# Introduction to Meta-analysis with `easymeta`

### *Getting started with easymeta*

Open your web browser.

Load **`easymeta`** at https://brui.shinyapps.io/easymeta/

### *1. Homogeneity*

The file **`statin.csv`** contains data from a meta-analysis of 4 randomised clinical trials to compare the use of high dose versus standard dose of statins in preventing non-fatal myocardial infarction[1].

Load the dataset going to the left-side menu,

**Load data > Upload data – Browse…**

Inspect the data clicking to the top-menu **Data preview**.

What data was collected to run the meta-analysis?

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To run the meta-analysis, choose first the effect size going to the left-side menu,

**Choose effect size – Odds Ratio**

and the statistical model,

**Choose effect size – Fixed**

Finally, click on the **Calculate** button.

Display the **Forest plot** from the top-menu.

How do you interpret the pooled estimate? How large is the heterogeneity between studies?

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[1] *Cannon et al. J Am Coll Cardiol 2006.*

Now run a random effects model going back to the left-side menu,

**Choose effect size – Random**

and click on the **Calculate** button.

How do you interpret this new pooled estimate? Is the random effects pooled estimate similar to the fixed effects, why?

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What is your interpretation for this meta-analysis?

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### *2. Heterogeneity*

The file **`biomtx.csv`** contains data from a meta-analysis of 20 randomized clinical trials to compare the use of biological agents for patients with rheumatoid arthritis versus the usual anti-inflammatory treatment[2].

Load the dataset going to the left-side menu,

**Load data > Upload data – Browse…**

Inspect the data clicking to the top-menu **Data preview**.

What data was collected to run the meta-analysis?

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To run the meta-analysis, choose first the effect size going to the left-side menu,

**Choose effect size – Odds Ratio**

and the statistical model,

**Choose effect size – Fixed**

Finally, click on the **Calculate** button.

[2] *Kanters et al. Rheumatology 2014.*

Display the **Forest plot** from the top-menu.

How do you interpret the pooled estimate? How large is the heterogeneity between studies?

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Now run a random effects model going back to the left-side menu,

**Choose effect size – Random**

and click on the **Calculate** button.

How do you interpret this new pooled estimate? Is the random effects pooled estimate similar to the fixed effects, why?

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Here you have a categorical variable, **age52**, which might help to explain the heterogeneity, identifying those trials where the mean age of the patients is below and over 52 years. Choose the categorical **age52** variable from the left-side menu,

**Choose variable to explain heterogeneity > age52**

Change the statistical model to a fixed effects,

**Choose effect size – Fixed**

and click on the **Calculate** button.

Display the **Subgroup** meta-analysis from the top-menu.

Is there any difference between the two subgroups? Does the age explain the heterogeneity, why?

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Now run a **Meta-regression** from the top-menu.

What is the interpretation for the intercept (or constant term), and for the slope?

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Is there any difference between the two subgroups?

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Now consider the continuous variable **age** (in years) and run a meta-regression.

Choose the **age** variable from the left-side menu,

**Choose variable to explain heterogeneity >** **age**

and click on the **Calculate** button.

Display the **Meta-regression** meta-analysis from the top-menu.

Click on the **Bubble plot** tab, how does it look like?

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Click on the **Summary** tab, what is the interpretation for the intercept (or constant term) and the slope?

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What is your interpretation for this meta-analysis?

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