Question 2 b)

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Determine the inclusion probabilities and join inclusion probabilities for WSRSWR.

$w_u = N_u/N$ where N_u is the population of the community and N is the population of the country.

Inclusion Probability:

$$\pi_u = P(u \in s) = 1 - P(u \notin s)$$

$$\pi_u = 1 - (1 - w_u)^n$$

Joint Inclusion Probability:

$$\pi_{uv} = P(u \in s \ \& \ v \in s)$$

$$\pi_{uv} = [1 - P(u \notin s)]\,[1 - P(v \notin s)]$$

$$\pi_{uv} = 1 - P(v \notin s) - P(u \notin s) + P(u \notin s \ \& \ v \notin s)$$

$$\pi_{uv} = 1 - (1 - w_u)^n - (1 - w_v)^n + (1 - w_u - w_v)^n$$