

We propose a fully efficient joint fractional imputation method for handling bivariate or- dinal responses with missing observations. We show that the method is ideally suited for bivariate ordinal responses to create a single imputed data file and provides valid and efficient inferences for the joint and marginal probabilities, association measures as well as regression analysis. Asymptotic properties of estimators based on the joint fractionally imputed data set are developed and their superiority over existing methods, including available-case analysis, propensity score adjustment and sequential regression multiple imputation methods, is demonstrated through both theoretical results and simulation studies. The proposed joint fractional imputation strategy employs modelling procedures that could be used for the sequential regression multiple imputation method but creates a single imputed data set which can be easily analyzed using existing softwares with minor modifications. Variance estimation and test of independence are also discussed under the proposed joint fractional imputation method.