

Activity 5a: Cancer Rates in Georgian shipyards

The 9/21/1978 edition of the *Wall Street Journal* reported that Georgia residents working in shipyards had higher cancer rates than other Georgia residents.

The *Journal* reported: 22% of residents with cancer had worked in a shipyard
14% of residents without cancer had worked in a shipyard
4% of residents had cancer

We can rewrite these in probability notation as:

$$0.22 = P(\text{shipyard} \mid \text{cancer})$$
$$0.14 = P(\text{shipyard} \mid \text{no cancer})$$
$$0.04 = P(\text{cancer})$$

Someone living in Georgia at the time who had worked in a shipyard would be most interested in knowing the probability that he or she will be diagnosed with cancer: $P(\text{cancer} \mid \text{shipyard})$.

A) Calculate the probability of working in a shipyard and being diagnosed with cancer:

$$P(\text{shipyard} \cap \text{cancer}) = \underline{\hspace{2cm}}$$

B) Calculate the probability of working in a shipyard and *not* being diagnosed with cancer:

$$P(\text{shipyard} \cap \text{no cancer}) = \underline{\hspace{2cm}}$$

C) Calculate the probability of working in a shipyard:

$$P(\text{shipyard}) = \underline{\hspace{2cm}}$$

D) Finally, calculate the probability of being diagnosed with cancer given you worked in a shipyard:

$$P(\text{cancer} \mid \text{shipyard}) = \underline{\hspace{2cm}}$$