

23 September 2021

Technical annex. Presentation of results with more than two alternatives

Objective

This technical annex aims to support the preparation of applications to the Danish Health Technology Council with respect to enquiries regarding the use of health technology, including medical devices, but also other types of diagnostic devices, as well as treatments, rehabilitation, prevention, and types of organisation and collaboration in the provision of healthcare services. In the following, 'health technology' is used as an umbrella term for all of these.

This technical annex deals with presentation of the results of full economic analyses when two or more alternatives are included in the analysis. Where relevant, the results should be presented as described in this annex.

The approaches and methods set out in this technical annex should be considered as guidelines and therefore it is recommended that they be applied as the basis for drafting applications to the Danish Health Technology Council. However, the Danish Health Technology Council is aware that there may be situations in which it makes sense to deviate from the recommendations in this document. In such cases, the applicant should account for the reasons.

For further information concerning economic analyses, see other texts [1,2]. See also the Danish Health Technology Council's [process guide](#) and [methods guide](#) for further information on applications to the Danish Health Technology Council. The Danish Health Technology Council's methods guide is subject to regular updating, so make sure to check out www.behandlingsraadet.dk for any recent updates. If there are further queries about specific areas, these may be clarified in dialogue with the Danish Health Technology Council secretariat after publication of the evaluation design.

1. Presentation of results with more than two alternatives

When the full economic analysis includes more than two alternatives, the result should be presented in tabular form in the application according to the following principle. The principle is exemplified below.

1. Rank the interventions from the least costly intervention to the costliest intervention
2. Identify strongly dominated alternatives and mark these (strongly dominated: interventions with higher costs and lower effect than other alternatives included. If the outcome measure is an event to be avoided, such as a blood clot, infection, readmission, etc., the outcome estimate should be as low as possible, but if the outcome measure is desirable, such as QALY, the outcome estimate should be as high as possible). These should not be included any further in the comparative analysis.

3. Calculate incremental cost-effectiveness ratios (ICERs) pairwise between the alternatives included from the least to the costliest alternative
4. Identify cases of extended dominance and mark these (extended dominance: alternatives that are extendedly dominated have a higher ICER compared with more effective alternatives). These should not be included any further in the comparative analysis.
5. Recalculate pairwise ICERs between the alternatives included.
6. Repeat points 3) and 4) if necessary.

The analysis does not necessarily indicate one single alternative as more cost-effective than the others, but it rather indicates the cost-effectiveness between the alternatives.

The result of the analysis can also be illustrated as a diagram with a cost-effectiveness frontier.

1.1 Example of a presentation of results with more than two alternatives

Note that this is a very simplified example

Six alternatives:

Alternative	Costs DKK '000	Outcome, QALYs
A	375	7
B	403	17
C	380	10
D	424	18
E	390	9
F	401	13

1. The alternatives ranked from least to the costliest:

Alternative	Costs DKK '000	Outcome, QALYs
A	375	7
C	380	10
E	390	9
F	401	13
B	403	17
D	424	18

2. Strongly dominated alternative identified: Alternative E:

Alternative	Costs DKK '000	Outcome, QALYs
A	375	7
C	380	10
E	390	9
F	401	13
B	403	17
D	424	18

3. ICERs calculated pairwise between alternatives:

Alternative	Costs DKK '000	Outcome, QALYs	ICER (DKK/QALY)	Calculation basis
A	375	7	7	--
C	380	10	10	1667 C-A
E	390	9	9	
F	401	13	13	7000 F-C
B	403	17	17	500 B-F
D	424	18	18	21000 D-B

4. Extendedly dominated alternative identified (higher ICER than more effective alternative: Alternative F:

Alternative	Costs DKK '000	Outcome, QALYs	ICER (DKK/QALY)	Calculation basis
A	375	7	7	--
C	380	10	10	1667 C-A
E	390	9	9	
F	401	13	13	7000 F-C
B	403	17	17	500 B-F
D	424	18	18	21,000 D-B

5. Calculate mutual ICERs

This is exemplified in Table 17 in the Danish Health Technology Council application template.

Result of the economic analysis					
Intervention	Total cost, DKK	Outcome, ΔC, DKK QALYs	ΔQALY	ICER vs relevant comparator	Statement of dominance
Intervention A	375,000	7	-	-	- n.a.
Intervention C	380,000	10	5,000	3	1667 (C-A) n.a.
Intervention E	390,000	9	-	-	- Strongly dominated
Intervention F	401,000	13	-	-	- Extended dominated
Intervention B	403,000	17	23,000	7	3286 (B-C) n.a.
Intervention D	424,000	18	21,000	1	21,000 (D-B) n.a.

Result presented as a cost-effectiveness frontier diagram:

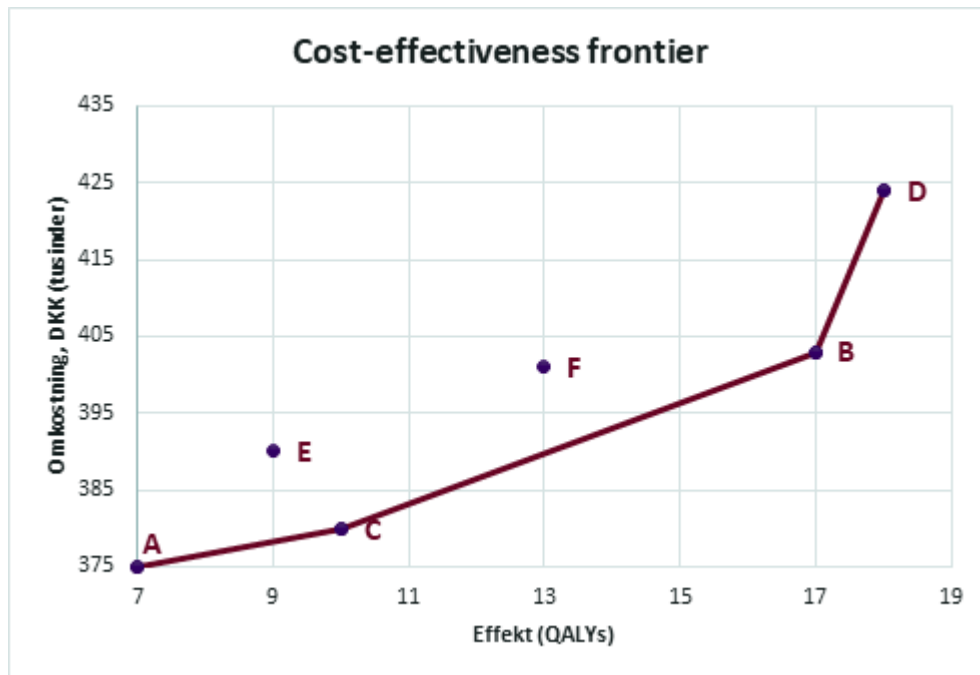


Figure 1. Cost-effectiveness frontier. The axes have been truncated so that alternative A is at (0,0) with the values; cost = DKK 375,000 and QALYs = 7.

2. References

1. J. Fox-Rushby, J. Cairns, Economic Evaluation, Open University Press, 2005.
2. M. Drummond, M.J. Schulpher, K. Claxton, G.L. Stoddart, G.W. Torrance, Methods for the Economic Evaluation of Health Care Programmes, 4th ed., Oxford University Press, Oxford, 2015.