Parkland College
Arba Minch
Short Term Trainings Programs

Statistical Analysis with R for Public Health Specialization

About the Course

Master Statistics for Public Health and Learn R. Develop your statistical thinking skills and learn key data analysis methods through R.

Statistics are everywhere. The probability it will rain today. Trends over time in unemployment rates. The odds that India will win the next cricket world cup. In sports like football, they started out as a bit of fun but have grown into big business. Statistical analysis also has a key role in medicine, not least in the broad and core discipline of public health.

In this specialisation, you'll take a peek at what medical research is and how – and indeed why – you turn a vague notion into a scientifically testable hypothesis. You'll learn about key statistical concepts like sampling, uncertainty, variation, missing values and distributions. Then you'll get your hands dirty with analysing data sets covering some big public health challenges – fruit and vegetable consumption and cancer, risk factors for diabetes, and predictors of death following heart failure hospitalisation – using R, one of the most widely used and versatile free software packages around.

Target Participants

This training is intended for public health professionals.

What you will learn

By the end of this training the participants will be able to learn:

- Recognise the key components of statistical thinking in order to defend the critical role of statistics in modern public health research and practice.
- Apply appropriate methods in order to formulate and examine statistical associations between variables within a data set in R.
- Describe a given data set from scratch using descriptive statistics and graphical methods as a first step for more advanced analysis using R software.
- Interpret the output from your analysis and appraise the role of chance and bias as explanations for your results.

Course learning outcomes

- Learn in-demand skills from university and industry experts
- Master a subject or tool with hands-on projects
- Develop a deep understanding of key concepts
- Earn a career certificate from Parkland College

Course Outline

1. **Module 1: Introduction to Statistics & Data Analysis in Public Health**
   1.1. Defend the critical role of statistics in modern public health research and practice
   1.2. Describe a data set from scratch, including data item features and data quality issues, using descriptive statistics and graphical methods in R
   1.3. Select and apply appropriate methods to formulate and examine statistical associations between variables within a data set in R
   1.4. Interpret the output from your analysis and appraise the role of chance and bias
2. **Module 2: Linear Regression in R for Public Health**
   2.1. Describe when a linear regression model is appropriate to use
   2.2. Read in and check a data set's variables using the software R prior to undertaking a model analysis
   2.3. Fit a multiple linear regression model with interactions, check model assumptions and interpret the output
3. **Module 3: Logistic Regression in R for Public Health**
   3.1. Describe a data set from scratch using descriptive statistics and simple graphical methods as a first step for advanced analysis using R software
   3.2. Interpret the output from your analysis and appraise the role of chance and bias as potential explanations
   3.3. Run multiple logistic regression analysis in R and interpret the output
   3.4. Evaluate the model assumptions for multiple logistic regression in R
4. **Module 4: Survival Analysis in R for Public Health**
   4.1. Run Kaplan-Meier plots and Cox regression in R and interpret the output
   4.2. Describe a data set from scratch, using descriptive statistics and simple graphical methods as a necessary first step for more advanced analysis
   4.3. Describe and compare some common ways to choose a multiple regression model

Training Approach

The training is delivered by our seasoned trainers who have vast experience as expert professionals using R programming language. The course is taught through a mix of practical activities, theory, group works and case studies.
Training manuals and additional reference materials are provided to the participants.

Prerequisites

Basic knowledge of Statistics ideal.

Certification

Upon successful completion of this course, participants will be issued with a certificate.

Tailor-Made Course

We can also do this as a tailor-made course to meet organization-wide needs. A training needs assessment will be done on the training participants to collect data on the existing skills, knowledge gaps, training expectations, and tailor-made needs.