

## **ATTACHMENT B**

### **Philippine Global Adult Tobacco Survey (GATS)**

#### **Sample Design**

The Philippine Statistics Authority (PSA) used a master sample (MS) for its household-based surveys such as the National Demographic and Health Survey (NDHS) and Labor Force Survey. The MS is designed with enough flexibility to meet the requirements of small-scale surveys for national estimation as well as for regional estimation. In 2009, the Philippine GATS used the 2003 MS with some modifications (i.e., assigning of household to male or female group and selection of one eligible individual per household) to follow the GATS protocol on sampling design and guidelines for the conduct of the GATS. These modifications were incorporated to maintain comparability of estimates across countries.

For the 2015 repeat GATS, the 2003 MS is being proposed to be used once more but with refresh list of households from the most recent censuses (i.e., 2012 Census of Agriculture conducted in March 2013, 2014 Pilot population census for areas extremely affected by calamities conducted in November 2014, and the 2015 Census of Population to be conducted this August 2015). There will be no more predesignated male or female household for the repeat GATS.

One of the four replicates of the 2003 Master Sample will be used for the 2015 GATS. The sample will be representative of the country as a whole and will also allow estimates of indicators of interest for urban and rural and by gender level, at an acceptable level of precision. The sampling design for the Philippine GATS follows that of the 2003 MS design using a stratified, three-stage cluster sampling design. In the first stage, PSUs will be selected with probability proportional to the number of households in the 2000 Census. In the second stage, in each selected PSU, enumeration areas (EAs) will be selected with probability proportional to the number of households in the 2000 Census. An EA is defined as an area with discernable boundaries consisting of about 350 contiguous households. In the third stage, from each EA, an average of 16 to 18 households will be selected using systematic sampling. For each sample household, one eligible individual (male/female depending on the household grouping) aged 15 years old and over will be selected for GATS interview. All the probabilities of selection will be kept for use in the computation of the weights.

#### **Target Population**

The target population for the GATS will be all household population in the Philippines in their usual place of residence. Specifically, it will cover all men and women age 15 years and older who consider the country to be their usual place of residence irrespective of citizenship. GATS will cover the 17 administrative regions of the country. It intends to represent the total 15 years and older

household population of the Philippines with exclusion of persons living in institutions, the homeless, those living in least accessible barangays.

### **Stages of Selection**

The GATS will be using barangays or combination of barangays as primary sampling units (PSU) since these are much larger in number compared to municipalities and provinces. There are around 1600 municipalities and 81 provinces compared to 41,592 barangays. Hence, the barangays are the most suitable administrative units to form the PSUs for the 2003 Master Sample. However, more than half of the barangays do not satisfy the minimum size requirement (number of households) of an ideal PSU, thus, “small” barangays were grouped with contiguous barangays within the municipality to form the desired PSUs. The total number of PSUs formed from 41,592 barangays is 16,586. The average number of households in a PSU (or PSU size) is 923.

The PSUs were selected within a set of strata using probability proportional to estimated size (PPES) sampling, where the measure of size was the number of households in the PSU according to the 2000 Census of Population and Housing (CPH). The primary strata were the 17 regions of the country. Within each region, further stratification was performed using geographic groupings such as provinces, highly urbanized cities (HUCs), and independent component cities (ICCs). Within each of these substrata formed within regions, the PSUs were further stratified, to the extent possible, using the proportion of strong houses in the barangay, indicator of engagement in agriculture of the barangay, and a measure of per capita income of the municipality or city as stratification factors.

The full 2003 MS consists of a sample of 2,835 PSUs (some of which were selected with certainty). To allow sub-sampling for smaller surveys, the 2,835 PSUs were randomly distributed to four replicates each with approximately 709 PSUs. Each replicate represents a national sample.

For the 2015 GATS, all sample housing units and sample households in replicate 4 (709 PSUs) will be selected as sample with about 13,000 households. An adjustment in the sample size has already been made for ineligibility of some sample households and possible non-response based on previous surveys of the PSA. The following are the rates used:

<b>Rate</b>	<b>Comment</b>	<b>Assumption</b>
Household Eligibility Rate	Ineligible housing units include those that are vacant, not occupied. Ineligible sample households include those that were found during the survey to have moved out from the sample housing unit.	80%
Household Response Rate		95%
Household Screening Rate	This accounts for households with no adult aged 15 years old and over. This also accounts for households selected for	95%

	the male household group and no males reside in the household. Similarly this accounts for households selected for the female household group and no females reside in the household.	
Person Eligibility Rate	In some cases, a person might be interviewed for GATS and later determined to be ineligible, e.g. they are in fact younger than 15 years old. This rate accounts for this.	98%
Person Response Rate for Males	Research suggests males will respond at slightly lower rates than females.	93%
Person Response Rate for Females		95%

*Note: Assumptions are based on past surveys of PSA.*

Assuming that the Person Response Rate for both Male and Females is 94%

For the national estimates, the overall sample size would be:

$$\frac{8,000}{0.94 \cdot .98} = 8,778 \text{ selected person}$$

$$\frac{8,777}{0.80 \cdot .95 \cdot .95} = 12,157 \text{ selected hhlds for national estimates}$$

(or about one replicate of the 2003 MS)

In the absence of urban-rural classification during the development of the 2003 MS, alternative variables were considered as stratification variables. These are per capita income at the city or municipality level, percentage of households in the barangay that are engaged in agriculture or fisheries, and proportion in the barangay of housing units occupied by households that are classified as made of strong materials in terms of both the roof and outer walls. The chosen variables approximated almost the same distribution of urban-rural population in the Philippines. Table 1 shows the total number and percentage distribution of sample urban and rural enumeration areas. This ensured that both urban and rural areas are well represented in the current set of sample.

**Table 1. Number and percent distribution of urban and rural enumeration areas by replicate**

<b>Replicate</b>	<b>Urban</b>	<b>Rural</b>	<b>Total</b>
1	409 (51.5%)	385 (48.5%)	794 (100.0%)
2	420 (52.8%)	375 (47.2%)	795 (100.0%)
3	404 (50.8%)	391 (49.2%)	795 (100.0%)
4	405 (51.0%)	389 (49.0%)	794 (100.0%)
<b>Philippines</b>	<b>1638</b> <b>(51.5%)</b>	<b>1540</b> <b>(48.5%)</b>	<b>3178</b> <b>(100.0%)</b>

*Note: The number of sample EAs is based on October 2008 Labor Force Survey. The urban-rural classification of the EAs is based on the 2000 Census of Population and Housing.*

**Selection of Sample Enumeration Areas.** In the second stage, in each PSU, EAs were selected with probability proportional to the number of households in the EA. An EA is defined as an area with discernable boundaries consisting of approximately 350 contiguous households. These EAs are the 2000 Census Enumeration Areas. For the GATS, there are 794 sample EAs in replicate 4.

**Sample Frame Updating.** During the development of the 2003 master sample, the lists of households for the sampled EAs were updated in 2003 to reflect a more updated record of housing units and households. The listing of households will be updated based on the results of the 2013 Census of Agriculture and Fisheries, 2014 Pilot Census (for areas extremely affected by calamities), and 2015 Census of Population (for ARMM provinces).

**Selection of Sample Housing Units.** In the third stage, from each sample EA, housing units will be selected using systematic sampling. For operational considerations, at most 30 housing units will be selected per sample EA. All households in the housing units will be interviewed except for housing units with more than three households. In those cases, only three households will be selected. All the sample housing units and sample households will have a unique control number within the sample EA.

In general, there will be no replacement of housing units for the GATS but in the case where original sample household already moved-out of the sample housing unit, the new occupant household will be interviewed instead. Also, if at the time of visit there is an occupant in the listed vacant housing units, the new occupant household will be interviewed also.

**Selection of One Eligible Respondent.** One eligible respondent (15 years old and over), will be randomly selected from the selected household using the

random generation program of GATS. There will be no substitutes for the eligible individual.

### **Weights and Analytical File**

There will be an analytical file which include among others the geographic identification codes from Census 2000 (region, province, municipality, barangay, urban and rural), the design codes (stratum code, PSU code, EA code, replicate and rotation group code), and all the auxiliary information collected about the sampled housing units and households. The file will include also selection probabilities at each sampling stage, the base weights, and the adjustments made to them.

Following a standard approach, base weights will be computed to compensate for the unequal selection probabilities in the sample design. Second, the base weights will be adjusted to compensate for nonresponse by sample households and sampled individuals eligible for the survey. Third, the nonresponse-adjusted weights will be further adjusted to make the weighted sample distributions conform to the projections of population 15 years old and over by gender as of the conduct of the survey.

The final survey weight assigned to each responding unit will be computed as the product of the base weight, the nonresponse adjustment, and the population weighting adjustment. The final weights will be used in all analyses to produce valid estimates of population parameters.