

Sensitivity and Specificity

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Definitions

Sensitivity

- Proportion of true positive (diseased) with a positive test result

$$\text{Sensitivity} = \frac{\text{Number of True Positives}}{\text{Number of True Positives} + \text{Number of False Negatives}}$$

Specificity

- Proportion of true negative (non-diseased) with a negative test result

$$\text{Specificity} = \frac{\text{Number of True Negatives}}{\text{Number of True Negatives} + \text{Number of False Positives}}$$

Real-World Application

Sensitivity

- Let's say test A has a sensitivity of 0.8 or 80%
 - Test A correctly identifies 80% of the people who have the disease
 - But it misses 20%.
 - This 20% have the disease but the test did not detect it
 - Also known as “False negative”

Specificity

- Let's say test A has a specificity of 0.8 or 80%
 - Test A correctly identifies 80% of the people who do NOT the disease
 - But it misidentifies 20%.
 - This 20% do NOT have the disease but the test said they did
 - Also known as “False positive”

**Do we have a test that is
100% Sensitive and 100%
Specific?**

Points to Ponder

- Usually a test with high sensitivity is an initial SCREENING test
 - Test A correctly identifies 95% of the people who have the disease
 - But it misses 5%.
 - This 5% have the disease but the test did not detect it

Where can I learn more about the sensitivity and specificity of COVID testing?

- <https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations>