



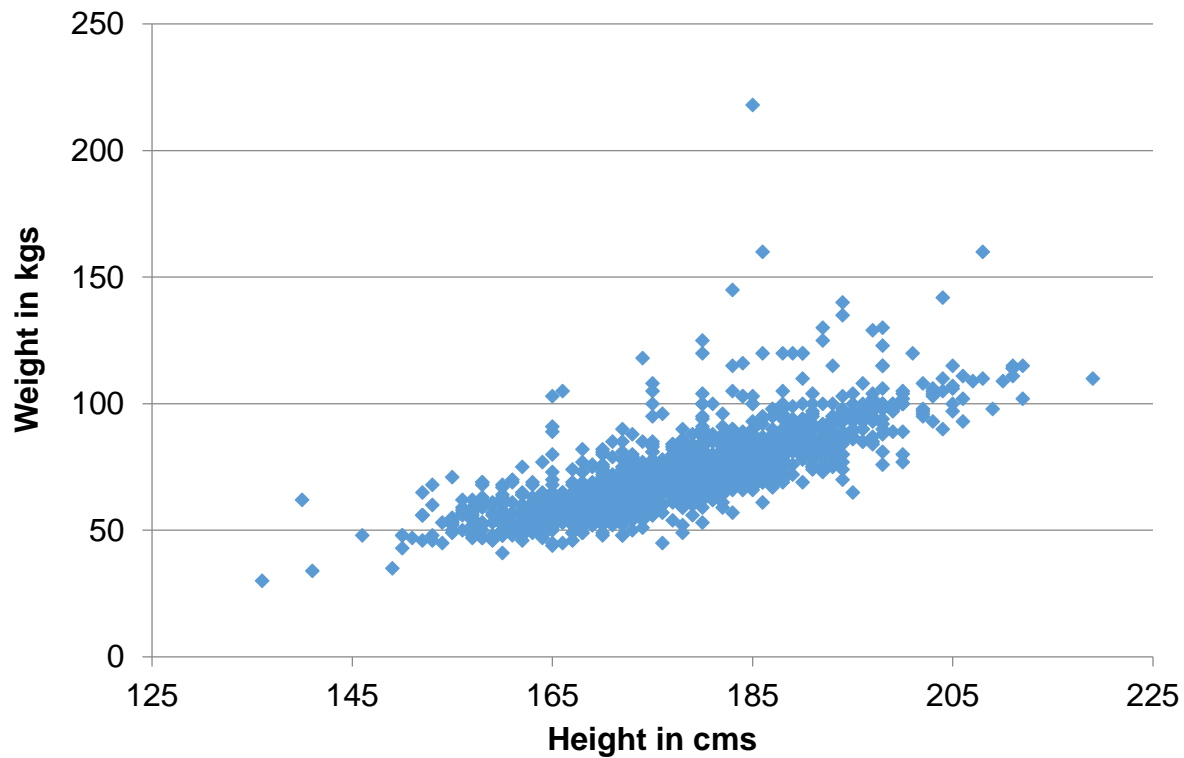
Measures of Association

Covariance

Correlation

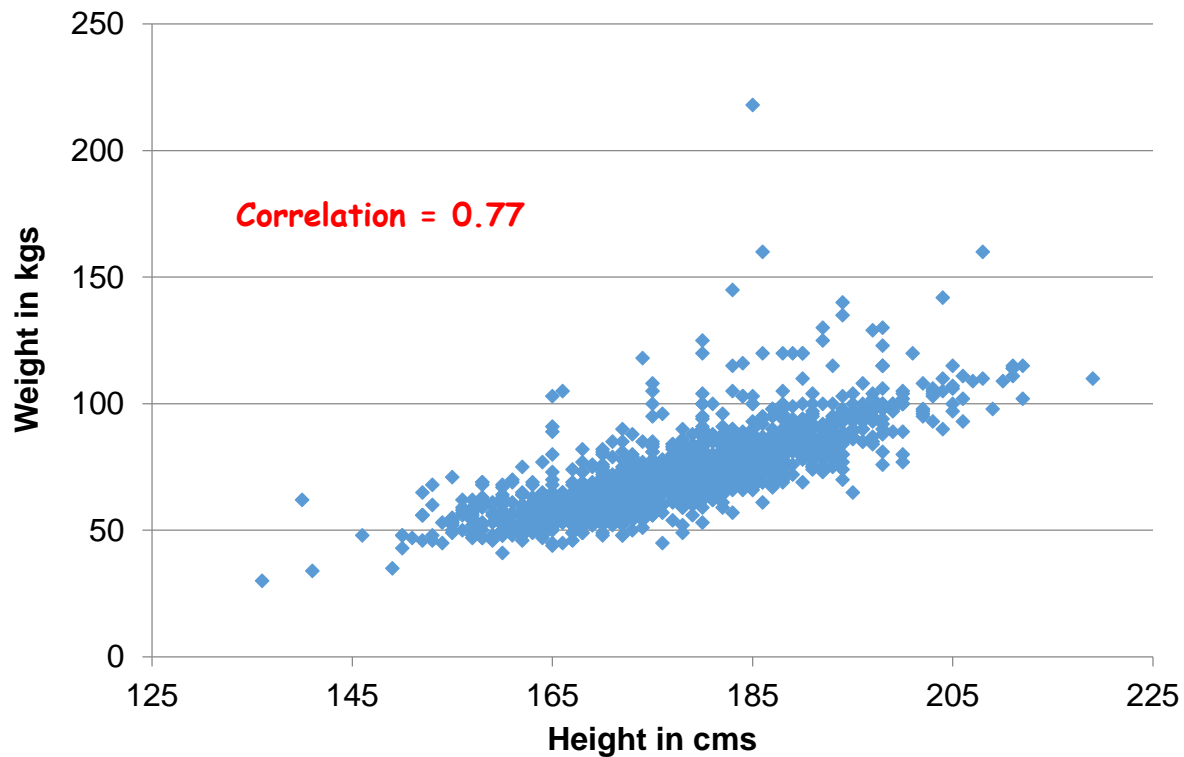


Heights and Weights of Athletes





Heights and Weights of Athletes





Does Weight cause Height ?

Does Height cause Weight ?



Causation versus Correlation

Causation versus Correlation

What is Causation and how do we establish it?

Causation versus Correlation

What is Causation and how do we establish it?

- Correlation

Causation versus Correlation

What is Causation and how do we establish it?

- Correlation
- Temporal distinction between the ***caused*** and the ***causing*** variable

Causation versus Correlation

What is Causation and how do we establish it?

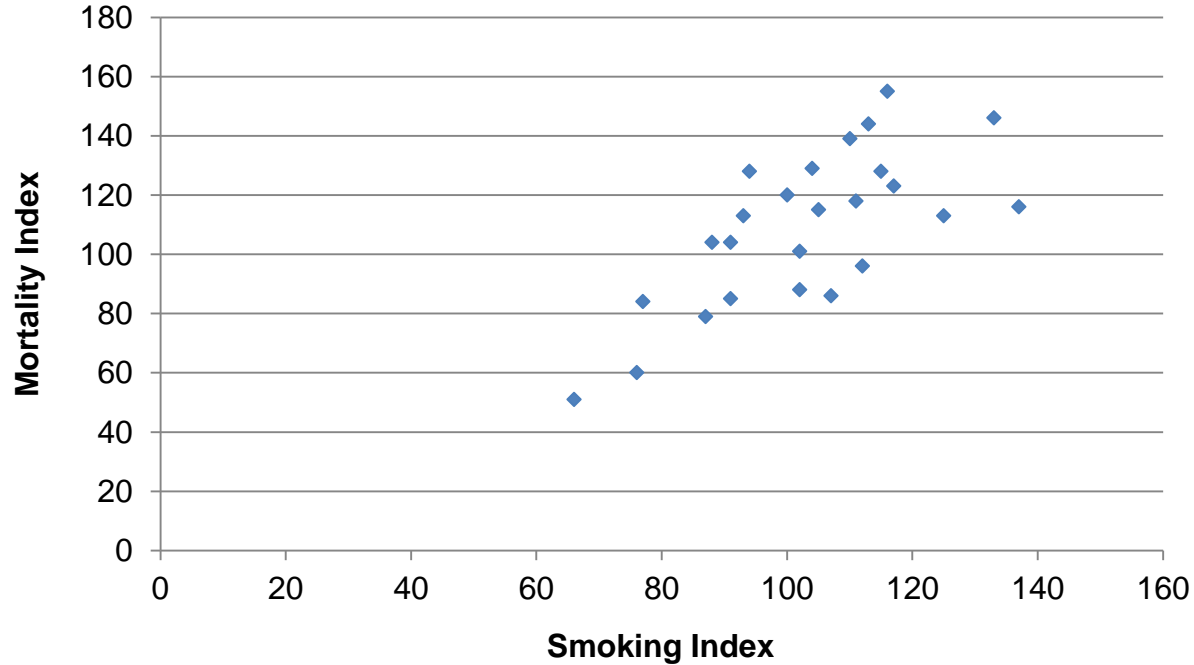
- Correlation
- Temporal distinction between the ***caused*** and the ***causing*** variable
- Control for other variables that may cause the focal variable



Smoking and Cancer

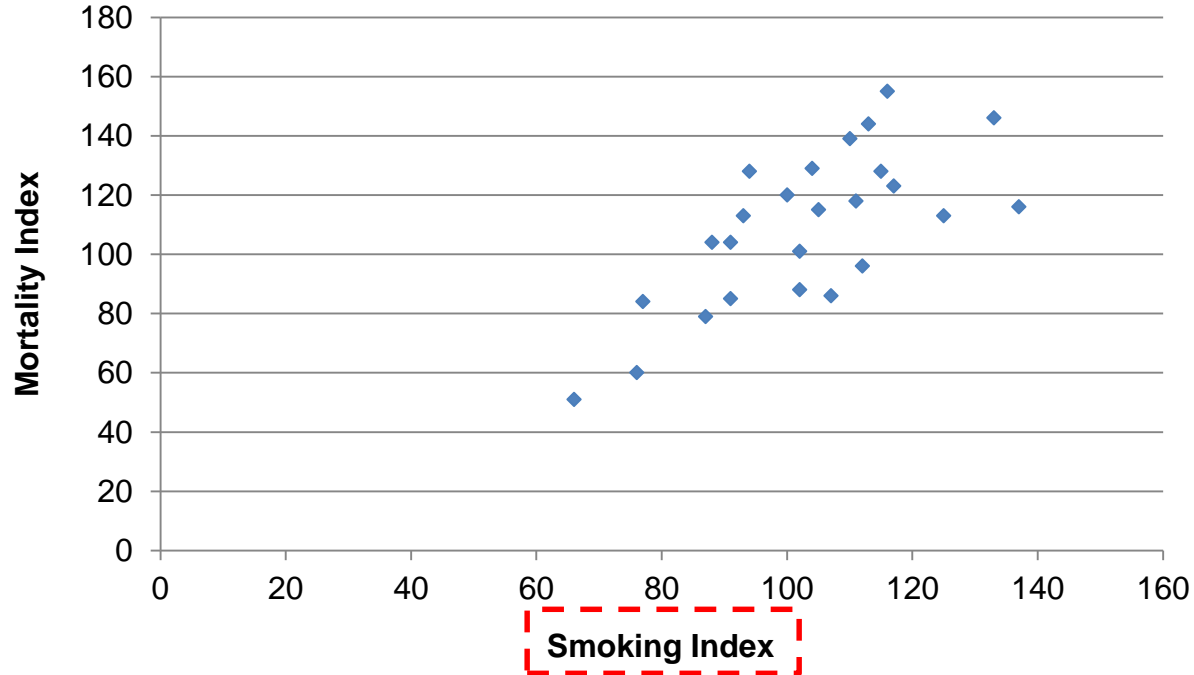


Smoking and Lung Cancer



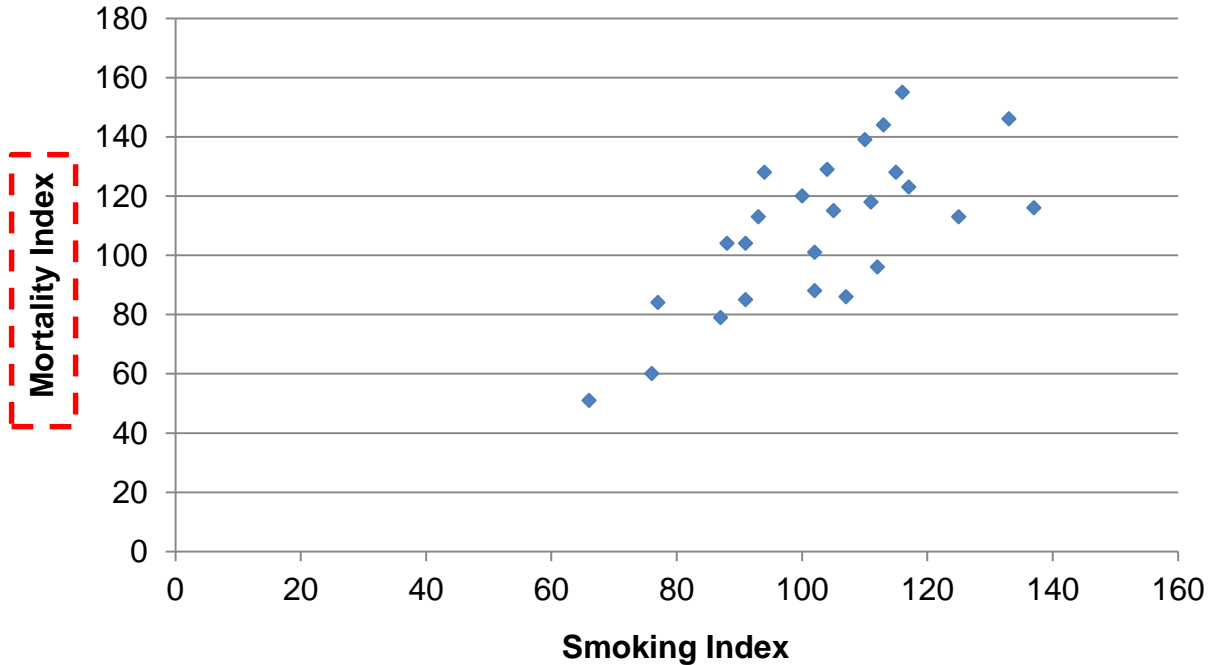


Smoking and Lung Cancer



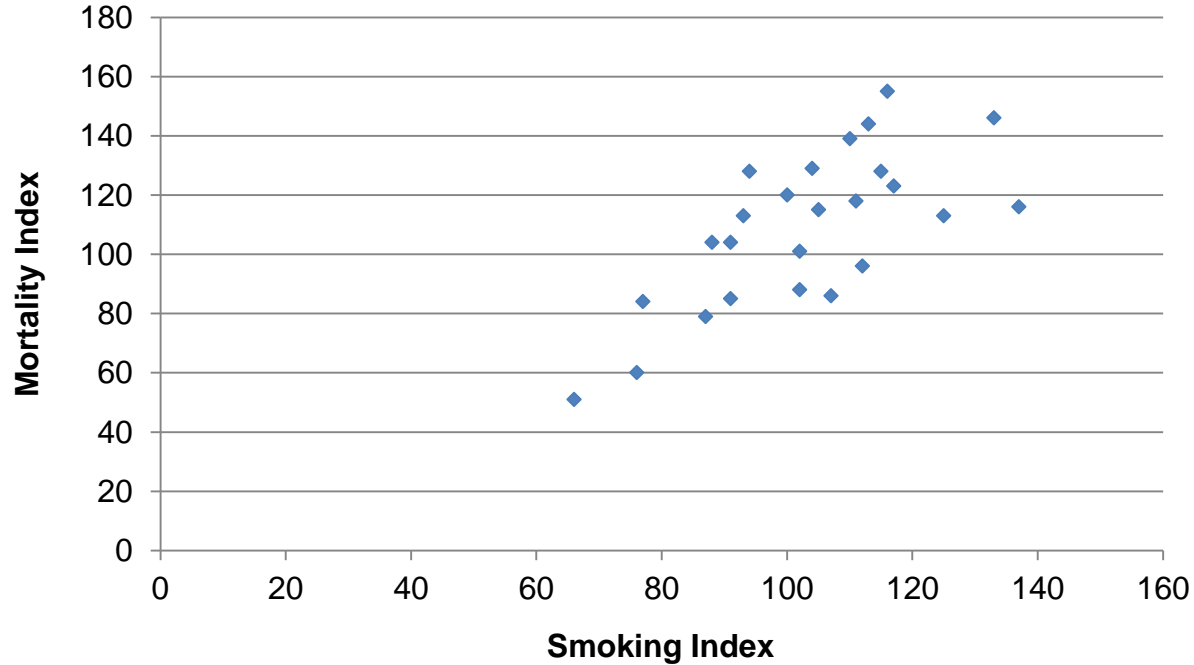


Smoking and Lung Cancer



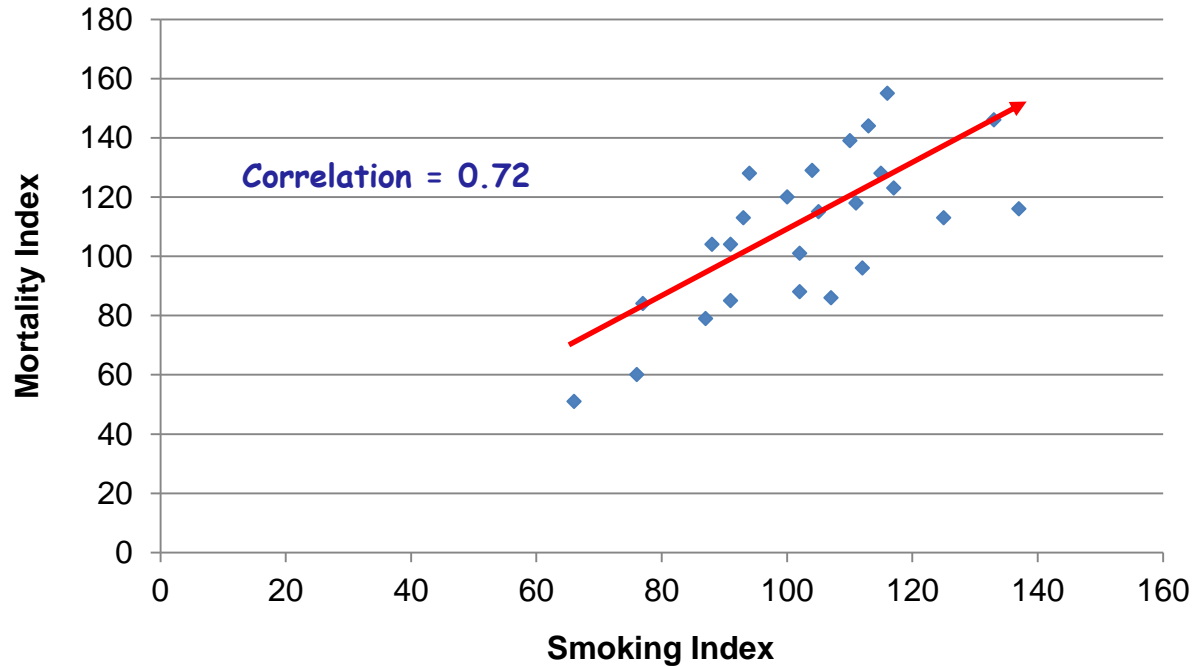


Smoking and Lung Cancer





Smoking and Lung Cancer

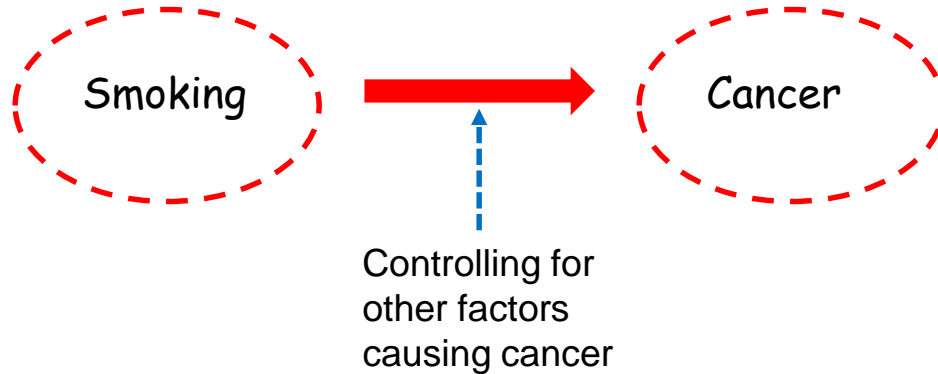


Causation versus Correlation

Studies have firmly established that smoking
causes cancer

Causation versus Correlation

Studies have firmly established that smoking **causes** cancer



Causation versus Correlation

It is important to distinguish between
Causation and Correlation