Indirect Meta-Analysis

This analysis model used when you want to compare indirectly between two interventions.

In case of continuous data:

Example:

	Interventions A			Control		
ID	Mean	SD	Total	Mean	SD	Total
Study 1						
Study 2						
Study 3						

	Interventions B			Control		
ID	Mean	SD	Total	Mean	SD	Total
Study 1						
Study 2						
Study 3						

If you want to compare between intervention A and intervention B you need to calculate treatment effect (TE) (mean difference between intervention and control) and Standard error of treatment effect (SE-TE).

In case of dichotomous data (event and total):

Example:

	Interventions A		Control	
ID	Event	Total	Event	Total
Study 1				
Study 2				
Study 3				

	Interventions B		Control	
ID	Event	Total	Event	Total
Study 1				
Study 2				
Study 3				

If you want to compare between intervention A and intervention B you need to calculate logarithm of treatment effect (log TE) (log RR or log OR) and Standard error of logarithm treatment effect (SE-logTE).

Continuous data(1):

Our calculator can calculate treatment effect (TE) (mean difference between intervention and control) and Standard error of treatment effect (SE-TE).

Computing TE from studies that use independent groups We can estimate the mean difference (TE) from a study that use mean for two independent groups as follows.

TE = mean for intervention – mean for control

SD1 and SD2 will be the standard deviation of the two groups. N1 and N2 will be the sample size of the two groups. In case of homogenous data (if we use fixed effect model), we assume the two standard deviations are equal.

So we can calculate the variance of TE as follow:

Var $= \frac{N1+N2}{N1*N2} SD^2$ SD^2 represent the pooled standard deviation of the two groups. Var represent variance

$$SD^2 = \sqrt{\frac{(N1-1)SD^2+(N2-1)SD^2}{N1+N2-2}}$$

SE-TE = $\sqrt{var}$

In case of heterogeneous data (if we use random effect model), we don't assume the two standard deviations are equal.

Var = $\frac{SD1^2}{N1} + \frac{SD2^2}{N2}$

SE-TE = $\sqrt{var}$

Dichotomous data(2):

Our calculator can calculate logarithm treatment effect (log RR or log OR) and Standard error of logarithm treatment effect (SE-log RR or SE-log OR).

Risk ratio:

RR = $\frac{event\ I}{total\ I} \div \frac{event\ C}{total\ C}$ I represent intervention, C represent control

Log RR = log (RR)

Var $_{\log RR}$ = $\frac{1}{event\ I} - \frac{1}{total\ I} + \frac{1}{event\ C} - \frac{1}{total\ C}$

SE $_{Var\ log\ RR}$ = $\sqrt{\text{Var log RR}}$

Odds ratio:

OR = $\frac{event\ I \times nonevent\ C}{event\ C \times nonevent\ I}$ I represent intervention, C represent control

Log OR = log (OR)

Var $_{\log OR}$ = $\frac{1}{event\ I} + \frac{1}{nonevent\ I} + \frac{1}{event\ C} + \frac{1}{nonevent\ C}$

SE $_{Var\ log\ OR}$ = $\sqrt{\text{Var log OR}}$

References:

1. Effect Sizes Based on Means. Introduction to Meta-Analysis2009. p. 21-32.
2. Effect Sizes Based on Binary Data (2×2 Tables). Introduction to Meta-Analysis2009. p. 33-9.