

**Question #283****Key: D**

For each member  $P(z) = [1 - 1.5(z-1)]^{-1}$

so for family of 4  $P(z) = [1 - 1.5(z-1)]^{-4}$  negative binomial with  $\beta = 1.5$   $r = 4$

$k$	$P_k$
0	0.026
1	0.061
2	0.092
3+	0.821

$$E(N \wedge 3) = 0 \times 0.026 + 1 \times 0.061 + 2 \times 0.092 + 3 \times 0.821 = 2.71$$

$$E(N) - E(N \wedge 3) = 6 - 2.71 = 3.29$$

$$3.29 \times 100 \text{ per visit} = 329$$

Alternatively, without using probability generating functions, a geometric distribution is a special case of the negative binomial with  $r = 1$ .

Summing four independent negative binomial distributions, each with  $\beta = 1.5$  and  $r = 1$  gives a negative binomial distribution with  $\beta = 1.5$  and  $r = 4$ . Then continue as above.