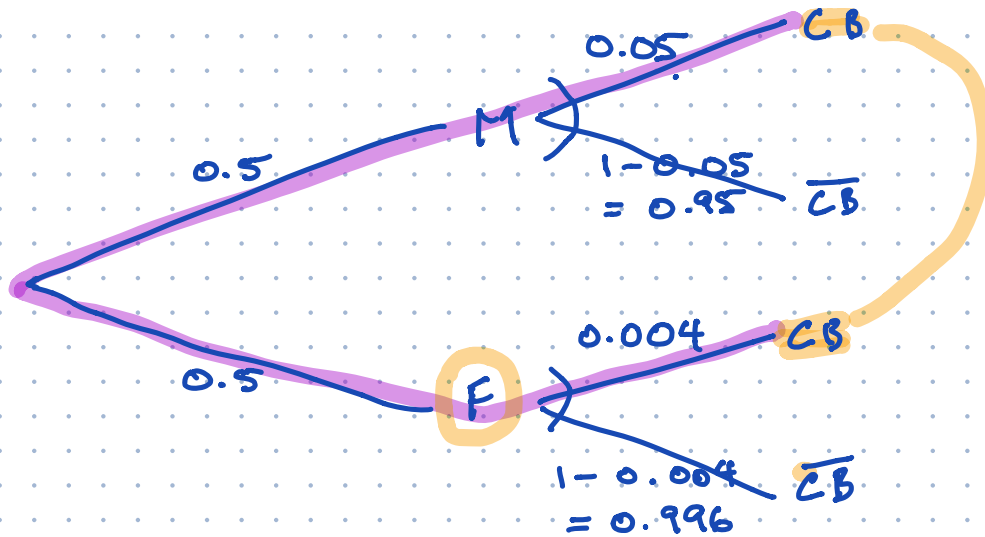


Colour blindness

Five percent of men are colour blind, but only 0.4% of women are.

What is the probability that a person selected at random is colour blind?

If a person selected at random is colour blind, what is the probability that they are female? Male?



$$\begin{aligned}
 p(CB) &= p(M) \cdot p(CB/M) + p(F) \cdot p(CB/F) \\
 &= 0.5 \cdot 0.05 + 0.5 \cdot 0.004 \\
 &= 0.027 \quad 2.7\%
 \end{aligned}$$

$$\begin{aligned}
 p(F/CB) &= \frac{0.5 \cdot 0.004}{0.5 \cdot 0.05 + 0.5 \cdot 0.004} \\
 &= 0.0740...
 \end{aligned}$$

prior $\uparrow$ posterior $\uparrow$

$\frac{p(F \cap CB)}{p(CB)}$

$$p(M/CB) = 1 - 0.0740... = 0.926...$$