Notes on sample sizes required for Receiver Operator Characteristic (ROC) curves

12 November 2018

1 Area under the curve of ROC

$$W = \frac{1}{n_A \times n_N} \sum_{1}^{n_A} \sum_{1}^{n_N} S(x_A, x_N)$$

2 Standard error of the area under the curve of ROC

$$SE(W) = \sqrt{\frac{\theta(1 - \theta) + (n_A - 1)(Q_1 - \theta^2) + (n_N - 1)(Q_2 - \theta^2)}{n_A n_N}}$$

where

θ = area under the curve

n_A = number of cases

n_N = number of non-caes

$$Q_1 = \frac{\theta}{2 - \theta}$$

$$Q_2 = \frac{2A^2}{1 + A}$$