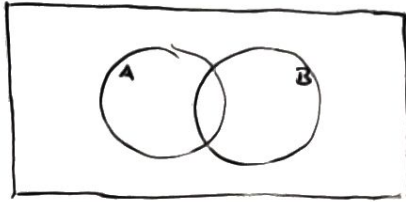


MÉTODOS ESTATÍSTICOS (FOLHA 2)

1.



$$P(A \cup B) = \frac{7}{8}$$

$$P(A \cap B) = \frac{1}{4} = \frac{2}{8}$$

$$P(B) = \frac{3}{8}$$

$$a) P(A) = P(A \cup B) - P(B) + P(A \cap B) = \frac{6}{8} = \frac{3}{4}$$

$$b) P(A \cap \bar{B}) = P(A) - P(A \cap B) = \frac{1}{2}$$

$$c) P(B \cap \bar{A}) = P(B) - P(A \cap B) = \frac{1}{8}$$

2.

B: "Ser infectado por bactérias"
C: "Ser infectado por cogumelos"

$$P(C) = 0,42$$

$$P(\bar{B}) = 0,85$$

$$P(B \cap C) = 0,05$$

$$a) P(B) = 1 - P(\bar{B}) = 0,15$$

$$P(B \cup C) = P(B) + P(C) - P(B \cap C) = 0,52$$

$$b) P(\bar{B} \cap \bar{C}) = P(\overline{B \cup C}) = 1 - P(B \cup C) = 0,48$$

$$c) P(B \cap C) = 0,05$$

$$\text{NÃO. } P(B \cap C) \neq P(B) \times P(C)$$

$$P(B) \times P(C) = 0,42 \times 0,15 = 0,063$$

ou

$$P(B|C) = \frac{P(B \cap C)}{P(C)} = 0,1190...$$

$$\text{NÃO. } P(B|C) \neq P(B)$$

Logo, há dependência

$$P(B) = 0,15$$

3. A: "Está infectado"

B: "Testou positivo"

$$P(B|A) = 0,99$$

$$P(B|\bar{A}) = 0,02$$

$$P(X|Y) = \frac{P(X \cap Y)}{P(Y)}$$

$$P(A) = 0,001 \quad P(\bar{A}) = 0,999$$

$$a) P(B) = P(A \cap B) + P(\bar{A} \cap B) = \overbrace{P(B|A) \times P(A)}^{0,00099} + \overbrace{P(B|\bar{A}) \times P(\bar{A})}^{0,01498} = 0,021$$

$$b) P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0,00099}{0,021} = 0,047$$

$$c) P(\bar{A}|\bar{B}) = \frac{P(\bar{A} \cap \bar{B})}{P(\bar{B})} = \frac{P(\overline{A \cup B})}{P(\bar{B})} = \frac{0,47899}{0,979} = 0,48925$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0,02101$$

$$P(\overline{A \cup B}) = 0,47899$$

4.

$$\begin{aligned} \#M &= 12 \\ \#F &= 6 \end{aligned}$$

$$a) P = \frac{{}^6C_2 \times {}^{12}C_2}{{}^{18}C_4} \approx 0,323$$

$$b) P = \frac{6^2 \times 12^2}{18^4} \approx 0,0494$$

5.

	B	n	A	
S	526	274	216	1016
NS	1964	1680	1899	5543
	2490	1954	2115	6559

$$a) P = \frac{1016}{6559} = 0,155$$

$$b) P = \frac{216}{2115} = 0,102$$

$$c) P = \frac{216}{6559} = 0,033$$