

Epidemiology and clinical evidence

Supported GRE teaching and original transfer practice

Identify the evidence

Identify the evidence

Distinguish incidence from prevalence and compute each

Use the overview measurement lesson VI for research inference.

Concepts 1

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Incidence counts NEW cases in a period (number of new diagnoses in a year); prevalence counts ALL existing cases at a time. Chronic conditions can have low incidence and high prevalence; short acute outbreaks show the reverse. A count of new cases in the United States in the past year is an incidence figure.

Rates need denominators: incidence rate is new cases divided by person-time at risk; prevalence is existing cases divided by the population. Comparing raw counts across populations of different sizes misleads; compare rates.

Concepts 2

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Case reports, case-control studies, cohorts, randomized trials and meta-analyses answer different questions. Random allocation can reduce baseline confounding under appropriate implementation; observational designs need explicit confounder analysis. Quality, bias, relevance and uncertainty must be evaluated within each design. A meta-analysis cannot automatically repair weak constituent studies.

Screening and risk run on base rates: with low prevalence, even an accurate test yields mostly false positives among positives. Number needed to treat and relative versus absolute risk are read against the baseline, not from the treatment label alone.

Reason through the worked case

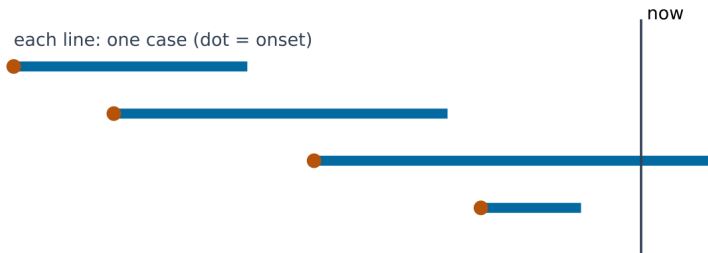
Reason through the worked case

In a fictional closed cohort, 12 of 600 initially unaffected people develop a condition over one year, with complete follow-up. Compute cumulative incidence. If 30 of 750 people have it at a census, compute prevalence.

Cumulative incidence=new cases/initially at-risk population= $12/600=.02$, or 2% over one year. Point prevalence=existing cases/population at that time= $30/750=.04$, or 4%. The first is not a person-time incidence rate; the second includes old and new existing cases at the census.

Read the reviewed representation

Incidence counts onsets in the window; prevalence counts lines crossing "now"



Original schematic for Epidemiology and clinical evidence. Illustrative relationships and numbers are not research results.

Attempt an unfamiliar case

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A fictional trial's risks over the same period are 4% in control and 3% in treatment. Compute relative and absolute reduction and NNT, then qualify.

Pause and write the explanation before continuing.

Check the transfer argument

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Absolute risk reduction=control risk—treatment risk=.04—.03=.01, or 1 percentage point. Relative risk reduction=absolute reduction/control risk=.01/.04=.25, or 25%. $NNT=1/\text{absolute reduction}=1/.01=100$ over the stated follow-up. These point estimates need uncertainty, harms and trial-quality review; they do not supply personal advice.

Accept a different explanation when its evidence and limits are justified.

Limit the conclusion

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Reporting a new-case count as prevalence, or quoting relative risk without the absolute baseline.

Original classroom cases are not official questions or personal clinical advice.

Check yourself

Independent retrieval

A screening programme detects more cases. Why could prevalence rise without a rise in new disease onset?

Write your reasoning before comparing it with the methods and limits taught in this lesson.