**R programming training plan for BRiCs MEAL members and CMU MEAL colleagues**

***Time: 1 and half hour per session***

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| **Date** | **Topic** | **User requirements** | **R packages to be used** |
| **10/06/2021** | **Introduction to R – part 1**   * What is R? * Why R? * Installing R and R studio * Basic rules in R * Setting a working directory * Creating projects * R packages * Installing and loading R packages   **Objectives**   * Understand what R programming is and how it operates * Be able to install R and Rstudio on own laptops * Be able to understand basic R syntax | * Laptop * Internet connection | Base R packages |
| **24/06/2021** | **Introduction to R – part 2**   * R prompt * Commands, objects and functions * Data types in R * Creating vectors (Variables) * Creating a data frame * Removing Objects * Getting Help   **Objectives**   * Create objects in R * Understand data types in R * Know how to get help about R functions * Be able to create a data frame in R | * Laptop * Internet connection | Base R packages |
| **08/07/2021** | **Reading data into R**   * Reading data into R (different types) * Writing data from R (different types)   **Objectives**   * Be able to read .csv, .xlsx and stata files into R * Be able to write .csv, .xlsx and stata files from R | * Laptop * Internet connection * Installation packages readr, haven and readxl | Readr  Haven  readxl |
| **22/07/2021** | **Data manipulation in R – part 1**   * Exploring properties of a data frame * Adding new variable to a data frame * Renaming variables * Selecting variables   **Objectives**   * Be able to explore the properties of a data frame * Be able to rename variables * Be able to select only variables of interest from a data frame | * Laptop * Internet connection * Installation of packages tidyverse, foreign, readxl and writexl | tidyverse  foreign  readxl  writexl |
| **28/07/2021** | **Data manipulation in R – part 2**   * Piping operator * Sorting variables * Handling duplicates in a data frame   **Objective**   * Understand how the pipe operator works and its value * Be able to sort data * Be able to remove duplicates from a dataframe | * Laptop * Internet connection * Installation of package tidyverse | tidyverse |
| **05/08/2021** | **Data manipulation in R – part 3**   * Filtering observations * Summarizing data by groups   **Objectives**   * Be able to filter out data * Be able to summarise data by grouping | * Laptop * Internet connection | tidyverse |
| **19/08/2021** | **Data manipulation in R – part 4**   * date manipulation * string manipulation   **Objectives**   * Be able to manipulate dates and strings | * Laptop * Internet connection  Installation of packages stringi, stringr and lubridate | tidyverse  lubridate  stringi  stringr |
| **02/09/2021** | **Data manipulation in R – part 5**   * Appending data * Merging data * Reshaping data   **Objectives**   * Be able to append, merge and reshape data | * Laptop * Internet connection | tidyverse |
| **13/09/2021** | **Test the participants on data manipulation**  **tasks**  **Objectives**   * For participants to be able to manipulate data | * Laptop * Internet connection | tidyverse  lubridate  stringr  readxl  readr  stringi |
| **27/09/2021** | **Data visualization in R – part 1**   * Bar graphs (dodged, stacked and identity) * Faceting * Line graphs * Boxplots   **Objectives**   * Be able to create some visualizations | * Laptop * Internet connection * Installation of package tidyverse | tidyverse |
| **11/10/2021** | **Data visualization in R – part 2**   * Themes * Labs() * Adding text to a plot * Package patchwork * Exporting plots from R   **Objectives**   * Be able to style plots * Be able to export plots from R | * Laptop * Internet connection * Installation of package patchwork | tidyverse  patchwork |
| **25/10/2021** | **Test the participants on data manipulation and visualization in R**  **Objectives**   * For participants to be able to read, manipulate data and create some visualization |  |  |