

# Background to risk of bias assessment in randomized trials

- Systematic error or deviation from the truth
- Systematic reviews depend on included studies
  - incorrect studies = misleading reviews
  - should I believe the results?
- Assess each study for risk of bias
  - can't measure the presence of bias
  - may overestimate or underestimate the effect
  - look for methods shown to minimize risk

## Imprecision

- random error due to sampling variation
- reflected in the confidence interval

## Quality

- bias can occur in well-conducted studies
- not all methodological flaws introduce bias

## Reporting

- good methods may have been used but not well reported

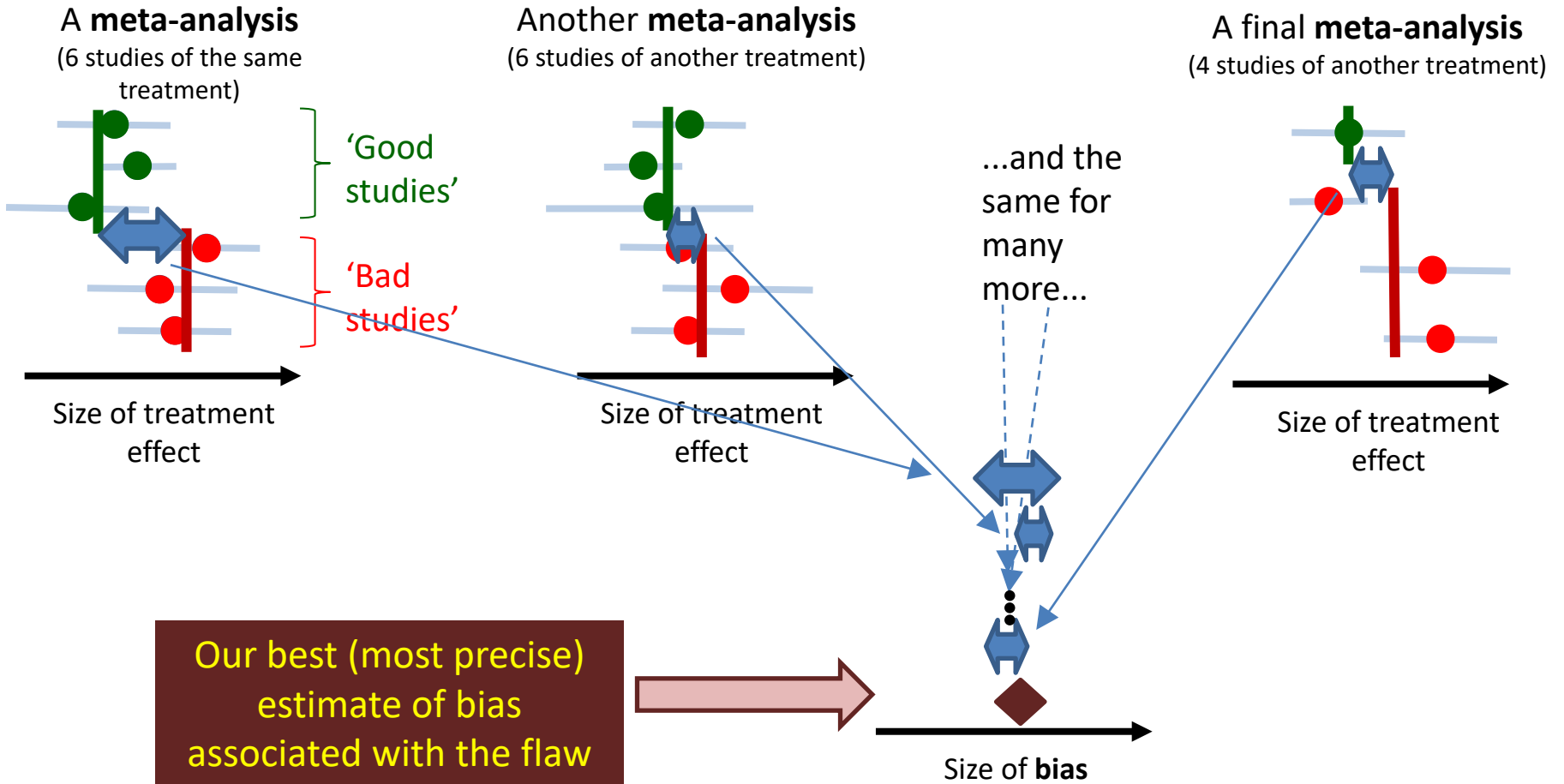
Empirical evidence of bias

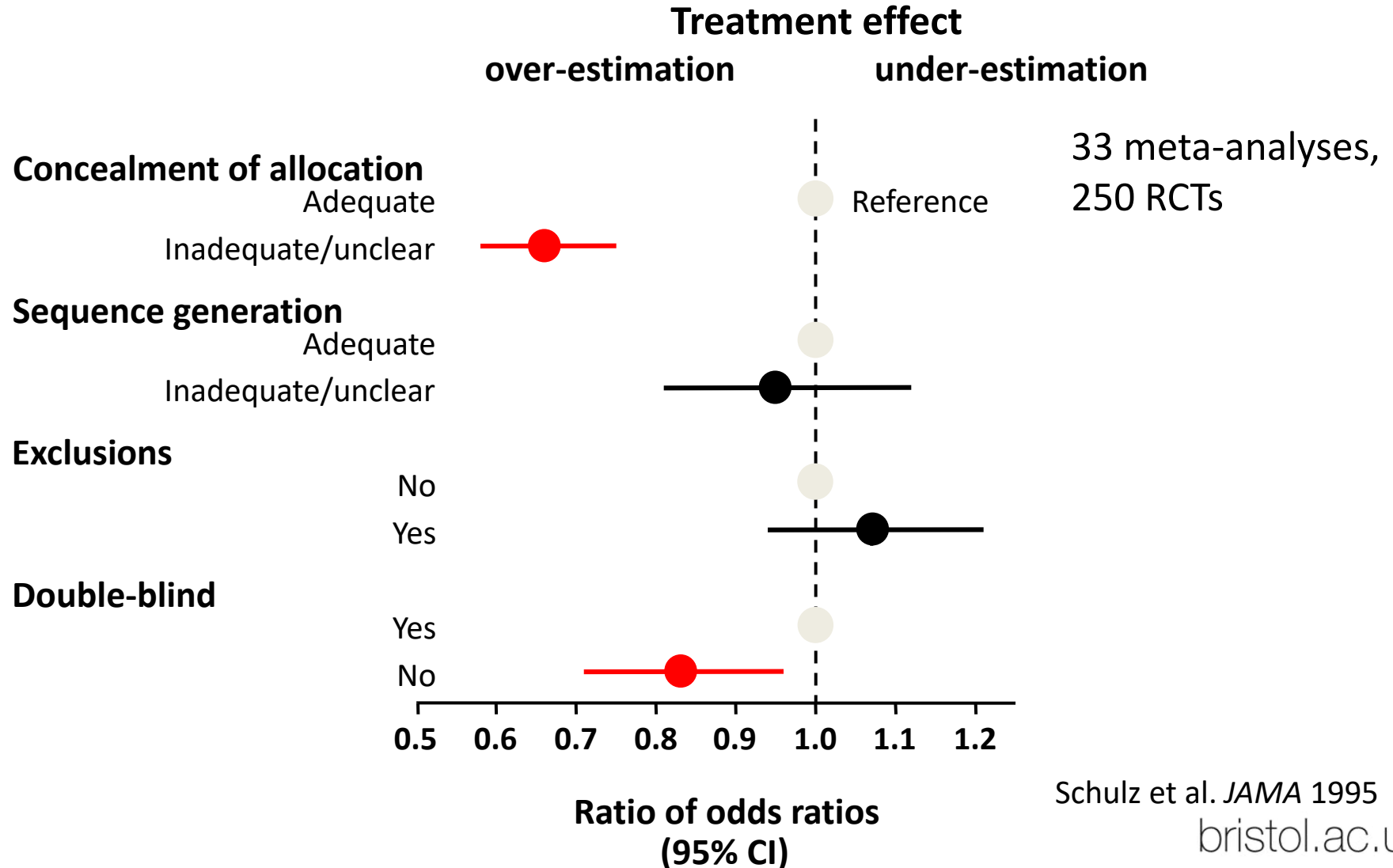


Evidence-based critical appraisal

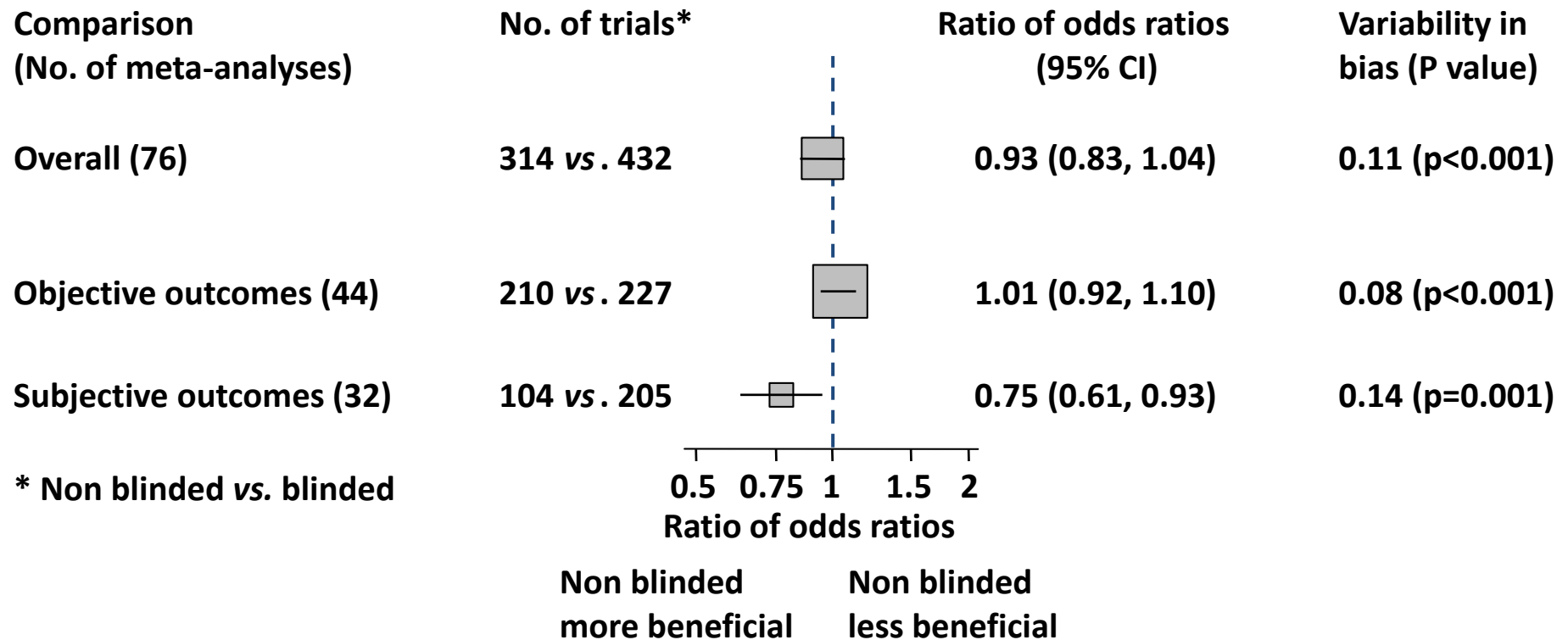
- Identify a large number of meta-analyses
- Record characteristics of individual studies (quality, type of publication, language etc.)
- Comparison of treatment effects within each meta-analysis (for example high-quality vs. low-quality)
- Calculate ratio of odds ratios
- Perform “meta-meta-analysis”

# “Meta-epidemiology”





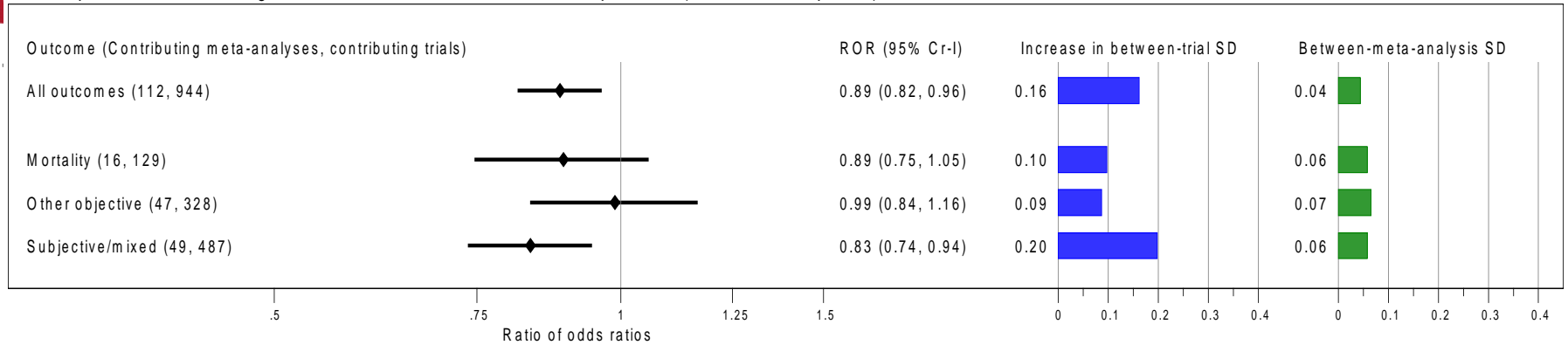
# Effect of blinding influenced by the type of outcome



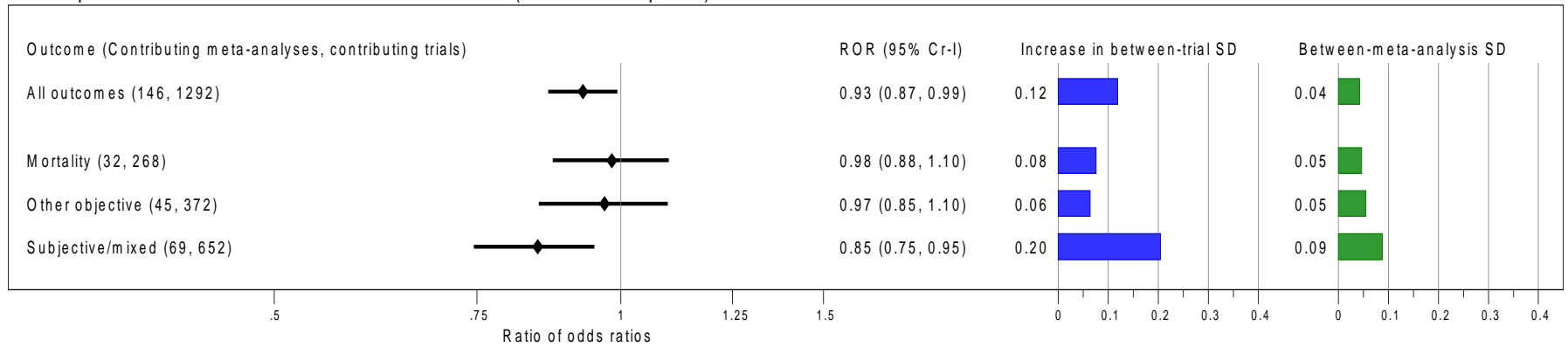
Wood, L., Egger, M., Gluud, L.L., Schulz, K., Jüni, P., Altman, D.G., Gluud, C., Martin, R.M., Wood, A.J.G. and Sterne, J.A.C. (2008) Empirical evidence of bias in treatment effect estimates in controlled trials with different interventions and outcomes: meta-epidemiological study. *BMJ* 336: 601-605



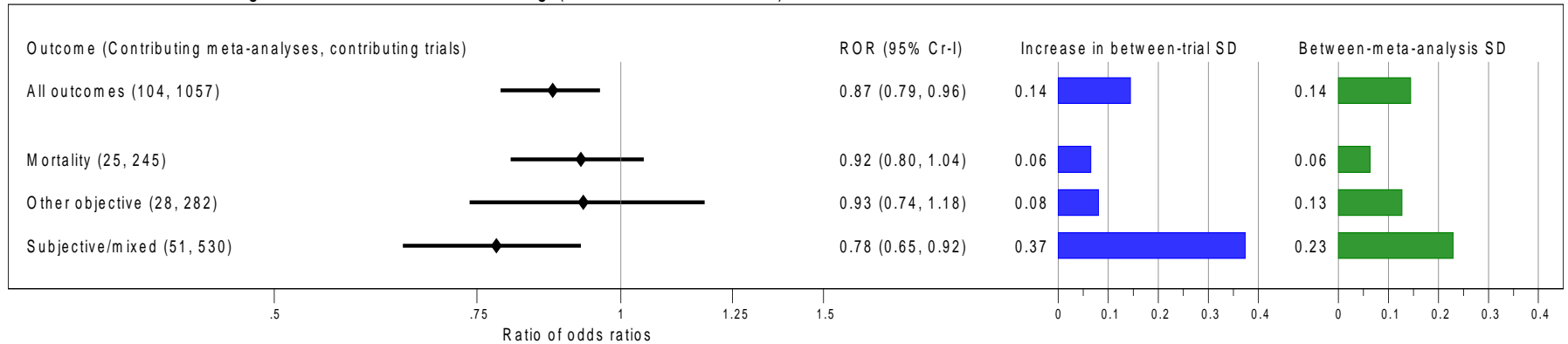
## Inadequate or unclear generation of randomization sequence (versus adequate)

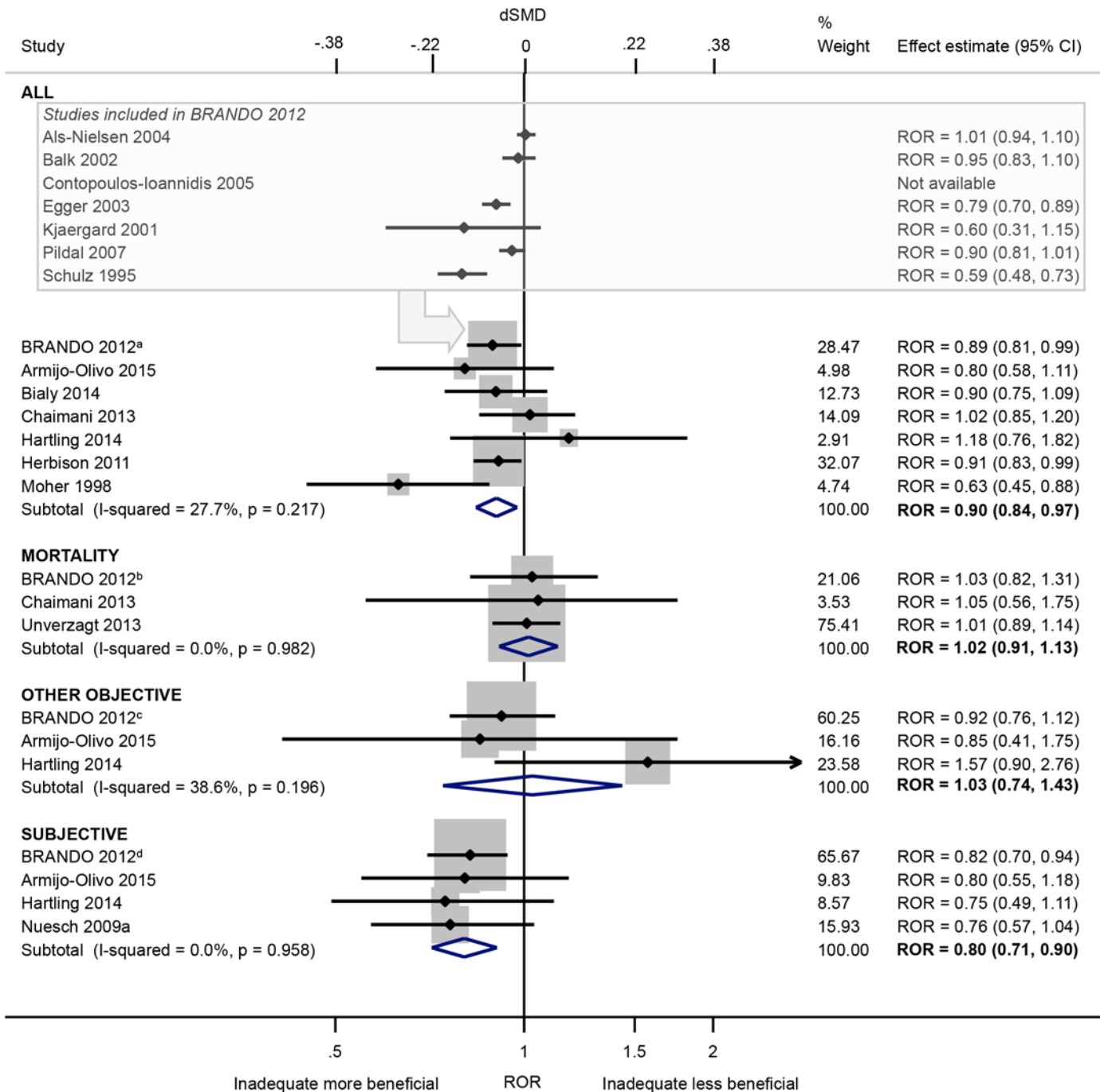


## Inadequate or unclear allocation concealment (versus adequate)



## Lack of double blinding or unclear double blinding (versus double blind)





(Page et al.  
*PLoS ONE*  
 2016)

Allocation  
 concealment

## Lack of evidence (in either direction)

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- Separate effects of blinding on bias during the trial (deviations from intended intervention) and on bias in assessment of outcomes
  - Situations in which blinding is not feasible
- Bias due to missing outcome data
- Bias in selection of the reported result

# Risk of bias in randomized trials

