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APPENDIX 1

The potential for bias in estimation of ORs: a worked example

Consider the example of diabetes and the effect of unemployment status, with the following input assumptions....

- The true OR we seek to estimate (odds of occupational injury in those with diabetes versus those without)=2.0
- The RR of diabetes in employed versus unemployed men=3.0
- The estimate of prevalence of diabetes in our controls (y)=1.59%⁹
- We planned to study 1700 cases and 8500 controls....

RR	Prevalence (%) among controls in our sample (y)	Prevalence (%) in workers (solve for 'p')	Expected OR (vs 2.0)
Diabetes			
3.00	$1.59 = (0.921 \times p) + (0.079 \times 3p)$	1.373%	1.72

The extract from table 1 (above) shows that the estimated prevalence of diabetes in working controls (p) is 1.373%, and that the OR of 2.0 can be expected to be biased downwards to 1.72. This last figure is derived as follows:

If all the controls were workers, 1.373% of 8500 that is 116.705 (without rounding) would be diabetics and the remainder (8383.295) would not.

In fact, as our controls include some unemployed men, and as a whole have a prevalence of 1.59%, we estimate in error that 135.15 controls would have diabetes and 8364.85 would not.

Imagine first the 'true' 2×2 table, confined to workers, among whom the true OR for injury is 2.

Injury?	Diabetes?		All
	Yes	No	
Yes	A	(1700–A)	1700
No	116.705	8383.295	8500

This table has one unknown, but $OR=2$. Thus, $(8383.295 \times A) / (116.705 \times (1700 - A)) = 2$.

Solving for 'A' gives a value of 46.05:

Injury?	Diabetes?		All
	Yes	No	
Yes	46.05	1653.95	1700
No	116.705	8383.295	8500

Using 'all' controls rather than 'worker' controls will alter the bottom row of this table as follows:

Injury?	Diabetes?		All
	Yes	No	
Yes	46.05	1653.95	1700
No	135.15	8364.85	8500

Thus, instead of an OR of 2, the estimated OR would become: $(46.05 \times 8364.85) / (135.15 \times 1653.95) = 1.723$.

Corrections

NO2 and children's respiratory symptoms in the PATY study. **Pattenden S**, Hoek G, Braun-Fahrlander C *et al* *Occup Environ Med* 2006;**63**:828–835. This article was published with an incorrect doi of 10.1136/oem.2006.025213. The correct doi is 10.1136/oem.2005.025213.

Occup Environ Med 2010;**67**:877. doi:10.1136/oem.2005.025213

Valentini E, Ferrara M, Prasaghi F *et al*. Systematic review and meta-analysis of psychomotor effects of mobile phone electromagnetic fields. *Occup Environ Med* 2010;**67**:708–716. The citation in this review contains an error. The fourth author is De Gennaro L, not Gennaro LD.

Occup Environ Med 2010;**67**:877. doi:10.1136/oem.2009.047027corr1