

Approximate subject-deletion influence diagnostics for Inverse Probability of Censoring Weighted (IPCW) methods

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Longitudinal studies may suffer from subjects' drop-out before completion of scheduled follow-up. Robins et al (1995 JASA) proposed a weighed estimating equation approach, called the Inverse Probability of Censoring Weighted (IPCW) method, to apply marginal regression models under a kind of Missing At Random (MAR) assumption. It relies on estimation of the probability of drop-out at each time point using past history. The estimation is usually done by fitting regression models such as logistic regression models. Same as other regression models, results of the IPCW method may be influenced much only by one or a few subjects' observations. In this research, a subject-deletion regression diagnostics method for the IPCW method is developed. A simple measure for influence of each subject is difference between estimators of interest based on all data and those based on data after removing the subject. One can evaluate it by deleting a subject from data, whereas computation may be demanding. An approximate formula for subject-deletion influence diagnostics is proposed. It saves computational time and is useful in particular for large datasets. More importantly, our formula provides decomposition of the influence into components due to several regression models the IPCW method possesses. It is useful to find from what regression models each subject influences and thus accelerates model building processes. Our proposed method is illustrated with some datasets.