Noorie Hyun, PhD
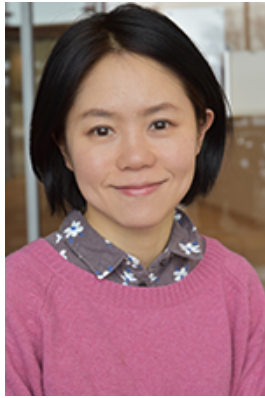
Assistant professor,
Division of Biostatistics,
Institute of Health and
Equity, Medical College
of Wisconsin

April 23, Tuesday
9-10 am EST

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Title

Sample-Weighted Semiparametric Estimates of Cause-Specific Cumulative Risk and Incidence Using Left-/Interval Censored Data from Electronic Health Records

Abstract

Electronic health records (EHRs) can be a cost-effective data source for forming cohorts and developing risk models in the context of disease screening. However, important issues need to be handled: competing outcomes, left-censoring of prevalent disease, interval-censoring of incident disease, and uncertainty of prevalent disease when accurate disease ascertainment is not conducted at baseline. Furthermore, novel tests that are costly and limited in availability can be conducted on stored biospecimens selected as samples from EHRs by using different sampling fractions. We propose sample-weighted semiparametric mixture models for estimating cause-specific risks. We use a general transformation of the subdistribution hazard function and regression parameters for flexible modeling of relative risks. We propose a numerical algorithm for nonparametrically calculating the maximum likelihood estimates for subdistribution hazard functions and regression parameters. Methods for calculating the consistent confidence intervals for relative and absolute risk estimates are presented. The proposed algorithm and methods show reliable finite sample performance through simulation studies. We apply our methods to a cohort assembled from EHRs at a health maintenance organization where we estimate cumulative risk of cervical pre-/cancer and incidence of infection-clearance by HPV genotype among human papilloma virus (HPV) positive women.

Professional Biography

Dr. Noorie Hyun is an assistant professor in Division of Biostatistics of Institute of Health and Equity at Medical College of Wisconsin. Dr. Hyun received her PhD in Biostatistics from the University of North Carolina at Chapel Hill and worked at the National Cancer Institute as a post-doctoral fellow. Dr. Hyun's current research work involves development of risk prediction models for time-to-event outcome under complex probability sample design.

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