Question: There are 250 residents in a community. They decided to set up a three person committee to advise them. The members are chosen at random. The first person chosen will become the chair. Their racial/ethnic composition is as follows: 50% white. 30% black and 20% latino.

What is the probability of all three members being black? The chair is a white person? The chair is white or latino?

Solution: Number of white residents: 250*0.5 = 125, black – 250*0.3 = 75, latino – 250*0.2 = 50.

Probability that all three members are black:

P{1-b, 2-b, 3-b} = $\frac{75}{250}\frac{74}{249}\frac{73}{248} = \frac{2701}{102920} \approx 0.3^3 = 0.027$.

Probability that the chair is a white person:

P{1-w} = $\frac{125}{250} = 0.5$.

Probability that the chair is white or latino:

P{1-w or 1-l} = $1 - P\{not\ (1\text{-}w\ or\ 1\text{-}l)\} = 1 - P\{1\text{-}b\} = 1 - \frac{75}{250} = 1 - 0.3 = 0.7$.

Answer: P{1-b, 2-b, 3-b} = $\frac{2701}{102920} \approx 0.027$;

   P{1-w} = 0.5;

   P{1-w or 1-l} = 0.7.