

DESIGNING TWO-PHASE PREVALENCE STUDIES IN THE ABSENCE OF A GOLD STANDARD TEST

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A population survey for estimating prevalence is challenging when a disease or condition is difficult to diagnose. If the cost of clinical diagnosis is expensive, a two-phase study where cheaper but less accurate tests are administered to all study subjects in the first phase (screening phase) and a more accurate but expensive or time consuming test is administered only to a subset of the subjects in the second phase, is an attractive approach. Published research has discussed ways of maximizing the precision of the prevalence estimate from a two-phase study with a gold standard second-phase test. For many psychiatric disorders, even the best diagnostic tests are not gold standard quality. In this paper, we propose a hybrid design for two-phase prevalence studies without a gold standard test; random effects latent class analysis (LCA) facilitates the estimation of prevalence and appropriately addresses the issue of dependent errors among the diagnostic tests. We show that the hybrid design is efficient compared to the balanced and random design under realistic parameter settings.