

## An Information Matrix Goodness-of-Fit Test of the Conditional Logistic Model for Matched Case-Control Studies

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**Abstract :** The case-control design has been widely applied in clinical and epidemiological studies to investigate the association between risk factors and a given disease. The retrospective design can be easily implemented and is more economical over prospective studies. To adjust effects for confounding factors, methods such as stratification at the design stage and may be adopted. When some major confounding factors are difficult to be quantified, a matching design provides an opportunity for researchers to control the confounding effects. The matching effects can be parameterized by the intercepts of logistic models and the conditional logistic regression analysis is then adopted. This study demonstrates an information-matrix-based goodness-of-fit statistic to test the validity of the logistic regression model for matched case-control data. The asymptotic null distribution of this proposed test statistic is inferred. It needs neither to employ a simulation to evaluate its critical values nor to partition covariate space. The asymptotic power of this test statistic is also derived. The performance of the proposed method is assessed through simulation studies. An example of the real data set is applied to illustrate the implementation of the proposed method as well.

**Keywords :** conditional logistic model, goodness-of-fit, information matrix, matched case-control studies

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