

TECHNICAL NOTES

2019 FUNCTIONAL LITERACY, EDUCATION AND MASS MEDIA SURVEY

I. Introduction

a. Background

The Functional Literacy, Education and Mass Media Survey (FLEMMS) is a household-based nationwide survey conducted every five (5) years in accordance with the Designation of Statistical Activities that will Generate Critical Data for Decision-making of the Government and the Private Sector (Executive Order No. 352 of 1996). FLEMMS 2019 is the sixth in the series of literacy surveys in the country starting in 1989. Prior to this survey round, FLEMMS was conducted in 2013.

b. Objectives

FLEMMS provides a quantitative framework that will serve as basis in the formulation of policies and programs on the improvement of literacy and education status of the population. It has the following specific objectives:

1. to estimate the proportion of the population 10 years old and over who are basically literate;
2. to estimate the proportion of the population 10 to 64 years old who are functionally literate and to determine their socio-economic characteristics;
3. to determine the educational skill qualifications of the population in terms of formal schooling; and,
4. to determine the mass media exposure of the population.

c. Scope and Coverage

With regions as domain, survey operations for FLEMMS 2019 ran from November to December 2019, and covered 41,686 eligible sample households and 119,807 individuals/household members 10 to 64 years old.

d. Questionnaires/Forms:

The survey utilized two questionnaires:

- FLEMMS Form 1, a household questionnaire, administered through face-to-face interview, was used to gather information about basic literacy, education, and employment of the population; and,
- FLEMMS Form 2, a self-administered questionnaire, was used to collect information on functional literacy and mass media exposure of population 10 to 64 years old.

The basic reading, writing and numeracy skill was measured by a standardized assessment instrument/scoring system developed in 1985 by the National Statistics Office in cooperation with the then Department of Education, Culture and Sports. The instrument was revised and, beginning FLEMMS 1989, FLEMMS Form 2 was implemented. In later rounds of the survey, basic reading comprehension skill was also measured in FLEMMS Form 2.

e. Changes from FLEMMS 2013

The FLEMMS, as in any survey, adopts recent developments in statistical methodology/processes and in the education system. The table below summarizes the comparison between FLEMMS 2019 and FLEMMS 2013.

Item	FLEMMS 2013	FLEMMS 2019
Sampling frame	2003 Master sample, based on 2000 Census of Population and Housing.	2013 Master Sample based on 2010 Census of Population and Housing and updated using the results of the 2015 Census of Population.
Starting age applicable to highest educational attainment	Age 6, official starting age for basic elementary education in <u>old</u> curriculum	Age 5, official starting age for basic elementary education in <u>K-12</u> curriculum, as provided in Section 3(c) of RA 10157 (Kindergarten Education Act) which states “ <i>Kindergarten education shall be understood in this Act to mean one (1) year of preparatory education for children at least five (5) years old as a prerequisite for Grade I</i> ”.
Age bracket for youth	15-24 based on age bracket for youth, adopted by the UN, UNESCO and ILO	15-30, as provided in Section 2 of RA 8044 (The Youth in Nation-Building Act) which states “ ... <i>The State hereby declares that “Youth” is the critical period in a person’s growth and development from the onset of adolescence towards the peak of mature, self-reliant and responsible adulthood comprising the considerable sector of the population from the age of fifteen (15) to thirty (30) years. ...</i> ”

Item	FLEMMS 2013	FLEMMS 2019
Educational attainment categories	Based on 2008 Philippine Standard Classification of Education	Based on 2017 Philippine Standard Classification of Education

II. Concepts and Definitions

Basic literacy is the ability of a person to read and write with understanding of a simple message in any language or dialect. The basic literacy status of an individual was determined based on the respondent's answer to the question "*Can _____ read and write a simple message in any language or dialect?*" in FLEMMS Form 1.

Functional literacy is a significantly higher level of literacy which includes not only reading and writing skills but also numeracy skills. The skills must be sufficiently advanced to enable the individual to participate fully and efficiently in activities commonly occurring in his life situation that require a reasonable capability of communicating by written language. Persons who at least graduated from high school under the old curriculum for basic education, or at least junior high school completer under the K-12 curriculum are automatically classified as functionally literate.

Levels of literacy identifies the range of skills and competencies of an individual. Specifically,

Literacy Level	Range of Skills and Competencies (Interpretation/Condition)
0	cannot read and write
1	can read and write
2	can read, write and compute (with numerical skill)
3	can read, write, compute and comprehend (with numerical and comprehension skills)
4	at least high school graduate in the old curriculum or at least junior high school completer in the K-12 curriculum

Youth:

- defined by the United Nations, for statistical purposes, as persons between the ages of 15 and 24 years, without prejudice to other definitions by Member States (<https://www.un.org/en/sections/issues-depth/youth-0/>). This definition is also adopted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Labor Organization (ILO). (<https://www.un.org/esa/socdev/documents/youth/fact-sheets/youth.definition.pdf>)

- as defined in Section 2, paragraph 2 of Republic Act 8044 (The Youth in Nation-Building Act), is the critical period in a person's growth and development from the onset of adolescence towards the peak of mature, self-reliant, and responsible adulthood comprising the considerable sector of the population from the age of 15 to 30 years.

Children are those persons under the age of fourteen in consideration of the statistical definition of youth.

Mass media refers to technology that is intended to reach a mass audience. It is the primary means of communication used to reach the vast majority of the general public. The most common platforms for mass media are newspapers, magazines, radio, television, and the Internet.

Open distance learning is a system of learning which combines the methodology of distance education with the concepts of open learning and flexible learning.

- Distance education is a mode of learning in which students and teachers are physically separated from each other. The personalized and distributed way of learning makes it easier for learners to study at their own pace using various media such as the internet, radio, and television.
- Open learning is an educational system which makes learning accessible to every individual with minimal restrictions. It emphasizes the flexibility of learning despite barriers to age, geographical location, time constraints and economic situation.

Government information refers to any records, documents, papers, reports, letters, contracts, minutes and transcript of official meetings, maps, books, photographs, data, research materials, films, sound and video recordings, magnetic or other tapes, electronic data, computer-stored data, or any other like or similar data or materials recorded, stored, or archived in whatever format, whether offline or online, which are made, received, or kept in or under the control and custody of any government office pursuant to law, executive order, and rules and regulations or in connection with the performance or transaction of official business by any government office (Executive Order No. 02, series of 2016).

This does not include requests for information on government services which cover processes or transactions involving applications for any privilege, right, reward, license, clearance, permit or authorization, concession, or for any modification, renewal or extension of the enumerated applications or requests which are acted upon in the ordinary course of business of the agency or office concerned. Examples include requests for information on the processes in getting birth and marriage certificates, business permits, barangay clearances, passports, pension and retirement benefits, etc. (Republic Act No. 11032 Ease of Doing Business and Efficient Government Service Delivery Act of 2018).

III. Sampling Design and Estimation Methodology

The FLEMMS 2019, being a household-based survey, used the 2013 Master Sample (MS) design of which 4 replicates equivalent to a total of 42,768 Secondary sampling Units (SSUs) or sample housing units were included as samples. Using a two-stage cluster sampling design, EAs/barangays were selected at the initial sampling stage as the primary sampling units (PSUs), while the housing units within the selected PSUs are selected as the secondary sampling units (SSUs). Generally, all households within the sample housing unit are also considered as sample households. However, for housing unit with more than three (3) households, a maximum of three (3) sample households were randomly selected.

Sampling Frame

The 2013 MS sampling frame was constructed based on the results of the 2015 Population Census. The EA Reference File (EARF) of the 2015 Census of Population was used as the PSU frame while the 2015 list of households for each of the PSUs were used as the SSU frame.

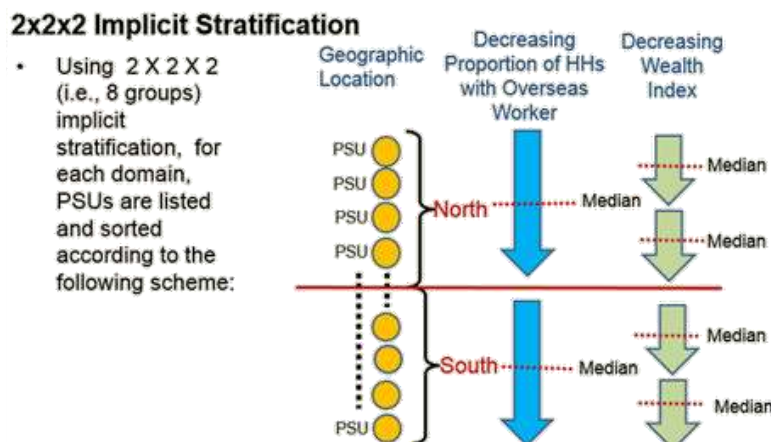
Sampling Domain

To provide subnational or provincial level statistics with precise estimates, the 2013 MS has 117 major domains as follows: 81 provinces (including the newly created province Davao Occidental); 33 highly urbanized cities (including 16 cities in the National Capital Region); and 3 other areas (Pateros, Isabela City, and Cotabato City).

Primary Sampling Units

In the 2013 Master Sample Design, each sampling domain (i.e., province/HUC) is divided into exhaustive and non-overlapping area segments known as Primary Sampling Units (PSUs) with about 100 to 400 households. Thus, a PSU can be a barangay/Enumeration Area (EA) or a portion of a large barangay, or two or more adjacent small barangays/EAs.

2x2x2 Implicit Stratification



The PSUs are then ordered according to the following: (1) North-South/West-East Geographic location; (2) Decreasing Proportion of HHs with Overseas Worker; and (3) Decreasing wealth Index.

Replicates

For the FLEMMS 2019, four replicates are used in all 117 sampling domains. A replicate is composed of ordered list of PSUs. Most of the provinces, that is, 75 out of 81, has six PSUs per replicate while in HUCs, eight PSUs form a replicate. Small domains such as Guimaras, Siquijor, Camiguin, Apayao, and Dinagat Islands had three PSUs per replicate.

Sample Allocation Scheme

For FLEMMS 2019, a total of four sample replicates were allotted. However, the total number of sample SSUs was allotted proportionately to the measure of size of the PSU. Thus, a PSU with only 100 HHs had less number of sample HHs than PSUs with 400 HHs but, on the average, there were 12 sample HHs allotted for each PSU in Highly Urbanized Cities (HUCs) and an average of 16 sample HHs for every PSU in the province

A total national sample of 42,768 sample HHs was allotted for the 2019 FLEMMS.

Domain	4 Sample Replicates (Regional Level Estimate)	
	Number of Sample PSUs	Number of Sample Housing Units/HHs
75 Province Domain (16 SSUs per PSU)	24	384
5 small provinces (Batanes, Guimaras, Siquijor, Camiguin, Apayao and Dinagat Islands) (16 SSUs per PSU)	12	192
31 HUCs (12 SSUs per PSU)	32	384
2 small HUCs (12 SSUs per PSU) San Juan City Lucena City	12 20	144 240
3 other urban areas (12 SSUs per PSU) Pateros City of Isabela Cotabato City	12 12 20	144 144 240
National	2,940	42,768

Base weight computation

The base weight is computed as the inverse of selection probability

$$w_{p\tau\alpha\beta} = \frac{A_p}{a_p} \times \frac{B_{p\tau\alpha}}{b_{p\tau\alpha}}$$

where:

A_p - total number of PSUs in the domain p

a_p - total number of sample PSUs in the domain p

$B_{p\tau\alpha}$ - total number of housing units in PSU α , and replicate τ in domain p

$b_{p\tau\alpha}$ - total number of sample housing units in PSU α , and replicate τ in domain p

For housing units with at most 3 households the base weight is computed as

$$w_{p\tau\alpha\beta} = \frac{A_p}{a_p} \times \frac{B_{p\tau\alpha}}{b_{p\tau\alpha}}$$

For housing units with more than 3 households the base weight is computed as

$$w_{p\tau\alpha\beta\gamma} = \frac{A_p}{a_p} \times \frac{B_{p\tau\alpha}}{b_{p\tau\alpha}} \times \frac{C_{p\tau\alpha\beta}}{c_{p\tau\alpha\beta}}$$

where:

$C_{p\tau\alpha\beta}$ - total number of households in the sample housing unit

$c_{p\tau\alpha\beta}$ - 3, the number of sample households in the sample housing unit

Base Weight Adjustment

The base weight was adjusted for unit non-response and was further calibrated to conform to the known or projected population count. For 2019 FLEMMS, the projected population count used was November 2019.

For unit non-response adjustment (within domain p), the adjustment was computed as:

$$A_{p1} = \frac{\text{weighted* total number of eligible sample households}}{\text{weighted* total number of responding households}}$$

Applying this to the base weight, we have:

$$w'_{p\tau\alpha\beta_{adj}} = w_{p\tau\alpha\beta} \times A_{p1}$$

Further calibration was made to conform with known population count, as follows:

Age Group	Sex	
	Male	Female
0 – 14	C1	C2
15 – 24	C3	C4
25 – 34	C5	C6
35 – 44	C7	C8
45 – 54	C9	C10
55 – 64	C11	C12
65 and over	C13	C14

$$A_{p2c} = \frac{X_{pc}}{\hat{X}_{pc,adj}}$$

where:

X_{pc} - is the projected total population for age-sex class c

$\hat{X}_{pc,adj}$ - is the weighted estimate of the population for age-sex class c using the non-response adjusted weight

Hence the final weight (calibrated weight was):

$$w'_{p\tau\alpha,fin} = \underbrace{w'_{p\tau\alpha,adj}}_{\substack{\text{non-} \\ \text{response} \\ \text{adjusted} \\ \text{weight}}} \times \underbrace{A_{p2c}}_{\substack{\text{population} \\ \text{adjustment} \\ \text{factor}}}$$

Estimation of Totals

- Generally, the estimate for the weighted total for a sampling domain (province/HUC) considering the number of sample replicates was derived using:

$$\hat{Y}_p = \sum_{\tau=1}^l \sum_{\alpha=1}^{a_\tau} \sum_{\beta=1}^{b_{\tau\alpha}} w'_{p\tau\alpha,fin} y_{p\tau\alpha\beta} \quad l = 1 \text{ to } L \text{ sample replicates}$$

- For each of the sampling domain which considered 4 sample replicates (e.g., 2019 FLEMMS), the estimate for the weighted total was derived using:

$$\hat{Y}_p = \sum_{\tau=1}^4 \sum_{\alpha=1}^{a_\tau} \sum_{\beta=1}^{b_{\tau\alpha}} w'_{p\tau\alpha,fin} y_{p\tau\alpha\beta} \quad l = 1 \text{ to } 4 \text{ replicates}$$

- For the region

The estimate for the weighted total for the region was derived as the sum of its weighted provinces/HUCs domain totals:

$$\hat{Y}_r = \sum_{p=1}^{m_r} (\hat{Y}_p) = \underbrace{\hat{Y}_1 + \hat{Y}_2 + \dots + \hat{Y}_{m_r}}_{\text{Weighted Province/HUC Totals}}$$

where

\hat{Y}_p - estimate of total for province/HUC p

m_r - total number of provinces/HUCs in the region

- For the entire country

$$\hat{Y} = \sum_{r=1}^n (\hat{Y}_r) = \underbrace{\hat{Y}_1 + \hat{Y}_2 + \dots + \hat{Y}_n}_{\text{Weighted Region Totals}}$$

where

\hat{Y}_r - estimate of total for region r

n - total number of regions in the country

Estimation of Proportions

To estimate the weighted proportion \hat{p}_r in the rth region

$$\hat{p}_r = \frac{\sum_{p=1}^{mr} \sum_{\tau=1}^4 \sum_{\alpha=1}^{a_{\tau}} \sum_{\beta=1}^{b_{\tau\alpha}} W'_{p\tau\alpha,fin} x_{p\tau\alpha\beta}}{\sum_{p=1}^{mr} \sum_{\tau=1}^4 \sum_{\alpha=1}^{a_{\tau}} \sum_{\beta=1}^{b_{\tau\alpha}} W'_{p\tau\alpha,fin} y_{p\tau\alpha\beta}}$$

Where $x_{p\tau\alpha\beta}$ = the total number of cases in the sample with a certain attribute x

$y_{p\tau\alpha\beta}$ = the total number of cases in the sample.

Estimation of Sampling Error

Sampling error is usually measured in terms of the standard error for a particular statistic (mean, percentage, etc.), which is the square root of the variance.

If the sample had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the FLEMMS 2019 is the result of a multi-stage design, and it was necessary to use more complex formulas.

Sampling errors are computed using statistical programs. These statistical programs use the Taylor linearization method to estimate variances for survey estimates that are means, proportions, or ratios.

The Taylor linearization method treats any percentage or average as a ratio estimate, $r=y/x$, where y represents the total sample value for variable y, and x represents the total number of cases in the group or subgroup under consideration. The variance of r is

computed using the formula given below, with the standard error being the square root of the variance:

$$SE^2(r) = var(r) = \frac{1-f}{x^2} \sum_{h=1}^H \left[\frac{m_h}{m_h-1} \left(\sum_{i=1}^{m_h} z_{hi}^2 - \frac{z_h^2}{m_h} \right) \right]$$

in which $z_{hi} = y_{hi} - rx_{hi}$, and $z_h = y_h - rx_h$

where h represents the stratum which varies from 1 to H ,
 m_h is the total number of clusters selected in the h^{th} stratum,
 y_{hi} is the sum of the weighted values of variable y in the i^{th} cluster in the h^{th} stratum,
 x_{hi} is the sum of the weighted number of cases in the i^{th} cluster in the h^{th} stratum, and
 f is the overall sampling fraction, which is so small that it is ignored.

In FLEMMS 2019, the 117 province/HUC domains are also treated as natural stratification while the primary sampling units (PSUs) are treated as clusters.

Data Checking, Coding and Filtering Prior to Estimation of Proportions

Data checking starts in the provinces where field enumeration is undertaken, based on the set of consistency checks provided in the FLEMMS 2019 Data processing Manual. The same set of specifications is embedded in the machine data processing system after the data are encoded in the regions, and submitted to the Central Office as part of checking on the submissions from the field offices.

During data analysis, another layer of checking/data filtering is done through cross-tabulation of related variables/characteristics, based on unweighted data. Cases with observed inconsistencies are returned to the field offices for verification. Verified/vetted information, including the correction of typographical errors/miscoded entries (particularly those involving multiple-digit codes) are reflected in the individual records. The updated datafile is then used to come up with the final estimated counts, and proportions.

IV. Dissemination of Results

FLEMMS 2019 results shall be disseminated online at the PSA website at www.psa.gov.ph, releasing three (3) Press Releases, as follows:

- Press Release 1: Basic Literacy
- Press Release 2: Functional Literacy
- Press Release 3: Mass Media

A final report shall likewise be released after the press releases are posted.

V. Citation

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VI. Contact Information

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