

## **Statistics: a summary**

The following statistics are commonly quoted in clinical papers:

### **Relative risk**

Is the probability an event will happen in the intervention group compared to the control group. You should be wary of a paper which quotes only relative risk as it can make the results look more impressive than they really are, especially in smaller trials.

*To work out the relative risk...*

You need to know

- the Experimental Event Rate (EER) = the number of people in the experimental group who experience the outcome
- the Control Event Rate (CER) = the number of people in the control group who experience the outcome

**Relative Risk = EER/CER**

### **Absolute risk reduction**

Is the actual difference in risk between the intervention and control groups. Absolute risk is generally considered a more reliable statistic than the relative risk.

*To work out the absolute risk reduction...*

You need to know

- the Experimental Event Rate (EER) = the number of people in the experimental group who experience the outcome
- the Control Event Rate (CER) = the number of people in the control group who experience the outcome

**Absolute Risk Reduction = CER - EER**

### **Number needed to treat (NNT)**

The number of people who need to undergo the intervention for one person to get benefit.

*To work out the NNT...*

You need to know

the Absolute Risk Reduction (ARR)

From this, you can work out the Number Needed to Treat:

**NNT = 100/ARR**

## Confidence intervals

Confidence intervals tell us how precise the results of the study are. Normally a 95% confidence interval is quoted.

e.g. if Patients in an intervention group are at a 0.72 risk, **relative** to those in the control group – or put another way, they are at 72% of the risk of someone in the control group.

The confidence interval is 0.49 – 1.04

This means that if we repeated the study in the population as a whole, we could be 95% certain that the relative risk would fall somewhere in this range. In this example, this means is that the relative risk may be as low as 0.49 (or 49%) or as high as 1.04 (or 104%) i.e. the experimental group could actually be at a higher risk!

- In general, the narrower the confidence interval, the more precise the result of the trial.
- The larger the trial, the narrower the confidence interval and vice versa.

*To work out a confidence interval...*

It is possible to work out confidence intervals for a given risk, using a fairly complex calculation (see below). However, mostly you will just be using the confidence interval to decide on whether the result is precise enough, rather than actually working them out:

$$\pm 1.96 \sqrt{\frac{\text{CER}(100-\text{CER})}{n \text{ (in control)}} + \frac{\text{EER}(100-\text{EER})}{n \text{ (in experimental)}}$$

To find the 95% CIs around the ARR, add and subtract this number from the ARR. To find the 95% CIs for the NNT, divide the new limits for the ARR into 100.