Epidemiology Research Assessment

Is there an Association ?

Is there an Bias ?

Is it due to Chance ?

Is there Causation ?

What action took place ?

Systematic bias

- selection (volunteer, low response rate, loss to follow up)
- measurement (recall bias, report bias, surveillance bias)

Precise (P) Accurate (A)

P + A = low random & systematic error

A, -P = low systematic error but random error

P, -A = low random but systematic error

Internal Validity = free from errors

External Validity = applicable to population

Experimental Study Blinding

single blind (person doesn't know which group they are in)

double blind (person + study don't know which individual is in what group)

triple blind (double blind + data don't know which individual is in what group)

Clinical Trial Phases

1. safety of drug 2. efficiacy 3. (1+2) + Placebo 4. long term effects

Causation

component cause (factor that aids in disease outcome, insuff. independently)

sufficient cause (factor or combo that leads to disease)

necessary cause (any cause required for disease)

Types of Causal relationships

necessary + sufficient
necessary, -sufficent
sufficent, -necessary
-suffcient, -necessary

Hill's Postulates of Causation

strength of association {odds ratio}
temporal sequence {expos b4 disease}
dose response {hi risk = hi exposure}
repetition {prev. study: expos.+ disease}
experimental evidence {random + Ctrl'd}
biological plausibility {evidence for Assoc.}

Confounding: 3rd factor, distortion of association of exposure & outcome

Age, Sex, SES, Smoking etc

Criteria:

- must be associated with exposure
- must be indep. factor for outcome
- must not be in causal pathway

Quality

Random trial
-random
cohort/ control
cross-sectional
case reports

Systematic Reviews

- normal (summed up studies)
- meta-analysis (RR or OR avg)
- pooled analysis