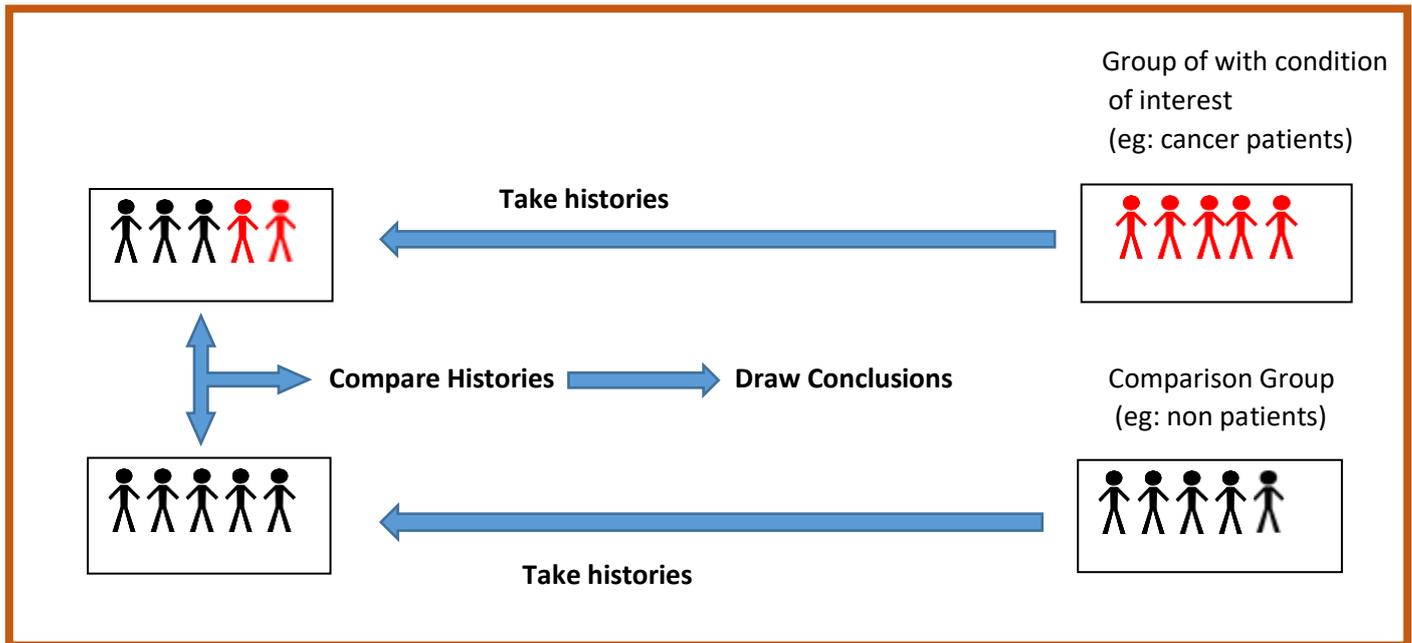


All you need to know about: Case Control Studies



Definition:

An observational study to find out the possible cause(s) of a disease or condition. This is done by comparing a group of patients who have the disease or condition (cases) with a group of people who do not have it (controls) but who are otherwise as similar as possible (in characteristics thought to be unrelated to the causes of the disease or condition). This means the researcher can look for aspects of their lives that differ to see if they may have caused the condition.

For example, a group of people with lung cancer might be compared with a group of people the same age who do not have lung cancer. The researcher could compare how long both groups had been exposed to tobacco smoke. Such studies are retrospective because they look back in time from the outcome to the possible causes of a disease or condition.

(NICE: <https://www.nice.org.uk/glossary?letter=c>)

Key Features:

- * Is an observational and analytical research design
- * Is retrospective – looks back through time
- * Researcher has no control – observes only
- * Looks at why how a group of patients with a condition differs from those who do not have the condition
- * Two groups observed

Strengths:

If correct methodologies used-

- * Good for investigating common exposures and rare outcomes
- * Inexpensive
- * Results can be obtained quickly
- * No loss to follow up

Weaknesses:

- * Not good for looking at rare exposures
- * Relies on retrospective data which may be unreliable/incomplete – thus introducing recall bias
- * Prone to selection bias
- * Unable to determine disease incidence

Examples:

“Osteoporosis as a risk factor for distal radial fractures: a case-control study”

“Reintubation after planned extubation in surgical ICU patients: a case-control study”

“Health status and risk for hip fracture: a case control study of 70-75-year-olds.”



Associated Terminology:

You may come across the following terms while reading a Cohort Study

- **Retrospective Study:** A research study that focuses on the past and present. The study examines past exposure to suspected risk factors for the disease or condition. Unlike prospective studies, it does not cover events that occur after the study group is selected.
- **Exposure:** the condition of being subjected to something which may have a harmful effect (eg: tobacco smoke, radiation).
- **Control Group:** A group of people in a study who do not have the intervention, condition or exposure being studied.
- **Confounding:** In a study, confounding occurs when the effect of an intervention on an outcome is distorted because of an association between the population or intervention or outcome and another factor (the 'confounding variable' or 'confounder') that can influence the outcome independently of the intervention under investigation.
- **Power Calculation:** Is an analysis used to calculate the minimum sample size required to provide a reasonable likelihood of detecting an effect.
- **Association:** a state in which two attributes occur together either more or less often than expected by chance.
- **Risk Factor:** Any aspect of a person's lifestyle, environment or pre-existing health condition that may increase their risk of developing a specific disease or condition.
- **Bias:** Systematic (as opposed to random) deviation of the results of a study from the 'true' results, which is caused by the way the study is designed or conducted.

Further resources:

- **CASP Checklist for Critically Appraising Case Control Studies :**
http://media.wix.com/ugd/dded87_63fb65dd4e0548e2bfd0a982295f839e.pdf
- **"How to Read a paper: The Basics of Evidence-Based Medicine"** by Patricia Greenhalgh. 4th Edition, 2010 published by Wiley-Blackwell. ISBN: 9781444334364
- **"Epidemiology, evidence-based medicine and public health: lecture notes"** by Y. Ben-Shlomo et al. 6th Edition, 2013 published by Wiley-Blackwell. ISBN: 9781444334784
- **NICE Glossary:**
<https://www.nice.org.uk/Glossary?letter=A>
- **Centre for Evidence Based medicine:**
www.cebm.net

Further training and assistance:

If you would like to learn more about Critical Appraisal, please contact the Library and Knowledge Service. We can arrange training sessions tailored to your needs, at a time and location that is convenient to you.

website: <https://library.merseywestlancs.nhs.uk/>

email: library@merseywestlancs.nhs.uk

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