OER for Teaching Advanced Epidemiological Methods

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Introduction

In response to the growing need for advanced methodological training among health researchers and trainees, our project introduces a comprehensive OER designed to bridge the gap between theoretical knowledge and practical application in epidemiology.

Project Summary

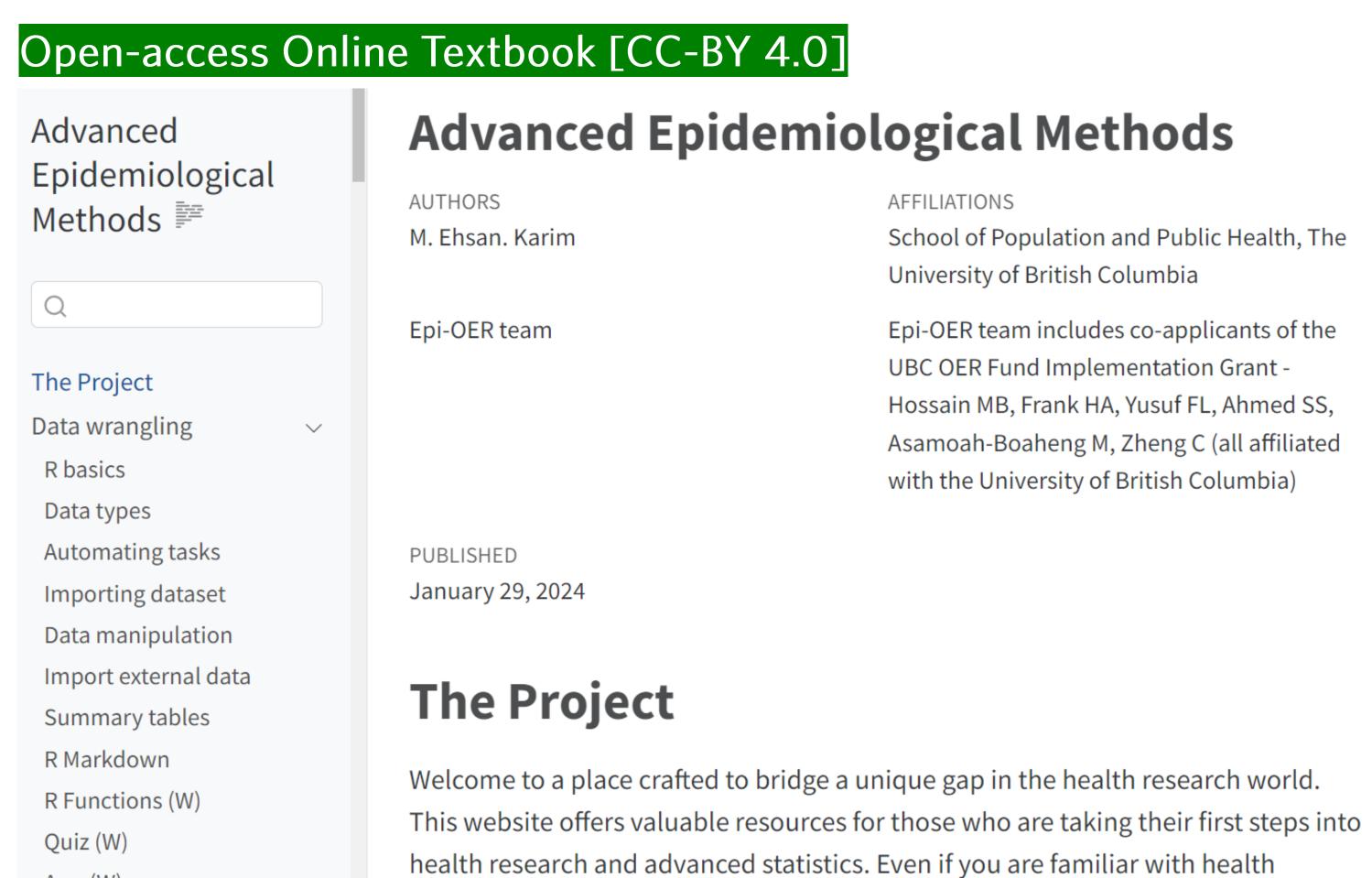
The SPPH 604 course, enhanced with a computational lab component, is at the forefront of our initiative, focusing on the implementation of advanced epidemiological methods using open-source data and software.

Goals and Objectives

- Develop an Interactive Open Textbook: A core resource that combines epidemiological theory with hands-on statistical practice.
- 2. Incorporate Real-World Data Analysis: Using government repositories such as Statistics Canada and the US CDC to provide authentic learning experiences.
- 3. Facilitate Self-Paced Learning: Through formative quizzes and interactive modules, catering to diverse learning needs.

Methodology

Leveraging the R software, we guide learners from novice to proficient levels, enabling them to conduct reproducible research and communicate findings effectively. The curriculum spans ten core modules, covering topics from confounding adjustment to machine learning in causal inference.



Organized Materials **Overview of tutorials**

Target parameters

The first tutorial provides a thorough exp particular focus on its impact on treatme emphasizes the importance of properly a accurate estimates.

Mediator

Confounding

This tutorial focuses on the role of mediat effects. It assesses how adjusting for the r treatment effect, exploring both scenario either non-null or null.

Collider

Step 4

Summary of fit.psm.sl:

without RHC use.

This tutorial serves as a practical guide fo Watch on VouTube

Annotated Software Codes

1 fit.psm.sl <- glm(Death ~ RHC.use,</pre>

RHC.use 1.26

The interpretation is the same as before. In the propensity :

odds of death was 26% higher among those participants wi

data = matched.data.sl,

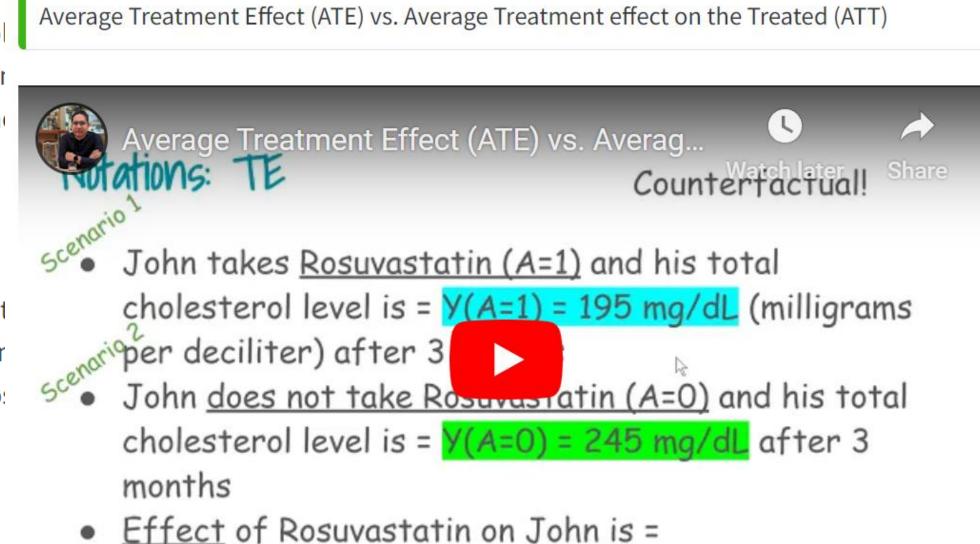
family = binomial)

Variable Odds_Ratio CI_Lower CI_U

1.09

Video Contents [Concepts + Computing] **Video Lessons**

research, but advanced statistical methods seem daunting, you are in the right



(A=0) = 195 - 245 = -50

Interactive Web Apps Self-assessing Interactive Quizzes Q1. Which is the correct way to access the NHANES 2017-18 data cycle in Numerically Exploring Table 1 your RStudio environment? DataExplorer package is used Select Plot Type A. Directly download from the CDC website and open it Missing Data B. Use R package 'nhanesA' to download Introduction Missing Data C. Both A and B are correct D. Neither A nor B is correct Incorrect. Try again.

Hints: The continuous NHANES files are stored on the NHANES website as SAS transport file formats (.xpt). You can import these data files in any statistical software that supports this file format. Some packages are also available to open those data files without downloading them.

Core + Bonus Modules

Module Topics.Indicators R for Data Wrangling (W) Accessing (A) Survey Data Resources Crafting Analytic Data for Research Questions (Q) Causal Roles (R) 5 <u>Predictive (P) issues</u> Complex Survey Data (D) Analysis

Propensity Score (S) Analysis

Missing (M) Data Analysis

- Machine Learning (L)
- Intergrating Machine Learners in <u> Causal (C) Inference</u>
- 11 Non-binary Outcomes (N)
- <u>Longitudinal Analysis (T)</u>
- 13 Mediation Analysis (I)
- 14 <u>Scientific Writing Tools (G)</u>

Exercises with Hints

Question III: [20% grade] 🔗

3(a) Subset

1 # your code here 3(b) Recode

Subset the dataset excluding 'Very good or excellent'

Recode self-rated mental health variable and make it

category labels only). Convert that variable to a factor 1 # your code here

3(c) Regression

Run a logistic regression model for finding the relatio eak) and self-rated mental health (Reference: Poor) disorders. Adjust the model for three confounders: se

1 # your code here

Impact & Accessibility

This OER initiative is set to revolutionize health research education by:

- Enhancing the quality and accessibility of methodological content.
- Promoting self-sufficiency among researchers with varying analytical expertise.
- Our resources will be openly shared through the UBC OER Catalogue, GitHub, and other digital platforms, ensuring widespread accessibility.
- The transition to OER significantly reduces reliance on traditional resources, leading to substantial cost savings and enhanced sustainability.

Evaluation Strategy

Feedback mechanisms are incorporated at every stage, from pilot testing with SPPH 604 students to broader community input.

Reference

 Karim M. E., Epi-OER team (2024). Advanced Epidemiological Methods. Retrieved from https://ehsanx.github.io/EpiMethods/on January 07, 2024.

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Partners

UBC OER Fund Implementation Grant



