CASE-CONTROL STUDIES

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CASE-CONTROL STUDIES

- Key features of CC studies
- Selection of cases
- Selection of controls
- Measuring exposure
- (Analysis)
- Interpretation

Definition

Observational analytic epidemiologic investigation in which subjects are selected on the basis of whether they do (cases) or do not (controls) have the disease under study

- The case-control method (especially the analysis) was developed in the 1950s as an approach to the problem of investigating risk factors for diseases with long latent periods and rare diseases.

CASES

- Case definition

  Set of standardised criteria used to identify cases

  Criteria might be
  - clinical
  - histological
  - specific category of diagnosis (e.g. death certificates)

CASES

- Source

  Definition of the population from which the cases are drawn

  Controls are drawn from the same population group

CASES

- Incident or prevalent cases
  - Incident cases: all new cases identified within a specific population at a specific time period
  - Prevalent cases: cases within a specific population at a specific point in time

CONTROLS

- Provide an estimate of the frequency and amount of exposure in subjects in the population without the disease being studied
- Must be representative of the population from which the cases derived, but must not have the outcome in question

CONTROLS

- Matching:
  - selecting controls who are similar to each case with respect to potential confounding factors
- group matching
- individual matching

MEASURING EXPOSURE

- Method used to measure depends on the type and period of time when the potential exposure may have occurred
  - sources of exposure data:
    - » interview of individual
    - » interview of a person close to the subject
    - » medical records
    - » biological samples

MEASURING EXPOSURE

- use objective records rather than subjective measures
- standardised questionnaire
- use measures of exposure taken before the outcome occurred
- if no pre-existing sources available, `blind` the investigator to the outcome status of the patient

INTERPRETATION

- Assessing potential sources of error
  - Bias
    - » selection bias
    - » information bias
  - Confounding
    - » matching, restriction
    - » stratification, regression modelling
  - Reverse causality

STRENGTHS

- relatively quick and inexpensive compared with other analytic design
- well-suited to evaluate diseases with long latent periods
- optimal for evaluation of rare diseases

LIMITATIONS

- temporal relationship between exposure and disease may be difficult to establish
- prone to bias, particular selection and recall
- cannot usually provide information on incidence rates of disease
- choice of appropriate control group may be difficult