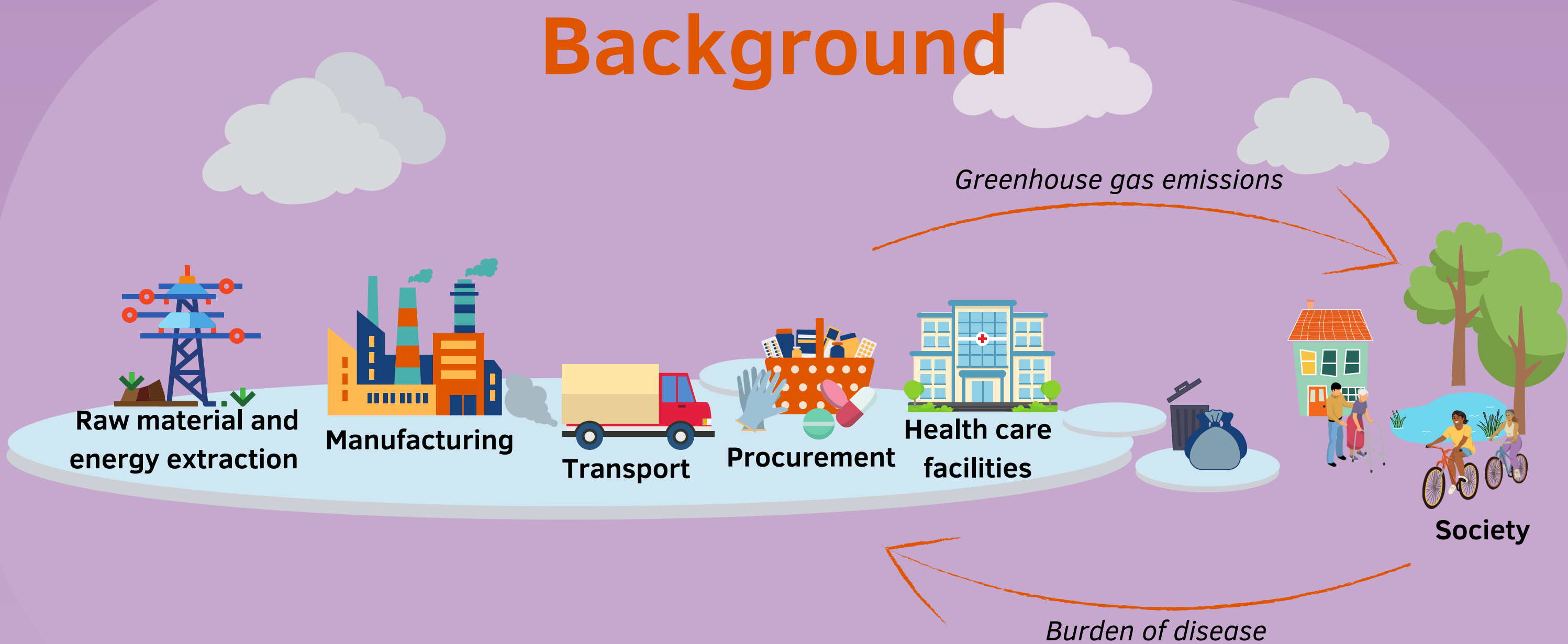


Exploring Methods to Include Carbon Footprint into an HTA: The Case of Remote Patient Management

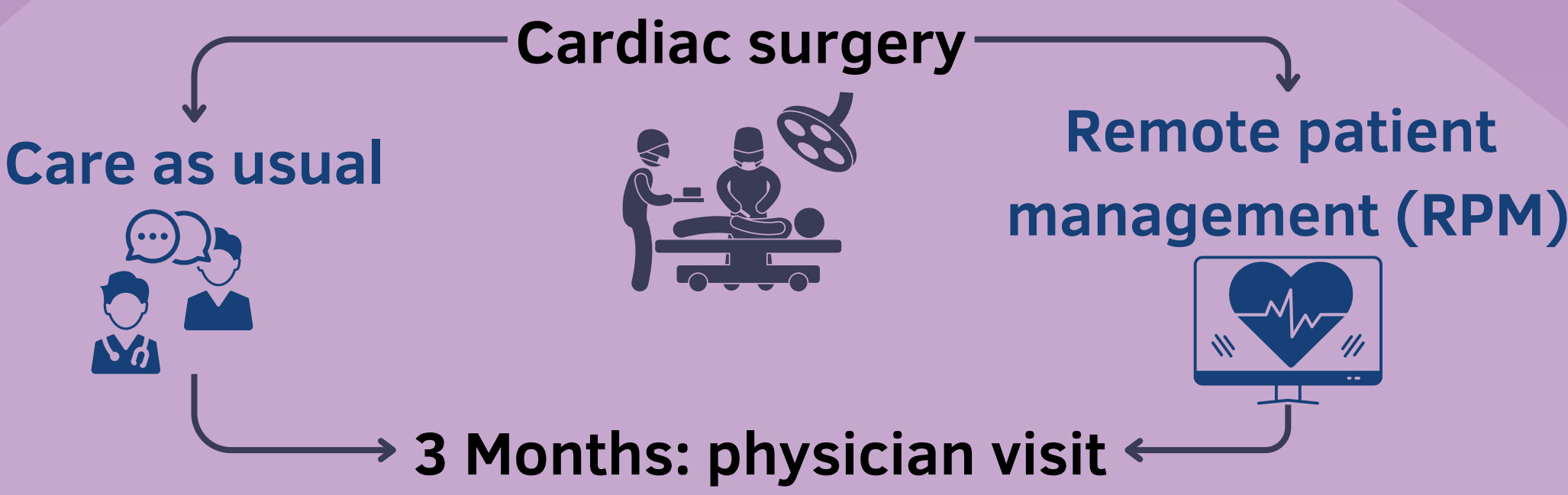
Sophia L. Kingma, MD, Department of Emergency Medicine, Leiden University Medical Center
Maureen P.M.H. Rutten-van Mölken, PhD, Erasmus School of Health policy and Management, Erasmus University Rotterdam

Background



- Healthcare accounts for 7% greenhouse gas emissions (GHG).
- Self-reinforcing effect of the generated GHG emissions on the public health.
- No established approach for incorporating environmental impacts into economic evaluations of new health technologies.

Methods



Design
Observational study (pre-post).

Outcome measures
Clinical outcomes, Quality of Life (EQ-5D-5D questionnaire), Costs, Environmental impact in GHG (adopted life cycle analysis)

- Analysis**
1. Propensity score matching and inversed probability weighting.
 2. Cost-utility analysis (CUA) and multi-criteria decision analysis (MCDA).



Results

C I Δ Mean (95%CI)
n=351 n=358

Clinical outcomes

ED visits (%)	23.8	12.8	-10.9 (-16.5; -5.3)
Readmissions	8.6	4.7	-4.2 (-7.8; -0.6)

Quality of life

EQ-5D utility (mean)	0.80	0.79	-0.01 (-0.1; 0.02)
EQ-VAS (mean)	77.8	79.4	1.6 (-0.7; 3.8)
Satisfaction score (mean)	8.1	7.9	-0.2 (-0.5; 0.1)

Costs (2022 euros)

Total costs per patient			
> Health care perspective	1,010	1,021	11 (-85; 207)
> Societal perspective	1,677	1,425	-251 (-579; 77)

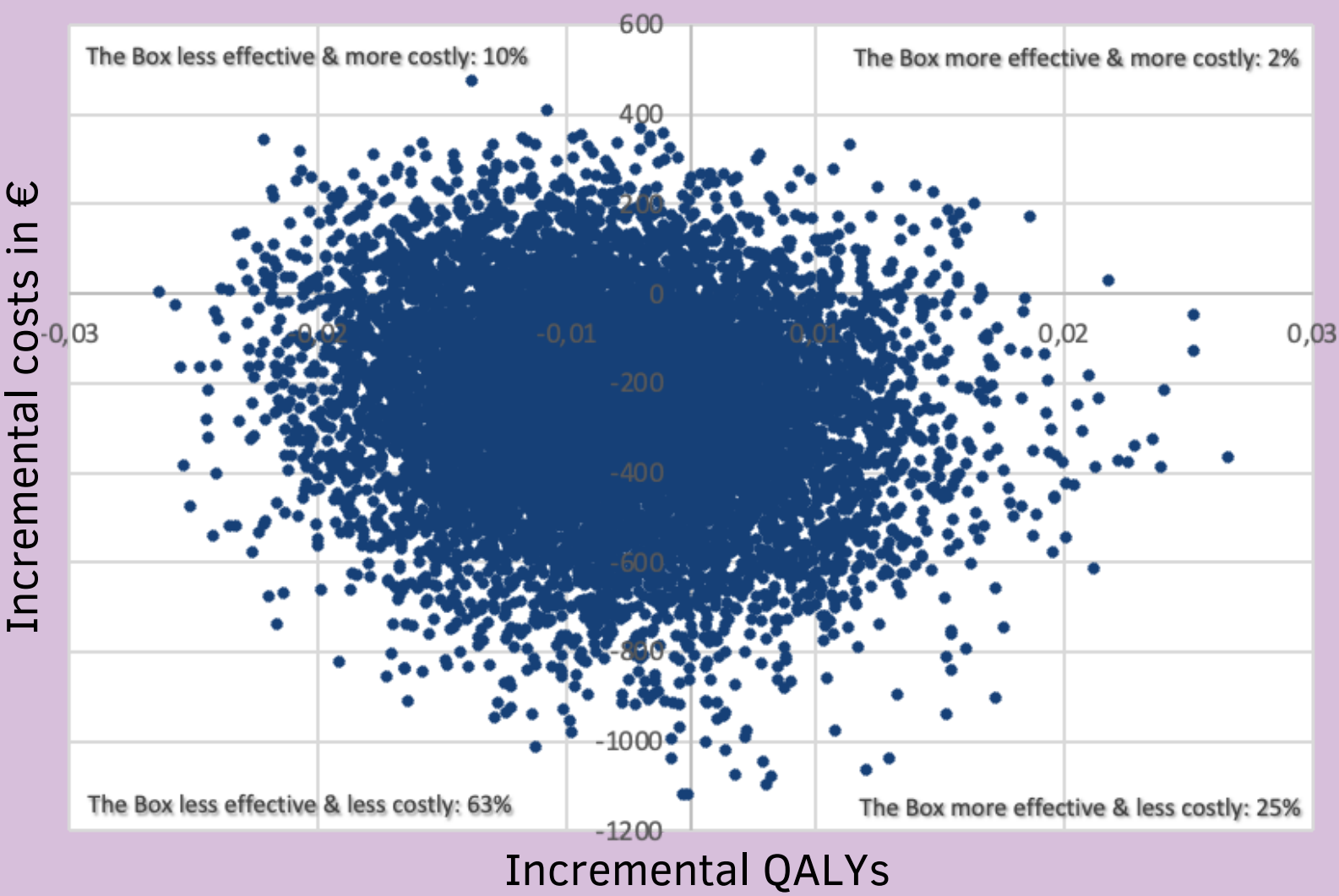
Environmental impact

RPM (material, data, e-consult)	0	46	46 (46; 46)
Outpatient clinic visit	23	11	-12 (-12; -12)
ED-visit	16	7	-8.9 (-13; -5)
Readmission	24	12	-12 (-22; -2)
Transport	21	10	-10 (-11; -9)
Total GHG emission	84	86	3 (-10; 16)

CUA

Standard societal perspective

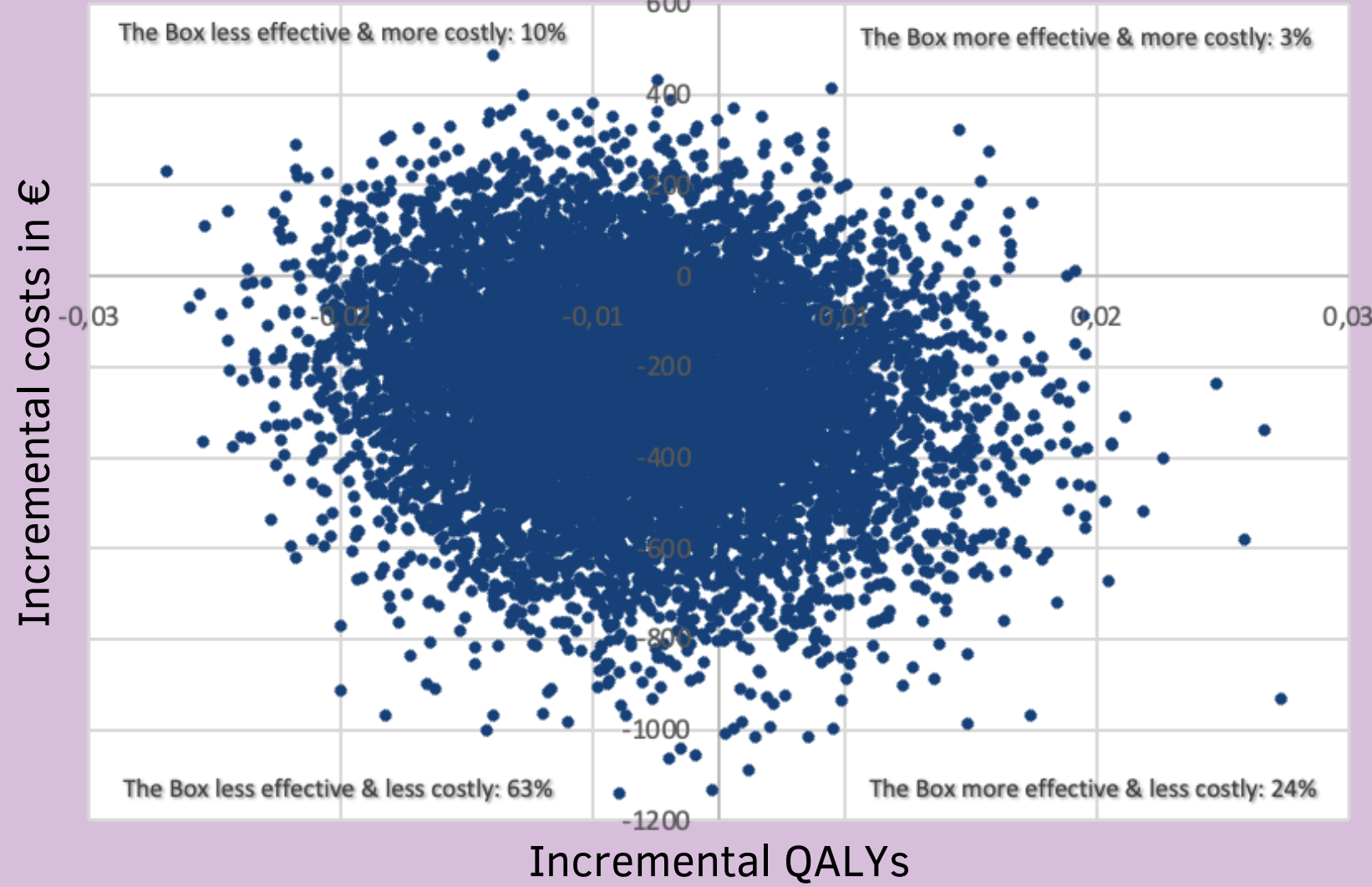
- Incremental QALY: -0.00334
- Incremental costs: -€249.29
- ICER: €74,740



MCDA

Societal perspective incl. environmental impact

- Incremental QALY: -0.00332
- Incremental costs: -€249.46
- ICER: €75,192



Criteria

- Total costs
- Innovativeness
- Environmental impact
- Patient satisfaction
- EQ-5D utility

Stakeholders

- Cardiology patient
- Cardiologist
- Sustainability expert
- Board member
- Health economist

Swing Weighting

- | | |
|-------------------------|------|
| 1. EQ-5D utility | 0.46 |
| 2. Patient satisfaction | 0.26 |
| 3. Total costs | 0.16 |
| 4. Innovativeness | 0.09 |
| 5. Environmental impact | 0.04 |

MAVT- overall value

Control 0.65
Intervention 0.74

Key Take-Aways

- This study must be seen as a proof-of-concept
- The difference in CO2e between interventions needs to be substantial to change the results of a CUA
- This also applies to the MCDA, unless the environmental impact criterion gets a larger weight.
- Establish robust method to consider environmental impact.
- Considering environmental impact in HTA could be a means of reducing the contribution of the healthcare sector to the climate crisis.
- How can this be realised in day-to-day HTA?

Contact:
Sophia Kingma
MD, PhD candidate
s.l.kingma@lumc.nl