NCD Mobile Phone Survey Implementation Guidelines

NCD Mobile Phone Survey
Implementation Guidelines

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1. INTRODUCTION

1.1 Overview

Noncommunicable diseases (NCDs) are the leading cause of death worldwide. Efficient monitoring and surveillance are cornerstones to track progress of NCD burden, related risk factors, and policy interventions. The systematic monitoring of risk factors to generate accurate and timely data is essential for a country's ability to prioritize essential resources and make sound policy decisions to address the growing NCD burden.

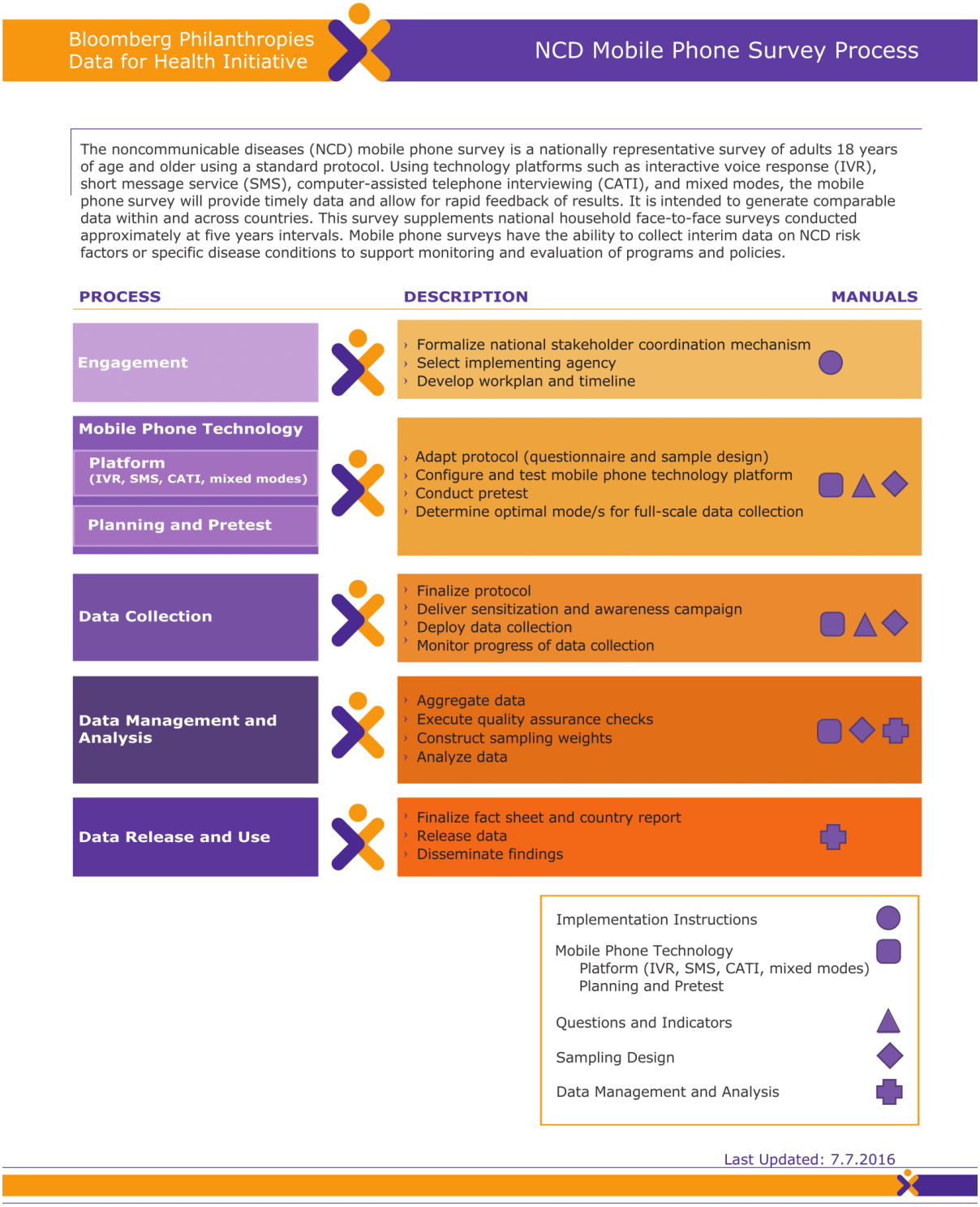
With increasing access and use of mobile phones globally, opportunities exist to explore the feasibility of using mobile phone technology as an interim method to collect data and supplement household surveys. Such technologies have the potential to allow for efficiencies in producing timely, affordable, and accurate data to monitor trends, and augment traditional health surveys with new, faster mobile phone surveys.

The Bloomberg Data for Health initiative aims to strengthen the collection and use of critical public health information. One of the components of the initiative aims to explore innovative approaches to NCD surveillance, including the use of mobile phone surveys for NCDs. The main objectives of this component are to assess the feasibility, quality, and validity of nationally representative NCD Mobile Phone Surveys and propose a globally standardized protocol. The specific objectives are to:

- Implement mobile phone surveys in ten countries and support face-to-face (F2F) STEPS surveys in six overlapping countries
- Compare findings from the two methodologies

The NCD Mobile Phone Survey is a nationally representative stratified survey of adults 18 years of age and older. The survey uses standardized instruments and procedures reviewed and approved by international experts. This includes a core questionnaire with optional questions, sample design utilizing random digit dialing, data management procedures, and data collection using single or mixed-mode technology such as interactive voice response (IVR), short message service (SMS), and computer-assisted telephone interviewing (CATI). The implementation process consists of five stages: 1) engagement and orientation; 2) mobile phone technology and pretesting, which includes formative and optimization phases; 3) data collection; 4) data management; and 5) data release and use. Details on each stage are presented in the NCD Mobile Phone Survey Process Chart (see **Figure 1**).

Figure 1. NCD Mobile Phone Survey Process Chart



1.2 Purpose

The purpose of this document is to provide step-by-step guidance for the implementation of the NCD Mobile Phone Survey.

2. ENGAGEMENT PROCESS

2.1 Country Commitment and Partner Engagement

The Bloomberg Data for Health initiative partners begin the engagement process by introducing the initiative and inviting the country to participate through the Ministry of Health (MOH) and other key national officials. Once the country officials have expressed interest in joining the NCD surveillance component, the partners will provide an official engagement letter to MOH, and a commitment letter is then expected from MOH.

An introductory engagement mission to begin planning for a successful implementation of the NCD Mobile Phone Survey will be organized for discussions with the key implementing and coordinating organization and other partners, such as the Ministry of Information and telecommunications providers. The objectives of the engagement mission include identification of stakeholder coordination mechanisms, delineation of partner roles and responsibilities, selection of an implementing agency (IA), and development of plans for implementation of the survey.

See **Appendices A** and **B** for examples of engagement letter and agenda templates for engagement missions, respectively.

2.2 Technical Exchange

Partners from the Centers for Disease Control and Prevention (CDC) and the Johns Hopkins Bloomberg School of Public Health (JHSPH) are available to engage in technical exchange.

Once the political commitment is obtained from the country, a series of technical workshops will be held to ensure the implementation of the NCD Mobile Phone Survey according to agreed parameters, including the following:

1. **Pretest (formative and optimization phases) training and implementation.** This workshop will provide an opportunity for technical exchange and guidance on adapting the mobile phone survey, testing and finalizing the technology platform, and developing the sample design. In addition, technical issues will be identified and resolved to optimize survey delivery.
2. **Data management (analysis and reporting).** This workshop will focus on quality assurance, sample weighting, and analysis and reporting after data collection.
3. **Release and dissemination.** Technical exchange will focus on media release and dissemination of NCD Mobile Phone Survey data. In addition, the use of data will be discussed.

These workshops will be attended by relevant subject matter experts from partner organizations, MOHs, and IAs.

2.3 Implementing Agency Selection Process

The MOH will be responsible for selecting the IA in consultation with partners.

The IA of the NCD Mobile Phone Survey should have the following experience and capabilities:

- Previously partnered with or willing to partner with MOH
- Able to conduct training activities, fieldwork preparation, implementation, data management and analysis, and quality assurance procedures
- Able to access or generate national sampling frame and implement sample according to the ***Sampling Design Manual***
- Previously conducted nationally representative survey(s)
- Able to preserve the confidentiality of respondents' data
- Able to administer contracts efficiently and enter into international contracts
- Able to develop budget proposals and process funding from donor agencies and partners
- Able to translate key manuals and guidelines internally or through a contractor
- Able to repeat the survey in the future

The IA of the NCD Mobile Phone Survey should have the following infrastructure:

- Available human resources (i.e., dedicated team and project manager for mobile phone survey)
- Existing information technology (IT) department to assist with the mobile phone survey procedures
- Existing training department or access to training facilities

2.4 Country Ethical Clearance

IAs are strongly encouraged to obtain ethical approval for their NCD Mobile Phone Survey using their in-country approval process. Ethical clearance ensures that data is collected according to accepted governmental standards. Underlying this is the idea that the risk of harm to participants is minimized while being fully compliant with relevant in-country laws governing ethical clearance.

2.5 Documentation for Partner Engagement

Countries participating in the NCD Mobile Phone Survey may want to develop Terms of Reference outlining the scope of the partnership for the project (see **Appendix C** for template) and a coordination committee for project management (see **Appendix D** for an example).

3. PROTOCOL

3.1 Questionnaire

3.1.1 Adaptation

- Prior to the pretest of the NCD Mobile Phone Survey, begin with the ***Questions and Indicators Manual***.
- To maintain comparability across countries in this initiative, IA should not revise standard core questions (unless prompted for country-specific categories).
- Highlight the country adaptations to the NCD Mobile Phone Survey Core Questionnaire so they can be easily referenced.
- Use strikethrough to note deletions of any core questions so they can be easily referenced.
- Skip patterns should only be changed when necessary because of additions or deletions to the questionnaire.
- Modify question item lists where prompted.
- Add any questions deemed important for the country.
- Limit the number of additional questions to maintain a realistic questionnaire length (refer *to* ***Mobile Phone Technology: Formative*** and ***Optimization Phase Manuals*** for details).
- Adaptations need to be aligned across modes (i.e., IVR, SMS, CATI, mixed-modes) to ensure comparability.
- After the pretest (formative and optimization phases), make modifications to the questionnaire based on results of the pretest.

3.1.2 Translation

The IA is responsible for the translation and back-translation of survey questionnaires with the support of language experts. Two options for translating the questionnaire are presented below.

Option 1

- Translate the ***Questions and Indicators Manual*** into the local language and make adaptations in local language.
- Finalize draft questionnaire in the local language.
- Translate draft questionnaire into English.
- Share the English version of the draft questionnaire with CDC and JHSPH for comments and suggestions.

- Finalize the English questionnaire taking into account comments and suggestions from CDC and JHSPH.
- Incorporate any final revisions from the English version into the local language questionnaire.

Option 2

- Make country-specific adaptations in the English version of the ***Questions and Indicators Manual***.
- Finalize the draft questionnaire in English.
- Share the English version of the draft questionnaire with CDC and JHSPH for comments and suggestions.
- Finalize the English questionnaire taking into account comments and suggestions from CDC and JHSPH.
- Translate the final English country-adapted questionnaire into the local language.
- Back-translate the local language questionnaire into English.
- Share the back-translated questionnaire with CDC and JHSPH to ensure consistency with the original questions.

For details on the questionnaire review process, refer to ***Data Management and Quality Assurance Manual***.

3.2 Sampling Design

3.2.1 Sampling Frame

- The IA should review the ***Sampling Design Manual*** before beginning the sample process.
- Meet with the telecommunications regulatory agency to gain support and learn about potential legal obstacles.
- Meet with the telecommunications providers to:
  - Identify the range of prefixes for mobile phone numbers.
  - Determine local disposition codes that will need to be standardized to American Association for Public Opinion Research (AAPOR) disposition codes described in Section 8.3 of the ***Sampling Design Manual*** (e.g., codes each telecommunications provider uses for successful connect, unavailable mobile phone numbers [MPNs], unavailable network connection, etc.).
- Perform the optimization phase to determine:
  - Non-response rates
  - Eligibility rates
- Adjust the sampling design and sample size based on the results of the optimization phase.

3.2.2 Sampling Summary Table

Below is a summary of the sample design features of NCD Mobile Phone Survey, which provides a tabular overview and specifications of the entire sample design.

Sample Design Specification of NCD Mobile Phone Survey [Country]
[CDC Country Technical Focal Point, e-mail]
[Date Prepared]
[Eligibility Definition for Survey Population]

Sampling Unit and Frame Source	Stratification	Sample Selection	Overall Sample Size
What is being sampled and from what sampling frame?	*Stratify by what (e.g., sex, age)?* *Which sample allocation approach?*	*How will random selection be used?*	*What is the sample size across all strata?*
Sampling Unit: [Range of MPNs/list of MPNs] Frame:	[Range of MPNs/list of MPNs] Master sample:	[Range of MPNs/list of MPNs] Master sample:	Survey selection probability (to be recorded on respondent data file):

4. TECHNOLOGY PLATFORMS

4.1 Introduction

Mobile phone technology platforms, such as IVR, SMS, and CATI, have facilitated rapid data collection and feedback in recent years. Depending on the technological landscape of each country each method has its strengths and weaknesses, summarized in **Table 1** below.

Table 1. Strengths and Weaknesses of Methods

	SMS: The user is able to use text messaging to answer text message questions displayed on the screen.	**CATI:** The user is interviewed by a live person in a call center.	**IVR:** The user is able to use a touch-tone keypad to respond to questions that are audio recorded.
Strengths	▪ Fastest method ▪ Popular mobile data service	▪ Best measurement quality (live interviewer) ▪ Best quality control ▪ Higher response rates	▪ Does not require literacy ▪ Middle ground between SMS and CATI (in terms of question length, number of questions, cost, and speed)
Weaknesses	▪ Requires literacy ▪ Short question length	▪ Potential for interviewer bias ▪ Slower than SMS, IVR	▪ Unfamiliar to respondents, so may result in poor data quality ▪ Audio recordings of questions and responses lead to longer time to test and finalize

The following sections provide guidance on implementing the NCD Mobile Phone Survey on the IVR platform.

The subsequent version will be expanded further to include guidance on SMS and CATI platforms as well as selection of mode(s) for survey administration.

4.2 Interactive Voice Response

4.2.1 Adaptations

Questionnaire: Recording and Storage of Question Audio

Materials: Quiet room, final questionnaire, and desktop or laptop computer with attached microphone

- Provide survey narrator a copy of the translated, back-translated version of the questionnaire adapted for IVR, preferably days before recording to allow for time to practice. Bold any words that the narrator should intonate.

- Obtain a microphone and audio recording device.
- Place narrator in a quiet room with the microphone and audio recording device. Ensure that the computer fan noise is not excessive or being picked up by the microphone.
- Turn on the recorder, and provide a three second pause (no sound) before recording each question.
- Starting with the introduction, have the narrator read aloud the script while speaking into the microphone. Speak far enough from the microphone to avoid popping sounds when speaking certain words. Stop the audio recording and listen to it to verify and approve sound quality and content.
- Save the audio file in the highest quality format (highest sampling rates and bit depth) supported by the IVR platform; save file as "LANGUAGE __Introduction."
- Continue recording the survey questions beginning with Question 1.
- Name the saved audio file using the recommended format: "LANGUAGE_Question Number."
- Continue recording and saving audio files one by one until all questions have been individually audio recorded.
- Edit the audio to suit telephone surveys.*
- Upload audio files to the IVR platform.

*Audacity (http://www.audacityteam.org/) is an example of a free, easy-to-use program that can be used to edit and record audio files. It works on Windows, Mac OS X, GNU/Linux, and other operating systems. Tutorials available from URL: http://www.audacityteam.org/help/documentation.

Questionnaire Integration to IVR Technology Platform

The exact methods for integrating the questionnaire into the IVR platform are dependent on the IA's selection of an IVR platform. The following are generalized steps for integrating the questionnaire:

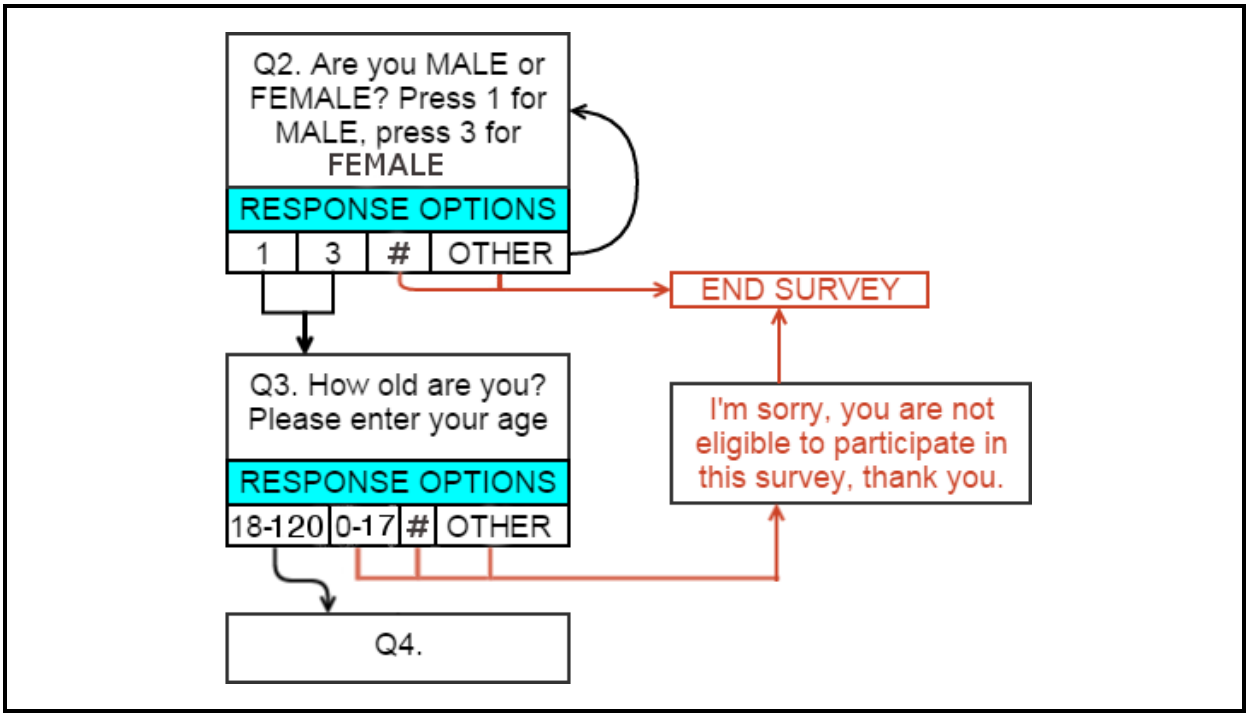
- Generate a detailed codebook of the questionnaire, where each question is precisely articulated, together with the appropriate responses and the numeric codes associated with each response.
- Key columns to include in this codebook are the module name, the question number within that module, the question type (multiple choice or numeric), the question wording, the response options, the skip patterns, and the variable name (for database purposes). For the response options column, include the range of acceptable values.
- For numeric questions, such as age, the range of acceptable answers is 18–120. For multiple choice questions, include all the available options and assign them a numeric code (e.g., 1 = MALE, 3 = FEMALE). In the response options column, also include any response to indicate refusal. In the Skip Patterns column, indicate the sequence of questions for each of the provided response options.

Table 2. Example Codebook for Demographics

Module	Question #	Question Type	Question	Response Options	Skip Patterns	Variable Name
Demographics	Q1	Multiple Choice	Are you MALE or FEMALE? If you are MALE, press 1. If you are FEMALE, press 3.	1 = MALE 3 = FEMALE # = Refuse	If 1 or 3, ask Demographics Q2. If #, END SURVEY	SEX
Demographics	Q2	Numeric	How old are you? Please enter your age. If you don't know exactly, please make your best guess. If you still can't provide an answer, press #.	0–120	If 18–120, ask Demographics Q3. If 0–17, 120+ ,END SURVEY	AGE

- To facilitate the integration of the questionnaire into the IVR platform, generate a flow diagram of each module to pictorially show the skip patterns as seen below.

Figure 2. Skip Pattern Diagram Example



4.2.2 Training

Pretest Phase Planning Checklist

Action	Responsible
Protocol is shared with IA.	CDC
Protocol is translated into local language(s), if needed.	IA
Pretest training	
Agenda template is shared with IA.	CDC
Agenda is finalized to cater to country needs.	CDC, IA
Participant list is finalized (includes formative/optimization phases interviewers, IT experts, etc.).	IA
Questionnaire	
Country- and mode-adapted questionnaires are completed.	IA, CDC, JHSPH
Final questionnaires are approved.	CDC, JHSPH
Questionnaires in local language(s) are available.	IA
Sampling design	
Sampling design is developed and available.	IA, CDC, JHSPH
Formative phase	
Final interview guides for key informant (KI) interviews, focus group discussions (FGDs), and semi-structured interview (SSIs) are available.	IA
KI interview, FGD, and SSI interviewers and participants are recruited and identified.	IA
Informed consent form, project information, and voice recorder are available.	IA
Survey questions, introductions, and prompts are recorded using different voices in local language(s).	IA
Survey (with audio recordings) is available on the IVR platform.	IA
Paper-based version of the IVR survey is available in local language(s).	IA
Report with formative phase results is available to inform the optimization phase.	IA
Optimization phase	
IVR survey available with voice determined during formative phase.	IA
Agreements have been made with telecommunication providers on the delivery of incentives to respondents.	IA
Community sensitization message are finalized to inform selected respondents of survey overview, delivery time, and incentives.	IA
Interview guide is finalized for non-respondents, drop-off callers, and those who refused to participate.	IA
Report with optimization phase results is available to inform the full survey implementation.	IA

Pretest Training and Implementation Activities and Timeline

Days	Activity/Objective
3	Provide training on formative phase interviews FGDs
3	Provide training on IT/data management (see detailed agenda below)
3	Participant recruitment
7	KI interviews
15	FGDs
15	SSIs
3	Deploy and observe IVR survey
2	Aggregate data
1	Debrief with all partners
7	Prepare pretest report with recommendations for full survey

IT/Data Management Training Workshop Template

Day 1	
AM	Overview of functionality and setup of IVR platform
PM	Final review of questionnaire Run-through of questionnaire on IVR platform
Day 2	
AM	Quality assurance processes
PM	Data monitoring response rates, disposition codes, data view Data management
Day 3	
AM	Review plan for pretest and full survey

4.2.3 Testing

IVR Specification Checklist

This section will be expanded further in the subsequent version.

Formative Phase

The formative phase aims to contextualize the use of mobile phone surveys on an IVR platform for usability and optimal performance in participating countries through KI interviews, FGDs, and SSIs.

For more information, refer to the ***Mobile Phone Technology: Formative Phase Manual***.

Key Informant Interview Process

The objective of KI interviews is to discuss lessons learned and identify challenges from KIs who have experiences with NCDs or mobile phone surveys.

Participant Recruitment and Preparation

- In-country IA will identify MOH officials, researchers with experience in conducting NCD surveys or in using mobile phone–based platforms for other health surveys, and in-country technical partners engaged with NCDs or in generating NCD data.

- Team members skilled in conducting SSIs and note taking will conduct the KI interviews.

Conducting the KI Interview

- Permission will be sought to audio record the interviews for future reference, if needed. (No names or identifying information will be used or recorded when conducting KI interviews.)
- Sample topic guides can be found in the ***Mobile Phone Technology: Formative Phase Manual***.

Data Management

- Interviews will be transcribed into the local language, translated into English, and then back-translated into the local language to ensure accuracy of transcription and translation.
- Audio recordings will be destroyed.
- Translated KI interview transcripts will be destroyed after 3 years.
- De-identified data will be stored on a secure server by in-country IA.
- Two team members will review transcripts and notes from the KI interviews and independently prepare synthesis on findings on the following:
  - Likely policy implications and potential use of survey results;
  - Experiences with using incentives, cultural and political sensitivities, and suggestions for adapting the survey and design features to fit the country context;
  - Experiences conducting mobile phone surveys to inform perceptions on the appropriateness of survey questions and design features.

Focus Group Discussions Process

The objective of the FGDs is to explore community acceptance and willingness to respond to an IVR platform.

Participant Recruitment and Preparation

- In-country IA will recruit participants from the community who are 18 years of age and older and willing to sign an informed consent.
  - Participants will be selected to proxy for similar demographic groups as those that will be targeted by the NCD Mobile Phone Survey, including language spoken, age, sex, and location (urban vs. rural).
  - Prior to enrollment, participants will be provided an overview of the FGDs and given time to ask any questions.

Conducting the FGD

- Permission will be sought to audio record the interviews for future reference, if needed. (During recording, participants will only be identified by their IDs.)

- Enrolled participants will be administered a short F2F survey.
  - Survey topics include respondent demographics, preferred language to participate in a mobile phone survey, and questions on preferred voice of an IVR platform.
- Up to 5 FGDs will be conducted with groups of 7-9 participants each.
  - Discussion topics include perceptions (e.g., on incentives and disincentives), acceptance and willingness to participate and complete mobile phone surveys on the IVR platform, and overall potential challenges, barriers, and solutions.
- Sample topic guides can be found in the ***Mobile Phone Technology: Formative Phase Manual***.

Data Management and Use

- Interviews will be transcribed into the local language, translated into English, and then back-translated into the local language to ensure accuracy of transcription and translation.
- Audio recordings will then be destroyed.
- Translated discussion transcripts will be destroyed after 3 years.
- De-identified data will be stored on a secure server by in-country IA.
- A brief report will be compiled by the in-country implementing team on the following:
  - Demographic survey
    - Enter and tabulate the demographics;
    - Analyze voice preference.
  - Transcribe, translate, analyze, and synthesize FGD data for 5 groups of up to 45 participants on:
    - The acceptability of a survey on an IVR platform and willingness to respond to an IVR-delivered survey;
    - Pairing of incentives (timing, amount, and structure) for completing an IVR-delivered survey;
    - Potential challenges, barriers, and solutions.
- The results will be used to modify the IVR platform and survey.

Semi-structured Interviews Process

The objective of SSIs is to explore the influence of local factors and context, refine the usability of the IVR platform, and compare performance between IVR and F2F surveys in community members.

Participant Recruitment and Preparation

- In-country IA will recruit participants from the community who are 18 years of age and older and willing to sign an informed consent.

  - Participants will be selected to proxy for similar demographic groups as those that will be targeted by the NCD Mobile Phone Survey, including language spoken, age, sex, and location (urban vs. rural).
  - Prior to enrollment, participants will be provided an overview of the SSIs and given time to ask any questions.
- NCD Mobile Phone Survey questionnaire will be translated into local languages and back-translated to English.
- Five to six local staff members, representing different categories of age, sex, and pitch of voice, will be identified to provide narration (in local languages) of the survey.

Conducting the SSI

- Permission will be sought to audio record the interviews for future reference. (During recordings, participants will only be identified by their IDs.)
- Up to 5 SSI groups of approximately 7–11 individuals will be led by an in-country moderator and several assistants trained in formative research.
- Enrolled participants will be administered a short F2F survey.
  - Survey topics include respondent demographics, preferred language to participate in a mobile phone survey, and questions on voice of an IVR platform.
- Participants will be placed in a private room, and an IVR survey will be sent to their mobile phone (either personally owned or provided by survey staff).
  - The order of the survey questions will be the same within a SSI group but vary across the 5 SSI groups.
- Survey staff will record the following:
  - Average time spent on each question;
  - Number of times questions were repeated;
  - Number of "Do not know" or "Refused" responses;
  - Overall subjective assessment of the participant's ability to navigate the IVR survey.

  Note: survey staff will not assist participants with IVR survey completion
- Moderator will determine the following from participants:
  - Acceptability of translation;
  - Preference on voice narrating survey;
  - Most engaging introduction;
  - Experience in responding to the IVR survey administered before the SSI.
- After the SSI, survey staff will interview the same participants using a F2F paper-based version of the IVR survey.

- Comparisons of results from IVR and F2F paper-based surveys will be made to assess the comparability of answers and understand if any IVR questions are problematic.
- Survey staff will initiate conversation with participants for any discrepant answers.
- Sample topic guides can be found in the ***Mobile Phone Technology: Formative Phase Manual***.

Data Management and Use

- Interviews will be transcribed into the local language, translated into English, and then back-translated into the local language to ensure accuracy of transcription and translation.
- Audio recordings will then be destroyed.
- Translated discussion transcripts will be destroyed after 3 years.
- De-identified data will be stored on a secure server by the in-country IA.
- A brief report will be compiled by the in-country implementing team on the following:
  - Demographic survey
    - Demographics;
    - Analyze voice preference.
  - Assessment of 5 groups of data of up to 55 participants on participants' ability to successfully navigate an IVR-delivered survey data
    - Duration of survey;
    - Difficulty on navigating through survey;
    - Number of and identification of questions that needed to be repeated;
    - Number of and identification of questions that were refused;
    - Opinions on translation and comprehension of survey questions;
    - Participant feedback on survey voice and introduction;
    - Experience and challenges with IVR platforms.
  - Comparability of IVR responses with F2F responses
    - Compare F2F data to mobile phone data;
    - Summarize open-ended discussion on difference between F2F and IVR-delivered surveys with the participants.
  - Summarize the voice preference data from both the demographic survey and the voice preference data during the SSIs (playback of preferred prerecorded recordings)
  - Summarize the overall experience for up to 55 participants
    - Summarize preferred voice introduction;
    - Experiences in responding to the survey that was administered before the SSI;

  - Open-ended questions about survey length;
  - Ease or difficulty in answering NCD-related questions on an IVR platform;
  - Potential problems they foresee with using an IVR platform.
- The results will be used to modify the IVR platform and survey.

Optimization Phase

The main objective of the optimization phase is to identify technical issues associated with staged scale-up, such as survey deployment, data capture, and data extraction, and to assess baseline survey response and completion percentages. A series of sub-assessments will be conducted to improve the survey's contact, response, and completion rates.

For more information, refer to the ***Mobile Phone Technology: Optimization Phase Manual***.

Preparation of Questionnaire

- Questionnaire will be translated from English into local languages and then back-translated to ensure accuracy.
- Country residents with voice that was determined from formative phase will be recruited to provide audio recording of the survey.
- The audio recording of the survey will be uploaded into the IVR platform and tested during the formative phase to identify any issues.

Baseline Assessment

- IVR surveys will be sent to randomly dialed participants at random times of the day potentially (8 a.m. to 8 p.m.) until 100 respondents have completed the survey.
- An SMS will be sent to selected participants to notify of the upcoming IVR survey along with information on incentives.
- The IVR survey, with randomly ordered modules, will be sent at least 5 minutes after the SMS is sent. Precise timing of SMS delivery will be guided by formative phase results.
- If applicable, airtime-based incentive (amount of incentive will be determined by country) will be transferred to respondent's mobile phone once all questions are answered.

Sub-assessments

- Three sub-assessments are recommended to assess different mechanisms to improve survey contact, response, and completion rates and the relationship between incentives and survey response (see ***Mobile Phone Technology: Optimization Phase Manual***).
- Survey staff will attempt to call a small number of randomly selected individuals who did not respond, refused to participate, or partially completed an IVR survey.

- If successfully reached, the survey staff will interview the individuals about the reasons for their non-response, refusal and incomplete surveys. It may be useful to also capture suggestions for improvement from these individuals.

Data Management and Use

- De-identified data will be stored on a secure server identified by implementing partners.
- The following will be calculated:
  - Contact, response, and completion rates;
  - Average time per question for both completed and incomplete surveys;
  - Average time spent to complete the survey.
- The findings will be used for the following:
  - Revise the survey questionnaire;
  - Recalculate sample size requirements for the national mobile phone survey;
  - Identify and resolve issues around SMS, IVR survey, and incentive delivery;
  - Determine optimal incentive amount, timing, and structure for the national survey.

4.2.4 Data Collection

IVR System Data Flow Diagram

This section will be expanded further in the subsequent version.

Software Setup (includes instructions on technical specifications related to hardware/software)

This section will be expanded further in the subsequent version.

Sensitization Process Options

- Identify different media outlets, including television, radio, and print (newspapers and magazines), and the influence of each media outlet.
- Develop media campaign to heighten awareness of NCD Mobile Phone Survey.
- Begin media campaign 2–4 weeks before NCD Mobile Phone Survey.
- Meet with mobile network operators to discuss sending out bulk text messages to their subscribers.
- Send notification SMS to randomly selected mobile phone numbers before sending the NCD Mobile Phone Survey. Include information about requirements to receive incentive (if applicable). The notification SMS should be sent before and on the same day as the NCD Mobile Phone Survey as guided by the formative phase.

Survey Deployment Process

- Preparation

  - Establish start and end dates of NCD Mobile Phone Survey delivery and program the IVR platform accordingly.
  - Establish which days of the week the survey will be deployed, and program the IVR platform accordingly. Recommend that the survey be deployed each day of the week to minimize bias.
  - Identify the time window for which the NCD Mobile Phone Survey will be sent to random digit dialing individuals and program the selected IVR platform accordingly.
  - Identify the number of times a participant incorrectly answer a single question before terminating the survey. Program the IVR platform accordingly.
  - If applicable, use the findings from the optimization phase, program the IVR platform with the incentive amount, timing (pre- or post-survey), and structure (fixed or lottery). Ensure there is an adequate balance to distribute airtime incentives for completed surveys.
  - Troubleshoot the IVR platform to ensure that the capping of age-sex strata, randomization of NCD modules, airtime incentive delivery, and data extraction are working optimally.

- Delivering NCD Mobile Phone Survey
  - After sending the notification SMS, send the NCD Mobile Phone Survey, with randomly ordered modules, on the same day.
  - If applicable, deliver airtime incentive in accordance with the findings of the optimization phase and the programming of the IVR platform. Airtime incentive will be wirelessly transferred to the respondent's mobile phone once all questions are answered.

IVR Interviewing Progress Monitoring

- Conduct sample size requirements.
- Program IVR platform to cap enrollment once the age-sex strata sample size has been met.

  Note: Before implementing the NCD Mobile Phone Survey, conduct a technical assessment of the IVR platform's ability to successfully cap enrollment. See ***Mobile Phone Technology: Optimization Phase Protocol***.
- Examine the IVR platform's system logs daily to ensure that capping rules are functional.

4.2.5 Data Management

Data Storage, Cleaning, and Transferring Process

This section will be expanded further in the subsequent version.

Real-time Data Analytics Process

For data analysis and dissemination guidance, refer to ***Analysis Plan Manual***.

5. PROPOSAL DEVELOPMENT

5.1 Budget Proposal Template

The CDC Foundation will provide the IA with financial and resource support for the implementation of the NCD Mobile Phone Survey. In addition, the CDC Foundation will play a coordination role between the NCD and implementing partners when necessary.

The CDC Foundation will require a funding proposal prior to providing financial support for the NCD Mobile Phone Survey. The proposal will consist of the country-specific mobile phone survey protocol approved/exempted by the local institutional review board (IRB), a timeline specifying the timeframe of the survey (see **Appendix E** for template), and a comprehensive budget. Once all three portions have been received, the CDC Foundation will review the proposal for funding. The inclusion of the protocol is for completeness of documentation; it will not need to undergo another scientific review after it is approved by the local IRB.

The IA, with support from the CDC Foundation, will develop the budget for the implementation of the NCD Mobile Phone Survey. The purpose of developing a survey budget is to provide the IA and the CDC Foundation with a comprehensive understanding of the financial resources required for the implementation of the mobile phone survey. The development of the budget will begin with a review of the survey protocol to identify required resources at each stage of the mobile phone survey process in accordance with the NCD Mobile Phone Survey Process Chart. Templates for the budget is provided in **Appendix F**.

The following items should be identified during the development of the budget:

5.1.1 Personnel

Throughout the process, the IA will need to consider staffing for developing the survey protocol and implementing all processes of the NCD Mobile Phone Survey. The IA should also identify the percentage of effort of its current personnel will be required for implementing the NCD Mobile Phone Survey. This includes current staff that may provide strategic coordination, protocol review, and survey implementation.

5.1.2 Contracts

The IA will identify potential contracting partners that will provide support to implement the survey, which may include IT specialists to help in the development of necessary technology platforms and infrastructure for the mobile phone survey. Other contracting partners may also include mobile phone companies that will provide the necessary airtime and SMS capabilities for the survey.

5.1.3 Travel

Domestic and international travel will be a crucial component for coordinating with partners to ensure effective survey implementation. The IA will identify domestic travel for survey implementation and international travel for partner coordination into its budget.

5.1.4 Supplies and Printing

The benefit of the mobile phone survey is the reduction in survey tools in paper form, thus reducing necessary supplies and printing resources for surveillance. However, implementing partners may consider potential costs, such as printing protocols and meeting supplies.

5.1.5 Meetings and Trainings

The IA should include expenses related to the logistics for convening the meetings needed for survey implementation. Expenditures that should be considered include meetings and trainings related to protocol development, sampling design review, and the dissemination of survey results.

5.1.6 Technology Equipment

The mobile phone survey may require the procurement of data servers and computer systems to effectively deliver and collect NCD data via the mobile phone survey. The IA also may need to acquire mobile phones for pretesting and data collection purposes depending on the structure and sampling design of the survey. Other equipment to be considered may include hardware related to the protection of data servers, such as back-up electricity generators and firewall systems, and software necessary for data collection and data management.

5.2 Funding Mechanism

Once the proposal has been reviewed, the CDC Foundation and implementing partner will consider the various funding mechanisms necessary to support the expenses related to the survey. Funding mechanisms may include the following:

- A direct funding agreement between the CDC Foundation and the implementing partner
- A funding agreement between the CDC Foundation and a partner that has an existing project agreement with the implementing partner. For example, the CDC Foundation may consider providing funding to CDC or WHO, which may already have cooperative agreements with the implementing partner and, thus, can provide funding through these existing mechanisms
- Invoicing of materials and services to be paid directly by the CDC Foundation

Please note that the IA may choose to use a mixture of these funding mechanisms to cover expenses related to the NCD Mobile Phone Survey.

Appendix A
Engagement Letter Template

[NAME]
[TITLE]
Ministry of Health [COUNTRY]
[ADDRESS]

Dear [NAME]:

On behalf of the Bloomberg Data for Health Initiative's Noncommunicable Diseases (NCD) surveillance component partners, U.S. Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), Johns Hopkins Bloomberg School of Public Health, and the CDC Foundation, I am writing as the coordinating partner to follow up on the meetings between [PARTNERS] with the Bloomberg Data for Health Initiative delegation that took place in [CITY, COUNTRY] in [MONTH, YEAR], and the subsequent exchange of commitment to collaborate. We were so pleased to learn that [COUNTRY] is interested in participating in the NCD surveillance component.

As you may know, the NCD surveillance component aims to determine the feasibility, quality, validity, and reliability of using mobile phone surveys as an interim and complementary mechanism to existing household surveys on NCD risk factors. We understand plans are underway to implement a WHO-supported STEPwise approach to surveillance (STEPS) survey of NCD risk factors in [YEAR], which would help to assess comparability of the results between F2F and mobile phone methodologies.
We are delighted to learn of your interest to collaborate on the NCD surveillance component of this initiative and would like to have an opportunity to meet with you to discuss the scope and feasibility and initiate detailed planning to implement an assessment using mobile phone surveys for NCD surveillance in [COUNTRY].

We are currently beginning the development of a standard protocol for the mobile phone surveys. We would very much like for [COUNTRY] to be one of the first countries to collaborate on the development of this protocol and to implement both WHO STEPS and mobile NCD surveys and demonstrate success that can be scaled up for other countries. Partners will be available to provide technical resources and any assistance that may be needed.

We are eager to meet with you to discuss this further and develop future plans. We would be grateful if you could respond to [PROJECT COORDINATOR NAME, E-MAIL], to indicate suitable dates in [MONTH] for a brief mission by the NCD team representing all the partners. Please feel free to contact us if you have any further questions.

We look forward to your favorable reply and collaborating with you.

Sincerely,

Samira Asma, DDS, MPH
Chief
Global Noncommunicable Diseases
Division for Global Health Protection
Center for Global Health
Centers for Disease Control and Prevention

Appendix B
Engagement Mission Agenda Template

Proposed Engagement Mission Agenda

Day 1	
AM	Team introductions and remarks
AM	Overview of Bloomberg Data for Health Initiative and NCD component Country experience with NCD surveys, surveillance and mobile phone surveys
Lunch	
PM	NCD Mobile Phone Survey draft protocol introduction • Questionnaire • Sample design • Implementation process • Technology demonstration Country adaptation and implementation
Day 2	
AM	Meetings with partners *(suggested groups for consideration)* • Ministry of Health, telecommunications providers
Lunch	
PM	Discuss IVR technology for NCD survey
Day 3	
AM	Implementation plans • Partners and partner roles • Coordination mechanism • Implementing agency (data collection) • Timelines
Lunch	
PM	Summary, next steps, and wrap-up

Appendix C
Term of Reference Template

Term of Reference
Noncommunicable Disease (NCD) and Risk Factors Surveillance

BACKGROUND

Noncommunicable diseases (NCDs) such as stroke, heart disease, diabetes mellitus, neoplasms and chronic respiratory diseases are becoming increasingly important drivers of premature death in low- and middle-income countries, including [COUNTRY]. However, in many of these countries there are limited knowledge about the status of NCDs, the life-style and the risk behaviors that drive them, such as tobacco use, lack of physical exercise and poor diet.

[COUNTRY] is undergoing a rapid epidemiological transition, and NCDs are becoming the dominant share of the overall disease burden in the country ([PREVALENCE %]). [COUNTRY] faces several challenges to effective implementation of universal health coverage in terms of expanding breadth, height, and depth of coverage, especially in addressing NCD conditions that are generally chronic in nature, require careful sophisticated patient case management over time, expensive and can be most cost-effectively prevented at the grass-root level.

In this regards, policy-makers and other public health practitioners may lack some types of essential public health data needed to prioritize specific health issues, communicate with stakeholders, and plan strategies to improve health.

[COUNTRY'S EXPERIENCE WITH NCD SURVEILLANCE]

It is commonly agreed that major risk factors for NCDs should be addressed holistically, through public health interventions beyond the health facility and, indeed, beyond the health sector alone. A considerable action across sectors to address the challenge of NCDs, such as promotion and prevention activities supported with strong political and community leadership, together with cost-effective and targeted curative activities can help mitigate the negative impact of NCD.

Efficient monitoring and surveillance are cornerstones to track such progress NCDs. The systematic monitoring of risk factors to generate accurate and timely data is essential for a country's ability to prioritize essential resources and make sound policy decisions to address the growing NCD burden.

With increasing access and use of mobile phones globally and in [COUNTRY], opportunities exist to explore the feasibility of using mobile phone surveys as an additional method to collect data and supplement household surveys. Such technologies have the potential to allow for

efficiencies in producing timely, affordable, and accurate data to monitor trends, and augment traditional household surveys with mobile phone surveys that could be potentially efficient in terms of time and resources.

OBJECTIVES

The objectives include:

- Implement NCD mobile phone survey and strengthen regular data collection and surveillance of NCDs
- Quantify the feasibility assessments and strategic investments needed to collect such data to address NCDs and major risk factors
- Build capacity in NCD surveillance, monitoring, analysis and reporting to inform program and policy interventions. Specifically using technology such as the mobile phones for NCD surveys.
- Formulate health system reforms and provision of a continuum of care to curb the NCD epidemic and mitigate the impact

STRATEGIES

Strategies to be formulated include:

- Implement an NCD mobile phone survey using the global standardized protocol and processes, and adapting it to the [COUNTRY] context.
- Collaborate with national and international partners to systematically assess the feasibility, quality and validity of the mobile phone surveys and compare it with household surveys and with the data from other countries involved in this initiative.
- Contribute to generating a knowledge base for NCD surveillance using mobile phone technology.
- Support future advocacy strategies by applying the latest Information Communication Technologies (ICT) (e.g., website, Twitter, short message service [SMS] gateway, etc.).
- Formulate best practice forum to prevent and control NCDs and its risk factors with active participation of community, PVOs, public and private sectors, civil society and local governments to curb NCD.

METHODS

Phase 1. Strengthening NCD risk factors surveillance.

The NCD mobile phone survey is a nationally representative survey of adults 18 years of age and older using a standard protocol. To achieve this, a systematic methodology will be adapted to the [COUNTRY] context. Using open-source mobile phone technology platforms such as

interactive voice response (IVR), SMS, computer-assisted telephone interviewing (CATI), and mixed modes, the NCD mobile phone survey will provide timely data and allow for rapid feedback of results. It is intended to generate comparable data within and across countries. This survey supplements national household face-to-face surveys conducted approximately at five years intervals. Mobile phone surveys have the ability to collect interim data on NCD risk factors or specific disease condition to support monitoring and evaluation of programs and policies.

Phase 2. Assessing the feasibility, quality, validity of NCD mobile phone surveys with other participating countries using standard metrics and indicators.

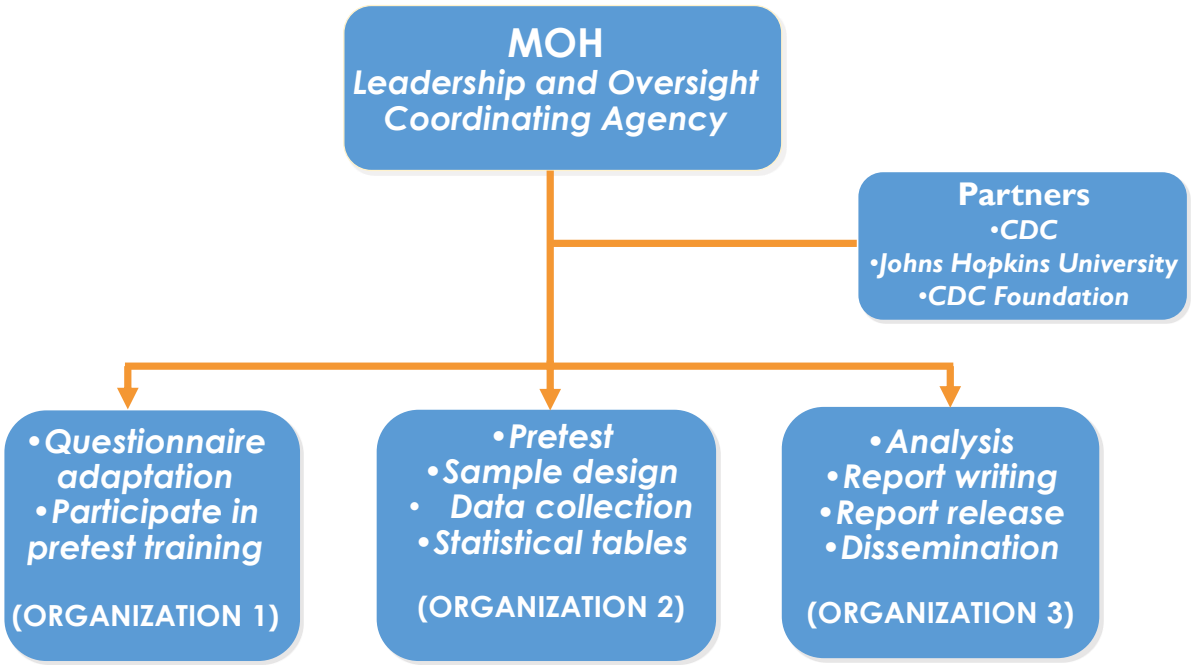
Phase 3. Quantifying the strategic investment, capacity building, formulating advocacy and health promotion policies, formulating health system reforms and designing appropriate interventions to curb NCD.

AREA OF SUPPORT

Technical assistance for NCD and Risk Factors Surveillance includes:

- Capacity building for periodic cost-effective survey implementation (mobile phone surveys)
- Capacity building for data management, analysis, and reporting results and advocacy skills
- Using ICT to enhance the intervention on behavior change to prevent NCD and mitigating their impacts

Appendix D
NCD Mobile Phone Survey Coordinating Committee Example



Appendix E
NCD Mobile Phone Survey Timeline Example

Engagement and Orientation	2016												2017											
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Engagement mission																								
Stakeholder coordination mechanism																								
Funding resource mechanisms																								
Convene steering/technical committee																								
Modify protocol to fit country needs																								
Submission of institutional review board																								
Pretest (Formative and Optimization Phases)																								
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Translation of materials																								
Recruitment of participants for focus group discussions and user groups																								
Training for staff																								
Key informant interviews																								
Conduct focus groups and user groups																								
Adapt protocol based on formative findings																								
Conduct sub-assessments of interactive voice response (IVR) - incentives, survey delivery, non-response and refusals																								
Adapt protocol based on optimization findings																								
Technical specifications for IVR developed																								
Technical specifications for national IVR developed																								
Select platform for national mobile phone survey																								
Data storage and management plan																								
Data Collection																								
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sensitization campaign																								
Deploy IVR																								
Monitoring progress																								
Data collection - wrap - Up																								
Data Management																								
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Data aggregation																								
Quality assurance																								
Weighting																								
Data analysis																								
Fact sheet																								
Country report																								
Data Release																								
Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dissemination																								
Data release																								

Appendix F
NCD Mobile Phone Survey Budget Example

	Expense Categories						
NCD Mobile Phone Survey Processes	**Personnel**	**Contract**	**Travel**	**Supplies/ Printing**	**Meetings**	**Technology Equipment**	**TOTAL**
Engagement and Orientation							
Mobile Phone Technology: *Formative Phase*							
Mobile Phone Technology: *Optimization Phase*							
Data Collection							
Data Management							
Data Release and Use							
Total							