



**The Effect of
Age, Sex, Obesity and Smoking
on Health Transitions -
A statistical meta-analysis
based on a systematic literature review**

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Risk Factors

Age

Sex

Obesity

Smoking



Risk Factors

(Age)

Sex

Obesity

Smoking



Risk Factors

Age

Sex

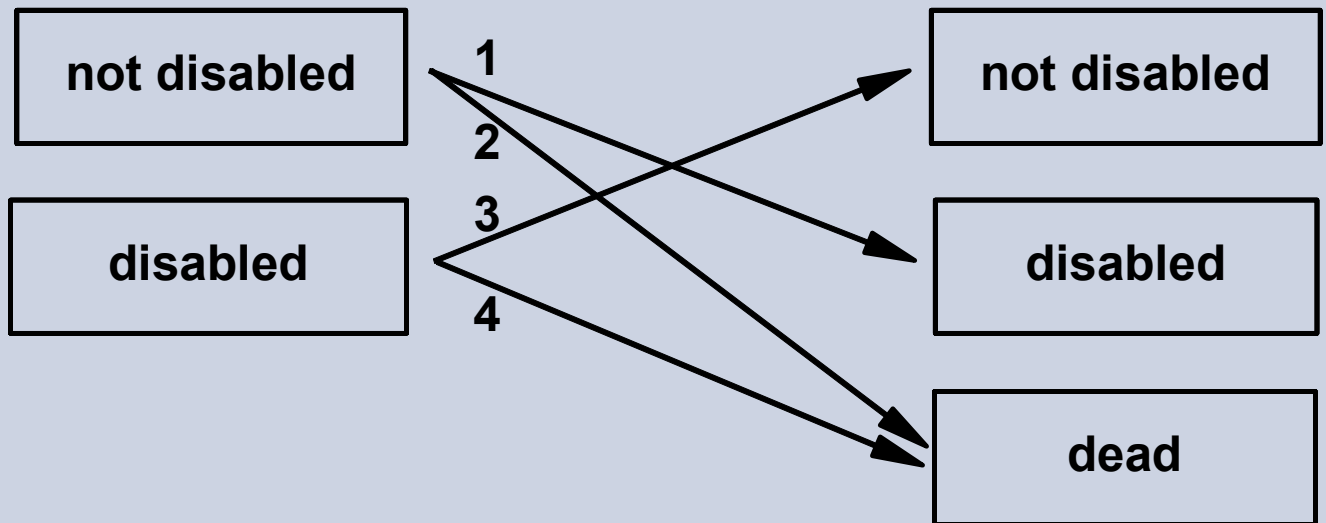
Obesity

Smoking

Marital Status

Education

Transitions





Selection Criteria

Search performed from September 2005 to February 2006

Publications from 1985 to 2005

Only studies containing odds ratios (OR), rate ratios, relative risks (RR), or incidence rates.

No hospitalized populations

Only clear distinction of the disability status at baseline

Only follow-up period more than one year

No disability caused by injuries or specific chronic conditions or surgeries

At least one of the four transitions shown in Transition-Figure

Number of Articles

Basis for literature review: 8016 articles		
7729	127	160
Electronic Databases: Medline PsycInfo SOCA	Expert Recommendations: 78 Stuck et al. (1999) 49 other	References of Present Articles
561 ordered and searched		
63 used for final analysis		



Results

Results of the Statistical Meta-Analysis of the Effect of Sex and Obesity

Risk factor	Transition	Number of Included Effect Sizes	Number of Excluded Effect Sizes	Number of Studies	Fixed Effects Model			Random Effects Model			Heterogeneity		Publication Bias		
					Mean	Confidence Interval		Mean	Confidence Interval		P-Value	Variance τ^2	P-Value	Bias	
						Lower	Upper		Lower	Upper					
Sex females vs males	1	29	0	20	1.34	1.30	1.38	1.35	1.28	1.43	0.01	0.01	0.30	0.34	0.00
	2	13	0	7	0.41	0.37	0.45	*	*	*		*	0.58	-0.24	0.00
	3	13	2	7	0.72	0.66	0.78	0.71	0.63	0.81	0.02	0.02	0.50	-1.08	0.00
	4	18	2	9	0.58	0.57	0.60	0.56	0.51	0.62	0.00	0.03	0.94	-0.57	0.00
Obesity															
Overweight vs normal	1	2	0	2	1.13	0.93	1.38	*	*	*	*	*	n.a.	n.a.	n.a.
	3	2	0	2	0.82	0.61	1.11	0.81	0.74	1.22	0.19	0.04	n.a.	n.a.	n.a.
Obese vs normal & overweight	1	7	0	5	1.31	1.23	1.39	1.30	1.19	1.41	0.17	0.00	0.23	-0.63	0.00
	2	3	0	2	0.78	0.66	0.91	*	*	*	0.39	*	n.a.	-9.69	0.00
	3	2	0	1	0.66	0.51	0.84	*	*	*	0.91	*	n.a.	n.a.	n.a.
	4	2	0	1	0.81	0.66	1.00	0.82	0.61	1.09	0.17	0.02	n.a.	n.a.	n.a.
Obese vs normal	1	11	0	5	1.47	1.34	1.62	1.49	1.33	1.66	0.24	0.01	0.07	2.34	0.00
	3	2	0	2	0.90	0.66	1.24	*	*	*	0.64	*	n.a.	n.a.	n.a.
	4	3	1	1	0.72	0.69	0.74	0.70	0.67	0.75	0.06	0.00	0.71	4.18	0.00
Obesity continuous	1	9	0	4	1.01	0.99	1.03	*	*	*	0.50	0.00	0.53	0.76	0.00

Results of the Statistical Meta-Analysis of the Effect of Smoking

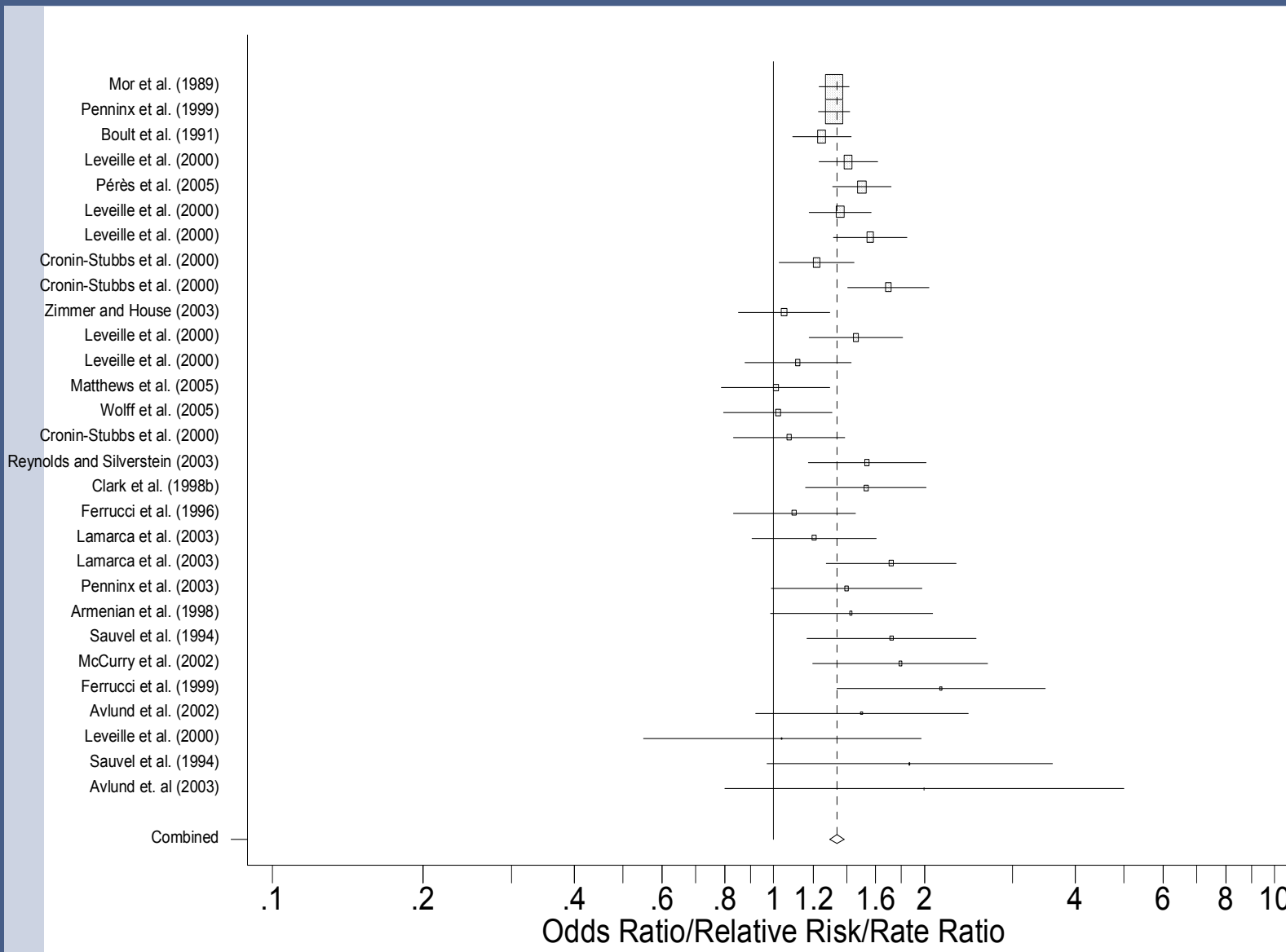
Risk factor	Transition	Number of Included Effect Sizes	Number of Excluded Effect Sizes	Number of Studies	Fixed Effects Model			Random Effects Model			Heterogeneity		Publication Bias		
					Mean	Confidence Interval		Mean	Confidence Interval		Q-Test	Between Study Variance τ^2	P-Value	Bias	Egger's Test
						Lower	Upper		Lower	Upper					
Smoking															
Smoking current vs never smoked	1	15	0	5	1.25	1.17	1.33	1.24	1.14	1.33	0.26	0.01	0.15	-0.67	0.2
Smoking current vs former/non-smoker	3	2	0	2	0.76	0.61	0.94	0.79	0.58	1.08	0.19	0.02	n.a.	n.a.	n.a.
Smoking former vs never smoked	1	10	0	8	1.02	1.01	1.03	1.15	1.08	1.22	0.00	0.00	0.1	1.71	0.0
Smoking former vs never/non-smoker	1	12	0	4	1.08	1.02	1.14	*	*	*	0.33	*	0.45	0.06	0.9
Smoking former vs never/non-smoker	3	2	0	1	1.05	0.79	1.39	*	*	*	*	*	n.a.	n.a.	n.a.

For moment, restricted Maximum-Likelihood and Maximum-Likelihood estimates of the between study variance are zero; significant effects are indicated in bold

n.a. not applicable

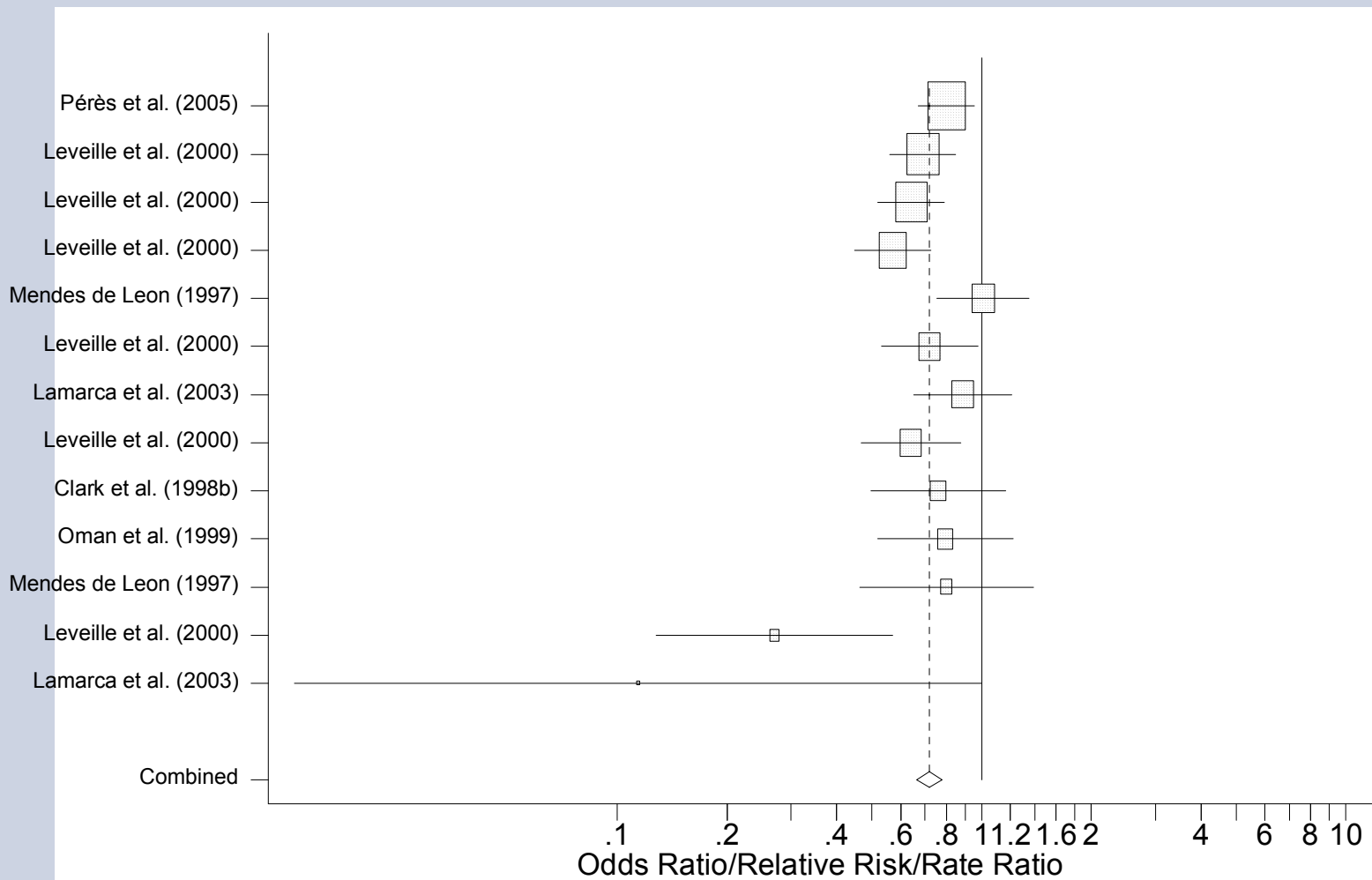
Risk factor sex (women vs men),

Transition 1, from not disabled to disabled



Risk factor sex (women vs men),

Transition 3, from disabled to not disabled (recovery)



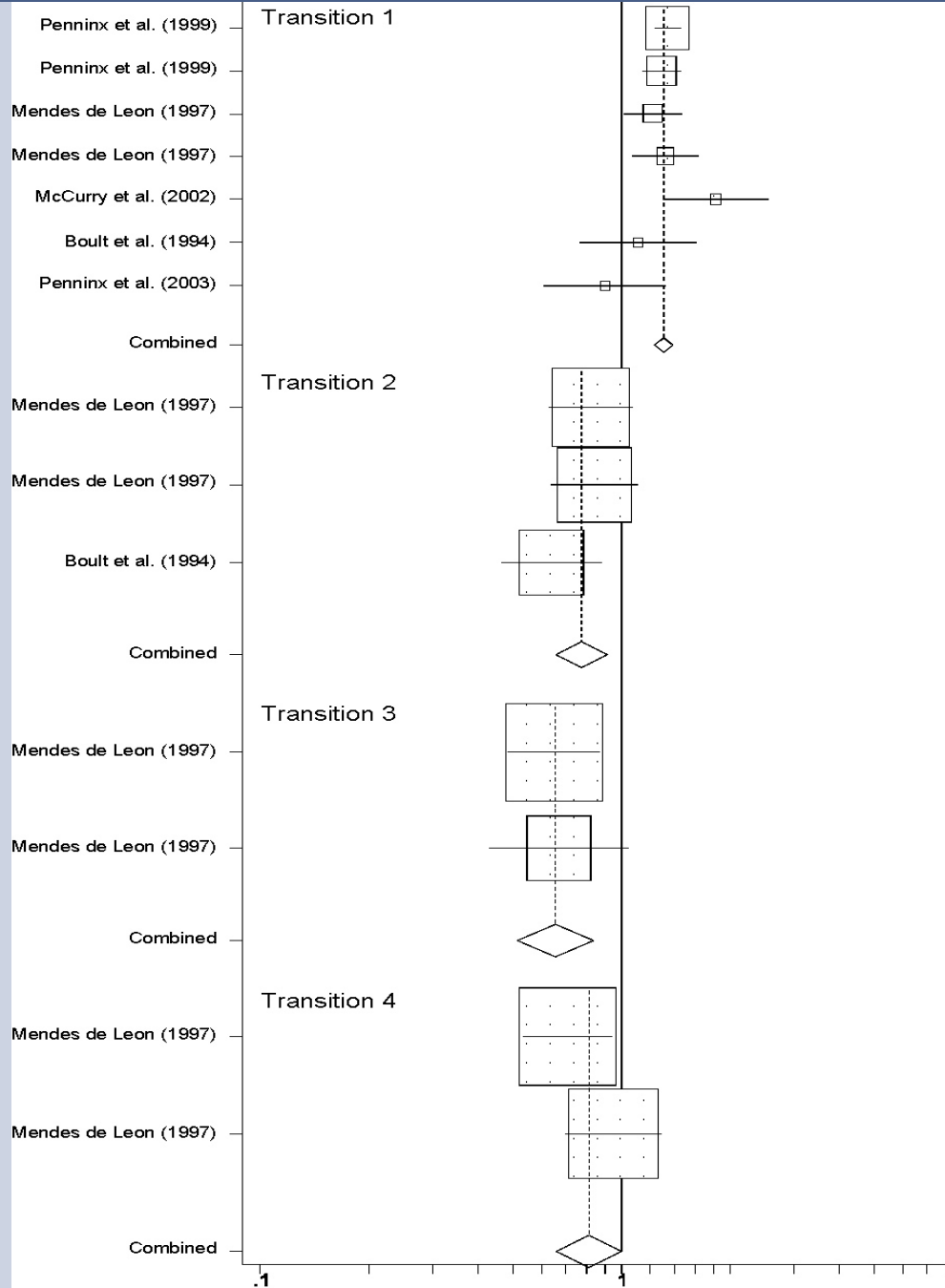


From not disabled to disabled

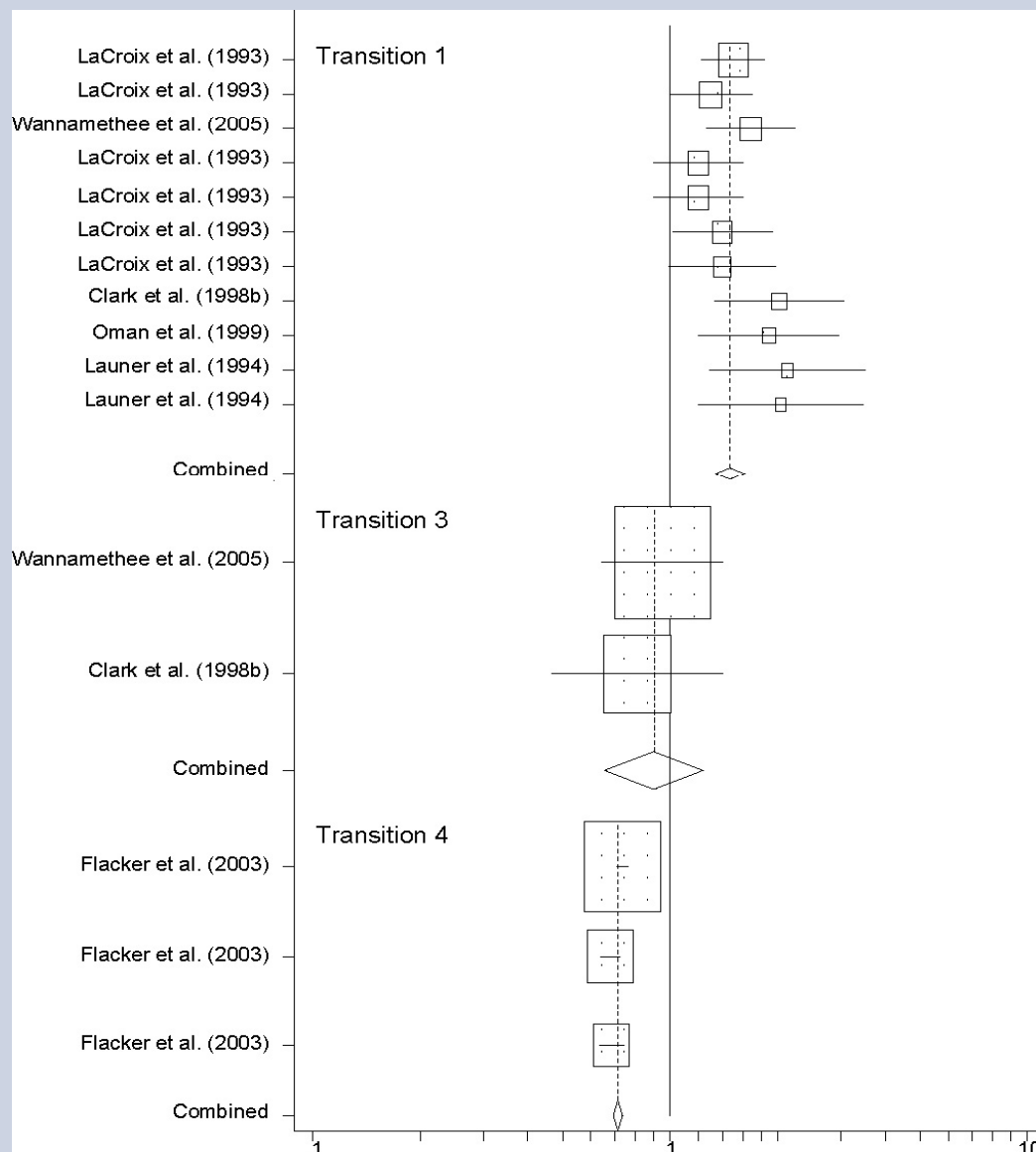
From not disabled to dead

From disabled to not disabled

From not disabled to dead



Risk factor obesity (obese vs normal), Transitions 1, 3 and 4





Surprising Findings for Obesity

Overweight and obesity increase the risk of becoming or remaining disabled (transitions 1 and 3), but they are associated with lower mortality for healthy and unhealthy persons (transitions 2 and 4).

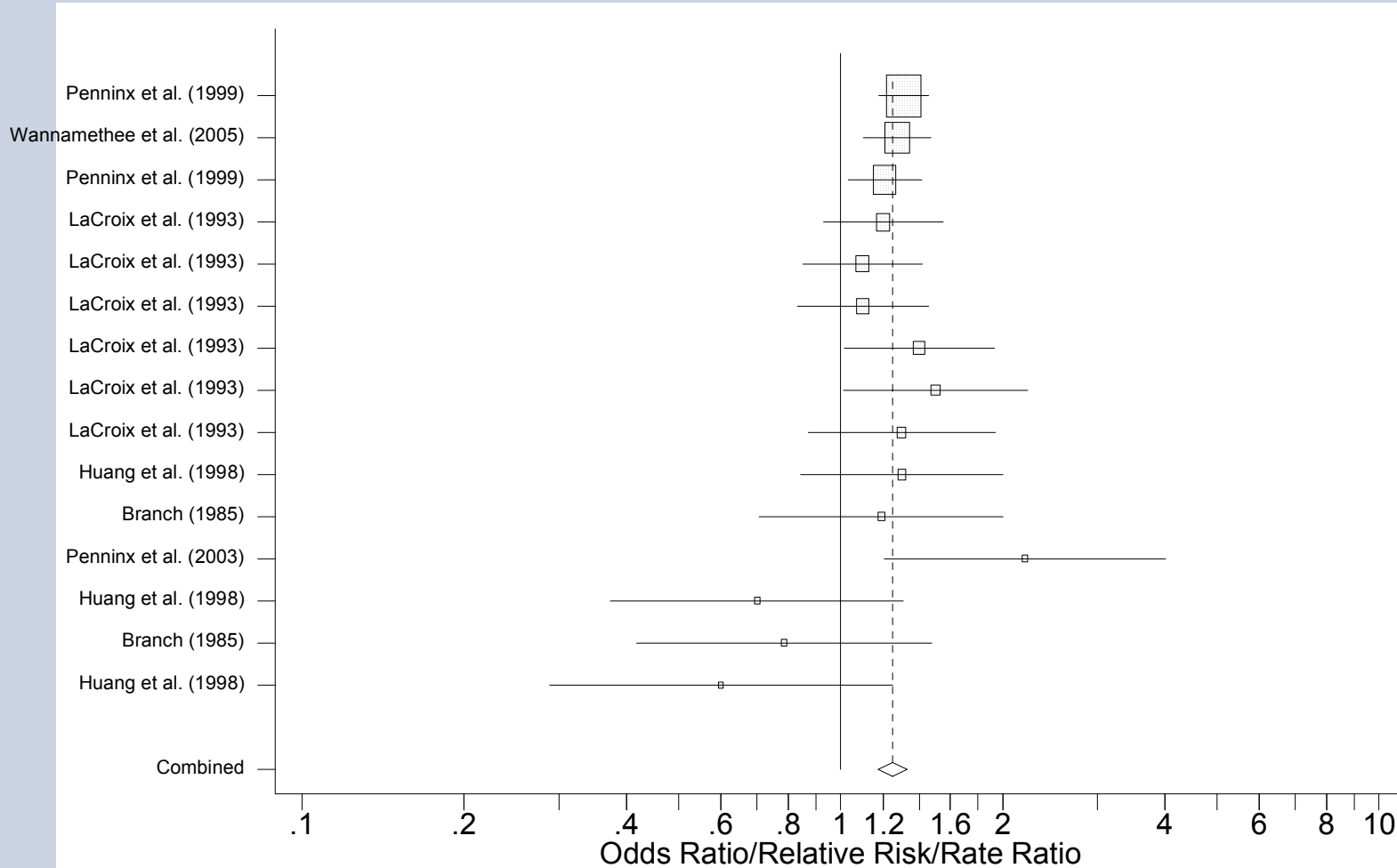
Lower mortality for obese persons???

Obesity means higher probability to become and to stay disabled
+
Disabled persons have higher mortality
=
Higher mortality for obese persons

But why do obese persons also have lower mortality when we look at healthy persons?

Risk factor smoking (current vs never),

Transition 1 from not disabled to disabled





Meta-Regression

Do effect sizes also depend on study characteristics?

(age range, RR/OR, type of disability, sex, household type)

The risk of becoming disabled due to obesity is larger for young and middle aged.

RR vs OR does not influence the result (exception: smoking).

For all transitions, CDM-measures result in larger sex differences than do ADL/IADL.

Studies with men lead to lower effect sizes than studies based on both sexes.

No significant results for household type



Conclusions

- 1. Harmonization of disability concepts is needed**
- 2. More studies on transition rates are needed, especially on transitions other than from health to disability, and on risk factors other than age and sex.**
- 3. Future research should check the finding that obesity implies a lower risk of mortality.**



Thank you !