

Question # 39

Answer: B

X is the random sum $Y_1 + Y_2 + \dots + Y_N$.

N has a negative binomial distribution with $r = \alpha = 1.5$ and $\beta = \theta = 0.2$.

$$E(N) = r\beta = 0.3$$

$$\text{Var}(N) = r\beta(1 + \beta) = 0.36$$

$$E(Y) = 5000$$

$$\text{Var}(Y) = 25,000,000$$

$$E(X) = 0.3 \times 5000 = 1500$$

$$\text{Var}(X) = 0.3 \times 25,000,000 + 0.36 \times 25,000,000 = 16,500,000$$

Number of exposures (insureds) required for full credibility

$$n_{FULL} = (1.645 / 0.05)^2 \times 16,500,000 / (1500)^2 = 7937.67.$$

Number of expected claims required for full credibility

$$E(N) \times n_{FULL} = 0.3 \times 7937.67 = 2381.$$