ADVANCES IN MEASUREMENT ERROR METHODOLOGY RELATED TO NUTRITION

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The difficulty of measuring an individual's dietary intake has greatly complicated studies to investigate links between diet and disease. Errors in dietary assessment, if ignored, cause bias in relative risks estimated from nutritional case-control or cohort studies. Two simple methods, regression calibration and moment reconstruction, can be used to correct this bias. Recent studies indicate that the measurement error encountered in dietary self-reports does not follow the classical measurement error. Instead errors are correlated with true intake. We extend the method of moment reconstruction to this situation. We also describe how multiple imputation represents a natural step beyond moment reconstruction, and provides a further simple way of correcting for measurement error induced bias. We then compare the performance of the three methods, considering a variety of situations including: a continuous outcome with a linear regression model; and a binary outcome with a logistic regression model, either in a prospective cohort design or a retrospective case-control design. We consider internal validation studies that include an unbiased measurement of dietary intake. We find that there are some situations where regression calibration performs better than its rivals and other situations where it performs a lot worse.