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Biostatistics

Design and Analysis Considerations for Cluster Randomized Trials with a Time-to-Event Outcome

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12:00 noon Eastern Time, January 28, 2021
Virtual Seminar via Zoom

Join from PC, Mac, Linux, iOS or Android: https://yale.zoom.us/j/94098442783
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Abstract: In pragmatic clinical trials, data clustering is a common occurrence. It is typical for large scale trials to contain data with multiple levels of clustering (i.e., clinics nested within health care networks, patients nested within these clinics, and repeated measures for each patient represents a typical example of three level clustering design). In time-to-event data, the proportional hazard model framework with incorporated gamma-frailty accounting for a single-level clustering has been well developed and is standard of statistical practice now days. In my talk, I will propose an alternative framework within the realm of additive, semiparametric models: d_(tjX) = d_(t) + X(t)o_dt; extended for the possibility of multilevel clustering. Our model can be superior/preferred to the proportional hazard model in certain settings and provide valuable insight and comparison in other cases. By mimicking the structural development of the standard linear mixed elect model, it provides additional advantages in terms of interpretability (regression coefficients are interpreted as risk difference), easier fitting (more stable fitting algorithm), and manipulation (model collapsibility). In my talk, I will focus on the two-level clustering scenario and specifically on the inference for the treatment effect. I will provide framework for parameter estimation, closed form solution to sample size calculation, and sandwich type variance used in hypothesis testing and multiple possibilities for its small sample correction. Performance of the corrections is evaluated in a large-scale simulation study and practicality of the framework is demonstrated on real data from a large scale pragmatic trial (STRIDE).

Brief Bio: Dr. Blaha's research interests span around clinical trials, specially cluster randomized, pragmatic trials with time-to-event outcomes. Currently, he has two main research topics: (1) Additive model for cluster randomized trials and (2) Exact Platform design for multi-arm, multi-stage trials.

Ondrej is currently a post-doctorate associate at Yale Center for Analytical Sciences (YCAS). He holds a Ph.D. in Biostatistics from LSU and M.Sc. in Biostatistics from Hasselt University, Belgium. Before joining Yale University, he worked as a senior Biostatistician at Stanford University, School of Medicine.