Bias in clinical studies

- Bias - systematic error in a clinical study which is not reduced by increasing the study sample size (as opposed to random variation)
- Classification - (type) of bias is based on the source of bias

- Types of bias
  - Selection bias
    - Systematic differences between baseline characteristics of the groups that are compared
  - Performance bias
    - Systematic differences between care given to groups/exposure to factors other than that being studied
  - Attrition bias
    - Systematic differences between groups in withdrawals from a study
  - Detection bias
    - Systematic differences between groups in how outcomes are measured
  - Reporting bias
    - Systematic differences between reported/unreported findings

  - Confounding bias
    - 3rd variable exists which isn't accounted for
      - It is associated with the cause
      - It is also associated with the effect
      - It is not distributed the same between the groups being studied
    - The supposed cause-effect relation will be confounded by the third variable

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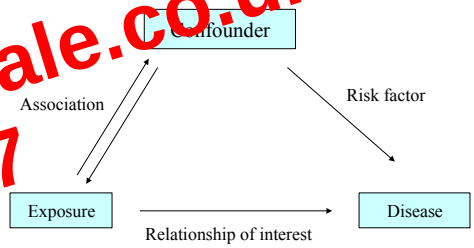

e.g.

Alcohol and lung cancer

The confounded association	One possible explanation	The confounded factor	The confounding (causal) factor
People who drink alcohol have a raised risk of lung cancer	Alcohol drinking and smoking are behaviours which go together	Alcohol, which is a marker for, on average, smoking more cigarettes	Tobacco, which is associated with both alcohol and with the disease

What do you do next to check the assumption of smoking being a confounder?

See if the association between alcohol and lung cancer still holds in people not exposed to tobacco