WEIGHTED GLMS FOR CENSORED MEDICAL COSTS

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Evaluation of healthcare data often requires the mean total cost of treatments to be estimated and compared. However, cost data commonly present with skewed distributions and informative censoring. Therefore, standard estimators and techniques may not be appropriate.

A GLM approach enables flexible parametric modeling of skewed cost data whilst maintaining focus on the mean. However, censoring cannot be addressed in such models. Complex inverse probability weighting techniques provide consistent estimators of mean cost that accommodate informative censoring. However, these fail to incorporate the advantages of a GLM framework.

The current study describes a simple but effective weighted GLM approach to estimation of mean total cost, and the between treatment cost difference, that encompasses the benefits of both of these methods. Informative censoring is addressed by giving greater weight to higher costs that have been fully observed, whilst the underlying GLM structure provides an effective way to model skew and covariates effects on mean cost using exponential family distributions. Simulations and application to health care data are used to examine estimates of mean cost and cost difference for a variety of survival and cost distributions. The results show that weighted GLMs provide virtually unbiased estimates in all the scenarios explored. However, the corresponding coverage probabilities appear to deteriorate as the within-person correlation of interval costs increases.