



## **BASIC STATISTICS 2: ESTIMATION AND HYPOTHESIS TESTING (BS 2)**

Inferential Statistics is a valuable statistical technique when examination of each member of the population is not practical or possible. The course tackles the two areas of Inferential Statistics: 1) estimation of numerical characteristics of the population and 2) tests of hypotheses relative to the population of interest. Both techniques utilize a random sample, and allows for conclusions to be generalized to the population. The course uses a free software add-in found in Microsoft Excel® called “PHStat” to generate random samples, estimates of parameters, and tests of hypotheses.

### **Purpose**

To provide participants with an understanding of the principles of inferential statistics as a tool in evidence-based decision-making and policy analysis. The training will provide the participants with basic skills in data processing and analysis of sample survey results, and assess the fitness of said results for generalization to the population.

### **Benefits to the Participants**

Hands-on applications of the statistical techniques useful in making evidence-based decisions, with PHStat as the computing tool to generate the needed statistics. Moreover, the knowledge and skills learned in this training builds on the foundational knowledge needed to perform advanced statistical analysis that allows for more sophisticated understanding and analysis of data.

### **Target Participants**

Technical staff and people involved in data analysis for the generation of statistics used in decision-making and policy analysis. Knowledge in computer concepts and basic statistics, up to descriptive statistics, is required prior to taking this course. Participants are recommended to take MS Excel® for Database Management (SW 1) and Basic Statistics 1: Descriptive Statistics (BS 1) as prerequisites.

### **Course Coverage**

- I. Review of Basic Concepts and Some Summary Measures
  1. Descriptive and Inferential Stats
  2. Population and Sample
  3. Parameter and Statistic
  4. Levels of Measurement
  5. Mean, Standard Deviation, Coefficient of Variation, and Proportions
- II. Sampling and Sampling Techniques
  1. Basic Concepts in Sampling
  2. Methods of Nonprobability Sampling
  3. Methods of Probability Sampling
- III. Estimation
  1. Two Areas of Inferential Statistics
  2. Point Estimation
  3. Interval Estimation

- IV. Elements of Hypothesis Testing
  - 1. Basic Concepts in Hypothesis Testing
  - 2. Null and Alternative Hypotheses
  - 3. One-tailed vs Two-tailed Tests
  - 4. Type I and Type II errors
  - 5. Steps in Conducting a Test of Hypothesis
  
- V. Hypothesis Testing for One Population Case
  - 1. Test of Hypothesis for the Population Mean
  - 2. Test of Hypothesis for the Population Proportion
  
- VI. Hypothesis Testing for Two Population Case (Mean and Proportion)
  - 1. Hypothesis Testing for Independent Samples
  - 2. Hypothesis Testing for Matched or Paired Samples
  
- VII. Hypothesis Testing for More Than Two Populations (Analysis of Variance)
  
- VIII. Chi-Square Test for Independence

**Duration:** 5 Days – 8:30am to 4:00pm