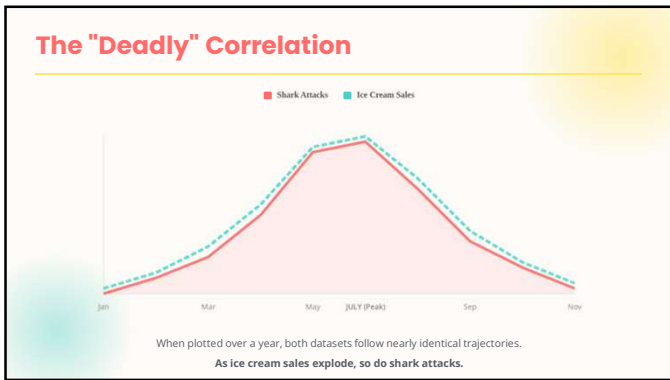


Correlation \neq Causation

The Case of Ice Cream & Shark Attacks



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The Logical Trap

If you look purely at the data without context, the conclusion seems obvious but absurd:

"Eating ice cream makes you delicious to sharks."

This is a classic **Spurious Correlation**. Just because two variables move together doesn't mean one causes the other.




The Confounding Variable

It's the Weather!

Neither variable causes the other. They are both reacting to a third, hidden factor: **Summer Heat**.

- Hot days cause more people to buy **Ice Cream**.
- Hot days cause more people to go **Swimming** (entering the shark's habitat).

If you control for temperature (e.g., look at ice cream sales in winter), the correlation vanishes.



Key Definitions

- Correlation**
A statistical measure that describes the size and direction of a relationship between two or more variables. (e.g., "When A goes up, B goes up").
- Causation**
Indicates that one event is the **result** of the occurrence of the other event. (e.g., "A **makes** B happen").
- Confounding Variable**
An outside influence that changes the effect of a dependent and independent variable. This is the **"hidden third factor"** (like the Sun) that tricks us.