Negative Predictive Value (NPV)

Negative predictive value refers to the probability that a person with a negative test result does not have the tested disease. NPV allows for clinicians to explain to patients the likelihood of a negative result being truly negative. The formula to calculate NPV is True Negatives (TN) divided by the sum of True Negatives (TN) and False Negatives (FN), or NPV = TN / (TN + FN).



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Proportion of Negative Tests that are Truly Negative
Proportion of Negative tests that are Truly Negative with Tin
A negative test result does not always mean a patient has the disease; a false negative may still occur. More false negatives will lower the NPV.

Probability that Person with Negative Test is Healthy
Probability-spinner showing Negative-tests as Healthy or Diseased
This refers to the probability of NOT having a disease out of all the people who tested negative for it.

Formula

(TN) True Negatives
True Negative with Tin
A true negative is a person who does not have a disease and tests negative for the disease. TN will be the numerator in the formula.

Divided by /
Divide
True negatives (TN) will be the numerator that is divided by the calculated denominator below.

All Negative Test Results
All Negative
The denominator is the sum of all negative results for a given test. This will include people who have a disease but test negative for the disease, otherwise known as a false negative.

(FN + TN)
Fin Plus Tin
Add the number of true negatives to the number of false negatives to obtain the denominator in the equation.

Considerations

Varies Inversely with Prevalence
Up-arrow Disease with Down-arrow NPV
Prevalence is the amount of patients who are currently affected by a disease. A common disease will have a high prevalence, while a rare disease will have a low prevalence. As the prevalence and pretest probability of a disease increase, the negative predictive value decreases. This inverse relationship is in contrast to the direct relationship shared by positive predictive value and these two factors.

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