

2.2.2. Samples from animals of unknown status

When the so-called reference standard is imperfect, which is the rule with any diagnostic tests, estimates of DSe and DSp for the candidate assay based on this standard will be flawed. A way to overcome this problem is to perform a latent class analysis of the joint results of the two tests assuming neither test is perfect.

Latent-class models do not rely on the assumption of a perfect reference test but rather estimate the accuracy of the candidate test and the reference standard with the joint test results (Branscum et al., 2005; Enøe et al., 2000; Georgiadis et al., 2003; Hui & Walter, 1980). If a Bayesian latent class analysis is used, prior knowledge about the performance of the reference test and the candidate test can be incorporated into the analysis.

Because these statistical models are complex and require critical assumptions, statistical assistance should be sought to help guide the analysis and describe the sampling from the target population(s), the characteristics of other tests included in the analysis, the appropriate choice of model and the estimation methods based on peer-reviewed literature (see *Terrestrial Manual* Chapter 3.6.5 [footnote ¹⁴] for details).