

Meta-analysis: Advanced methods using the STATA software

Lausanne, September 20 to 22, 2017

Room in Biopôle 1, Route de la Corniche 2, 1066 Epalinges

Wednesday 20 September 2017 - Introduction to meta-analysis

Afternoon	
Introduction I. Why do a meta-analysis? II. How does a meta-analysis work?	14h00-14h15
Some concepts III. Definition of an «effect size» 1. The concepts of parameter, estimator and estimation	14h15-14h35
2. «Effect sizes» based on means a. The mean (μ) b. The difference in means (D) c. The standardized mean difference (d and g) d. The ratio of means (R) e. Which of the measures D, d, g and R to use and when?	14h35-15h15
Exercises (means)	15h15-15h45
<i>Coffee break</i>	<i>15h45-16h00</i>
3. « Effect sizes » based on binary data a. The proportion (p) b. The Relative Risk (RR) c. The Odds Ratio (OR) d. The Risk Difference (RD) e. Which of the three measures RR, OR et RD to use and when?	16h00-16h40
Exercises (binary data)	16h40-17h15h

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Thursday 21 September 2017 - Introduction to meta-analysis

Morning	
4. «Effect sizes» based on correlations 5. Conversion of «Effect sizes»	9h00-9h20
Exercises (correlations and conversions)	9h20-9h50
IV. Fixed effect model versus random effects models 1. The fixed effect model a. Estimation of the fixed effect model : «Inverse variance method» b. Estimation of the fixed effect model with rare events	9h50-10h30
<i>Coffee break</i>	<i>10h30-10h45</i>
2. The random effects model a. Estimation of the «between studies» variance b. Estimation of random effects model: «DerSimonian&Laird» method c. Estimation of random effects model with rare events 3. How to chose between the two models	10h45-11h30
Exercises (fixed effect vs. random effects models)	11h30-12h30
V. The heterogeneity 1. Sources of heterogeneity 2. How to identify heterogeneity?	12h30-13h00
<i>Lunch break</i>	<i>13h00-14h00</i>

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Afternoon	
3. Quantifying heterogeneity a. The calculation of Cochrane Q b. The estimation of the variance τ^2 across studies c. The calculation of I^2 4. How to deal with heterogeneity?	14h00-14h45
Exercises (heterogeneity)	14h45-15h30
<i>Coffee break</i>	<i>15h30-15h45</i>
VI. Prediction interval	15h45-16h00
Exercises (prediction interval)	16h00-16h20
VII. Subgroups analysis 1. Which model to adopt to calculate the «combined» effect for each subgroup? 2. Is it reasonable to calculate an overall «combined» effect from each of the subgroups «combined» effect and how? 3. Method for comparing subgroups 4. The proportion of variance explained R^2	16h20-17h15

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Friday 22 September 2017 - Advanced meta-analysis techniques

Morning	
Exercises (the analysis of subgroups)	9h00-9h45
VIII. The meta-regression 1. The mathematical model 2. The residual heterogeneity indexes 3. The test of residual heterogeneity 4. The proportion of variance explained 5. The prediction interval 6. The false positive risk and the «ecological bias»	9h45-10h45
<i>Coffee break</i>	<i>10h45-11h00</i>
Exercises (meta-regression)	11h00-11h30
IX. Diagnostic tools 1. Investigation of selection bias and publication bias a. The funnel plot b. Tests of funnel plot asymmetry c. The contour-enhanced funnel plot d. What are the practical consequences of a «funnel plot» asymmetry	11h30-12h30
Exercises (diagnostic tools: the funnel plot)	12h30-13h00
<i>Lunch break</i>	<i>13h00-14h00</i>

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Friday 9 December 2016 - Advanced meta-analysis techniques

Afternoon	
2. Sensitivity analysis, residual analysis, and detection of influential studies a. The stratified funnel plot b. The Trim&Fill method c. The cumulative meta-analysis d. Residual analysis e. The detection of influential studies	14h00-15h00
Exercises (diagnostic tools: sensitivity analysis)	15h00-15h30
<i>Coffee break</i>	<i>15h30-15h45</i>
X. Can we combine randomized studies with observational studies? 1. Fundamental differences between RCTs and observational studies 2. Adjustment on the basis of quality scores 3. How many studies are required to conduct a meta-analysis?	15h45-16h30
Evaluation and conclusion	16h30-16h45