

From Prompt

$$\begin{aligned} P(D) &= .01 \\ P(A|D) &= .95 \\ P(A^c|D^c) &= .931 \end{aligned}$$

Complements



$$\begin{aligned} P(D^c) &= .99 \\ P(A^c|D) &= .05 \\ P(A|D^c) &= .069 \end{aligned}$$

$$\text{* We want : } P(D|A) = \frac{P(A \text{ and } D)}{P(A)} \quad \left. \vphantom{\frac{P(A \text{ and } D)}{P(A)}} \right] \text{Conditional Prob y Rule}$$

$$\begin{aligned} \textcircled{1} \text{ Find } P(A) &= P(A \text{ and } D) + P(A \text{ and } D^c) \quad \left. \vphantom{P(A \text{ and } D^c)} \right] \text{By Law of total probability} \\ &= P(A|D)P(D) + P(A|D^c)P(D^c) \\ &= .95(.01) + .069(.99) \\ &\approx .0095 + .068 \\ &= .0775 \end{aligned}$$

② Plug $P(A)$ into *

$$\begin{aligned} P(D|A) &= \frac{.0095}{.0775} \\ &\approx .123 \end{aligned}$$

When testing the general population, only about 12% of those who test positive for COVID actually have COVID.