

# CONFIDENCE INTERVALS & P-VALUES – HIGH YIELD

## Confidence Interval (CI)

**Definition:** A confidence interval is a range of values within which the true population value is likely to lie, with a specified level of confidence (usually 95%).

**Interpretation:** If the study were repeated many times, 95% of calculated confidence intervals would contain the true value.

**Key Exam Points:**

- Narrow CI = high precision
- Wide CI = low precision
- CI crossing 1 (RR/OR) = not statistically significant
- CI gives BOTH effect size and precision (more useful than p-value alone)

## p-value

**Definition:** The probability of obtaining a result as extreme as (or more extreme than) the observed result, assuming the null hypothesis is true.

**Interpretation:** Measures strength of evidence against the null hypothesis.

**Key Exam Points:**

- $p < 0.05$  → statistically significant (reject null hypothesis)
- $p \geq 0.05$  → fail to reject null (NOT proof of no effect)
- Does NOT measure clinical significance
- Strongly affected by sample size

## CI vs p-value (Ultra High Yield)

- CI shows magnitude + precision
- p-value shows statistical significance only
- Best practice: interpret BOTH together