UNIVERSITY MEDICINE • EXERCISE SHEET

# 12.2 Study designs

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

**KEY WORDS** relative risk • odds ratio

## Objective

Match design to statistic; compute RR and OR.

## 1 Key knowledge and worked examples

■ **The rule**

Cohort samples by exposure → RR legal; case-control samples by outcome → OR only ✓: $RR = \frac{a/(a+b)}{c/(c+d)}$, $OR = ad/bc$.

■ **Worked example: two clean datasets**

Cohort 20/200 vs 10/200 → RR 2.0, attributable fraction 50 % ✓. Case-control $30 \cdot 40/(10 \cdot 20)$ → OR 6.0 ✓.

## 2 Practice

**2.1** Which design licenses the relative risk? [3]

**2.2** Exposed 30/300, unexposed 15/300 – RR? [3]

**2.3** Cases: 40 exposed, 10 not; controls: 20 and 30 – OR? [3]

## 3 Exam-style questions

**3.1** A synthetic cohort: 400 exposed (36 events) and 400 unexposed (12 events).

Compute both risks (9 % vs 3 %), the RR (3.0) and the attributable fraction among the exposed ((RR−1)/RR = 67 %) ✓. Explain what the attributable fraction claims and what it assumes (causal exposure; no confounding) ✓. [8]

**3.2** A synthetic case-control of a rare outcome: among 50 cases, 30 exposed; among 50 controls, 10 exposed.

Compute the OR (30×40 / 20×10 = 6.0) ✓. Explain why RR cannot be computed (sampling by outcome fixes the 50/50 split) and why OR ≈ RR here (rare outcome: (a+b)/b ≈ b/b) ✓. [7]