

Analytical Epidemiology

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1. Introduction

- Analytical epidemiology tests hypotheses about the causes of disease by comparing groups.
- It moves from describing disease to explaining why it occurs.

2. Cohort Studies

- **Design:** follow exposed and unexposed groups over time to see who develops disease.
- **Measure:** relative risk, comparing incidence in the exposed to the unexposed.
- Good for studying many outcomes of one exposure.

3. Case-Control Studies

- **Design:** compare people with the disease (cases) to those without it (controls) and look back at exposures.
- **Measure:** the odds ratio.
- Efficient for rare diseases and quicker than cohort studies.

4. Cross-Sectional Studies

- Measure exposure and disease at the same point in time.
- Useful for prevalence but cannot establish that exposure came before disease.

5. Bias and Confounding

- **Bias:** systematic error in selection or measurement.
- **Confounding:** a third factor linked to both exposure and outcome that distorts the association.

6. Summary

- Analytical studies compare groups to estimate associations and infer causation, while controlling for bias and confounding.