

MIX 2.0



Using the Data Converter

Prerequisites

None.

Summary of the tutorial content

Practical examples of the use of the data converter inside MIX 2.0 and a description of the conversion details.

Content

1. Description of the data converter
2. Preparing data
3. Example 1: Converting odds ratios with confidence intervals to log odds ratios with standard errors
4. Example 2: Converting correlation coefficients with sample size to Fisher's z with standard errors
5. Example 3: Converting rates and sample size (proportions) to double arc sine with standard errors
6. Appendix: Numerical details

Description of the data converter

The data converter in MIX 2.0 Pro is part of the ‘Data wizard’. The converter is designed to allow researcher to get their data ‘in shape’ for meta-analysis with MIX 2.0. For example, some case control studies may have reported odds ratios with confidence intervals, but MIX 2.0 (like most other meta-analysis software) requires log odds ratios with standard errors. The data converter can convert such data to make them compatible with the data entry. MIX 2.0 Pro has facilities to automatically provide the results from converted measures on the original scale (default); alternatively the user can use to use the converted scale in the presentation of the end results. For example, if a log odds ratio is entered with standard errors MIX 2.0 will by default present odds ratios with confidence intervals in the meta-analysis results. The numerical settings dialog allows the user to turn off this feature.

Currently, the following conversions are available:

Binary data		
Odds ratio with CI	>	Log odds ratio with SE
Risk ratio with CI	>	Log risk ratio with SE
Hazard ratio with CI	>	Log hazard ratio with SE
Log odds ratio with SE	>	Cohen’s d with SE
	>	Hedges’ g with SE

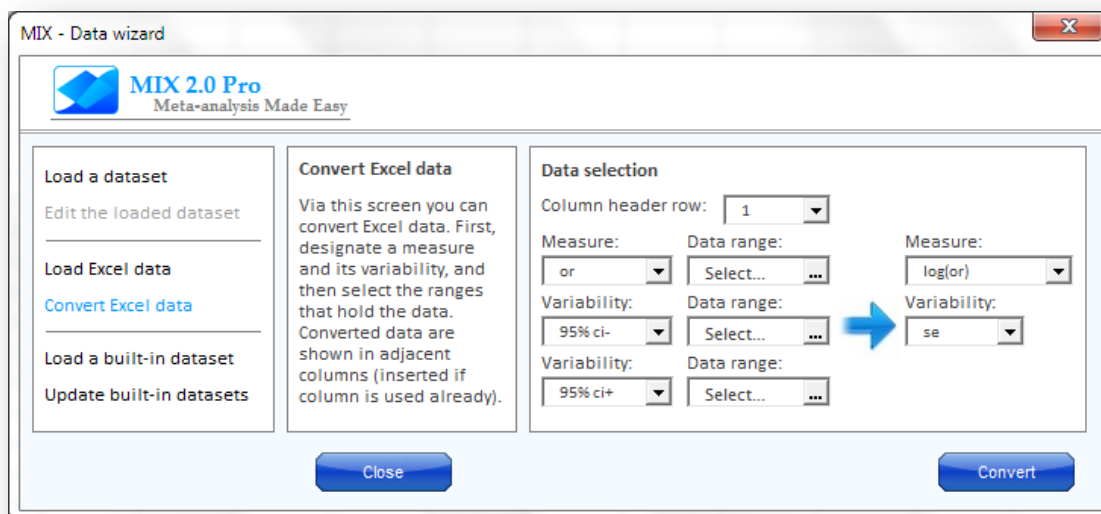
Continuous data		
Paired mean difference with SD and N	>	Paired mean difference with SE
	>	Cohen’s d with SE
	>	Hedges’ g with SE

Correlations		
Correlation coefficient with N	>	Fisher’s z with SE
	>	Cohen’s d with SE
	>	Hedges’ g with SE

Event data		
Event rate and N	>	Freeman-Tukey double arcsine with SE
	>	Logit with SE
Event rate and person years	>	Log incidence rate with SE

CI=confidence interval, SE=standard error, SD=standard deviation, N=sample size

The converter looks like this:



Preparing data

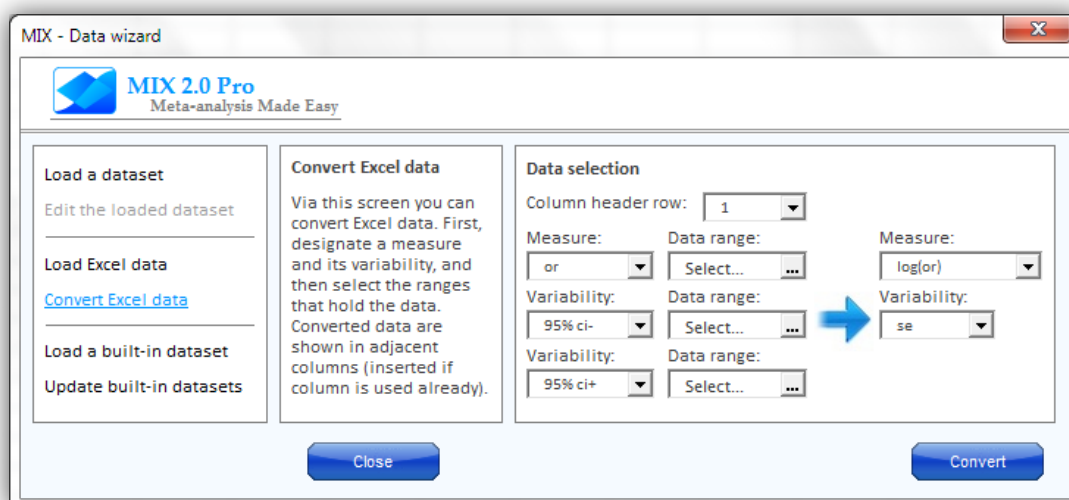
The first requirement to use the data converter is to have data in an Excel file. Excel can import many types of files and virtually every statistical or data management software can export files in CSV format (CSV files can be imported automatically with Excel). Alternatively, you can copy-paste data from tables in many applications directly into Excel or you could even do the data entry entirely in Excel.

Example 1: Converting odds ratios with confidence intervals to log odds ratios with standard errors

In the first example, we will assume that you have a dataset with odds ratios and confidence intervals, from clinical trials or, perhaps, from case-control studies. To analyze such datasets in MIX 2.0 Pro (or in other meta-analysis software), you will have to transform the odds ratios to the log scale and calculate standard errors from the log-transformed confidence intervals. Below is a fictional dataset:

Study ID	OR	CI-	CI+
Study 1	0.353455	0.086192	1.449435
Study 2	0.631284	0.293938	1.355792
Study 3	0.83527	0.326025	2.139951
Study 4	0.631284	0.166497	2.393545
Study 5	0.755784	0.419795	1.360686
Study 6	0.66365	0.303011	1.453516
Study 7	0.516851	0.231405	1.154405
Study 8	0.516851	0.287081	0.930521
Study 9	1.682028	0.402213	7.034128
Study 10	0.895834	0.667648	1.202009

When you have this dataset in an Excel file, like we have, you can open the file in an instance of Excel in which MIX 2.0 Pro is active and use the conversion utility in the Data Wizard to make the data compatible with the data entry in MIX 2.0 Pro. When you have the data ready, start the Data Wizard and choose 'Convert Excel data':

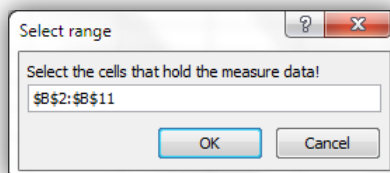


Coincidentally, the converter's default settings are appropriate for this particular conversion. The column headers are in row 1, the measure to transform is the odds ratio (or), the variability measures to transform

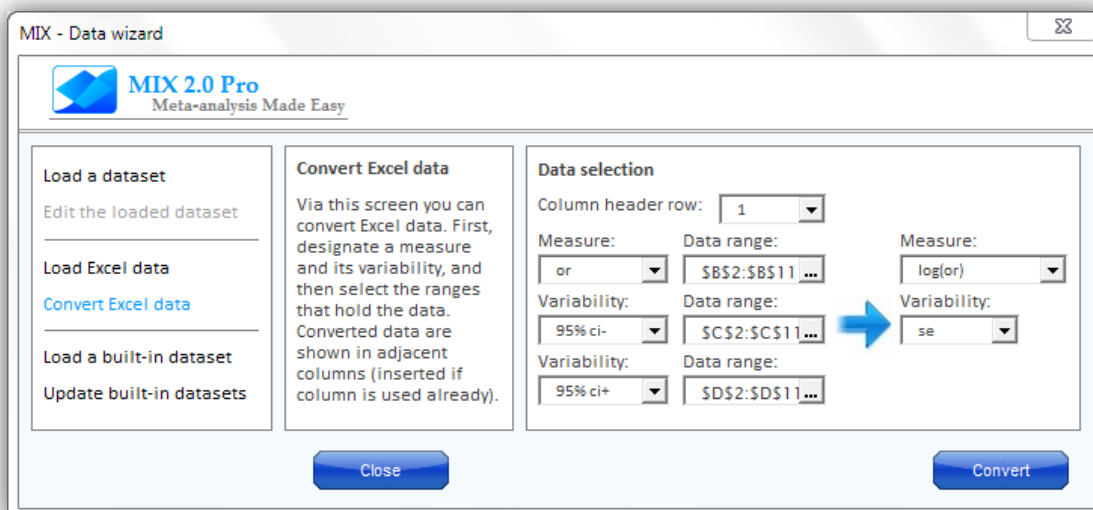
Using the Data Converter

are the confidence intervals and we would like to get a log odds ratio ($\log(\text{or})$) with its standard error (se). All we need to do is select the appropriate data ranges for the measure we want to convert and click 'Convert'. Let's start with the data ranges and click on the first (top) list box that says 'Select...'. The following pop-up will ask you to select the range that holds the odds ratio data. Select the range and click 'OK':

	A	B	C	D
1	Study ID	OR	CI-	CI+
2	Study 1	0.353455	0.086192	1.449435
3	Study 2	0.631284	0.293938	1.355792
4	Study 3	0.83527	0.326025	2.139951
5	Study 4	0.631284	0.166497	2.393545
6	Study 5	0.755784	0.419795	1.360686
7	Study 6	0.66365	0.303011	1.453516
8	Study 7	0.516851	0.231405	1.154405
9	Study 8	0.516851	0.287081	0.930521
10	Study 9	1.682028	0.402213	7.034128
11	Study 10	0.895834	0.667648	1.202009



Repeat this process for the confidence intervals and click 'Convert' in the Data Wizard:



MIX 2.0 will calculate the log odds ratios and standard errors for each study and will enter the data in the spreadsheet next to the original data:

	A	B	C	D	E	F
1	Study ID	OR	CI-	CI+	$\log(\text{or})$	se
2	Study 1	0.353455	0.086192	1.449435	-1.04	0.719987
3	Study 2	0.631284	0.293938	1.355792	-0.46	0.389993
4	Study 3	0.83527	0.326025	2.139951	-0.18	0.479991
5	Study 4	0.631284	0.166497	2.393545	-0.46	0.679988
6	Study 5	0.755784	0.419795	1.360686	-0.28	0.299994
7	Study 6	0.66365	0.303011	1.453516	-0.41	0.399993
8	Study 7	0.516851	0.231405	1.154405	-0.66	0.409992
9	Study 8	0.516851	0.287081	0.930521	-0.66	0.299994
10	Study 9	1.682028	0.402213	7.034128	0.52	0.729987
11	Study 10	0.895834	0.667648	1.202009	-0.11	0.149997

Using the Data Converter

The log odds ratios and the standard error data are directly compatible with data entry methods in the MIX 2.0 Pro Dataset Wizard ('Load Excel data') for generic datasets. For example, let's call the dataset "Odds ratio test" with determinants 'intervention' and 'placebo', and outcome 'disease':

The screenshot shows the 'MIX - Data wizard' dialog box. The 'Description' section is active, showing 'Dataset name: Odds ratio test' and 'Dataset type: generic'. The 'Determinants' field contains 'Intervention, Placebo'. The 'Outcome' is 'Disease', 'Measure' is 'or', and 'Transformed' is 'log'. The 'Load Excel data' section is also visible, with instructions to load data as binary, continuous, or generic datasets. The 'Next >>' button is highlighted.

Clicking 'Next' will get you to the data range selection screen:

The screenshot shows the 'MIX - Data wizard' dialog box at the 'Data selection' step. The 'Load Excel data' section is pre-filled with 'Select data range: \$A\$1:\$F\$11', 'Labels in first row' checked, 'Number of studies: 10', and 'Selection type: log(or) & se'. The 'Data selection' section has 'id' set to column 'A', 'log(or)' to column 'E', and 'se' to column 'F'. The 'OK' button is highlighted.

The settings under 'Load Excel data' are already correct, but we still have to choose the ranges in 'Data selection'. Select column 'A' for the 'id', column 'E' for the 'log(or)' and column 'F' for the 'se'. When you click 'OK' you will be asked to check the data entry:

The screenshot shows the 'Data entry' dialog box with the instruction: 'Check and apply the data entry: Click 'Enter data' when you have checked the data entry and would like to load the data in MIX. Click 'Cancel' if you would like to abort the data entry or start over. When this screen closes you will be brought back to the Data Wizard.' The 'Enter data' button is highlighted.

	A	B	C	D	E	F
1	id	author	year	log(or)	se	N
2	Study 1			-1.04	0.719987	
3	Study 2			-0.46	0.389993	
4	Study 3			-0.18	0.479991	
5	Study 4			-0.46	0.679988	
6	Study 5			-0.28	0.299994	
7	Study 6			-0.41	0.399993	
8	Study 7			-0.66	0.409992	
9	Study 8			-0.66	0.299994	
10	Study 9			0.52	0.729987	
11	Study 10			-0.11	0.149997	

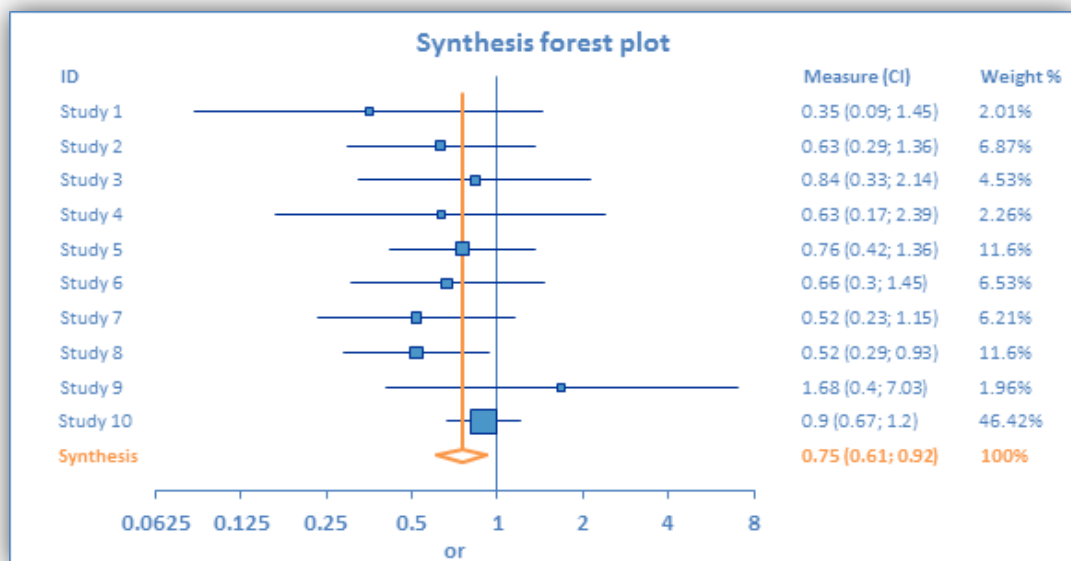
Using the Data Converter

Click 'Enter data' and MIX 2.0 Pro will load the dataset.

	A	B	C	D	E	F
1	Dataset					
2						
3	id	author	year	log(or)	se	N
4	Study 1			-1.04	0.71998677	
5	Study 2			-0.46	0.389992834	
6	Study 3			-0.18	0.47999118	
7	Study 4			-0.46	0.679987505	
8	Study 5			-0.28	0.299994487	
9	Study 6			-0.41	0.39999265	
10	Study 7			-0.66	0.409992466	
11	Study 8			-0.66	0.299994487	
12	Study 9			0.52	0.729986586	
13	Study 10			-0.11	0.149997244	
14						

By default, MIX 2.0 Pro will transform the log odds ratios back to odds ratios for most meta-analysis results, such as the 'Synthesis details' and the 'Synthesis forest plot':

	A	B	C	D	E	F	G	H
1	Synthesis details							
2								
3	id	N	or	ci-	ci+	z	p	w
4	Study 1		0.353454682	0.086194566	1.449397769	-1.444470987	0.148606535	2.01%
5	Study 2		0.631283646	0.293942265	1.355773186	-1.179508853	0.238195613	6.87%
6	Study 3		0.835270211	0.326030147	2.139913538	-0.375006891	0.707655342	4.53%
7	Study 4		0.631283646	0.16650149	2.393486332	-0.676483019	0.498734024	2.26%
8	Study 5		0.755783741	0.419799362	1.360671586	-0.933350484	0.350639037	11.60%
9	Study 6		0.66365025	0.30301554	1.453495272	-1.025018835	0.305354301	6.53%
10	Study 7		0.516851334	0.231408561	1.154388155	-1.609785678	0.107444653	6.21%
11	Study 8		0.516851334	0.287084583	0.930510788	-2.200040426	0.027804027	11.60%
12	Study 9		1.68202765	0.402223483	7.033942911	0.712341857	0.476253111	1.96%
13	Study 10		0.895834135	0.667651335	1.202002836	-0.733346809	0.463346932	46.42%
14								
15			0.749156972	0.61317585	0.915293987	-2.826060558	0.004712435	100%

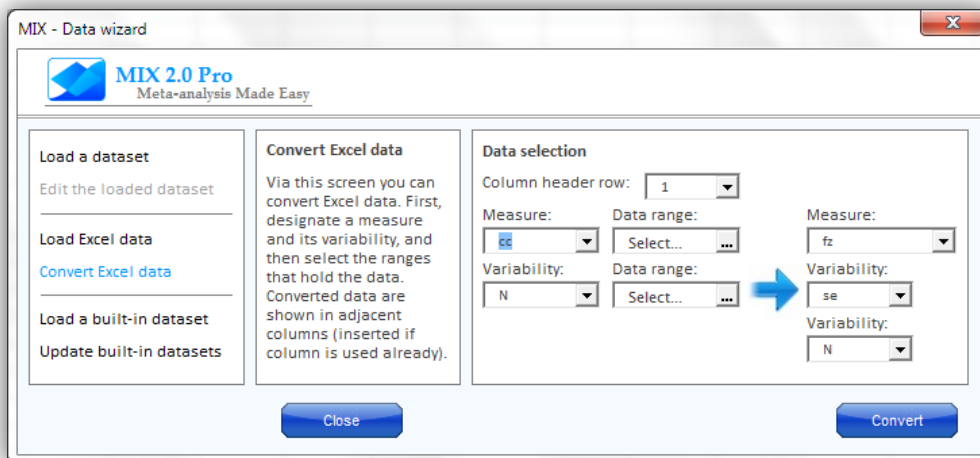


Example 2: Converting correlation coefficients with sample size to Fisher’s z with standard errors

In the second example we will assume that you have a dataset with correlation coefficients and sample sizes. Although you could calculate standard errors for the correlation coefficients, it’s generally recommended to convert a correlation coefficient to Fisher’s z when performing a meta-analysis and transforming the meta-analysis result back. Below is a fictional dataset:

Study ID	cc	N
Study 1	0.5	40
Study 2	0.6	90
Study 3	0.4	25
Study 4	0.2	400
Study 5	0.7	60

When you have this dataset in an Excel file, like we have, you can open the file in an instance of Excel in which MIX 2.0 Pro is active and use the conversion utility in the Data Wizard to make the data compatible with the data entry in MIX 2.0 Pro. When you have the data ready, start the Data Wizard and choose ‘Convert Excel data’. The converter’s default settings are not appropriate for this particular conversion and we must first change the measure we are trying to convert. Instead of odds ratio (or), choose correlation coefficient (cc). The variability will automatically change to sample size (N) and the measure to which the correlation coefficient is transformed is automatically set to Fisher’s z (fz) with a standard error (se) and a sample size (N). The column headers are in row 1, so that can stay as it is.



All we need to do now is select the appropriate data ranges for the measure, like in the previous example, and your result should be as follows:

	A	B	C	D	E	F
1	Study ID	CC	N	fz	se	N
2	Study 1	0.5	40	0.549306	0.164399	40
3	Study 2	0.6	90	0.693147	0.107211	90
4	Study 3	0.4	25	0.423649	0.213201	25
5	Study 4	0.2	400	0.202733	0.050189	400
6	Study 5	0.7	60	0.867301	0.132453	60
7	Study 6	0.45	50	0.4847	0.145865	50

Using the Data Converter

The Fisher's z data can be entered in MIX as a generic dataset. Make sure you choose 'cc' as the measure and 'fz' as the transformation:

MIX - Data wizard

MIX 2.0 Pro
Meta-analysis Made Easy

Load a dataset
Edit the loaded dataset
Load Excel data
Convert Excel data
Load a built-in dataset
Update built-in datasets

Load Excel data
Load Excel data into the MIX program as binary, continuous, or generic datasets.
Start with a description (see the frame on the right). Compulsory fields are indicated with an asterisk (*).

Description
Dataset name: relation coefficient test * Dataset type: generic *
Determinants: Intervention, placebo
Outcome: Disease Measure: cc * Transformed: fz *

Cancel Next >>

In the next screen, choose the appropriate columns for the data and click 'OK'

MIX - Data wizard

MIX 2.0 Pro
Meta-analysis Made Easy

Load a dataset
Edit the loaded dataset
Load Excel data
Convert Excel data
Load a built-in dataset
Update built-in datasets

Load Excel data
Select data range: \$A\$1:\$F\$7
 Labels in first row
Number of studies: 6
Selection type: fz(cc) & se

Data selection
General: id: A, author: -, year: -
Data: fz(cc) D, se E, F
Covariates: first column: -, last column: -

Cancel << Back OK

When you click 'OK' and choose 'Enter data' in the next dialog box, you will be able to analyze your data in MIX. The synthesis results will automatically be shown in terms of correlation coefficients.

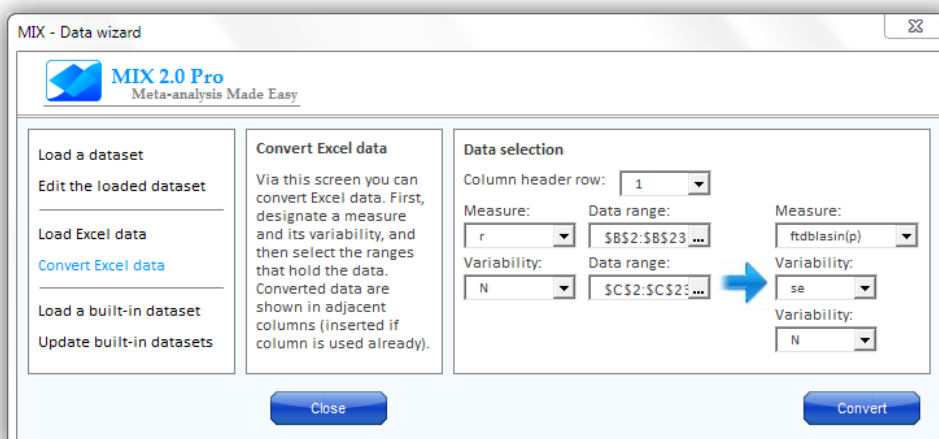
	A	B	C	D	E	F	G	H
1	Synthesis details							
2								
3	id	N	cc	ci-	ci+	z	p	w
4	Study 1		0.5	0.223265259	0.702146716	3.341298832	0.000833874	5.72%
5	Study 2		0.6	0.448656557	0.717889938	6.465246493	1.01134E-10	13.45%
6	Study 3		0.4	0.00578314	0.686610491	1.987089619	0.046912466	3.40%
7	Study 4		0.2	0.103987511	0.292319239	4.039417523	5.35841E-05	61.36%
8	Study 5		0.7	0.542503896	0.809957033	6.54797539	5.83222E-11	8.81%
9	Study 6		0.45	0.196231554	0.647272631	3.322937695	0.000890748	7.26%
10								
11			0.358391447	0.289467467	0.423618098	9.539566695	0	100%

Example 3: Converting rates and sample size (proportions) to Freeman-Tukey double arc sines with standard errors

In the third example we will assume that you have a dataset with single group rates and sample sizes. Calculating standard errors for the probability itself is not recommended because it would result in inaccurate confidence intervals. It is generally recommended to convert a single group rate with a Freeman-Tukey double arc-sine or a logit transformation and calculate a standard error for that entity. When performing a meta-analysis these can be transformed back to a probability scale. Below is a fictional dataset:

Study ID	r	N
Study 1	214	311
Study 2	58	65
Study 3	59	67
Study 4	182	285
Study 5	65	73
Study 6	66	116
Study 7	99	183
Study 8	600	696
Study 9	45	57
Study 10	165	277
Study 11	32	35
Study 12	49	60
Study 13	175	199
Study 14	155	311
Study 15	64	81
Study 16	526	537

When you have the data imported or pasted in Excel, start the Data Wizard and choose “Convert Excel data”. The converter’s default settings are not appropriate for this particular conversion and we must first change the measure we are trying to convert. Choose rate (r) for the measure. The variability will automatically change to sample size (N) and the measure to which the rate is transformed is automatically set to the Freeman-Tukey transform of the probability (ftdblasin(p)) with a standard error (se) and a sample size (N). The column headers are in row 1, so that can stay as it is.



Using the Data Converter

After selection of the appropriate data ranges and clicking 'Convert', your results should be as follows:

	A	B	C	D	E	F
1	Study ID	Rate	N	ftdblasi(p)	se	N
2	Study 1	214	311	0.97759776	0.02833	311
3	Study 2	58	65	1.227135177	0.06178	65
4	Study 3	59	67	1.209569492	0.060858	67
5	Study 4	182	285	0.925330508	0.029591	285
6	Study 5	65	73	1.225166339	0.058321	73
7	Study 6	66	116	0.853991733	0.046324	116
8	Study 7	99	183	0.826204925	0.036911	183
9	Study 8	600	696	1.189538445	0.018946	696
10	Study 9	45	57	1.088097921	0.065938	57
11	Study 10	165	277	0.881309657	0.030015	277
12	Study 11	32	35	1.254456486	0.083918	35
13	Study 12	49	60	1.121740272	0.064282	60
14	Study 13	175	199	1.213241962	0.0354	199
15	Study 14	155	311	0.783795588	0.02833	311
16	Study 15	64	81	1.09062193	0.055385	81
17	Study 16	526	537	1.424101066	0.021567	537

The Freeman-Tukey double arc-sine transformed probabilities can be entered in MX as a generic dataset. Make sure you choose probability 'p' as the measure and 'ftdblasi' as the transformation:

MIX - Data wizard

MIX 2.0 Pro
Meta-analysis Made Easy

Load a dataset
Edit the loaded dataset
Load Excel data
Convert Excel data
Load a built-in dataset
Update built-in datasets

Load Excel data
Load Excel data into the MIX program as binary, continuous, or generic datasets.
Start with a description (see the frame on the right). Compulsory fields are indicated with an asterisk (*).

Description
Dataset name: Rates test *
Dataset type: generic *
Determinants:
Outcome: Disease event
Measure: p *
Transformed: ftdblasi *

Cancel Next >>

In the next screen, choose the appropriate columns for the data, choose 'Enter data' and the dataset will be loaded. The synthesis results will be shown in terms of probabilities:

	A	B	C	D	E	F	G	H
1	Synthesis details							
2								
3	id	N	p	ci-	ci+	z	p	w
4	Study 1	311	0.688102894	0.635412098	0.738476265	34.50795466	0	9.27%
5	Study 2	65	0.892307692	0.803666388	0.957932305	19.86291807	0	1.95%
6	Study 3	67	0.880597015	0.790572011	0.948976333	19.87525486	0	2.01%
7	Study 4	285	0.638596491	0.581853563	0.693476586	31.27014772	0	8.49%
8	Study 5	73	0.890410959	0.807065696	0.953358861	21.00722666	0	2.19%