Let X = number of hospital claims $\quad X \sim \text{Pareto}(\alpha=2, \theta=300)$

B = bonus paid to the physicians $\quad E(B) = 100$

$$B = \begin{cases} C\cdot(400 - X) & 0 \le X \le 400 \\ 0 & X > 400 \end{cases} \qquad C = ?$$

$$B = \begin{cases} C\cdot 400 - C\cdot X, & 0 \le X \le 400 \\ C\cdot 400 - C\cdot 400, & X > 400 \end{cases}$$

$$= C\cdot 400 - C\cdot(X \wedge 400)$$

~~$100 = E(B) = E(400C - C\cdot E(X\wedge 400))$~~

~~$= E[400C - C\cdot(X\wedge 400)]$~~

$$100 = E(B) = E[400C - C\cdot(X\wedge 400)]$$

$$= 400C - C\cdot E(X\wedge 400)$$

From Exam C/4 Tables.

$X \sim \text{Pareto}(\alpha, \theta)$

$$E(X\wedge x) = \frac{\theta}{\alpha-1}\left[1-\left(\frac{\theta}{x+\theta}\right)^{\alpha-1}\right], \quad \alpha \neq 1$$

$\alpha = 2, \quad \theta = 300, \quad x = 400$

$$E(X \wedge 400) = \frac{300}{2-1}\left[1 - \left(\frac{300}{400+300}\right)^{2-1}\right] = \frac{1200}{7}$$

$$100 = E(B) = 400c - c \cdot \frac{1200}{7}$$

$$c = 0.44$$