

Suppose we know the base rate, false positive rate and false positive rate.

Testing once, we get a signal $s_1 \in \{+, -\}$. Updating, we obtain the posterior $\Pr[d \mid s_1]$.

Testing again, we obtain a new (independent) signal $s_2 \in \{+, -\}$.

We update again, with $\Pr[d \mid s_1]$ as the new prior:

$$\begin{aligned}\Pr[d \mid s_2, s_1] &= \frac{\Pr[d, s_2, s_1]}{\Pr[s_2, s_1]} \\ &= \frac{\Pr[s_2 \mid d, s_1] \cdot \Pr[d, s_1]}{\Pr[s_1, s_2]} \\ &= \frac{(\Pr[s_2 \mid d] \cdot \Pr[s_1 \mid d]) \cdot \Pr[d]}{\Pr[s_1, s_2]}\end{aligned}$$