

Odds ratios uncovered

Chris Cates continues his series unravelling the mysteries of statistics

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To recap from last month, risks measure the number of events as a proportion of the total – if ten out of total 100 suffer a bad event the risk is 1/10 – while odds compare the number of events to the number free from an event, so would be 10/90 or 1/9. For rare events risks and odds come to a very similar figure, but for common events they can be very different. Take, for example, 90 out of 100. This would be a risk of 9/10 but odds of 90/10 which is 9 to one – a figure ten times higher than the risk.



If we return to the table of results from the trial of nursing interventions to help smokers to quit (below) we can now proceed to compare the results from the control group and the treatment group. The number of those who successfully quit in the nurse intervention group comes to 79 out of a total 1997, compared to the control group where there are 15/710 quitters. The risk ratio for quitting is therefore 0.0396/0.0211 which is 1.88. This could be described as an 88% relative increase in your chances of being a quitter with nurse intervention.

The difficulty is that when we compare the risk of continuing to smoke, this is 1918/1997 in the nurse group and 695/170 in the control group, giving a ratio of 0.96/0.98 – a risk ratio of 0.98. This works out as a 2% relative reduction in your risk of continuing to smoke with nurse intervention. The results appear to be rather unimpressive when presented this way!

In contrast the odds for those who quit are 75/1918 with nursing intervention and 15/695 for the control group, giving an odds ratio of 0.0412/0.0216, or 1.91. For those who continue to smoke both odds can be inverted (1918/75 and 695/15) so the odds ratio of continuing to smoke is the inverse



of the odds ratio of quitting and is 1/1.91 or 0.52. For the rare quitters the odds ratio of 1.91 is similar to the risk ratio of 1.88, but for those who continue to smoke the odds ratio still looks worthwhile at 0.52, while the risk ratio appears much less encouraging at 0.98.

When reading papers that report risk ratios or odds ratios look out for the ways these are reported, and remember that when events are common (like those who continue to smoke in this study) risks and odds behave very differently.

REFERENCE

Hollis JF, Lichtenstein E, Vogt TM, Stevens VJ, Biglan A. Nurse-assisted counseling for smokers in primary care. *Annals of Internal Medicine* 1993;118(7):521-5.

Dr Chris Cates' EBM website can be found at www.nntonline.net

Quit results

	Number of quitters	Number still smoking	Total
Control group	15	695	710
Nurse intervention	79	1,918	1,997