**Tip for data extraction for meta-analysis - 6**



*How do you calculate a standard error of a beta coefficient?*

Kathy Taylor

I have shown how to [rescale hazard ratios](https://bit.ly/2U3jpnS) (HRs) to a common change in a predictor variable, and also [beta coefficients](https://bit.ly/2CXI9nL.) which are HRs (natural) log-transformed. We need to enter beta coefficients and their SEs into meta-analysis software. In this post I’ll show how to calculate these SEs.

Beta coefficients may be reported with a standard error (SE) or a t-value. HRs are usually reported with a confidence interval.

A bit of maths (see below if you're interested) shows us:

and rescaling from a change of x units to y units in the predictor variable

and if the HR hasn’t already been rescaled to y units

Let me show you some examples. Returning to the studies mentioned in my previous [post](https://bit.ly/2U3jpnS). I had already scaled them to a 5mmHg increase in systolic blood pressure variability:

[study](https://www.ncbi.nlm.nih.gov/pubmed/17452502) by Mancia et al has a beta coefficient of -0.092 and its

[study](https://www.ncbi.nlm.nih.gov/pubmed/20212270) by Hansen et al has a beta coefficient of 0.01 and its

[study](https://www.ncbi.nlm.nih.gov/pubmed/14654744) by Pringle et al has a beta coefficient of 0.16 with its

So the data are ready for meta-analysis, but all these data cannot be pooled together. The data of Mancia et al may be pooled with the data of Hansen et al, or the data of Pringle at al, but not the data from both studies, because the patient populations of these two studies overlap – double counting patients can inflate the effect estimates. I’ll return to the issue of overlapping patient populations in a later post.

*Here’s a tip….*

Standard errors of beta coefficients can be calculated from t values and confidence intervals

In my next post I will show how to pool data from studies reporting categorical risk data with different numbers of categories and different thresholds.

*Where did the equations come from?*

(You can skip this if you are only interested in carrying out the calculations)

This can be rearranged to

A 95% confidence interval is

Therefore

This equation applies to any symmetric 95% confidence interval.

As has a confidence interval

As has a confidence interval

Rescaling beta coefficients from a change of x units to y units in the predictor variable,

both follow on from the explanation I gave in my last post (<link>EBHC KT blog post 5</link>) for



The same applies for

which follows on from the explanation given for



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