EPIDEMIOLOGY

Selection and Information Bias in Epidemiological Studies

"Any systematic error in the design, conduct or analysis of a study that results in a mistaken estimate of an exposure's effect on the risk of disease."*

Selection bias

Information bias

Systematic error introduced during the selection of study participants (implementation and/or analysis phases).

Systematic error introduced by the collection of information that is erroneous from study participants (data collection phase).

The study population is NOT representative of the target population.

It impacts the study's internal and external validity.

Can result in:

- Misclassification bias
 - Differential
 - Non-differential

In RCTs and COHORT studies:

- Inadequate concealment (RCT)
- Self-selection (e.g., volunteer bias)
- Eligibility criteria/membership bias
- Loss to follow-up
- Withdrawals
- Non-response and missing data

In CASE-CONTROL studies:

- Inadequate control selection
- Matching

- Recall bias
- Interviewer bias
- Observer or surveillance bias
- Reporting bias

PREVENTION

FORMS/SOURCE

- At design stage: retain study participants
- Sensitivity analysis

- Standardized data collection tools
- Blinding
- Validated instruments
- 'Phantom' control (for interviewer bias)
- Objective & multi source information
 - Sensitivity analysis

*Schlesselman JJ: Case-Control Studies: Design, Conduct, and Analysis. New York, Oxford University Press, 1982. Rothman K. Epidemiology: an Introduction, 2nd edition. Oxford University Press, 2012

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