Recent Advances in Association Analysis for Multivariate Failure Time Data

Discussion

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Why Multivariate Failure-time Analysis?

- Modern biomedical research proliferates with multivariate failure-time data
  - Familial, Community
  - Outcomes research
    - Falls history
    - Comorbid disease onset
    - Multiple sleep latency assessment

- Modern: data, computing advances
Does doing things multivariately matter?

1: Primary interest = marginal distributions
   - If data are analyzed globally: Yes (for inference)
     - Wei, Lin, & Weissfeld (1989), and much subsequent work
   - If within-cluster comparisons not of interest: Efficiency?
     - My impression: considerably less work

2: Primary interest = associations
   - Yes (self evident)
   - Import: Yes (heritability, provider effects, etiology)
   - Sleep example: Circadian rhythm
Session - Overview

- Much prior work on association analysis
  - Tradition 1: The Modelers
    - Global: Kendall (1955); Clayton (1978); Oakes (1982)
    - Frailties: Vaupel (1979); Hougaard (1986); Oakes (1989)
    - Copulas: Sklar (1959); Genest (1986); Shih (1995);
      Shih (2006); Oakes (2006)
  - Benefits: Parsimony; interpretation; efficiency
  - Drawbacks: Assumptions; inflexibility of description
Session - Overview

- Tradition 2: The Nonparametric Describers
  - Benefits: Flexibility of description
  - Drawbacks: Complex implementation, interpretation

Session – Overview
A primary message

- Getting to flexible, yet practicable, association models has been hard…

- … The talks we’ve seen advance toward this goal
Session – Oakes / Wang
An insight whose exploitation is due

- Accommodating censoring in estimating the BPIT—and Kendall-based association, has proven hard
- Truly exciting: end-of-paper tidbit
  - Fully nonparametric estimator of Archimedean-defining inverse Laplace transform; interpretable descriptor
- Two questions
  - Do we need another estimator of AC parameters?
  - How practicable?
Session – Yan / Fine
A very “complete”-feeling methodology

- I wonder why this general approach hasn’t been more widely pursued
- Shared with David: Truly flexible, interpretable association estimation accommodating censoring
- Two questions
  - Complexities re estimation at each t (or, (s,t))? 
  - How practicable?
There remains a place for parametric modeling

Moon mission: Synthesis of analytic methods and modules to accomplish a challenging whole

Two questions
- Necessity / price of modular strategy?
- How practicable?
Advancements in this area have required high-level expertise

Have they had the impact they should have?
> My suspicion: No.

(Brief) General reactions?

There is impact to be made. I either hope I’m wrong, or higher impact will be achieved.