

# Using the MAFEIP-tool for the early technology assessment of a planned device to predict falls in older people

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**This case study was carried out between February and June 2015 in order to test the MAFEIP web-tool developed by DG-JRC IPTS in collaboration with G. de Graaf, L. Steuten, F. Abadie and L. Pecchia**

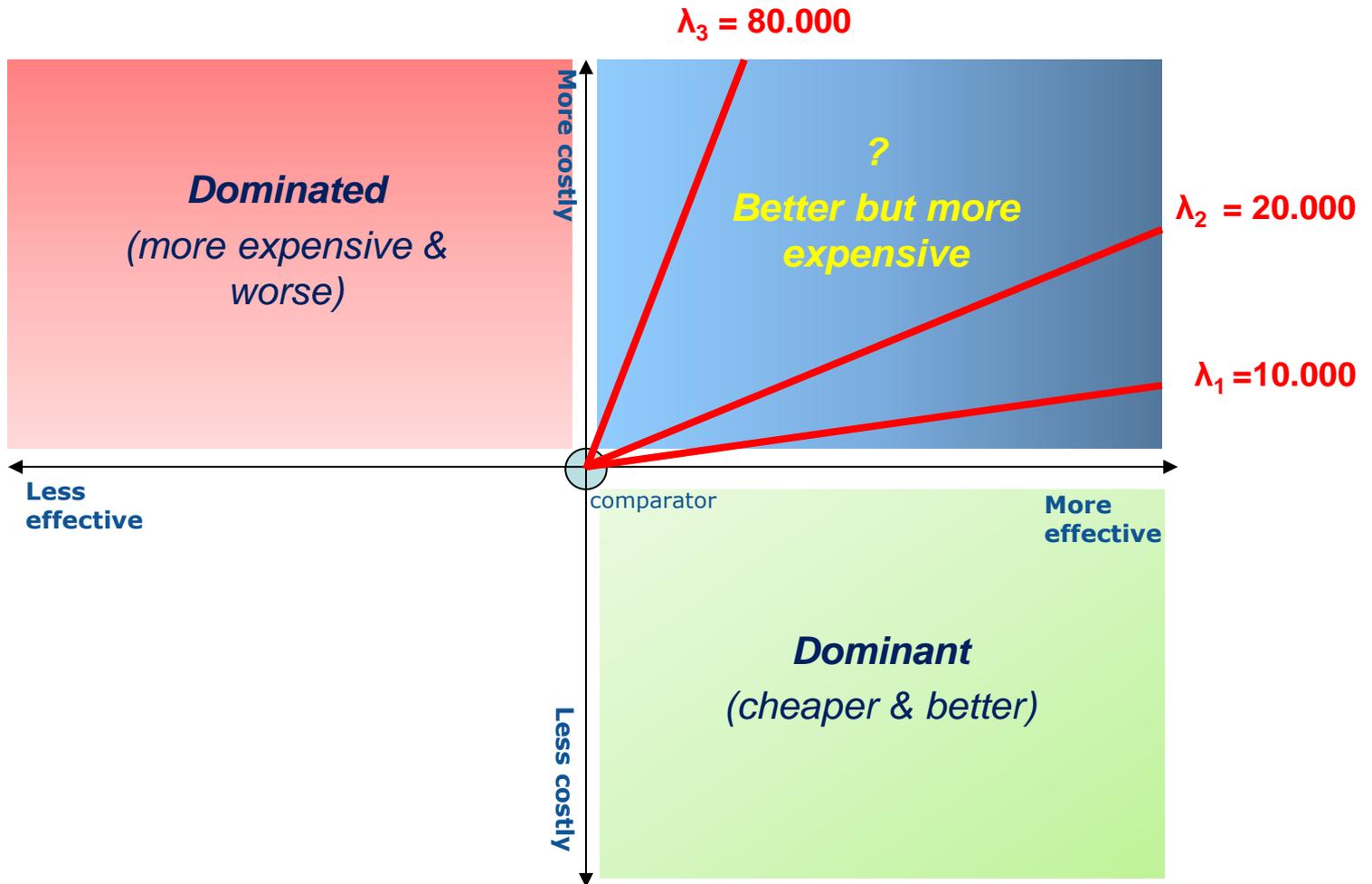
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**DG-JRC/IPTS** has developed a monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (**MAFEIP-Project**)

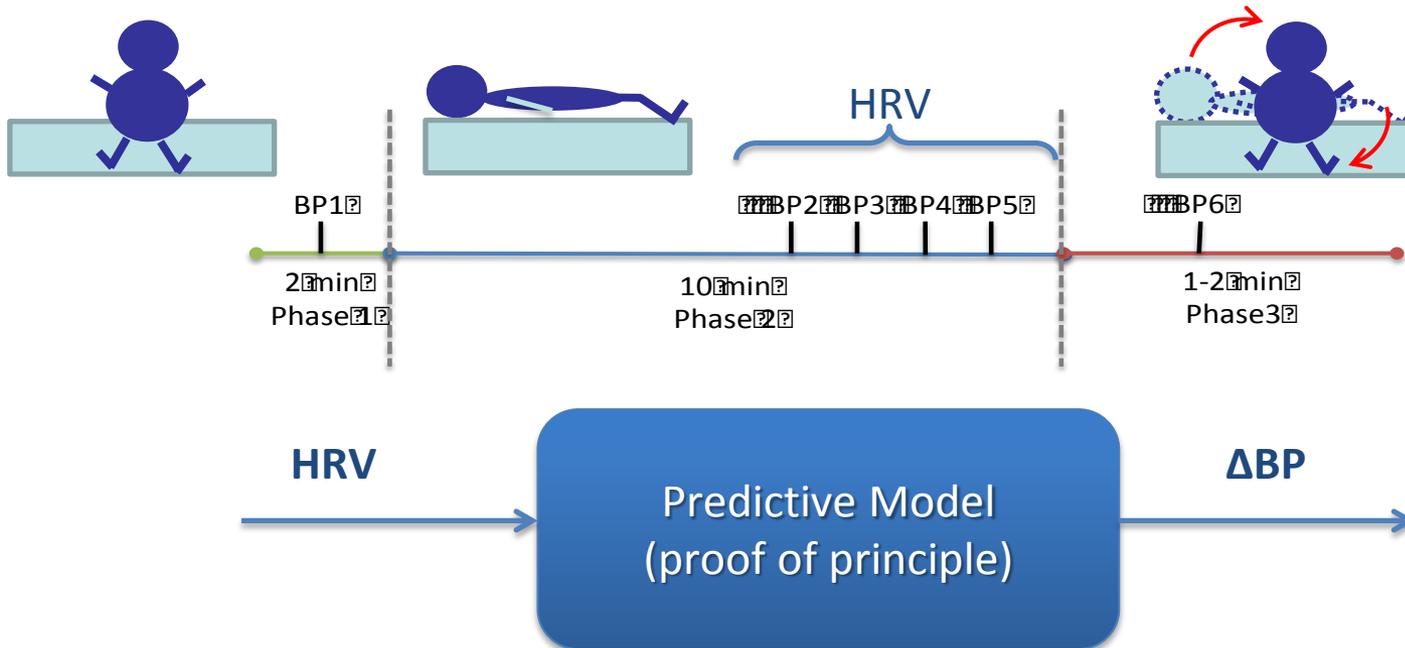
In this context, we tested the MAFEIP-tool in a case study to assess the potential health and economic impact of an *early technology* to predict falls in older people

# MAFEIP Approach



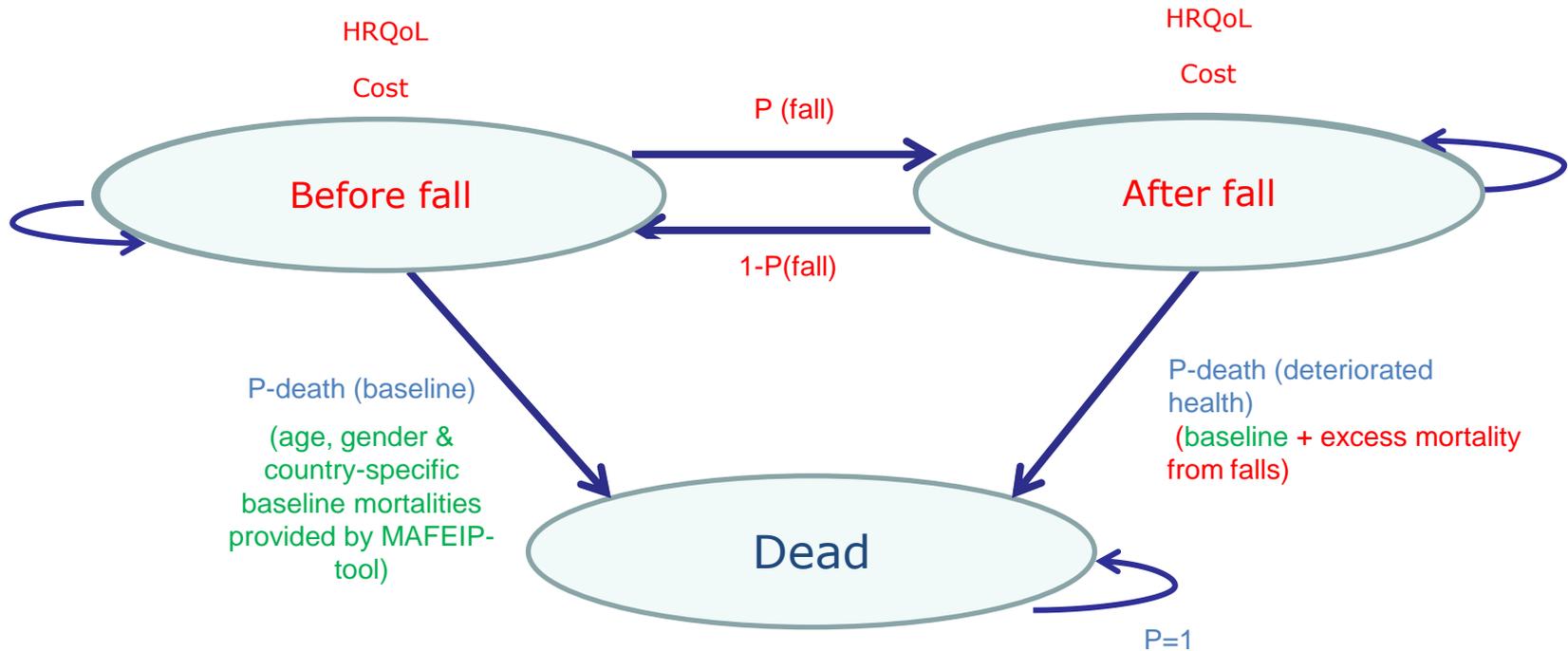
## Early modelling of falls prediction device\*

- A number of indoor falls happen while rising from beds/chairs, and in some cases this may be due to postural hypotension



- To which extent is it possible to predict falls due to standing hypotension by using HRV and wearable devices?

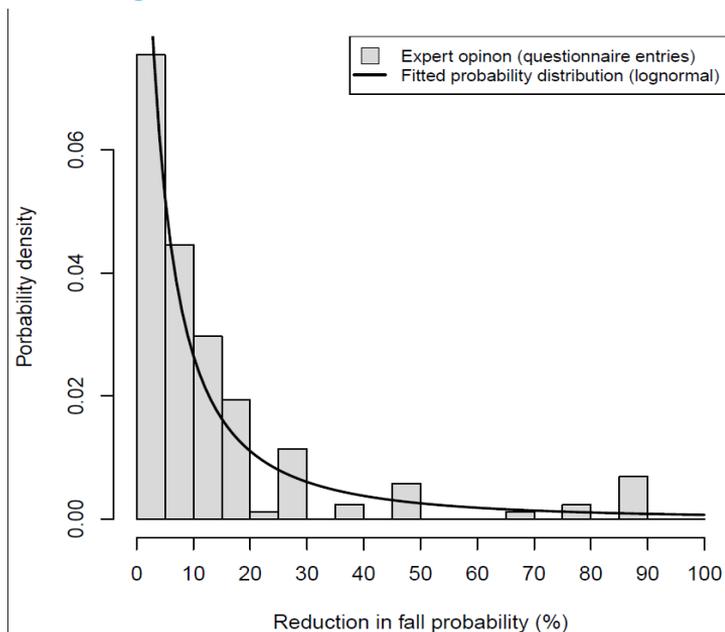
# MAFEIP Model



## Early modelling based upon:

### Expert Opinion:

- Which proportion of falls among elderly at home / in nursing homes / in the hospital could be avoided with a device that can predict a sudden drop in blood pressure based on the ECG of an individual during the last five minutes before rising?

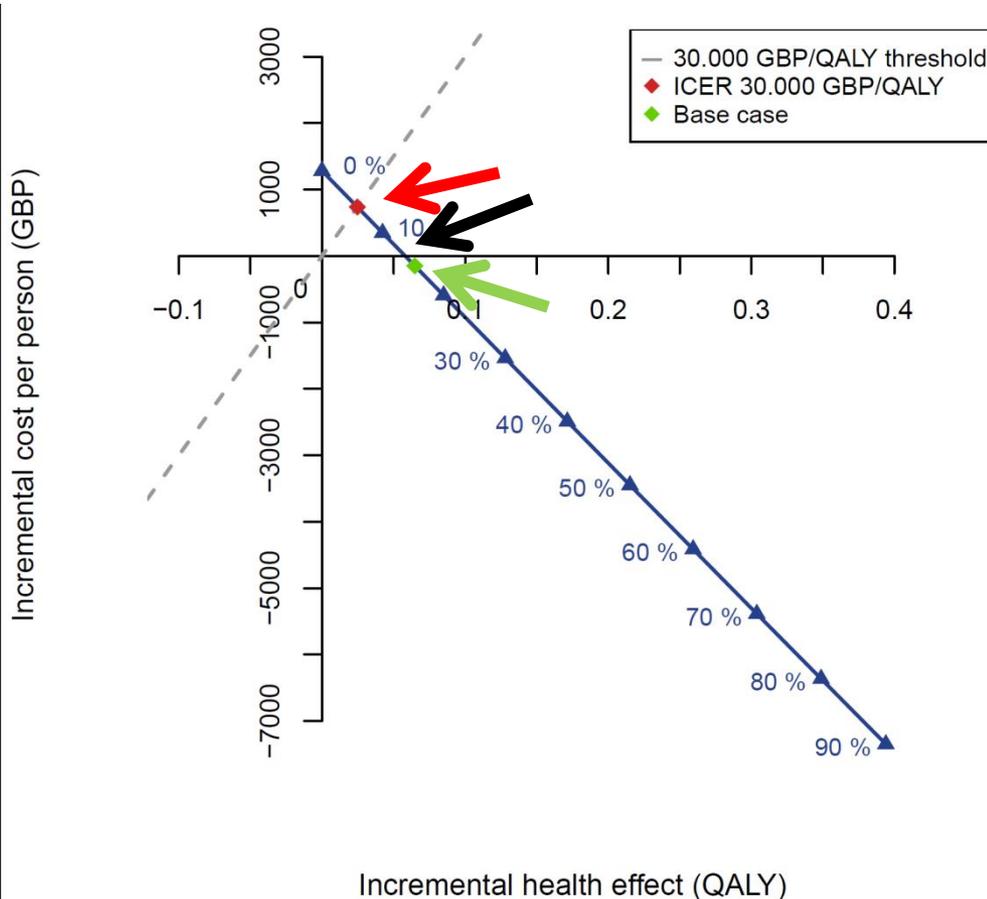


### Secondary data:

<b>Discount factors</b> (NICE, 2008)		
Costs		3.50%
Effects		3.50%
<b>Alive transition probabilities</b> (mainly UK-DH, 2009)		
Incidence (current care scenario)		0.3
'Recovery' (current care scenario)		0.7
Incidence (intervention scenario)		0.2541
'Recovery' (intervention scenario)		0.7459
<b>Relative risks (mortality)</b> (human mortality database)		
Deteriorated health (current care scenario)		1.373
Baseline health (intervention scenario)		1
Deteriorated health (intervention scenario)		1.373
<b>Resource use weights</b> (various sources)		
Baseline health		0
Deteriorated health		3674.92
<b>HRQoL weights</b> (Thiem et al., 2014 & EuroQoL)		
Baseline health		0.811
Deteriorated health		0.7553
<b>Cost of intervention</b> (by analogy - REFINE-study)		
GBP per user per year		130.00

# Case study

## Results



Device reaches WTP threshold of 30,000 GBP/QALY at a relative risk reduction of falls (RRR) of 5.8%. (ARR: 1.74%)

The planned device would be cost neutral at a RRR of 13.7% (ARR: 4.14%)

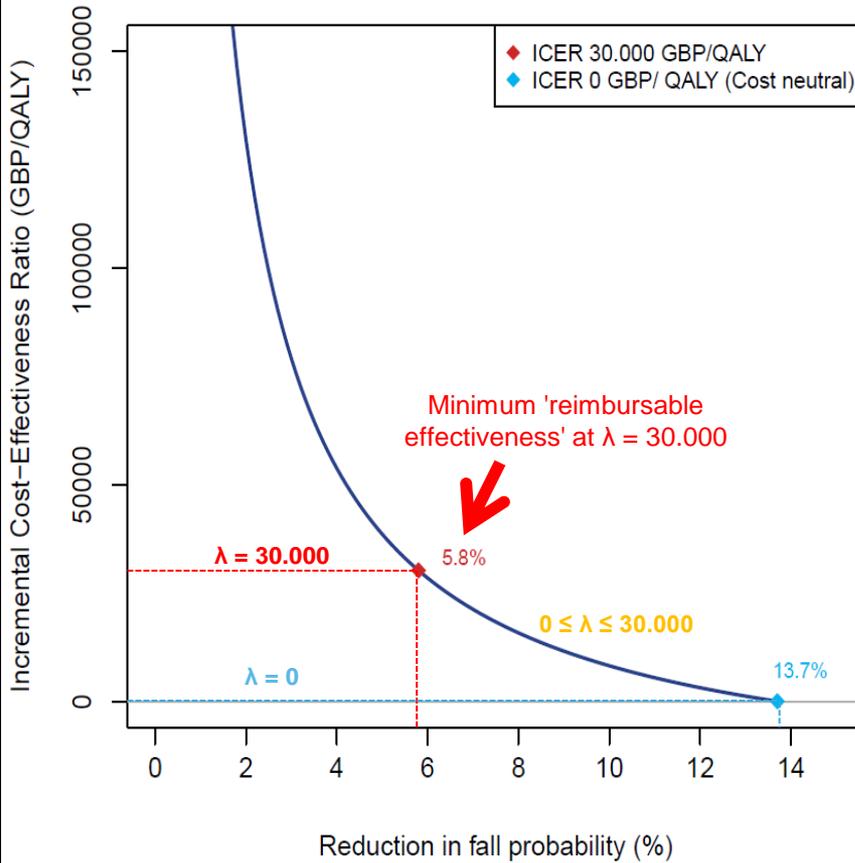
**Base case:** assuming achievable RRR of 15% and cost of device of 130GBP / year would result in annual cost savings of **149GBP** and **0.065 QALYs** gained

# Case study

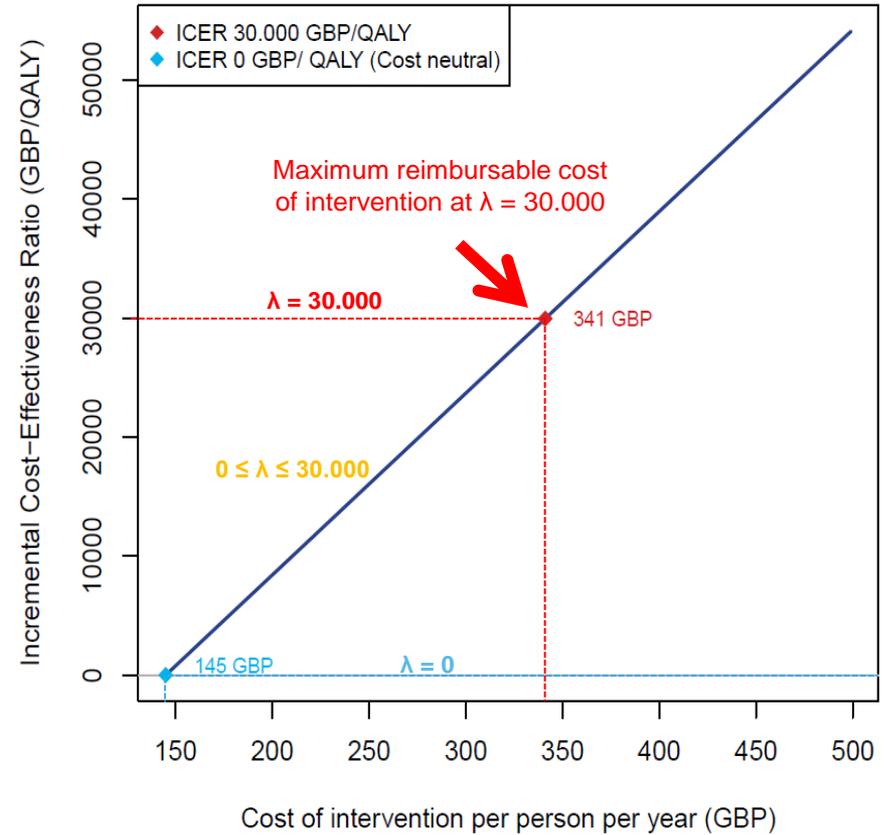
## Results



### ICER vs. device effectiveness



### ICER vs. device cost

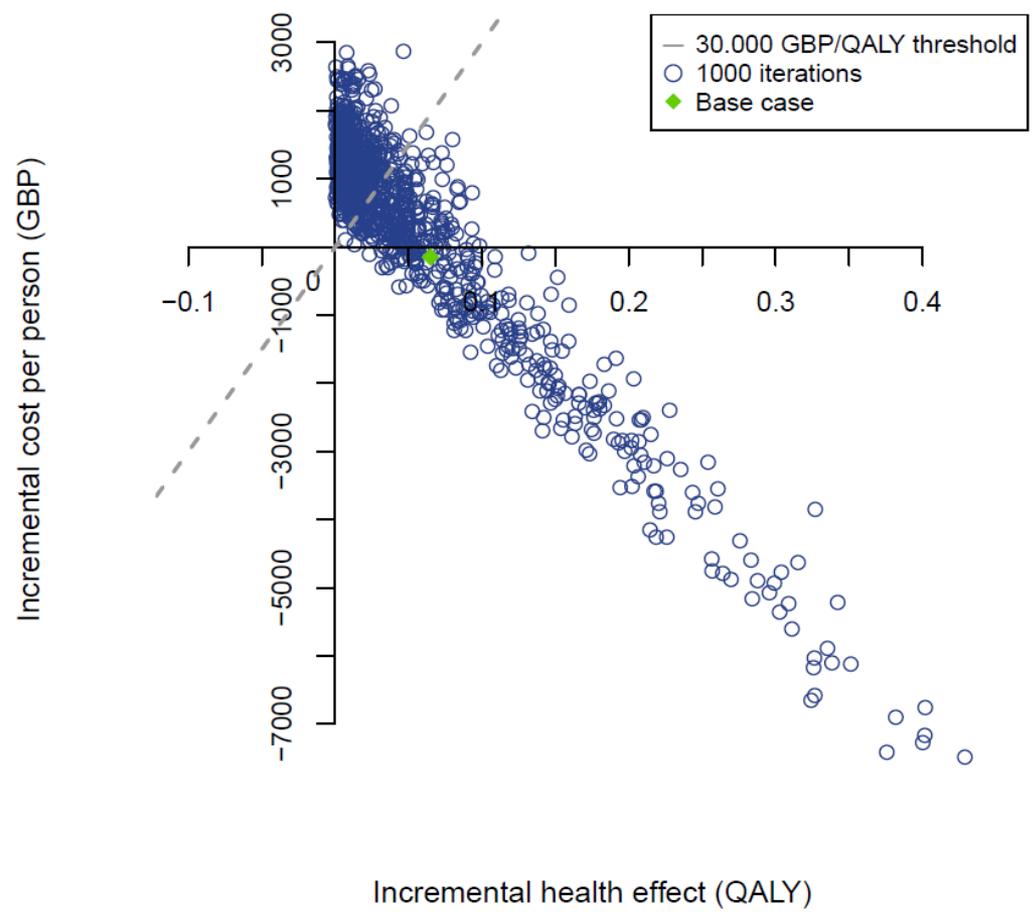


# Case study

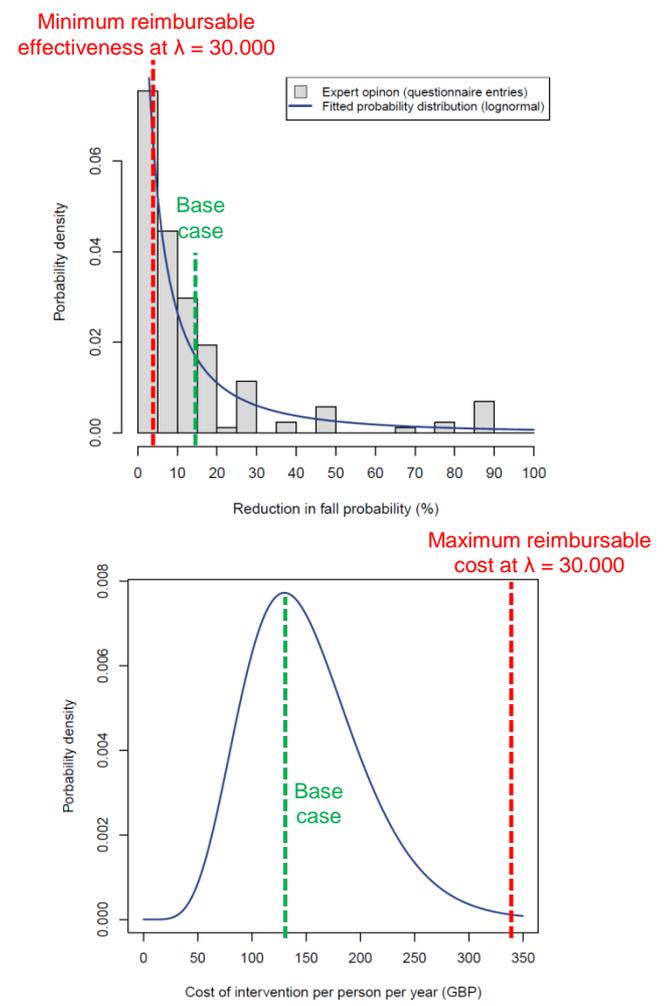
## Results



### Probabilistic analysis



### Parameter distributions



# Conclusions



- The MAFEIP-tool can be applied to assess technologies even at an early stage of development
- It does so by using methods conventionally used for informing '*decisions to buy*' (demand-side) into the development process of a new technology ('*decision to invest*')
- Hence, with MAFEIP we can take on an '*investors perspective*', which is particularly interesting for the EIP on AHA (and other policy initiatives) as
  - The Partnership aims at identifying and scaling up innovations to improve AHA
  - It is still a 'young' policy initiative, with interventions at an early stage of development and
  - The information available about respective technologies is typically scarce and scattered
- In this context, the MAFEIP tool can be a useful for *assessing the potential* of a new technology, which in turn, may provide valuable information for
  - The developer of a technology to decide upon further investment and
  - The EIP on AHA, to provide the right support for respective innovations so that they can progress faster to the next stage of development

# ***Buxton's Law\****

***It is always too  
early*** (for an economic  
evaluation) ***until,***  
***unfortunately, it's  
suddenly too late!***

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## Some relevant literature (all open access)

- BOEHLER C, DE GRAAF G, STEUTEN L, YANG Y, ABADIE F (2015) **Development of a web-based tool for the assessment of health and economic outcomes of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA)**. *BMC Medical Informatics and Decision Making* 15(Suppl 3):S4
- BOEHLER C, ABADIE F (2015) Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP) - **Conceptual description of the Monitoring and Assessment Framework for the EIP on AHA**. European Commission, DG Joint Research Centre, Institute for Prospective Technological Studies (EUR 27412); DOI: 10.2791/290381
- BOEHLER C, ABADIE F, SABES FIGUERA R (2014) Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP) - **Second report on outcome indicators**. European Commission, DG Joint Research Centre, Institute for Prospective Technological Studies (EUR 27034); DOI: 10.2791/171684
- ABADIE F, BOEHLER C, LLUCH M, SABES FIGUERA R (2014) Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP) - **First report on outcome indicators**. European Commission, DG Joint Research Centre, Institute for Prospective Technological Studies (EUR 26826); DOI: 10.2791/12311
- ABADIE F, BOEHLER C, LLUCH M, SABES FIGUERA R, ZAMORA TALAYA MB(2014) Monitoring and Assessment Framework for the European Innovation Partnership on Active and Healthy Ageing (MAFEIP). **Second update of the process indicators**. European Commission, DG Joint Research Centre, Institute for Prospective Technological Studies (EUR 26827); DOI: 10.2791/12501

### More information on MAFEIP:

<http://is.jrc.ec.europa.eu/pages/TFS/MAFEIP.html>