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Estimation of the Prevalence of a Disease from Screening Tests

of

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Abstract: Since most screening tests are not 100% accurate, the proportion of subjects screened positive in such a test cannot be used as an estimate of the population prevalence. Methods which take sensitivity and the specificity into consideration should be employed in such circumstances. Estimation of the population prevalence as defined by Gartland Buck may produce results which are outside the range of 0 to 1. A Bayesian approach avoids results of this kind, but requires complicated computations. Lew and Levy proposed an approximation to the Bayesian estimate of the population prevalence. To simplify the computations, I propose a method which requires the evaluation of a logistic function. The coefficients of the function are tabulated for some selected test characteristics and sample sizes. For other values that are not tabulated, coefficients can be interpolated. Although the method is simple it produces very accurate results.

Key Words: Estimation, prevalence, screening tests, sensitivity, specificity.

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