Statistics for Public Health Research: A weekly webinar series
Organized by
Center for Data Research and Analytics

The sessions will usually take place on <u>every Saturday at 9:00 PM</u> Bangladesh Standard Time. Each session will be limited between 1-2 hours.

Session-1: Introductory Session (11 Dec 2021, 09:00 PM)
- Ice breaking
- Objective of the training
- Course content
- Training session norms
- Training Infrastructure
  - R installation
  - Participating in discussion forum

Session-2: Foundation of Statistical Methods in Public Health Research (18 Dec 2021, 09:00 PM)
- Population and parameters
- Sample & Estimators
- Research question
- Quantification of a research question
- Measuring the outcome
  - Collecting data for the study parameters
  - The other factors
- Inference vs generalizability
  - Random sample
  - Source of biases in sampling

Session-3: Research Question Driven Data Analysis

- Understanding data requirements based on a research question
- Practical demonstrations and in-class exercise

Session-4: Measurement Scales & Analysis Plan
- Variety of outcome measurements
- Nominal, ordinal, interval, ratio
- Time to event data
- Other data (Lab report, Genomic data, X-ray, MRI, Audio)
- Data collection tools
- Preparing for analysis
  - Data preparation
  - Statistical analysis plan

Session-5: Data preparation for statistical analysis using R

- Practical demonstration on data preparation & analysis

Session-6: Descriptive Study
- Study designs
- Epidemiological investigation
- Cross sectional survey
- Census
- Methods of survey addressing heterogeneity
    - Simple Random Sampling
    - Stratified random sampling
    - Cluster sampling
    - Multistage sampling
- Descriptive statistics
    - Mean, variance, quartile, and percentile, median
    - Frequency, percentage
- Hypothesis testing
    - Null and alternative hypothesis
    - p-value
    - Confidence intervals
- Descriptive statistics in subgroups
- Subgroup statistics by linear regression

Session-7: Computing and presenting descriptive statistics
- Practical demonstration on:
    - descriptive statistics
    - descriptive statistics in sub-groups
    - descriptive statistics by regression
- In-exercise

Session-8: Analytical Study Designs
- Measure of associations
- Association vs causation
- Exposure and outcome variables
- Confounders
- Counterfactuals
- Study designs
    - Cross sectional study
    - Case-control study
    - Cohort study
    - Randomized controlled trial

Session-9
Statistical models to measure association between outcome and exposures

Session-10: Reproducibility

- Sample size calculation & power analysis
- Method of randomization
- Drawing random samples
- Reproducibility of research
- Working with a statistician

Session-11: Reproducibility of statistical analysis

- Practical demonstration on structuring R code to reproduce statistical findings
- Prospects
- Closing ceremony