

Chapter 1

How can a meta-analysis be defined? What differentiates a meta-analysis from other types of literature reviews?

A meta-analysis tries to summarize the results of multiple studies on a similar topic in a mathematical way. It differs from other kinds of literature reviews by being quantitative and by aiming to select studies in a systematic way. A meta-analysis is therefore also a kind of systematic review.

Can you name one of the founding mothers and fathers of meta-analysis? What achievement can be attributed to her or him?

Gene V. Glass: Developed a technique to pool SMD across studies and termed it **meta-analysis**. He was also part of the first ever published meta-analysis

Peter Elwood and Archie Cochrane: used meta-analysis to show that aspirin has a small, but relevant preventive effect on the recurrence of heart attacks

Name three common problems of meta-analyses and describe them in one or two sentences

1. Garbage in, Garbage out

Since a meta-analysis aims to synthesize research, bad research will lead to unhelpful results

2. Apples and Oranges

In most sciences there exists a garden of forking paths how to measure a target. Many studies differ, even if the aim to measure the same things. Critics therefore often claim, that heterogeneity diminishes the results of meta-analytic studies

3. The file-drawer

The population of all studies a meta-analysis can use are censored in a way that some studies are never published. This includes studies with contradicting and statistically non-significant findings.

Name qualities that define a good research question for a meta-analysis.

It should specify a problem, which needs to be solved in the bigger picture of the literature. Several frameworks can help with this procedure. The FINER framework, the PICO, the PRISMA.