

What is a poison?

• Association

- Weakest of all epidemiological evidence
- An observation occurs with another observation without further quantification:
- (Actual example...)
 - "The last person who lived in this house died of lung cancer."
 - "The last five occupants of this house died."
 - FACT: "Occupancy in the house is associated with death."
 - Fallacy: "This house is *causing* people to die"

• Fact:

- Virtually all people who have died have lived in an house
- Absolutely all people who have lived in an house will die.

17

What is a poison?

• Correlation

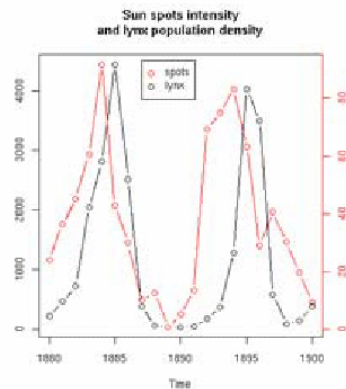
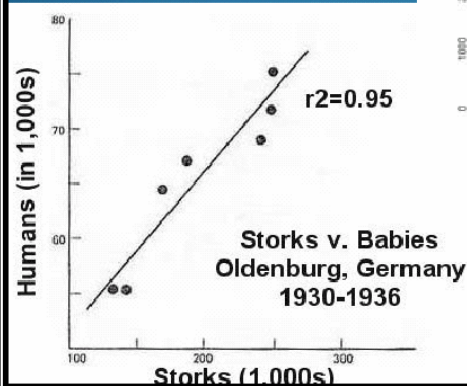
- A type of quantified association
- Stronger than association
- Required for causation, but independent of causation
- An event is observed to change with another event
 - Can be positive or negative

18

Correlation

Do storks cause babies?

Do lynx cause sunspots?



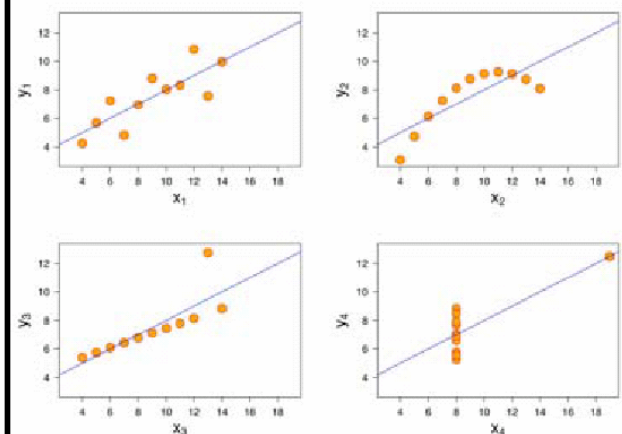
Elton C, *The Ten Year Cycle in Numbers of the Lynx in Canada* (1924) Br. J. Exp. Biol., 2:119-163

Population of Oldenburg, Germany, 1930-1936 (*Ornithologische Monatsberichte* 44, Jahrgang, 1936, Berlin

19

What is a poison?

• Correlation



EACH of these curves also has a coefficient of correlation of 0.85!

Anscombe, Francis J. (1973) Graphs in statistical analysis. *American Statistician*, 27, 17-21.

20