# Use of evidence in cost-effectiveness decision modelling: taxonomy for current practice and methods

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# Overview

**Section 1 : Background**

- Cost-Effectiveness Analysis
- Use of evidence in Cost-Effectiveness Analysis
- Motivation for Paper

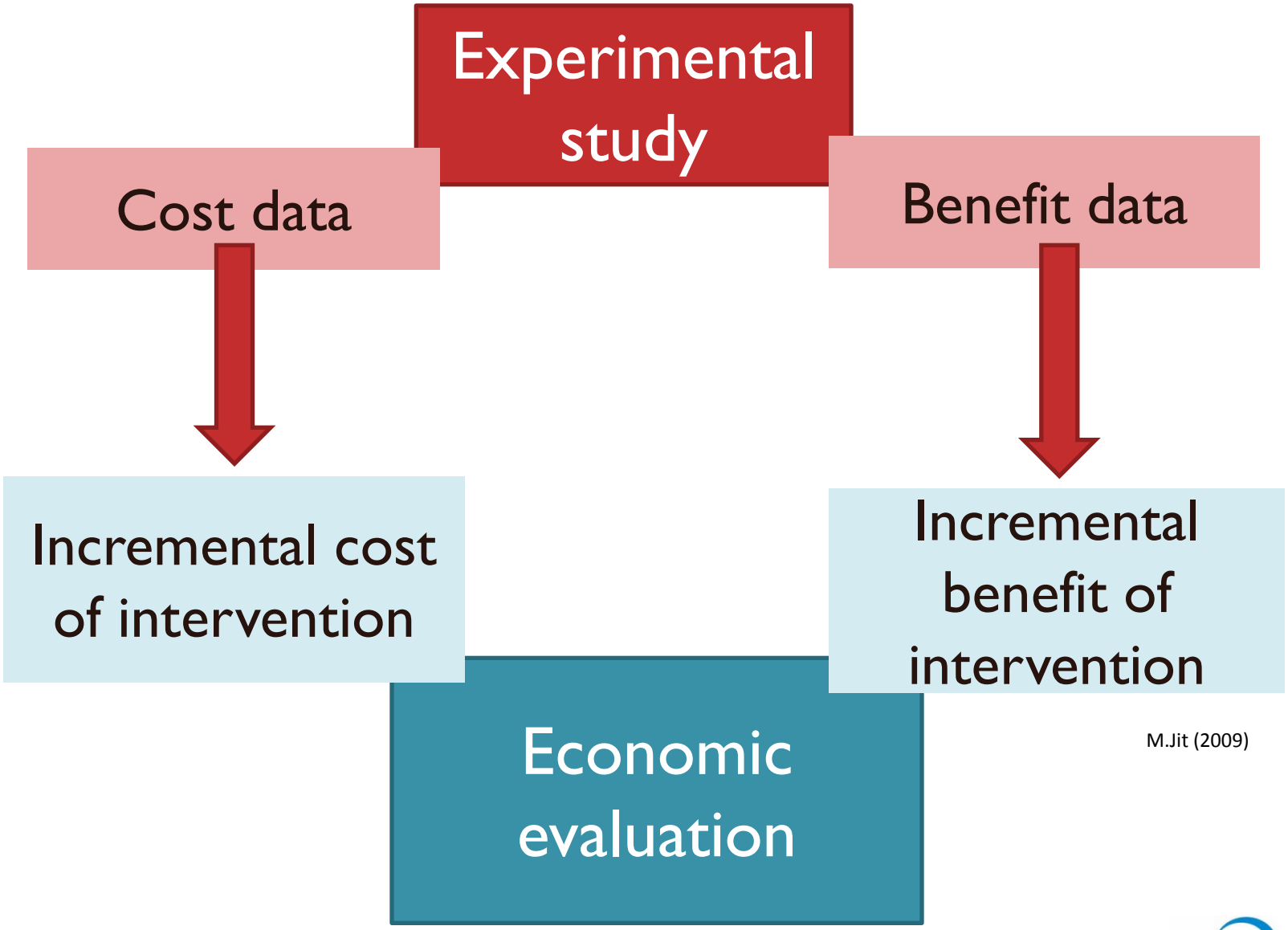
**Section 2 : Taxonomy for the use of effectiveness evidence in CE modelling**

- Proposed taxonomy structure
- Methods for synthesizing evidence

**Section 3 : Synthesizing evidence for other CE model input parameters**

**Section 4 : Conclusions**

# Background




M.Jit (2009)

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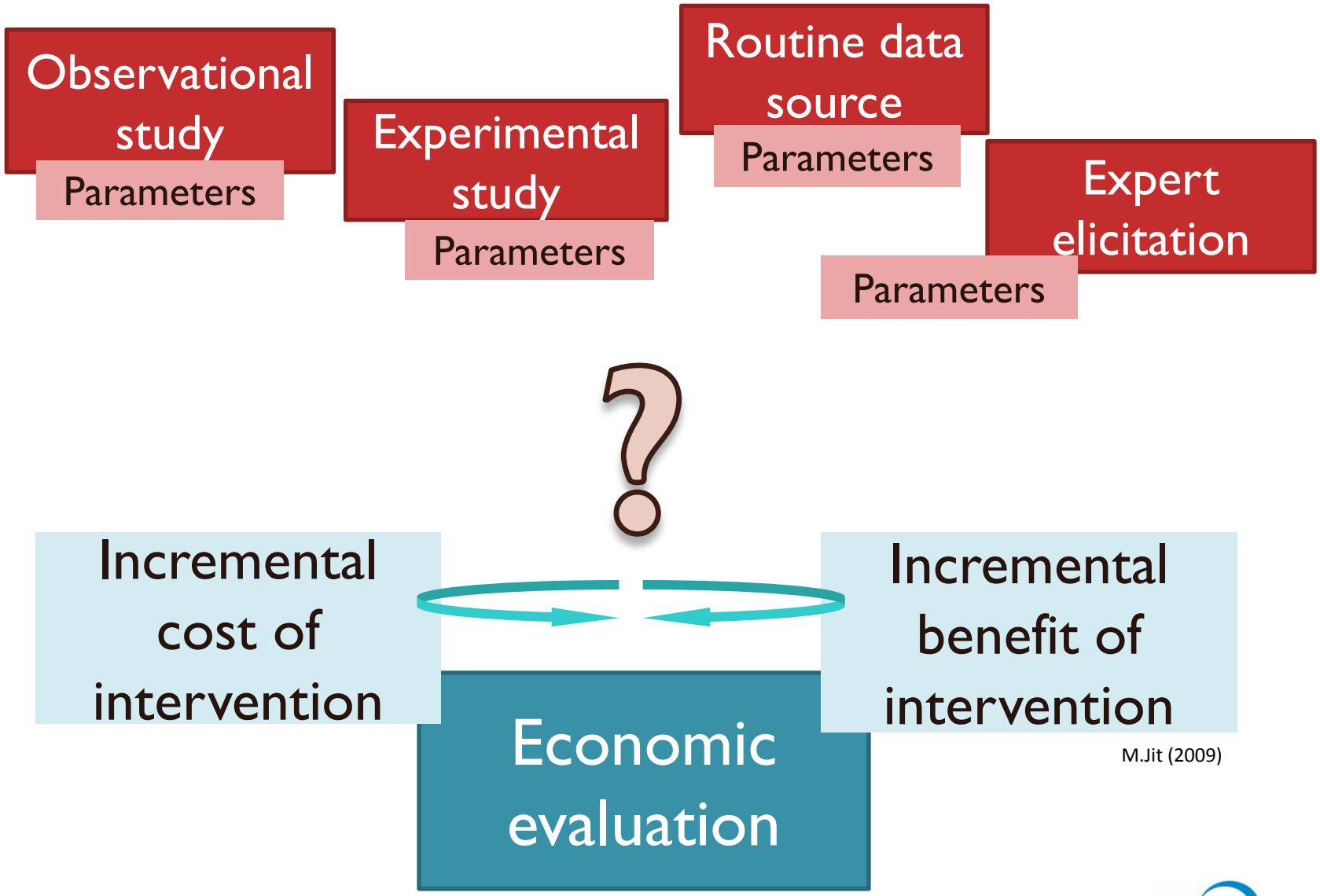


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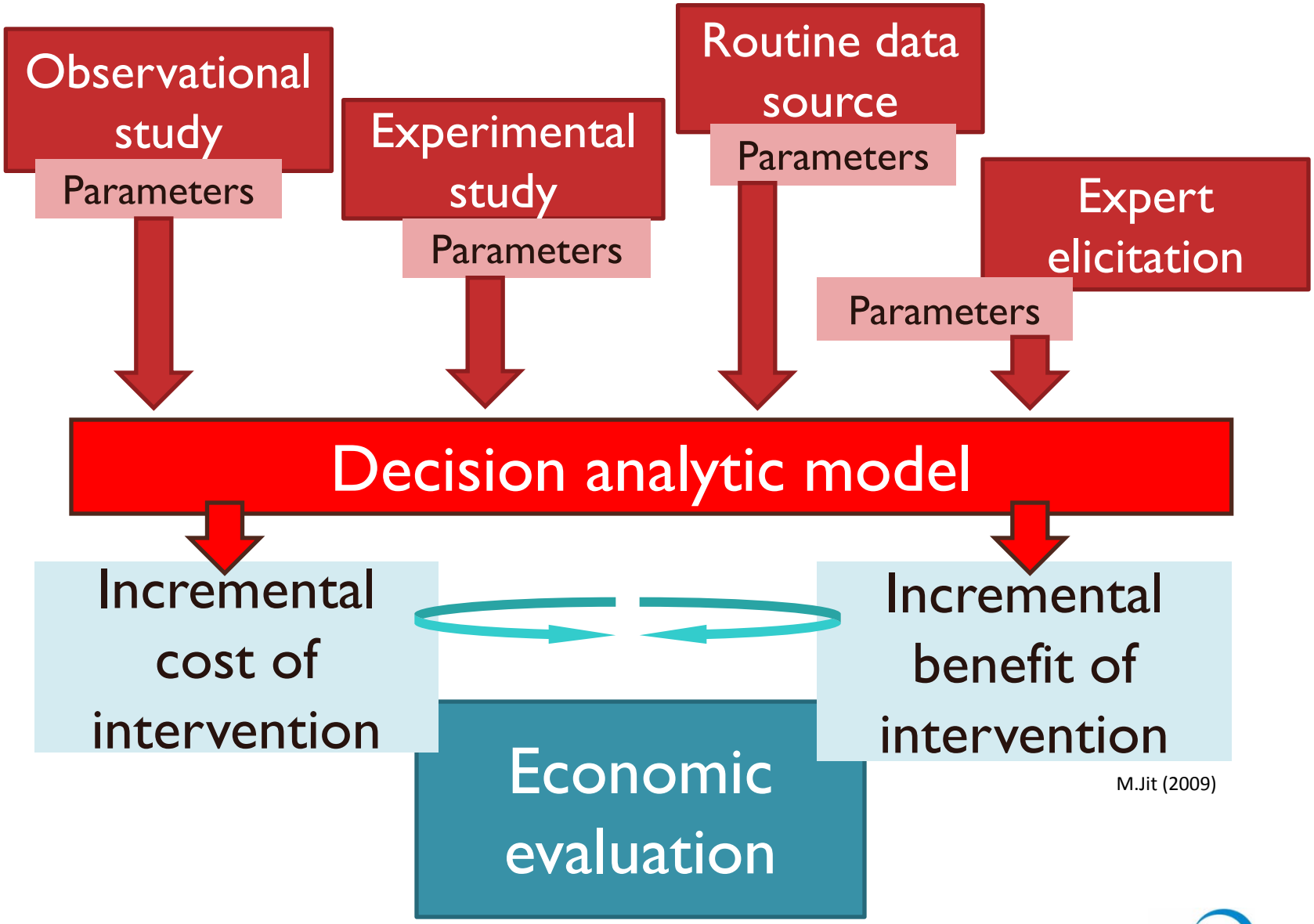


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# Motivation

- **NICE - Guidelines to the Methods of Technological Appraisal** (NICE, 2008)**:**

  - All “relevant” evidence must be identified

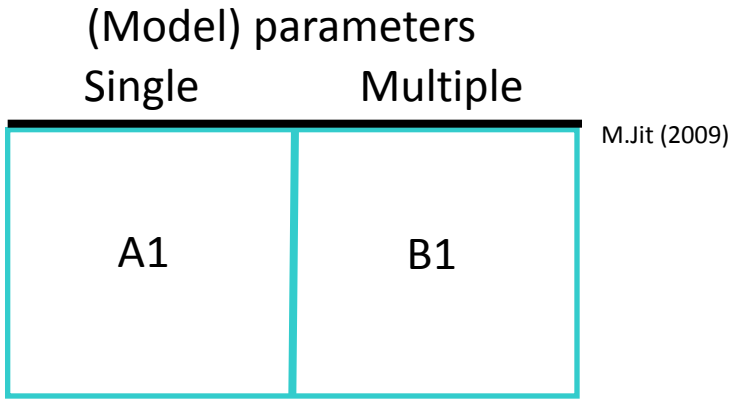
  - Evidence must be **quality assessed** and, where appropriate, pooled using **explicit criteria** and **justifiable** and **reproducible methods**

- **Need for:**

  - categorisation of evidence sources and formats

  - guidance on the synthesis methods

# Taxonomy for the use of effectiveness evidence in CE modelling

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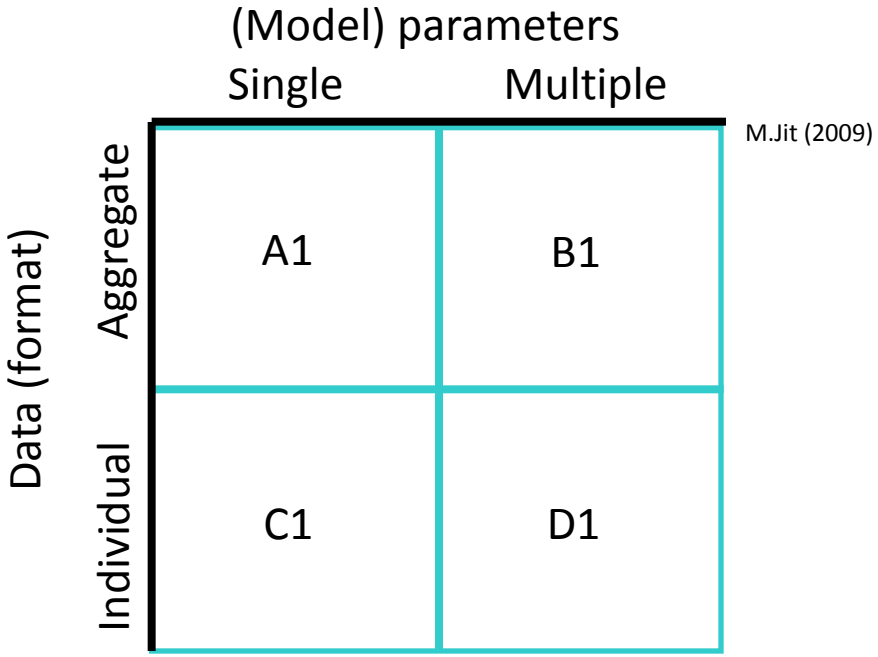


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- **AD:** evidence base available in aggregate format (any reduction of IPD)
- **IPD:** most informative format of data collected within a study

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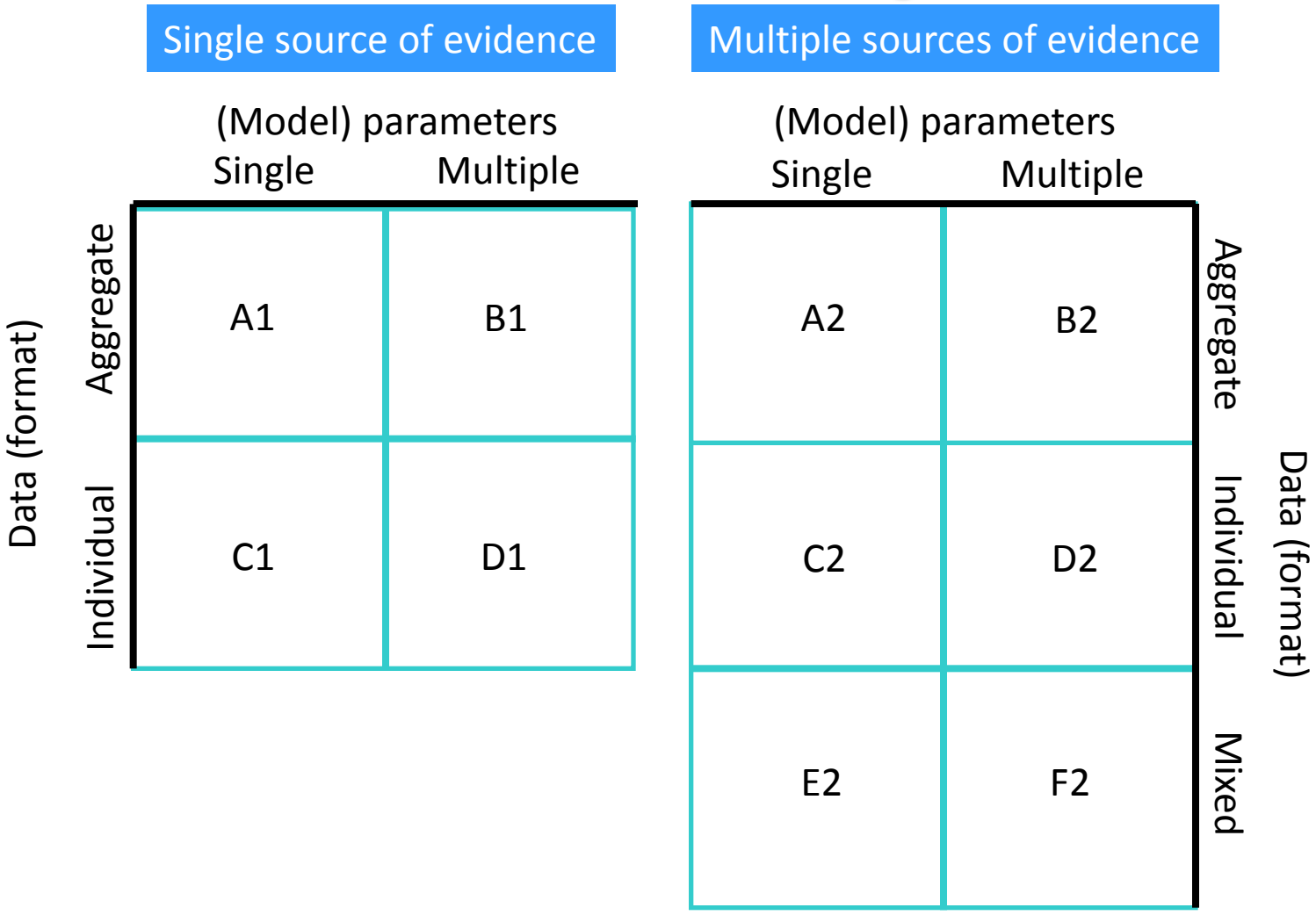

# Taxonomy for the use of effectiveness evidence in CE modelling

| | Evidence | Parameters | Data | Methods |
|---|---|---|---|---|
| A1 | Single | Single | Aggregate | Direct insertion in the model |
| B1 | Single | Multiple | Aggregate | Direct insertion in the model - correlation should be included if reported |
| C1 | Single | Single | Individual | Using estimation procedures |
| D1 | Single | Multiple | Individual | Using estimation procedures - include correlation structure if reported |
| A2 | Multiple | Single | Aggregate | Meta-analysis<br>Meta-regression |
| B2 | Multiple | Multiple | Aggregate | Multivariate meta-analysis (eg BRMA)<br>Mixed treatment comparison |
| C2 | Multiple | Single | Individual | "Mega-analysis" (meta-analysis using IPD) |
| D2 | Multiple | Multiple | Individual | Multivariate meta-analysis with IPD (eg BRMA)<br>Mixed treatment comparison with IPD |
| E2 | Multiple | Single | Mixed | Two-stage (reduce IPD to AD or reconstruct IPD from AD)<br>One-stage (Bayesian and non-Bayesian hierarchical models) |
| F2 | Multiple | Multiple | Mixed | Extensions of previous synthesis models to the hierarchical framework |

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# Taxonomy for the use of effectiveness evidence in CE modelling

## Example

| | Evidence | Parameters | Data | Methods |
|---|---|---|---|---|
| A2 | Multiple | Single | Aggregate | Meta-analysis<br>Meta-regression |

- **Meta-analysis (MA):**

  - combines results (eg OR) into a single quantitative estimate

  - investigate presence of heterogeneity and causes – approach FE or RE; frequentist or Bayesian

- **Meta-regression:**

  - patient's baseline covariates mean estimates at study-level available; are important to explain underlying heterogeneity

# Synthesizing evidence for other CE model input parameters

- **Resource use, health related preferences**

  - wide range of evidence may be considered (eg RCTs, observational data, aggregate data and expert opinion)

  - synthesis methodology usually poorly reported if at all – few examples published

# Conclusions

- Taxonomy grid exhaustively identifies and describes scenarios related to the use of evidence in cost-effectiveness analysis

- This work allowed the:

  **(i)** categorisation of evidence sources to inform model structure and parameter estimates;

  **(ii)** assessment of methods used to synthesize or transform evidence from different study designs; and

  **(iii)** drawing guidance on these analysis methods

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