Poster No. 5

Title: Stochastic Curtailment of Health Questionnaires: A Computer-Based Approach to Reducing Respondent Burden

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Abstract:

The use of questionnaires to screen for psychiatric and medical conditions has become common practice. Because answering questionnaire items can be burdensome, practitioners strive to make their assessments as efficient as possible. One way to enhance efficiency is to employ computerized classification testing (CCT), which involves interim analysis of a respondent's answers while assessment is underway. By tracking the respondent's answers in real time, a computer algorithm can determine whether presenting another item is necessary or if assessment can be stopped in favor of a classification decision.

A critical component of CCT is its stopping rule, i.e., its algorithm to determine when the questionnaire should be ceased. The aim of this research was to examine the potential of stochastic curtailment, a statistical method originally developed for interim analysis of clinical trials, as a stopping rule for health questionnaires. Stochastic curtailment terminates testing if the future items scheduled for a respondent are sufficiently unlikely to affect the respondent's final classification. The method was investigated retrospectively using data from n = 119,512 individuals who had taken the Medicare Health Outcomes Survey in 1998. The dataset included demographic information, respondents' answers to 84 survey items, and respondents' vital statuses two years after survey administration. Stepwise logistic regression was performed to define a nominal questionnaire predicting two-year mortality from demographic information and survey responses. Stochastic curtailment was applied post-hoc to evaluate whether it could reduce average test lengths without compromising sensitivity and specificity.

Forty-seven items were selected by the stepwise logistic regression procedure. The resulting questionnaire had 60.4% sensitivity and 84.1% specificity for predicting two-year mortality. Stochastic curtailment reduced the average number of items by 58% without decreasing the sensitivity or specificity by more than 0.2%. It was concluded that stochastic curtailment has potential to lessen the respondent burden of questionnaires without compromising their screening properties.