Probability practice

Probability Practice.

Part A

$$P(\text{Yes}) = P(\text{Yes}|RC) \times P(RC) + P(\text{Yes}|TC) \times P(TC) = 0.65$$

$$0.65 = 0.5 \times 0.3 + P(\text{Yes}|TC) \times 0.7$$

$$P(\text{Yes}|TC) = \frac{(0.65 - 0.5 \times 0.3)}{0.7} \approx 71.43\%.$$

Approximately 71.43% of truthful clickers answered Yes.

Part B

$$P(+) = P(+|D) \times P(D) + P(+|-D) \times P(-D).$$

$$P(+|-D) = 1 - 0.9999 = 0.0001$$

$$P(-D) = 0.999975.$$

$$P(+) = 0.993 \times 0.000025 + 0.0001 \times 0.999975$$

$$P(+) = 0.00002485 + 0.00009999975$$

$$= 0.00012484975.$$

$$P(D|+) = \frac{0.993 \times 0.000025}{0.00012484975}$$

$$P(D|+) = \frac{0.00002485}{0.00012484975}.$$

$$P(D|+) = 0.198945.$$

There is approximately a 19.89% chance that the individual actually has the disease