

# Workshop on the Production of Statistics on Asset Ownership from a Gender Perspective through Household Surveys

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ADB's Statistical Capacity Development  
for Social Inclusion and Gender Equality

## **Field Operations, Interview Protocol and Survey Weighting**

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# Outline of Presentation

- Overview
- Field Operations and Interview Protocol
- Data Cleaning and Validation
- Calculation of Survey Weights
- Post-stratification Weight Adjustment



# Field Operations and Interview Protocol

| Participating country | Coverage                  | Sample Size<br><i>(households)</i> |
|-----------------------|---------------------------|------------------------------------|
| Georgia               | Nationally representative | 3,160                              |
| Mongolia              | Nationally representative | 3,008                              |
| Philippines           | Province of Cavite only   | 1,536                              |

- Stand-alone household survey
- Self-reported and proxy data collection



# Field Operations and Interview Protocol

## Data Collection Strategy in ADB Pilot Countries

- A two-stage stratified sampling design was adopted for Georgia and Cavite, Philippines while three stage selection process for Mongolia.
- Households in each PSU stratified into two strata:
  - Households with 3 or more adult members
  - Less than 3 members
- Questionnaires
  - **Household Questionnaire:** household roster and selection of individual adults
  - **Individual Questionnaire:** collects data on assets owned and entrepreneurship



# Field Operations and Interview Protocol

## Data Collection Strategy in ADB Pilot Countries

### Identifying Eligible Respondents

The individual questionnaire was administered to **at most 3 adult members** of the household



1. **Primary Respondent (PR)**
2. **Spouse/partner** (if available) together defined as the **Principal couple** are important units of analysis)
3. **Third adult randomly selected** if there are more than 3 adults in a household



# Field Operations and Interview Protocol

## Data Collection Strategy in ADB Pilot Countries

- Face-to-face paper based interviews
- Respondents were interviewed **simultaneously and independently.**
- Team approach – each team comprising 2 to 5 members (enumerator/supervisor)
- Tight field work quality control through supervisors and field visits by Headquarter team



# Field Operations and Interview Protocol

## Data Collection Strategy in ADB Pilot Countries



- **Georgia** – Field enumerators contracted at regional level and regional supervisors supervised field work
  - Additional back checks by GeoStat team
- **Mongolia** – Field enumerators and supervisors both recruited centrally
  - Field visits by central team to the field
- **Cavite, Philippines** – Field enumerators recruited regionally and regional supervisors supervised field work
  - Field visits by central team to the field



# Field Operations and Interview Protocol

## Distribution of Sample Households Interviewed by Strata

| Country and Strata               | Number of sample HH interviewed | HH with at least 1 eligible adult member interviewed (%) | HH in which all eligible adult members were interviewed (%) | HH in which all eligible adult members were interviewed simultaneously (%) |
|----------------------------------|---------------------------------|--|---|--|
| <b>Georgia</b>                   | <b>2783</b>                     | <b>100.0</b>   | <b>82.4</b>   | <b>52.2</b>  |
| Household with 3 or more adults  | 1,399                           | 100.0  | 75.3  | 56.5   |
| Household with 2 or fewer adults | 1,384                           | 100.0  | 89.5  | 47.8   |
| <b>Mongolia</b>                  | <b>2962</b>                     | <b>99.8</b>  | <b>61.0</b>   | <b>30.4</b>  |
| Household with 3 or more adults  | 1,341                           | 99.8   | 39.0  | 26.5   |
| Household with 2 or fewer adults | 1,621                           | 99.8   | 79.0  | 33.6   |
| <b>Cavite, Philippines</b>       | <b>1536</b>                     | <b>99.9</b>  | <b>83.5</b>   | <b>39.6</b>  |
| Household with 3 or more adults  | 790                             | 99.9   | 76.2  | 31.8   |
| Household with 2 or fewer adults | 746                             | 100.0  | 91.2  | 47.9   |

- Almost all surveyed hhds had at least one eligible adult member interviewed.
- Out of every 10 hhds surveyed all eligible adult members were interviewed in more than 8 hhds in Georgia and Philippines, but only 6 in Mongolia
- In only 50%, 40% and 30% hhds all eligible members could be interviewed simultaneously in Georgia, Philippines, and Mongolia respectively.

HH = household.

Source: Asian Development Bank estimates using Evidence and Data for Gender Equality pilot surveys.



# Field Operations and Interview Protocol

## Distribution of Sample Households with Principal Couple

| Country and Location       | Total Number of Interviewed Households | Households with Principal Couple (%) | Households Interviewed (%)       |                                |                                    |
|----------------------------|--|--------------------------------------|----------------------------------|--------------------------------|------------------------------------|
|                            |  |                                      | Both Members of Principal Couple | One Member of Principal Couple | Neither Member of Principal Couple |
| <b>Georgia</b>             |  |                                      |                                  |                                |                                    |
| <b>Total</b>               | <b>2,783</b>                           | <b>61.0</b>                          | <b>84.0</b>                      | <b>16.0</b>                    | <b>0.0</b>                         |
| Rural                      | 1,288                                  | 63.8                                 | 87.0                             | 13.0                           | 0.0                                |
| Urban                      | 1,495                                  | 58.6                                 | 81.3                             | 18.7                           | 0.0                                |
| <b>Mongolia</b>            |  |                                      |                                  |                                |                                    |
| <b>Total</b>               | <b>2,962</b>                           | <b>71.3</b>                          | <b>77.6</b>                      | <b>22.1</b>                    | <b>0.4</b>                         |
| Rural                      | 1,089                                  | 75.2                                 | 80.6                             | 18.9                           | 0.5                                |
| Urban                      | 1,873                                  | 69.0                                 | 75.6                             | 24.1                           | 0.3                                |
| <b>Cavite, Philippines</b> |  |                                      |                                  |                                |                                    |
| <b>Total</b>               | <b>1,536</b>                           | <b>73.8</b>                          | <b>86.6</b>                      | <b>12.8</b>                    | <b>0.6</b>                         |
| Rural                      | 608                                    | 75.0                                 | 88.6                             | 11.0                           | 0.4                                |
| Urban                      | 928                                    | 73.1                                 | 85.3                             | 14.0                           | 0.7                                |

↗ The survey was successful in interviewing sufficient number of households with principal couple – about 74% in Cavite, Philippines; 71% in Mongolia and 61% in Georgia.

↗ The proportion was higher in the rural than in the urban areas.

# Field Operations and Interview Protocol

## Distribution of Primary Respondents, by Relationship with Head of Household

| Relationship to the Head of Household | Primary respondents |       |          |       |                     |       |
|---------------------------------------|---------------------|-------|----------|-------|---------------------|-------|
|                                       | Georgia             |       | Mongolia |       | Cavite, Philippines |       |
|                                       | Men                 | Women | Men      | Women | Men                 | Women |
| Head                                  | 86.9                | 52.3  | 94.2     | 27.6  | 95.4                | 45.8  |
| Spouse                                | 0.2                 | 36.8  | 0.5      | 64.9  | 0.7                 | 51.4  |
| Son/daughter                          | 11.5                | 4.2   | 4.4      | 4.3   | 3.2                 | 2.2   |
| Parents                               | 0.1                 | 0.3   | 0.3      | 2.3   | 0.2                 | 0.1   |
| Grandchildren                         | 0.7                 | 0.3   | 0.1      | 0.0   | 0.0                 | 0.0   |
| Sibling (of head or spouse)           | 0.4                 | 0.4   | 0.3      | 0.7   | 0.1                 | 0.1   |
| Other relatives                       | 0.3                 | 5.8   | 0.2      | 0.2   | 0.1                 | 0.4   |
| Non-relatives                         | 0.0                 | 0.0   | 0.0      | 0.1   | 0.1                 | 0.0   |
| Total                                 | 100.0               | 100.0 | 100.0    | 100.0 | 100.0               | 100.0 |

- Of the male primary respondents interviewed, 87%, 94%, and 95% were also head of hhd respectively in Georgia, Mongolia, and Cavite.
- Among women primary respondents, only 52%, 28%, and 46%, respectively were also head of hhd in Georgia, Mongolia, and Cavite.

Source: Asian Development Bank estimates using Evidence and Data for Gender Equality pilot surveys.



# Field Operations and Interview Protocol

| Manner in which individual interviews conducted (%) |         |          |        |
|---|---------|----------|--------|
|   | Georgia | Mongolia | Cavite |
| Simultaneously                                      | 28.6    | 36.4     | 49.6   |
| Sequentially  | 4.7     | 32.7     | 25.6   |
| Simultaneously and sequentially                     | 40.0    | 20.5     | 20.1   |
| Other   | 26.7    | 10.4     | 4.8    |



# Field Operations and Interview Protocol

## Average Time Spent for Interviewing a Household (minutes)

| Countries              | Average Time Spent for Interviewing a Household |       |             |            |       |             |
|------------------------|---|-------|-------------|------------|-------|-------------|
|                        | Household                                       |       |             | Individual |       |             |
|                        | Urban   | Rural | Total       | Urban      | Rural | Total       |
| Georgia                | 11.8  | 14.0  | <b>12.8</b> | 28.3       | 29.7  | <b>29.5</b> |
| Mongolia               | 11.6  | 12.8  | <b>12.1</b> | 19.9       | 23.0  | <b>21.5</b> |
| Cavite,<br>Philippines | 13.4  | 11.7  | <b>12.7</b> | 22.3       | 22.6  | <b>22.6</b> |

Source: Asian Development Bank estimates using Evidence and Data for Gender Equality pilot surveys.

- The average time spent for fielding a household questionnaire was more or less the same in the three countries at around 12 minutes.
- Completing an individual questionnaire took much longer, due to its complexity and length.
- The average time for interviewing an adult individual differs in the pilot countries at 22 minutes in Mongolia, 23 minutes in Cavite, Philippines and 30 minutes in Georgia.



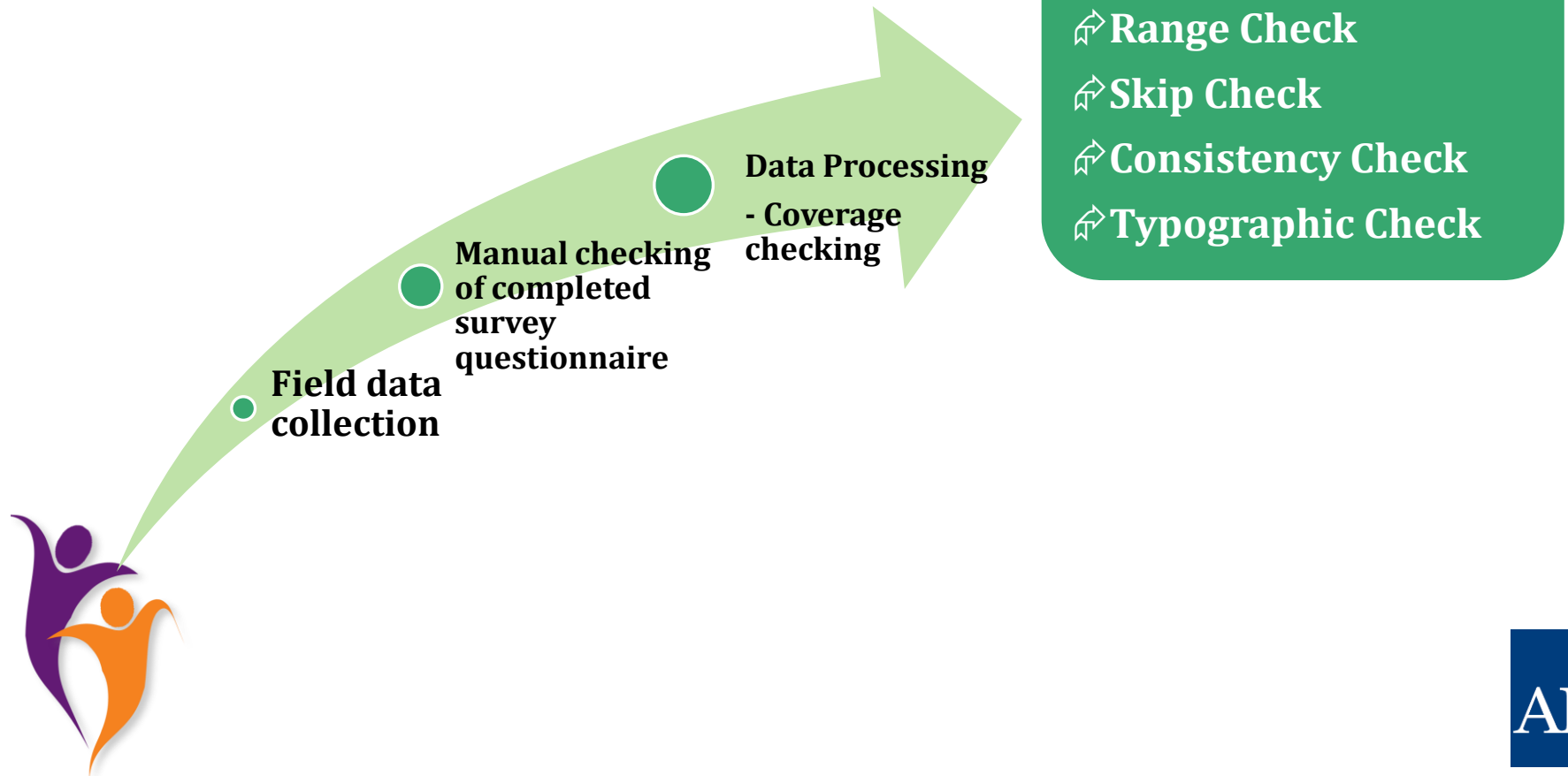
# Field Operations and Interview Protocol

## Hidden Assets

| Country                    | Type of Asset       | Number of respondents self-reporting ownership of asset |       | Number of respondent owners self-reporting ownership of hidden asset |       | Incidence of Self-reported Hidden Assets (%) |       |
|----------------------------|---------------------|---|-------|--|-------|--|-------|
|                            |                     | Men   | Women | Men  | Women | Men  | Women |
| <b>Georgia</b>             |                     |   |       |  |       |  |       |
|                            | Agricultural land   | 1,309   | 1,331 | 2  | 2     | 0.2  | 0.2   |
|                            | Other real estate   | 381   | 349   | 1  | -     | 0.3  | -     |
|                            | Financial assets    | 144   | 125   | 17   | 16    | 11.8   | 12.8  |
|                            | Financial liability | 776   | 862   | 30   | 32    | 3.9  | 3.7   |
| <b>Mongolia</b>            |                     |   |       |  |       |  |       |
|                            | Agricultural land   | 237   | 85    | 4  | -     | 1.7  | -     |
|                            | Other real estate   | 417   | 329   | 3  | -     | 0.7  | -     |
|                            | Financial assets    | 602   | 798   | 29   | 71    | 4.8  | 8.9   |
|                            | Financial liability | 1,005   | 1,141 | 5  | 9     | 0.5  | 0.8   |
| <b>Cavite, Philippines</b> |                     |   |       |  |       |  |       |
|                            | Agricultural land   | 83  | 71    | 1  | 1     | 1.2  | 1.4   |
|                            | Other real estate   | 88  | 99    | -  | 1     | -  | 1     |
|                            | Financial assets    | 266   | 414   | 19   | 35    | 7.1  | 8.5   |
|                            | Financial liability | 248   | 391   | 12   | 17    | 4.8  | 4.3   |



# Post-Survey Phase: Data Cleaning and Validation



# Post-Survey Phase: Data Cleaning and Validation

## Range Check

ensures that every variable in the survey is within a limited domain of valid values

verifies whether the skip patterns and codes have been followed appropriately

## Skip Check

## Consistency Check

verifies the values from one question are consistent with values from another question

entails transposition of figures mistakenly encoded

## Typographic Check

- Data cleaning codes per module using Stata were created by the ADB-EDGE team to validate the data from the NSOs.
- Conducted Country Workshop on Data Validation
- Discussion of issues encountered in data cleaning and validation



# Calculation of Survey Weights

Development of two types of sampling weights based on the measurement approaches

## Ownership Assigned by Any Respondent (OAR)

- **Combines self-reported and proxy information provided by the respondents constitute a household-level information**

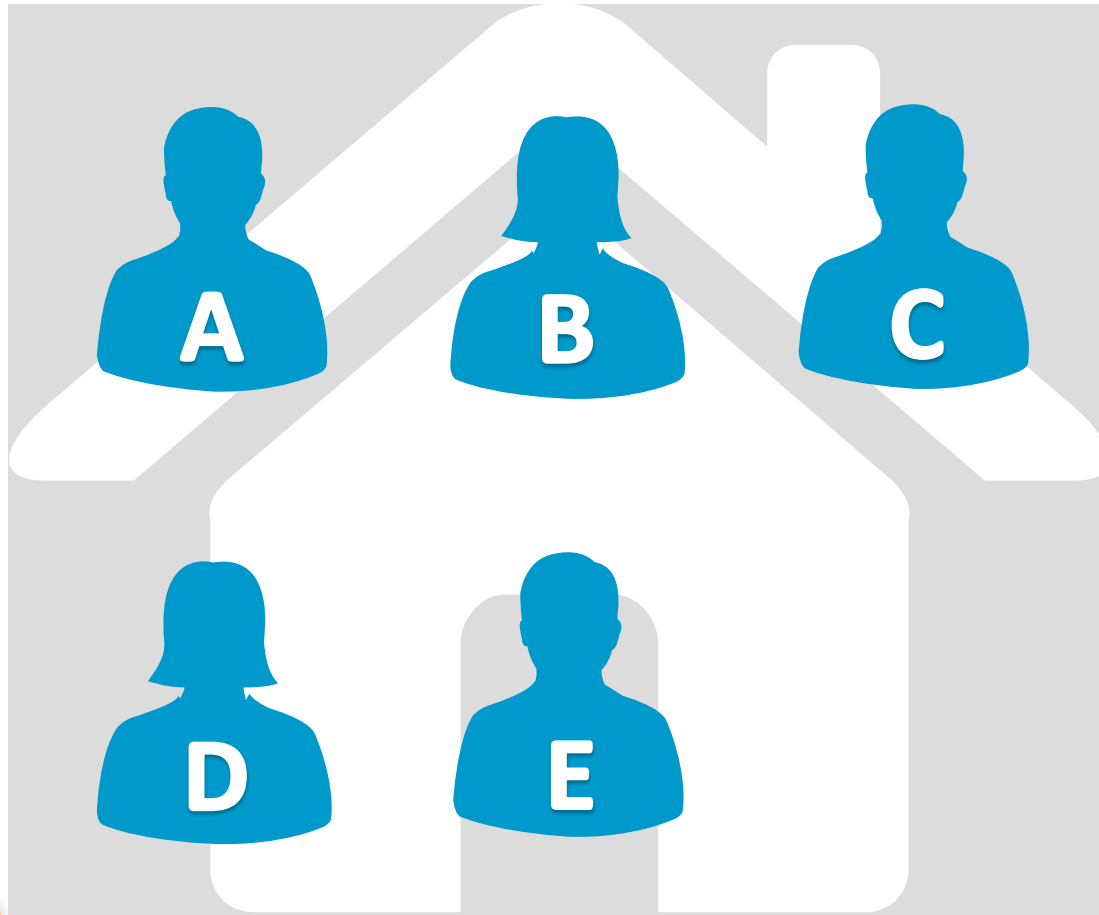
## Self-Assigned Ownership (SAO)

- **Considers on self-reported data by individual respondents**
- **Additional weights were assigned to each individual and multiplied by the usual household weights to obtain individual level weights.**





# *Ownership Assigned by Any Respondent (OAAR) vs Self Assigned Approach (SAO)*











In this household there are **5** adult members.

Household members **A, B** and **D** were interviewed.



# Ownership Assigned by Any Respondent (OAAR) vs Self Assigned Approach (SAO)

|  |  <b>A</b> |  <b>B</b> |  <b>C</b> |  <b>D</b> |  <b>E</b> |            |
|--|--|--|--|--|--|------------|
|  <b>A</b> | <b>YES</b>   | NO   | NO   | NO   | NO   |            |
|  <b>B</b> | YES  | <b>YES</b>   | NO   | NO   | YES  |            |
|  <b>D</b> | YES  | NO   | NO   | NO   | YES  |            |
| <b>OAAR</b>  | YES  | YES  | NO   | NO   | YES  | <b>3/5</b> |
| <b>SAO</b>   | <b>YES</b>   | <b>YES</b>   |  | NO   |  | <b>2/3</b> |



# Calculation of Survey Weights (cont'd)

## Ownership Assigned by Any Respondent

- Calculating survey weights for this approach is similar to the weights derived for estimation of parameters in usual household surveys by combining the weights at each stage of selection.

### Georgia: Two-Stage PPS Design

$$\frac{Z_i}{n_i} \times \frac{1}{z_{ij}} \times \frac{H_{ijk}}{h_{ijk}}$$

### Mongolia: Three-Stage PPS Design

$$\frac{P_l}{d_l} \times \frac{1}{p_{lm}} \times \frac{Z_{lmi}}{n_{lmi}} \times \frac{1}{z_{lmi j}} \times \frac{H_{lmi jk}}{h_{lmi jk}}$$

### Cavite, Philippines: CSS Design

$$\frac{N_i}{n_i} \times \frac{H_{ijk}}{h_{ijk}}$$

Where:

- l stands for the region
- m stands for the m<sup>th</sup> province
- i stands for the stratum
- j stands for the j<sup>th</sup> PSU
- k Stands for the second stage stratum (SSS) of households
- z<sub>ij</sub> total number of households in the j<sup>th</sup> PSU of the i<sup>th</sup> stratum (available in census database)
- H<sub>ijk</sub> total number of households in the k<sup>th</sup> second stage stratum (SSS) of the j<sup>th</sup> PSU of i<sup>th</sup> stratum
- h<sub>ijk</sub> number of households actually surveyed in the k<sup>th</sup> SSS of the j<sup>th</sup> PSU of i<sup>th</sup> stratum

- n<sub>i</sub> number of PSUs selected from i<sup>th</sup> stratum
- Z<sub>i</sub> =  $\sum_j z_{ij}$  total number of households in the i<sup>th</sup> stratum (available in Census database)
- N<sub>i</sub> total number of PSUs in the i<sup>th</sup> stratum (available in Census database)
- d<sub>l</sub> number of aimags selected in the l<sup>th</sup> region
- P<sub>l</sub> total population in the l<sup>th</sup> region
- p<sub>lm</sub> population of m<sup>th</sup> province in the l<sup>th</sup> region



# Calculation of Survey Weights (cont'd)

## Self-Assigned Ownership

- For households with 3 or less adults, all adults were selected for interview (i.e., with probability one) and therefore the survey weight assigned was 1 for each adult.
- For households with 4 or more adults, a maximum of three adults were interviewed. The following explains the procedure of assigning weights at the individual level in different situations

Survey Weights for Households with Principal Couple

| Interviewed        |        |                  | Selection Probability |        |                  | Weight             |        |                  |
|--------------------|--------|------------------|-----------------------|--------|------------------|--------------------|--------|------------------|
| Principal Couple   |        | Third Respondent | Principal Couple      |        | Third Respondent | Principal Couple   |        | Third Respondent |
| Primary Respondent | Spouse |                  | Primary Respondent    | Spouse |                  | Primary Respondent | Spouse |                  |
| Yes                | Yes    | Yes              | 1                     | 1      | $1/(M-2)$        | 1                  | 1      | $(M-2)$          |
| Yes                | No     | Yes              | $1/2$                 | 0      | $1/(M-2)$        | 2                  | 0      | $(M-2)$          |
| No                 | Yes    | Yes              | 0                     | $1/2$  | $1/(M-2)$        | 0                  | 2      | $(M-2)$          |
| Yes                | Yes    | No               | $2/M$                 | $2/M$  | 0                | $M/2$              | $M/2$  | 0                |
| No                 | No     | Yes              | 0                     | 0      | $1/M$            | 0                  | 0      | M                |
| No                 | Yes    | No               | 0                     | $1/M$  | 0                | 0                  | $M/2$  | 0                |
| Yes                | No     | No               | $1/M$                 | 0      | 0                | M                  | 0      | 0                |

Survey Weights for Households without Principal Couple

| Interviewed        |                   |                  | Selection Probability |                   |                  | Weight             |                   |                  |
|--------------------|-------------------|------------------|-----------------------|-------------------|------------------|--------------------|-------------------|------------------|
| Primary Respondent | Second Respondent | Third Respondent | Primary Respondent    | Second Respondent | Third Respondent | Primary Respondent | Second Respondent | Third Respondent |
| Yes                | Yes               | Yes              | 1                     | $2/(M-1)$         | $2/(M-1)$        | 1                  | $(M-1)/2$         | $(M-1)/2$        |
| Yes                | Yes               | No               | 1                     | $1/(M-1)$         | 0                | 1                  | $(M-1)$           | 0                |
| No                 | Yes               | Yes              | 0                     | $2/M$             | $2/M$            | 0                  | $M/2$             | $M/2$            |
| Yes                | No                | Yes              | 1                     | 0                 | $1/(M-1)$        | 1                  | 0                 | $(M-1)$          |
| No                 | No                | Yes              | 0                     | 0                 | $1/M$            | 0                  | 0                 | M                |
| No                 | Yes               | No               | 0                     | $1/M$             | 0                | 0                  | M                 | 0                |
| Yes                | No                | No               | $1/M$                 | 0                 | 0                | M                  | 0                 | 0                |

- Notes:**
1. "Yes" indicates that the selected respondent was surveyed/ interviewed.
  2. "No" indicates that the selected respondent was not surveyed/interviewed due to non-response.
  3. "M" denotes the total number of adults in the household

- The weights at the individual level were combined with the household-level weights when estimating survey parameters under the self-assigned approach.

# Post Stratification Weight Adjustment

**In post-stratification, household and individual weights are adjusted to correct for estimated population and sex ratio.**

- The pilot survey's target population is the collection of all adult household members. If the nonresponse rate is zero or random, the sum of the survey weights calculated based on the formula presented in the previous section should be very close to the actual number of adults in the population.
- However, the actual pattern of nonresponse usually observed in many survey operations is not random. In the case of the EDGE pilot surveys conducted in Mongolia and Georgia, nonresponse rates among men were significantly higher than among women.
- During survey operations, men were more likely to be working, and thus, were not available for interview. As a result, the distribution of adults calculated based on the sum of the survey weights is biased toward women. Such a bias warrants a post-stratification adjustment to be introduced for the individual level weights.



# Post Stratification Weight Adjustmnt

## Nonresponse Rates

| Country             | Households | Individuals |        |       |
|---------------------|------------|-------------|--------|-------|
|                     |            | Male        | Female | Total |
| Georgia             | 11.9       | 20.6        | 9.6    | 14.6  |
| Mongolia            | 1.5        | 24.3        | 14.7   | 19.2  |
| Cavite, Philippines | 0.0        | 9.5         | 5.5    | 7.4   |

Source: Asian Development Bank estimates from the Evidence and Data for Gender Equality pilot surveys.

# Post Stratification Weight Adjustment (cont'd)

- At the household level, nonresponse rates were registered at 11.9% in Georgia and 1.5% in Mongolia. The figure was not significant in Cavite, Philippines.
- At the individual level, the **nonresponse rate was highest in Mongolia** where only 5,592 adults (**80.8%**) were interviewed out of 6,922 selected adults.
- In Georgia, of the 6,949 total number of individuals selected for the survey, only 5,937 (**85.4%**) were actually interviewed, with corresponding **20.6% nonresponse rates among male adults and 9.6% among female adults.**
- In Cavite, Philippines, only 3,456 out of 3,733 individuals responded to the survey or a **nonresponse rate of 7.4% (9.5% for males and 5.5% for females).**
- As a result, the distribution of adults calculated based on the sum of the survey weights was biased toward women. **Such bias warranted post-stratification adjustment introduced for the individual level weights.**



# Post Stratification Weight Adjustment (cont'd)

## Sample Post-Stratification Adjustment

| Geographic Area | Gender | Survey estimate | Control Data (e.g., census) | Post-stratification Adjustment Factor |
|-----------------|--------|-----------------|-----------------------------|---------------------------------------|
|                 |        | (A)             | (B)                         | (B/A)                                 |
| X               | Men    | 895,672         | 1,032,451                   | 1.15                                  |
| X               | Women  | 1,049,530       | 987,956                     | 0.94                                  |
| Y               | Men    | 297,673         | 501,678                     | 1.69                                  |
| Y               | Women  | 549,530         | 432,145                     | 0.79                                  |
| Z               | Men    | 695,672         | 502,675                     | 0.72                                  |
| Z               | Women  | 249,530         | 4,569,123                   | 18.31                                 |

## Illustration of how post-stratification works

- Column A shows the total number of men and women estimated in the survey after applying the survey weights while
- Column B shows the total number of men and women from census records, summarized by geographic area in the same year.
- If there is reason to believe that census records are more reliable, post-stratification can be used to adjust the survey weights. The numbers provided in the last column will be multiplied with the survey weights for each of the respondent from the same geographic area and gender group.

Source: Asian Development Bank estimates using Evidence and Data for Gender Equality pilot surveys.





# Post Stratification Weight Adjustment (cont'd)

The post-stratification weight adjustment done was deemed effective in compensating for the differences in control population figures obtained from the census counts of number of adults in the population and unadjusted weighted estimates of male and female population

Number of Adult Population based on Census, Unadjusted Weights and Post-Stratification

| Country and Sex            | Number of Adult Population |                                   |                                    | Number of Adult Household Members (After Post-Stratification of Household Weights) | Number of Adult Respondents (After Post-Stratification of Individual Weights) |
|----------------------------|----------------------------|-----------------------------------|------------------------------------|--|---|
|                            | Population Census          | With unadjusted Household Weights | With Unadjusted Individual Weights |  |   |
| <b>Georgia</b>             |                            |                                   |                                    |  |   |
| Male                       | 1,329,054                  | 1,333,444                         | 1,185,974                          | 1,333,444  | 1,333,444   |
| Female                     | 1,547,996                  | 1,581,624                         | 1,729,094                          | 1,581,624  | 1,581,624   |
| Total                      | 2,877,050                  | 2,915,068                         | 2,915,068                          | 2,915,068  | 2,915,068   |
| <b>Mongolia</b>            |                            |                                   |                                    |  |   |
| Male                       | 943,117                    | 968,299                           | 976,149                            | 904,344  | 942,755   |
| Female                     | 1,005,511                  | 1,074,895                         | 1,296,564                          | 1,209,629  | 1,005,215   |
| Total                      | 1,948,628                  | 2,043,193                         | 2,272,714                          | 2,113,973  | 1,947,970   |
| <b>Cavite, Philippines</b> |                            |                                   |                                    |  |   |
| Male                       | 1,137,700                  | 1,177,827                         | 1,104,495                          | 1,162,263  | 1,137,699   |
| Female                     | 1,170,659                  | 1,238,233                         | 1,310,559                          | 1,221,871  | 1,170,658   |
| Total                      | 2,308,359                  | 2,416,060                         | 2,415,054                          | 2,384,134  | 2,308,357   |

**Georgia:** Estimated number of adults and sex ratio based on EDGE survey household weights were found to be very close to that of 2014 Population Census. Thus, no post-stratification weight adjustment was applied on the household level weights.

**Mongolia:** Considerable difference in the estimated number of urban and rural households between the 2015 Census of Population and EDGE pilot survey at the regional level were noted. Thus, post stratification was first done at the household level.

**Cavite, Philippines:** Although the estimated number was not that far from the 2015 Census of Population, post stratification at the household level was still done to make the EDGE survey estimates consistent with the population.



# Thank you.

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