

A DISEASE AFFECTS 1% OF THE POPULATION

A TEST EXISTS: ON SICK PERSONS: POSITIVE ON 90%
NEGATIVE ON 10%

ON HEALTHY PERSONS: POSITIVE ON 10%
NEGATIVE ON 90%

A PERSON GETS A POSITIVE TEST: WHAT IS PROB. THAT PERSON IS SICK?

$$P_n(\text{SICK} | \text{POS}) = \frac{P_n(\text{POS} | \text{SICK}) P_n(\text{SICK})}{P_n(\text{POS})}$$

$$= \frac{P_n(\text{POS} | \text{SICK}) P_n(\text{SICK})}{P_n(\text{POS} | \text{SICK}) P_n(\text{SICK}) + P_n(\text{POS} | \text{HEALTHY}) P_n(\text{HEALTHY})} = \frac{0.9 \cdot 0.01}{0.9 \cdot 0.01 + 0.1 \cdot 0.99} = \underline{\underline{0.083}}$$