

Economic Evaluation of Complex Interventions

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Complexity as a property of an intervention and/or system

Properties of interventions

- Multiple components
- High degree of stakeholder involvement
- Multiple operational levels
- Multiple goals and outcomes
- Flexibility or tailoring of the intervention to heterogeneous recipients

Properties of a system

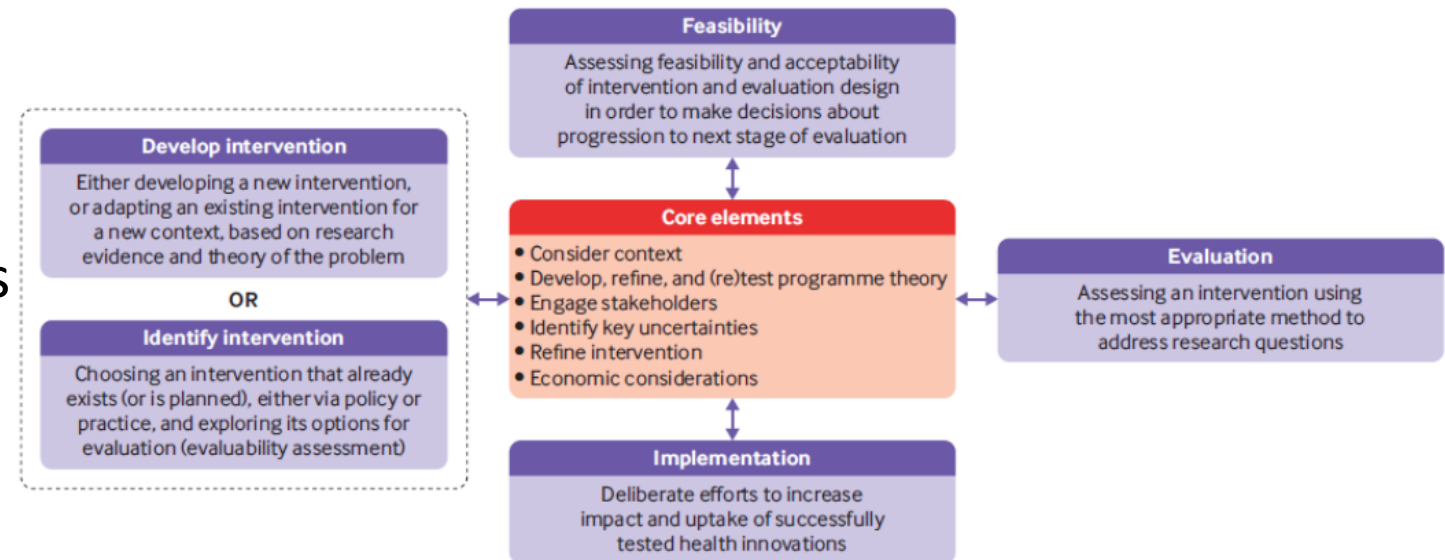
- Adaptive to changes in its local environment
- Composed of other complex systems
- Sensitive to initial conditions
- Behaves in a non-linear fashion
- ...

“Complexity arises from the properties of the intervention itself, the context in which an intervention is delivered and the interaction between the two.”

(UK Medical Research Council framework for the development and evaluation of complex interventions, Skivington et al. 2021)

Economic evaluation in the UK MRC Framework (2021)

- Economic evaluation should be considered during all phases of intervention research
- Broad (societal) perspective on costs and benefits should be taken
- Wide range of available approaches (CEA, CUA, CCA, MCDA, CBA) should be used



Skivington et al. 2021

Economic evaluation in in the UK MRC Framework

- **Use of decision modelling and value of information analysis** should be systematically considered in prioritizing research questions and optimizing research design
- **Cost benefit analysis or cost consequence analysis** should be preferred to narrower approaches such as cost-effectiveness or cost-utility analysis
- **Equity–efficiency trade-offs** should be considered when the intervention is likely to have different costs and benefits for different groups
- **Implementation questions** should be included in economic considerations during the early stages of intervention and study development

The continuum of research perspectives

- **Efficacy:** To what extent does the intervention produce the intended outcome(s) in experimental settings?
 - **Effectiveness:** To what extent does the intervention produce the intended outcome in real-world settings?
 - **Theory-based:** What works, for whom, under which circumstances, and how?
 - **System:** How does the intervention interact with the system to produce change?
- The choice of the perspective determines methodological requirements of economic evaluation

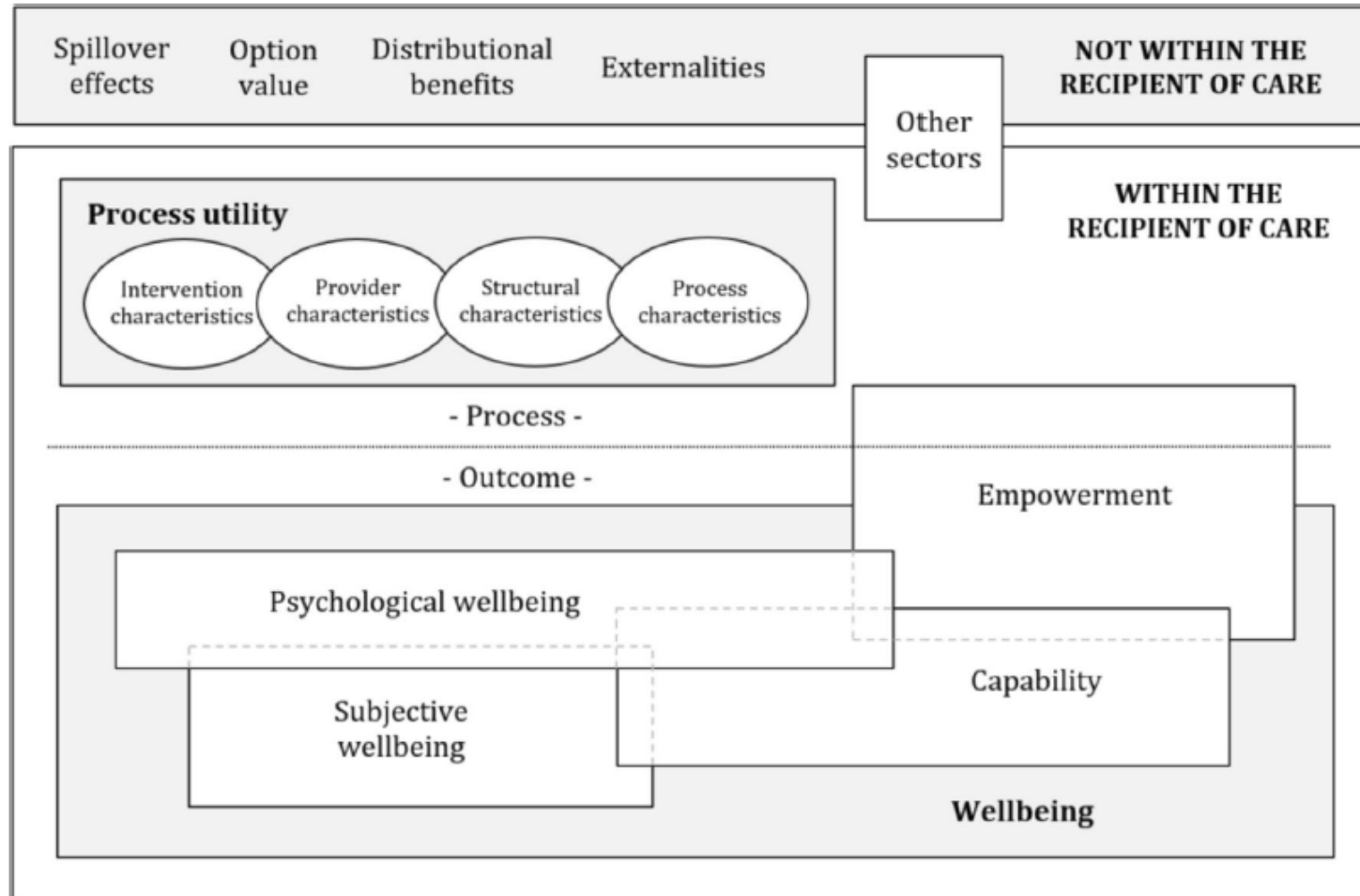
Efficacy/Effectiveness perspective

- Many challenges can be tackled by more comprehensive data collection or statistical techniques or more sophisticated decision modelling, e.g.:
 - multiple dimensions of health
 - non-health benefits
 - externalities/spill-over effects
 - heterogeneity of participants
- Time, effort, and resources
- Poor generalizability remains a major challenge!

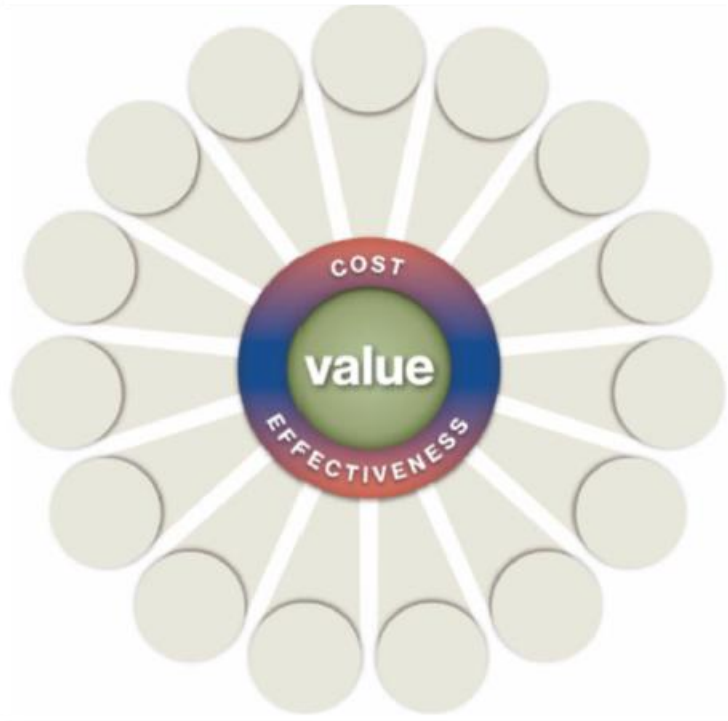
Efficacy/Effectiveness perspective

- Recent guidelines and recommendations emphasize the use of a broad framework for economic evaluation, such as CCA or CBA
 - National Institute for Health and Care Excellence 2020;
 - The Second Panel on Cost-Effectiveness in Health and Medicine 2017
- Additional work required to reach agreement on which elements to include from a societal perspective, how these should be determined, and how to value them
- Additional guidance is required with regard to approaches to include equity issues into economic evaluation
- Standardization of methods?

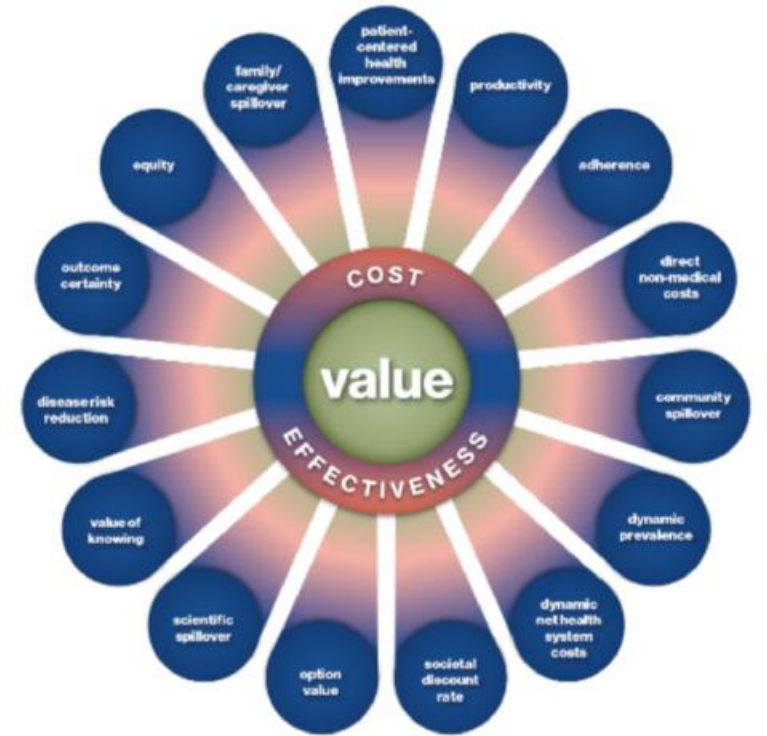
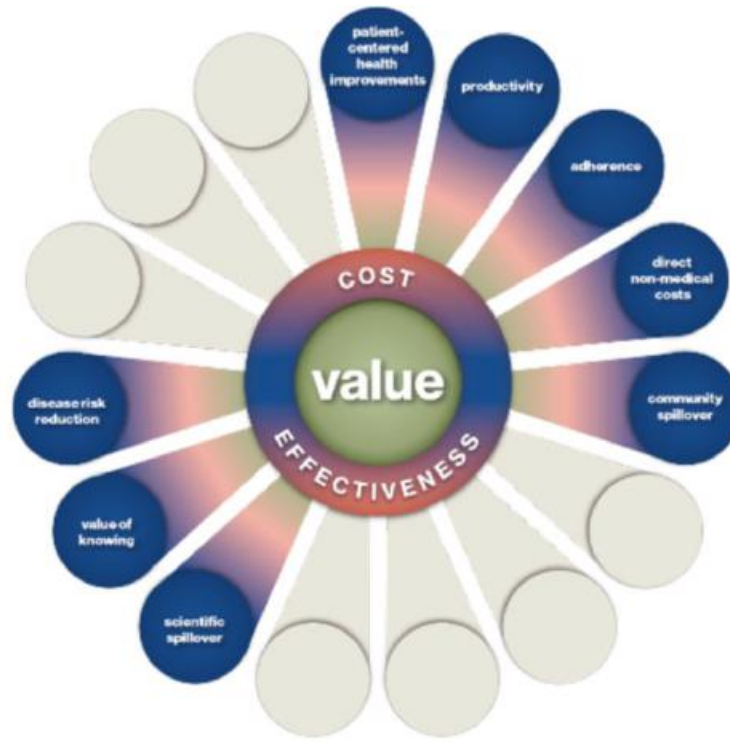
Conceptualizing 'benefits beyond health' within the context of the quality-adjusted life-year framework



GCEA value flower: valuing the societal impact of health technologies

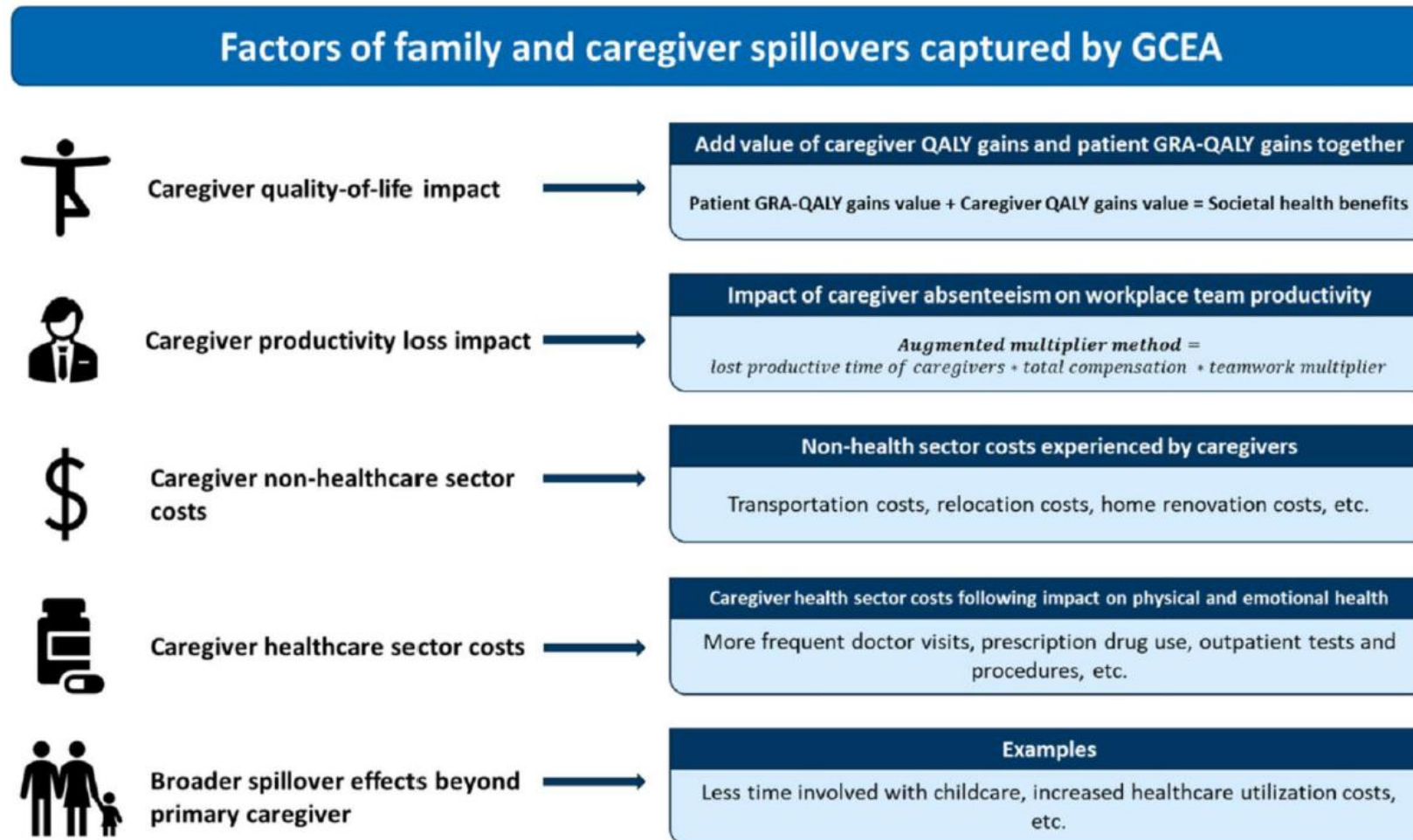


Conventional CEA

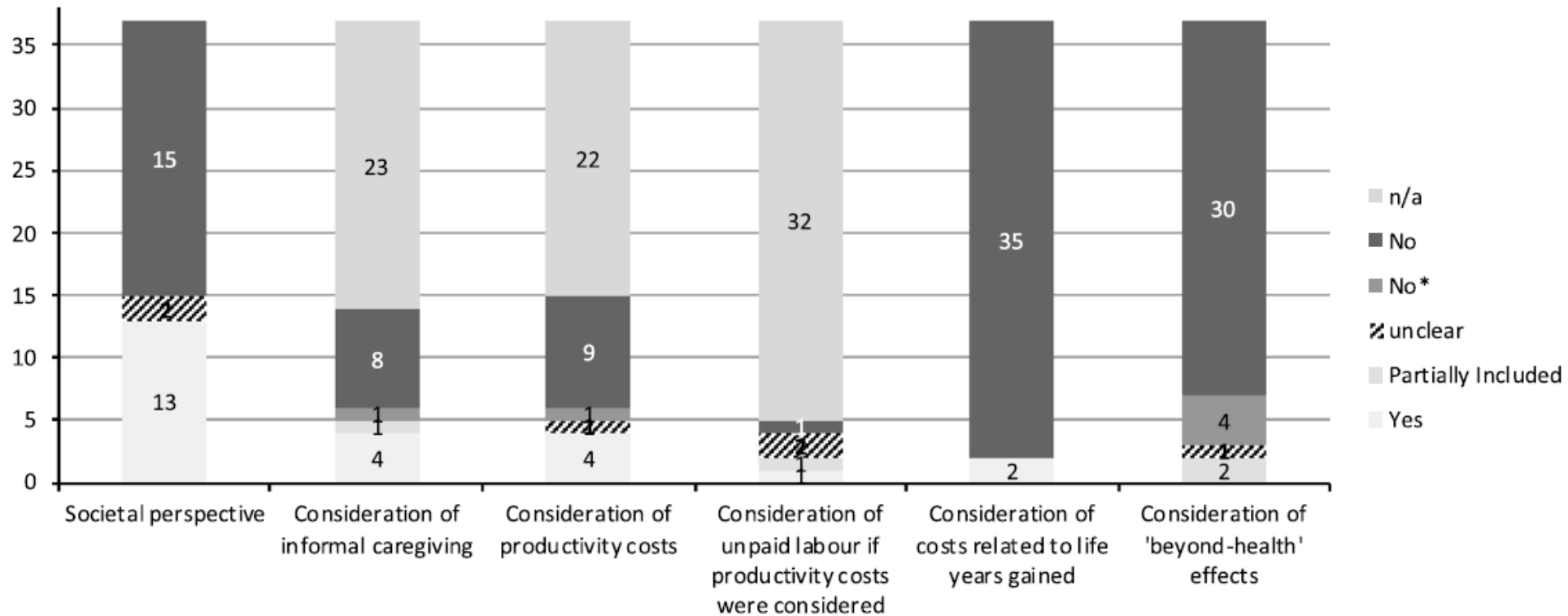


Generalized CEA

Overview of implementing family and caregiver spillover into GCEA



Example: Economic evaluation of health promotion interventions for older people



Huter et al. 2018

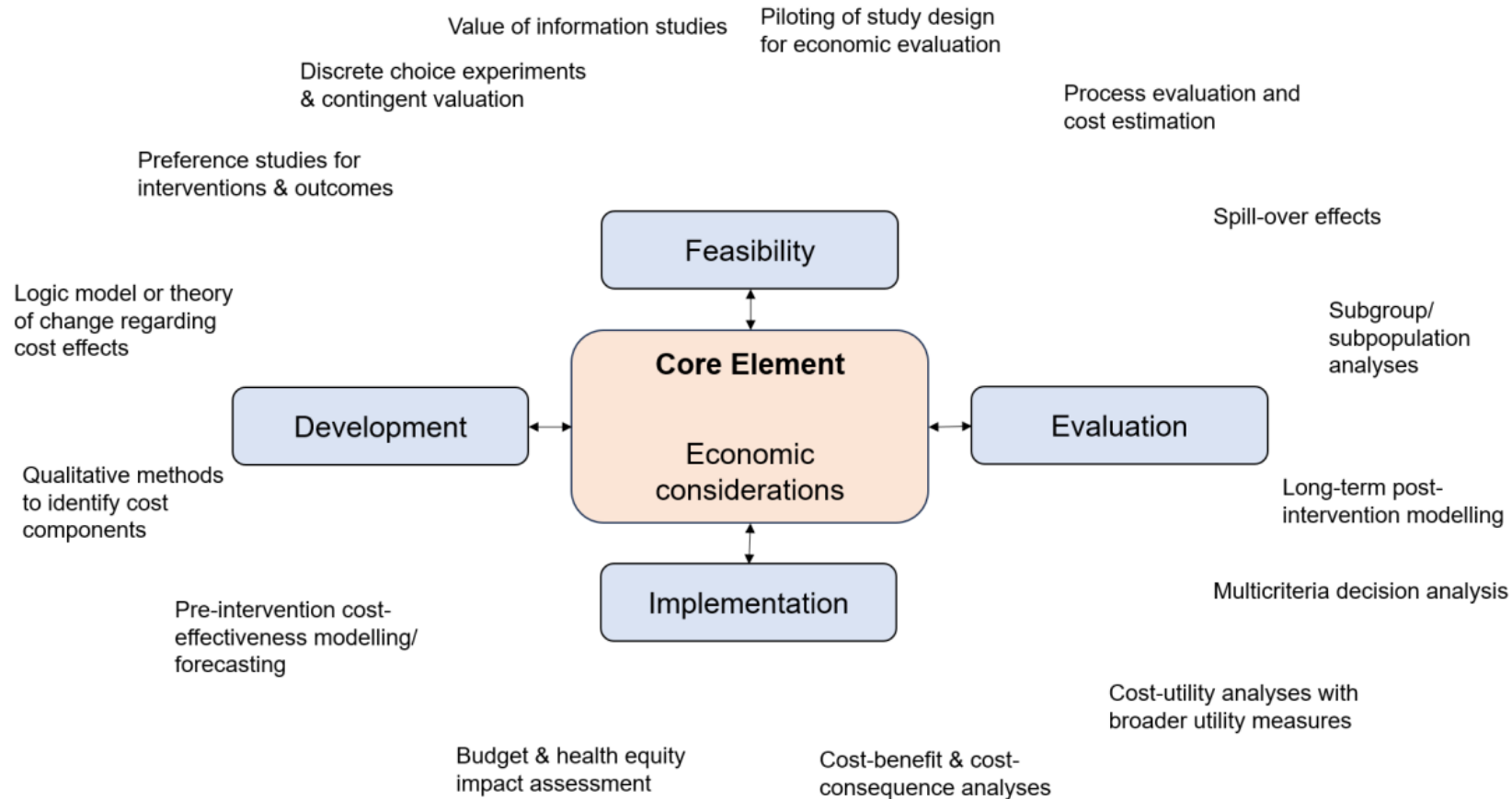
Theory-based/ Realist perspective

- Focus on understanding complex relationship between inputs and outputs
- An economic evaluation logic models to describe anticipated causal pathways and inter-relationships of resource use and outcomes
- Better understanding of the context in which a particular intervention is likely to be cost-effective to improve generalizability
- Does not currently represent standard practice

System perspective

- Considering interactions between micro level and macro level variables, nonlinearities, multiplier effects, and interaction between individual values, interventions and contexts → *new approaches to economic evaluation required*
- Outcomes are likely to extend beyond the lifetime of an evaluation – evidence of intermediate changes as proxies to system change?
- The practical challenge of identifying and capturing these effects within an evaluation is substantial
- E.g. tracking changes in distribution and transformation of resources, comprehensive assessment of (healthcare) activities displaced in practice

Health economic considerations & methods along the phases of complex intervention research



Areas of (future) research

- Choice of a (theoretical) framework for incorporating broad range of outcomes (CCA, MCDA, CBA, capability approach, 'subjective wellbeing')
- Development of guidance to account for supply and demand constraints, delivery and implementation factors, and other elements pertinent to real-world settings
- Use of complex systems models for economic evaluations

THANK YOU FOR LISTENING !