1 $P(A) = 0.138$

$P(B) = 0.261$

$P(A \cap B) = 0.082$

(a) $P(B|A) = \frac{P(A \cap B)}{P(A)} = \frac{0.082}{0.138} = 0.594$ #

(b) $P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.082}{0.261} = 0.314$ #

(c) ∵ A and B independent

$P(A \cap B) = P(A) * P(B)$

$\Rightarrow 0.082 \neq 0.138 \times 0.261$

⇒ 不獨立 #

2. (a) $RR = \frac{\frac{273}{2914}}{\frac{716}{7996}} = \frac{7996 \times 273}{2914 \times 716} = 1.043$ #

(b) $\frac{P(E|D)}{P(E|D')} = \frac{\frac{273}{989}}{\frac{2641}{9901}} = \frac{273 \times 9901}{989 \times 2641} = 1.03$

∵ ratio 接近 1 ∴ 無關

3.

(a) $RR = \frac{\frac{42}{1518}}{\frac{23}{1473}} = \frac{42 \times 1473}{23 \times 1518} = 0.558$ #

$odds = \frac{\frac{42}{23}}{\frac{1476}{1400}} = \frac{42 \times 1400}{23 \times 1476} = 0.546$ #

(b) 有關，∵ RR & odds 都和1有很大差距，越接近1越有關 #

4

(a) $1 - 0.05 - 0.1 - 0.6 - 0.15 = 0.1$ #

(b) $P(6) + P(7) + P(8) = 0.05 + 0.1 + 0.6 = 0.75$ #

(c) $P(6) + P(7) = 0.05 + 0.1 = 0.15$ #

(d) $P(X \geq 7) = 1 - P(X < 7) = 1 - 0.05 = 0.95$ #

(e) $P(X > 7) = 1 - P(X \leq 7) = 1 - (0.05 + 0.1) = 0.85$ #

5.

$$P(C|D) = \frac{P(D|C)\,P(C)}{P(D)} = \frac{0.012 \times 0.3}{0.0181} = 0.199 \#$$

- $P(D) = 0.4 \times 0.005 + 0.3 \times 0.015 + 0.3 \times 0.012$

  $= 0.01 + 0.0045 + 0.0036 = 0.0181 \#$