Patterns of Bias due to Differential Misclassification by Case-Control Status in a Case-Control Study

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Background: Case-control study is commonly used in epidemiological research. Misclassification of case-control status remains a significant issue because it will bias the results of a case-control study. This paper shows patterns of bias induced by differential misclassification. Methods: Odds ratios are derived according to: 1) controls are misclassified as cases by exposure status; 2) cases are misclassified as controls by exposure status; and 3) controls and cases are misclassified by exposure status simultaneously. These methods are carried out by simulation analyses. Results: Simulation analyses show that quite a number of biased odds ratios tend to move away from the null hypothesis. These patterns are associated with the exposure status and the values of unbiased odds ratio, one or not one.
Conclusions: Unlike nondifferential misclassification, differential misclassification in a case-control study may not weaken the exposure-outcome association toward the null hypothesis.

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