Computational Pool-Testing Strategy

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Abstract

Pooling sample for the purpose of testing has a long history dating back to the Second World War with its first application being screening of pooled urine samples for the presence of syphilis. Recently, pooling has been used in epidemiological studies for screening of human immunodeficiency virus HIV/AIDS antibody to help curb the spread of the virus. Pooling reduces the cost but also – and more importantly – offers a feasible way to lower the misclassifications associated with labeling samples when imperfect tests are used in inspection. Computer intensive pool-testing strategy is discussed in this study with a view to digitalizing the procedure. Moments of the number of tests as in the traditional pool-testing strategy have been digitized via MATLAB code and the same has been done for the case of misclassifications associated with this strategy. Moments are used in the computation of the cost or efficiency associated with pool-testing procedure. The digitalization provides insight into the merits and demerits of the pooltesting procedure supported by empirical evidence.

Keywords: Pool; Pooling; Specificity; Sensitivity; Tests; Misclassifications.