We Need It Now:
How To Analyze COVID Data Quickly

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Abstract

R is an open-source programming language that helps to analyze the spread and consequences of viruses such as COVID-19. In particular, epidemiologists that seek to give policy advice employ R to combine data from different sources, to create various statistics, and to visualize the degree of the outbreak. This lecture will cover how epidemiologists utilize R as a tool in assessing viral outbreaks, how publicly available data can be structured and utilized in making analyses, and how to utilize visualization tools on R to create graphs to assist with conceptualizing, forecasting and understanding the characteristics of a virus and its degree of infectiousness. To visualize and analyze and the outbreak quickly is essential to guide political responses. The lecture also includes several real life case studies of COVID-19 to aid with the theoretical topics.

Learning Objectives

After this course you should be able to:

- Understand the importance of R in large-scale data analysis
- Accumulate data from desired authorised sources to produce a customized analysis
- Explore alternative resources for COVID-19 data acquisition
- Use R to visualize COVID-19 data with graphs and maps

Course Outline

1 Why R is a significant tool of choice for epidemiologists

1.1 Data analytics and Epidemiology
1.2 Role of 'r' number's in COVID-19 data collection
1.3 What is RECON and what do they do?
1.4 Web Scraping and Data Coalition
1.5 Case Study: Saxony, Germany

2 How we can acquire COVID-19 data, just like epidemiologists

2.1 Gathering COVID-19 related data through authentic sources
2.2 Strengths of R as a statistical application for forecasting/predictions

3 How to support policy making with visualizations of COVID-19 data

3.1 Overview of plot() and ggplot()
3.2 Case Study 1: Visualization capabilities using plot()
3.3 Case Study 2: Visualization capabilities using ggplot()

Recommended Readings

Ponce, M., Sandhel, A. (2020). covid19.analytics: An R Package to Obtain, Analyze and Visualize Data from the Corona Virus Disease Pandemic, 1–47. Retrieved from https://arxiv.org/pdf/2009.01091.pdf

Literature

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Resources for lecture notes, in-class slides and exercises

Ishikawa, A., 2020. *Aqualisa/HSF-MIBM2-COVID19*. [online] GitHub. Available at: <https://github.com/aqualisa/HSF-MIBM2-COVID19>.

Further Reading