

## 2 solutions for estimating odds ratios with zeros Dos soluciones para la estimación de "odds ratios" con ceros.

Valenzuela,

Two solutions are proposed for the estimation of odds ratios (OR) when one or the two elements of the principal (A, D) or secondary (B, C) diagonals of a 2 x 2 matrix (A, B, C, D) are 0. The OR estimate is  $AD/BC$ . If A or D are 0,  $OR = 0$ ; if B or C are 0, the OR is undefined. Analytical solution.

This solution conserves the marginal totals. If  $B = 0$  and  $C = 0$ , the OR cannot be less than  $AD/1$  (the minimal acceptable value), then the equation  $(A-X)(D-X)/X^2 = KAD/1$  searches for that X which subtracted to A and D and added to B (0) and C (0) yields an OR K times AD; if  $B = 0$  and  $C > 0$  then  $(A-X)(D-X)/X(C+X) = AD/C$ ; if  $B > 0$  and  $C = 0$ , then B replaces C in the latter equation. If A and D are 0,  $X^2/(B-X)(C-X) = 1/KBC$ ; if  $A = 0$  and  $D > 0$ ,  $X(D+X)/(B-X)(C-X) = D/KBC$ ; if  $A > 0$  and  $D = 0$ , A replaces D in the latter equation. K can be taken at the maximum Chi squared value.

Probabilistic solution. Zeros are replaced by ones and the elements of the diagonal without zeros are increased proporti