

## How to use the meta-analysis to calculate an updated effect size after entering information from a new study

The best way to describe this is by an example:

A new hypothetical study measures the volume of the putamen in patients with bipolar disorder and controls, and the following results are obtained:

Volumes in ml	Controls (n=30)	Bipolar Patients (n=35)
Total putamen volume (SD)	13.3 (1.4)	14.1 (1.5)
Left putamen volume (SD)	6.4 (0.8)	6.9 (0.9)
Right putamen volume (SD)	6.5 (0.9)	6.8 (0.9)

### To combine this with the putamen meta-analyses (total, left, right):

#### For total putamen

Open the BiND database Excel file (this needs to be downloaded from [www.bipolardatabase.org](http://www.bipolardatabase.org)).

Go to the Putamen (total) sheet 'Put' (to find this quickly go to the main summary sheet and click on the Putamen link).

Select the row **under** the last study: Click on the row number 29 so the entire row is selected.

Click menu: Insert, Rows

Enter all the information (total volumes, SDs, left volumes, right volumes) and demographic information in the correct cells in the new row. For example you would enter 35 into cell X29, 30 into cell Y29, 6.9 into cell Z29, 0.9 into cell AA29 and so on.

Select the row **of** the last study in the meta-analysis table: Click on the row number 38 so the entire row is selected.

Click menu: Insert, Rows so that a row is inserted before the last study.

Click on cell A37, hold down mouse button and move to cell Q37 so that all cells between and including these cells are highlighted.

Click on the small black box at the bottom right hand corner of cell Q37 and drag down **two** rows to Q39.

The new study information for the total putamen volume should now be included in row 39 and new calculations have been performed to add this study to the meta-analysis.

To make the chart at the top of the sheet show the correct information, you need to renumber the values in column A (row 32-39). Start at cell A39 and enter '1', enter '2' in cell A38, enter '3' in cell A37 and so on up to '8' in cell A32.

The new study is now at the bottom of the chart. If the information is entered in correctly the effect size for the new study is 0.54 (check in cell I39).

Adding this new study has changed the random effects pooled effect size (see cell D16) from:

d=0.201	95%CI: -0.084 to 0.485	p=1.671x10 <sup>-1</sup> = 0.17
to		
d=0.263	95%CI: 0.003 to 0.523	p=4.779x10 <sup>-2</sup> = 0.048

Hence the addition of this hypothetical study has increased the evidence that the putamen is larger in bipolar disorder.

The main summary sheet in the meta-analysis excel file will now be updated with the new effect size and will also be displayed on the summary graph. If you wish to change the method of meta-analysis, such as using % increases in volume, this can be achieved by changing the switches on the main summary sheet. Enter 1 into cell C82 to select a percentage change meta-analysis; you will now need to view the sheet ‘%Effect size’ to see the results. The volume as a percentage of the control group can be found in column L of the %Effect size sheet.

#### For left and right putamen

The above is repeated for the left and right putamen (the row numbers will obviously be different). The process is quicker because you will not have to enter the new study information again by hand. Simply copy row 29 from the ‘Put’ sheet.

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