User Guide for
Meta_Analysis.xls

This meta-analysis software implements the methods discussed by DerSimonian and Kacker (2007). This User's Guide describes and illustrates the input/output screens with two examples.

NOTE: To open/start the program, enable macros when prompted.

INPUT

Figure 1A (page 4) provides a view of a blank input screen. The input screen allows the user to include a title, select the input data method, select the measure / scale of interest, select the level for confidence intervals, and run the analysis using the "CLICK TO RUN META-ANALYSIS MODELS" button. These options are described in this section and are illustrated in Figures 2A-3A (pages 5-6).

Project label

This box allows specification of a title.

Select input data method

Enter binary data **(Example shown in Figure 2A)**

This selection is appropriate when the data available from each trial include the "Sample size" and the "Number of events" from the "Treated group" and the "Control group". Cells with zero counts are not allowed with this data input option.

Enter observed estimates **(Example shown in Figure 3A)**

This selection is appropriate for binary outcome data when sample sizes and number of events from individual studies are not available, when there are cells with zero counts, or when summary statistics and corresponding sampling variances other than those described in DerSimonian and Laird (1986) are desired. This data entry selection is also the appropriate choice for continuous outcomes.

Select outcome measure / scale

Mean **(including difference in proportions)**

With the "Enter binary data" option, this selection generates estimate of difference in proportions (with corresponding sampling variance) for each study and executes the program in this scale.

With the "Enter observed estimates" data input option, this selection allows entry of a summary statistic (e.g., mean, proportion, or difference in proportions) as well as the corresponding sampling variance estimate for each study **(Figure 3A)**.

Log relative risk

With the "Enter binary data" option, this selection generates estimate of relative risk and log relative risk (with corresponding sampling variance) for each study and executes the program in the log relative risk scale **(Figure 2A)**.

With the "Enter observed estimates" data input option, this selection allows entry of a log relative risk estimate as well as a corresponding sampling variance estimate for each study.

Log odds ratio

With the "Enter binary data" option, this selection generates estimate of odds ratio and log odds ratio (with corresponding sampling variance) for each study and executes the program in the log odds ratio scale.

With the "Enter observed estimates" data input option, this selection allows entry of a log odds ratio estimate as well as a corresponding sampling variance estimate for each study.

Select level for confidence interval

This box is used to select the level for the confidence interval calculated for each method.

Data entry cells

The "Study identifier" cells allow specification of an ID for each study, and the remaining white cells allow for data entry from each study. The white cells that require data entry correspond to the selected data input option. The grey cells are filled in by the software.

OUTPUT

The output screen presents the title, the selected measure / scale, the number of studies, the selected level for the confidence intervals, a table of results, a chi-square statistic for the test of heterogeneity, and the p-value with degrees of freedom. Figure 1B provides a view of a blank output screen while Figures 2B-3B provide output screens corresponding to input data in Figures 2A-3A.

Corresponding to the selected scale in the input screen, the table of results in the output screen includes inter-study variance estimates from the five methods described in DerSimonian and Kacker (2007). Based on each inter-study variance estimate as well as for the fixed model, the output screen provides overall mean and standard error estimates with corresponding confidence limits **(Figure 3B)**. For the log odds and log relative risk scales, it provides overall treatment effect estimates and corresponding confidence limits in the retransformed scales **(Figure 2B)**. With binary data input and 'mean' outcome measure selection, the output screen displays the results for difference in proportions.

NOTE: The program file with a specific data set and corresponding Input/Output screens can be saved for future reference and recalculations.

REFERENCES

DerSimonian R, Kacker R. "Random-effects Model for Meta-analysis of Clinical Trials: An update." Con Clinical Trials 2007; 28:105-114.

DerSimonian R, Laird N. "Meta-analysis in Clinical Trials". Con Clinical Trials 1986; 7: 177-188, 1986.

Figure 1A

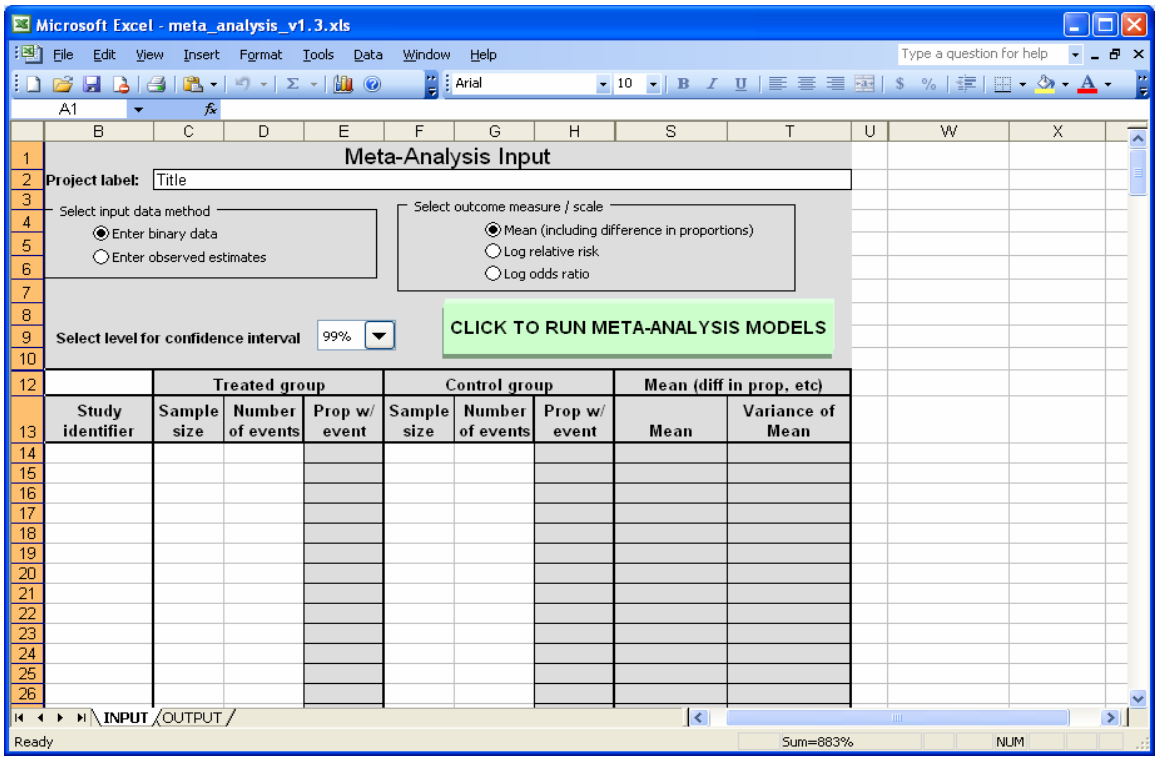


Figure 1B

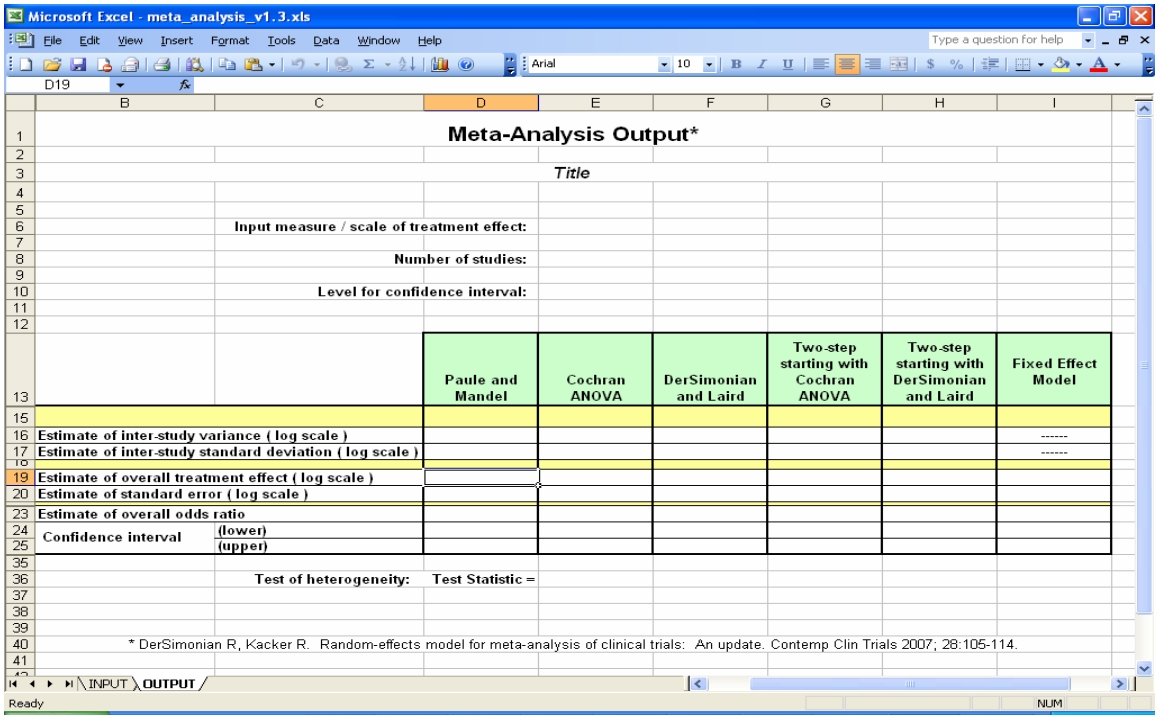
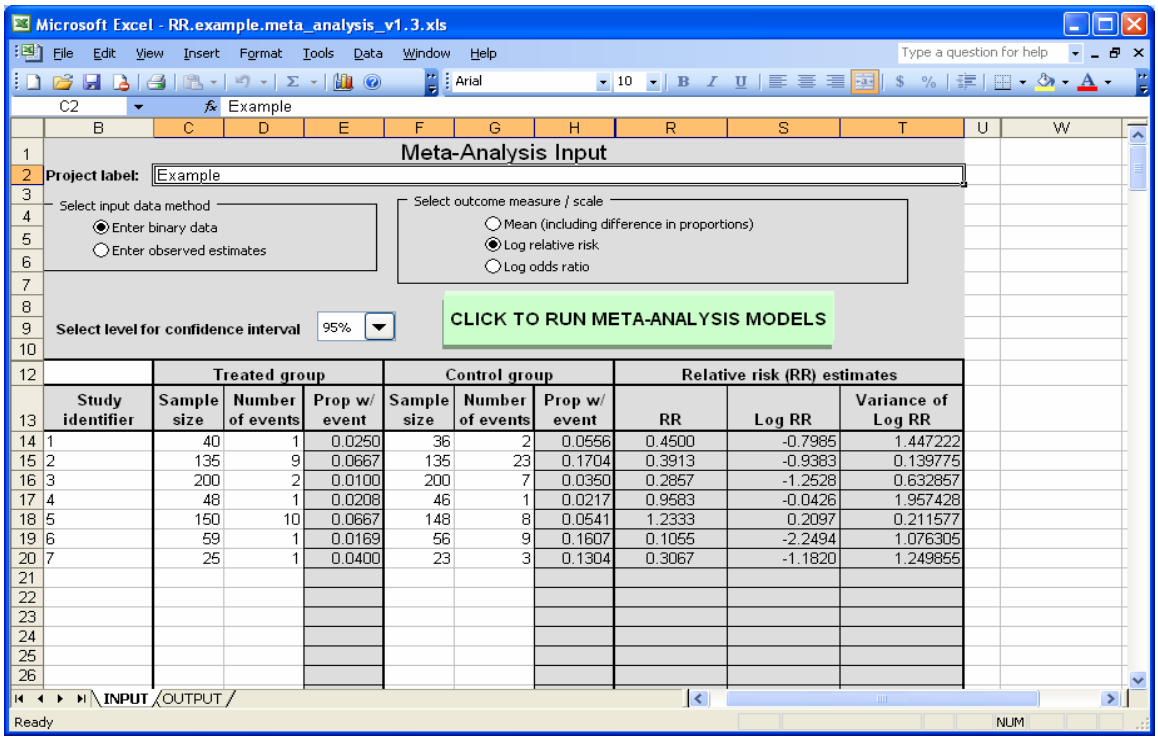


Figure 2A



Microsoft Excel - RR.example.meta_analysis_v1.3.xls

File Edit View Insert Format Tools Data Window Help

Meta-Analysis Input

Project label: Example

Select input data method
- (•) Enter binary data
- ( ) Enter observed estimates

Select outcome measure / scale
- ( ) Mean (including difference in proportions)
- (•) Log relative risk
- ( ) Log odds ratio

Select level for confidence interval: 95%

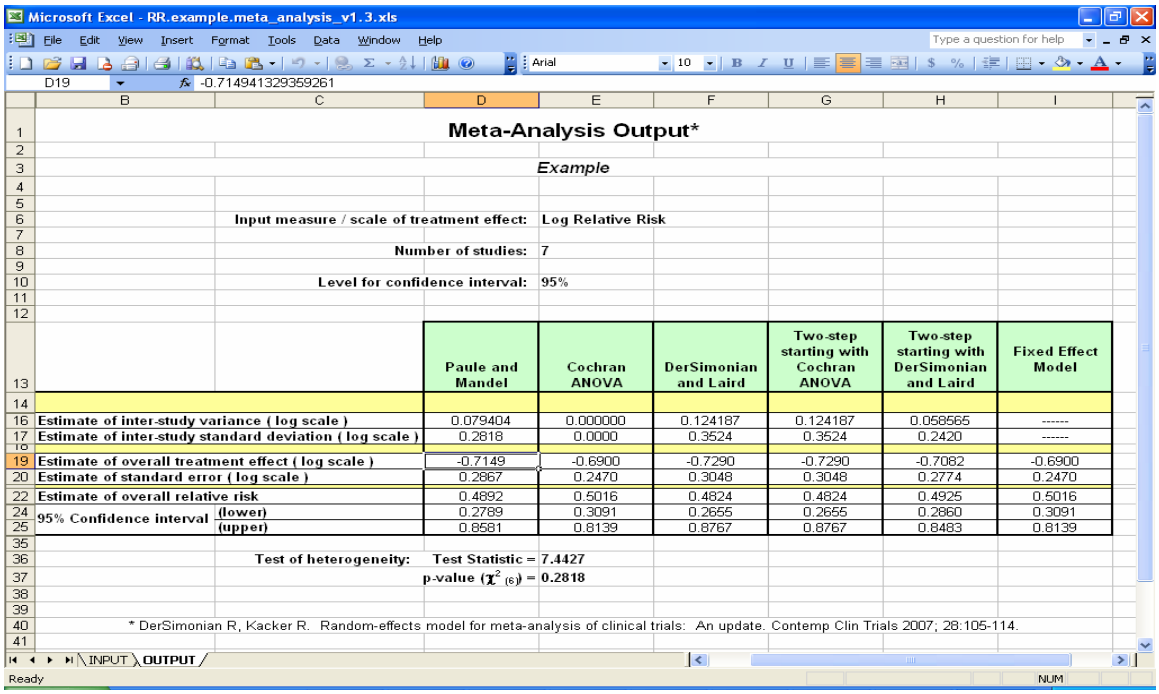
CLICK TO RUN META-ANALYSIS MODELS

Study identifier	Treated group: Sample size	Treated group: Number of events	Treated group: Prop w/ event	Control group: Sample size	Control group: Number of events	Control group: Prop w/ event	Relative risk (RR) estimates: RR	Relative risk (RR) estimates: Log RR	Relative risk (RR) estimates: Variance of Log RR
1	40	1	0.0250	36	2	0.0556	0.4500	-0.7985	1.447222
2	135	9	0.0667	135	23	0.1704	0.3913	-0.9383	0.139775
3	200	2	0.0100	200	7	0.0350	0.2857	-1.2528	0.632857
4	48	1	0.0208	46	1	0.0217	0.9583	-0.0426	1.957428
5	150	10	0.0667	148	8	0.0541	1.2333	0.2097	0.211577
6	59	1	0.0169	56	9	0.1607	0.1055	-2.2494	1.076305
7	25	1	0.0400	23	3	0.1304	0.3067	-1.1820	1.249855

INPUT OUTPUT

Ready NUM

Figure 2B



Microsoft Excel - RR.example.meta_analysis_v1.3.xls

Meta-Analysis Output*

Example

Input measure / scale of treatment effect: Log Relative Risk

Number of studies: 7

Level for confidence interval: 95%

	Paule and Mandel	Cochran ANOVA	DerSimonian and Laird	Two-step starting with Cochran ANOVA	Two-step starting with DerSimonian and Laird	Fixed Effect Model
Estimate of inter-study variance (log scale)	0.079404	0.000000	0.124187	0.124187	0.058565	------
Estimate of inter-study standard deviation (log scale)	0.2818	0.0000	0.3524	0.3524	0.2420	------
Estimate of overall treatment effect (log scale)	-0.7149	-0.6900	-0.7290	-0.7290	-0.7082	-0.6900
Estimate of standard error (log scale)	0.2867	0.2470	0.3048	0.3048	0.2774	0.2470
Estimate of overall relative risk	0.4892	0.5016	0.4824	0.4824	0.4925	0.5016
95% Confidence interval (lower)	0.2789	0.3091	0.2655	0.2655	0.2860	0.3091
95% Confidence interval (upper)	0.8581	0.8139	0.8767	0.8767	0.8483	0.8139

Test of heterogeneity: Test Statistic = 7.4427

p-value ($\chi^2_{(6)}$) = 0.2818

* DerSimonian R, Kacker R. Random-effects model for meta-analysis of clinical trials: An update. Contemp Clin Trials 2007; 28:105-114.

INPUT OUTPUT

Ready NUM

Figure 3A

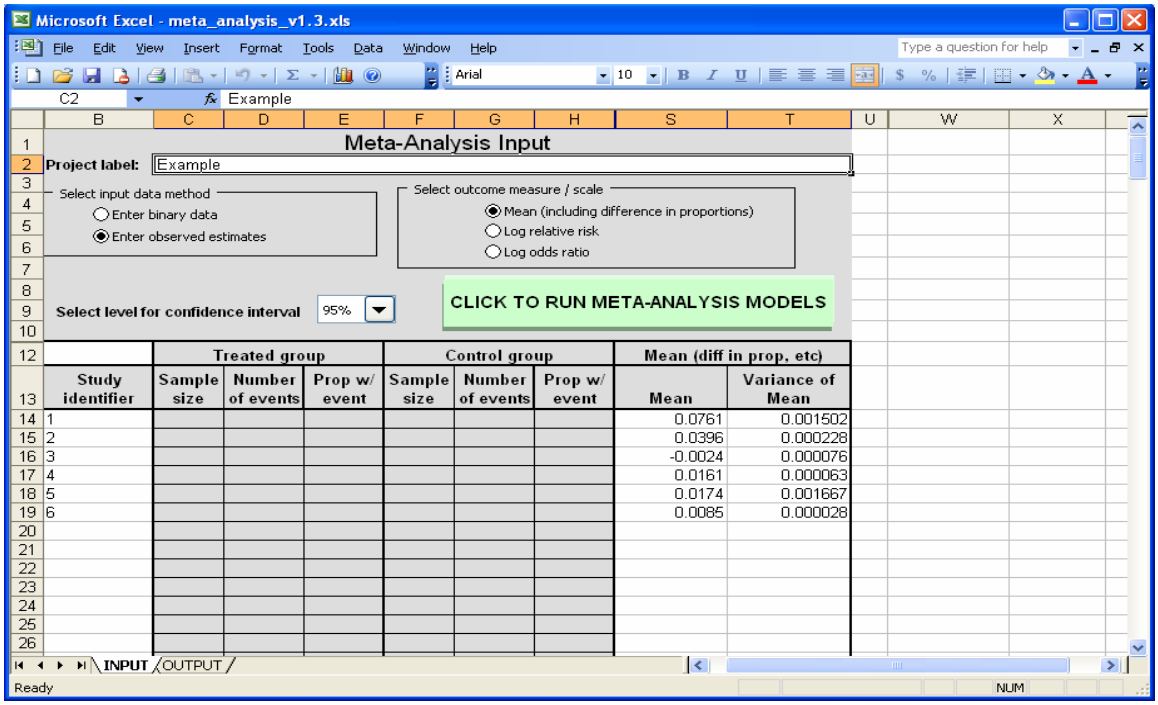


Figure 3B