
Censored Poisson regression with missing censoring indicators

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Abstract

Poisson regression is widely used to investigate the relationship between covariates and a count response. We consider the situation where the count of interest is right-censored. The literature on censored counts analysis already contains several approaches for handling such data. In this work, we additionally suppose that the censoring indicator, which tells whether an observed count is censored or not, is missing for some subjects.

First, we propose a multiple-imputation based estimator of the regression parameter in Poisson regression, adapted to this setting. We establish its consistency and asymptotic normality. Variance estimation in multiple imputation is usually handled using Rubin's rule. Here, we obtain an explicit expression for the asymptotic variance of the proposed estimator. A consistent estimate is proposed for this asymptotic variance. Then, we investigate a doubly robust inverse-probability-weighted estimator.

We report the results of a simulation study investigating the finite sample performance of the proposed estimators. We compare our results with the naive complete-case estimator.

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