

Exercise walk-through

26.1

Epidemiology and clinical evidence: evidence and transfer

GRE · GRE Subject Test · GRE Psychology

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

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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.

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/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.

Exercises 2.1·2.2

2.1 A researcher counts the number of new schizophrenia diagnoses in a country during the past year. This statistic is the: [1]

A. prevalence B. incidence C. morbidity ratio D. base rate E. lethality

2.2 Which design follows exposed and unexposed groups forward in time to see who develops the outcome? [1]

A. case report B. case-control study C. cohort study D. cross-sectional survey E. meta-analysis

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2.1 Answer: B. New cases in a period are incidence; all existing cases would be prevalence. The other options do not satisfy the stated defining conditions.

2.2 Which design follows exposed and unexposed groups forward in time to see who develops the outcome? [1]

A. case report B. case-control study C. cohort study D. cross-sectional survey E. meta-analysis

2.2 Answer: C. Cohort designs move forward from exposure to outcome; case-control designs look backward. Compare the exact process, design or evidence, rather than an associated keyword.

Exercises 2.3-3.1

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

3.1 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. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]

Exercises 2.3-3.1

2.3 Revisit the worked case. State one conclusion its evidence supports and one stronger conclusion it does not support. Explain the difference. [2]

2.3 Use the worked case evidence to support a bounded claim and explain why a causal, universal or stronger claim needs additional evidence. The claim must fit the specific design and observed process.

3.1 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. Give the interpretation, supporting reasoning, a relevant alternative or limitation, and an appropriate check. [4]

3.1 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/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. Award B1 each (authored) for the interpretation, its reasoning, a relevant limitation/alternative and an appropriate check, up to four points. Accept a different justified answer satisfying these demands.