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New methods apply to meta-analysis:

- Applicable to intervention reviews
- Using random-effects models
- Suitable for any outcome type, for example,
  - Binary, measured using odds ratio (OR), risk ratio (RR)
  - Continuous, measured with mean difference (MD), standardised mean difference (SMD)

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Why did we make these changes?

- Different methods exist for calculating the summary effect, the heterogeneity variance and confidence intervals in a meta-analysis
- The performance of the methods can differ depending on the characteristics of the meta-analysis (e.g. number and size of the included studies)
- Previously in RevMan,
  - the **Wald-type** confidence interval was the only confidence interval method for the summary effect, and
  - the **DerSimonian and Laird** (DL) method was the only one available for calculating the heterogeneity variance
- These methods may not be optimal, particularly in meta-analyses with a small number of studies
- Alternative methods with better performance have been implemented
- There are **three** main points of difference for authors

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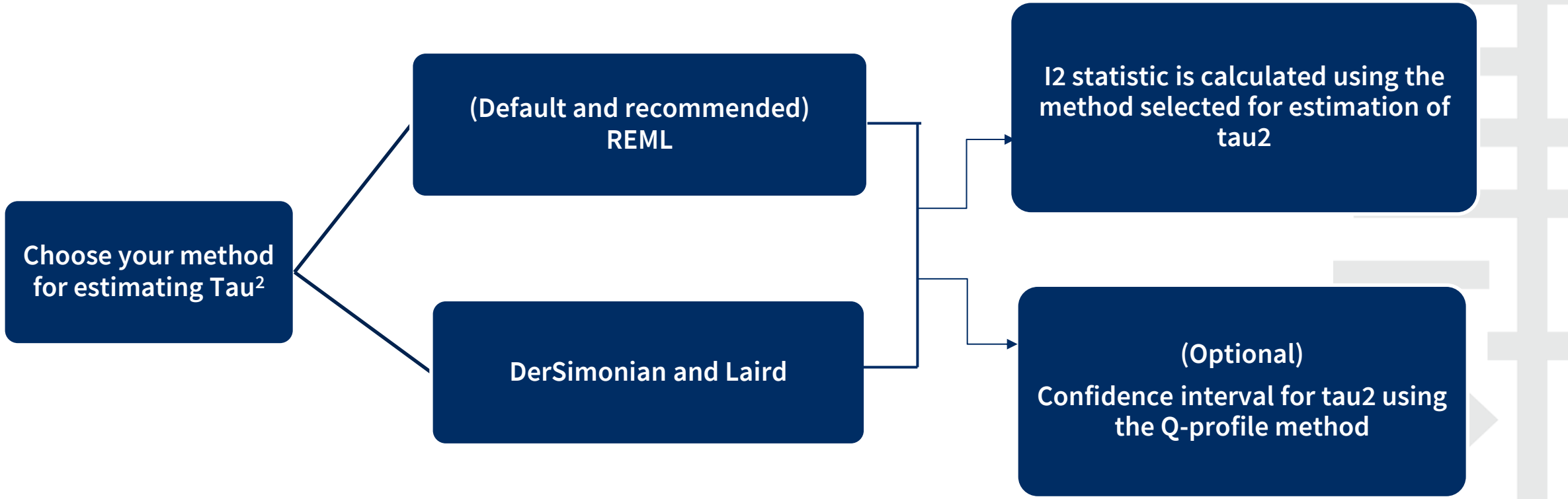
First - estimating heterogeneity

- Tau^2 provides an estimate of the heterogeneity variance, which is a measure of how the intervention effects vary
- Why is Tau^2 important?
  - Influences the weights the individual studies receive
  - Affects the calculation of the confidence interval for the summary effect
  - Impacts the calculation of the I^2 statistic
- What is new in RevMan?
  - The default option in RevMan for calculating Tau^2 is now REML (Restricted Maximum Likelihood)
  - Authors can still use the previous method (DL – DerSimonian and Laird) but REML is recommended
  - A confidence interval for Tau^2 can now be displayed
  - For more details, see the Cochrane Handbook, section 10.10.4.4

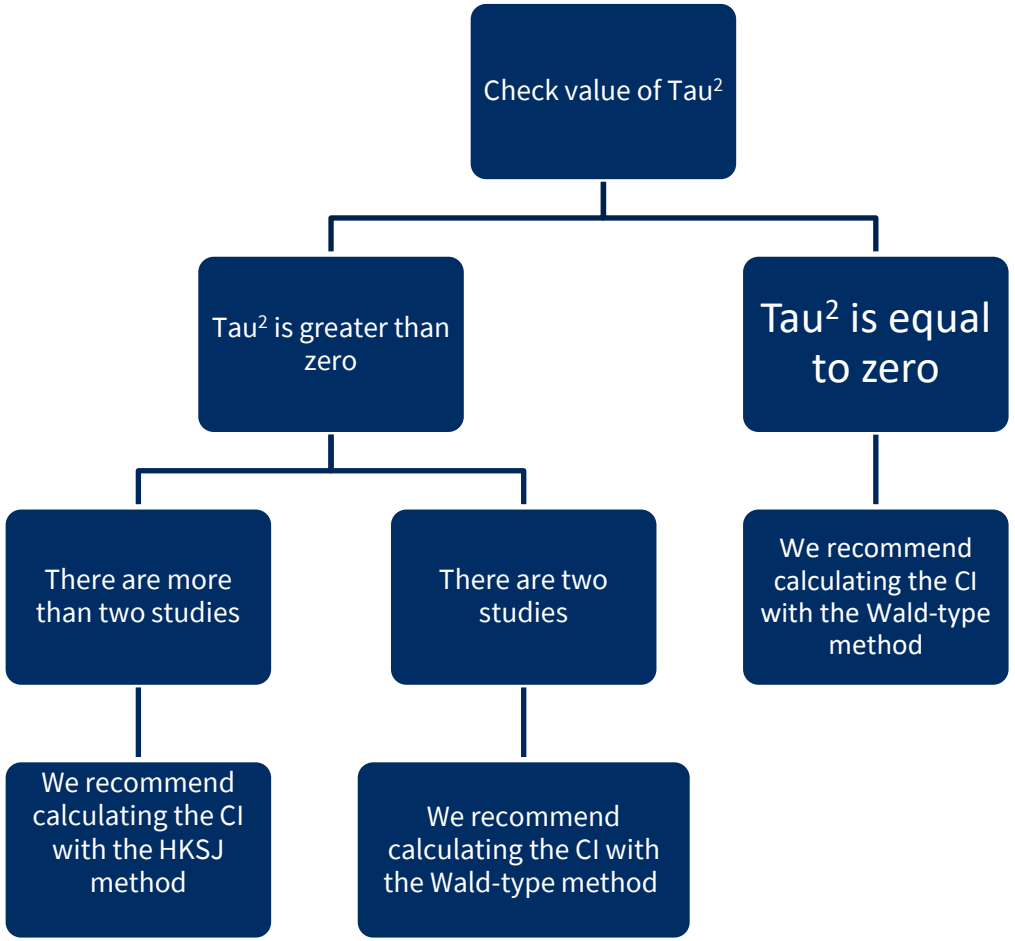
Decision tree on heterogeneity for authors



Second – calculating confidence intervals for the summary effect

- Confidence intervals (CIs) show the uncertainty associated with the effect estimate
- In RevMan, the default method for calculating a CI for the summary effect remains the Wald-type
- A new CI method called the HKSJ (Hartung-Knapp-Sidik-Jonkman) CI method is now available
- The recommended CI method depends on:
  - The value of Tau^2
  - The number of studies in the meta-analysis
- For more details, see the Cochrane Handbook, sections 10.10.4.4 and 10.10.4.5

Decision tree on selecting a CI for the summary effect for authors



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Third – is a prediction interval required?

- Authors can decide whether they want to include a prediction interval (PI)
- A prediction interval 'predicts' the possible true effects in a new study that is similar to the studies already in the meta-analysis.
- Why use PIs? They provide us with a direct way of understanding whether heterogeneity is clinically important; whether we expect that the intervention to always be beneficial, or always be harmful, or sometimes beneficial and harmful
- RevMan automatically calculates a PI using the most appropriate statistical approach
- Warning! The Cochrane Handbook urges caution in using PIs, especially in the case of few studies – see Section 10.10.4.3