$$P(SM) = \begin{cases} P(S)P(M|S) \\ P(M)P(S|M) \end{cases}$$

Eventos:

M: sea mujer $\longrightarrow P(M) = 0.6$

H: sea hombre $\longrightarrow P(H) = 0.4$

S: es fumador

$P(S|H) = 0.5$

$P(S|M) = 0.3$

$P(H|S) = ?$

$$P(H|S) = \frac{P(HS)}{P(S)}$$

$$P(HS) = \begin{cases} P(H)P(S|H) \\ P(S)P(H|S) \end{cases}$$

$S = SM \cup SH \rightarrow P(S) = P(SM \cup SH) \rightarrow$

$P(S) = P(SM) + P(SH) - P(SMH)^{\nearrow \emptyset}$

Así:

$$P(H|S) = \frac{P(H)P(S|H)}{P(M)P(S|M) + P(H)P(S|H)}$$

$$= \frac{(0.4)(0.5)}{(0.6)(0.3) + (0.4)(0.5)} \Rightarrow P(H|S) = 0.52 = 52\%$$

| | Mujer $^{0.6}$ | Hombre $^{0.4}$ |
|---|---|---|
| Fuma | 0.3 | 0.5 |
| No Fuma | | 0.5 |