

E 43 MODIFIED CHI-SQUARED TESTS FOR COMPLEX SURVEY DATA

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When doing large scale surveys very often the samples are taken using complex methods such as stratified or multistage sampling. In such a complex survey, the observations cannot be regarded as independent.

In these surveys, statistical tests such as chi-squared and log-linear models are frequently used to investigate the association between variables. However, when applying these tests, most researchers ignore the stratification and clustering structure of the survey design and assume that the observations are independent. The validity of these tests were recently examined^{1,2}. Their empirical results showed strong evidence that the results of these tests

can be badly affected if the assumption of independence is violated. They have introduced general modification factors which could improve the validity of the chi-squared test.

In this paper the modified chi-squared tests developed by the above authors are discussed, and the relative performance of the modified tests and the unadjusted χ^2 test are compared by analysing data from Sri Lanka surveys.

References

1. Holt, D. et al (1980) Chi-squared tests with survey data J. Royal Stat. Society. A 303-320.
2. Rao, J.N.K. and Scott, A.J. (1981) The analysis of categorical data from complex sample surveys; chi-squared tests for goodness-of-fit and independence in two-way tables. J. Amer. Stat. Assoc. 221-230.