A, B P(A), P(B).

$$P(A/B) = \frac{P(B/A) \cdot P(A)}{P(B)}$$

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

$$\Rightarrow P(A \cap B) = P(A/B) \cdot P(B).$$

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

$$\Leftarrow P(B \cap A) = P(B/A) \cdot P(A).$$

$$P(A/B) \cdot P(B) = P(B/A) \cdot P(A)$$

$$P(A/B) = \frac{P(B/A) \cdot P(A)}{P(B)}$$

Posterior Prior

- A - Covid 19 $P(A) = 0.001$
- B - PCR +
- True Positive - 98%.
- True Negative - 97%

$$P(A/B) = \frac{P(B/A) \cdot P(A)}{P(B)}$$

$$P(A/B) = \frac{0.98 \times 0.001}{P(B)}$$

$$P(A/B) = 0.00098 / P(B)$$

$$P(\sim A/B) = \frac{P(B/\sim A) \cdot P(\sim A)}{P(B)}$$

$$= \frac{0.03 \times 0.999}{P(B)}$$

$$P(\sim A/B) = 0.03 / P(B)$$

$P(u) = 1/3 \qquad P(y) = 2/3$

$$P(u) = \frac{P(u)}{P(u) + P(y)} \Rightarrow$$

$$= \frac{1/3}{1/3 + 2/3} \leq \frac{1}{3}$$

$$P(A/B) = \frac{P(A/B)}{P(A/B) + P(\sim A/B)}$$

$$\leq \frac{0.00098/P(B)}{0.00098/P(B) + 0.03/P(B)}$$

$$= \frac{0.00098}{0.031}$$

$$P(A/B) = 0.03$$

$$P(\sim A/B) = 0.97$$