## Solution for exercise 3.5.5 in Pitman

Assuming the microbes are randomly distributed we apply the Poisson distribution. The parameter of the Poisson distribution is found using the Poisson Scatter Theorem p. 230 t., thus $5,000 \cdot 10^{-4} = 0.5$. Applying this we get

$$P(\text{at least one microbe}) = 1 - e^{-0.5} = 0.3935$$