

## Review Notes Confidence Intervals

### ‘Statistics means never having to say you’re certain.’

- confidence intervals (CI) present a range of values around the sample estimate (you may be familiar with this concept when hearing about poll results and the ‘margin or error’)
- the 95 % CI is the range of values with which there is a 95% probability that the true value lies
- CI should be calculated for measures of effect such as relative and absolute risk reduction, odds ratio etc.
- for example: if a study find that the difference in mortality between the control and experimental group (ARR) is 2% the true difference could be somewhat different from this; if we repeated the study we could find a different value for the mortality difference; CI help to tell us how precise the value of 2% is
  - if the 95% CI is given as 1.9 to 2.1% then we are 95% confident that the true value lies somewhere in this range, and the result is statistically significant (because the 95% confidence interval does not overlap zero)
  - if the 95% CI is given as – 8% to + 9% it means:
    - there is a lot of uncertainty associated with the original point estimate of 2%
    - the mortality rate could actually be higher in the experimental group compared to the control group (note that the 95% CI includes an ARR of negative 8%, (a negative value) meaning that the mortality rate in the experimental group could be 8% higher than that in the control group)
    - the result is not statistically significant for  $p = .05$  (because the 95% CI includes the value of 0 or no effect)
- note that values on the extremes (either end) of the 95% confidence interval are less probable than values in the middle

- note that studies may also diagram results with point estimates and 95% confidence intervals as a line around a point estimate
- to interpret the diagram note that if the 95% CI crosses RR of 1 (no effect) then the result is not statistically significant for a p value of .05

