

# Cost-effectiveness of multidisciplinary management of tinnitus at a specialised tinnitus centre

Maes I, Cima R, Vlaeyen J, Anteunis L, Baguley D,  
El Refaie A, Scheyen D, Joore M



# Table of contents

## Part I

- Economic evaluation: how does it work?

## Part II

- Study design and objective
- Methods
- Results
- Conclusion

# Economic Evaluation

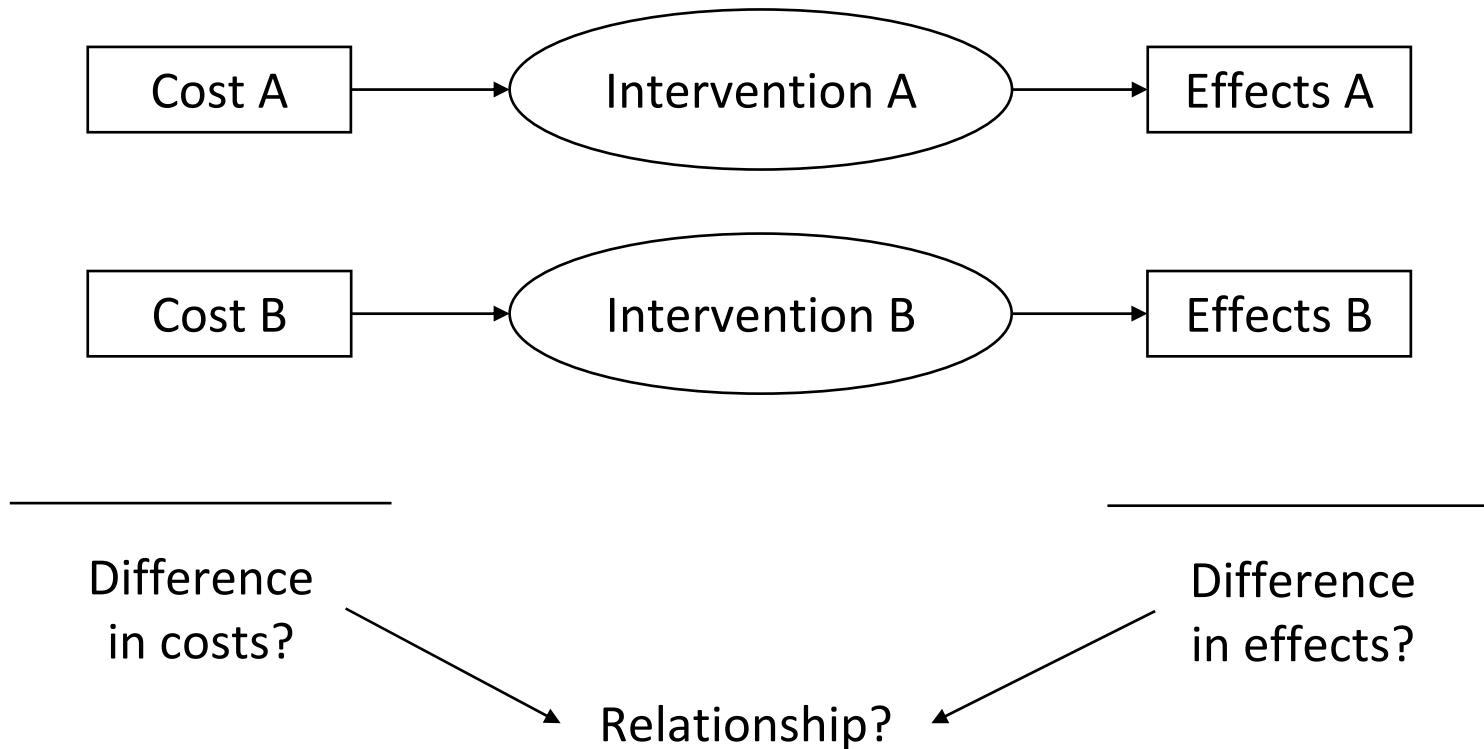
*‘The comparative analysis of alternative courses of action in terms of both their costs and their benefits’.*

Drummond *et al.*, 1996

*Economic evaluation is not “choosing the cheapest”*

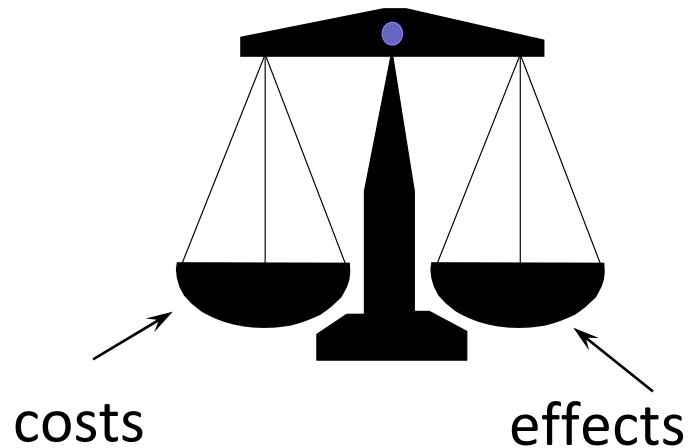
*A bridge between the scientific evidence and policy decision making*

# Economic Evaluation

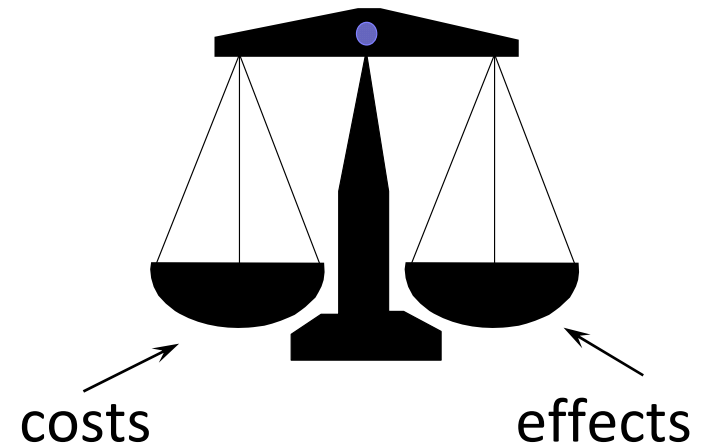


# Economic Evaluation

New intervention



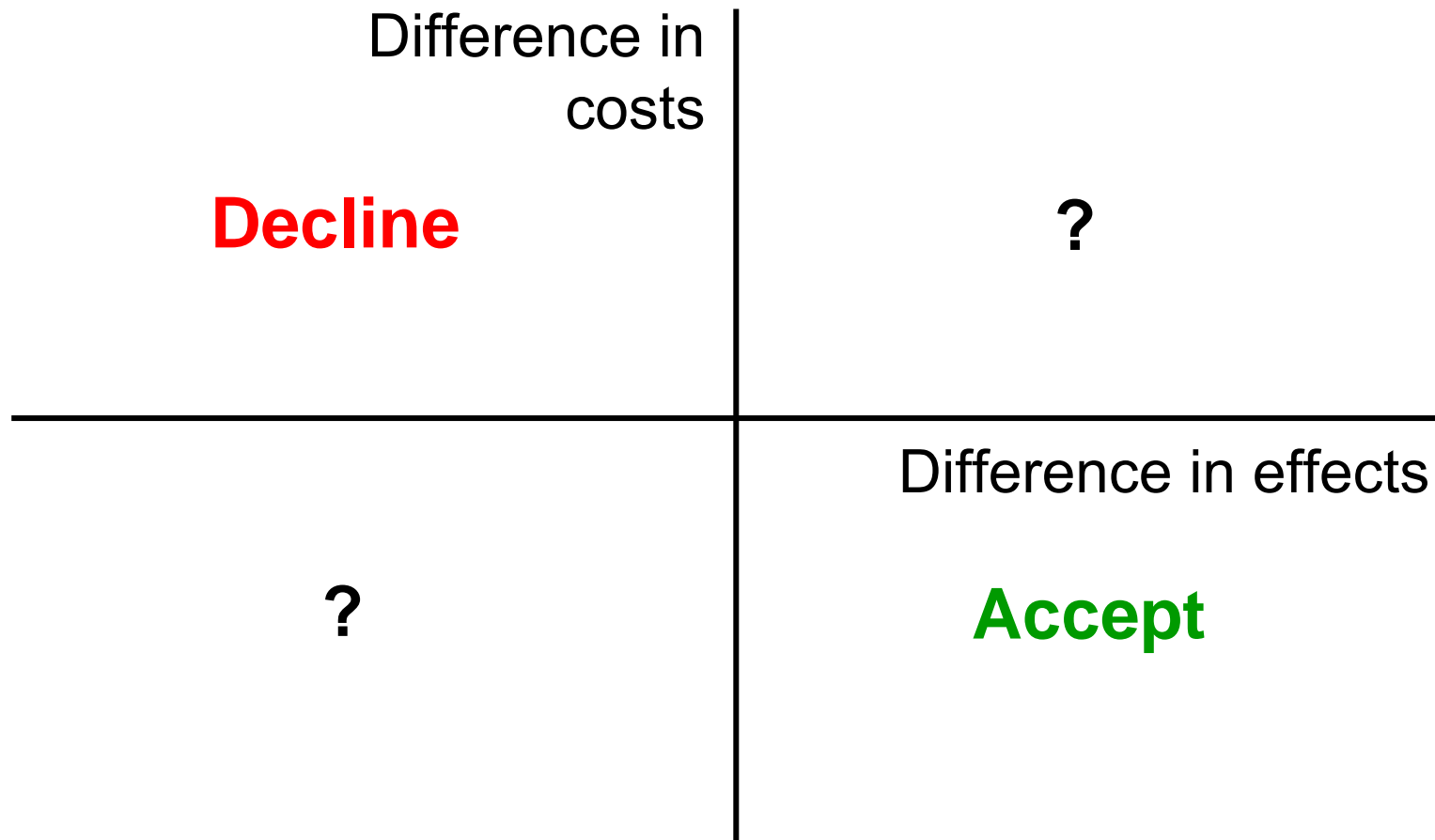
Alternative



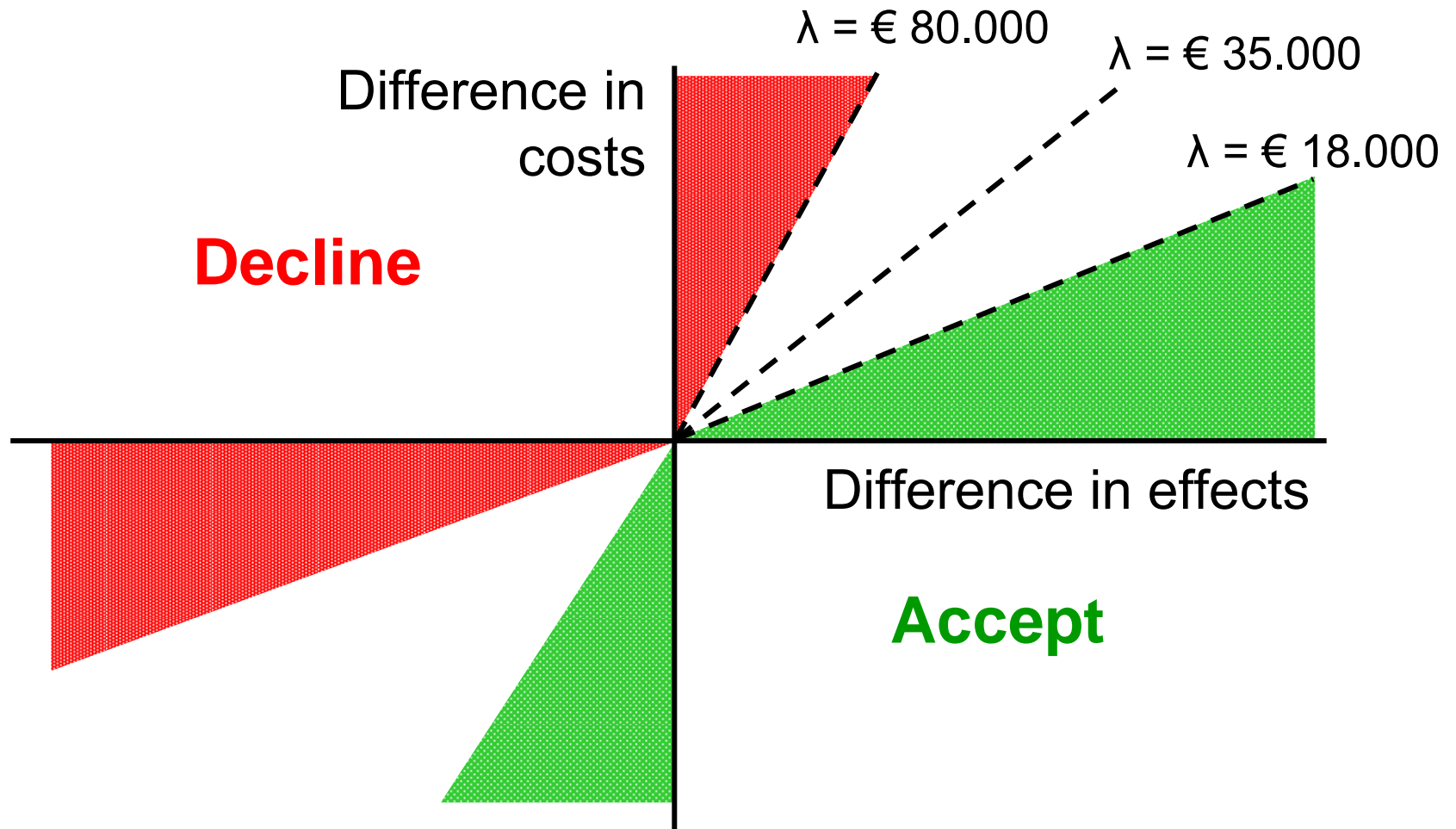
Incremental Cost-effectiveness ratio (ICER):

$$\frac{C_n - C_a}{E_n - E_a}$$

# Economic Evaluation



# Economic Evaluation



# Objective

To determine the cost-effectiveness of a specialised integral multidisciplinary tinnitus treatment, compared to care as usual, in an audiological centre in the Netherlands



# Design

- Randomized controlled clinical trial:
  - Multi-disciplinary treatment versus care as usual
- Patients (>18 years) referred to audiological centre in the Netherlands
- Data collection
  - Baseline
  - Follow-up at 3, 8 and 12 months

# Methods: effects

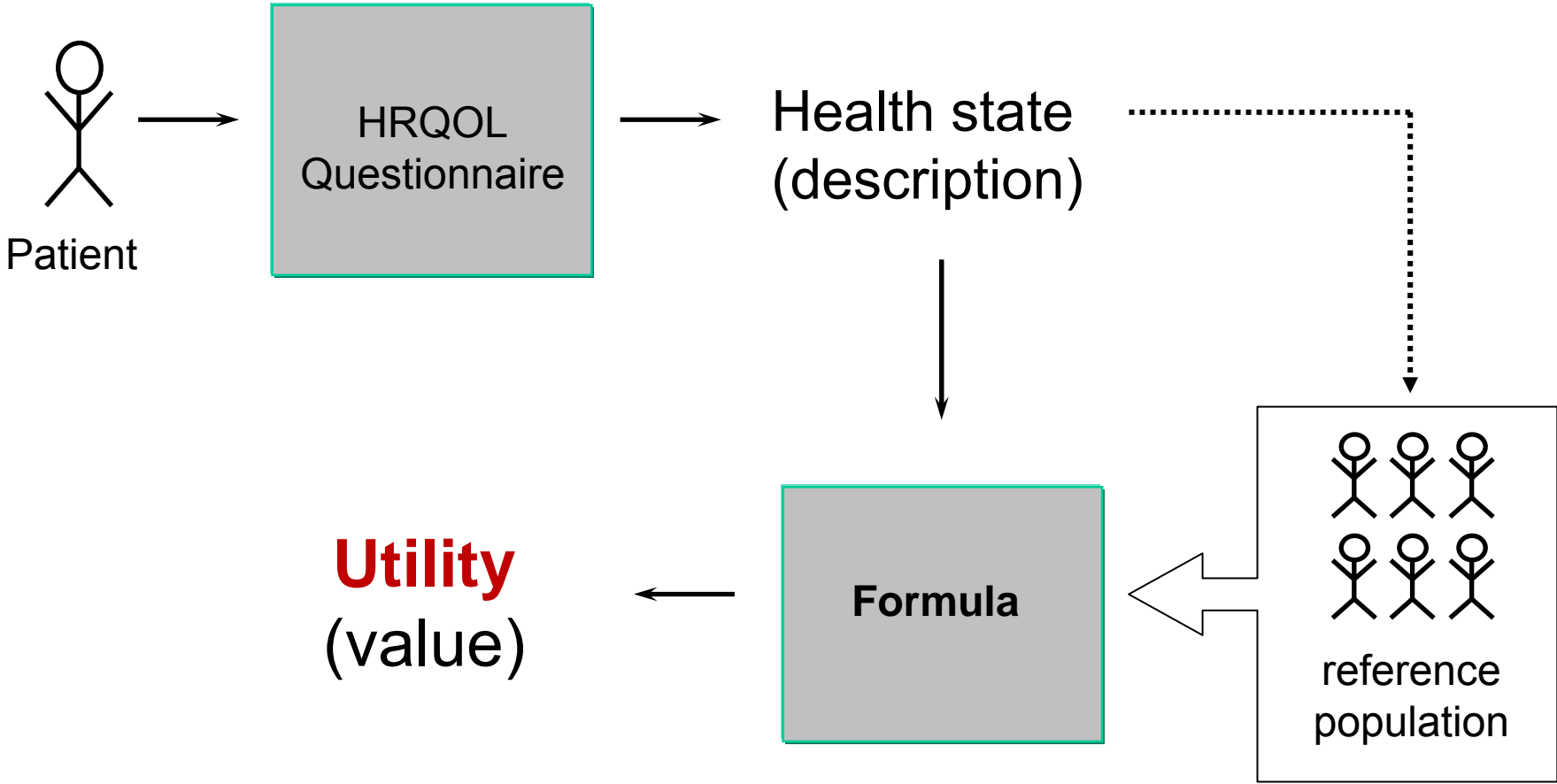
- Generic instruments:
  - Health Utilities Index Mark III
  - Utilities → Quality Adjusted Life Years
- Disease specific questionnaires:
  - Tinnitus Questionnaire

# Methods: Health Utilities Index mark III

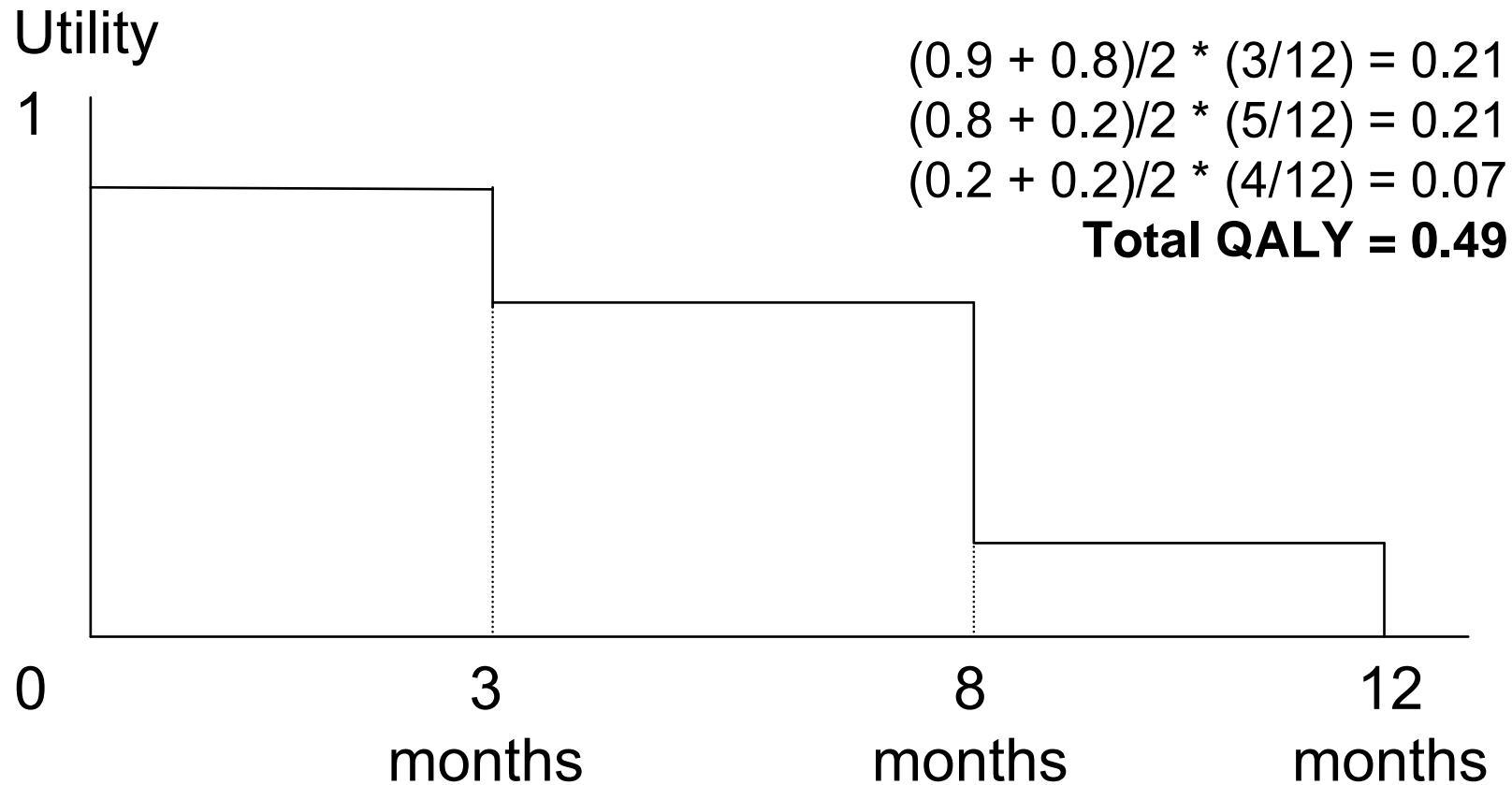
- *18 questions*
- *8 dimensions with 5 or 6 levels:*

Vision (6)	Dexterity (6)
Hearing (6)	Emotion (5)
Speech (5)	Cognition (6)
Ambulation (6)	Pain / complaints (5)
- *Possible health state:*  
*1, 4, 1, 1, 1, 5, 4, 3*

# Methods: utilities



# Methods: Quality Adjusted Life Years



# Methods: Costs

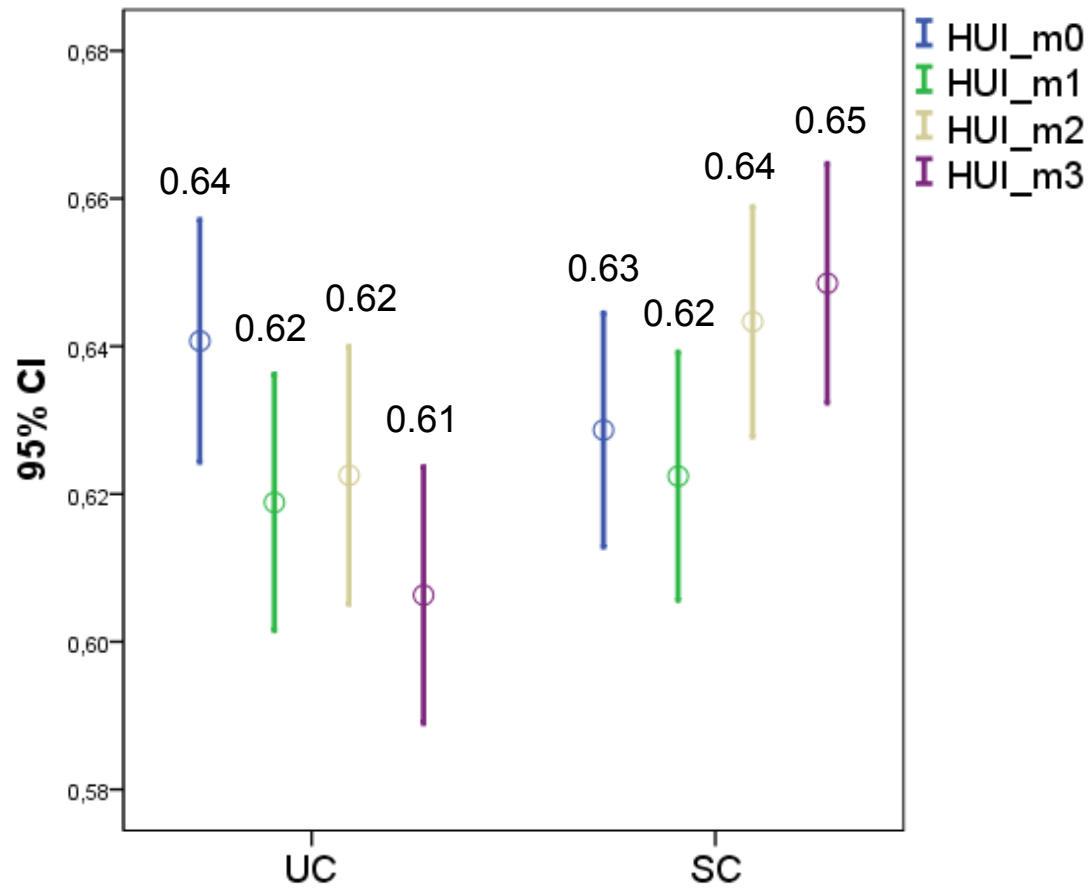
- Societal perspective:
  - Health care costs (CRF; questionnaire)
  - Out of pocket costs (questionnaire)
  - Productivity losses (PRODISQ)
- Interpolation to yearly cost

$$Cost_i = C_{i,t1} + (C_{i,t2} / 3) * 5 + (C_{i,t3} / 3) * 4$$

# Methods: analysis

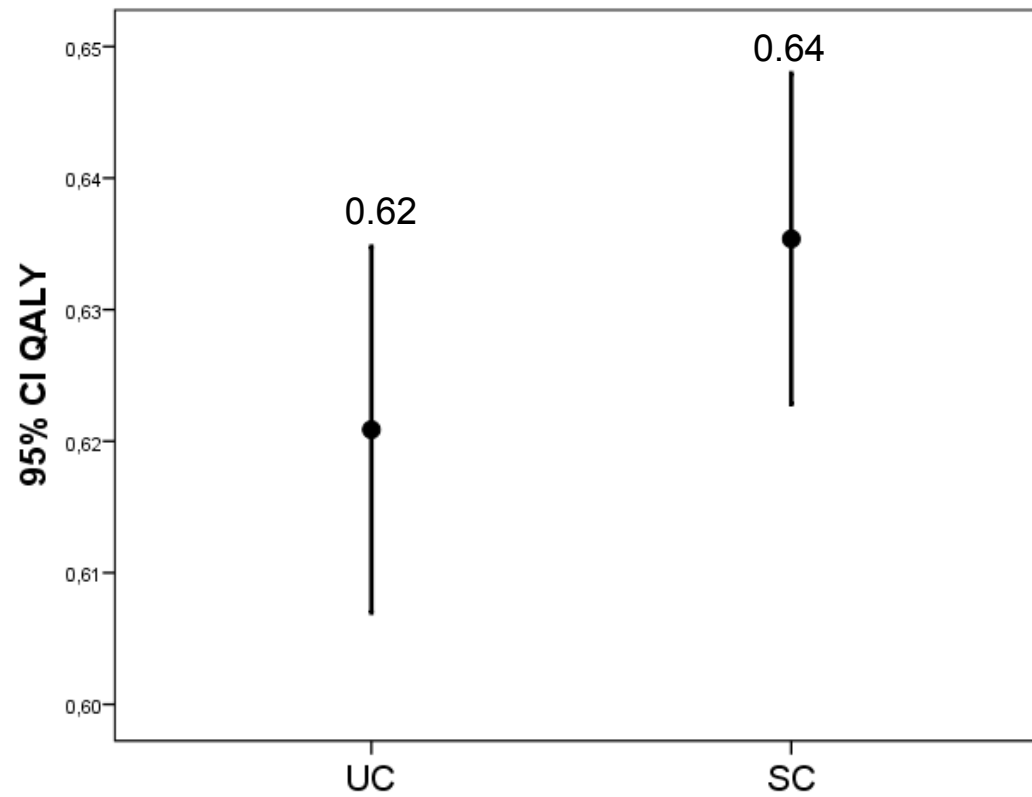
- Missing data:
  - Multiple imputation
- Sensitivity analysis:
  - Complete cases
  - Utilities based on predicted values from mixed multilevel regression analysis

# Results: effects





# Results: Effects



# Results: costs

	Mean Costs €	
	SC	UC
<b><i>First level tinnitus care</i></b>	<b>1675</b>	<b>1480</b>
Pure tone audiometry	66.30	65.23
Speech audiometry	46.34	45.60
Tympanometry: incl. stapdial reflexes	55.09	54.21
Tinnitus analysis: PMF, MML	30.41	29.92
Uncomfortable Loudness Levels	122.37	120.41
Individual consult by clinical physicist in audiology	296.55	291.80
Hearing aid fitting	154.90	150.20
New hearing aid	271.35	252.33
Hearing aid check and optimisation	60.40	86.10
Fitting tinnitus masker	102.86	111.94
New tinnitus masker	253.06	259.11
BERA	11.84	11.75
Intake psychologist	191.62	0.65
Tinnitus Educational Group session	11.49	0.90
<b><i>Second level tinnitus care</i></b>	<b>693</b>	<b>292</b>
Individual trajectory	14.21	-
Treatment group A	198.55	-
Treatment group B	282.18	-
Social work trajectory (incl. intake)	198.55	292.43

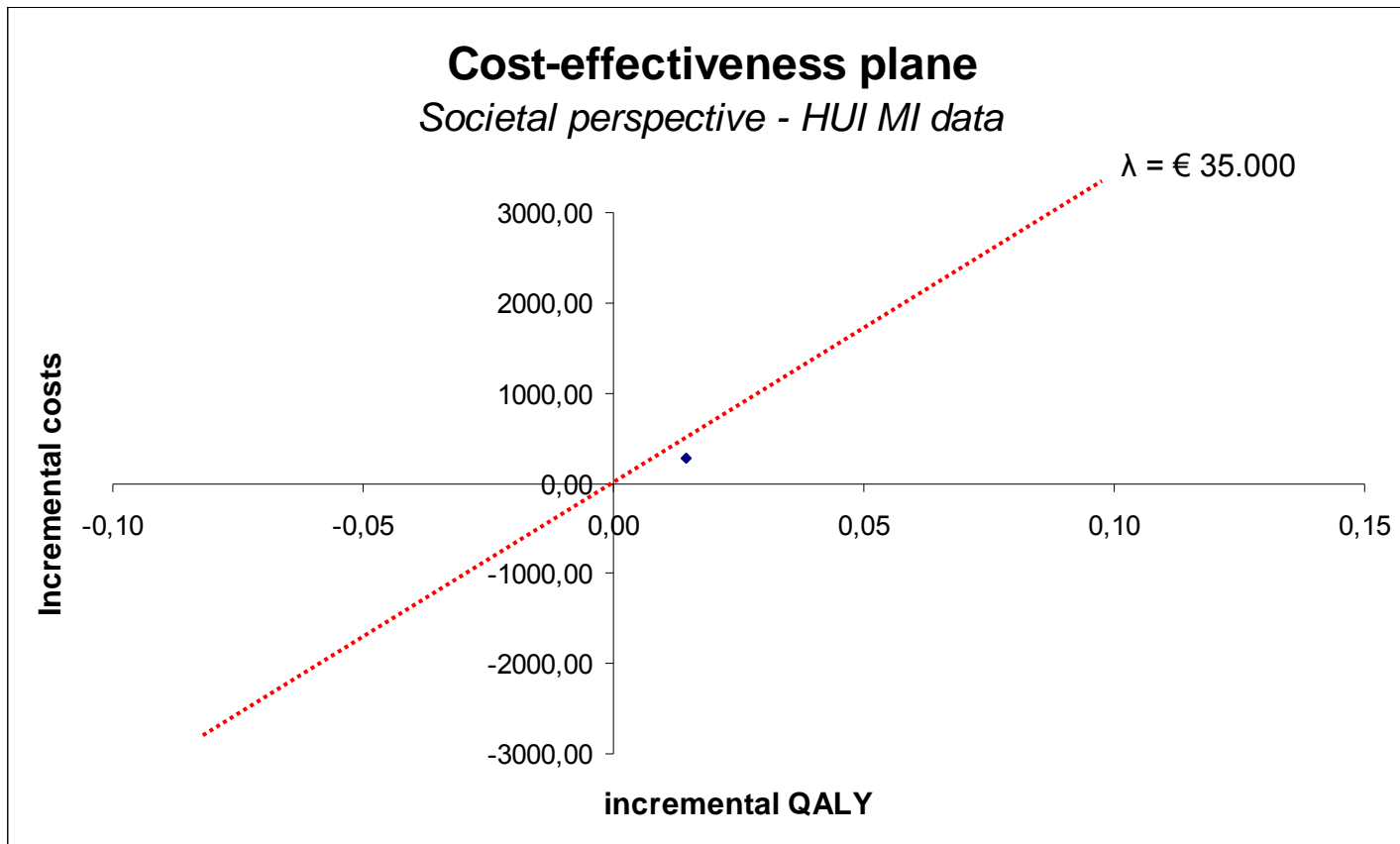
# Results: costs

	Mean Costs €	
	SC	UC
	<b>N</b>	
	240	242
First level tinnitus care	1675	1480
Second level tinnitus care	693	292
General practitioner practice	78	133
Hospital care	384	450
Other health care professionals	540	753
Prescribed medication	24	29
<b>Health care costs</b>	<b>3231</b>	<b>3110</b>
Patient & family costs	85	108
Productivity losses	2605	2417
<b>Total societal costs</b>	<b>5921</b>	<b>5636</b>

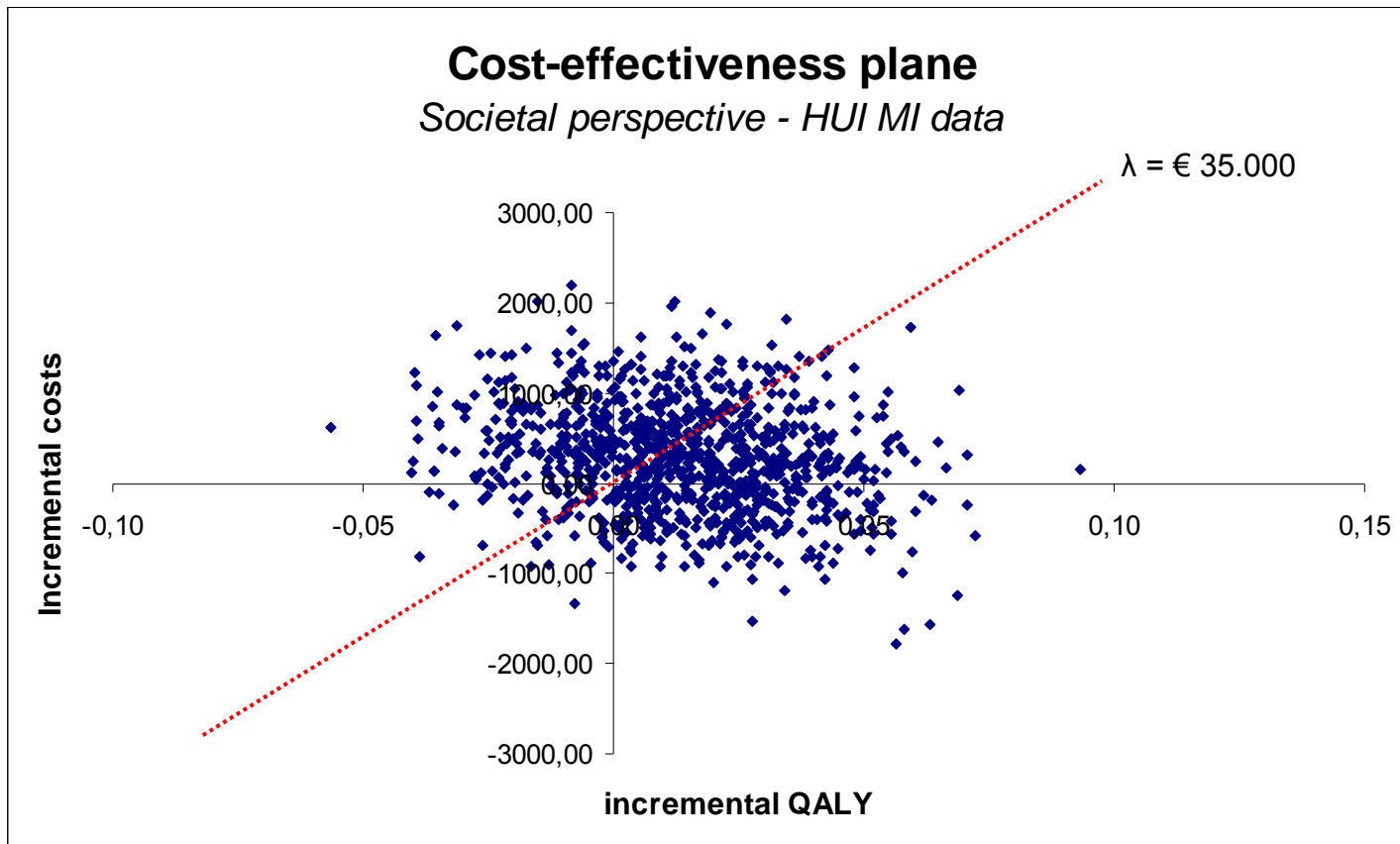
**Increment=  
€122**

**Increment=  
€286**

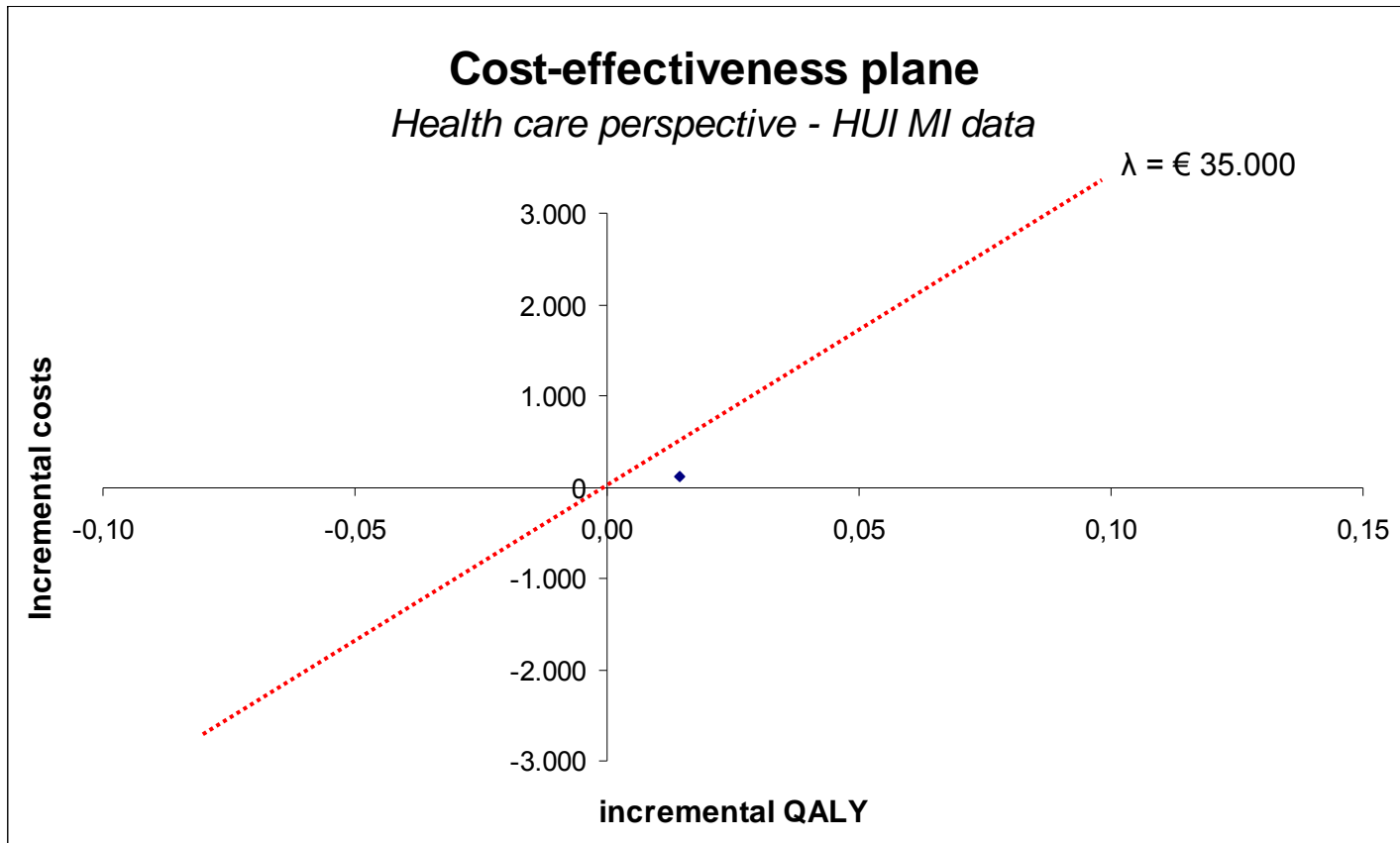
# Results: Cost-effectiveness



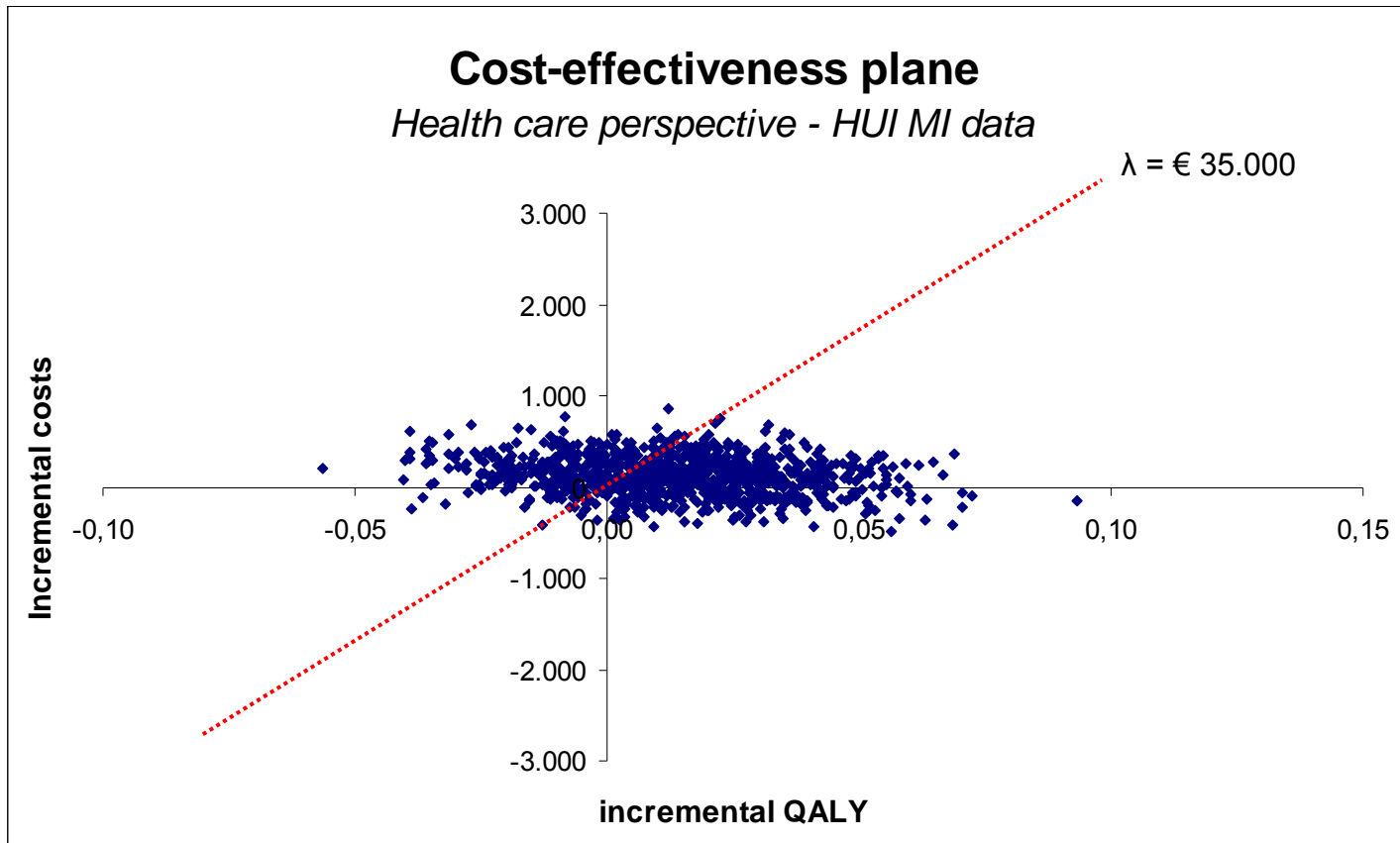
# Results: Cost-effectiveness



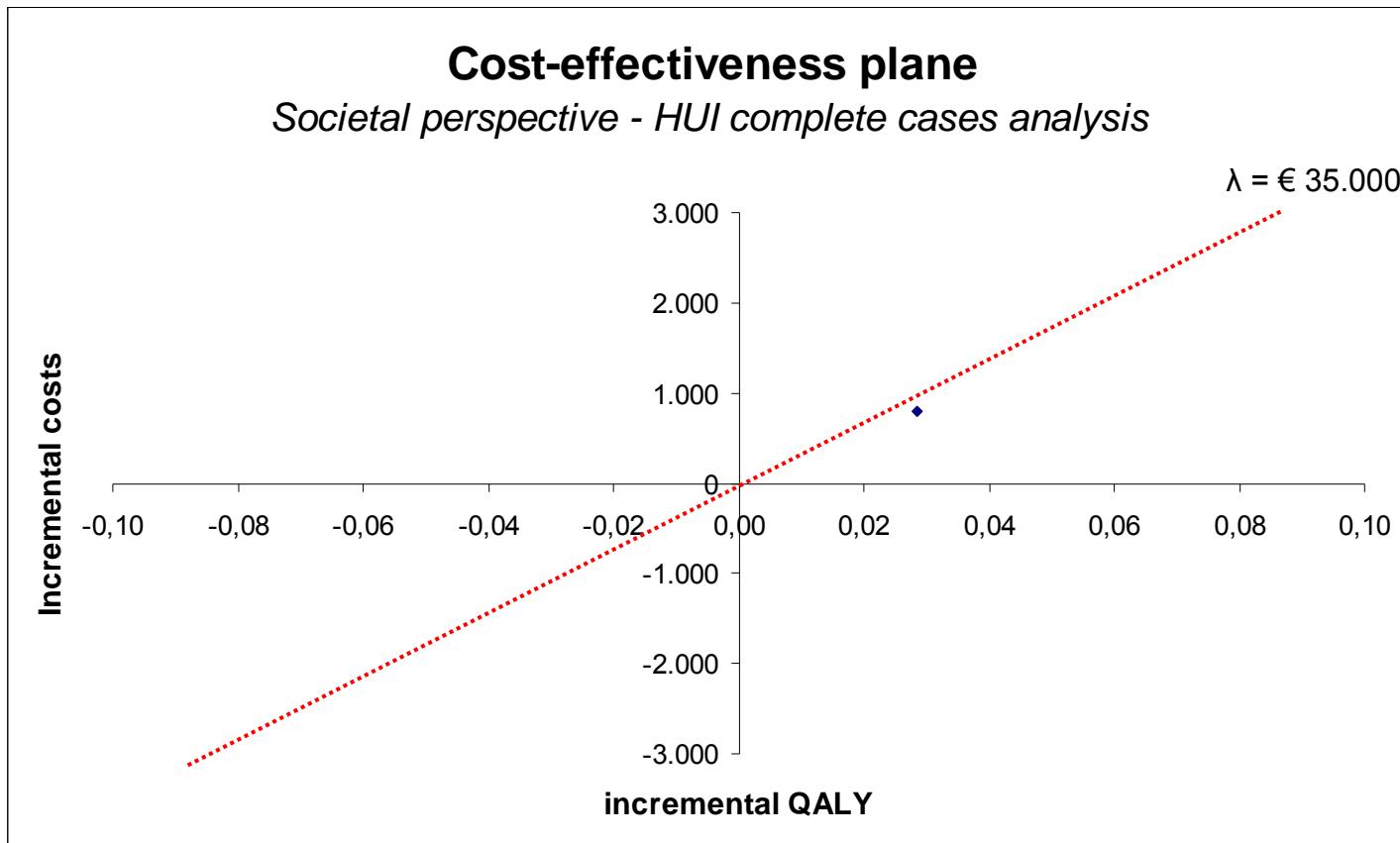
# Results: Cost-effectiveness



# Results: Cost-effectiveness

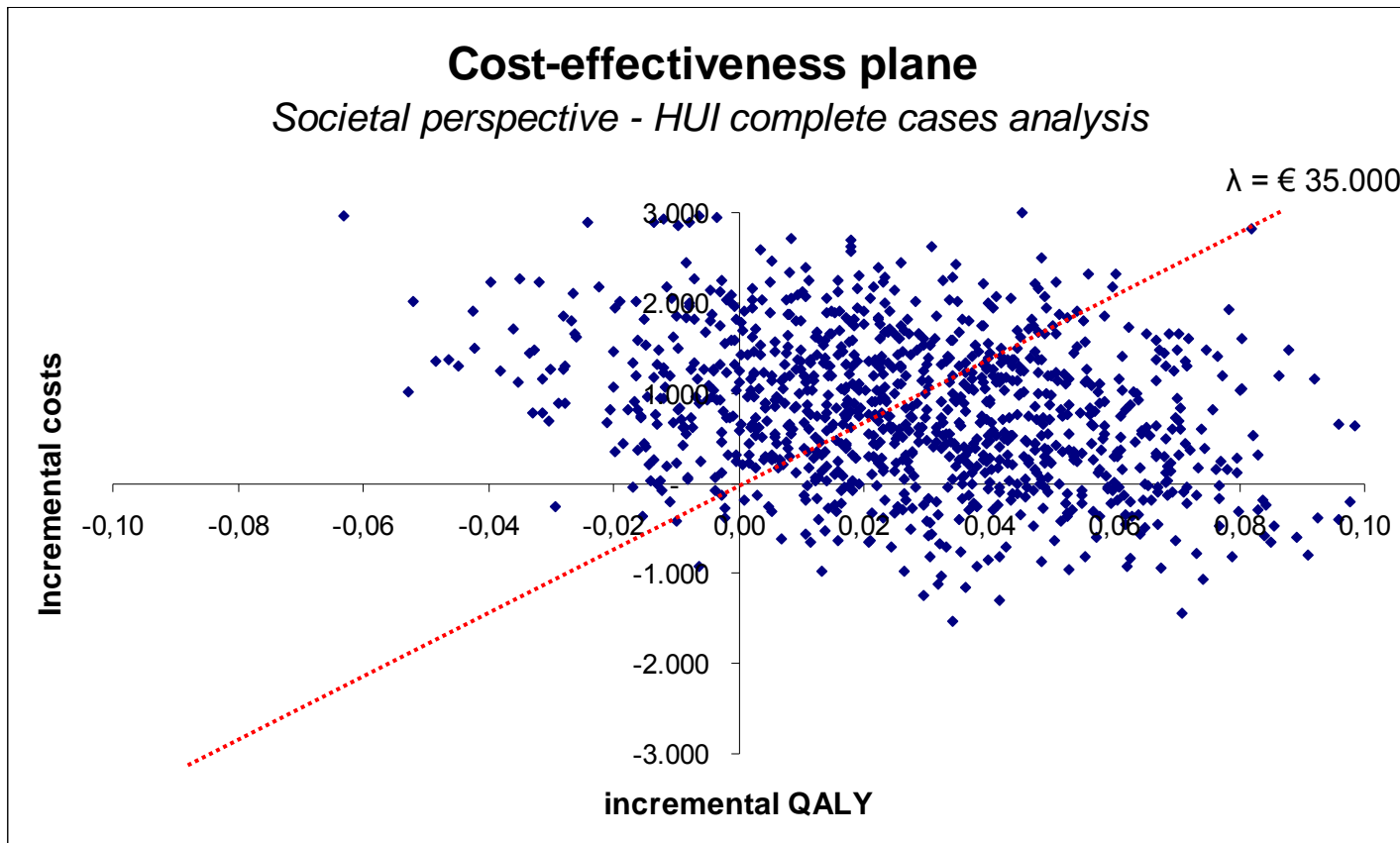


# Results: Cost-effectiveness

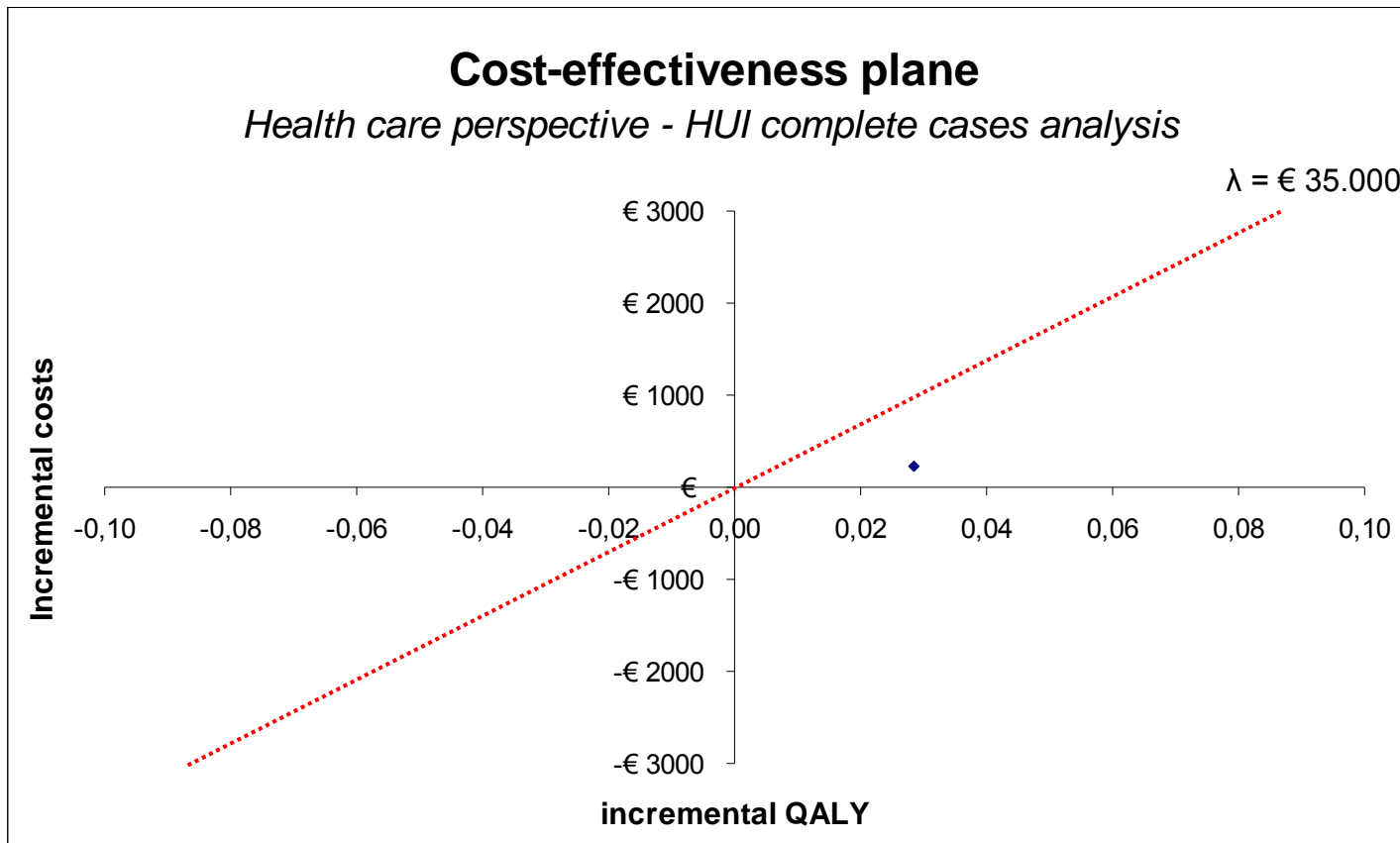




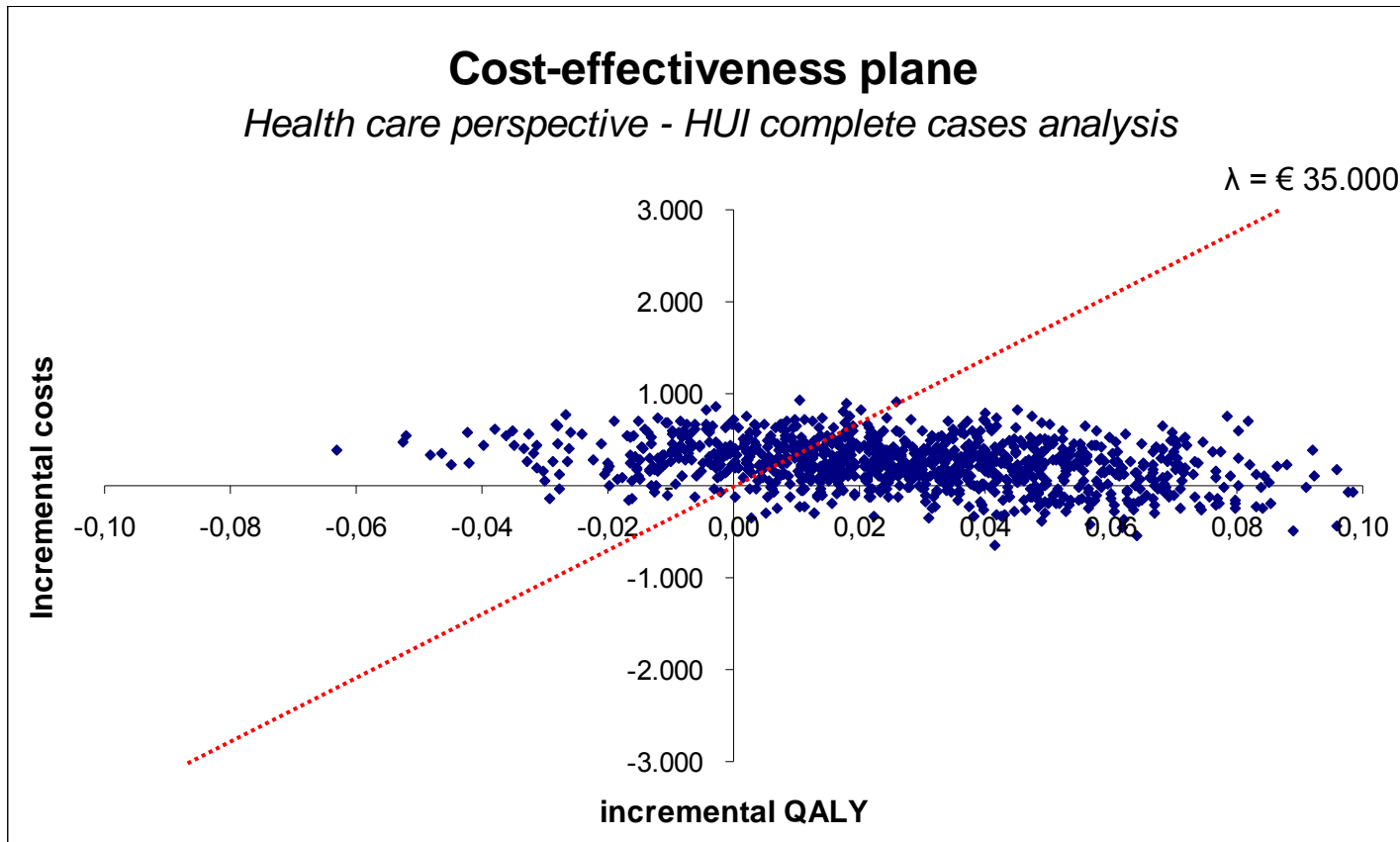
# Results: Cost-effectiveness



# Results: Cost-effectiveness



# Results: Cost-effectiveness



# Conclusion

1. Increase in utility in SC; decrease in UC
2.  $QALY UC < QALY SC$
3. SC more costly than UC
4. SC is more cost-effective than UC

# Questions?



[Iris.maes@mumc.nl](mailto:Iris.maes@mumc.nl)