Meng, Xiao-Li; **Rubin, Donald B.**
Performing likelihood ratio tests with multiply-imputed data sets. (English) Zbl 0754.62041
Biometrika 79, No. 1, 103-111 (1992).

Summary: Existing procedures for obtaining significance levels from multiply- imputed data either (i) require access to the completed-data point estimates and variance-covariance matrices, which may not be available in practice when the dimensionality of the estimand is high, or (ii) directly combine p-values with less satisfactory results. Taking advantage of the well-known relationship between the Wald and log likelihood ratio test statistics, we propose a complete-data log likelihood ratio based procedure.

It is shown that, for any number of multiple imputations, the proposed procedure is equivalent in large samples to the existing procedure based on the point estimates and the variance-covariance matrices, yet it only requires the point estimates and evaluations of the complete-data log likelihood ratio statistic as a function of these estimates and the completed data. The proposed procedure, therefore, is especially attractive with highly multiparameter incomplete-data problems since it does not involve the computation of any matrices.

MSC:

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Keywords:

p-values; Wald test statistic; significance levels; multiply-imputed data; log likelihood ratio test statistics; complete-data log likelihood ratio based procedure; variance-covariance matrices; multiparameter incomplete-data problems

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