Example name	SKIV
Effect size	Odds ratio
Analysis type	Basic analysis, Cumulative analysis
Level	Basic

Synopsis

This analysis includes 33 studies where patients who had suffered an MI were randomized to be treated with either streptokinase or placebo. Outcome was death, and we focused on the odds ratio as the effect size.

We use this example to show

- How to enter data from 2x2 tables
- How to get a sense of the weight assigned to each study
- How the study weights are affected by the model
- How to perform a cumulative analysis

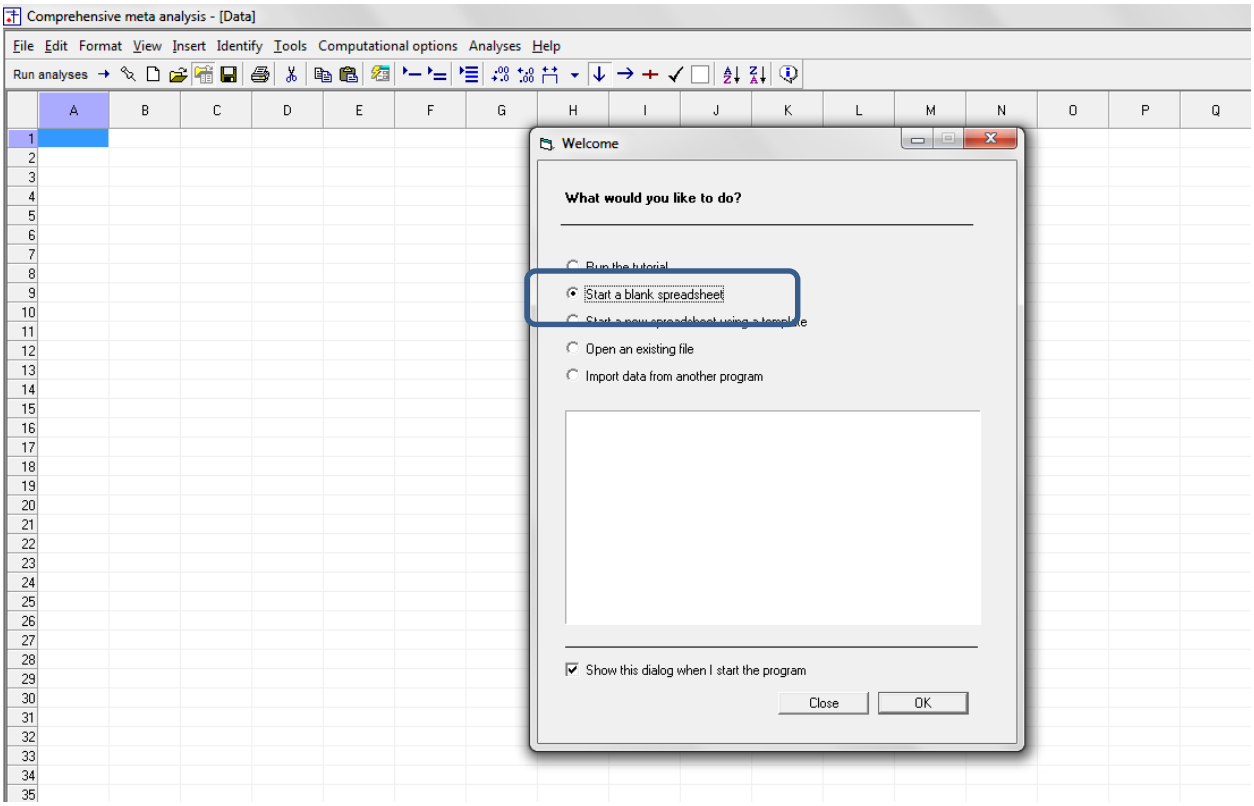
To open a CMA file > Download and Save file | Start CMA | Open file from within CMA

Download CMA file for computers that use a period to indicate decimals
Download CMA file for computers that use a comma to indicate decimals

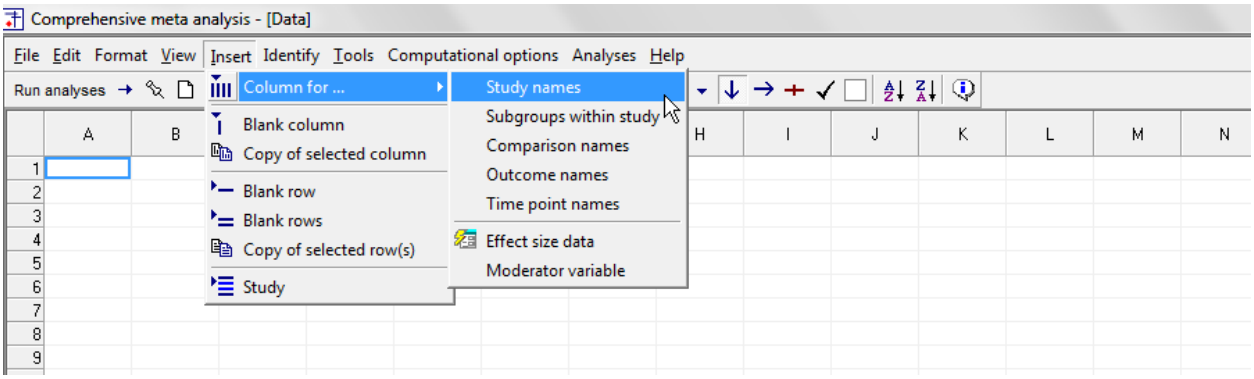
Download this PDF
Download data in Excel
Download trial of CMA

Start the program

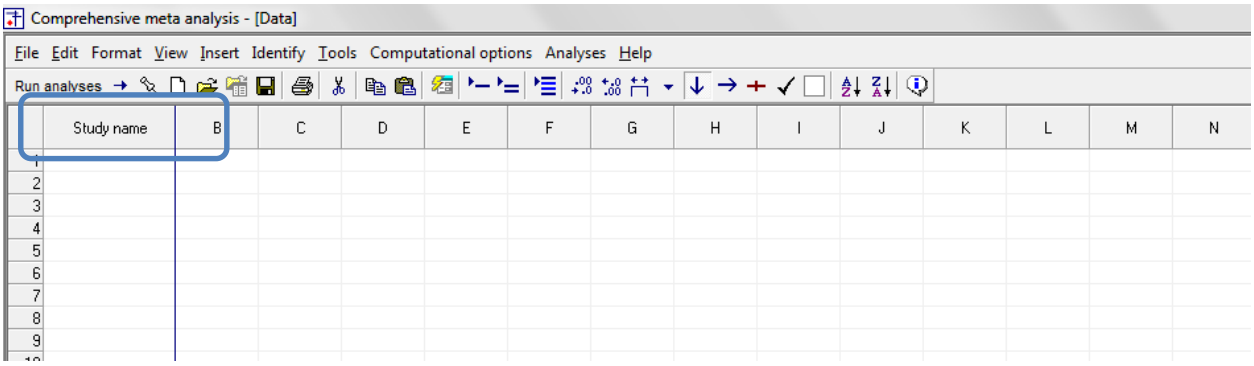
- Select the option [Start a blank spreadsheet]
- Click [Ok]



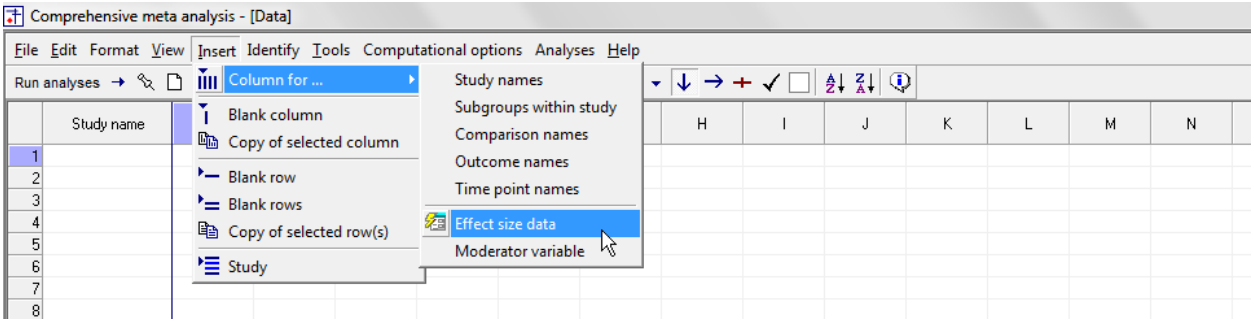
Click Insert > Column for > Study names



The screen should look like this

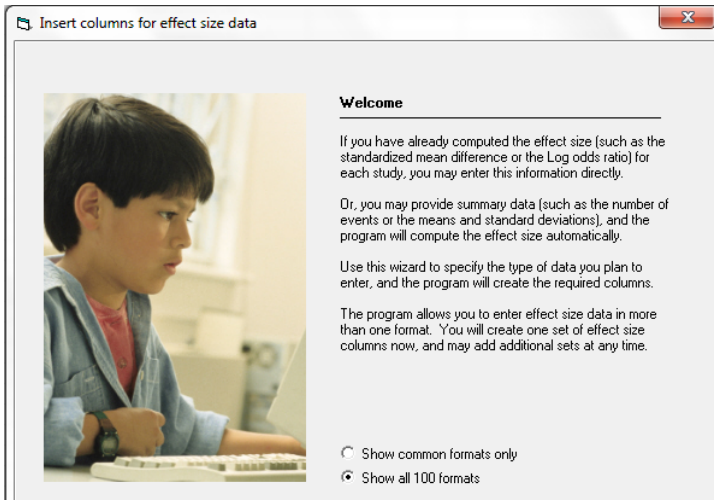


Click Insert > Column for > Effect size data

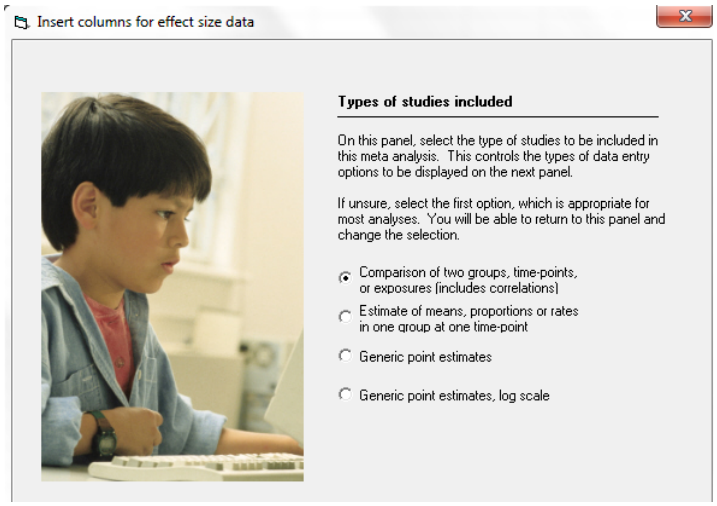


The program displays this wizard

Select [Show all 100 formats]
Click [Next]

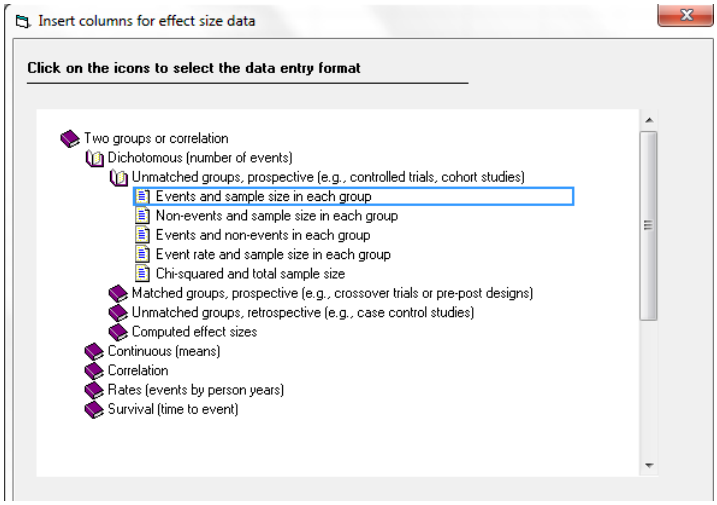


Select [Comparison of two groups…]
Click [Next]



Drill down to

Dichotomous (number of events)
Unmatched groups, prospective …
Events and sample size in each group

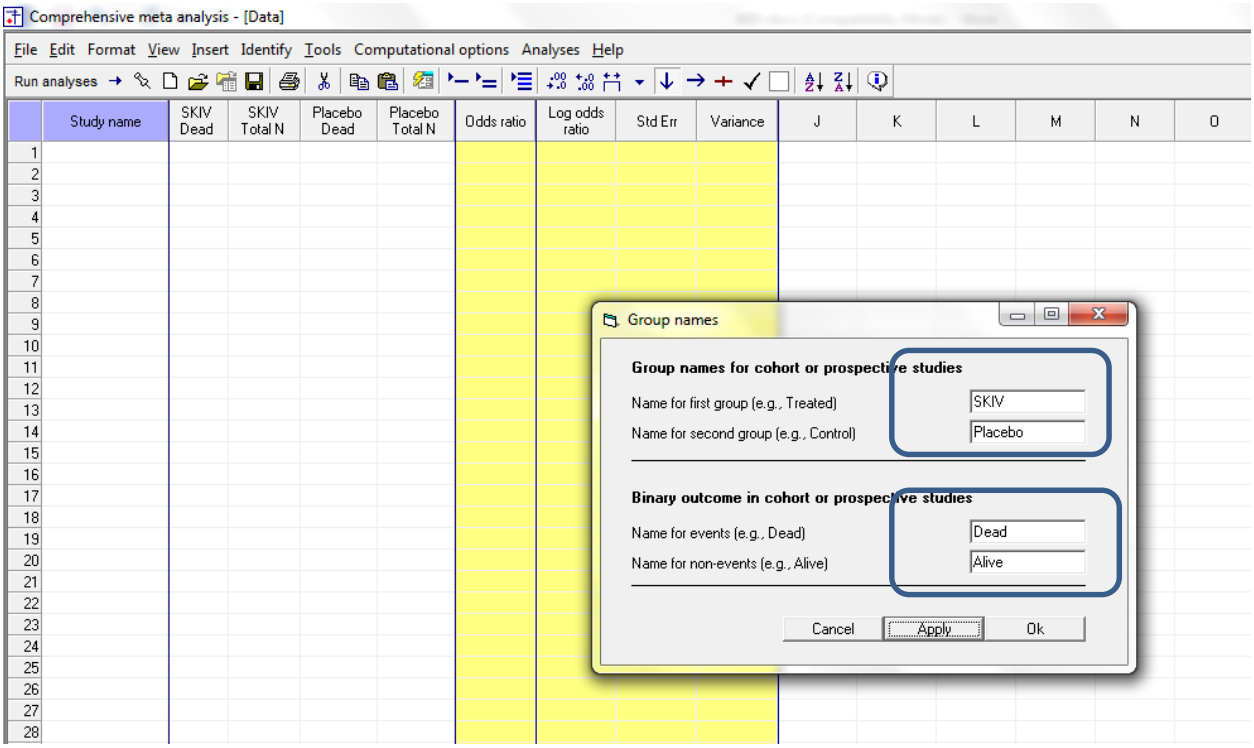


The program displays this wizard

Enter the following labels into the wizard

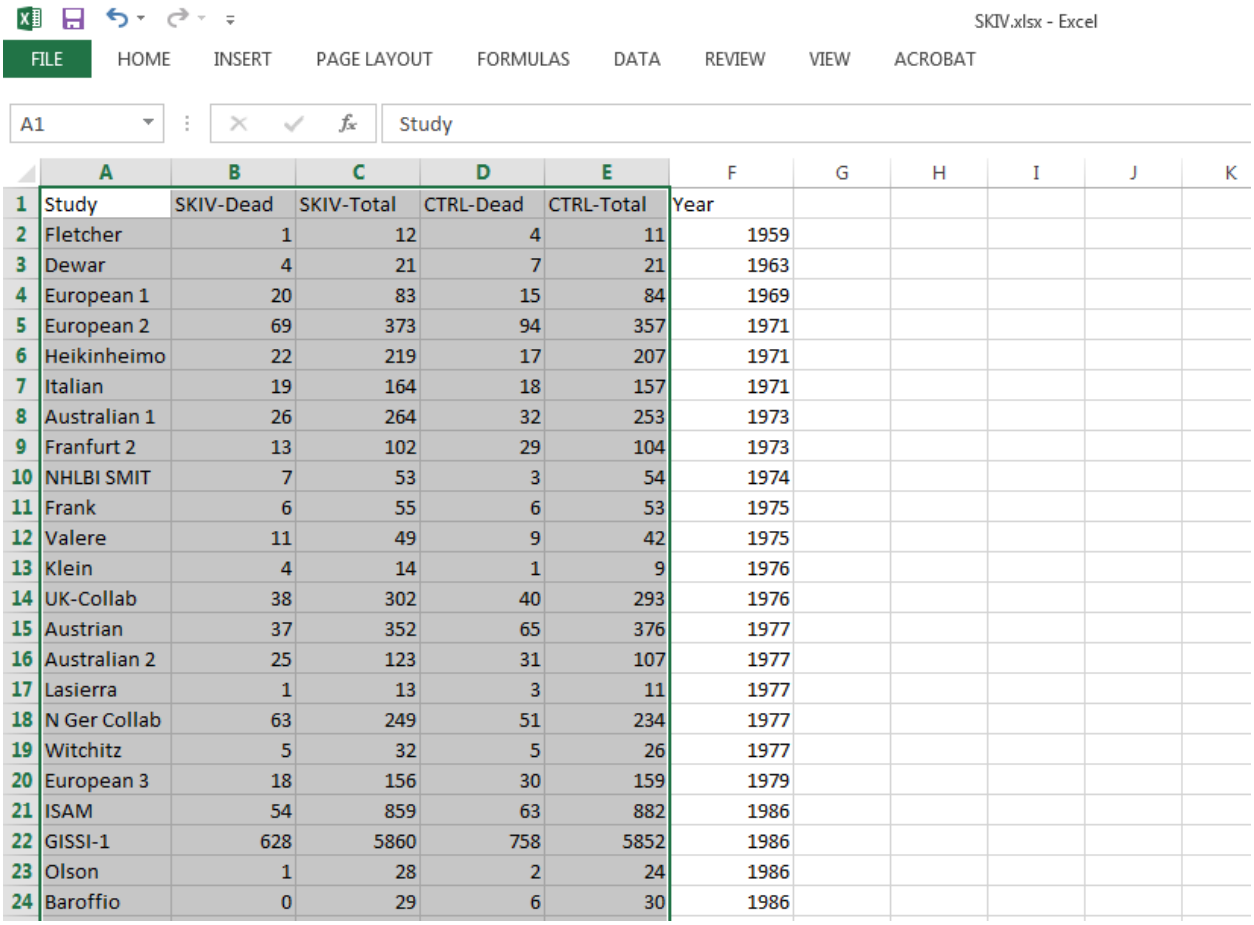
- First group > SKIV
- Second group > Placebo
- Name for events > Dead
- Name for non-events > Alive

Click [Ok] and the program will copy the names into the grid



Rather than enter the data directly into CMA we will copy the data from Excel

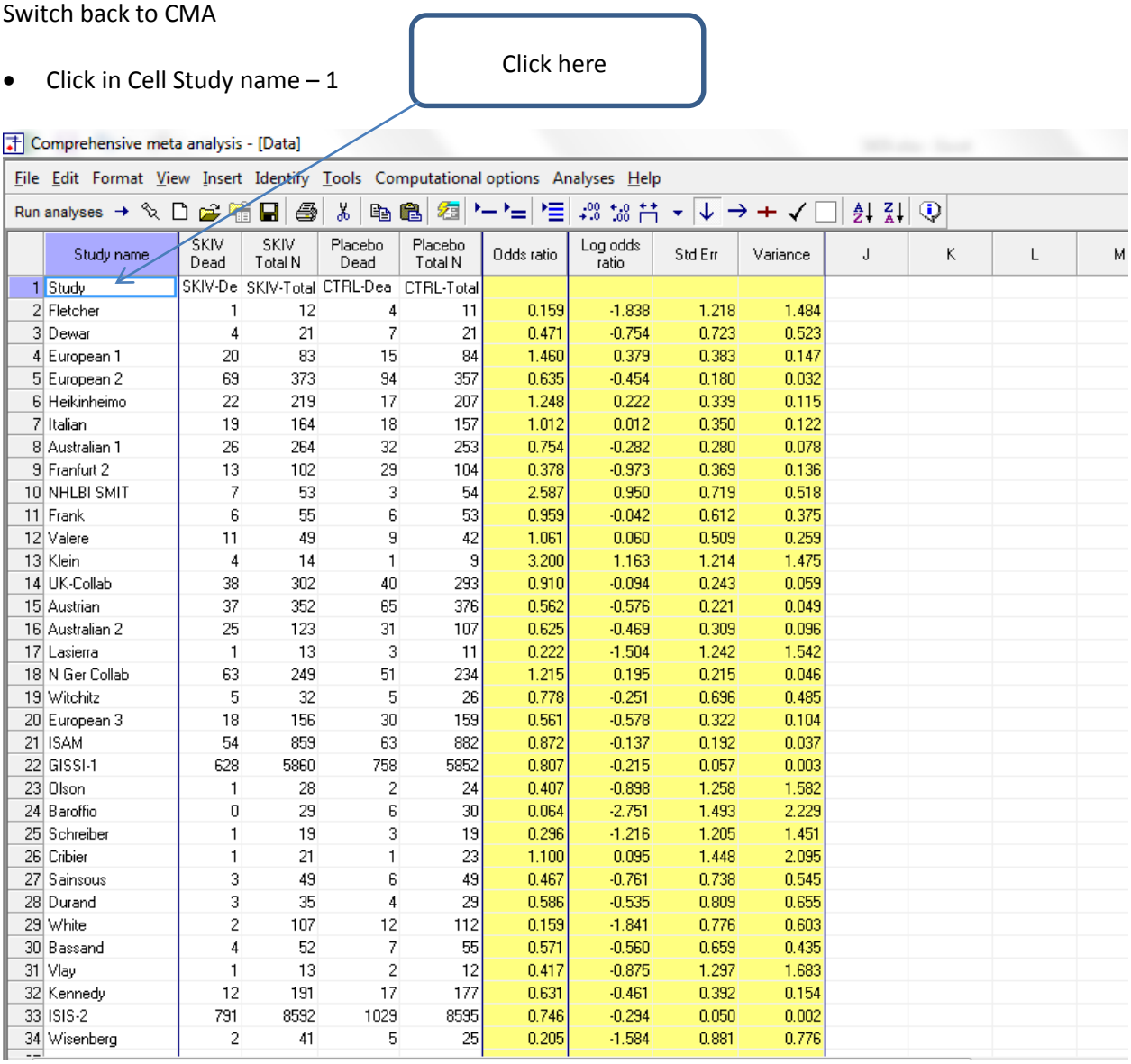
- Switch to Excel and open the file “SKIV”
- Highlight columns (A to E) rows (1 to 34) and press CTRL-C to copy to clipboard



	A	B	C	D	E	F	G	H	I	J	K
1	Study	SKIV-Dead	SKIV-Total	CTRL-Dead	CTRL-Total	Year					
2	Fletcher	1	12	4	11	1959					
3	Dewar	4	21	7	21	1963					
4	European 1	20	83	15	84	1969					
5	European 2	69	373	94	357	1971					
6	Heikinheimo	22	219	17	207	1971					
7	Italian	19	164	18	157	1971					
8	Australian 1	26	264	32	253	1973					
9	Franfurt 2	13	102	29	104	1973					
10	NHLBI SMIT	7	53	3	54	1974					
11	Frank	6	55	6	53	1975					
12	Valere	11	49	9	42	1975					
13	Klein	4	14	1	9	1976					
14	UK-Collab	38	302	40	293	1976					
15	Austrian	37	352	65	376	1977					
16	Australian 2	25	123	31	107	1977					
17	Lasierra	1	13	3	11	1977					
18	N Ger Collab	63	249	51	234	1977					
19	Witchitz	5	32	5	26	1977					
20	European 3	18	156	30	159	1979					
21	ISAM	54	859	63	882	1986					
22	GISSI-1	628	5860	758	5852	1986					
23	Olson	1	28	2	24	1986					
24	Baroffio	0	29	6	30	1986					

Switch back to CMA

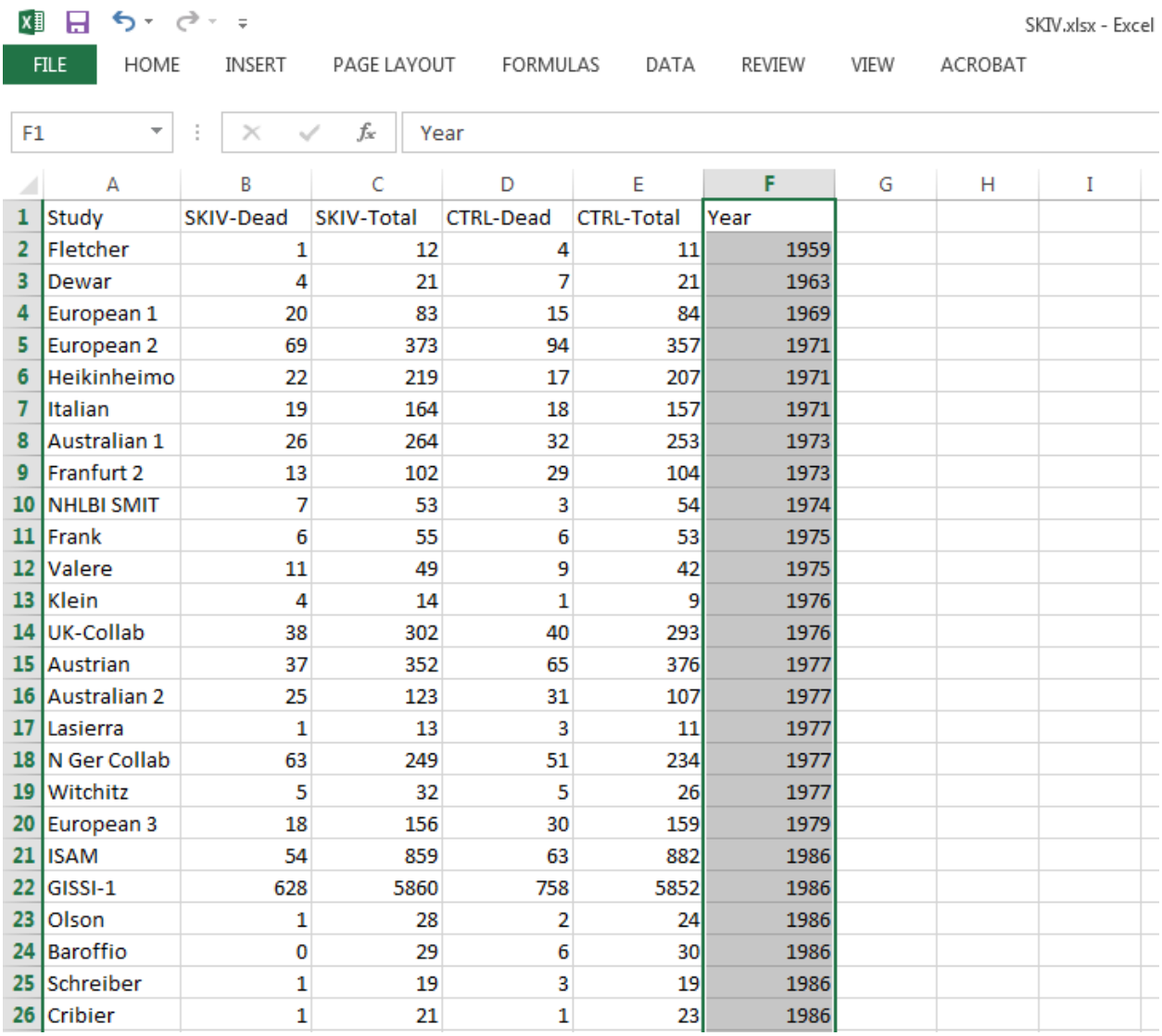
- Click in Cell Study name – 1



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	J	K	L	M
1	Study	SKIV-De	SKIV-Total	CTRL-Dea	CTRL-Total								
2	Fletcher	1	12	4	11	0.159	-1.838	1.218	1.484				
3	Dewar	4	21	7	21	0.471	-0.754	0.723	0.523				
4	European 1	20	83	15	84	1.460	0.379	0.383	0.147				
5	European 2	69	373	94	357	0.635	-0.454	0.180	0.032				
6	Heikinheimo	22	219	17	207	1.248	0.222	0.339	0.115				
7	Italian	19	164	18	157	1.012	0.012	0.350	0.122				
8	Australian 1	26	264	32	253	0.754	-0.282	0.280	0.078				
9	Franfurt 2	13	102	29	104	0.378	-0.973	0.369	0.136				
10	NHLBI SMIT	7	53	3	54	2.587	0.950	0.719	0.518				
11	Frank	6	55	6	53	0.959	-0.042	0.612	0.375				
12	Valere	11	49	9	42	1.061	0.060	0.509	0.259				
13	Klein	4	14	1	9	3.200	1.163	1.214	1.475				
14	UK-Collab	38	302	40	293	0.910	-0.094	0.243	0.059				
15	Austrian	37	352	65	376	0.562	-0.576	0.221	0.049				
16	Australian 2	25	123	31	107	0.625	-0.469	0.309	0.096				
17	Lasierra	1	13	3	11	0.222	-1.504	1.242	1.542				
18	N Ger Collab	63	249	51	234	1.215	0.195	0.215	0.046				
19	Witchitz	5	32	5	26	0.778	-0.251	0.696	0.485				
20	European 3	18	156	30	159	0.561	-0.578	0.322	0.104				
21	ISAM	54	859	63	882	0.872	-0.137	0.192	0.037				
22	GISSI-1	628	5860	758	5852	0.807	-0.215	0.057	0.003				
23	Olson	1	28	2	24	0.407	-0.898	1.258	1.582				
24	Baroffio	0	29	6	30	0.064	-2.751	1.493	2.229				
25	Schreiber	1	19	3	19	0.296	-1.216	1.205	1.451				
26	Cribier	1	21	1	23	1.100	0.095	1.448	2.095				
27	Sainsous	3	49	6	49	0.467	-0.761	0.738	0.545				
28	Durand	3	35	4	29	0.586	-0.535	0.809	0.655				
29	White	2	107	12	112	0.159	-1.841	0.776	0.603				
30	Bassand	4	52	7	55	0.571	-0.560	0.659	0.435				
31	Vlay	1	13	2	12	0.417	-0.875	1.297	1.683				
32	Kennedy	12	191	17	177	0.631	-0.461	0.392	0.154				
33	ISIS-2	791	8592	1029	8595	0.746	-0.294	0.050	0.002				
34	Wisenberg	2	41	5	25	0.205	-1.584	0.881	0.776				

- Press [CTRL-V] to paste the data into CMA
- Stretch the columns as needed for the text to be fully visible

In Excel, copy column F to the clipboard



	A	B	C	D	E	F	G	H	I
1	Study	SKIV-Dead	SKIV-Total	CTRL-Dead	CTRL-Total	Year			
2	Fletcher	1	12	4	11	1959			
3	Dewar	4	21	7	21	1963			
4	European 1	20	83	15	84	1969			
5	European 2	69	373	94	357	1971			
6	Heikinheimo	22	219	17	207	1971			
7	Italian	19	164	18	157	1971			
8	Australian 1	26	264	32	253	1973			
9	Franfurt 2	13	102	29	104	1973			
10	NHLBI SMIT	7	53	3	54	1974			
11	Frank	6	55	6	53	1975			
12	Valere	11	49	9	42	1975			
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14	UK-Collab	38	302	40	293	1976			
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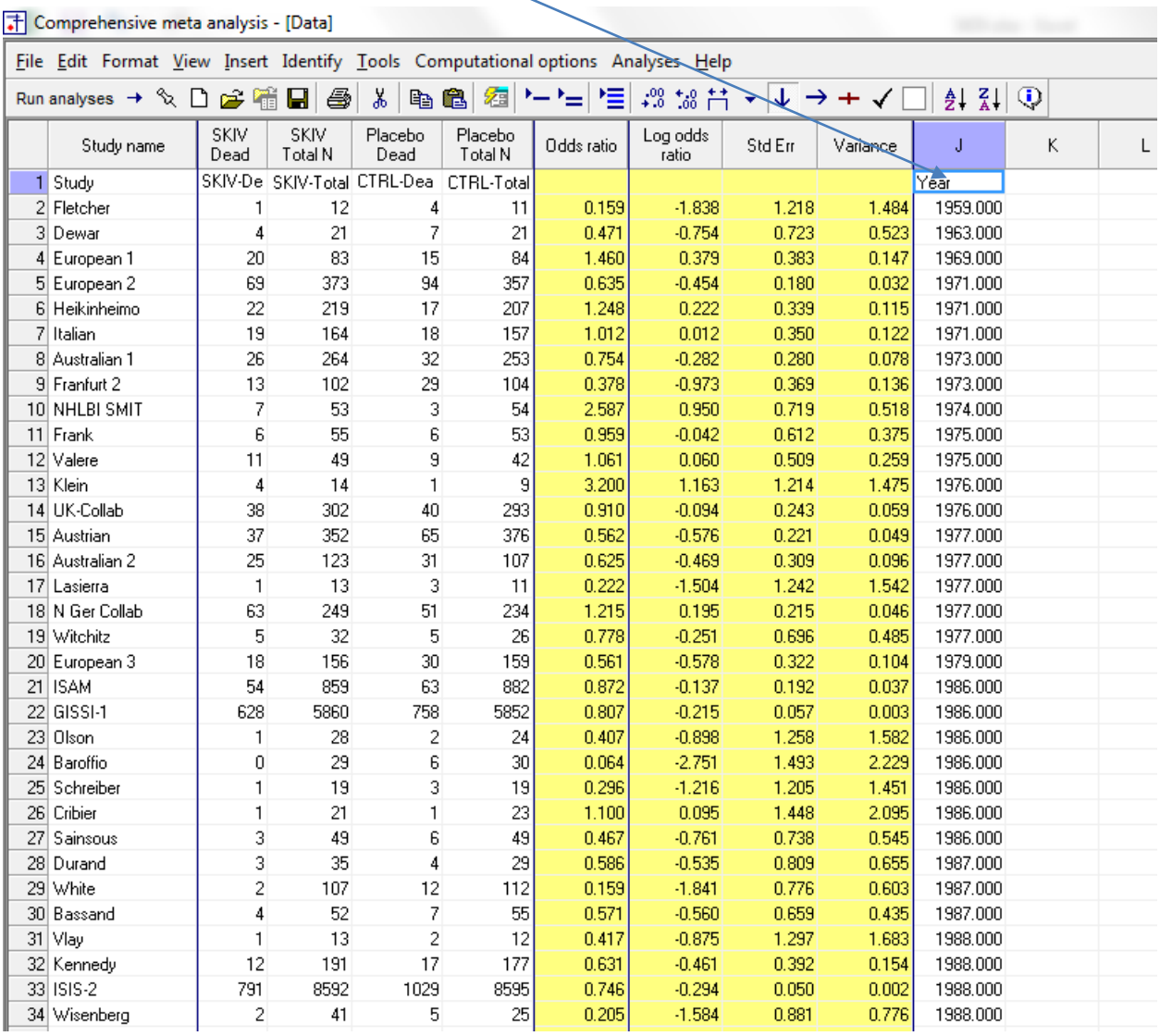
17	Lasierra	1	13	3	11	1977			
18	N Ger Collab	63	249	51	234	1977			
19	Witchitz	5	32	5	26	1977			
20	European 3	18	156	30	159	1979			
21	ISAM	54	859	63	882	1986			
22	GISSI-1	628	5860	758	5852	1986			
23	Olson	1	28	2	24	1986			
24	Baroffio	0	29	6	30	1986			
25	Schreiber	1	19	3	19	1986			
26	Cribier	1	21	1	23	1986			

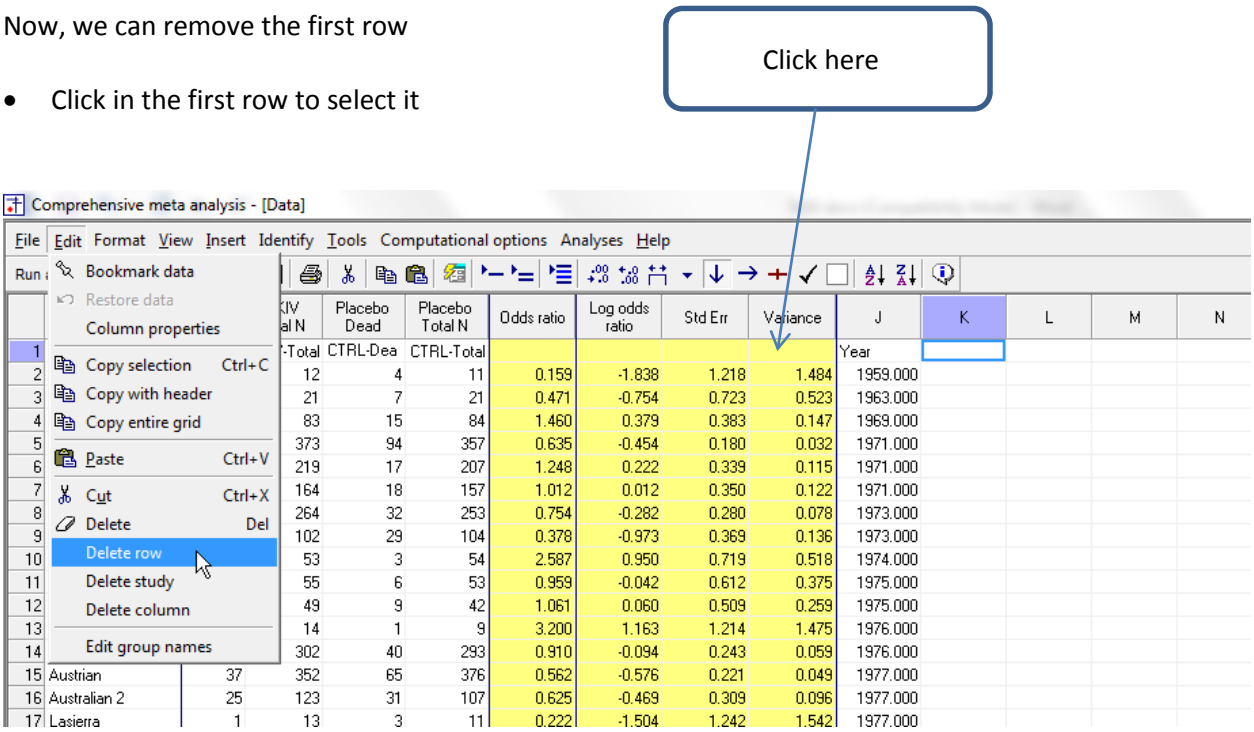
In CMA, click and paste into column J



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	J	K	L
1	Study	SKIV-De	SKIV-Total	CTRL-Dea	CTRL-Total					Year		
2	Fletcher	1	12	4	11	0.159	-1.838	1.218	1.484	1959.000		
3	Dewar	4	21	7	21	0.471	-0.754	0.723	0.523	1963.000		
4	European 1	20	83	15	84	1.460	0.379	0.383	0.147	1969.000		
5	European 2	69	373	94	357	0.635	-0.454	0.180	0.032	1971.000		
6	Heikinheimo	22	219	17	207	1.248	0.222	0.339	0.115	1971.000		
7	Italian	19	164	18	157	1.012	0.012	0.350	0.122	1971.000		
8	Australian 1	26	264	32	253	0.754	-0.282	0.280	0.078	1973.000		
9	Franfurt 2	13	102	29	104	0.378	-0.973	0.369	0.136	1973.000		
10	NHLBI SMIT	7	53	3	54	2.587	0.950	0.719	0.518	1974.000		
11	Frank	6	55	6	53	0.959	-0.042	0.612	0.375	1975.000		
12	Valere	11	49	9	42	1.061	0.060	0.509	0.259	1975.000		
13	Klein	4	14	1	9	3.200	1.163	1.214	1.475	1976.000		
14	UK-Collab	38	302	40	293	0.910	-0.094	0.243	0.059	1976.000		
15	Austrian	37	352	65	376	0.562	-0.576	0.221	0.049	1977.000		
16	Australian 2	25	123	31	107	0.625	-0.469	0.309	0.096	1977.000		
17	Lasierra	1	13	3	11	0.222	-1.504	1.242	1.542	1977.000		
18	N Ger Collab	63	249	51	234	1.215	0.195	0.215	0.046	1977.000		
19	Witchitz	5	32	5	26	0.778	-0.251	0.696	0.485	1977.000		
20	European 3	18	156	30	159	0.561	-0.578	0.322	0.104	1979.000		
21	ISAM	54	859	63	882	0.872	-0.137	0.192	0.037	1986.000		
22	GISSI-1	628	5860	758	5852	0.807	-0.215	0.057	0.003	1986.000		
23	Olson	1	28	2	24	0.407	-0.898	1.258	1.582	1986.000		
24	Baroffio	0	29	6	30	0.064	-2.751	1.493	2.229	1986.000		
25	Schreiber	1	19	3	19	0.296	-1.216	1.205	1.451	1986.000		
26	Cribier	1	21	1	23	1.100	0.095	1.448	2.095	1986.000		
27	Sainsous	3	49	6	49	0.467	-0.761	0.738	0.545	1986.000		
28	Durand	3	35	4	29	0.586	-0.535	0.809	0.655	1987.000		
29	White	2	107	12	112	0.159	-1.841	0.776	0.603	1987.000		
30	Bassand	4	52	7	55	0.571	-0.560	0.659	0.435	1987.000		
31	Vlay	1	13	2	12	0.417	-0.875	1.297	1.683	1988.000		
32	Kennedy	12	191	17	177	0.631	-0.461	0.392	0.154	1988.000		
33	ISIS-2	791	8592	1029	8595	0.746	-0.294	0.050	0.002	1988.000		
34	Wisenberg	2	41	5	25	0.205	-1.584	0.881	0.776	1988.000		

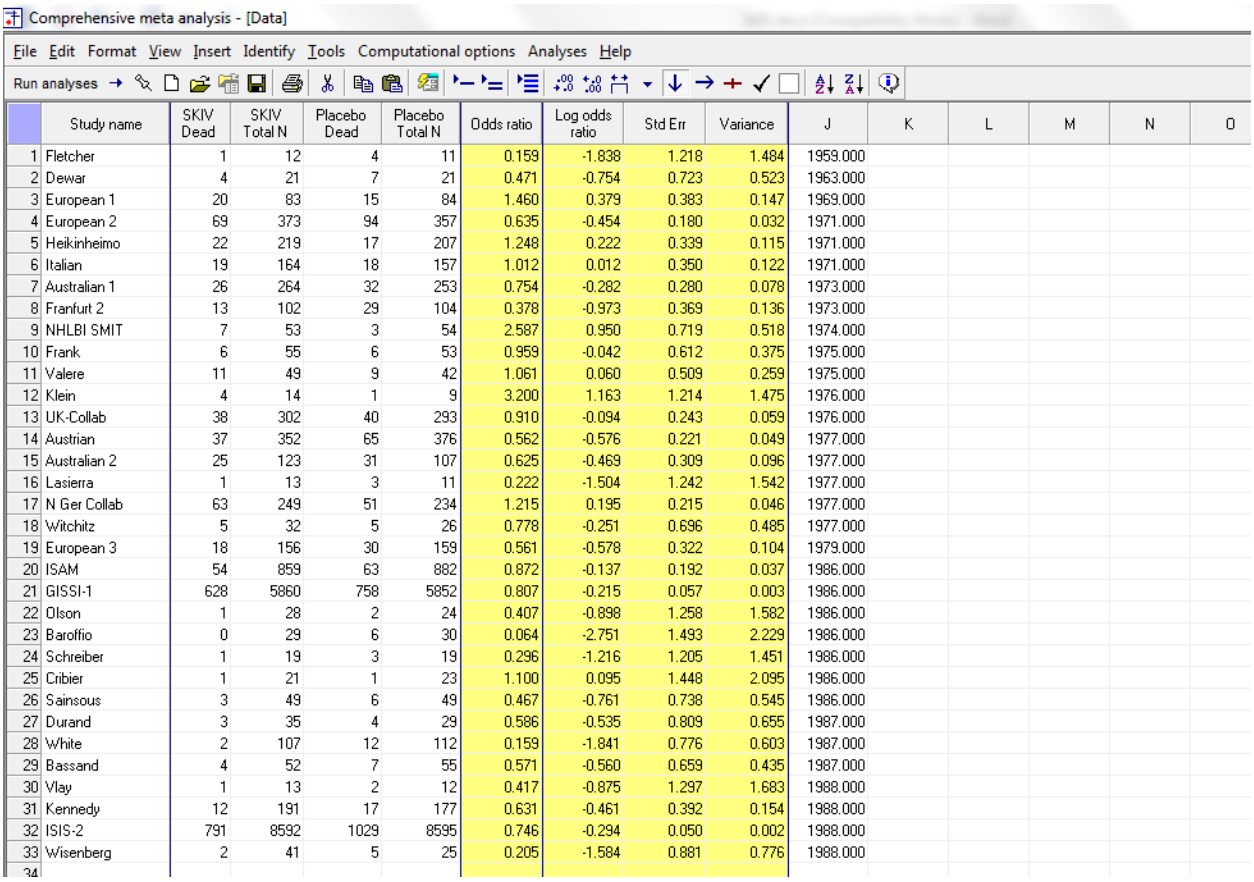
Now, we can remove the first row

- Click in the first row to select it



- Click Edit > Delete row and confirm

The screen should look like this



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	J	K	L	M	N	O
1	Fletcher	1	12	4	11	0.159	-1.838	1.218	1.484	1959.000					
2	Dewar	4	21	7	21	0.471	-0.754	0.723	0.523	1963.000					
3	European 1	20	83	15	84	1.460	0.379	0.383	0.147	1969.000					
4	European 2	69	373	94	357	0.635	-0.454	0.180	0.032	1971.000					
5	Heikinheimo	22	219	17	207	1.248	0.222	0.339	0.115	1971.000					
6	Italian	19	164	18	157	1.012	0.012	0.350	0.122	1971.000					
7	Australian 1	26	264	32	253	0.754	-0.282	0.280	0.078	1973.000					
8	Franfurt 2	13	102	29	104	0.378	-0.973	0.369	0.136	1973.000					
9	NHLBI SMIT	7	53	3	54	2.587	0.950	0.719	0.518	1974.000					
10	Frank	6	55	6	53	0.959	-0.042	0.612	0.375	1975.000					
11	Valere	11	49	9	42	1.061	0.060	0.509	0.259	1975.000					
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15	Australian 2	25	123	31	107	0.625	-0.469	0.309	0.096	1977.000					
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20	ISAM	54	859	63	882	0.872	-0.137	0.192	0.037	1986.000					
21	GISSI-1	628	5860	758	5852	0.807	-0.215	0.057	0.003	1986.000					
22	Olson	1	28	2	24	0.407	-0.898	1.258	1.582	1986.000					
23	Baroffio	0	29	6	30	0.064	-2.751	1.493	2.229	1986.000					
24	Schreiber	1	19	3	19	0.296	-1.216	1.205	1.451	1986.000					
25	Cribier	1	21	1	23	1.100	0.095	1.448	2.095	1986.000					
26	Sainsous	3	49	6	49	0.467	-0.761	0.738	0.545	1986.000					
27	Durand	3	35	4	29	0.586	-0.535	0.809	0.655	1987.000					
28	White	2	107	12	112	0.159	-1.841	0.776	0.603	1987.000					
29	Bassand	4	52	7	55	0.571	-0.560	0.659	0.435	1987.000					
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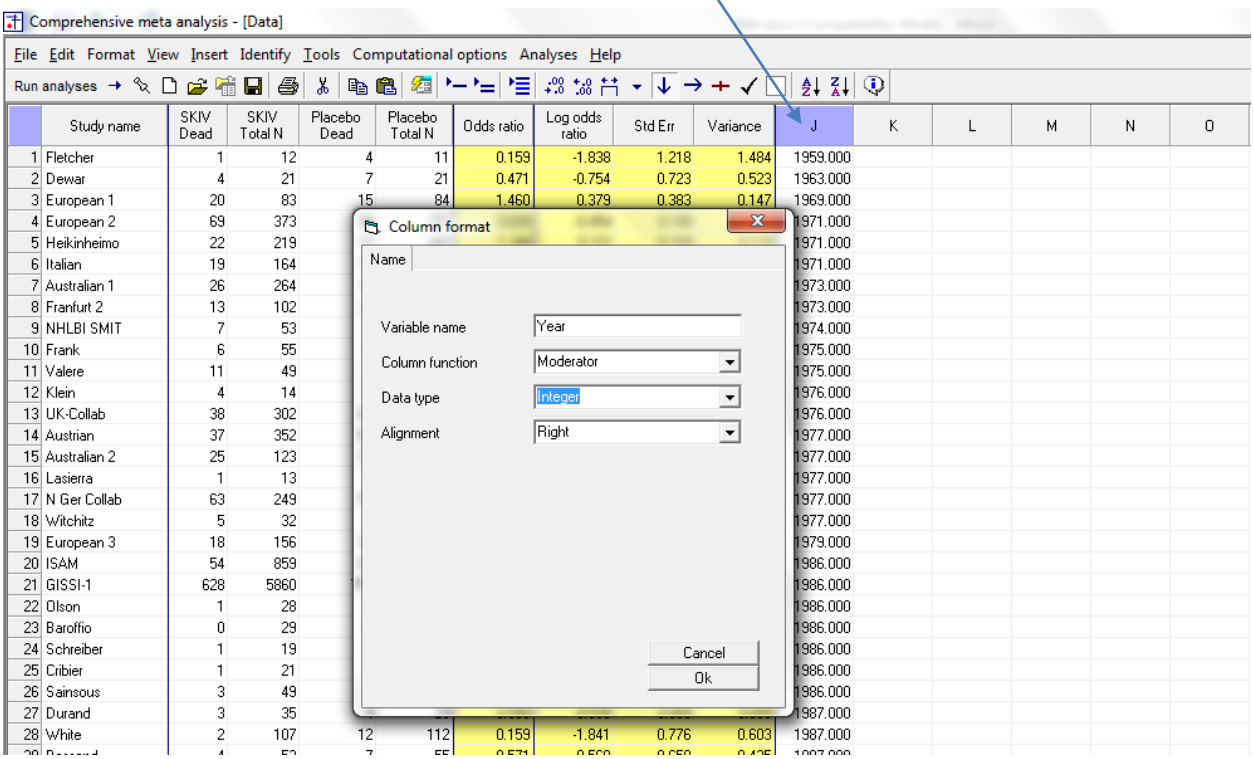
31	Kennedy	12	191	17	177	0.631	-0.461	0.392	0.154	1988.000					
32	ISIS-2	791	8592	1029	8595	0.746	-0.294	0.050	0.002	1988.000					
33	Wisenberg	2	41	5	25	0.205	-1.584	0.881	0.776	1988.000					
34															

Define Column J as a moderator

- Double-click on the header for column J
- Set the name to Year
- Set the function to Moderator
- Set the type to Integer
- Click OK



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	J	K	L	M	N	O
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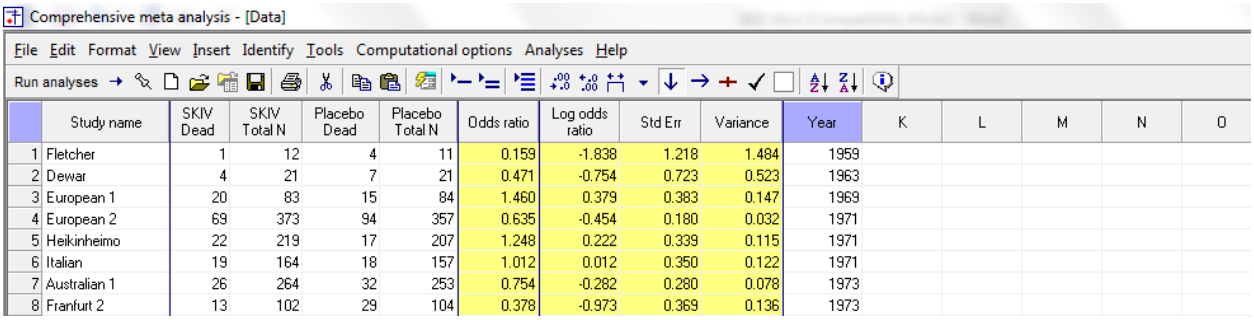
4	European 2	69	373							1971.000					
5	Heikinheimo	22	219							1971.000					
6	Italian	19	164							1971.000					
7	Australian 1	26	264							1973.000					
8	Franfurt 2	13	102							1973.000					
9	NHLBI SMIT	7	53							1974.000					
10	Frank	6	55							1975.000					
11	Valere	11	49							1975.000					
12	Klein	4	14							1976.000					
13	UK-Collab	38	302							1976.000					
14	Austrian	37	352							1977.000					
15	Australian 2	25	123							1977.000					
16	Lasierra	1	13							1977.000					
17	N Ger Collab	63	249							1977.000					
18	Witchitz	5	32							1977.000					
19	European 3	18	156							1979.000					
20	ISAM	54	859							1986.000					
21	GISSI-1	628	5860							1986.000					
22	Olson	1	28							1986.000					
23	Baroffio	0	29							1986.000					
24	Schreiber	1	19							1986.000					
25	Cribier	1	21							1986.000					
26	Sainsous	3	49							1986.000					
27	Durand	3	35							1987.000					
28	White	2	107	12	112	0.159	-1.841	0.776	0.603	1987.000					

We've followed the convention of putting the treated (SKIV) group before the control (Placebo). When we do this, if (a) the treated group does better and (b) the outcome is something bad (being dead) the odds ratio will be less than 1.0.



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	Year	K	L	M	N	O
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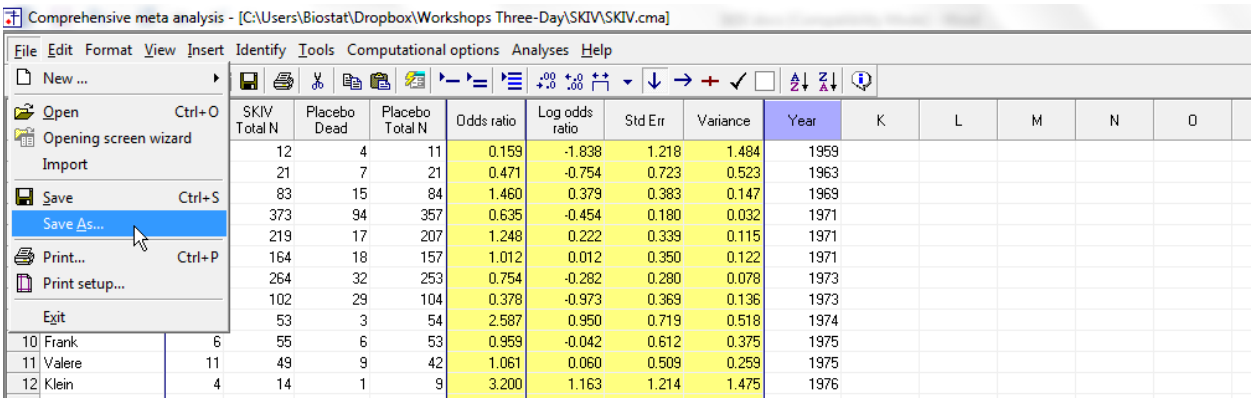
3	European 1	20	83	15	84	1.460	0.379	0.383	0.147	1969					
4	European 2	69	373	94	357	0.635	-0.454	0.180	0.032	1971					
5	Heikinheimo	22	219	17	207	1.248	0.222	0.339	0.115	1971					
6	Italian	19	164	18	157	1.012	0.012	0.350	0.122	1971					
7	Australian 1	26	264	32	253	0.754	-0.282	0.280	0.078	1973					
8	Franfurt 2	13	102	29	104	0.378	-0.973	0.369	0.136	1973					

To check that things are working as planned let's use the first study. The two groups have roughly the same N, but 1 person died in the SKIV group while 4 died in the control group. The odds ratio (0.159) is indeed less than 1. In the analysis, odds ratio less than 1 should be labeled "Favors SKIV" while odds ratios greater than 1 should be labeled "Favors Control". We need to apply these labels manually.

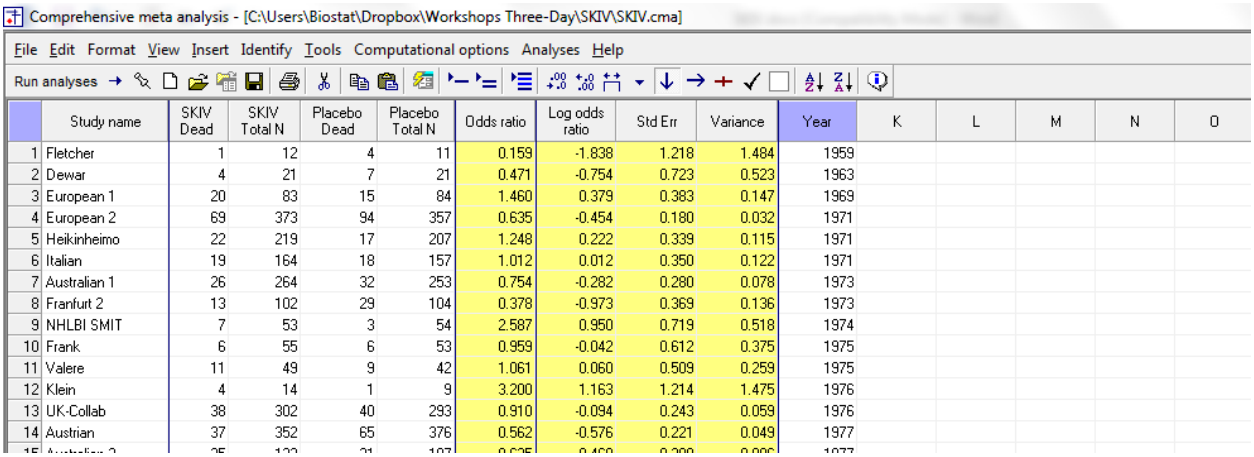
At this point we should save the file

- Click File > Save As …



Note that the file name is now in the header.

- [Save] will over-write the prior version of this file without warning
- [Save As…] will allow you to save the file with a new name



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	Year	K	L	M	N	O
1	Fletcher	1	12	4	11	0.159	-1.838	1.218	1.484	1959					
2	Dewar	4	21	7	21	0.471	-0.754	0.723	0.523	1963					
3	European 1	20	83	15	84	1.460	0.379	0.383	0.147	1969					
4	European 2	69	373	94	357	0.635	-0.454	0.180	0.032	1971					
5	Heikinheimo	22	219	17	207	1.248	0.222	0.339	0.115	1971					
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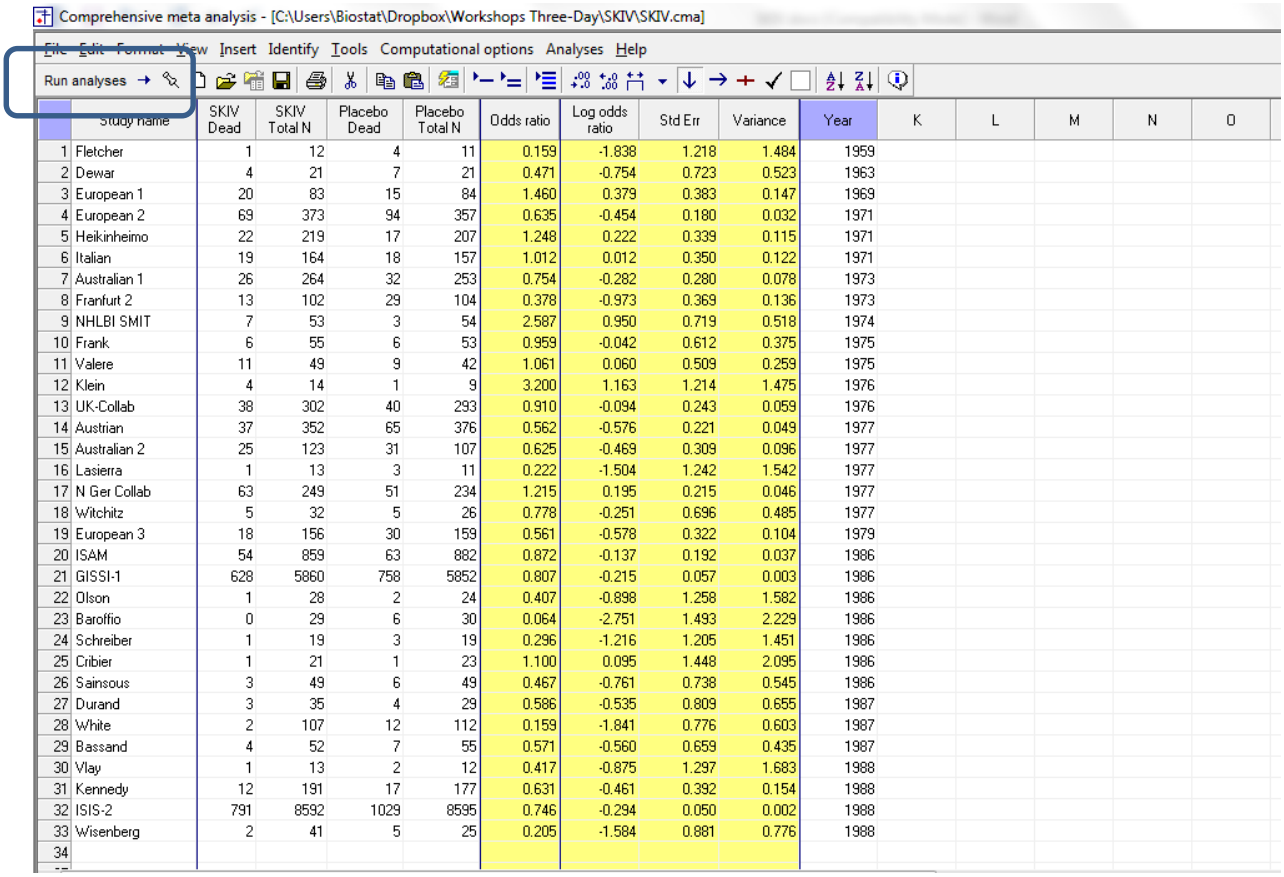
7	Australian 1	26	264	32	253	0.754	-0.282	0.280	0.078	1973					
8	Franfurt 2	13	102	29	104	0.378	-0.973	0.369	0.136	1973					
9	NHLBI SMIT	7	53	3	54	2.587	0.950	0.719	0.518	1974					
10	Frank	6	55	6	53	0.959	-0.042	0.612	0.375	1975					
11	Valere	11	49	9	42	1.061	0.060	0.509	0.259	1975					
12	Klein	4	14	1	9	3.200	1.163	1.214	1.475	1976					
13	UK-Collab	38	302	40	293	0.910	-0.094	0.243	0.059	1976					
14	Austrian	37	352	65	376	0.562	-0.576	0.221	0.049	1977					

By default the program displays the odds ratio.

This is what we want to use in the analysis, so no modification is needed.

- To run the analysis, click [Run analysis]



	Study name	SKIV Dead	SKIV Total N	Placebo Dead	Placebo Total N	Odds ratio	Log odds ratio	Std Err	Variance	Year	K	L	M	N	O
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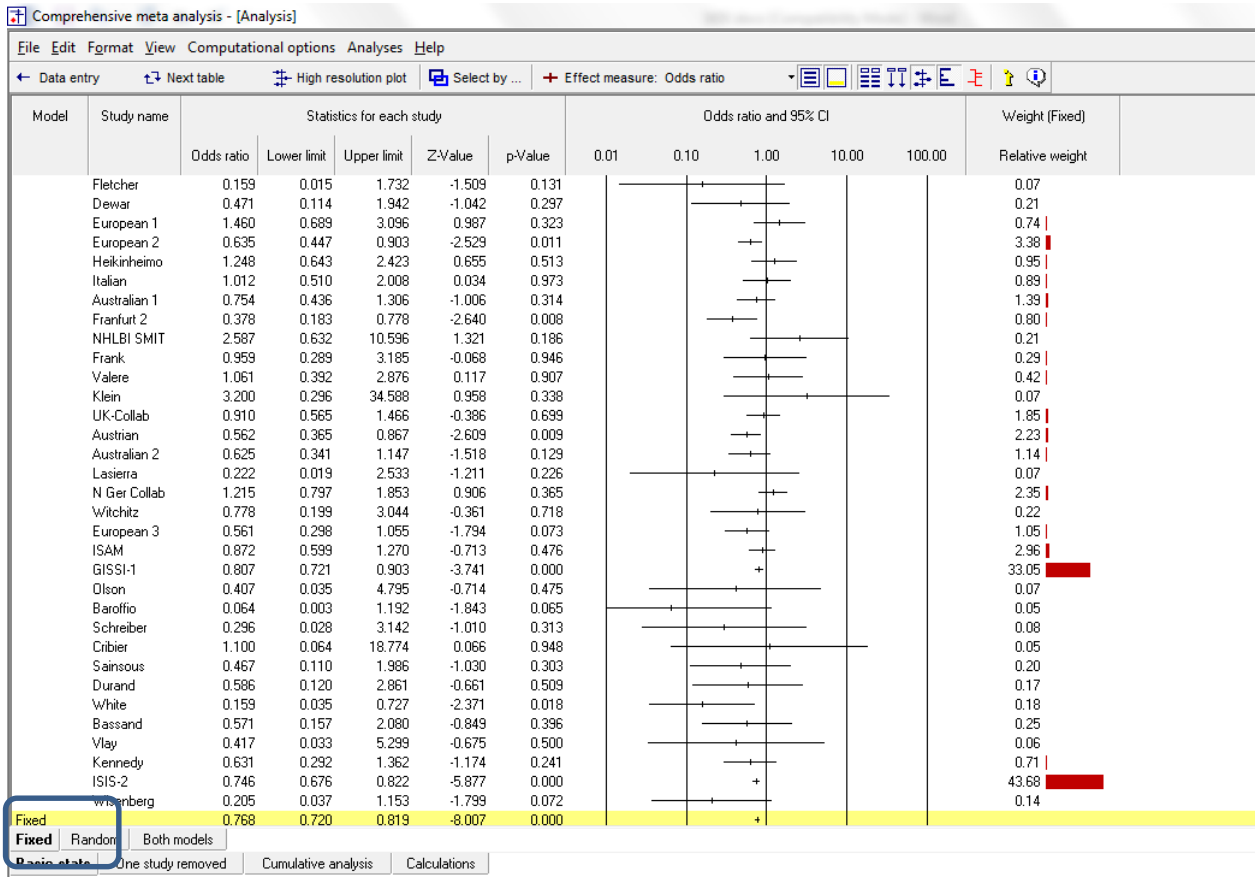
13	UK-Collab	38	302	40	293	0.910	-0.094	0.243	0.059	1976					
14	Austrian	37	352	65	376	0.562	-0.576	0.221	0.049	1977					
15	Australian 2	25	123	31	107	0.625	-0.469	0.309	0.096	1977					
16	Lasierra	1	13	3	11	0.222	-1.504	1.242	1.542	1977					
17	N Ger Collab	63	249	51	234	1.215	0.195	0.215	0.046	1977					
18	Witchitz	5	32	5	26	0.778	-0.251	0.696	0.485	1977					
19	European 3	18	156	30	159	0.561	-0.578	0.322	0.104	1979					
20	ISAM	54	859	63	882	0.872	-0.137	0.192	0.037	1986					
21	GISSI-1	628	5860	758	5852	0.807	-0.215	0.057	0.003	1986					
22	Olson	1	28	2	24	0.407	-0.898	1.258	1.582	1986					
23	Baroffio	0	29	6	30	0.064	-2.751	1.493	2.229	1986					
24	Schreiber	1	19	3	19	0.296	-1.216	1.205	1.451	1986					
25	Cribier	1	21	1	23	1.100	0.095	1.448	2.095	1986					
26	Sainsous	3	49	6	49	0.467	-0.761	0.738	0.545	1986					
27	Durand	3	35	4	29	0.586	-0.535	0.809	0.655	1987					
28	White	2	107	12	112	0.159	-1.841	0.776	0.603	1987					
29	Bassand	4	52	7	55	0.571	-0.560	0.659	0.435	1987					
30	Vlay	1	13	2	12	0.417	-0.875	1.297	1.683	1988					
31	Kennedy	12	191	17	177	0.631	-0.461	0.392	0.154	1988					
32	ISIS-2	791	8592	1029	8595	0.746	-0.294	0.050	0.002	1988					
33	Wisenberg	2	41	5	25	0.205	-1.584	0.881	0.776	1988					
34															

This is the basic analysis screen

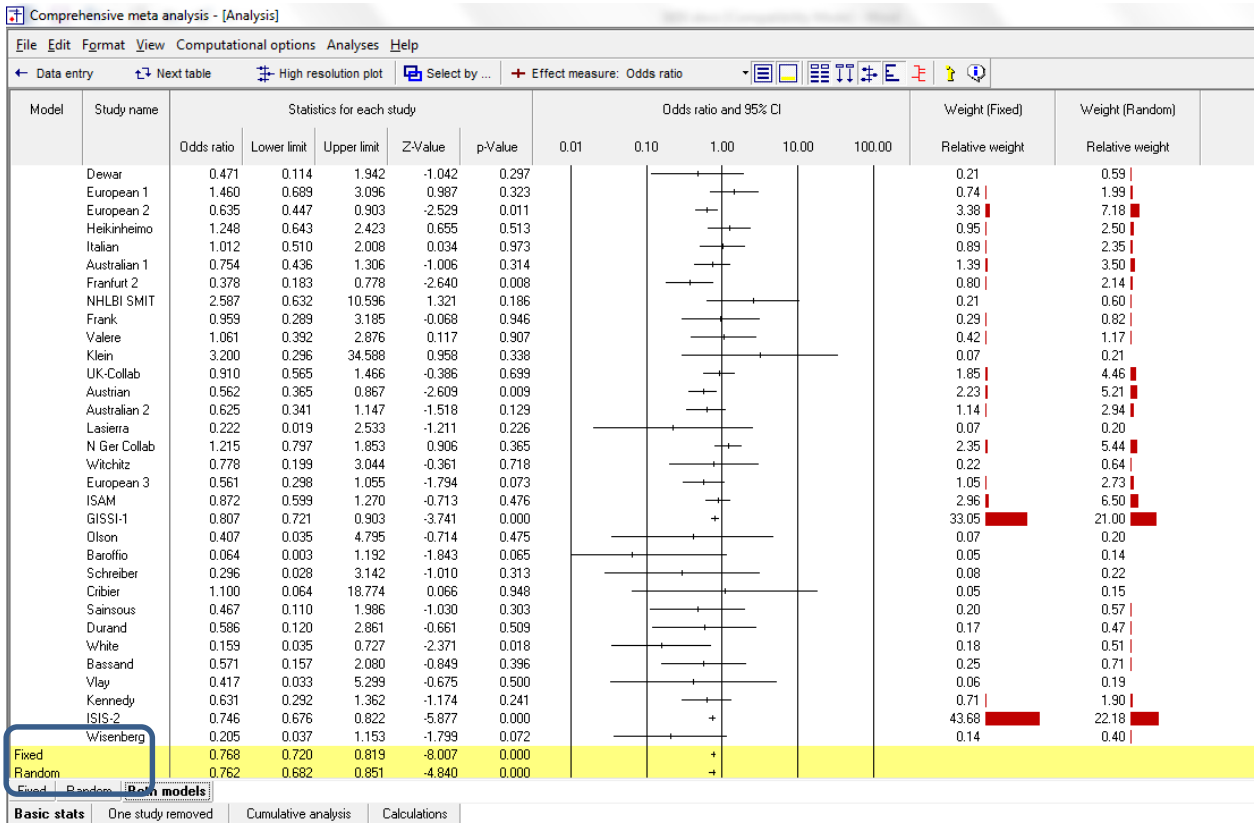
Stretch the Study name column so the full name displays

Initially, the program displays the fixed-effect analysis. This is indicated by the tab at the bottom and the label in the plot.



Click [Both models]

The program displays results for both the fixed-effect and the random-effects analysis.

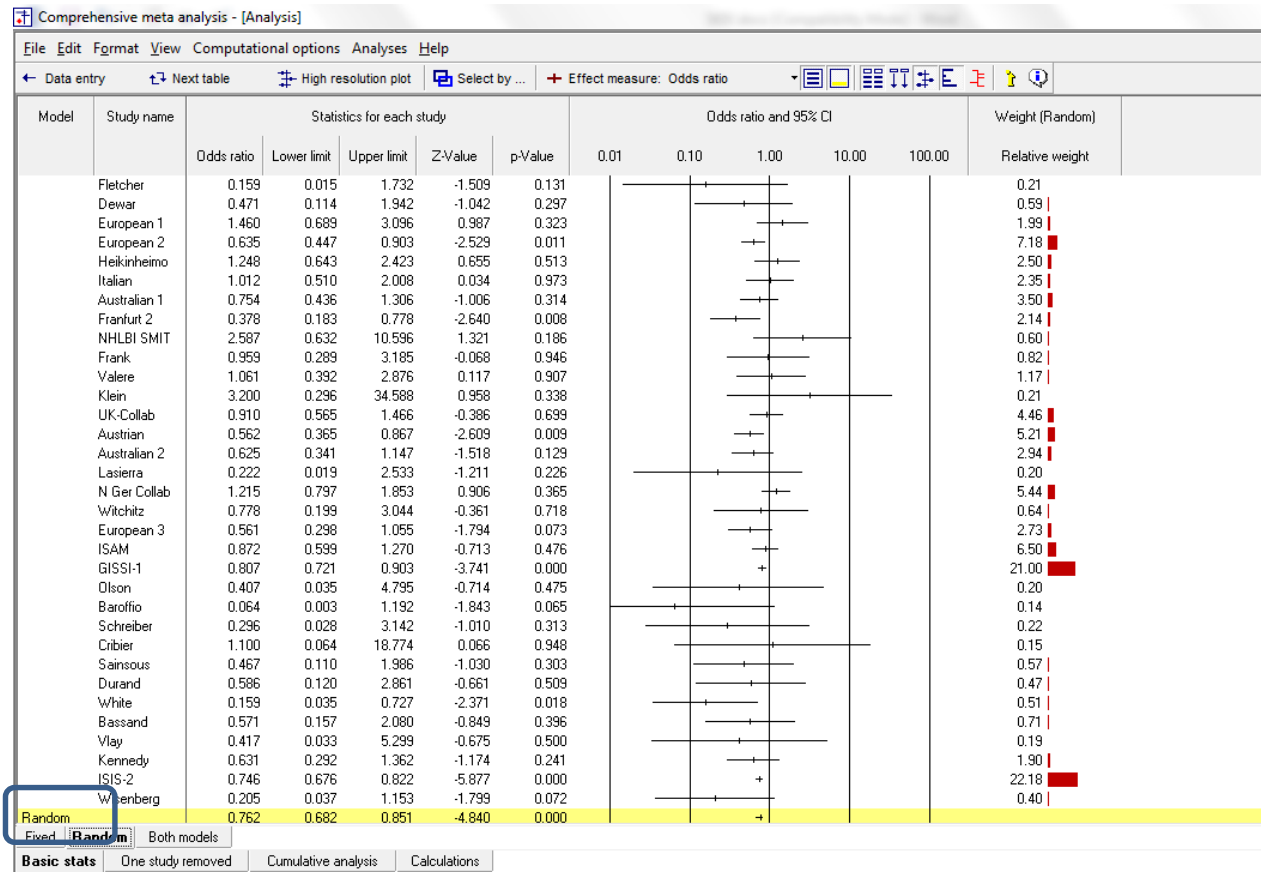


The fact that the two results are not identical tells us that the weights are different, which means that the effect size varies from study to study. (This means that T^2, the estimate of between-study variance in true effects is non-zero. It is *not* a test of statistical significance).

In any event, the random-effects model is a better fit for the way the studies were sampled, and therefore that is the model we will use in the analysis.

- Click Random on the tab at the bottom

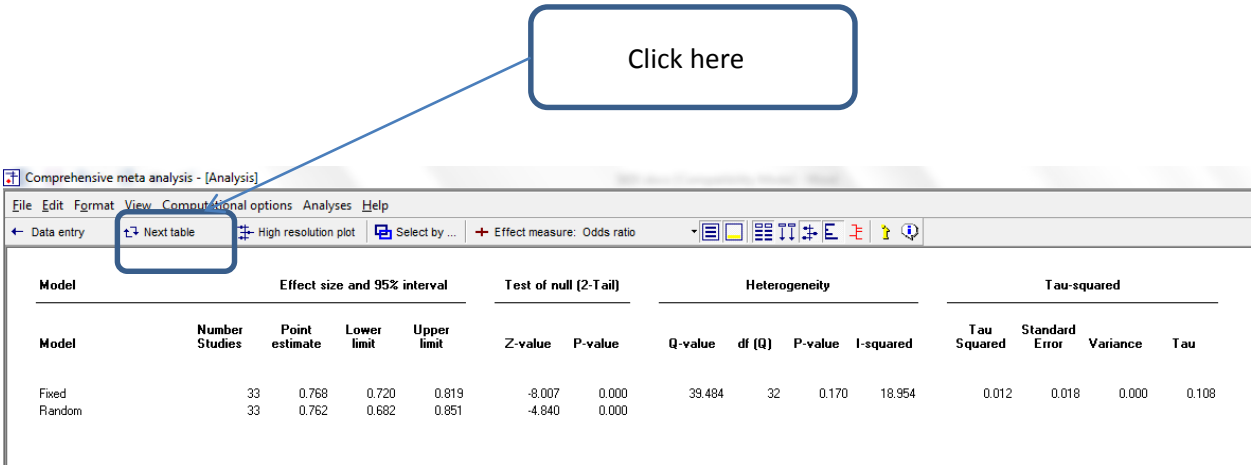
The plot now displays the random-effects analysis alone.



A quick view of the plot suggests the following

- The summary effect is 0.762 with a CI of 0.682 to 0.851. Thus, the mean effect is likely in the clinically important range.
- The summary effect has a Z-value of −4.840 and a *p*-value of < 0.001. Thus we can reject the null hypotheses that the true odds ratio is 1.0.

Click [Next table]



Model		Effect size and 95% interval			Test of null (2-Tail)		Heterogeneity				Tau-squared			
Model	Number Studies	Point estimate	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared	Tau Squared	Standard Error	Variance	Tau
Fixed	33	0.768	0.720	0.819	-8.007	0.000	39.484	32	0.170	18.954	0.012	0.018	0.000	0.108
Random	33	0.762	0.682	0.851	-4.840	0.000								

The statistics at the left duplicate those we saw on the prior screen.

- The summary effect is 0.762 with a CI of 0.682 to 0.851. Thus, the mean effect is likely in the clinically important range.
- The summary effect has a Z-value of −4.840 and a *p*-value of < 0.001. Thus we can reject the null hypotheses that the true odds ratio is 1.0.
- The statistics at the upper right relate to the dispersion of effect sizes across studies.
- The Q-value is 39.484 with df=32 and p=0.170. *Q* reflects the distance of each study from the mean effect (weighted, squared, and summed over all studies). Q is always computed using FE weights (which is the reason it is displayed on the "Fixed" row, but applies to both FE and RE analyses.
- If all studies actually shared the same true effect size, the expected value of *Q* would be equal to df (which is 32). Here, *Q* exceeds that value, but still falls in the range that can be attributed to random sampling error. The p-value is 0.017, and so we cannot reject the null hypothesis that all studies share the same true effect size.
- T^2 is the estimate of the between-study variance in true effects. This estimate is 0.012. *T* is the estimate of the between-study standard deviation in true effects. This estimate is 0.109. Note that these values are in log units. Therefore, to use these estimates to compute confidence intervals or prediction intervals we would need to convert all values into log units, perform the computations, and convert the values back into odds ratios. (This is handled automatically by the program.)
- The variance in effect sizes includes both sampling error and variance in the true effect size from study to study. The I^2 value is 18.954, which tell is that about 20% of the *observed* variance in effect sizes reflects differences in *true* effect sizes. This means that if each of the studies had a huge sample size (so that the observed effect closely mirrored the true effect size for that study's population) the observed effects would fall closer to each other than they do now, but would not align exactly. The variance of the observed effects would drop by about 80%.

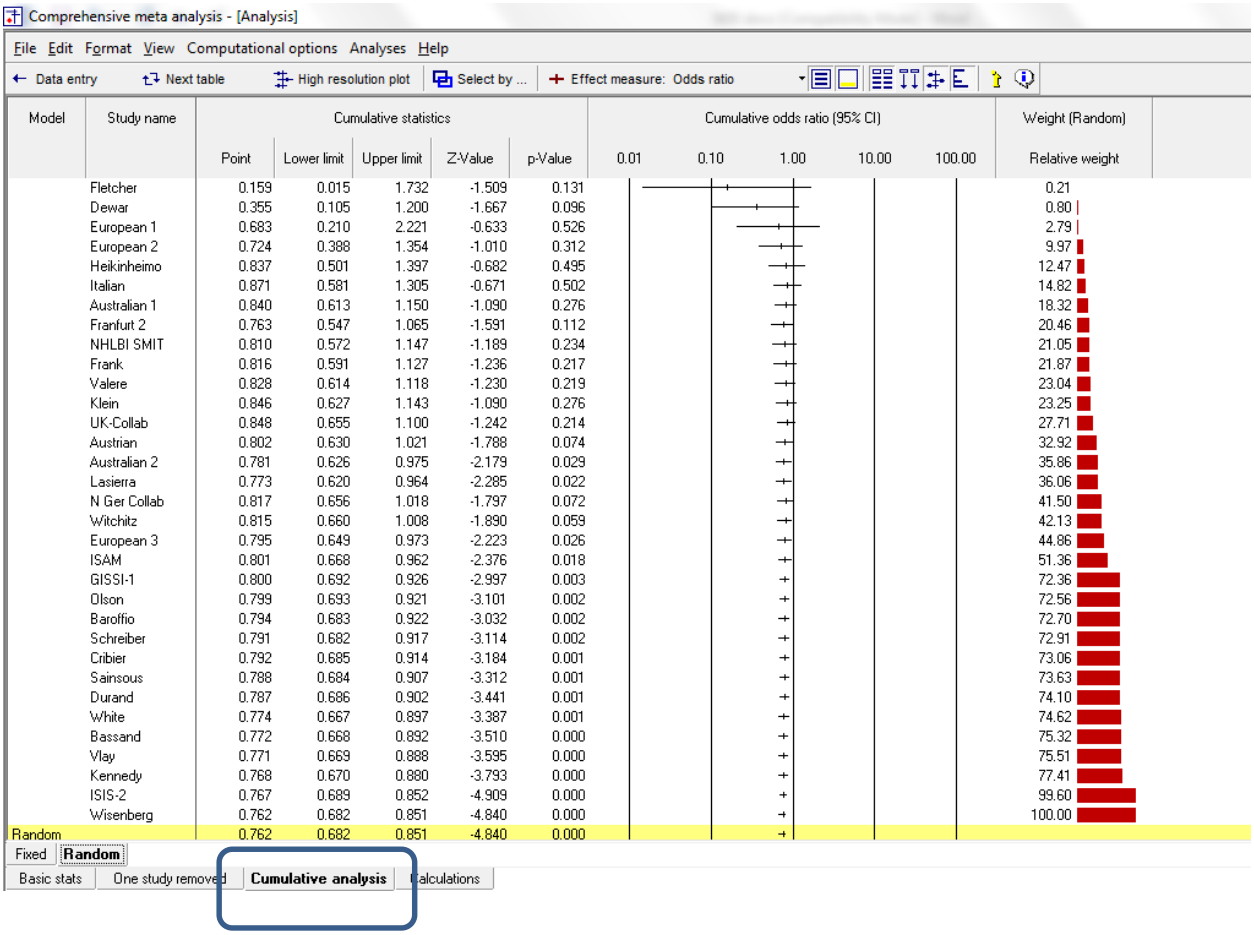
Click [Next table] to return to this screen

We might wonder how the weight of the evidence has shifted over time. In other words, what would a meta-analysis have shown if we had performed it after the first study, after the first two studies, and so on.

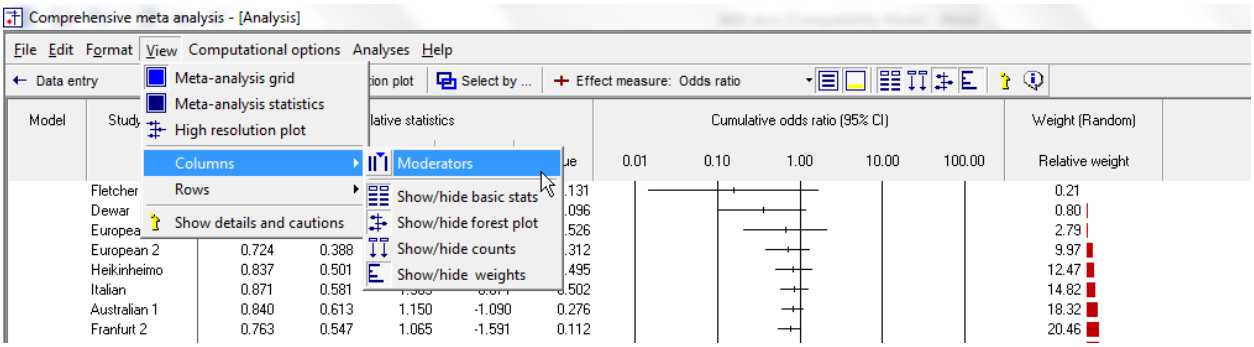
To run this analysis we need to ensure that the studies are sorted by year on the data-entry screen. In this case, they are, and so we can proceed.

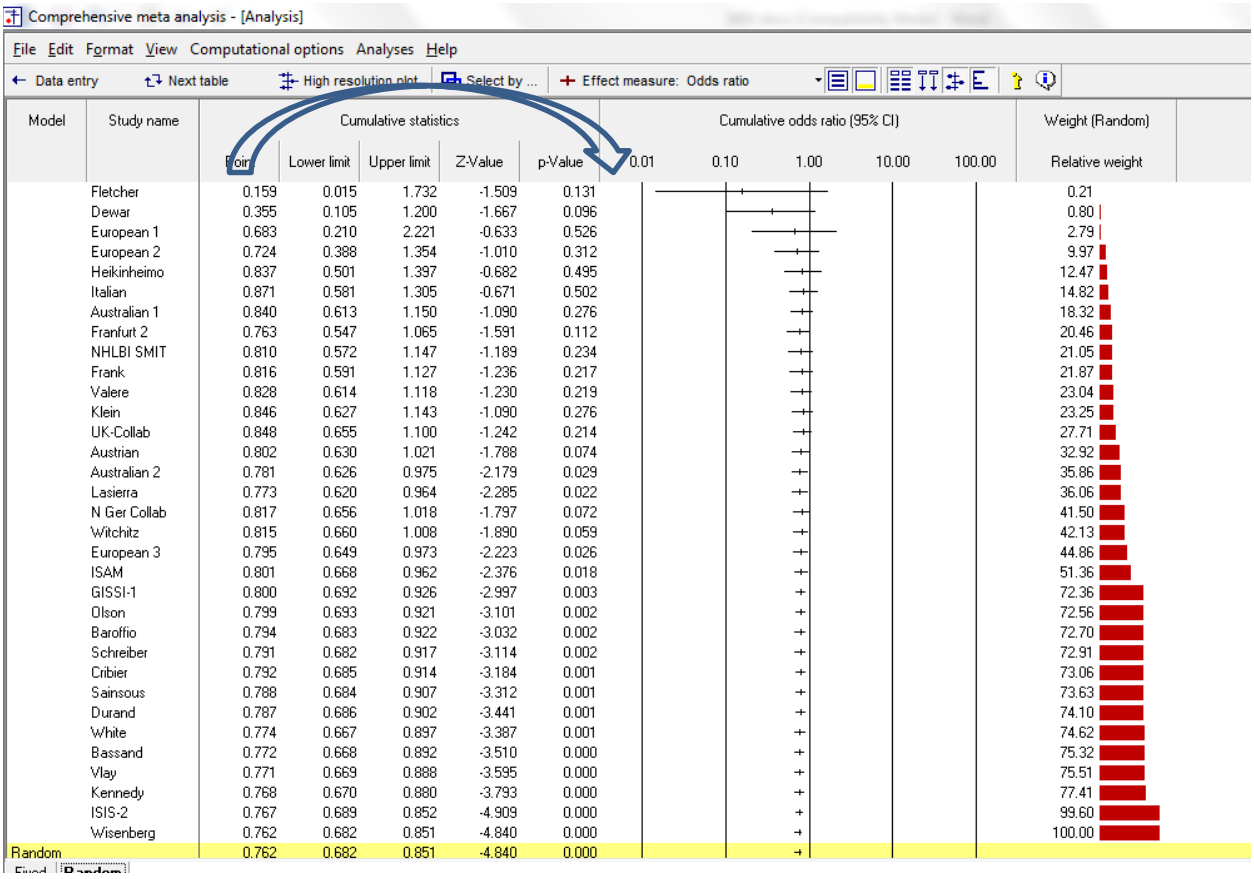
- Click [Cumulative analysis] on the bottom
- Click the tool for relative weights on the menu

The program displays this screen

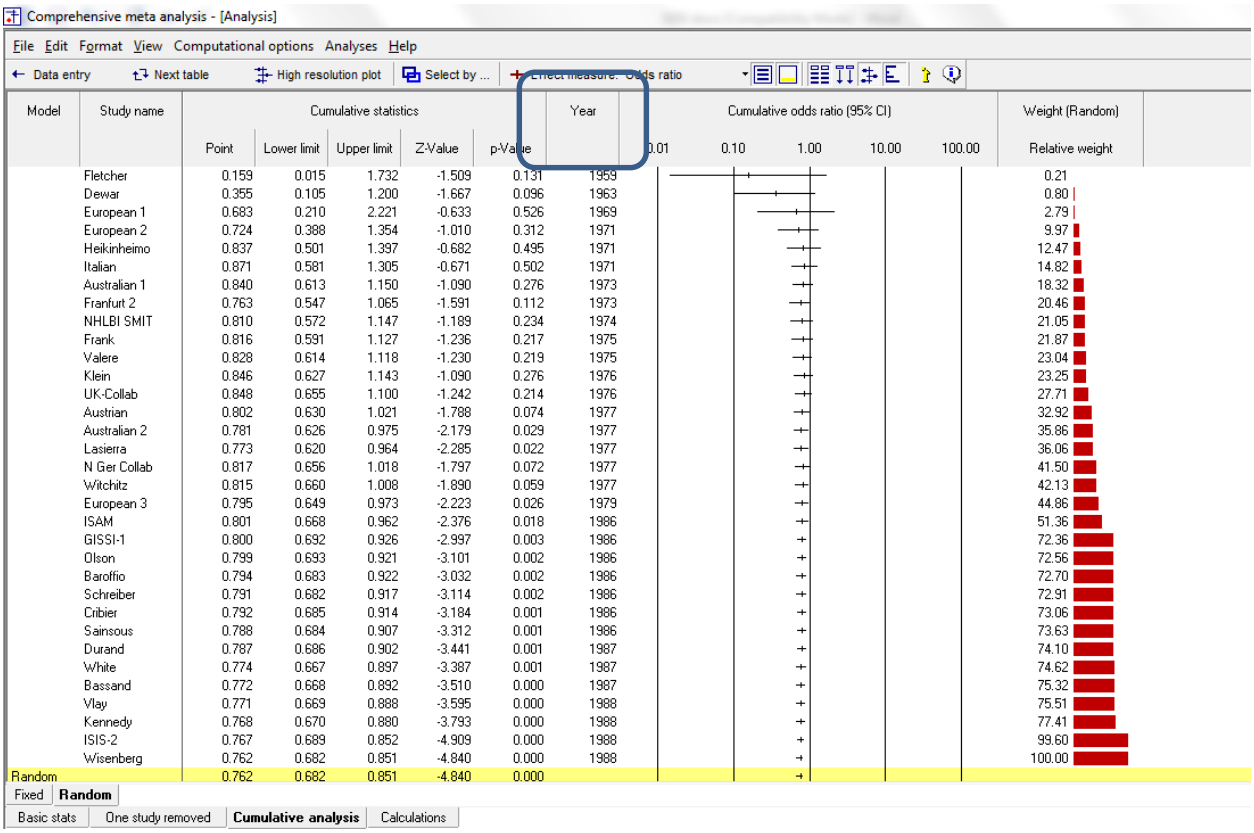


- Click View > Columns > Moderators
- Click Year and Drag it as shown

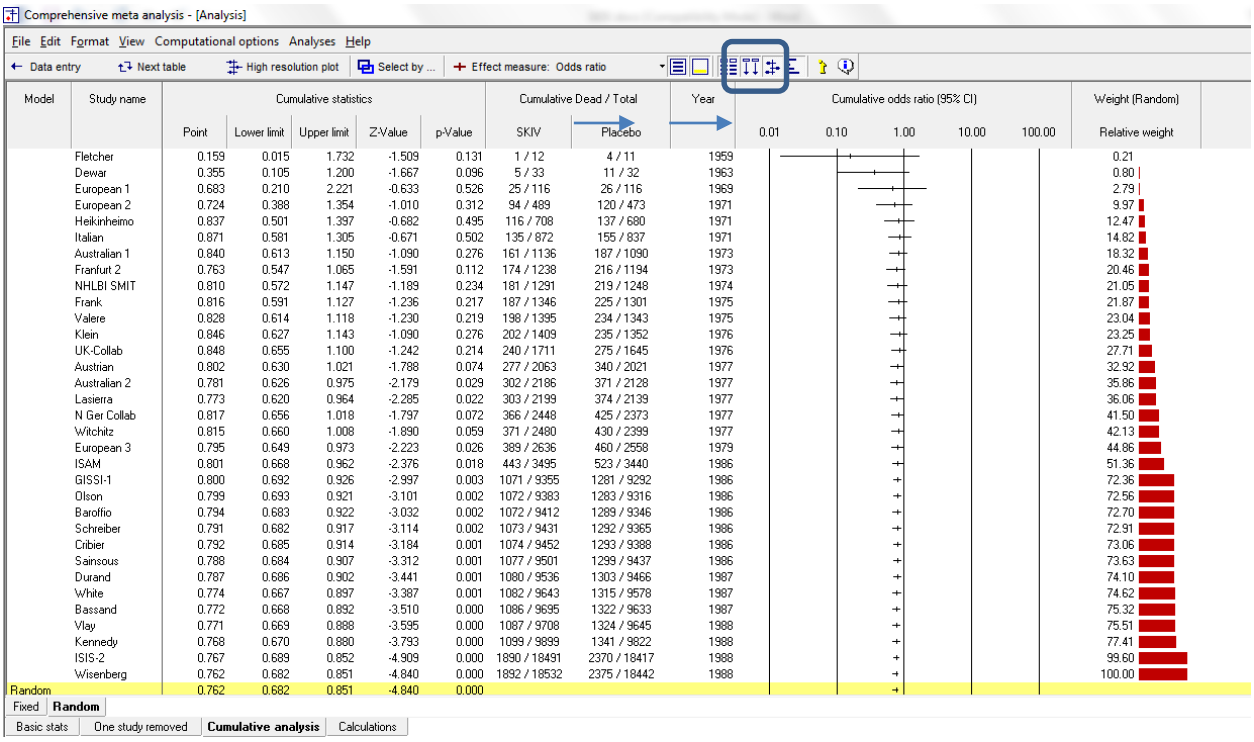




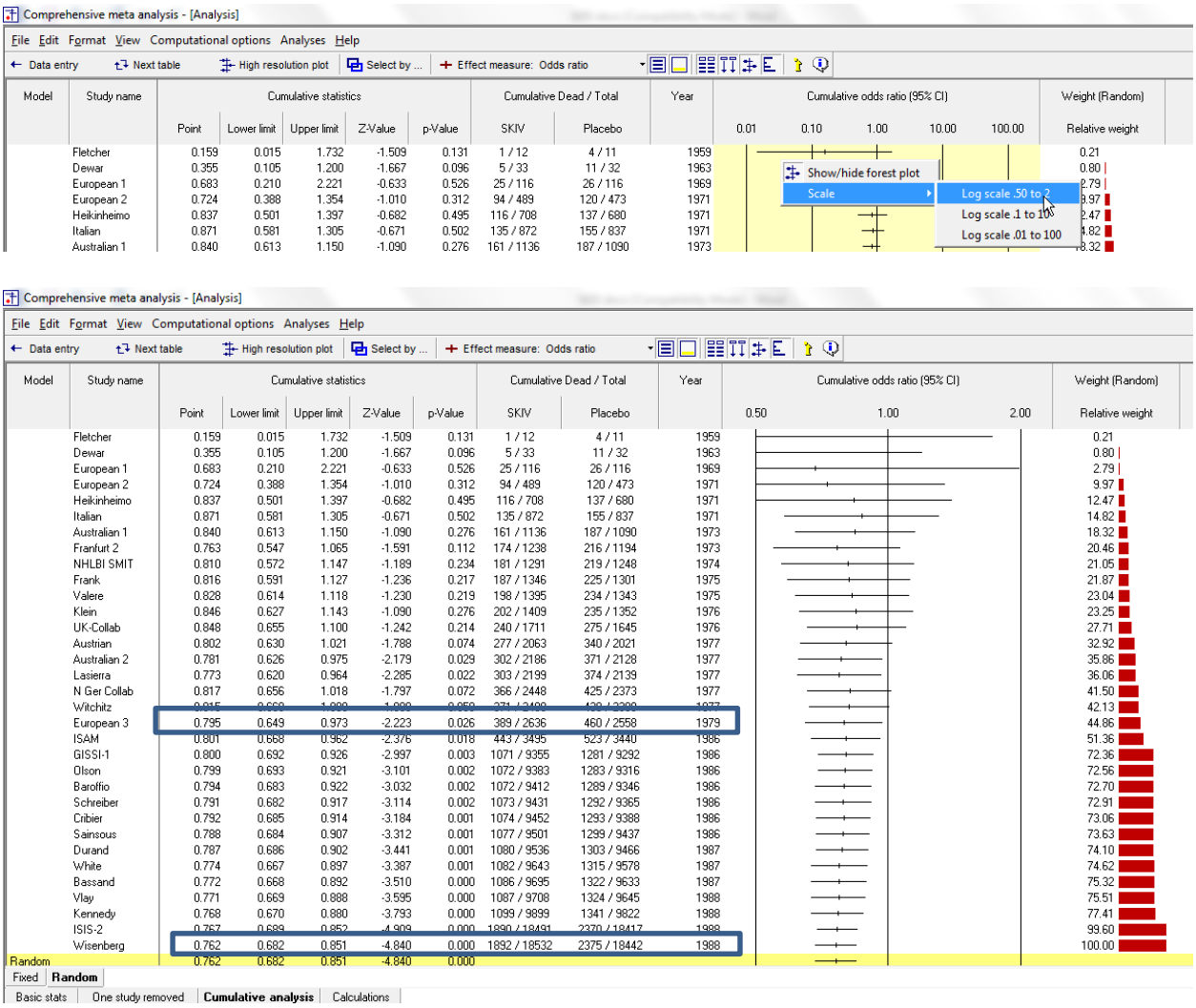
A column for year is now displayed



- Click the button to display counts
- Drag the right-hand side of the new columns as needed to display the full numbers



Change the scale



If a meta-analysis had been performed based on studies published through 1979, it would have reported an odds ratio of 0.795 with a CI of 0.649 to 0.973 and a p-value of 0.026.

The meta-analysis that was performed based on studies published through 1988 reported an odds ratio of 0.762 with a CI of 0.682 to 0.851 and a p-value of < 0.001.

Please note that the cumulative analysis shown here is intended only as a look-back. It would be a very bad idea to repeat a meta-analysis every time a new study was added to the literature, with the goal of stopping when the *p*-value hits 0.05. If the goal is to repeat the analysis every time a study is added, then adjustments must be made to the *p*-value and confidence interval.

Summary

This analysis includes 33 studies where patients who had suffered an MI were randomized to be treated with either streptokinase or placebo. Outcome was death, and we focused on the odds ratio as the effect size.

Do the guidelines affect the likelihood of survival?

The mean odds ratio is 0.762, which means that SKIV reduced the risk of death by about 25%.

These studies were sampled from a universe of possible studies defined by certain inclusion/exclusion rules as outlined in the full paper. The confidence interval for the odds ratio is 0.682 to 0.851, which tell us that the mean odds ratio in the universe of studies could fall anywhere in this range. This range does not include an odds ratio of 1.0, which tells us that the mean odds ratio is probably not 1.0.

Similarly, the *Z*-value for testing the null hypothesis (that the mean odds ratio is 1.0) is −4.840, with a corresponding *p*-value of < 0.001. We can reject the null that the risk of death is the same in both groups, and conclude that the risk of death is lower in the SKIV group.

Does the effect size vary across studies?

The *observed* effect size varies somewhat from study to study, but a certain amount of variation is expected due to sampling error. We need to determine if the observed variation falls within the range that can be attributed to sampling error (in which case there is no evidence of variation in true effects), or if it exceeds that range.

The *Q*-statistic provides a test of the null hypothesis that all studies in the analysis share a common effect size. If all studies shared the same effect size, the expected value of *Q* would be equal to the degrees of freedom (the number of studies minus 1).

The *Q*-value is 39.484 with 32 degrees of freedom and the corresponding p-value is 0.170. Thus, we cannot reject the null hypothesis that the true odds ratio is the same in all studies.

The I^2 statistic tells us what proportion of the observed variance reflects differences in true effect sizes rather than sampling error. I^2 is 18.954, which means that about 20% of the observed variance reflects variance in true effects. Put another way, if we could plot the true effects rather than the observed effects, the variance of the new plot would shrink by about 80%.

T^2 is the variance of true effect sizes (in log units). Here, T^2 is 0.012 in log units. *T* is the standard deviation of true effects (in log units). Here, *T* is 0.108 in log units.