



Colloquium Series



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Probability-scale residuals for event time data

Abstract: The probability-scale residual (PSR) is defined as the expectation of the sign of the difference between the observed value and a random variable from the fitted distribution. The PSR is useful in settings where differences between the observed and fitted values are not meaningful or where the expectation of the fitted distribution cannot be calculated. Previous work has defined the PSR for continuous, ordered discrete, right-censored outcomes and current-status data; however, development of the PSR has not yet been considered for data subject to case- k interval censoring. We describe an extension of the PSR to mixed-case censored data by first developing a PSR for interval-censored data and then defining a more general “unified PSR” (uPSR). We derive the statistical properties of the uPSR and show that the uPSR encompasses several previously defined PSR for continuous and censored outcomes as special cases. The performance of the residual is illustrated on real data.

Keywords: Diagnostics, modeling, right censoring, interval censoring.