NHMRC Clinical Trials Centre

RESEARCH SEMINAR

Translating trial evidence of binary event rates for clinical and economic evaluation: relative risk fallacies and odds solution

Professor Simon Eckermann

When: **Thursday 29 October 2009**
3.30- 5.00pm

Where: **Medical Foundation Building Auditorium**
92-94 Parramatta Road, Camperdown
Map ref:
1. campus map http://db.auth.usyd.edu.au/directories/map/building.stm?location=01B
2. local street map http://www.whereis.com/index.htm?ref=homeMap#session=MjE=

(nb. **post-seminar drinks will be in L5 Training Room, Medical Foundation Building**)

Abstract: Simon Eckermann, Michael Coory, Andrew Willan (Eckermann S,, Coory M,, Willan AR. 2009, 'Indirect comparison: relative risk fallacies and odds solution'. *Journal of Clinical Epidemiology*. Published Online: January 2009. DOI: 10.1002/hec.1353.)

Objective: Economic analysis and assessment of net clinical benefit often require estimation of absolute risk difference (ARD) for binary outcomes such as survival or progression, given baseline epidemiological risk in a jurisdiction of interest and trial evidence of treatment effects. Typically, the assumption is made that relative treatment effects are constant across baseline risk, in which case relative risk (RR) or odds ratios (OR) could be applied to estimate ARD. Our objective is to establish whether use of RR or OR allows consistent estimates of ARD.

ARD is calculated from alternate framing of effects (e.g., mortality vs. survival) using relative risk (RR) and odds ratios (OR) in direct and indirect comparisons. ARD is shown to be consistently estimated and appropriately bounded with OR but changes with framing of effects using RR and not necessary bounded wherever epidemiological risk differs from trial risk. Additionally, in indirect comparisons ARD is also shown to be consistently estimated with OR, while the direction, let alone extent, of ARD is shown to not necessarily be consistent with RR, where risk in common comparator arms differ.

Conclusion: Odds ratios allow consistent calculation of absolute risk difference in translating evidence from trial settings and across trials in direct and indirect comparisons, avoiding selection biases from framing of effects with relative risk. These findings are critical for translating evidence to inform economic analysis and assessment of net clinical benefit, given that use of RR in estimating ARD is commonly suggested precisely where risk differs in practice or across arms.

The presenter: Simon Eckermann is Professor in Health Economics at the Flinders Centre for Clinical Change & Health Care Research, Flinders University. He has extensive experience in teaching and applying trial-based and decision analytic methods for economic analysis in Health Technology Assessment (HTA) and practice. His original research includes: (i) using value of information to simultaneously inform optimal decision making and efficient trial design in HTA; (ii) comparing two or more strategies in HTA to best inform risk neutral or risk averse decision makers, in particular the expected net loss frontier; (iii) demonstrating inferential fallacies arising with use of relative risk in indirect comparisons and an

odds ratio solution; and (iv) a correspondence method allowing ratio measures of relative efficiency consistent with maximising net benefit. More generally, Simon's research has demonstrated the links between optimal decision making in research reimbursement and regulation. Since 2005 he has been active in education, guideline revision and evaluation on the Economic Sub-committee of the Pharmaceutical Benefits Advisory Committee (PBAC), run the international course "Health Economics from Theory to Practice: informing related decision of research, reimbursement and regulation" with Professor Willan from Canada and a CI on national competitive health research grants totalling more than $12 million.