

Cohort study vs case-control: pros, cons, and differences

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Case-Control Studies

A case-control study is a kind of research design in which two subsisting groups varying in outcome are differentiated and classified on the basis of some conjectured casual characteristic.

Case-control research subjects chosen based on disease status and assessed for previous illness to a risk factor of interest. “ Cases” are those determined to have the disease or outcome of interest. “ Controls” are free from the disease or outcome of interest. The illness data can come from a variety of sources, like subsisting data in a medical record or by surveying the participants. You can think of this as a “ flashback” study.

It accounts for the passage of time using a flashback technique to assess past characteristics or exposures and to groups of people, cases and controls.

Case-Control Study Design

At the present time, cases and controls are identified and past exposures are measured. The study determines the odds of having the exposure among cases and controls, and then compares these groups to determine the association between the exposure and the outcome. Unbiased selection of cases and controls is very crucial to this research design. Selection biases pose a substantial threat to the validity of study findings for this design. Case-control studies measure the probabilities of having an exposure or characteristics in the case and control populations.

These probabilities are then compared using the odds ratio – a measure of association.

Cohort Study

A cohort study, in other words a prospective study, is a research design which study subjects – disease-free at enrollment and chosen based exposure rank. Unexposed and exposed groups are followed for the same amount of time to determine who develops the disease of interest. This design meets the need to confirm a casual relation between exposure and outcome. Since the exposure is established first and the potential effect is captured prospectively, the temporal association is actually witnessed during the course of the study. You can think of it as a “ motion picture” study.

This research design follows groups of individuals free from disease through a period of time in motion picture fashion to determine whether the disease develops.

Cohort Study Design

A cohort time at present time exposed and unexposed are recruited to be in the study, then they are followed prospectively to see if they amplify the outcome or disease of interest. The exposed and unexposed groups are then compared to determine the association with the outcome. Data from cohort studies are used to calculate the risk or rate of the health characteristics or disease.

Pros and Cons

Strengths of Case-Control Studies:

- Can be relatively quickly done;

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- Can be relatively inexpensive;
- Good for diseases with short or long latency/duration;
- Good for rare diseases.

Weaknesses of Case-Control Studies:

- Inefficient for rare exposures;
- Usually unable to determine prevalence or the incidence in the population;
- More predisposed to bias, especially selection, and recall biases.

Strengths of Cohort Studies:

- Good for rare exposures;
- Exposure clearly precedes disease;
- Can examine multiple effects of an exposure;
- Able to determine incidence of disease in population.

Weaknesses of Cohort Studies:

- Can be expensive;
- Inefficient for rare diseases;
- Once begun, difficult to examine other study factors (exposures);
- The prospective study may take a long time if the disease has a long latency.