Meta-analysis

Scientific Writing and Presentation

Assignment 2: Article type presentation

Rok Vatovec

Matic Sašek

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Introduction

- Karl Pearson (1904) was the first researcher to use formal techniques to combine data from different studies.

- Later, Gene Glass (1976) introduced the term "meta-analysis".

- To date, the amount of information collected using this approach continues to increase.

"It is a powerful tool to cumulate and summarize the knowledge in research field through statistical instruments, and to identify the overall measure of treatments effect by combining several individual results."
(Greco, Zangrillo, Biondi-Zoccai and Landoni, 2013)

Pearson K. Report on Certain Enteric Fever Inoculation Statistics. Br Med J 1904; 2: 1243-6.

Glass GV. Primary, secondary and meta-analysis of research. Educ Res 1976; 5: 3-8.

Key elements of meta-analysis

- Protocol registration
- Identification and selection of studies
    - Literature search
    - Inclusion and exclusion criteria
- Statistical analysis
    - Presented on the next slide
- (presentation of the) Results
    - Flow diagram
    - Forest-plot
- Biases in meta-analysis

Hadish AB. Meta-analysis in medical research. Hippokratioa 2010: 14(1); 29-37.

Sections of meta-analysis

- Title with Abstract
- Introduction
- Methodology
    - Search Strategy
    - Eligibility Criteria
    - Study Selection
    - Data Extraction
- Results
- Discussion
- Conclusions
- References
- List of Tables
    - Summary of studies
    - Comparisons
    - Flow Chart
    - Forest Plots

Statistical analysis

- How to do it?
  - Dichotomous data
    - Risk ratio
    - Odds ratio
  - Continuous data
    - Standardised mean difference
  - Heterogeneity and sensitivity analysis
  - Evaluation of publication bias

- Fixed and random effects model

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Submission procedures and required materials

- PLOS One example
  - **Title** should include subtitle of the study design (meta-analysis)
  - Study design must be mentioned in the **cover letter**
  - Complete PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) **checklist** and **flow diagram** must be included
  - **Registered** meta-analyses should use the **PRISMA-P** or **SPIRIT** protocol reporting guidelines
  - **Justification** of the rationale of the meta-analysis and its contribution to the base of scientific knowledge is asked

Thank you for your attention