

Bayesian Statistics

Bayes Rule

$$P(A \cap B) = P(A|B)P(B) = \text{likelihood} \times \text{prior}$$

$$P(B|A) = \frac{P(A \cap B)}{P(B)} = \frac{P(A|B)P(B)}{P(B)}$$

↓
Posterior

↳ Evidence

$$P(\text{disease} | \text{test}(+)) = \frac{P(\text{disease} \cap \text{test}(+))}{P(\text{test}(+))} \rightarrow \begin{array}{l} \text{people with} \\ \text{disease and} \\ \text{were tested} \\ (+) \end{array}$$
$$= \frac{P(\text{test}(+) | \text{disease})P(\text{disease})}{P(\text{test}(+))}$$

