How to use the NNT app

NNT definition

The number needed to treat (NNT) represents the number of subjects who need to change their behaviour regarding an exposure of interest (i.e. consumption of processed meat, consumption of vegetables…) during a certain time in order to prevent one additional case of disease (i.e. breast cancer, colorectal cancer…).

Guidelines

Fill-in the blank spaces with numeric values. By definition, the first exposure group and the second exposure group are defined so that the cumulative incidence (see definition below) in the first group is higher than the cumulative incidence in the second group.

Then, choose your alpha error between 0 and 100 in order to compute the corresponding confidence interval.

To compute the NNT, click on the blue button “compute NNT”. Your results will appear at the bottom of the page. Warning message in red will appear if your data are not relevant.

Cumulative incidence

The cumulative incidence is the proportion of subjects included in a cohort who are diagnosed with a disease during follow-up. It is expressed as: $Cum_{Inc} = \frac{number\ of\ cases}{number\ of\ person{-}year}$.

Absolute risk reduction

An absolute risk reduction (ARR) is the difference of cumulative incidences between two groups of subjects with different behaviours regarding the exposure of interest. For example, one groups with subjects eating one fruit per day and another group eating two fruits per day. The ARR is expressed as: $ARR = \frac{cases\ in\ group\ 1}{person{-}year\ in\ group\ 1} - \frac{cases\ in\ group\ 2}{person{-}year\ in\ group\ 2}$.

NNT computation

The NNT is defined as the inverse of ARR: $NNT = \frac{1}{ARR}$. It was computed with the hypothesis of a decreasing risk across groups of exposure. In other words, the cumulative incidence observed in group 1 should be higher than the cumulative incidence observed in group 2.

Confidence intervals

The confidence interval (CI) of the NNT was based on the CI of the ARR. Indeed, the calculation of the CI of ARR was based on the Wilson score (Wilson, 1927). Then, the CI of ARR was converted into interval predictions for NNT, defining LL(ARR) and UL(ARR) as the lower and upper confidence limits for ARR. If the CI for ARR does not enclose 0, then the CI for NNT can be expressed as 1/UL(ARR) and 1/LL(ARR). If the confidence interval for ARR encloses 0, the CI for NNT is the union of [-∞; 1/LL(ARR)] and [1/UL(ARR); +∞] (Bender and Blettner, 2002).

References

BENDER, R. & BLETTNER, M. 2002. Calculating the "number needed to be exposed" with adjustment for confounding variables in epidemiological studies. J Clin Epidemiol, 55, 525-30.

WILSON, E. 1927. Probable Inference, the Law of Succession, and Statistical Inference. J Am Stat Assoc, 158, 209-212.