. At the level of each target household, a script also needs to decide whether there is at least one valid contact number.

Compile other contact information

Depending on the outcome of the evaluation, there are different next actions. If the household has adequate contact information, an assignment can be created for it. If the household does not have adequate contacts, some attempt must be made to either compile auxiliary contacts (e.g., get contacts for community members or neighbors apt to know the contact household) or gather contacts (e.g., call auxiliary contacts in order to get a phone number for the household).

Transform contacts into preload format(s)

Once adequate contacts have been compiled for target households, a script will transform the contact data from the current format into the format(s) required by the CATI application.

*Create a CATI management system**Decide on the best approach for a given context*

In a sense, running a CATI survey is no different than running a CAPI survey. In a CAPI survey, managers allocate work to interviewers, interviewers complete those interviews, and return completed interview for review. With that in mind, survey manager's role is, first, to make an initial allocation and, then, to monitor completed interviews. This role is somewhat passive. Whatever happens in between interview allocation and completion—making multiple contact attempts, making multiple calls to complete an interview, monitoring/reporting on progress—is left to interviewers to manage without oversight/assistance from survey managers.

In another sense, running a CATI survey may be different than a CAPI survey. In a CAPI survey, interviewers complete an allotted set of interviews in a single place (i.e., a primary sampling unit) over a set period of time (e.g., 1 week). Because work is fixed in space, interviewers completes their work for a given place before moving on to another place. Because interviews are long and rapport with households increases response rates, an interviewer typically completes all the interviews that they were initially assigned. In a CATI survey, the constraint of place is relaxed, but the constraints of time to completion may be more binding—particularly for this urgent survey on COVID-19. Because work is relatively disconnected from place, interviewers may interview any target households. Because starting an interview may require several contact attempts, different interviewers may make contacts to contact the same household. For example, one interviewer working a morning shift may call in the morning, another interviewer working an evening shift may call again in the evening, and still another interviewer working a weekend shift may call during the weekend. Because interviews are short, a single interviewer may complete the interview in 10-30 minutes. But because interview break-off is more likely with CATI than CAPI, completing an interview may require several interview sessions—potentially by different interviewers, depending on how well the respondent's and the initial interviewer's availability align. With all the above in mind, the survey manager's role is to allocate interview assignments, assess next steps after each contact attempt, and reallocate interviews until all interviews are completed. This role is quite active. The interviewers

Two broad approaches to CATI management

This comparison above articulates two broad approaches to CATI survey management. In the first, survey managers are passive. They allocate interviews and then await results. This approach keeps things simple but may sacrifice efficiency. In the second, survey managers are active. They allocate interviews and then reallocate them, as needed, in order to get work done in the shortest possible time. This approach keeps things efficient but may sacrifice simplicity.

Option 1: Keep it simple

The first approach—of keeping things simple by running a CATI survey like a CAPI one—has several virtues. First, it keeps things simple in terms of responsibilities. The responsibilities for survey managers are clear: assign interviews; monitor results; chastise/help interviewers if their results are not up to expectations. The responsibilities for interviewers are equally clear: call households as much as needed to make contact; work as hard as possible to complete interviews.

Second, it keeps things simple in terms of actions. At the outset, survey managers allocate interviews. After that, interviewers complete their allocation. If interviewers complete their initial assignments, survey managers allocate more assignments. If interviewers fail to complete initial assignments, survey managers either let interviewers continue working on incomplete initial assignments or ask interviewers to move on to new assignments.

Third, it keeps things simple by keeping them familiar. For interviewers, the CATI workflow would exactly match the familiar CAPI one: sync to receive assignments, start interviews, stop and re-start interviews as needed, complete interviews when finished, and sync to send completed interviews for review. For survey managers, the CATI workflow would be equally familiar: make initial assignments to interviewers, react to incoming completed interviews, assign new interviews as needed.

Fourth, it keeps things simple in terms of technology. One technological component is the need for internet access. At the survey's start, interviewers need to sync in order to get their assignments. As interviewers complete assignments, they sync to send them to the server. If new assignments are needed, interviewers sync to get them. Otherwise, interviewers can work offline. Likewise, survey managers can get updates on progress through phone calls to interviewers. This may be an important virtue if cellular networks are saturated during COVID-19 outbreaks. Another technological component is the need for a survey management system. To assign interviews, survey managers use Survey Solutions Headquarters. This simply involves finding an assignment and assigning it to an interviewer. To monitor work progress, survey managers use a traditional system outside of survey solutions—for example, calling interviewers to get an update on work in progress and compiling it in an Excel document. This may be a welcome virtue in that Survey Solutions, with its existing functionality, could be used without any effort on the part of WB or NSO staff to develop a new solution and to train on use of that solution.

This approach—of managing a CATI survey like a CAPI one—also has several definite or likely downsides. First, it makes interviewers' work invisible until completed interviews are sent. When an interview is still with an interviewer, survey managers cannot see what progress has been made. Because of this, survey

managers cannot provide interviewers feedback or support on their work in progress. For example, supervisors cannot advise interviewers to call at different hours in order to reach a household or move an unproductive assignment to others. Because of this also, survey managers cannot easily observe how much work remains at any given moment at time. For example, survey managers do not know whether an incomplete assignment has been started, how many call attempts have been made, or whether an interview has begun or not. This lack of information will lead survey managers either to wait passively until completed assignments are sent, or to call each interviewer for updates daily.

Second, it may imply that more time (or human resources) is required to complete a given survey sample. If interviews stay with the interviewers to which they were initially allocated, the time needed for survey completion is a function of the time needed for the slowest interviewer to complete. If difficult interviews stay with their initial interviewer, each interviewer's workload may take longer to complete. For example, a difficult to reach respondent may take longer to reach if contact attempts can only be made during a single interviewer's availability. If difficult interview cases are not reallocated to other interviewers who have different availability, more interviews may exhaust contact attempts before successful contact is made.

Option 2: Keep it efficient

This approach—of constantly monitoring progress and reassigning cases to promote interview completion—has several virtues. First, it allows managers to spread work across a team in order to maximize chances of interview completion—for example, after an unsuccessful call attempt during the day/weekday, shifting the assignment to another interviewer for an evening/weekend call attempt.

Second, it makes the work of interviewers visible to survey managers. After each contact attempt, the interviewer marks the interview as complete and sends back to the server for evaluation and reassignment. In this way, the survey manager can see for each interview what work has been done (e.g., completed 4th unsuccessful contact attempt during the weekday), can understand what work needs to be done next (e.g., make another call attempt), and can decide on the next action (e.g., move call attempts to nights and/or weekends). In similar fashion, the survey manager can have a real-time overview of survey—of the progress made, of the work in progress, and the workload for different segments of interviewers (e.g., daytime/nighttime workers, weekday/weekend workers). As a result, the survey manager has the control needed in order to make most efficient and effective work of the human resources available for the survey.

This approach, of course, is not without its downsides. **First**, it requires adoption of a new workflow. For CAPI surveys, as outlined above, the typical workflow for survey managers is to allocate assignments and then react to incoming completed interviews—and for interviewers is to receive assignments, complete them, and sync completed work. For CAPI staff to move to a CATI workflow, there will be some (re)training required. **Second**, it requires regular syncing, and internet to do that. If interviewers must sync and supervisors assign often, they need the internet connection to do so. If internet proves problematic, this approach will become difficult to implement. If work can be performed in a call center, this problem may be less likely to arise. If the survey team needs to move to home-based work, this problem may be more

likely to arise. Intimate knowledge of the country context—and of the connectivity both at the office and at interviewers’ homes—will be required to evaluate the severity of this risk. **Third**, it requires a new survey management system—and time build it and some effort to train it.

Build an appropriate survey management system

Each approach has different technological requirements for a survey management system. The section below tries to articulate those needs for the approaches outlines above. Option 1 consists of managing a CATI survey like a CAPI one. Option 2 requires managing a CATI survey in the way most appropriate for that mode of data collection.

Option 1: using existing SuSo functionality

Without any additional work, Survey Solutions provides survey managers the ability to search and allocate assignments based any information that’s preloaded to identify the assignments (e.g., previously known location of the respondent, previously known language of the respondent, etc.). To use this functionality, the survey manager simply navigates to the list of available assignments and performs a simple text search. Search operates over the identifying questions of all assignments and returns those assignments where the search term is found.

While quite useful, this functionality has several limitations. Search cannot target a single identifying question (e.g., find all Bambara speakers), process multi-term queries (e.g., find all Bambara speakers that are male), or accommodate queries that rely on information captured in the interview (e.g., find all calls rescheduled for Saturday afternoon).

Option 2: Extending SuSo functionality

To meet the full needs of phone surveys, one would need to extend Survey Solutions’ functionality by developing an external application that operates as an interface for Survey Solutions—that is, that draws necessary data from Survey Solutions, that creates a more sophisticated view of assignments, and that allows the user to take actions on those assignments. This is both possible and realistic. Thanks to a rich application programming interface (API), Survey Solutions has an in-built mechanism for interacting with external application. With the API, anything that could be done through the point-and-click interface could also be done through a script or application. Thanks to prior work, members of the Survey Solutions team has some tools that could be build a solution that meets a phone survey’s needs. This includes an R package for interacting with Survey Solutions’ API, a tool for building interactive user interfaces (i.e., R Shiny), and a platform for deploying these interfaces to survey managers (i.e., RStudio Connect).

The task of building a bespoke phone survey management system on top of Survey Solutions will entail the phases of work described below.

Articulate requirements

While this document attempts to articulate a survey manager’s needs, it would be good to brainstorm requirements before starting work. Based on this, the team should decide on what functionality is mission critical and what would be nice to have.