MODULE 2

Understanding and Using the Demographic and Health Surveys

DHS Curriculum
Facilitator's Guide
March 2014
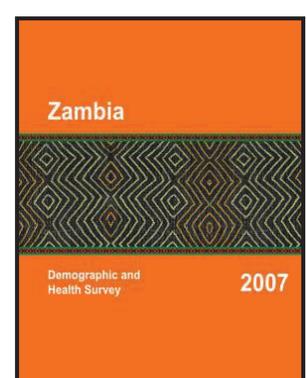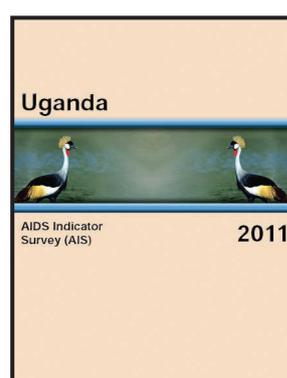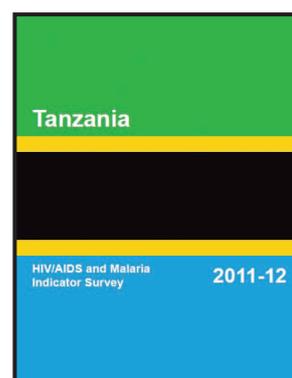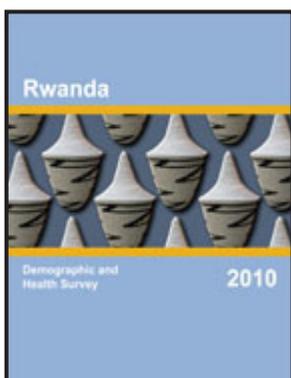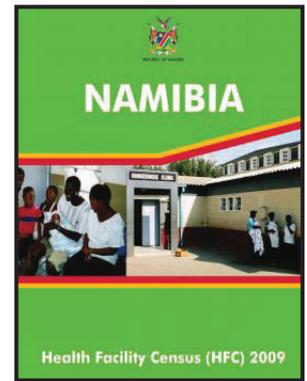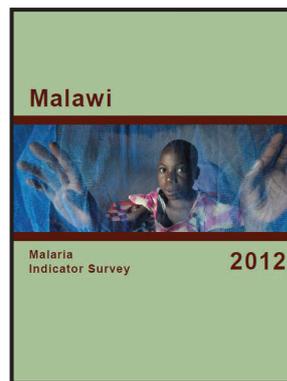
About the DHS Curriculum Facilitator's Guide

The following persons (in alphabetical order) have contributed to developing, reviewing, and editing *Understanding and Using the Demographic and Health Surveys – DHS Curriculum Facilitator's Guide*: Sarah Balian, Thada Bornstein, Sarah Bradley, Anne Cross, Joy Fishel, Lia Florey, Debbie Gachuhi, Hannah Guedenet, Kiersten Johnson, Shane Khan, Laurie Liskin, Erica Nybro, Cameron Taylor, and Sally Zweimueller

The DHS Curriculum Facilitator's Guide is a comprehensive package of ready-made training materials about understanding and using Demographic and Health Survey reports. The curriculum is designed for use in African universities and with public health program staff. Over 25 hours of instruction are divided into eight stand-alone modules designed to be a course on its own or customized and integrated into existing curricula. Each module is complete with instructor guides, Power Point slides, exercises, handouts, pre and post tests and answer keys. The DHS Curriculum Facilitator's Guide is available in both print and electronic versions.

Questions and comments regarding the DHS Curriculum can be sent to
curriculum@dhsprogram.com

About The DHS Program

The DHS Program assists countries worldwide in the collection and use of data to monitor and evaluate population, health, and nutrition programs. Funded by the U.S. Agency for International Development (USAID) under the terms of Contract No. GPO-C-00-08-00008-00, The DHS Program is implemented by ICF Macro in Rockville, Maryland. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development.

The main objectives of The DHS Program are:

1) to provide decision makers in survey countries with information useful for informed policy choices
2) to expand the international population and health database
3) to advance survey methodology
4) to develop in participating countries the skills and resources necessary to conduct quality demographic and health surveys

Information about The DHS Program or the status of The DHS Program surveys is available on the Internet at http://www.dhsprogram.com or by contacting:

ICF International
530 Gaither Road, Suite 500
Rockville, MD 20705 USA
Telephone: 301-572-0200
Fax: 301-572-0999
Email: info@dhsprogram.com

Suggested citation

2014. *Understanding and Using the Demographic and Health Surveys – DHS Curriculum Facilitator's Guide: Instructor's Guide, March 2014*. Rockville, Maryland, USA: ICF International.

Module 2: Basic Statistics and Demographic and Health Terms for Understanding DHS Data

PREPARATION

Review Instructor Guide

Equipment, Materials, Supplies

- LCD projector and screen
- Flipchart or writing board
- Markers
- VIPP cards
- PowerPoint presentation
- 2008-09 Kenya DHS report (available at: http://www.DHSprogram.com/pubs)

Exercise Preparation

Review Exercise 2.1, *A New Neighborhood*

Prepare VIPP cards

Handouts

Make copies for each participant of:

- Handout 2.1, *Definitions of Descriptive Statistics*
- Handout 2.2, *Glossary of Demographic and Health Terms in the DHS*
- Exercise 2.1, *A New Neighborhood*

Room Arrangements

Participants should be seated at tables in groups of four to seven, if possible.

PURPOSE	The purpose of this module is to help participants understand basic statistical concepts and demographic and health terms to facilitate interpretation of DHS data.
OBJECTIVES	By the end of the module, participants should be able to:
	• Define basic statistical terms
	• Define demographic and health terms used in The DHS Program
TIME	2 hours, 30 minutes

MODULE OVERVIEW

Session 1	Basic Statistical Concepts, Part 1	30 minutes
Session 2	Basic Statistical Concepts, Part 2	1 hour
Session 3	Basic Demographic and Health Terms	1 hour

Note: This module uses examples mostly from the 2008-09 Kenya DHS. You may wish to substitute examples from your own country's DHS instead.

Session 1	**Basic Statistical Concepts, Part 1**
30 minutes	
Session Objective	Define basic statistical terms
STEP 1	PRESENT **Slides 1 and 2**.
	DISCUSS the objectives for Module 2, and EXPLAIN that the first two sessions will focus on the first objective: statistical concepts and terms.
	PRESENT **Slide 3**.
	TELL participants that this session will cover statistical concepts. REASSURE participants that most of the statistics presented are quite basic. While some more complex statistics are explored, participants only need to understand them on a conceptual level.
	EXPLAIN that when we choose a sample from a larger population, we may want to have a way of quantitatively summarizing or describing the data. For example, if we ask the seven players on a football team how old they are, we could publish our results by simply listing all of their ages. But we probably want a more efficient way to summarize our results. The two most common ways to summarize data are through calculation of the **mean** and the **median**.
STEP 2	ASK participants to work together in pairs.
	PRESENT **Slide 4**.
	ASK participants to calculate the **mean**, the **median**, and the **mode** for the ages of the players on the football team.
STEP 3	PRESENT **Slide 5**.
	Note: Each text box definition is revealed one at a time as you progress through the definitions.
	EXPLAIN that the **mean**, or the average, is the sum of all values divided by the number of values.
	TELL participants that the **mean** is calculated as follows:
	Mean = (15 + 16 + 16 + 17 + 18 + 19 + 20) divided by 7 equals 17.3 years.
	That indicates that the average age of the boys in this group is 17.3 years.
	EXPLAIN that the **median** is the value that, when the data

are listed in order from lowest to highest (or vice versa), is the middle value. Thus, it divides the sample in half, with an equal number of values above and below it. In this example, the values are ages, but they could be any kind of data values. If there is an even number of data points, the two middle numbers are added together and then divided by two to calculate the median.

EXPLAIN that here we see seven boys whose ages are listed in order from low to high. We determine the age of the boy in the middle position, who is the fourth boy. His age divides the sample in half: there are three ages that are either equal or lower than his own and three ages that are either equal or higher. In this case, the median is 17, the "middle" value of our ordered list.

Now ASK participants to define **mode**. EXPLAIN that the mode is the value that occurs with the highest frequency. ASK what the mode is in this slide. The answer is 16 because two boys are 16. ASK what would happen if we added another 20-year-old to the group. Then there would be two modes: 16 and 20.

STEP 4

PRESENT **Slide 6**.

ASK participants what would the median be if another 20-year-old boy joins our sample? There is no longer a clear middle value because we now have an even number of players.

ASK how they would calculate the median. (Answer: 17.5)

If no one answers correctly, EXPLAIN that to find the median, we take the middle value. However, when there is an even number in the sample, there is no clear middle. Therefore, we take the average of the two middle values—the ages of the fourth and the fifth boys—as the median. In this example, the median is 17 plus 18, divided by 2, which equals 17.5. This is also written as (17+18) / 2.

If there are still participants who are unable to calculate the median, LIST variations on these data on a flipchart. ASK different participants what the median is until everyone can answer.

STEP 5

PRESENT **Slide 7**.

EXPLAIN that statistical reports use both means and medians, because each has its own strengths and weaknesses. ASK participants if they can identify any strengths and weaknesses, and WRITE these on the flipchart.

TELL participants that the mean may be biased. Think back to our example of the ages of the football players. If one

person on the team is much older than the others, then the mean would be high and probably not a good summary of the ages of the other boys. The one age that is very much higher than the rest is called an **outlier**, because it lies outside the ages of the others.

On this slide, for example, the mean age of the first six football players is 16.8. If we add another player who is 60 years old, the mean will be 23 (15 +16+16+17+18+19+60=161, divided by 7 equals 23).

Therefore, the median—which is still 17—is now a better measure of the ages of the football players in this example.

TELL participants that some tables in the DHS use the mean (for example, the mean ideal number of children), while others use the median (for example, median age at first birth). Many tables show both the mean and the median.

STEP 6

(NOTE to the instructor: The following is an optional activity. It uses the 2008-09 Kenya DHS as an example, but the activity can be completed with any DHS final report.)

REFER participants to the 2008-09 Kenya DHS report. ASK them to find an example of a **mean**. If they do not find one, TELL them that one example of a **mean** in the DHS is the mean size of households (Chapter 2-Table 2.2). ASK what the mean size of households is in the Kenya DHS 2008-09. (Answer: 4.2 persons.)

TELL participants to look at the data in the DHS for the age of first marriage (Chapter 6, Table 6.3). ASK what is the median age at first marriage among women age 25-49 in Kenya? (Answer: 20.0 years.)

Note: Tell participants that an easy way to find information in the DHS is to look at the List of Tables and Figures in the beginning of the Final Report.

STEP 7

End this session by ASKING participants if they have any questions about mean, median, mode, or outliers. EXPLAIN that the next session will go into more advanced statistical concepts.

Session 2	**Basic Statistical Concepts, Part 2**
1 hour	
Session Objective	Define basic statistical terms
STEP 1	PRESENT **Slide 8.**
	TELL participants that they are going to learn about other basic statistical concepts in this session, including:
	• Frequency
	• Range
	• Percentage
	• Rate and ratio
	• Standard deviation
STEP 2	PRESENT **Slide 9.**
	ASK participants what is meant by a **frequency**. EXPLAIN that a frequency is a count of the number of times an event occurs. When we list the ages of the seven football players in a table, it looks like this slide.
	From this table, we see the number of times that there is a player of a specific age.
	ASK how many boys are 16 years old? What about other ages? (Answer: There are two boys age 16. All the other ages have a frequency of 1.)
	Before proceeding to Slide 10, ASK participants to define **range**. ASK participants to determine the range for the football players on this slide. (Answer: 15 to 20.)
STEP 3	PRESENT **Slide 10.** Additional clicks on this slide will reveal the answers for each group.
	TELL participants that the **range** indicates the lowest and highest values in a group of data.
	ASK participants to determine the range for the second set of data, which includes a 60-year-old player. (Answer: 15 to 60.)
	Before turning to Slide 11, ASK what a **percentage** is.
STEP 4	PRESENT **Slide 11**.
	EXPLAIN that a **percentage** is a way of expressing a number as a fraction of 100, where 100 represents the

whole. Thinking of our 7 football players, there are two boys who are age 16. The percentage of players age 16 is calculated as follows:

DIVIDE the number of players who are 16 years old by the total number of players. Multiply this number by 100. The result is the percentage.

2/7 x 100 = 28.6%

A percentage can be expressed as a fraction.

In this example, the fraction would be 2/7. The two players who are age 16 are the numerator, and the total number of players (7) is the denominator.

STEP 5

PRESENT **Slide 12**.

TELL participants that DHS reports, like other survey reports, use percentages frequently.

EXPLAIN that it is important to look carefully at the denominators. Sometimes DHS data are presented as percentages of all women. But sometimes data are presented as percentages only of currently-married women, of ever-married women, or of never-married women.

This example from Kenya shows how the percent of women with secondary school or higher education is calculated.

STEP 6

PRESENT **Slide 13**.

ASK participants what a **rate** is.

TELL them that a **rate** is a percentage, often representing an occurrence over a fixed time period. It describes a relationship between two measurements that use the same units.

For rates, the denominator includes the numerator. In other words, the denominator is a total of which the numerator is a subset.

EXPLAIN how to determine the infant mortality rate in a country: The number of infant deaths during a set time period (usually 5 years) is divided by the total number of infants born in the same time period (usually 5 years).

TELL participants that the numerator has to be part of the denominator or we cannot call it a rate. Point out that the rate is the same as a percentage.

STEP 7

PRESENT **Slide 14.**

EXPLAIN that rates are often expressed per 1,000 (instead

of per 100, as percentages do), especially when events are rare. For example, the 2008-09 Kenya DHS survey reported that the neonatal mortality rate was 31 per 1,000 live births. This means that for every 1,000 children born, 31 died within the first month of birth.

STEP 8

PRESENT **Slide 15.**

ASK participants to define a **ratio**. A **ratio** compares two quantities with different units, in contrast to a rate, which compares quantities with the same units. DESCRIBE the example in this slide.

Another example of a ratio from the DHS is the maternal mortality ratio. This is the number of maternal deaths per 100,000 live births.

EXPLAIN the difference between the:

- **maternal mortality ratio**, which is the number of maternal deaths during a given time period per 100,000 live births during the same time period, and the

- **maternal mortality rate**, which is the number of maternal deaths in a given time period per 100,000 women of reproductive age during the same time period.

One is a ratio because it compares two different units: women (maternal deaths) and children (live births). The other is a rate because both the numerator and denominator use the same unit: women.

STEP 9

PRESENT **Slide 16.**

ASK participants what is meant by **standard deviation**.

TELL participants that **standard deviation** is a measure of how widely values spread out from the mean or the median. When the data points clump very closely around the mean (or median), then the standard deviation is small. When the data points spread far away from the mean (or median), the standard deviation is large.

EXPLAIN that when we place data points from a large sample of people on a graph and there are a sufficient number of points, the graph is often shaped like a bell. A commonly used statistical term is a bell-shaped distribution or a bell-shaped curve. As this graph illustrates, in a normal distribution 68% of the population lay close to the mean, that is, within one standard deviation. Ninety-five percent fall within two standard deviations of the mean. And almost all (99.7%) fall within three standard deviations of the mean. Very few outliers, just 0.3%, are

farther from the mean.

TELL participants to think about measuring height in a population where the average height is 170 centimeters (or almost 5'7"). If the standard deviation is 8 centimeters (about 3"), then 68% of people will have a height within 8 centimeters of the mean; that is, they will be between 162 and 178 centimeters tall (5'4" and 5'10"). Almost everyone (95% of the population) will be within two standard deviations, or 16 centimeters, of the mean; that is, they will be between 154 and 186 centimeters tall (5'1" and 6'1"). Less than 1% of the population would be shorter than 154 centimeters (5'1") or taller than 186 centimeters (6'1"). If the standard deviation were smaller, say 4 centimeters, peoples' height would not vary as much. If the standard deviation were zero, then everyone would be the same height.

PRESENT **Slide 17**

TELL participants that the DHS uses standard deviations to express measurements of the nutritional status of children. During the DHS, interviewers measure the height and weight of children under age five. The results are compared to the median and standard deviations of a reference population of healthy, breastfed children from eight countries around the world. This reference population was designed by the WHO to provide standards for measuring children's nutritional status, and it was used to create the WHO Child Growth Standards.

EXPLAIN that this slide shows the standard curves for height-for-age for girls according to the WHO Child Growth Standards. The blue line shows the median height at each age for healthy girls. Girls who fall below the pink line (-2 standard deviations below the median) are considered stunted; girls who fall below the red line (-3 standard deviations below the median) are considered severely stunted. Girls who are 2 standard deviations *above* the mean are considered overnourished, particularly when looking at weight-for-age.

PRESENT **Slide 18.**

EXPLAIN that DHS reports contain tables that show the percent of children who fall two and three standard deviations below the median according to the WHO Child Growth Standards.

In Tanzania, 42% of children under age five are moderately stunted; that is, 42% are two or more standard deviations below the median height of the reference population. 16.5% of children are severely stunted; that is,

they are three standard deviations below the median height of the reference population.

ASK participants if they have any questions about these definitions and descriptions.

ASK participants to read **Handout 2.1**, *Definitions of Descriptive Statistics*, during their free time.

EXERCISE

PRESENT **Slide 19**.

DIVIDE participants into three groups and DISTRIBUTE **Exercise 2.1**, A *New Neighborhood*. ASK the groups to answer the questions on the handout (the answers are upside down on the bottom of the sheet).

Allow about 10 minutes for this activity. After they have finished, BRING everyone together. ASK each group to take turns answering the questions.

Session 3 1 hour	**Basic Demographic and Health Terms**
Session Objective	Define basic demographic and health terms used in The DHS Program
STEP 1	TELL participants that in this session they will learn some of the terms that are commonly used in the public health field and are found in most DHS surveys. This will help them to read and better understand the DHS and other surveys.
EXERCISE	DIVIDE the participants into groups of 3–4. DISTRIBUTE prepared index cards with the terms listed below on them. Refer participants to **Handout 2.2**, *Glossary of Demographic and Health Terms in the DHS*. Also, if time permits and if there are enough reports to share with each group, ask the groups to find at least one indicator in the DHS and be prepared to share it with the other participants. For example, for the first term below, participants should look up the section on child health in the DHS and provide on survey finding on ARI.
	Allow about 20 minutes for this activity. BRING everyone together, and ASK each group to share their definitions with the rest of the participants. DISCUSS each definition and clarify any misunderstandings.

Terms:

- Acute respiratory infection (ARI)
- Age-specific fertility rate
- Anemia
- Antenatal care (ANC)
- Background characteristics
- Birth intervals
- Child mortality rate
- Comprehensive knowledge of AIDS
- Contraceptive prevalence rate
- Crude birth rate
- Discordance of HIV infection
- Ever use of contraception
- Exclusive breastfeeding
- Family planning

- Female genital cutting (FGC)
- Full immunization/vaccination
- Higher-risk sex
- HIV incidence
- HIV prevalence
- Infant mortality rate
- Informed choice
- Informed consent
- Insecticide-treated mosquito net (ITN)
- Intermittent preventive therapy during pregnancy (IPTp)
- In union
- Lactational amenorrhea method (LAM)
- Male circumcision
- Malnutrition
- Maternal mortality rate
- Maternal mortality ratio
- Median age at first marriage
- Modern family planning methods
- Neonatal mortality rate
- Oral rehydration therapy (ORT)
- Population-based HIV testing
- Postnatal care (PNC)
- Rate
- Ratio
- Representative sample
- Routine data collection
- Sentinel surveillance
- Stunting
- Survey
- Total fertility rate (TFR)
- Traditional family planning methods
- Under-five mortality rate
- Underweight
- Unmet need for family planning
- Wasting

STEP 2   End the session by ASKING participants to read through the list of terms in their free time and familiarize themselves with their meanings. REMIND participants that these are terms that they will see used throughout all DHS surveys, therefore, they should be comfortable with what they mean.

Module 2

Basic Statistics and Demographic and Health Terms for Understanding DHS Data

---

Objectives for Module 2

By the end of the module, participants should be able to:

- Define basic statistical terms
- Define demographic and health terms used in The DHS Program

---

Module 2
Session 1

Basic Statistical Concepts, Part 1

The DHS Surveyors Football Team: Players' Ages
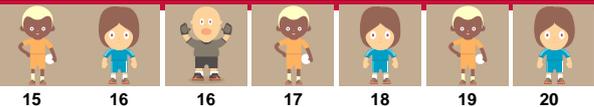
| 15 | 16 | 16 | 17 | 18 | 19 | 20 |

Mean   **Median**   **Mode**

Mean, Median, and Mode

| 15 | 16 | 16 | 17 | 18 | 19 | 20 |

Mean

Also known as "average"

The sum of all values divided by the number of values

The mean age of this football team is:
(15+16+16+17+18+19 +20) ÷ 7 = **17.3 years**

Median

The value that divides the sample in half; when values are ordered, the median is the middle value.

The median age of this football team is **17**.

Mode

The value that occurs most frequently

The mode of this football team is **16**.

Another Look at the Median

| 15 | 16 | 16 | 17 | 18 | 19 | 20 |

20

- What if we add another 20-year-old boy to the sample?
- Now there is no clear middle value; the middle is between 17 and 18.
- To calculate the median, we take the average of the two middle values:

(17 +18) ÷ 2 = **17.5**

Outliers

| 15 | 16 | 16 | 17 | 18 | 19 | 60 |
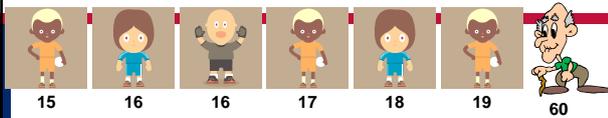
- What if a 60-year-old replaces the 20-year-old on the football team? What is the median? What is the mean?
  - Is the mean a good summary statistic in this case?
  - Which measure (mean or median) would be a better way to describe the team?
- The 60-year-old is called an "outlier" – that is, a value that lies far outside the normal range of the data. Outliers have a strong effect on the mean, but not the median.

Module 2 Slide 7

Module 2
# Session 2

Basic Statistical Concepts, Part 2


Frequency

| 15 | 16 | 16 | 17 | 18 | 19 | 20 |
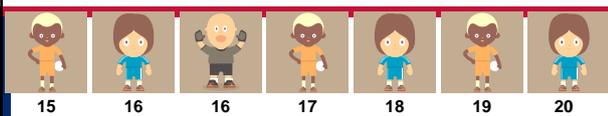
Age	Frequency
15	1
16	2
17	1
18	1
19	1
20	1
Total	**7**

Module 2, Slide 9

Range

| 15 | 16 | 16 | 17 | 18 | 19 | 20 |
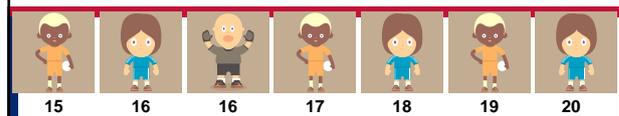
Range is 15 to 20

| 15 | 16 | 16 | 17 | 18 | 19 | 60 |
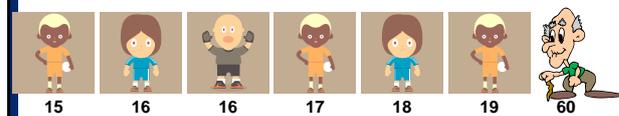
Range is 15 to 60

Module 2, Slide 10

Percentage

| 15 | 16 | 16 | 17 | 18 | 19 | 20 |
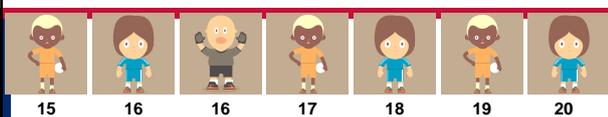
- A *percentage* is a way of expressing a number as a fraction of 100.

- What percentage of boys are age 16?

To calculate the percentage, we divide the 2 boys age 16 by the total number of boys, and then multiply by 100:

$$\frac{2}{7} \times 100 = 28.6\%$$

Module 2, Slide 11

Percentages in the DHS

- The 2008-09 Kenya DHS found that 34.2 percent of female respondents age 15-49 have attended secondary school or higher.
- The **numerator** is the number of women age 15-49 who have attended secondary school.
- The **denominator** is the total number of women age 15-49.

$$\frac{\text{\# of women age 15-49 who attended secondary school or higher}}{\text{All women age 15-49}} \times 100$$

Module 2, Slide 12

2

Rates in the DHS (1)

- In most rates, the **denominator** **includes** the **numerator** – that is, the denominator is the total of a category of which the numerator is a subset.
- For example, the DHS Infant Mortality Rate

# of infant deaths during set time period (usually 5 years)
_____

All infants born during same time period (usually 5 years)

Rates in the DHS (2)

- Rates can be expressed per 1,000 or 100,000, depending on how frequently an event occurs.
- For example, neonatal mortality in Kenya in 2008-09 was 31 deaths per 1,000 live births. In other words, for every 1,000 children born, 31 died within the first month of birth.


Ratios

- A **ratio** compares two quantities with _different_ units. For example, if there are 4 boys and 1 girl in a class, the ratio of boys to girls is 4:1 (read as "4 to 1")
- In a ratio, the denominator does NOT include the numerator
- Ratios can also be expressed as a fraction
- Example from the DHS: The maternal mortality ratio is the number of maternal deaths per 100,000 live births

---

Standard Deviation

99.7% of population is within 3 SDs of mean
95% of population is within 2 SDs of mean
68% of population is within 1 SD of mean
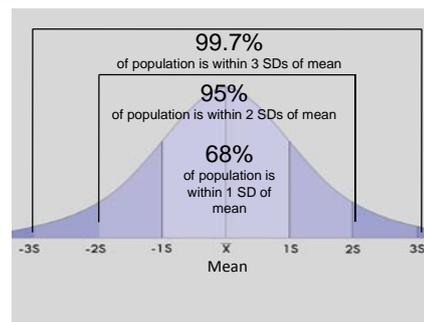
Standard Deviation in the DHS: Nutrition

Children that fall in this shaded area are 2 or 3 standard deviations below the median. Therefore, they are stunted or severely stunted.
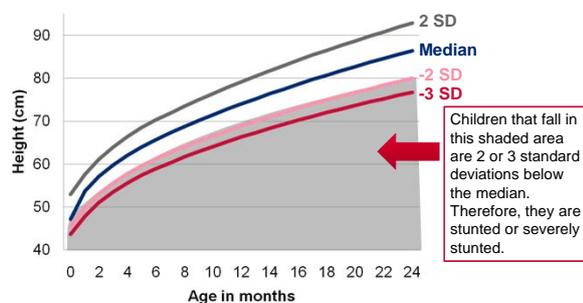
Nutritional Status of Children in Tanzania

Percentage of children under five years classified as stunted (too short for age), by residence, Tanzania 2010

Characteristic (Residence)	% below -3 SD	% below -2 SD	Number of children
Urban	11.6	31.5	1,451
Rural	17.7	44.5	6,040
Total	16.5	42.0	7,491

42% of Tanzanian children are 2 SD or more below the median height compared with children their age in the reference population.

This indicates that more than one-third of Tanzanian children are not growing at a healthy rate.

Exercise: A New Neighborhood

$1,000 $1,000 $1,000 $10,000 $5,000

$700 $300 $900 $100 $500

Exercise 2.1

A New Neighborhood

$1,000 $1,000 $1,000 $10,000 $5,000

$700 $300 $900 $100 $500

1. How many households (huts) have an income over $1,500?

2. What is the range of income for this new neighborhood?

3. What is the mean (average) income for this new neighborhood?

4. What is the median income for this new neighborhood?

5. What is the mode of incomes for this new neighborhood?

6. What percentage of households makes less than $1,000?

Handout 2.1

Definitions of Descriptive Statistics

Measures of central tendency	
Mean	The average; calculated by totaling the values of all observations and dividing by the number of observations.
Median	The middle observation—half the observations are smaller, and half are larger. When there are an odd number of observations, the median is found by arranging the observations from lowest to highest (or vice versa) and selecting the middle value. When there is an even number of observations, the median is calculated by taking the mean of the two middle values.
Mode	The value that occurs most frequently.
Descriptive measures	
Proportions	The number of observations with a given characteristic divided by the total number of observations.
Frequencies	Arrangement of values from lowest to highest with a count of the number of observations sharing each value; the counts are often converted into a percentage of the total.
Percentages	A way of expressing a number as a fraction of 100; calculated by multiplying a proportion times 100, e.g., the number of men in a classroom divided by the total number of people in a classroom times 100.
Rate	A percentage that often represents the frequency of an occurrence over a fixed time period; it indicates a relationship between two measurements with the same units (e.g., the number of infant deaths during a set time period (usually 5 years) divided by the total number of infants born in the same time period).
Ratios	A comparison of two quantities with different units and in which the numerator does not include the denominator. For example, if there are four boys and one girl in a class, the ratio of boys to girls is 4:1.
Measures of dispersion	
Range	Difference between the largest observation and the smallest; often expressed as the largest and smallest observation rather than the difference between them.
Standard deviation	A measure of the spread of data around the mean or median.

Glossary of Demographic & Health Terms in the DHS

Acute respiratory infection (ARI): Potentially serious illness in children and older adults. ARI is measured in the DHS by the following symptoms: cough accompanied by short, rapid breathing at any time during the two weeks preceding the interview. ARI is considered a proxy for pneumonia.

Age-specific fertility rate: Number of births that occurred 1–36 months before the survey to women in a specific age group (e.g., 20-24) divided by the number of women-years of exposure in that age group 1-36 months before the survey.

Anemia: Lower than normal levels of hemoglobin (iron-carrying molecules) in the blood; anemia can lead to fatigue and increased risk of infection and hemorrhage. Severe anemia in children can damage learning ability.

Antenatal care (ANC): Visits to a nurse, midwife, or other trained health care provider at any time during pregnancy for health education, monitoring, and preventive and curative care related to pregnancy and childbirth. Most countries recommend at least four ANC visits with the first visit occurring in the first trimester (12 weeks) of pregnancy.

Artemisinin-based combination therapy (ACT): ACTs are the recommended first-line treatment for uncomplicated malaria caused by *Plasmodium falciparum* in most malaria-endemic countries.

Background characteristics: Usually age group, urban-rural residence, region or province, education, employment, household wealth status, marital status, and sometimes ethnicity and religion.

Birth intervals: Number of months between successive births to the same woman. Closely spaced births (less than 24 months apart) lead to higher infant and under-five mortality. The World Health Organization (WHO) now recommends 36 month (3-year) birth intervals.

Child mortality rate: Probability of dying between age one and five; calculated as the number of children dying between age one and five (13 to 59 months) per 1,000 children surviving to 12 months of age.

Comprehensive knowledge of AIDS (as defined by UNAIDS): This indicator has four parts: (1) knowing that HIV can be prevented by using condoms; (2) knowing that HIV can be prevented by having just one uninfected, faithful partner; (3) knowing that a healthy-looking person can have HIV; and (4) rejecting the two most common local misconceptions about HIV transmission or prevention, which vary by country.

Contraceptive prevalence rate: The percentage of currently married women of reproductive age (15-49) who are using contraception.

Crude birth rate: Number of live births per 1,000 population.

Discordance of HIV infection: When one member of a marriage or cohabiting partnership is infected with HIV and the other is not.

Endemic: An endemic disease is always present in a population, leading to a high prevalence of the disease.

Epidemic: An epidemic is the occurrence of more cases of disease than would normally be expected in a specific place or group of people in a given period of time.

Ever use of contraception: Any use at any time of a modern or traditional method of family planning. Ever use does not necessarily mean current use. For example, a woman who used oral contraceptive pills is listed as an ever user, even if she discontinued using the pills.

Exclusive breastfeeding: Providing a child with only breast milk and no other food or liquid, even water. The World Health Organization (WHO) recommends that children be exclusively breastfed for the first six months of life.

Family planning: Conscious effort by sexual partners to regulate the number and spacing of births through modern and/or traditional methods of contraception.

Female genital cutting (FGC): Cutting or removal of part or all of a female's external genitalia. FGC can also include sewing up part of the vaginal opening; sometimes referred to as female circumcision or female genital mutilation (FGM).

Full immunization/vaccination: Child has received all basic immunizations, including: BCG (against tuberculosis); three doses of DPT (diphtheria, pertussis, and tetanus), which may also be given as a pentavalent vaccine with Hepatitis B and Hib (*haemophilus influenzae* type b); at least three doses of polio vaccine; and one dose of measles vaccine. Full vaccination is usually calculated for children age 12–23 months.

Higher-risk sex: Sexual practice that increases the risk of becoming infected with or transmitting HIV; defined as sex with more than one partner in the past year.

Handout 2.2

HIV incidence: The number of people contracting HIV infection in a year per 1,000 population. Incidence measures new cases of HIV infection in a given year. The DHS does not measure HIV incidence. The laboratory tests done through the DHS project measures whether or person is infected or not infected. These tests cannot tell when a person was infected.

HIV prevalence: The percentage of people in a population who are infected with HIV. Prevalence measures both new and ongoing cases of HIV infection.

Indoor Residual Spraying (IRS): IRS is organized, timely spraying of an insecticide on the inside walls of houses. IRS interrupts malaria transmission by killing adult female mosquitos when they enter houses and rest on the walls after feeding, but before they can transmit infection to another person.

Infant mortality rate: Probability of dying between birth and age one; calculated as the number of deaths among infants under 12 months per 1,000 live births.

Informed choice: For a woman using modern contraceptive methods, being informed about the effectiveness of a method, potential side effects or problems of a method, and being told what to do if side effects or problems occur. In the case of sterilization, being told that the method prevents future childbearing.

Informed consent: For individuals who participate in the DHS, informed consent means they have voluntarily agreed to participate in the study after the interviewer has clearly explained the purpose of the study, how the results will be used and any possible consequences to the study participant because of his or her participation.

Insecticide-treated mosquito net (ITN): A net treated with a chemical repellent that deters the mosquito from biting or kills the mosquito, thus preventing malaria transmission. Long-lasting insecticidal nets (LLIN) are treated nets that repel mosquitoes for three years.

Intermittent preventive treatment during pregnancy (IPTp): Treating pregnant women with sulfadoxine pyrimethamine/Fansidar (SP/Fansidar) to prevent malaria at least twice during antenatal visits.

In union: Refers to marital unions (woman and man who are cohabiting) whether legal, religious, customary, traditional, or informal.

Lactational amenorrhea method (LAM): In the first six months after birth and among women whose menstrual periods have not returned, exclusive breastfeeding at least every four hours during the day and at least every six hours at night; considered a modern method of family planning.

Long-lasting insecticidal net (LLIN): A LLIN is a factory treated net that does not require any treatment. It is designed to maintain efficacy against mosquito vectors for at least three years. Since 2007, the WHO has recommended that national malaria control programs procure only LLINs.

Male circumcision: The removal of the foreskin of the penis for cultural, religious, or health reasons. Some studies have linked male circumcision with reduced risk of HIV transmission.

Malnutrition: A state of undernourishment or overnourishment due to a lack of adequate macro- and micronutrient intake. Also known as undernutrition.

Maternal mortality rate: Number of women who die during pregnancy, childbirth, or in the six weeks after childbirth per 100,000 women of reproductive age during the same time period.

Maternal mortality ratio: Number of women who die during pregnancy, childbirth, or in the six weeks after childbirth per 100,000 live births.

Median age at first marriage: The age by which half the population marries. If the median age at first marriage is 17, this means that half of the married women in the population married before or at age 17 and half married at or after age 17.

Modern family planning methods: The DHS defines the following contraceptives as modern family planning methods: male and female sterilization; male and female condoms; oral contraceptive pills; injectables; implants; intrauterine devices (IUDs); diaphragms; contraceptive foam, jelly, and spermicide; emergency contraception; and the lactational amenorrhea method (LAM). Other modern methods are added based on country programs (e.g. standard days method and fertility awareness method).

Neonatal mortality rate: Probability of dying within the first month of life; calculated as the number of children dying within the first 30 days after birth per 1,000 live births.

Handout 2.2

Oral rehydration therapy (ORT): The use of either packets of oral rehydration salts (ORS) or increased fluids to prevent dehydration during episodes of diarrhea.

Population-based HIV testing: HIV-testing done among a representative sample of the population.

Postnatal care (PNC): Check-up by a trained health care provider after delivery; WHO recommends a postnatal visit within 6–12 hours of delivery.

Rapid Diagnostic Test (RDT): RDT kits are used to assess the presence of malaria antigens in respondents' blood. RDT kits are easy to use in remote areas where lab facilities are not available.

Rate: The frequency of events in a population during a specified time period (usually one year) divided by the total population. Rates tell us how common it is for an event to occur. For example, the infant mortality rate is the number of infant deaths during a set time period (usually 5 years) is divided by the total number of infants born in the same time period (usually 5 years). Rates can be age-specific, sex-specific, and so on. (Hint: In rates, people in the numerator must be part of the same group as people in the denominator.)

Ratio: The relation of one population subgroup to the entire population or to another subgroup of the population. For example, the maternal mortality ratio is the number of women who die because of complications of pregnancy or childbearing in a given year per 100,000 live births in that year. (Hint: In ratios the numerator is not part of the denominator.)

Representative sample: A group of households or people selected for a study from a larger population using scientific probability to ensure that the sample has similar characteristics to the population from which it is drawn. Each household or person is selected by chance through a systematic process designed by a trained statistician. This means that each member of the population has a known chance of being included in the sample.

Routine data collection: A standard procedure for gathering and measuring information on any topic, for example, the number of children at a health care center who get immunized each month. Another example is birth registration systems.

Handout 2.2

Sentinel surveillance: Sentinel surveillance refers to a systematic and continuous monitoring of a disease. In Tanzania, for example, sentinel surveillance of HIV has been carried out in two specific groups of people—pregnant women coming to specific health care facilities for antenatal care and blood donors. These groups are tested every year or every other year for HIV. This allows researchers to see if the prevalence of HIV changes over time.

Stunting: Height-for-age is two or more standard deviations below the median determined by international growth standards. The DHS measures height among children under five and among women. Stunting is a sign of chronic malnutrition.

Survey: Interviews with selected persons or households in a population to gather information about specific topics, like family planning use or health practices.

Total fertility rate (TFR): Average number of children born to a woman in her reproductive life time if she were to pass through all of her childbearing years conforming to the age-specific fertility rates in a population.

Traditional family planning methods: The DHS defines the following methods as traditional family planning methods: periodic abstinence (rhythm method, calendar method), withdrawal (*coitus interruptus*), and folk methods.

Under-five mortality rate: Probability of children dying between birth and age five; calculated as the number of children dying between birth and age five per 1,000 live births.

Underweight: Weight-for-age is two or more standard deviations below the median determined by international standards.

Unmet need for family planning: The DHS defines this as the percentage of women who (1) want to wait at least two years until their next birth or who do not want any more children AND (2) are not using a method of family planning.

Vector: An organism that carries and transmits a disease. Mosquitos are the vectors for malaria carrying the malaria parasite.

Wasting: Weight-for-height is two or more standard deviations below the median determined by international standards.

Module 2: Pre-Test

1. **Match each statistical term with its definition**

   _____Mode   a. The middle value in an ordered list

   _____Median   b. The statistical average

   _____Mean   c. The value that occurs most frequently

2. **Fill in the blanks.**

   In a normal or bell-shaped distribution _____% of the populations falls within one standard deviation of the mean, _____% of the populations falls within two standard deviations of the mean, and _____% of the populations falls within three standard deviations of the mean.

Indicate whether each example below represents a rate or a ratio:

3. **Neonatal mortality:**
   a. Probability of dying within the first month of life; calculated as the number of children dying within the first 30 days after birth per 1,000 live births. _____

4. **Maternal mortality:**
   a. Number of women who die during pregnancy, childbirth, or in the six weeks after childbirth per 100,000 live births. _____

5. **Total fertility:**
   a. Average number of children born to a woman in her reproductive life time if she were to pass through all of her childbearing years conforming to the age-specific fertility rates in a population. _____

Module 2: Post-Test

1. Match each statistical term with its definition

_____Mode   a. The middle value in an ordered list

_____Median   b. The statistical average

_____Mean   c. The value that occurs most frequently

2. Fill in the blanks.

In a normal or bell-shaped distribution _____% of the populations falls within one standard deviation of the mean, _____% of the populations falls within two standard deviations of the mean, and _____% of the populations falls within three standard deviations of the mean.

Indicate whether each example below represents a rate or a ratio:

3. Neonatal mortality:
   a. Probability of dying within the first month of life; calculated as the number of children dying within the first 30 days after birth per 1,000 live births. _____

4. Maternal mortality:
   a. Number of women who die during pregnancy, childbirth, or in the six weeks after childbirth per 100,000 live births.
   _____

5. Total fertility:
   a. Average number of children born to a woman in her reproductive life time if she were to pass through all of her childbearing years conforming to the age-specific fertility rates in a population.
   _____

ANSWER KEY

Module 2

1. **Match each statistical term with its definition**

   _____**C**_____Mode   a. The middle value in an ordered list

   _____**A**_____ Median   b. The statistical average

   _____**B**_____Mean   c. The value that occurs most frequently

2. **Fill in the blanks.**

   In a normal or bell-shaped distribution __**68**__% of the populations falls within one standard deviation of the mean, ___**95**__% of the populations falls within two standard deviations of the mean, and ___**99.7**__% of the populations falls within three standard deviations of the mean.

Indicate whether each example below represents a rate or a ratio:

3. **Neonatal mortality:**
   a. Probability of dying within the first month of life; calculated as the number of children dying within the first 30 days after birth per 1,000 live births. _____**RATE**_____
4. **Maternal mortality:**
   a. Number of women who die during pregnancy, childbirth, or in the six weeks after childbirth per 100,000 live births. _____**RATIO**_____
5. **Total fertility:**
   a. Average number of children born to a woman in her reproductive life time if she were to pass through all of her childbearing years conforming to the age-specific fertility rates in a population. _____ **RATE** _____