

... about calculation of risk & odds

Outcomes at 5 years from a study of surgical vs. medical intervention*

Outcome	Intervention	
	Surgical (n=1324)	Medical (n=1325)
Death	350	404
Life	974	921

Risk (incidence or event rate) = number having an event / total number

- ◆ **Absolute risk** of death with surgery = $350 / 1324 = 26.4\%$
Absolute risk of death with medical treatment = $404 / 1325 = 30.5\%$
- ◆ **Absolute risk reduction (ARR)** of death with surgery = $30.5\% - 26.4\% = 4.1\%$
- ◆ **Relative risk** of death, i.e. **risk ratio (RR)** = $26.4 / 30.5 = 0.87$
- ◆ **Relative risk reduction (RRR)** of death with surgery
= $1 - RR = 1 - 0.87$ or $100 - 87\% = 13\%$
or = $ARR / \text{risk of death with medical treatment} = 4.1\% / 30.5\% = 13\%$

Odds = number having an event / number not having an event

- ◆ Odds of death with surgery = $350 / 974 = 0.36$
Odds of death with medical treatment = $404 / 921 = 0.44$
- For odds >1, the event is more likely to happen than not; if odds are <1, the event is more likely not to occur.
- ◆ **Odds ratio (OR)** = $0.36 / 0.44 = 0.82$
- When event rates are low, as in most randomised trials, odds ratios are similar to risk ratios. Risk and odds values diverge when event rates are high (or treatment effects are large).

* Adapted from Statistics for the non-statistician. In: *Greenhalgh T. How to read a paper. London: BMJ Publishing Group, 1997.*