UW SISCER 2021
Module 11: Mixed-effects Models for Longitudinal Data Analysis
July 20, 2021

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 introduce statistical methods for the analysis of longitudinal data, with a focus on generalized linear mixed-effects models, which combine a model for the mean response with a model for population heterogeneity. 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 some prior experience with statistical methods for longitudinal data analysis. Individuals without such experience should consider Module 10: Generalized Estimating Equations for Longitudinal Data Analysis. Experience with using regression methods to analyze data (e.g., linear regression, logistic regression) is important background for this module.

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

Tuesday, July 20		
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	Mixed-effects models	Live lecture
10:15 – 10:30	Break	
10:30 – 11:00	Mixed-effects models	Live lecture
11:00 – 11:30	Data analysis	Live lecture + on your own
11:30 – 12:00	Discussion and questions	Live lecture

Resources
- All course materials and links are posted on the SISCER Module 11 webpage (access for module registrants only).
- All live lectures will take place via Zoom.
    - Links to live sessions are posted on the SISCER Module 11 webpage and Slack.
    - 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 11 webpage.

- A Slack channel <md11_mixed-effects_longitudinal_2021> in the UW Biostatistics 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 `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.)