

**Title:** Survival analysis and estimating time-to-events in educational research

**Presenters:** Sabrina Zadrozny & Jess Edwards

**Duration:** 3.5 hours

**Description.** In this workshop, we introduce concepts in survival analysis; discuss the relevance of these methods in the context of education research; learn strengths, limitations, and assumptions of three well-established methods to estimate contrasts in the time to events (i.e., survival analysis methods); explore differences between approaches; and, using a publicly available data set, discuss and run annotated code to conduct three simple survival analyses.

(1.5 hours) For the first section of the workshop, we will answer the following questions about survival analysis in education research:

- When and why should survival analysis be used in education research?
- What are main types of survival analysis and how do we decide which is most appropriate for our research questions?
- For each of the primary methods, what are the known strengths, limitations, and assumptions of the approaches we've discussed?

(30 mins) We will take a 10-minute break, then use this scheduled transition time to ensure everyone has a) the appropriate software, b) access to the datasets, and c) has become part of a 3-person group.

(1.5 hours) Following the first section of this workshop where we introduce survival analysis, we will engage in a practical working session with open-source data. We will attempt to answer the following questions:

- How can we apply what we've just learned?
- What does the code look like?
- How can I report and interpret my results?

For this practical portion of our workshop, we have procured data and permission to use the data based on the popular HBO television series "Game of Thrones." Using data collected about characters who appear in this television series provides a flexible example to apply the skills and concepts from the first part of this session. The population enrolled in and followed over the course of the "Game of Thrones" series offers an ideal cohort to demonstrate key concepts of survival analysis.

**Significance.** In March of 2019, at the annual conference of the Society for Research on Educational Effectiveness in Washington, DC, Dr. Judith Singer gave the Hedges Lecture, entitled: "Shaping the arc of educational research." She called for a paradigm shift in educational research to align with epidemiologic research, econometrics, and data science. Specifically, she recommended more longitudinal analyses, attention to assessment and measurement, and embracing approaches that incorporate complex data (i.e., leveraging tools from machine learning and data science). This workshop responds directly to Dr. Singer's charge by considering survival analysis (i.e., estimating contrasts in the time to events).

**Audience:** This workshop is designed for people with basic programming skills in R or SAS, but who have no experience with survival analysis and would like to learn.