# Semiparametric Analysis of Incomplete Current Status Outcome Data

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## Abstract

This work considers semiparametric analysis of incomplete current status outcome data. Here the current status data, including an examination time and an indicator for whether or not the event of interest has occurred by the examination time, is not observed for all subjects. Instead, a surrogate outcome subject to misclassification of the current status is available for all subjects. Under the missing at random assumption where the missingness of the current status outcome can depend only on the observed surrogate outcome and covariates, we propose an approach of validation likelihood based on the likelihood from the validation subsample where the data are fully observed, with adjustments of the probability of observing the current status outcome, as well as the distribution of the surrogate outcome in the validation subsample. We derive the consistency and asymptotic normality for the proposed estimator. Results from simulation studies and an analysis of osteoporosis survey data reveal the utilities of the proposed method.