Methods

A receiver operating characteristic curve (ROC curve) is a graphical plot that illustrates the diagnostic ability of a binary classifier system as its discrimination threshold is varied. The ROC curve is created by plotting the true positive rate against the false positive rate at various threshold settings. The true-positive rate is also known as sensitivity. The false-positive rate is also known as probability of false alarm and can be calculated as \((1 - \text{specificity})\).

Youden's index integrates sensitivity and specificity information under circumstances that emphasize both sensitivity and specificity, with a value that ranges from 0 to 1. The Youden index (or Youden's J statistic) is defined as

\[
J = \text{sensitivity} + \text{specificity} - 1
\]

Often, the maximum Youden index is reported, i.e.,

\[
J_{\text{max}} = \max_t \{\text{sensitivity}(t) + \text{specificity}(t) - 1\}
\]

Where \(t\) denotes the classification threshold for which \(J\) is maximal.

At the ROC curve and Youden index analysis we could find that the optimal cutoff value, for example, the value providing the best tradeoff between sensitivity and specificity.

The samples used for the calculation were those who were enrolled into our published paper.
ROC curve for total score among parents

Diagonal segments are produced by ties.
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The test result variable(s): Total Score has at least one tie between the positive actual state group and the negative actual state group.

a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.
References
