

## Video 14 Causation

1. People who own more cars tend to live longer than people who own fewer cars. Why is this relationship not evidence that buying more cars increases life expectancy?

Individuals with a higher standard of living usually own more than one car. Additionally, people with higher incomes tend to have a longer lifespan, likely due to having access to quality medical care and nutritious food. The factor that influences both the ownership of cars and lifespan is wealth.

2. Heavy smokers are about 20 times more likely to get lung cancer than nonsmokers. Why isn't this link by itself good evidence that smoking causes lung cancer?

It is possible that a hidden factor, such as a specific gene, influenced both the likelihood of smoking and the development of lung cancer. Therefore, the hidden factor, rather than smoking itself, may be responsible for causing the cancer.

3. What is the difference between a retrospective study and a prospective study?

A retrospective study looks at a group of people with a certain condition, like lung cancer, and looks back to see if they have anything in common. In the case of lung cancer, smoking was found to be common. A prospective study starts with a group of people who have similar traits, like both smokers and non-smokers, and follows them over time to see if they develop the same condition. For example, years later the rates of cancer in the smoking and non-smoking groups could be compared.

4. Why is a prospective study that compares a group of smokers with a similar group of nonsmokers not an experiment?

Smoking is a choice on the behalf of the individual. It is not a condition decided by the researchers.

5. Why do experiments with animals add to the evidence that smoking causes cancer in humans?

The studies on animals demonstrated that smoking could cause cancer in animals, which means that it had carcinogenic effects.