

November 14, 2013

**STEP Survey Weighting Procedures Summary
(Based on The World Bank Weight Requirement)**

Armenia

November 14, 2013

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1 Survey Design Overview

The Armenia survey firm implemented a Full Literacy Assessment design. The Full assessment required each selected person to attempt to complete a General Booklet comprising Reading Components and a set of Core Literacy Items. Subsequently, those respondents that correctly answered at least 3 Core Literacy items were assigned one of four assessment Exercise Booklets to complete. The full assessment sampling objective was to have a minimum of about 2400 completed Exercise Booklets, with a distribution of about 600 complete cases for each of the four Exercise Booklets.

1.1 Target Population

The target population for the Armenia STEP survey comprises all non-institutionalized persons 15 to 64 years of age (inclusive) living in private dwellings in urban areas of the country at the time of data collection. This includes all residents except foreign diplomats and non-nationals working for international organizations.

1.2 Sample Frame

The sample frame for the selection of first stage sample units is the file '[ARM-STEP-HH-Frame \(11-Mar-2013\)](#)'.

The sample frame is a list of 3508 clusters created by the Armenia survey firm. The clusters were formed so that each cluster includes approximately 150 household listings from the database of users of Electricity Networks of Armenia (ENA). Each urban cluster in the sample frame is uniquely identified by the variable 'Cluster_ID'.

Table 1 provides the sample frame count of the number of PSUs & the estimated number of households by region.

Table 1: Armenia Sample Frame Count; Number of PSUs & # of Households by Region

Region	# of Clusters	# of Households
Aragatsotn	65	9,890
Ararat	119	17,983
Armavir	160	24,075
Gegharkunik	122	18,506
Kotayk	270	40,496
Lori	304	45,627
Shirak	271	40,521
Syunik	152	23,042
Tavush	90	13,765
Vayots Dzor	38	5,684
Yerevan	1917	287,582
Total	3,508	527,171

Note: The STEP data collection results reveal that the sample frame is not current; 1180 of the 6814 activated sampled households, i.e., 17.3% of the activated sampled households, could not be interviewed due to issues pertaining to the sample frame. These cases were categorized as 'Dwelling could not be found - insufficient Sample Frame address info/Vacant dwelling/ Dwelling not habitable'. Refer to Table 10 on page 20 for the detailed count of interview result status codes.

1.3 Sample Design

The Armenia sample design is a 3 stage sample design. There was no explicit stratification but the sample is implicitly stratified by Region. Implicit stratification was achieved by sorting the PSUs by Region and selecting a systematic sample of PSUs.

First Stage Sample

The primary sample unit (PSU) is a cluster of households that are users of Electricity Networks of Armenia (ENA). The first stage units were selected by the World Bank Survey Methodologist.

Each PSU is uniquely defined by the sample frame variable 'Cluster_ID'. The sampling objective was to conduct interviews in 200 PSUs. In addition, 25 extra PSUs were selected for use in case it was impossible to conduct any interviews in one or more initially selected PSUs. (N.B. None of the 25 extra PSUs were required to be activated.)

Second Stage Sample

The second stage sample unit (SSU) is a household. The sampling objective was to obtain interviews at 15 households within each selected PSU. The households were selected in each PSU using a systematic random method.

There was an expectation of high non-response for the Armenia STEP. Therefore, it was decided to select 60 households in each PSU; in each PSU, 2 replicates of 30 households each were selected. The sample of 60 households was divided randomly into an initial sample of 15 households and a reserve sample of 45 households which was activated as necessary in the order in which the sample was selected.

During the data collection operation, one PSU (i.e., PSU #183) required additional sample due to exceptionally high non-response. A 3rd replicate of 30 households was selected to accommodate this requirement. Thus, a sample of 90 households was selected in this PSU.

Third Stage Sample

The third stage sample unit was an individual aged 15-64 (inclusive). The sampling objective was to select one individual with equal probability from each selected household.

Table 2 provides, for the Primary Sample Units (PSUs) and Households (HHs) in the target population, the population size and the sample size by Region.

Region	PSUs in Target Population *	Sample Size PSUs **	HHs in Target Population *	Sample Size HHs **
Aragatsotn	65	3	9,890	180
Ararat	119	6	17,983	360
Armavir	160	10	24,075	600
Gegharkunik	122	7	18,506	420
Kotayk	270	15	40,496	900
Lori	304	17	45,627	1020
Shirak	271	16	40,521	960
Syunik	152	9	23,042	570
Tavush	90	5	13,765	300
Vayots Dzor	38	2	5,684	120
Yerevan	1917	110	287,582	6600
Total	3,508	200	527,171	12,030

*Source: Sample Frame derived from Electricity Networks of Armenia (ENA)

**Source: Data File 'STEP Armenia - Data for Weighting_S7'

2 Data Collection Outcomes

The final survey weights depend on the outcome from the attempt to obtain an interview at each selected household. The treatment of each sampled case in the weighting process depends on the result code assigned to the sampled household and the result code assigned to the selected person. The result codes used in STEP are listed in Table 3. A variable called 'final_status' with these code values was created during the weighting process and a 'final_status' was assigned to each sampled case.

Table 3: <i>Full Literacy Assessment</i> Result Codes for Sampled Households and Selected Persons	
I. Household-level Codes	
Code	Code Description
01	Refusal-Household
02	Household unusual circumstance (e.g., death in family, illness, fire in dwelling, etc.)
03	No knowledgeable household member found after 3 visits (only a child, non-competent adult, etc.)
04	Temporarily absent/unavailable for field period (information from other persons)
05	No competent household member to interview (because of severe illness, mental disability, etc.)
06	Language problem – no household member spoke a language understandable by survey team, no translator available
07	Dwelling could not be found – insufficient address information in sample frame
08	Vacant dwelling / selected address has no household
09	Dwelling not habitable/dwelling destroyed/dwelling converted to commercial use
21	Household Refusal to continue Household Module (i.e., begun but not complete)
22	Household unusual circumstance (e.g., death in family, illness, fire in dwelling, etc.) prevented continuance
31	No household member in the eligible range of 15-64
94	Case dropped due to data quality issue
95	Sample case justifiably not activated, e.g., reserve sample household not needed , sample goal achieved
96	General non-response; Reason unspecified by survey firm
97	Household not interviewed due to sample selection error – wrong household selected in its place
II. Person-level Codes	
Code	Code Description
Individual modules 2-7 <u>not</u> begun or unacceptable interview	
32	Refusal by Selected Person to begin modules 2-7
33	Unusual circumstance - Selected Person (e.g., death in family, illness, fire in dwelling, etc.)
34	Refusal - Another household member refused to let selected individual do individual modules
35	Unable to contact Selected Person after three visits during field period
36	Temporarily absence/unavailability of Selected Person for field period (info from household member)
37	Hearing Problem - Selected Person is deaf or so hard-of-hearing, no translator available
38	Learning or mental disability (includes emotional conditions like severe depression) of Selected Person
39	Speech impairment of Selected Person prevented participation, no translator available
40	Language problem – Selected Person’s language not understood by survey team, no translator available
98	Sample selection error – an incorrect eligible person was selected
99	Sample selection error – an ineligible person was selected
Individual modules 2-7 begun but not completed	
51	Refusal by Selected Person to continue modules 2-7
52	Unusual circumstance - Selected Person
General Booklet (module 9) not begun	
61	Unable to read or write in language of General Booklet – Selected Person refused to begin
62	Refusal by Selected Person to begin General Booklet
63	Unusual circumstance - Selected Person
64	Blindness or visual impairment of Selected Person prevented completion of General Booklet
65	Physical disability of Selected Person prevented completion of General Booklet

Table 3: <i>Full Literacy Assessment</i> Result Codes for Sampled Households and Selected Persons	
	General booklet (module 9) looked through or attempted but not completed
71	Selected Person looked at Booklet but unable to read & write the language of Booklet - did not begin
72	Refusal by Selected Person to continue the General Booklet
73	Interruption – unacceptably long, General Booklet administration terminated
74	Unusual circumstance - Selected Person
75	Attempted General Booklet but no answers marked
76	Marked some items but did not attempt all items in General Booklet
	Exercise Booklet (module 9)
81	No attempt at any of the exercise booklet items / refusal to start
82	Interruption too long during exercise booklet administration
83	Unusual circumstance, Exercise Booklet administration terminated
84	Attempt at some Exercise Booklet items but no answers marked
85	Attempt at all Exercise Booklet items but no answers marked
86	Marked some Exercise Booklet items, not all items attempted
87	Marked some Exercise Booklet items, all items attempted
88	Marked all Exercise Booklet items

3 Weighting Overview

While the Armenia three-stage stratified cluster design greatly enhanced the operational feasibility of data collection, it resulted in differential probabilities of selection for the selected persons. Consequently, each selected person in the survey does not necessarily represent the same number of persons in the target population. To account for differential probabilities of selection due to the nature of the design and to ensure accurate survey estimates, STEP requires a sampling weight for each person that participated in the survey.

In general, the objectives of the STEP weighting are to construct a set of survey weights to,

- 1) compensate for unequal probabilities of selection;
- 2) compensate for household-level non-response and person-level non-response;
- 3) adjust the weighted sample distribution for key variables of interest (for example, age, gender, education) so that it conforms to a known population distribution for these variables.

The general weighting procedure for the Armenia STEP survey required the following tasks.

1) Creation of a data file to input into the weighting process;

2) **World Bank (WB) Weight Requirement:**

Create survey weights for sampled cases of households and persons that provided sufficient data to be considered a participant in the survey. This requirement does not necessarily include the completion of an assessment General Booklet, nor does it necessarily include the completion of all household and individual questionnaire modules.

- a) Calculation of a PSU weight for 200 sampled PSUs;
- b) Calculation of a household weight for each sampled household;
 - i) Calculation of a household-level non-response adjustment independently for each PSU.
- c) Calculation of a person weight for each selected person (SP);
 - i) Calculation of a non-response adjustment independently for each sampled person.

3) The required output from the weighting process is a final Armenia data file with the survey design weights (i.e., for each sampled PSU, household, person) appended to each data record.

4 Files - Weighting Process

4.1 Input Files

The key file for the weighting process is the file ‘STEP Armenia - Data for Weighting_S7.dta’ provided by the WB core team. The file ‘STEP Armenia - Data for Weighting_S7.dta’ contains a data record for each of the 12,030 sampled households from the Armenia sample frame. An SPSS version of this file, i.e., ‘STEP Armenia - Data for Weighting_S7.sav’, was created for the weighting process.

4.1.1 Revisions to Input Data File

The following general revisions were made to the Armenia SPSS data file ‘STEP Armenia - Data for Weighting_S7’:

- 1) ‘CaseID’, sample case sequential identification number from 1 to 12030
 - a) The data file was sorted in ascending order by the variables PSUsmpID, HHSmpOrder, field_rst, and HHSmpSEQ; the CaseID was subsequently generated.
- 2) ‘m11_q07’, the Result of Interview Code: added value labels; the value labels for ‘m11_q07’ are as follows:

00-No assigned code	51-Refusal by SP to continue modules 2-7'
01-Refusal-Household	52-Interview termination-SP unusual circumstance'
02-Unusual circumstance-Household	61-SP unable to read language of General Booklet (GB)'
03-No knowledgeable household member found after 3 visits	62-SP refusal to begin GB'
04-Temporarily absent/unavailable for field period	63-SP unable to do GB due to unusual circumstance'
05-No competent household member to interview (e.g., due to severe illness, mental disability, etc.)	64-SP blindness or visual impairment-unable to do GB'
06-Language problem	65-SP physical disability'
07-Dwelling could not be found - insufficient Sample Frame address info	71-SP looked through GB-unable to read & write language of GB'
08-Vacant dwelling / selected address has no household	72-SP refused to continue GB after starting'
09-Dwelling not habitable/dwelling destroyed/dwelling converted to commercial use	73-GB interruption too long'
10-household moved away	74-GB terminated due to unusual circumstance'
21-Household Refusal to continue Household Module (i.e., begun but not complete)'	75-Attempted GB but no answers marked'
22-Household module terminated due to unusual circumstance'	76-Attempted part or all of GB; less than 3 correct Core answers'
31-No eligible household member aged 15-64'	77-Marked some items & attempted all items in GB'
32-Refusal-Refusal by SP to begin modules 2-7'	78-Marked all items in GB'
33-Interview termination-SP unusual circumstance'	81-No attempt at any exercise booklet items / refusal to start administration'
34-Refusal-Other Household Member refused to let SP participate'	82-Interruption too long during exercise booklet administration'
35-Unable to contact SP after 3 attempts'	83-Unusual circumstance, Exercise Booklet administration terminated'
36-SP absent for entire survey period'	84-Attempt at some Exercise Booklet items, no answers marked'
37-SP deaf or hard of hearing'	85-Attempt at all Exercise Booklet items, no answers marked'
38-SP learning or mental disability'	86-Marked some Exercise Booklet items, not all items attempted'
39-SP speech impairment'	87-Marked some Exercise Booklet items, all items attempted'
40-SP language problem'	88-Marked all Exercise Booklet items'
	95-Household not activated'.

3) New Variables needed for weighting calculations

a) **final_status**: Final status code for sampled cases; used to create response categories for sampled households and sampled persons.

i) Refer to Table 3 in section 2 for the list of **final_status** codes.

ii) The data file variables '*m11_q07* - Result code of interview' and '*field_rst* - Fieldwork result code' were used to create the variable 'final_status'.

- ◆ For '*m11_q07*', the description of the codes is included in Table 4 above.
- ◆ For '*field_rst*' the description of the codes is as follows:

Code	Code Description
1	Activated; for an 'initial sample' HH this means that it was contacted, for a 'reserve sample' HH it means that it was activated for an interview attempt.
2	Never activated; applicable to reserve sample HHs, the case was correctly never activated, i.e., the prescribed fieldwork procedures were followed.
3	Wrongly activated; applicable to reserve sample cases, the reserve case was activated, but according to the prescribed fieldwork procedures it should <u>not</u> have been activated (i.e., a reserve sample HH was incorrectly activated).
4	Wrongly never activated; applicable to reserve sample cases, the reserve case was never activated but according to the prescribed fieldwork procedures it should have been activated (i.e., a reserve HH should have been activated based on the provided activation order, but it wasn't).
5	Incorrect eligible HH member selected; during the random selection process, an incorrect household member was selected from the list of <u>eligible</u> members.
6	Ineligible HH member selected; during the random selection process, an <u>ineligible</u> household member was selected.

iii) The specifications for creating the variable '**final_status**' are as follows;

-
- IF ((m11_q07 ≠ 0 & m11_q07 ≠ 10) & (field_rst = 1 or field_rst = 3))then final_status=m11_q07;
 - IF (m11_q07 = 10) then final_status = 7;
 - IF (field_rst = 2) then final_status=95;
 - IF (field_rst = 4) then final_status=97;
 - IF (field_rst = 5) then final_status=98;
 - IF (field_rst = 6) then final_status=99.
-

b) **EligPers_Cnt**: Number of selected Persons in the sampled Household; used in place of the variable '*m1c_a_clean*'; there was one case with a missing value for the variable '*m1c_a_clean*' (i.e., NUMBER A: Eligible Persons).

i) **EligPers_Cnt**: Number of selected Persons in the sampled Household

- ◆ for data records with non-missing variable '*m1c_a_clean*',
 - **EligPers_Cnt**= '*m1c_a_clean*'
- ◆ for data records with missing variable '*m1c_a_clean*',
 - **EligPers_Cnt**= *m1c_a_median*, the PSU median value for non-missing cases of the variable '*m1c_a_clean*'

4.1.1.1 Input File – Revised for Weighting

The SPSS Revised Input File for weighting is ‘W00-ARM Final Revised Data File(7-Nov-2013)’. This file is the primary file for the process of creating the survey weights; it includes all 12030 sampled cases; each case includes a final status code. Table 5 provides the list of key variables for weighting purposes that are included in the file.

Table 5: Key Variables in Primary Input File for Weighting Process		
Variable Name	Source	Description
Country	Sample File	Country abbreviation code
CaseID	Created during file preparations	Sampled case ID#
PSUsmpID	Sample File	PSU Sample ID#
PSUsmp_Type	Sample File	PSU Sample Type (Initial, Reserve)
HHsmpOrder	Sample File	Sample activation order
HHsmpSeq	Sample File	Household Sample Sequence #s 01 to 30
HHsmpType	Sample File	HH Sample Indicator
Region	Sample Frame	Region
HHs_Cluster	Sample Frame	Sample Frame # of households in PSU
m1c_a_clean	Final Data File	NUMBER A-# of eligible persons
m11_q07	Final Data File	Result code of interview
field_rst	Final Data File	Fieldwork result code
final_status	Created during file preparations	Final Result Code

Table 6 provides the breakdown of the 12030 sample cases by the final result of the interview attempt, i.e., by ‘*final_status*’ code.

Table 6: Armenia: Number of Sampled Dwellings by Final Result Code of Interview 'final_status'

RESULT CODE OF INTERVIEW	# of Dwellings
01-Refusal-Household	960
02-Unusual circumstance-Household	26
03-No knowledgeable household member found after 3 visits	119
04-Temporarily absent/unavailable for field period	981
05-No competent household member (e.g., severe illness, mental disability, etc.)	133
06-Language problem; survey team not able to speak household member language	42
07-Dwelling could not be found - no Sample Frame address information	482
08-Vacant dwelling / selected address has no household	638
09-Dwelling not habitable/destroyed/converted to commercial	60
21-Household Refusal to continue Household Module (begun,not complete)	2
22-Household module terminated - unusual circumstance	0
31-No eligible household member aged 15-64	164
32-Refusal by SP to begin modules 2-7	9
33-Interview termination-SP unusual circumstance	0
34-Refusal-Other Household Member refused to let SP participate	4
35-Unable to contact SP after 3 attempts	6
36-SP absent for entire survey period	1
37- Hearing Problem - Selected Person is deaf or so hard-of-hearing	0
38-SP learning or mental disability	1
39- Speech impairment of Selected Person prevented participation	0
40- Language problem – Selected Person’s language not understood by survey team	0
51-Refusal by SP to continue modules 2-7	5
52-Interview termination-SP unusual circumstance	1
61-SP unable to read language of GB	24
62-SP refusal to begin GB	196
63-SP unable to do GB due to unusual circumstance	10
64-SP blindness or visual impairment-unable to do GB	12
65-SP physical disability	6
71-SP looked through GB-unable to read/write language of GB	0
72-SP refused to continue GB after starting	16
73-GB interruption too long	0
74-GB terminated - unusual circumstance	3
75-Attempted General Booklet, no answers marked	0
76-Attempted part or all of General Booklet; <3 correct Core answers	11
81-No attempt at any exercise booklet items / refusal to start	219
82-Interruption too long during exercise booklet administration	1
83-Unusual circumstance, Exercise Booklet administration terminated	1
84-Attempt at some Exercise Booklet items, no answers marked	16
85-Attempt at all Exercise Booklet items, no answers marked	3
86-Marked some Exercise Booklet items, not all items attempted	30
87-Marked some Exercise Booklet items, all items attempted	1330
88-Marked all Exercise Booklet items	1108
95- Sample case justifiably not activated, e.g., reserve sample HH not needed	5216
97- Household not interviewed due to field activation procedure error	188
98- Sample selection error – an incorrect eligible person was selected	6
99- Sample selection error – an ineligible person was selected	0
TOTAL	12030

4.2 Final Output Files from Weighting Process

The final output file from the weighting process is,

- 1) [ARM-W01-STEP\(HH\)-Final Wts with BM-SP Wts \(14-Nov-2013\)](#)
 - a) This file contains the original data variables from the Armenia data file '[STEP Armenia - Data for Weighting_S7.dta](#)' and the applicable PSU weights, household weights, person weights, benchmarked person weights, and other associated variables that were created during the weighting process.
 - b) The file contains a data record for each of the 6814 cases that were activated or should have been activated during the data collection operation.
 - i) 3019 participating households with a final household weight
 - ◆ For participating households, the weighted sum of the household weights is 426,884.
 - ii) 2992 participating selected persons with a final person weight
 - ◆ For participating individuals, the weighted sum of the person weights is 1,185,359.
 - iii) 2992 participating selected persons with a final benchmarked person weight
 - ◆ For participating individuals, the weighted sum of the benchmarked person weights is 1,355,817.
 - c) In addition to the Armenia data file original variables, the weighted data file includes several additional variables that were created during the weighting process. The essential variables that are needed for estimation of survey results are included in the final weighted data file.
 - i) Table 7 provides a list of variables from the weighting process that are included in the final weighted data file.
 - ii) Table 8 provides a list of variables from the weighting process that are not included in the final weighted data file. These variables are available from other interim files that were created during the weighting process.
 - iii) Table 9 provides the frequency count of result codes for sampled households that were activated or should have been activated in the final weighted data file '[ARM-W01-STEP\(HH\)-Final Wts with BM-SP Wts \(14-Nov-2013\)](#)'.

Table 7: Variables Created During Weighting Process - Added to Armenia Data File

Variable Name	Description	Values
CaseID	Created during file preparations	n/a
m1c_a_median	Median # Eligible Persons in Stratum	n/a
EligPers_Cnt	Eligible Person Count in Participant HH	n/a
final_status	Final Result Code	Refer to Table 2 for code descriptions
RespCat_HH	Final Response Category-Households	1-Participant HH 2-Ineligible HH 3-Non-participant Eligible HH 4-Non-participant Unknown Eligibility HH
RespCat_SP	Final Response Category-Selected Person	1-Participant SP 2-Non-participant SP 3-Not applicable - non-participant HH
W1_PSUwt	Basic PSU Weight	n/a
W2_FinHHwt	Final Household Weight Use for estimation of Household characteristics	n/a
W3_FinSPwt	Final Person Weight	n/a
AgeGrp	Age Group (5 years)	1 - '15 to 19' 2 - '20 to 24' 3 - '25 to 29' 4 - '30 to 34' 5 - '35 to 39' 6 - '40 to 44' 7 - '45 to 49' 8 - '50 to 54' 9 - '55 to 59' 10 - '60 to 64'
Sex_AgeGrp_Est	Persons: Estimated Sex_AgeGrp Population	n/a
Sex_AgeGrp_2013	Census Sex_AgeGrp Population(2013)	n/a
SP_BMwt	BM PERSON Weight: Adjusted for Benchmark Gender_AgeGrp Population (2013)	n/a

Table 8: Variables Created During Weighting Process – Not Added to Armenia Data File

Variable Name	Description	Values
W2_HH	Household Weight within PSU	n/a
W2_HHwt_basic	Basic Household Weight	n/a
W2_HH_BM	Basic HH Wt, Benchmarked to Frame # of HHs	
PSU_RespFreq	Count of 'RespCat_HH' in PSU	n/a
HH_k	# of participant HHs in PSU	n/a
HH_x	# of Ineligible HHs in PSU	n/a
HH_z	# of Non-participant Eligible HHs in PSU	n/a
HH_u	# of Non-participant Unknown Eligible HHs in PSU	n/a
Elig_Prop_HH	Proportion of Eligible HHs - known eligibility	n/a
R_adj_HH	Response adjustment ratio for HHs	n/a
EligPers_Cnt	Eligible Person Count in Sampled HH	n/a
W3_SP	Selected Person n weight within household	n/a
R_adj_SP	Response adjustment for selected person	n/a
EP_PSU_RCat	Total Eligible Persons-PSU Participant Households	n/a
EP_k	PSU - # of Participant SPs in participant HHs	
EP_z	PSU - # of Non-participant SPs in participant HHs	

Table 9: Armenia, Frequency/Percent of Final Status Codes For Activated Sample Cases

Case Final Result Code	Frequency	Percent
01-Refusal-Household	960	14.1%
02-Unusual circumstance-Household	26	.4%
03-No knowledgeable household member found after 3 visits	119	1.7%
04-Temporarily absent/unavailable for field period	981	14.4%
05-No competent household member (e.g., severe illness, mental disability, etc.)	133	2.0%
06-Language problem	42	.6%
07-Dwelling could not be found - insufficient Sample Frame address info	482	7.1%
08-Vacant dwelling / selected address has no household	638	9.4%
09-Dwelling not habitable/destroyed/converted to commercial	60	.9%
21-Household Refusal to continue Household Module (begun,not complete)	2	.0%
31-No eligible household member aged 15-64	164	2.4%
32-Refusal by SP to begin modules 2-7	9	.1%
34-Refusal-Other Household Member refused to let SP participate	4	.1%
35-Unable to contact SP after 3 attempts	6	.1%
36-SP absent for entire survey period	1	.0%
38-SP learning or mental disability	1	.0%
51-Refusal by SP to continue modules 2-7	5	.1%
52-Interview termination-SP unusual circumstance	1	.0%
61-SP unable to read language of General Booklet (GB)	24	.4%
62-SP refusal to begin GB	196	2.9%
63-SP unable to do GB due to unusual circumstance	10	.1%
64-SP blindness or visual impairment-unable to do GB	12	.2%
65-SP physical disability	6	.1%
72-SP refused to continue GB after starting	16	.2%
74-GB terminated - unusual circumstance	3	.0%
76-Attempted part or all of GB; <3 correct Core answers	11	.2%
81-No attempt at any Exercise Booklet items / refusal to start	219	3.2%
82-Interruption too long during Exercise Booklet administration	1	.0%
83-Unusual circumstance, Exercise Booklet administration terminated	1	.0%
84-Attempt at some Exercise Booklet items, no answers marked	16	.2%
85-Attempt at all Exercise Booklet items, no answers marked	3	.0%
86-Marked some Exercise Booklet items, not all items attempted	30	.4%
87-Marked some Exercise Booklet items, all items attempted	1330	19.5%
88-Marked all Exercise Booklet items	1108	16.3%
97-Household not interviewed - field procedure error	188	2.8%
98-Incorrect eligible household member selected	6	.1%
Total	6814	100.0%

5 Weight Calculations based on World Bank (WB) Weight Requirement

The input file for the process of calculating the weights based on the World Bank (WB) weight requirement is '[W00-ARM Final Revised Data File\(7-Nov-2013\)](#)'.

5.1 First-stage Weight (PSU Weight)

The basic first stage weight, i.e., the PSU weight, is based on a sample size of 200 PSUs. Although 225 PSUs were initially selected to allow for 25 reserve PSUs for non-responding PSUs, only the 200 'initial' PSU sample was actually activated during data collection; none of the 25 'reserve' PSUs was used for the Armenia STEP data collection. Therefore, the STEP survey weight is based on the probability of selection for each of the 200 'initial' PSU sample.

For the Armenia systematic sample of PSUs, the probability of selection of the j^{th} PSU, say p_j , may be represented as,

$$1) \quad p_j = \frac{m}{M} = \frac{200}{3508} = 0.057013$$

where,

m - the number of sampled PSUs (i.e., m=200 CEAs in the case of the Armenia STEP Survey),

M - the total number of PSUs in the target population

The basic first stage weight for the j^{th} PSU, W_{1j} (i.e., weighted data file variable '**W1_PSUwt**'), is calculated as the inverse of its probability of selection:

$$2) \quad W_{1j} = \frac{1}{p_j} = \frac{M}{m} = \frac{1}{0.057013} = 17.54$$

- **The basic first stage PSU weight is the same for each of the 200 sampled PSUs; it is appended to the STEP weighted data file.**

5.2 Second-stage Weight (Household Weight)

5.2.1 Basic Household Weight

The basic second stage weight for the k^{th} household in PSU 'j', W_{2jk} , is calculated as follows:

$$3) \quad W_{2jk} = \frac{N_j}{n_j}$$

where,

- N_j - the number of sample frame households (i.e., weighted data file variable 'HHs_Cluster') in the j^{th} PSU,
- n_j - the number of households sampled in the j^{th} PSU, (i.e., $n_j = 60$ households in each Armenia sampled PSU except for PSU #183 from which 90 households were sampled).

Example 1: Second Stage Basic Weight

The basic second stage weight for each of the 60 sampled households in the Armenia PSU # 102 which contains 153 sample frame households is calculated as follows:

$$W_{2jk} = \frac{m'_j}{n_j} = \frac{153}{60} \approx 2.55$$

The basic second stage weight is similarly calculated for each of the 200 PSUs.

5.2.2 Second-stage Benchmark-adjusted Household Weight

The product of the basic second stage household weight and the first stage PSU weight provides the estimated number of households, \hat{N} , in the target population, i.e.,

$$\hat{N} = \sum(W1_j * W2_{jk}) , \text{ for the Armenia sample of 200 PSUs, } \hat{N} = 526,884.06 \text{ households.}$$

There are 527,171 households in the Armenia sample frame. In order to make \hat{N} consistent with the sample frame count of households a benchmark-adjusted household weight, $W2_{BM}$, was calculated for each PSU 'j' as follows:

$$4) \quad W2_{BM_j} = (W1_j * W2_{jk}) * \frac{N}{\hat{N}}$$

Example 2: Second Stage Benchmark-adjusted Household Weight

For PSU #102,

$$\begin{aligned} W2_{BM_j} &= (W1_j * W2_{jk}) * \frac{N}{\hat{N}} \\ &= 17.54 \times 2.55 \times \frac{527171}{526884.06} \\ &\approx 44.751358 \end{aligned}$$

The second stage benchmark adjusted household weight is similarly calculated for all sampled households.

5.2.3 Second-stage Response Adjustment

The second-stage response adjustment was carried out for each sampled PSU, i.e., at the PSU level.

For treatment in the weighting process the data collection outcomes for the sampled households may be summarized in four possible categories: participant, ineligible, non-participant with known eligibility, non-participant with unknown eligibility.

Participant - A participating household 'k' is an eligible sampled household that provides sufficient data to be considered a participant in the survey. The sampled households 'k' with person-level result codes 32-40, 51-88 and 98-99 satisfy the requirement for classification of the household as a survey participant. The result codes and corresponding code descriptions for participating households 'k' are as follows:

I. Household-level Codes – Participant, Eligible Household	
Code	Code Description
Individual modules 2-7 <u>not</u> begun	
32	Refusal by Selected Person to begin modules 2-7
33	Unusual circumstance - Selected Person (e.g., death in family, illness, fire in dwelling, etc.)
34	Refusal - Another household member refused to let selected individual do individual modules
35	Unable to contact Selected Person after three visits during field period
36	Temporarily absence/unavailability of Selected Person for field period (info from household member)
37	Hearing Problem - Selected Person is deaf or so hard-of-hearing, no translator available
38	Learning or mental disability (includes emotional conditions like severe depression) of Selected Person
39	Speech impairment of Selected Person prevented participation, no translator available
40	Language problem – Selected Person’s language not understood by survey team, no translator available
Individual modules 2-7 begun but not completed	
51	Refusal by Selected Person to continue modules 2-7
52	Unusual circumstance - Selected Person
General Booklet (module 9) not begun	
61	Unable to read or write in language of General Booklet – Selected Person refused to begin
62	Refusal by Selected Person to begin General Booklet
63	Unusual circumstance - Selected Person
64	Blindness or visual impairment of Selected Person prevented completion of General Booklet
65	Physical disability of Selected Person prevented completion of General Booklet
General booklet (module 9) looked through or attempted but not completed	
71	Selected Person looked at Booklet but unable to read & write the language of Booklet - did not begin
72	Refusal by Selected Person to continue the General Booklet
73	Interruption – unacceptably long
74	Unusual circumstance - Selected Person
75	Attempted General Booklet but no answers marked
76	Marked some items but did not attempt all items in General Booklet
77	Marked some items & attempted all items in General Booklet
78	Marked all items in General Booklet
81	No attempt at any of the exercise booklet items / refusal to start
82	Interruption too long during exercise booklet administration
83	Unusual circumstance, Exercise Booklet administration terminated
84	Attempt at some Exercise Booklet items but no answers marked
85	Attempt at all Exercise Booklet items but no answers marked
86	Marked some Exercise Booklet items, not all items attempted
87	Marked some Exercise Booklet items, all items attempted
88	Marked all Exercise Booklet items
98	Sample selection error – an incorrect eligible person was selected by the interviewer
99	Sample selection error – an ineligible person was selected by the interviewer

Ineligible – A sampled household ‘x’ is categorized as ineligible if there is no household member in the eligible 15-64 age range. The result codes for ineligible sampled households ‘x’ are as follows:

II. Household-level Codes – Ineligible Household

Code	Code Description
08	Vacant dwelling
09	Dwelling not habitable/dwelling destroyed/dwelling converted to commercial use
31	No household member in the eligible range of 15-64

Non-participant - Eligibility Known: A non-participating household ‘z’ results when an eligible household does not participate due to refusal, unusual circumstance, or the household was selected in error. The result codes for sampled households ‘z’ with known eligibility are as follows:

III. Household-level Codes – Non-participants, Eligible Household

Code	Code Description
21	Household Refusal to continue Household Module (i.e., begun but not complete)
22	Household unusual circumstance (e.g., death in family, illness, fire in dwelling, etc.) prevented continuance
97	Sample selection error – a wrong household was selected in the field

Non-participant - Eligibility Unknown: A non-participating household ‘u’ results when a household does not participate due to non-contact with a responsible household member, inconclusive information about the eligibility status of the sampled household, or sample case was not activated (this usually pertains to the reserve sample cases). The result codes for non-participating households ‘u’ with unknown eligibility are as follows:

IV. Household-level Codes – Non-participants, Unknown Eligibility Household

Code	Code Description
01	Household Refusal
02	Household unusual circumstance (e.g., death in family, illness, fire in dwelling, etc.)
03	No knowledgeable household member found after 3 visits (only a child, non-competent adult, etc.)
04	Temporarily absent/unavailable for field period (information from other persons)
05	No competent household member to interview (because of severe illness, mental disability, etc.)
06	Language problem – no household member spoke a language understandable by survey team, no translator available
07	Dwelling could not be found due to insufficient Sample Frame address info
95	Sample case not activated
96	General non-response; Reason unspecified by survey firm

The total number of sampled households in each PSU may be represented by the following equation.

$$5) \quad n_j = n_{jk} + n_{jx} + n_{jz} + n_{ju}$$

where,

n_j - the number of households sampled in the j^{th} PSU, (i.e., $n_j = 30$ households in each Armenia sampled PSU),

n_{jk} - the number of households 'k' that participate in the j^{th} PSU,

n_{jx} - the number of ineligible households 'x' in the j^{th} PSU,

n_{jz} - the number of non-participating households 'z' with known eligibility in the j^{th} PSU,

n_{ju} - the number of non-participating households 'u' with unknown eligibility in the j^{th} PSU.

Table 10 provides the STEP counts of activated households from the Armenia data file by the outcome categories described above.

Case Final Result Code	Final Response Category-Households					% of Total
	Participant (n _{jk})	Ineligible (n _{ix})	Non-participant Eligible (n _{jz})	Non-participant Eligibility(??) (n _{ju})	Total (n _j)	
01-Refusal-Household				960	960	14.1%
02-Unusual circumstance-HH				26	26	.4%
03-No knowledgeable HH member found				119	119	1.7%
04-Temporarily absent				981	981	14.4%
05-No competent HH member				133	133	2.0%
06-Language problem				42	42	.6%
07-Dwelling not found - no address info				482	482	7.1%
08-Vacant dwelling		638			638	9.4%
09-Dwelling not habitable		60			60	.9%
21-HHRefusal to continue HH Module			2		2	.0%
31-No eligible HH member aged 15-64		164			164	2.4%
32-Refusal by SP to begin modules 2-7	9				9	.1%
34-Refusal- HH Member other than SP	4				4	.1%
35-Unable to contact SP (3 attempts)	6				6	.1%
36-SP absent for entire survey period	1				1	.0%
38-SP learning or mental disability	1				1	.0%
51-Refusal by SP to continue modules 2-7	5				5	.1%
52-Interview termination-SP unusual circumstance	1				1	.0%
61-SP unable to read General Booklet (GB) language	24				24	.4%
62-SP refusal to begin GB	196				196	2.9%
63-SP unable to do GB due to unusual circumstance	10				10	.1%
64-SP visual impairment-unable to do GB	12				12	.2%
65-SP physical disability	6				6	.1%
72-SP refused to continue GB	16				16	.2%
74-GB terminated - unusual circumstance	3				3	.0%
76-Attempted GB; <3 correct Core answers	11				11	.2%
81-No attempt at Exercise Booklet(EB) items	219				219	3.2%
82-Interruption too long-EB termination	1				1	.0%
83-Unusual circumstance, EB terminated	1				1	.0%
84-Attempt at some EB items, no answers marked	16				16	.2%
85-Attempt at all EB items, no answers marked	3				3	.0%
86-Marked some EB items, some items attempted	30				30	.4%
87-Marked some EB items, all items attempted	1330				1330	19.5%
88-Marked all EB items	1108				1108	16.3%
97-HH not interviewed - field procedure error			188		188	2.8%
98-Incorrect eligible HH member selected	6				6	.1%
Total	3019	862	190	2743	6814	100.0%

5.2.3.1 Eligible Proportion of Households

The STEP assumes that the households 'u' with unknown eligibility in the j^{th} PSU are comprised of some proportion, say ε_j , that are eligible households and the complementary proportion, $1 - \varepsilon_j$, that are ineligible households.

Amongst the n_{ju} non-participating households 'u' with unknown eligibility in PSU 'j', the proportion of households with known eligibility is estimated to be

$$6) \quad \varepsilon_j = \frac{\text{Total \# of known eligible cases}}{\text{Total \# of known eligible \& known ineligible cases}} = \frac{n_{jk} + n_{jz}}{n_{jk} + n_{jx} + n_{jz}}$$

➤ Note that the eligible proportion is the same for all eligible participating households.

Example 3: Eligible Proportion of Households

For PSU #102, the following household results were obtained:

n_j	n_{jk}	n_{jx}	n_{jz}	n_{ju}
60	15	2	18	25

For PSU # 102, the proportion of households with known eligibility is calculated as,

$$\begin{aligned} \varepsilon_{102} &= \frac{\text{Total \# of known eligible cases}}{\text{Total \# of known eligible \& known ineligible cases}} \\ &= \frac{n_{jk} + n_{jz}}{n_{jk} + n_{jx} + n_{jz}} \\ &= \frac{15 + 18}{15 + 2 + 18} = \frac{33}{35} \approx 0.942857 \end{aligned}$$

5.2.3.2 Response Adjustment Factor for Non-participation

A household-level response adjustment is necessary to compensate for households that did not participate in the survey. The household-level response adjustment factor for the j^{th} PSU, R_j , is calculated as follows:

$$7) \quad R_{HH_j} = \frac{\text{Total eligible households in PSU } j'}{\text{Total participating households in PSU } j'} = \frac{n_{jk} + n_{jz} + (\epsilon_j * n_{ju})}{n_{jk}}$$

- The response adjustment ratio, R_{HH_j} , incorporates the adjustment for unknown eligibility, ϵ_j .
- The households that are categorized as ineligible, n_{jk} , are excluded from the calculation of the household-level response adjustment.

Example 4: Second Stage Response Adjustment Factor for sampled Households

For example, the following results were obtained for PSU #102

n_j	n_{jk}	n_{jx}	n_{jz}	n_{ju}
60	15	2	18	25

Therefore,

$$\begin{aligned} R_{102} &= \frac{\text{Total eligible households in PSU \#102}}{\text{Total participating households in PSU \#102}} \\ &= \frac{n_{jk} + n_{jz} + (\epsilon_{102} * n_{ju})}{n_{jk}} \\ &= \frac{15 + 18 + (.942857 * 25)}{15} \approx 3.7714 \end{aligned}$$

The response adjustment ratio, R_{HH_j} , is similarly calculated for all 200 sampled PSUs.

5.2.4 Final Second-stage Household Weight

The final household weight is the weight used for producing household-level estimates, such as the proportion of households with a specific attribute. This weight is appended to the STEP data file.

The final second stage household weight is calculated as the product of the benchmark-adjusted household weight and the response adjustment factor for non-participant households. Therefore, for household 'k' in PSU 'j', the final second stage household weight, $W2_{Radj,k}$, is calculated as follows:

$$8) \quad W2_{HH_k} = W2_{BM_j} * R_{HH_j}$$

- The final second stage household weight is appended to the STEP data file.

Example 5: Second Stage Response-adjusted Household Weight

For PSU #102,

$$\begin{aligned} W2_{HH_j} &= W2_{BM_j} * R_{HH_j} \\ &= 44.751358 \times 3.7714 \\ &\approx 168.776551 \end{aligned}$$

The household weight is similarly calculated for all sampled households.

5.2.5 Weighted Household Counts

The original sample frame '[ARM-STEP-HH-Frame \(11-Mar-2013\)](#)' showed there is a total of 527,171 households in the target population. However, the STEP data collection found that some of these households are ineligible for reasons such as vacant, not habitable, no eligible household member, etc.

Table 11 provides,

- i. the weighted count of households based on the sample frame count of households for the 200 sampled PSUs;
- ii. the weighted count of households based on the final status of the cases in the Armenia data file.

Source of PSU Household Count	# of PSUs	Weighted Sum of Households
1. Based on # PSU of Hhlds in Sample Frame ' ARM-STEP-HH-Frame (11-Mar-2013) '	3508	527,171
2. Based on # of PSU Hhlds in STEP Data File ' STEP Armenia - Data for Weighting_S7 ' [all participants, i.e., participants, non-participants, ineligible]	200	527,171
3. Based on # of PSU Hhlds in STEP Data File ' STEP Armenia - Data for Weighting_S7 ' [eligible households only]	200	426,484

As shown in the third row of Table 11, when ineligible households are excluded, the weighted number of eligible households is **426,484**.

For participating selected households, Table 12 provides a summary of the central tendency for the participating households.

Statistic	Final Household Weight
No. of Cases	3019
Mean	141.27
Std. Error of Mean	0.43
Median	145.27
Minimum	51.64
Maximum	175.50
Sum of Weights	426,484

5.3 Third-stage Weight (Person Weight)

5.3.1 Basic Third-stage Person Weight

The basic third stage weight for the i^{th} person, W_{3jki} , is calculated as follows:

$$9) \quad W_{3jki} = \frac{a_{jk}}{b_{jk}} = \frac{a_{jk}}{1} = a_{jk}$$

where,

a_{jk} - the number of eligible persons in the k^{th} household in the j^{th} PSU,

b_{jk} - the number of persons sampled in the k^{th} household in the j^{th} PSU, (i.e., $n_{jk} = 1$ person in each Armenia sampled household).

N.B. $A_{jk} = \sum_{k=1}^{n_{jk}} a_{jk} = \text{total \# of selected persons in the } j^{\text{th}} \text{ PSU}$
where,

n_{jk} - the number of households 'k' that participate in the j^{th} PSU

Example 6: Third Stage – Basic Person Weight within sampled Household

For PSU #102, selected household # 03 has 3 eligible persons. Therefore,

$$W_{3jki} = \frac{a_{jk}}{b_{jk}} = \frac{3}{1} = 3$$

5.3.2 Third-stage Person-level Response Adjustment

For eligible participating households, there are three possible person-level outcomes, a selected eligible person participates in the survey, a selected eligible person does not participate, a selected person is ineligible.

Participant SP - A participating selected person ‘i’ is an eligible sampled person that provides sufficient data to be considered a participant in the survey. The sampled persons ‘i’ with result codes 51-78 satisfy the requirement for classification of the person as a survey participant. The result codes for participating persons ‘i’ are as follows:

I. Person-level Codes – Participant in Eligible Selected Household	
Code	Code Description
Individual modules 2-7 begun but not completed	
51	Refusal by Selected Person to continue modules 2-7
52	Unusual circumstance - Selected Person
General Booklet (module 9) not begun	
61	Unable to read or write in language of General Booklet – Selected Person refused to begin
62	Refusal by Selected Person to begin General Booklet
63	Unusual circumstance - Selected Person
64	Blindness or visual impairment of Selected Person prevented completion of General Booklet
65	Physical disability of Selected Person prevented completion of General Booklet
General booklet (module 9) looked through or attempted but not completed	
71	Selected Person looked at Booklet but unable to read & write the language of Booklet - did not begin
72	Refusal by Selected Person to continue the General Booklet
73	Interruption – unacceptably long
74	Unusual circumstance - Selected Person
75	Attempted General Booklet but no answers marked
76	Marked some items but did not attempt all items in General Booklet
77	Marked some items & attempted all items in General Booklet
78	Marked all items in General Booklet
81	No attempt at any of the exercise booklet items / refusal to start
82	Interruption too long during exercise booklet administration
83	Unusual circumstance, Exercise Booklet administration terminated
84	Attempt at some Exercise Booklet items but no answers marked
85	Attempt at all Exercise Booklet items but no answers marked
86	Marked some Exercise Booklet items, not all items attempted
87	Marked some Exercise Booklet items, all items attempted
88	Marked all Exercise Booklet items

Non-participant SP - A non-participating person ‘q’ results when an eligible person does not participate due to refusal, unusual circumstance, non-contact, language problem, physical disability (hearing, vision, other) or the person was selected in error. The result codes for non-participating persons ‘q’ are as follows:

II. Person-level Codes – Non-participant in Eligible Selected Household	
Code	Code Description
Individual modules 2-7 <u>not</u> begun	
32	Refusal by Selected Person to begin modules 2-7
33	Unusual circumstance - Selected Person (e.g., death in family, illness, fire in dwelling, etc.)
34	Refusal - Another household member refused to let selected individual do individual modules
35	Unable to contact Selected Person after three visits during field period
36	Temporarily absence/unavailability of Selected Person for field period (info from household member)
37	Hearing Problem - Selected Person is deaf or so hard-of-hearing, no translator available
38	Learning or mental disability (includes emotional conditions like severe depression) of Selected Person
39	Speech impairment of Selected Person prevented participation, no translator available
40	Language problem – Selected Person’s language not understood by survey team, no translator available
98	Sample selection error – an incorrect eligible person was selected by the interviewer

Ineligible SP - A sampled person ‘f’ is categorized as ineligible if the person is not a member of the target population, for example, the person’s age is outside the eligible 15-64 age range. Ineligible sampled persons ‘f’ are as assigned the result code 99.

III. Person-level Codes – Non-participant in Eligible Selected Household	
Code	Code Description
99	Sample selection error – an ineligible person was selected by the interviewer

Note: there were no ineligible selected persons in the Armenia STEP Survey.

The third stage person weight is only relevant for sampled households in the final response category RespCat=1, i.e., participating households. Table 13 provides the pertinent frequency counts of the Final Status Codes for the participant households.

Table 13: Final Status Code for Participating Households (i.e., Households with RespCat_HH=1)

Case Final Status Code	Frequency	Percent
32-Refusal by SP to begin modules 2-7	9	.3%
34-Refusal-Other Household Member refused to let SP participate	4	.1%
35-Unable to contact SP after 3 attempts	6	.2%
36-SP absent for entire survey period	1	.0%
38-SP learning or mental disability	1	.0%
51-Refusal by SP to continue modules 2-7	5	.2%
52-Interview termination-SP unusual circumstance	1	.0%
61-SP unable to read language of General Booklet (GB)	24	.8%
62-SP refusal to begin GB	196	6.5%
63-SP unable to do GB due to unusual circumstance	10	.3%
64-SP blindness or visual impairment-unable to do GB	12	.4%
65-SP physical disability	6	.2%
72-SP refused to continue GB after starting	16	.5%
74-GB terminated - unusual circumstance	3	.1%
76-Attempted part or all of GB; <3 correct Core answers	11	.4%
81-No attempt at any Exercise Booklet items / refusal to start	219	7.3%
82-Interruption too long during Exercise Booklet administration	1	.0%
83-Unusual circumstance, Exercise Booklet administration terminated	1	.0%
84-Attempt at some Exercise Booklet items, no answers marked	16	.5%
85-Attempt at all Exercise Booklet items, no answers marked	3	.1%
86-Marked some Exercise Booklet items, not all items attempted	30	1.0%
87-Marked some Exercise Booklet items, all items attempted	1330	44.1%
88-Marked all Exercise Booklet items	1108	36.7%
98-Incorrect eligible household member selected	6	.2%
Total	3019	100.0%

In each participating household in the STEP Survey, one eligible person was selected to be interviewed. Therefore, for each participating household the basic person weight, $W_{3_{jki}}$, would also be the final person weight within a sampled PSU if all persons in the PSU participated. However, when there is one or more non-participating selected persons within a sampled PSU, the basic person-weights for the PSU require a response adjustment so that the final person weight for each participating person in the PSU is also representative of the non-participating person(s) in the sampled households in the PSU. In other words, the total number of participating persons in a sampled PSU must represent the total number of eligible persons in the sampled households in the PSU.

Therefore, within each sampled PSU, a person-level response adjustment to the basic person weight is necessary to compensate for persons that did not participate in the survey.

The total number of eligible persons in each PSU may be represented by the following equation:

$$10) \quad A_{jk} = A_{jki} + A_{jkq}$$

where,

- $A_{jk} = \sum_{k=1}^{n_{jk}} a_{jk}$ - the total number of eligible persons for all n_{jk} participating households in the j^{th} PSU,
 $A_{jki} = \sum_{k=1}^{n_{jk}} a_{jki}$ - the total number of eligible persons 'i' that participate for all n_{jk} participating households in the j^{th} PSU,
 $A_{jkq} = \sum_{k=1}^{n_{jk}} a_{jkq}$ - the total number of non-participating eligible persons 'q' for all n_{jk} participating households in the j^{th} PSU,

Therefore, the person-level response adjustment for the j^{th} PSU, R_{jk} , is calculated as follows:

$$11) \quad R_{SP_j} = \frac{\text{Total eligible persons in all participating sampled households in PSU } 'j'}{\text{Total participating persons in all participating sampled households in PSU } 'j'} = \frac{A_{jk}}{A_{jki}}$$

Example 7: Third Stage – Basic Person Weight Response Adjustment

- i) For PSU #102, there are 39 eligible persons across all participating households; also, all selected persons participated. Therefore,

$$A_{jk} = \sum_{k=1}^{n_{jk}} a_{jk} = 39 ; \quad A_{jki} = \sum_{k=1}^{n_{jk}} a_{jki} = 39$$

$$R_{SP_j} = \frac{A_{jk}}{A_{jki}} = \frac{39}{39} = 1.00$$

- ii) For PSU # 107, the total number of eligible persons across all participating households is 59. For PSU # 107, there are two non-participating selected persons. Therefore,

$$A_{jk} = \sum_{k=1}^{n_{jk}} a_{jk} = 59 ; \quad A_{jki} = \sum_{k=1}^{n_{jk}} a_{jki} = 57$$

$$R_{SP_j} = \frac{A_{jk}}{A_{jki}} = \frac{59}{57} \approx 1.035$$

Table 14 provides the sample counts of the Final Response Category for selected persons.

Table 14: Sample Counts by Selected Person Final Response Category for Participating HHs		
For Participating Households		
Final Response Category-SP	Frequency	Percent
1-Participant SP	2992	99.1
2-Non-participant, Eligible	27	0.9
Total	3019	100.0

Based on the above table, there are 2992 participating selected persons for which a final non-zero Person-weight was calculated. The sampled persons in category 2 have a zero-value final person weight.

5.3.3 Final Third-stage Person Weight

The final person weight is the weight used for producing person-level estimates, such as the proportion of persons with a specific attribute. This weight is appended to the STEP data file.

The final person weight is calculated as the product of the final household weight (which incorporates the PSU weight and the response adjustment for the basic household weight), the basic third stage person weight, and the response adjustment for the basic person weight. Therefore, for the selected person 'i' in household 'k' in PSU 'j', the final person weight, W_{SP} (i.e., weighted data file variable 'W_FinSPwt'), is calculated as follows:

$$12) \quad W_{3SP} = W_{2H} * W_{3jki} * R_{SPj}$$

➤ The final third stage person weight is appended to the STEP data file.

Example 8: Third Stage – Final Person Weight

- i) For PSU #102, selected household # 03 with 3 eligible persons, the selected person was a participant. All selected persons participated in PSU #102, therefore, $R_{SPj} = 1$

$$W_{2H} = 168.77655 * 3 * 1 \approx 506.32965$$

- ii) For PSU #107, in participant household # 22 with 4 eligible persons, the selected person was a participant. For this household,

$$W_{2H} \approx 163.8219; \quad W_{3jki} \approx 4; \quad R_{SPj} \approx 1.035$$

$$W_{SP} = 163.8219 * 4 * 1.035 \approx 678.28$$

The final person weight is similarly calculated for all sampled persons. Note that the final person weight will be zero for all non-participating selected persons.

5.3.3.1 Third-stage Benchmark-adjusted Person Weight

For each Gender and Age Group (i.e., GA) combination, the Armenia weighted data file includes the variable 'Sex_AgeGrp_Est', the STEP Survey estimate of the target population, say \hat{Y}_{GA} .

The Armenia survey firm provided the file 'Armstat_Urban Population by age gen_RA 2011 Census' which includes the Armenia Census population by gender and age for the year 2013. This file was used to generate, the variable 'Sex_AgeGrp_2013', say Y_{GA} , the census urban population for each GA combination corresponding to the variable 'Sex_AgeGrp_Est'.

In order to make \hat{Y}_{GA} consistent with the Armenian Census population count, a benchmark-adjusted person weight, $W3_{SP_{BM}}$, was calculated for each PSU 'j' as follows:

$$13) \quad W3_{SP_{BM}} = W3_{SP} * \frac{Y_{GA}}{\hat{Y}_{GA}}$$

Table 15 provides the data that was used to adjust the final person weight to Armenia Census urban population figures for the STEP target population; it includes, for each GA, the Step estimated urban population and the corresponding Census urban population.

Age Group (5 years)	# of Sample Cases			STEP Estimated Urban Population			Armenia Census Urban Population		
				Sex_AgeGrp_Est			Sex_AgeGrp_2013		
	Male	Female	Total	Male \hat{Y}_{1A}	Female \hat{Y}_{2A}	Total	Male Y_{1A}	Female Y_{2A}	Total
1 - '15 to 19' years	89	130	219	44,978	63,284	108,261	62,762	60,526	123,288
2 - '20 to 24' years	110	228	338	47,651	107,877	155,527	81,652	89,403	171,055
3 - '25 to 29' years	88	240	328	37,336	97,779	135,115	81,914	92,572	174,486
4 - '30 to 34' years	94	275	369	37,622	98,347	135,969	73,982	81,166	155,148
5 - '35 to 39' years	66	222	288	23,066	81,485	104,551	60,436	66,971	127,407
6 - '40 to 44' years	68	182	250	25,830	70,782	96,612	51,269	60,618	111,887
7 - '45 to 49' years	87	199	286	34,837	80,592	115,429	51,832	66,231	118,063
8 - '50 to 54' years	79	252	331	33,406	93,594	127,001	65,381	82,813	148,194
9 - '55 to 59' years	84	213	297	36,750	79,117	115,868	55,774	71,628	127,402
10 - '60 to 64' years	82	204	286	31,086	59,941	91,026	42,695	56,192	98,887
Total	847	2145	2992	352,562	832,797	1,185,359	627,697	728,120	1,355,817

Example 2: Third Stage Benchmark-adjusted Person Weight

For PSU #102, the participant selected person in selected household # 03 is a 35 year old female. Thus,

$$\begin{aligned} W3_{SP_{BM}} &= W3_{SP} * \frac{Y_{GA}}{\hat{Y}_{GA}} \\ &= 506.32965 \times \frac{66791}{81484.62769} \\ &\approx 416.144789 \end{aligned}$$

The third stage benchmark adjusted person weight is similarly calculated for all sampled participant persons.

5.3.4 Weighted Person Counts

The weighted count of the non-institutionalized persons 15 to 64 years of age (inclusive) living in private dwellings in urban areas of **Armenia** at the time of data collection is provided in Table 16. Based on the 2992 participating selected persons, the sum of the final person weights from the STEP survey is 1,185,359; the sum of the benchmark-adjusted final person weights from the STEP survey is 1,355,817

Table 16: Sample Frequency & Weighted Persons Totals by Final Selected Person Response Category For Participating Households			
Response Category (SP)	Sampled Cases	Total # of Eligible Persons in Target Population	
		(based on Final Person weight)	(based on Benchmark-adjusted Person weight)
1-Participant SP	2,992	1,185,359	1,355,817
2-Non-participant, Eligible	27	0	0
Total	3,019	1,185,359	1,355,817

For participating selected persons, Table 17 provides a summary of the central tendency of the number of eligible persons in the participating households. Based on the average of 2.77 eligible persons per participating household and an estimated 426,484 households, there are approximately 1,185,500 persons aged 15 to 64 in the target population.

Table 17: Summary - Eligible Persons, Person Weights			
Statistic	Eligible Persons	Final Person Weight	Benchmarked Person Weight
No. of Cases	2992	2992	2992
Mean	2.77	396.18	453.15
Std. Error of Mean	0.023	3.65	5.55
Median	3.00	350.99	383.15
Minimum	1	51.64	42.62
Maximum	9	1403.96	2758.92
Sum of Weights	8278	1,185,359	1,355,817

6 Response Rate

An overall response rate of 50.3% was achieved in the Armenia STEP Survey. Table 18 provides the detailed percentage distribution by final status code.

Table 18: Response Rate: Armenia, Activated HHs by Final Status Code

Case Final Status Code	Frequency	Percent
08-Vacant dwelling / selected address has no household	638	9.4%
09-Dwelling not habitable/destroyed/converted to commercial	60	0.9%
31-No eligible household member aged 15-64	164	2.4%
Ineligible HHs (N.B. % is based on total # of activated HHs, i.e., 6814 HHs)	862	12.7%
01-Refusal-Household	960	14.1%
02-Unusual circumstance-Household	26	0.4%
03-No knowledgeable household member found after 3 visits	119	1.7%
04-Temporarily absent/unavailable for field period	981	14.4%
05-No competent household member (e.g., severe illness, mental disability, etc.)	133	2.0%
06-Language problem	42	0.6%
07-Dwelling could not be found - insufficient Sample Frame address info	482	7.1%
21-Household Refusal to continue Household Module (begun, not complete)	2	0.0%
32-Refusal by SP to begin modules 2-7	9	0.1%
34-Refusal-Other Household Member refused to let SP participate	4	0.1%
35-Unable to contact SP after 3 attempts	6	0.1%
36-SP absent for entire survey period	1	0.0%
38-SP learning or mental disability	1	0.0%
97-Household not interviewed - field procedure error	188	2.8%
98-Incorrect eligible household member selected	6	0.1%
Non-respondents (Eligible) (N.B. % is based on total # of Eligible HHs, i.e., 5952 HHs)	2960	49.7%
51-Refusal by SP to continue modules 2-7	5	0.1%
52-Interview termination-SP unusual circumstance	1	0.0%
61-SP unable to read language of General Booklet (GB)	24	0.4%
62-SP refusal to begin GB	196	2.9%
63-SP unable to do GB due to unusual circumstance	10	0.1%
64-SP blindness or visual impairment-unable to do GB	12	0.2%
65-SP physical disability	6	0.1%
72-SP refused to continue GB after starting	16	0.2%
74-GB terminated - unusual circumstance	3	0.0%
76-Attempted part or all of GB; <3 correct Core answers	11	0.2%
81-No attempt at any Exercise Booklet items / refusal to start	219	3.2%
82-Interruption too long during Exercise Booklet administration	1	0.0%
83-Unusual circumstance, Exercise Booklet administration terminated	1	0.0%
84-Attempt at some Exercise Booklet items, no answers marked	16	0.2%
85-Attempt at all Exercise Booklet items, no answers marked	3	0.0%
86-Marked some Exercise Booklet items, not all items attempted	30	0.4%
87-Marked some Exercise Booklet items, all items attempted	1330	19.5%
88-Marked all Exercise Booklet items	1108	16.3%
Respondents (N.B. % is based on total # of Eligible HHs, i.e., 5952 HHs)	2992	50.3%
Total Eligible Households	5952	100.0%
Total Activated Households	6814	100.0%