**Statistics for Public Health Research**

**Center for Data Research and Analytics**

**Each session will be limited between 1-2 hours. The sessions will take place on every Saturday at 9:00 or 9:30 PM BTD.**

**Introductory Session**

Ice breaking

Objective of the training

Course content

Training session norms

* Timing
* Respect, Privacy and confidentiality
* Discussion
* Others

Training Infrastructure

* R installation
* Participating in discussion

**Session-2**

Population and parameters

Research question

Quantification of a research question

Measuring the outcome

* Collecting data for the study parameters
* The other factors

Sample

Estimators

Inference vs generalizability

* Random sample
* Source of biases in sampling

**Session-3**

Understanding data requirements based on a research question

**Session-4**

Variety of outcome measurements

Nominal, ordinal, interval, ratio

Time to event data

Binary data

Other data

Data collection tools

Preparing for analysis

* Data preparation
* Statistical analysis plan

**Session-5**

Data preparation for statistical analysis using R

**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
* Confidence intervals

Hypothesis testing

* Null and alternative hypothesis
* p-value

Descriptive statistics in subgroups

Subgroup statistics by linear regression

**Session-7**

Computing and presenting descriptive statistics

**Session-8**

Measure of associations

Association vs causation

Exposure and outcome variables

Confounders

counterfactuals

Cross sectional study

Case-control study

Cohort study

Randomized controlled trial

**Session-9**

Statistical models to measure association between outcome and exposures

**Session-10**

Hypothesis

Sample size calculation

Power analysis

Method of randomization

Drawing random samples

Reproducibility of research

Working with a statistician

**Session-11**

Reproducibility of statistical analysis