

Impact of COVID-19 on households and the workforce in Sri Lanka

Survey methodology note

Tharaka Amarasinghe and Ruwanka De Silva
LIRNEasia, 12 Balcombe Place, Colombo, Sri Lanka
November 2021



LIRNEasia is a pro-poor, pro-market think tank whose mission is *catalyzing policy change through research to improve people's lives in the emerging Asia Pacific by facilitating their use of hard and soft infrastructures through the use of knowledge, information and technology.*

Contact: 12 Balcombe Place, Colombo 00800, Sri Lanka. +94 11 267 1160. info@lirneasia.net
www.lirneasia.net

Table of Contents

1. Introduction.....	2
Objectives of the study.....	2
2. Sample size determination.....	4
3. Sampling	5
Survey target groups	5
Survey respondents	5
Sample frame and PSU definition	5
Overview of the sampling procedure	5
PSU selection	6
Segmentation, mapping and listing within sample PSUs.....	7
Mapping and identifying the GND boundaries	8
Segmentation	9
Listing.....	10
<i>The listing process was as follows:.....</i>	11
<i>Once listing was complete the field supervisor ensured that every structure had a structure ID.....</i>	11
Household and individual selection.....	12
Identification of households during main survey	12
Replacement procedures	13
4. Research Instrument.....	15
Development, translation and scripting.....	15
Pilot Testing.....	15
Pilot Goals.....	15
Pilot Approach and Conduct.....	15
Photography	16
6. Quality Control (QC) Mechanisms	17
7. Mandatory COVID-19 Related Protocols	18

1. Introduction

The COVID-19 related lockdowns, mandating citizens to ‘stay at home’ brought about a host of challenges, from restricted mobility to large scale job and income loss to disruptions in the provisions of essential services as well as education. To an extent, especially in urban areas, digital technology-driven solutions have been able to bridge the last mile of service delivery and help minimize the disruptions, for example through app-driven delivery services, online schooling, etc.

However, the disparities in access to technology that already existed have become even more apparent in this new context, leading to the potential for further marginalization of the already digitally marginalized. Similarly for workers, new forms of marginalization may have been experienced, with those in jobs where parts (if not in all) can be continued seamlessly from home through digital modes, versus those whose lack of access, connectivity and/or skills may not have been in a position to continue work seamlessly from home.

Given the new ‘normal’ that will be, going forward, it is imperative to understand firstly how these groups continued (or not) operations and/or work in the lockdown period, and what new forms of marginalization (or worsening of previously existing ones) were resulted in. This will give insights to design appropriate mechanisms to be used in the future.

Objectives of the study

The objective of the study was to collect the following regionally comparable data in Sri Lanka:

1. Nationally representative household level data on ICT access and use to enable estimates to be made within a 95% confidence interval with +/-2.8% margin of error
2. Nationally representative household level data on last mile delivery of food, medicine and other essential services during COVID-19 to enable estimates to be made within a 95% confidence interval with +/-2.8% margin of error
3. Nationally representative individual-level data on ICT access and use to enable estimates to be made within a 95% confidence interval with +/-2.8% margin of error
4. Nationally representative individual-level data on the impact of COVID-19 on labour force to enable estimates to be made within a 95% confidence interval with +/-4.7% margin of error

This data was collected by means of face-to-face surveys conducted using Computer Assisted Personal Interviewing (CAPI) and according to the methodology elaborated in this document. The fieldwork was conducted in Sri Lanka by competitively-procured market research company – Survey Research Lanka (SRL).

SRL was mainly involved in the fieldwork set-up (including scripting, translating and pilot testing the questionnaire and training of enumerators) and execution as well as dataset delivery. LIRNEasia monitored the companies in most cases being involved in the field

training and monitoring the fieldwork remotely. SRL's teams visited more than 2,500 households, 125 Grama Niladhari divisions for data collection after a rigorous training of 3 days.

The data collection timeline was affected due to government-imposed lockdowns and other restrictions brought about by COVID-19.

Throughout the data collection, SRL and LIRNEasia adopted several quality control mechanisms which helped in giving timely feedback to the data collectors to improve their work. The subsequent sections provide more information on the research design, coverage, field problems, remedial action, quality control mechanisms, etc.

2. Sample size determination

The desired level of accuracy was set to a confidence level of 95% and an absolute precision (relative margin of error) of 5%. The population proportion (p) was set conservatively to 0.5, which yields the largest sample size. The minimum sample size (n) was determined by the following equation

$$n = \left(\frac{Z_a \sqrt{p(1-p)}}{C_p} \right)^2 = \left(\frac{1.96 \sqrt{0.5(1-0.5)}}{0.05} \right)^2 = 384$$

Where,

n = Minimum sample size

Z_a = Z-value for 0.05 level of significance

C_p = Confidence level

p = Population proportion

Inserting the parameters for the survey yields the minimum sample size for simple random sampling; therefore, for our sample design (stratified with multiple levels in some cases) the minimum sample size was multiplied by the design effect variable.

In the absence of empirical data from previous surveys that would have suggested a different value, a value of 2 was used as the design effect for Sri Lanka to consider the additional levels of selection (district and sub-district) in the sample design. This yields then, a minimum sample size of 768 per country for households and individuals.

The actual sample size increased beyond the minimum requirement to compensate for clustering effects, and allow for urban/rural disaggregation of data, as well as gender-based disaggregation and more importantly to have representative data at Province level for Western Province.

3. Sampling

Survey target groups

The target groups of the study were:

- a) All households
- b) The population above the age of 15 years

Survey respondents

In a selected household, two persons were interviewed:

1. The household head, as identified by the households themselves. If the household head was not available, a suitable alternative was sought out (e.g., spouse or other) who would be able to provide sufficient detail on the household characteristics and other members.
5. A randomly selected individual from the pool of eligible household members, i.e., any household member age over 15 years, which could even include the household head or alternative household representative.

Sample frame and PSU definition

The sample size in Sri Lanka was 2,500 households and individuals. The primary sampling unit (PSU) in Sri Lanka was the Grama Niladhari division (GND). The method was developed using population and housing data at GN level from the Department of Census and Statistics, Sri Lanka. Random sampling was performed in three steps resulting in the selection of 125 PSUs across Sri Lanka.

Overview of the sampling procedure

The study methodology ensured national representation through random selection of all sampling units (GND, household, individual, etc.), enabled by household listing at the PSU level. Since the numbers of houses in GNDs can vary significantly, GNDs over a certain size had to be segmented. Thereafter, a segment(s) had to be randomly selected. Thereafter, the listing and mapping of households in the segment could be done, enabling random selection of households.

The methodology involves the following steps:

1. Separation of GND level sample frame into urban and rural PSUs

2. Sampling the required number of GND from each stratum¹ using probability proportionate to size (PPS).
 - a. Where the GND size exceeded a critical number, they were segmented and a segment was selected randomly, in which the remaining sampling steps were continued with.
3. Mapping, listing and marking all households in the selected PSU or segment – the lists serve as the sample frame for simple random selections if households; this was done with the assistance of key informants (e.g., Grama Niladhari officer, etc.)
4. Simple random selection of the required number of households (20-25 with about 5 extra households as buffer sample) from each selected PSU / segment
5. Listing all household members or visitors aged over 15 years staying the night at the selected household
6. Simple random selection of one household member or visitor for survey from the household list compiled in Step 5

PSU selection

The selection of PSUs was conducted by LIRNEasia and provided to SRL for fieldwork execution.

PSUs were selected by LIRNEasia in the following way; selected PSUs are depicted in Figure 1.

Pre defined number of PSUs (GNDs) were selected using PPS sampling techniques. The proportional allocation at district into urban rural level was used to maintain the district wise coverage of the sample.

Table 1: Number of PSUs by each stratum

Stratum	Number of sample PSUs(GNs)
WesternUrban	34
WesternRural	12
RestRural	51
RestUrban	28

¹ There were 4 stratum used in this study. Western Province divided into urban and rural PSUs and rest Sri Lanka divided into urban and rural PSUs.

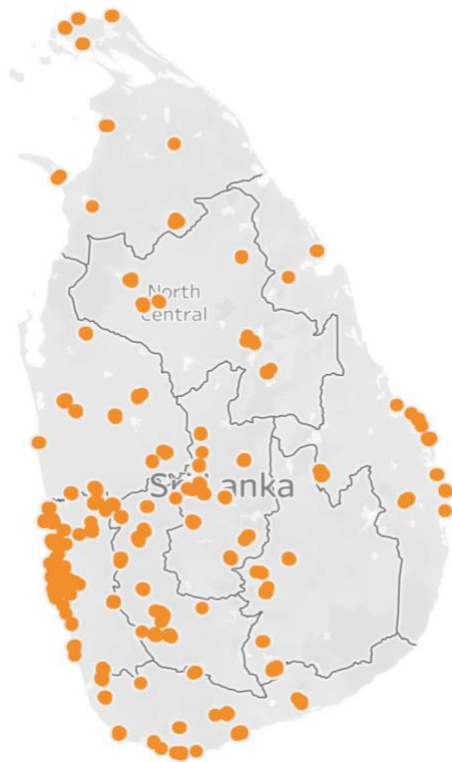


Figure 1: Sri Lanka sample locations

Segmentation, mapping and listing within sample PSUs

For selected PSUs, PSU-level household and population data were not readily available. In order to draw a random sample of households within a PSU, all households within a PSU had to be mapped and listed.

The objective of the mapping and listing of households was to ensure that the list of households covered the entire population living in the PSU. In this way, when the sample was selected from the list of dwellings or households, all eligible households in a PSU got equal chance of being selected for the survey.

This process was mainly used for creating a list of households from which a sample was chosen for the main survey. This process provided a complete list of occupied residential households in a selected area. This helped in defining the complete range of households, making possible the employment of systematic and equal probability random selection of the households. As an advantage, this helped in circumventing the problem of biased household selection for the main survey.

Households are found in dwellings, dwellings are located in structures and structures in clusters (PSU). The listing operation consisted of visiting each PSU, recording on listing forms a description of every structure together with the names of the heads of the households found in the structure, and drawing a location map of the PSU as well as a layout sketch map of all structures residing in the PSU.

These details helped and guided interviewers to relocate selected households for interviews during main survey data collection.

Mapping and identifying the GND boundaries

The Survey Department, Sri Lanka's GND level maps² were used to identify the administrative boundaries for selected 125 GNDs. The shape files were converted to A3 sized physical maps by overlaying the shape file on top of Google maps (satellite).

When arriving at a PSU, the listing team met with 2-3 key informants (KIs) to verify PSU details of the PSU (e.g., numbers of households, locations of households, PSU boundaries and access routes, etc.) and the boundaries. Any differences were marked on the map itself.

- KI was either one of the following: Grama Niladhari Officer/ Development Officer/ Senior resident/ schoolteachers etc.

The estimates of the number of households in a PSU provided by the KIs were also checked with census 2012 data. If the number varied (more or less than 10%) the figure was validated with another available KI in the PSU. Once validated, the final figure was reported on CAPI device.

Segmentation, mapping and listing was conducted in advance by listing teams (and by the research team for the large GNDs) and the survey itself was thereafter conducted by the main survey teams.

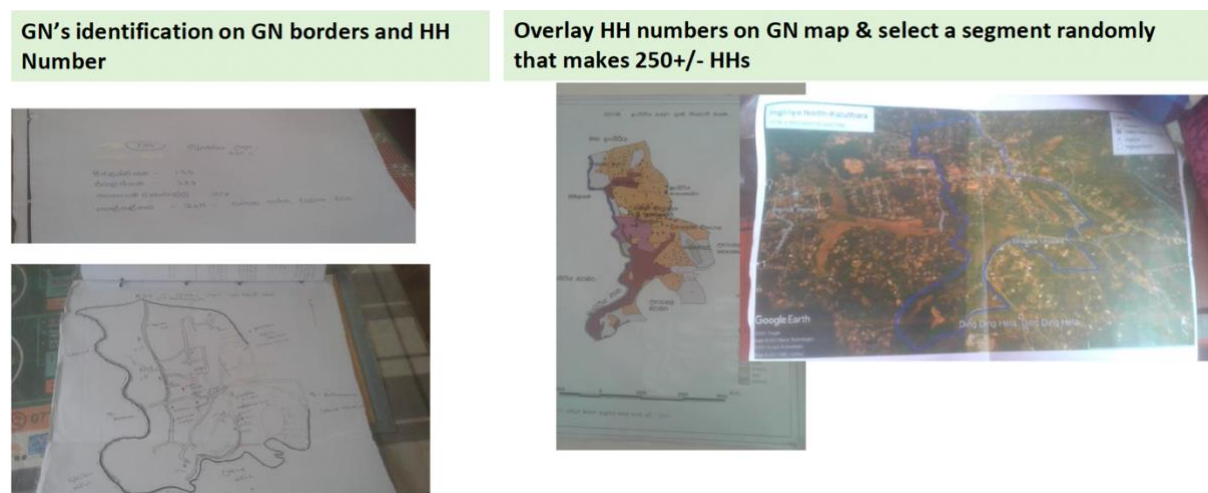


Figure 2. A map verification exercise

² <https://it.survey.gov.lk/gn Updating/>

Segmentation

If the total number of estimated households (for GNDs) for the year 2020 or 2021 was more than 250-300 , segmentation of the GND was done using the below procedure.

1. For segmenting the GND, the team used natural boundaries as they exist in the PSU in the form of landmarks like canals, rivers, ponds, footpaths, major or minor roads, schools that may exist.
2. For each segment, the estimated number of households was collected from key informants.
3. The supervisor drew an indicative map showing the approximate location of the segments on the printed map and then number them sequentially from the northwest corner. While drawing this map uninhabited areas and isolated households of the PSU were included as part of a segment.
4. The required number of segments were selected using the CAPI device.

The method of segmentation and determination of the number of segments to select was as per the following protocol:

1. If the estimated PSU size was between (301 - 500 HHs), segments of size approx. 120 to 130 HHs were formed, and 2 segments were selected randomly to ensure the listing of around 250 HHs.
2. If the estimated PSU size was between (501 – 1500 HHs), segments of size approximately 250 HHs were formed, and 1 segment was selected randomly to ensure the listing of around 250 HHs.
3. If the estimated PSU size was more than 1500 HHs,
 - a. The PSU was first divided into four quadrants (4 zones i.e., North-East, East-South, South-West, and West-North) and then the number of HHs in each quadrant was estimated
 - b. From the 4 quadrants, one was selected using a random number generator.
 - c. If the selected quadrant size was above 1500, the above process was repeated until the selected division has 1500 households or less
 - d. The final selected geographic division was divided into segments of approximately 250 households each. Then, one segment was selected using a random number generator to ensure the listing of around 250 HHs. This was done by the research team and provided the selected segment to the field team.

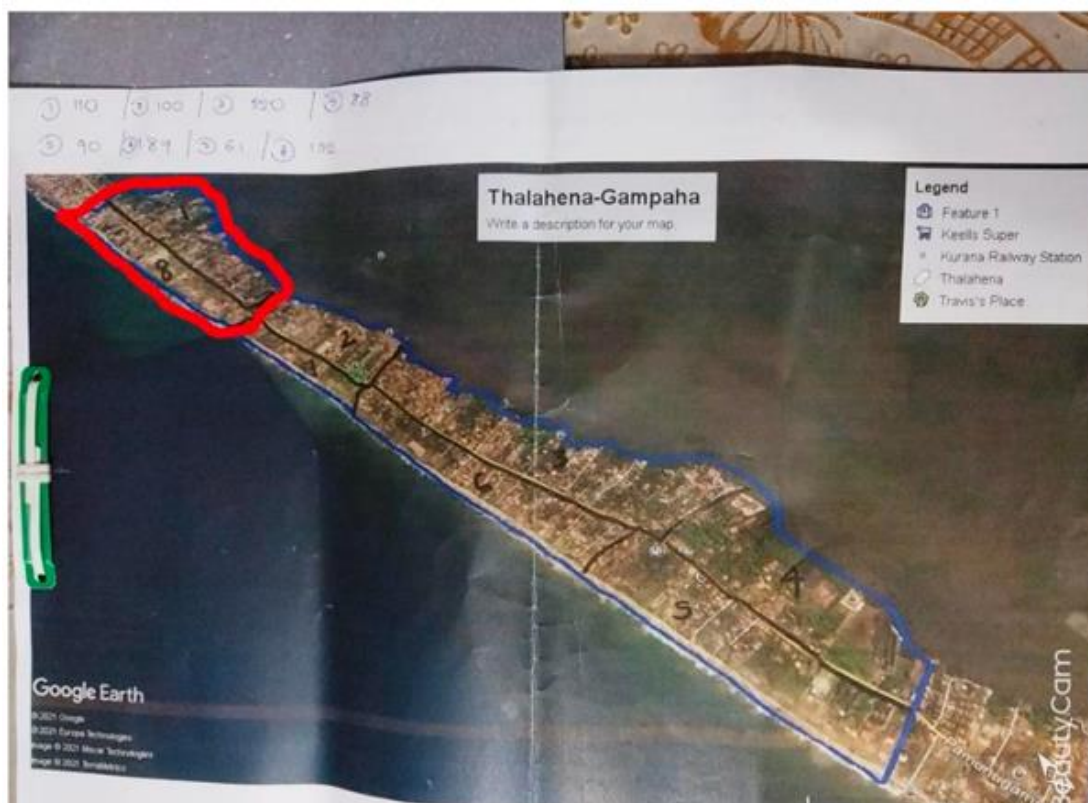


Figure 3. A segmentation map

Listing

A listing format was developed and finalized with LIRNEasia. The listing was performed using CAPI. The details were obtained from each household during the listing process using a listing questionnaire. The data collected through the listing questionnaire included:

1. Address of the household
2. GPS coordinates of the household
3. Contact information (mobile or landline number of the household)

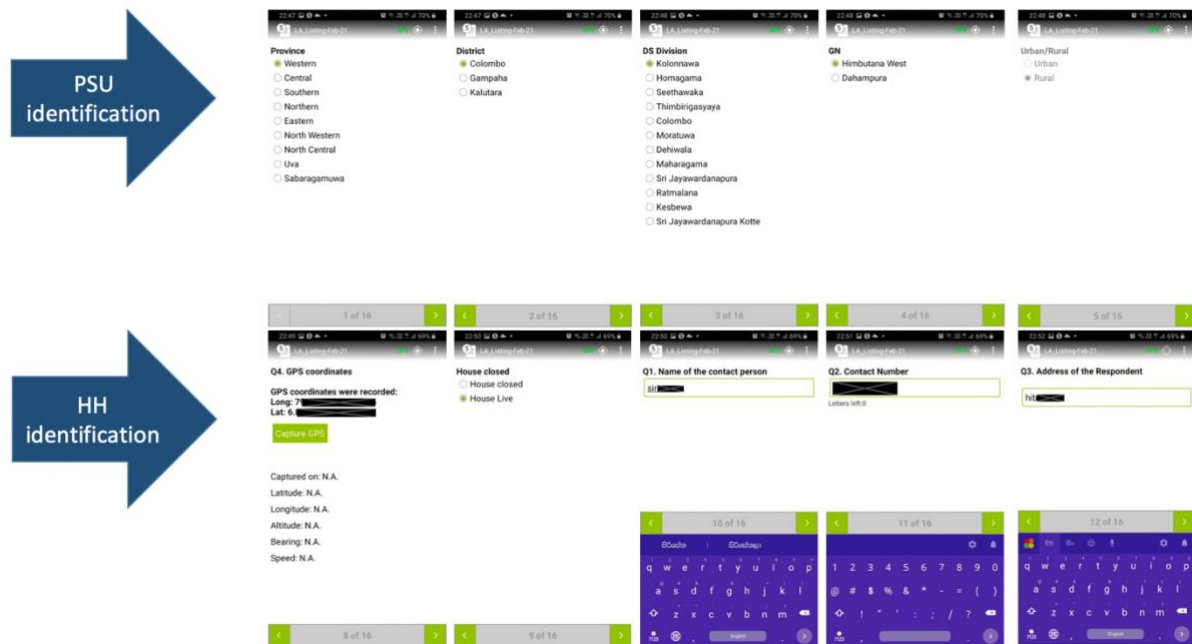


Figure 4. Listing Format

The listing exercise was carried out on CAPI devices. The listing team maintained a log sheet of the same in pen and paper with structure numbers. The listed structures were marked on the map in order to enable quality checks. In a selected PSU, the SRL team listed and marked all the structures (buildings) in that PSU, ensuring no houses were missed out. Once a complete list of households in a PSU was obtained, it served as a sample frame for the random selections of households. All structures in a PSU were listed and marked with a structure ID. All households within a structure were listed. Households were identified using the household number, name or household head's name.

The listing process was as follows:

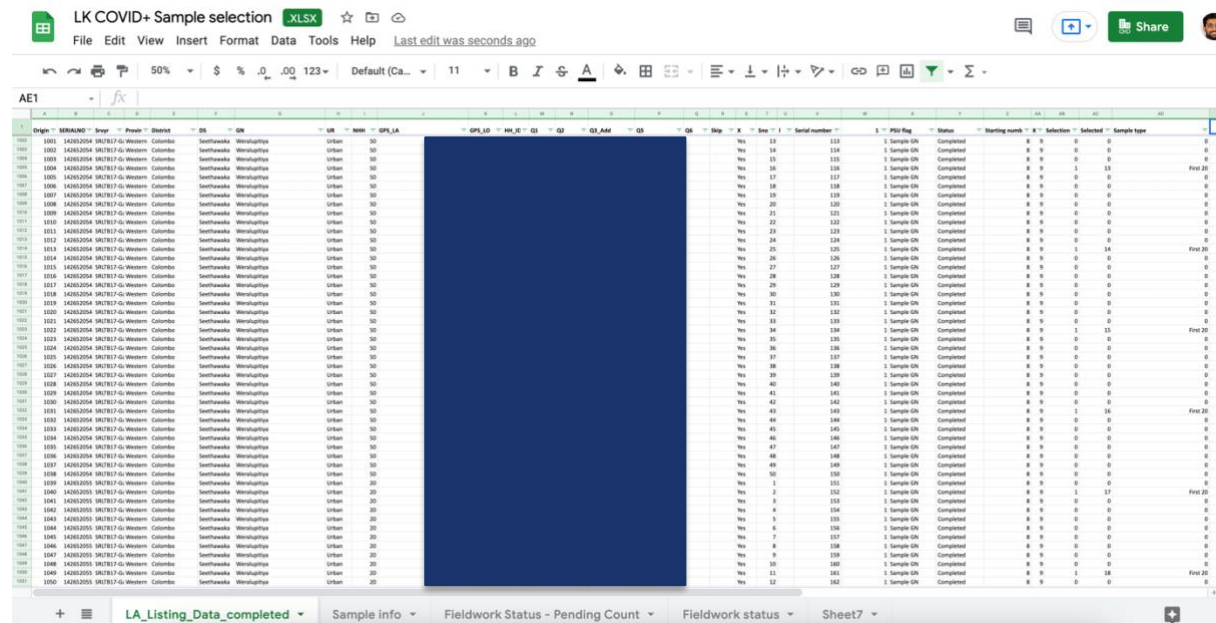
- Arrival at PSU and determining the boundary as mentioned.
- Allocated enumerators' walking routes (E.g., point A to B; point B to C, etc.). (In the case of multiple enumerators being allocated to a given PSU)
- Each enumerator filled their own listing form.
- Assigning a unique structure ID for all the listed households.
- All enumerators followed the right-hand rule to list the structures and households.

Once listing was complete the field supervisor ensured that every structure had a structure ID.

The PSU area listing data with GPS coordinates and listing of all structures including both residential and non-residential structures was shared with LIRNEasia upon completion of the listing.

Household and individual selection

After listing of households, a frame of households was formed and 25 households were randomly selected in each PSU/segment. The actual requirement was 20 but selected more considering replacement of households. The selection of households for the main survey was done by LIRNEasia’s research team.



The screenshot shows an Excel spreadsheet with the following columns: District, GPS, Status, Selection, and Sample type. The data is organized into rows, with a large blue shaded area covering the middle portion of the spreadsheet. The spreadsheet is titled 'LK COVID+ Sample selection' and has a status of 'Completed'.

Figure 5. Random selection of households for main survey

Identification of households during main survey

- Maps prepared by the listing team (sometimes the same teams did the survey as well) were used by the main survey team to reach the correct PSU / selected segment and identify the selected household for main survey.
- To identify the selected household, the address, GPS coordinates, name of head of household, structure number were displayed on CAPI screen.

Selection of household respondent during main survey

In a selected household, the household head was interviewed on household characteristics; if the household head was not available, a suitable alternative was sought out (e.g., spouse or other) who could provide sufficient detail on the household characteristics and other members.

Selection of individual respondents during main survey

In sample households, all eligible individuals (age over 15 years) were listed with the help of the household head or representative and one was selected automatically (randomly) using the CAPI device. The CAPI device was programmed to flash the selected individual’s details

(name, gender, age and relationship to the household head) on the screen and was not allowed to go back after this stage.

If the enumerator failed to reach the relevant respondent on the first visit, the enumerator consulted with other members of the household/staff or neighbors about the time availability of the target respondent. In case the selected respondent was not available at the first visit, a minimum of three (3) attempts (first visit +two follow up) were made (at different times of day or based on an appointment) to reach the target respondent.

Replacement of a selected respondent within a household was not allowed. If required, the whole household were replaced by drawing additional sample from the frame.

Replacement procedures

Strict replacement procedures were set in place, to ensure the randomness of the sample at all levels was preserved. The circumstances under which replacements were allowed are detailed below.

Individual replacement

If a target respondent could not be reached after a minimum of three (3) attempts were made (at different times of day or based on an appointment) to reach the target respondent, or the target respondent refused to participate in the research, then the household had to be replaced, with a random selection from the list of houses (applying the pre-determined sampling interval). Replacement of respondents within the household (either household or individual respondents) was strictly not allowed.

Household replacement

A household was replaced in the following situations:

- A household head or suitable alternative refused to participate in the survey
- A household head or suitable alternative was unavailable after three (3) attempts to contact them
- A house had been found to be locked/vacant after three (3) attempts to contact the house were made
- Household head and suitable alternative are both unable to be surveyed due to severe disability

A household was replaced if the randomly selected individuals from a household either:

- Refused to be surveyed
- Was unwell or unable to communicate (e.g., due to sickness or disability)
- Could not be reached, after three (3) consecutive attempts to reach them were made by the enumerator.

If any of these situations arose, the house had to be replaced with a random selection from the list of houses in the PSU/segment (applying the pre-determined sampling interval). Individual replacement in a household was not permitted.

PSU replacement

In some cases, it became impossible to conduct fieldwork in a selected PSU. For example, where security concerns prevented field teams from accessing the selected PSU, and local administrative leaders do not allow field teams to conduct research. In these cases, the local fieldwork partner (SRL) made requests for replacement PSUs. LIRNEasia provided random replacements, where the fieldwork partner then proceeded to carry out fieldwork in.

4. Research Instrument

Development, translation, and scripting

A structured questionnaire was used to capture the household and individual level data. The English language questionnaire was developed by LIRNEasia.

The questionnaire was translated into 2 languages by SRL, namely: Sinhala and Tamil. Translations were extensively checked by the LIRNEasia research team.

The scripting of the questionnaire was done by SRK. SRL project teams tested the script for all logical and consistency checks before planning for pilot-test. The bilingual tools and script with login details were also shared with LIRNEasia for comments and feedback before pilot-test.

Pilot Testing

The pilot-test exercise was conducted in actual field setting. The pilot-tests were conducted in non-sample locations, and among a range of respondents to ensure those with different literacy levels and both genders were included.

Pilot Goals

The goal of the pilot survey included:

- Estimate realistic median Length of Interview (LOI).
- Test Skipping and Routing.
- Test Language (phrasing).
- Test Translation.
- Test Understanding of the Questions, Cognitive Difficulties and Questions Sensitivities.
- Test Tablet Functionality.

Pilot Approach and Conduct

One urban PSU and one rural PSU were selected for the pilot test. The selection of the locations was done to represent the urban and rural mix and socio-economic groups.

The exercise was led by the senior SRL professionals and LIRNEasia researchers on the ground.

Based on the observations made during the pilot tests, various improvements to the field process as well as the research tools were made.

5. Consent

Prior to the commencement of an interview, the respondent was informed of the following:

1. The objectives of the research
2. That his/her participation was voluntary
3. That he/she could choose to end the interview at any point

Once informed of these, the respondent's written or verbal consent was obtained from the respondent to (1) proceed with the interview; (2) be photographed [if applicable]; and (3) be contacted again for further research. Respondents who refused to be photographed could still be interviewed if they agreed to participate.

Photography

In every PSU, while working high resolution digital photographs were captured. Proper consent of the relevant community members was taken before taking photograph.

Two-three teams captured photographs during the listing / mapping exercise (structure number on walls, listing household, KI interview or permission) using CAPI devices

6. Quality Control (QC) Mechanisms

Following are some of the QC procedures that were adopted by for the survey by SRL and LIRNEasia:

1. AC- Accompaniments – Supervisor accompanied first few interviews of each enumerator
2. BC- Back Checks – 30% of each enumerator’s interviews were back checked by supervisors
3. SC- Spot Checks – 10% of the sample was spot checked by the Operation Manager
4. TBC- Telephonic Back Checks – Once the data was synced to the server, telephonic back checks were done for all main interviews which have a contact number.
5. VC – Voice Checks – Parts of interviews randomly got recorded for quality check purpose
6. 100% MC – Map Checks for GPS - GPS location of the interview is captured to check sampling and authenticity of the selected respondent
7. For each enumerator’s interviews length of interview was checked.
8. CAPI script ensured the right filters for the questionnaire
9. Enumerators were trained on general Dos and Don'ts in the field and also on the questionnaire content and to administer different questions and scales. Further, mock interviews were conducted by enumerators before they are sent to the field for data collection

All research process and practices followed at SRL are based on ESOMAR research guidelines.

7. Mandatory COVID-19 Related Protocols

Since the survey took place while COVID-19 health risks still existed in Sri Lanka, mandatory steps were taken to ensure the safety of all parties related to the survey. The following protocols were issued by SRL with guidance from LIRNEasia's research team.

1. A mask was worn by enumerators every time they were in the field and it was replaced every day.
2. Hand sanitizer was used every time before and after visiting a household or when they used any public services such as transportation, bank, communication centres, etc.
3. A distance of one meter was kept from the respondent at all times.
4. Unless the household representatives allowed or invited the enumerator to step into the house they did not enter the home. To ensure safety of both parties, entering the house was discouraged even if the household representative allowed access.
5. If the household representative did not agree to participate in the survey and showed any discomfort of accepting it considering the current pandemic situation, enumerators moved on without attempting to force participation.
6. If the respondent is not wearing a mask, enumerators suggested that they wear a mask as well, for their own safety.
7. If there were props, cue/show cards or any the material to be shown or given to the respondent during the interview, hand sanitizer was given to the respondent to clean his or her hand and once the use of props and showcards was complete, the hand sanitizer was offered again.
8. It was **STRICTLY** prohibited to have any physical contact with the respondent or the household representative – i.e. a handshake, hand holding, or any sort of physical greeting was avoided during this process.
9. To ensure the comfort of the respondent during the interview, actions such as coughing, sneezing, scratching, removing the mask or glove, and/or any other action that might look like a threat to the respondent was avoided.