Evaluation Metrics Definition

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- Backgrouds:
  - True positive (TP): delirium patient correctly identified with delirium
  - False positive (FP): healthy people incorrectly identified as delirium patient
  - True negative (TN): healthy people correctly identified as healthy
  - False negative (FN): delirium patient incorrectly identified as healthy
- Accuracy was calculated as the proportion of predicted labels that matched the corresponding ground truth labels, which represents closeness of the predicted value to a ground truth value. It is the proportion of correct predictions including both TP and TN among the total number of cases examined, which answers the question like how many admission did we correctly predict out of all the admissions.
- Precision = $\frac{TP}{TP+FP}$, also called positive predictive value (PPV), which answers the question like how many of those who we predicted as delirium are actually with delirium.
- Sensitivity= $\frac{TP}{TP+FN}$, also called true positive rate (TPR) and recall, where FN represents the number of false negatives. answers the question like of all the people who are with delirium, how many of those we correctly predict.
- F1 score is a weighted average of the precision or recall, where an F1 score reaches its best value at 1 and worst score at 0. $F1 = 2 \cdot \frac{precision \cdot recall}{precision + recall}$.
- Specificity= $\frac{TN}{TN+FP}$, also called selectivity or true negative rate (TNR), which answers the question like of all the people who are healthy, how many of those did we correctly predict.
- ROC curve was plotted using the true positive rate (TPR) against the false positive rate (FPR) at various threshold settings. ROC-AUC was obtained via the probability that our binary classifier ranked a randomly chosen positive instance higher than a randomly chosen negative one (assuming 'positive' ranks higher than 'negative').
- False alarm= $\frac{FP}{FP+TN}$, also called false positive rate (FPR), which answers the question like of all the people who are without delirium, how many of those we incorrectly predict.
- Miss rate= $\frac{FN}{FN+TP}$, also called false negative rate (FNR), which answers the question of all the people who are with delirium, how many of those we incorrectly predict.