

SMOOTHING ESTIMATION OF RATE FUNCTION FOR RECURRENT EVENT DATA WITH INFORMATIVE CENSORING

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(Received August 29, 2001; revised February 18, 2003)

Abstract. This paper proposes kernel estimation of the occurrence rate function for recurrent event data with informative censoring. An informative censoring model is considered with assumptions made on the joint distribution of the recurrent event process and the censoring time without modeling the censoring distribution. Under the validity of the informative censoring model, we also show that an estimator based on the assumption of independent censoring becomes inappropriate and is generally asymptotically biased. To investigate the asymptotic properties of the proposed estimator, the explicit form of its asymptotic mean squared risk and the asymptotic normality are derived. Meanwhile, the empirical consistent smoothing estimator for the variance function of the estimator is suggested. The performance of the estimators are also studied through Monte Carlo simulations. An epidemiological example of intravenous drug user data is used to show the influence of informative censoring in the estimation of the occurrence rate functions for inpatient cares over time.

Key words and phrases: Occurrence rate function, independent censoring, informative censoring, kernel estimator, longitudinal study, Poisson process.