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A latent class method for diagnostic tests: the new, reference, gold standard problem

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Collins and Huynh [1] presented an extensive review of latent class methods for diagnostic tests published since 1991. A useful topic not mentioned is the application of latent class models to the new, reference, gold standard (NRGS) problem [2]. In the NRGS problem, the new test, reference test, and gold standard are all binary, and the data consist of two 2 x 2 tables of counts: (i) new test versus reference test, and (ii) reference test versus gold standard. The goal is to estimate sensitivity and specificity of the new test relative to the gold standard. Extending the method of Gart and Buck [3] to the NRGS problem, Baker [2] formulated a latent class model and derived closed form estimates and variances for the estimated sensitivity and specificity of the new test relative to the gold standard. Baker [2] also discussed extensions to covariates.

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