

## Bayes Theorm

The result  
of the  
test

	Has the disease (D)	Dose not have the disease ( $\bar{D}$ )	Total
Positive (T )	<p><b>Correct decision</b></p> <p><b>Sensitivity</b></p> <p><math>P(T/D) = \frac{n(T \cap D)}{n(D)}</math></p>	<p><b>False decision</b></p> <p><b>false positive</b></p> <p><math>P(T/\bar{D}) = \frac{n(T \cap \bar{D})}{n(\bar{D})}</math></p>	n(T)
Negative ( $\bar{T}$ )	<p><b>False decision</b></p> <p><b>false negative</b></p> <p><math>P(\bar{T}/D) = \frac{n(\bar{T} \cap D)}{n(D)}</math></p>	<p><b>Correct decision</b></p> <p><b>Specificity</b></p> <p><math>P(\bar{T}/\bar{D}) = \frac{n(\bar{T} \cap \bar{D})}{n(\bar{D})}</math></p>	n( $\bar{T}$ )
Total	n(D)	n( $\bar{D}$ )	n( $\Omega$ )

**Predictive value Positive :**

$$P(D/T) = \frac{P(T/D) * P(D)}{\text{نفس البسط} + \text{نفس البسط } (D \rightarrow \bar{D})}$$
$$= \frac{P(T/D) * P(D)}{P(T/D) * P(D) + P(T/\bar{D}) * P(\bar{D})} = \frac{\text{Sensitivity} * P(D)}{\text{Sensitivity} * P(D) + (1 - \text{Specificity}) * P(\bar{D})}$$

**Predictive value Negative :**

$$P(\bar{D}/\bar{T}) = \frac{P(\bar{T}/\bar{D}) * P(\bar{D})}{\text{نفس البسط} + \text{نفس البسط } (\bar{D} \rightarrow D)}$$
$$= \frac{P(\bar{T}/\bar{D}) * P(\bar{D})}{P(\bar{T}/\bar{D}) * P(\bar{D}) + P(\bar{T}/D) * P(D)} = \frac{\text{Specificity} * P(\bar{D})}{\text{Specificity} * P(\bar{D}) + (1 - \text{Sensitivity}) * P(D)}$$