

Statistical Problems in Assessing Nutrition and its Relation to Health

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The study of human nutrition and its relation to health is plagued by the problem of dietary measurement error. Individuals report their dietary intakes with considerable inaccuracy, and this affects nearly all epidemiologic research concerned with diet and health. Estimated disease relative risks associated with a dietary intake are generally biased towards the null and require adjustment. The method of regression calibration can be used to make this adjustment. However, regression calibration does not help with a second effect of measurement error, that is, the loss of statistical power to detect diet-disease relationships. In this talk we will describe a method of combining a dietary self-report with a biomarker that also measures dietary intake with measure. We show through realistic computer simulations that the biomarker can sometimes provide higher statistical power than the self-report, and that the combination can provide some modest gains in power over either measure alone. We provide an illustration of the method using data from a study of the relationship between intake of two carotenoids, lutein and zeaxanthin, and the occurrence of cataracts in the eye.