UW SISCER 2020
Module 3: Longitudinal Data Analysis
July 16–17, 2020

Longitudinal studies follow individuals over time and repeatedly measure health status, which facilitates prospective ascertainment of exposures and incident outcomes, and identification of changes over time within individuals. Analyses of longitudinal data must account for the correlation that arises from collecting repeated measures on the same individuals over time.

This module will overview statistical methods for the analysis of longitudinal data, with a focus on regression-based methods such as generalized linear mixed-effects models and generalized estimating equations. Relevant theoretical background will be provided. An illustrative example (conducted in R) will be used to illustrate analysis approaches, modeling strategies, and interpretation of results. This course is targeted toward individuals with little or no prior experience with statistical methods for longitudinal data analysis; experience with linear and logistic regression would be useful.

Overview and Schedule
* All times are Pacific Daylight Time (PDT)

Thursday, July 16
8:30 – 8:40	Introductions and logistics	Live lecture
8:40 – 9:15	Introduction to longitudinal studies	Live lecture
9:15 – 9:30	Break	
9:30 – 10:15	Generalized estimating equations	Live lecture
10:15 – 10:30	Break	
10:30 – 11:00	Generalized estimating equations	Live lecture
11:00 – 11:30	Data analysis	Live lecture + on your own
11:30 – 12:00	Discussion and questions	Live lecture

Friday, July 17
8:30 – 8:45	Review and questions	Live lecture
8:45 – 9:30	Mixed-effects models	Live lecture
9:30 – 9:45	Break	
9:45 – 10:15	Mixed-effects models	Live lecture
10:15 – 10:45	Data analysis	Live lecture + on your own
10:45 – 11:00	Break	
11:00 – 11:30	Discussion and questions	Live lecture
11:30 – 12:00	Advanced topics and summary	Live lecture

Resources
- All course materials and links are posted on the SISCER Module 3 webpage (access for module registrants only).

- Links to a pre-module and post-module survey are posted on the SISCER Module 3 webpage. Please complete these to facilitate tracking of your knowledge and skills.
- All live lectures will take place via Zoom.
    - Links to live sessions are posted on the SISCER Module 3 webpage.
    - Please keep your audio muted unless you are speaking.
    - Please feel free to interrupt and ask questions!
    - Live lectures will be recorded, with access to recordings provided via the SISCER Module 3 webpage.
- A Slack channel (mod03_longitudinal_data) in the SISCER Slack workspace is available for discussion and questions outside of live lectures.
- All data analyses will be conducted using the current version of R (www.r-project.org) within RStudio (www.rstudio.com). Please have the `geepack`, `lme4`, `dplyr`, `ggplot2`, and `JM` extension packages installed in advance.
- R commands will be provided in both an R script file (.R) and an R Markdown file (.Rmd). If you wish to execute the R Markdown file, please install the necessary extension packages in RStudio.
- After the course, please complete the course evaluation through your SISCER account. I appreciate your feedback! (After you complete the evaluation, you will be able to download a certificate of completion.)