

Zika Virus FL 2016

based on true story

Prevalence of Zika in FL $10^{-5} = P(\text{Zika})$

accuracy of blood test is 99%

$$- P(\text{test} = \text{pos} | \text{Zika}) = 99/100$$

$$- P(\text{test} = \text{pos} | \text{no Zika}) = 0.01$$

2 diff pieces
of information.

Jimmy tests positive! what is the chance Jimmy actually has Zika?

Z = have Zika

T = positive test

want $P(Z|T)$

$$\frac{P(T|Z) \cdot P(Z)}{P(T)}$$

$$\frac{99/100 \cdot 1/100,000}{(99/100 \cdot 1/100,000) + (0.01 \cdot (1 - 10^{-5}))}$$

$$= \frac{99/100 \cdot 1/100,000}{99/100 \cdot 1/100,000 + 1/100 \cdot (1 - 10^{-5})} = \frac{99/10^7}{99/10^7 + 99999/10^7}$$

$\approx 0.00099 \approx 0.1\% = 1 \text{ in } 1000$ maybe not
or at least repeat the test. to worry yet