EARLY HEALTH ECONOMIC ASSESSMENT IN INNOVATION PARTNERSHIPS: LESSONS FROM THE EUROPEAN INNOVATION PARTNERSHIP ON ACTIVE AND HEALTHY AGEING (EIP ON AHA)

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Background

The European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) is a European wide policy initiative to address the challenges of an ageing society. Monitoring and assessing the societal, healthcare and patient impact of large innovation partnerships, such as the EIP on AHA, is challenging for many reasons, such as the wide range of interventions developed; the variety in target populations; the need for fast, iterative assessments of technologies from development to implementation stages; the need for readily available repositories of (country-specific) epidemiology and cost data; and the need to extrapolate results over time and settings.

Objectives

The Institute for Prospective Technological Studies (IPTS), part of the European Commission's Joint Research Centre (JRC), developed a Monitoring and Assessment Framework for the EIP on AHA within the MAFEIP-project. In this context, a generic Markov model was developed and implemented as a web-based early assessment tool (MAFEIP-tool) for estimating the health and economic outcomes of a large variety of social and technological innovations carried out within the EIP on AHA. Our aim is to describe this tool and show its application to early HTA within a case study on the planned development of a device that predicts falls by older people.

Model structure and user interface

A Markov model with three mutually exclusive health states (Fig. 1) underlies the MAFEIP-tool, and the optional inclusion of additional health states may be envisaged for future development. The model considers healthcare and societal costs, life expectancy and HRQoL in 1 year cycles over a population's expected lifetime and it draws from a default data set of mortality in Europe, based on the Human Mortality Database. The tool allows (iterative) assessments at various stages of technology development and includes extensive options for performing 1-way sensitivity analyses.

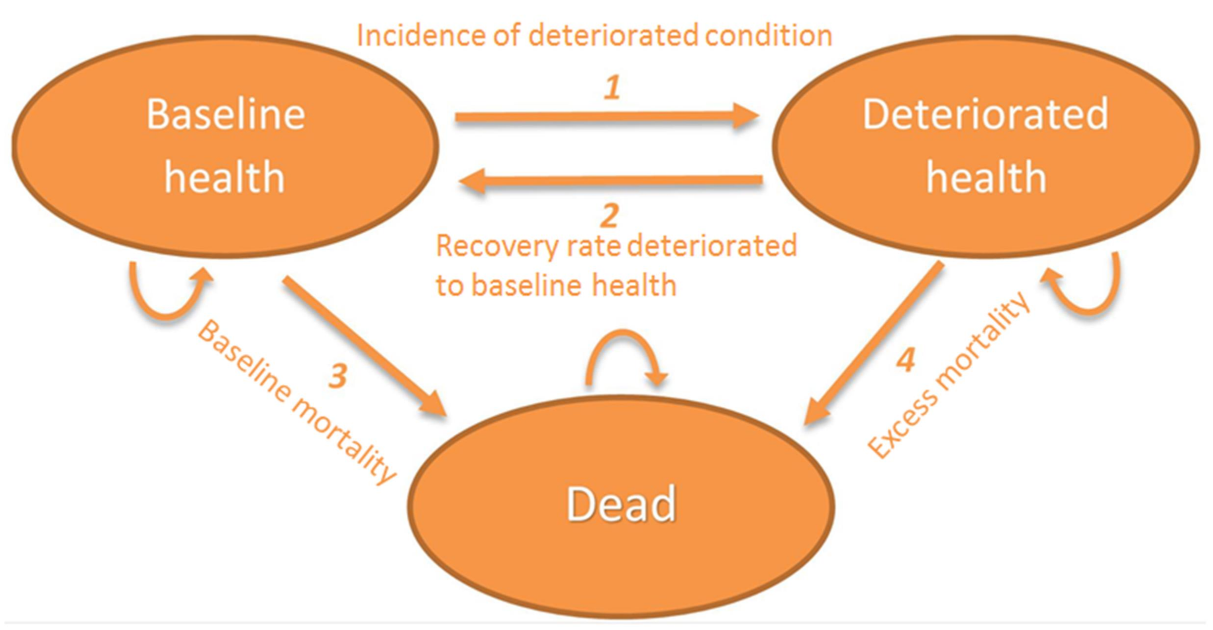

Figure 1: *Markov Model underlying the MAFEIP-tool. Source: Boehler et al. (2015). BMC Med Inform Decis Mak, 15 (suppl. 3): S4, Open Access*

An intuitive interface – a snapshot of which is shown in Fig. 2 - guides users to performing an evaluation of their intervention with minimal external support.

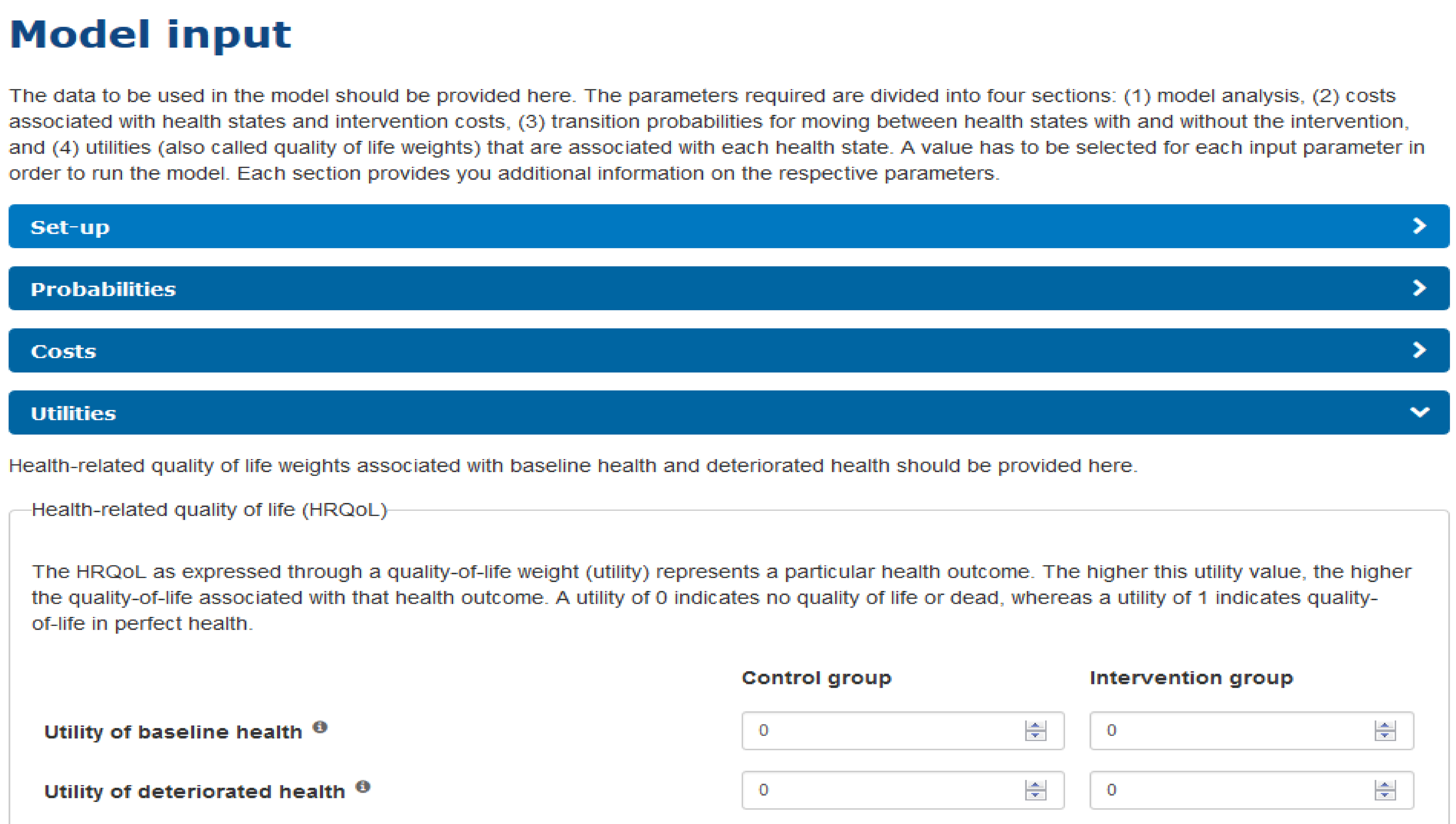

Figure 2: *MAFEIP-tool input sheet. Source: http://mafeip.jrc.ec.europa.eu*

Model output as generated in the context of a case study on falls prediction

A wearable device is currently planned to be developed for predicting postural hypotension after rising from a bed or chair in order to warn individuals and caregivers about their imminent risk of falling. It is hypothesized that the device, compared to usual care, can reduce the number of falls among older people. Input data are derived from the literature and expert opinion about potential device performance was formally elicited through a survey. Model outcomes are expressed as incremental costs/QALY from a UK NHS perspective. Sensitivity analyses identify key parameters for further R&D.

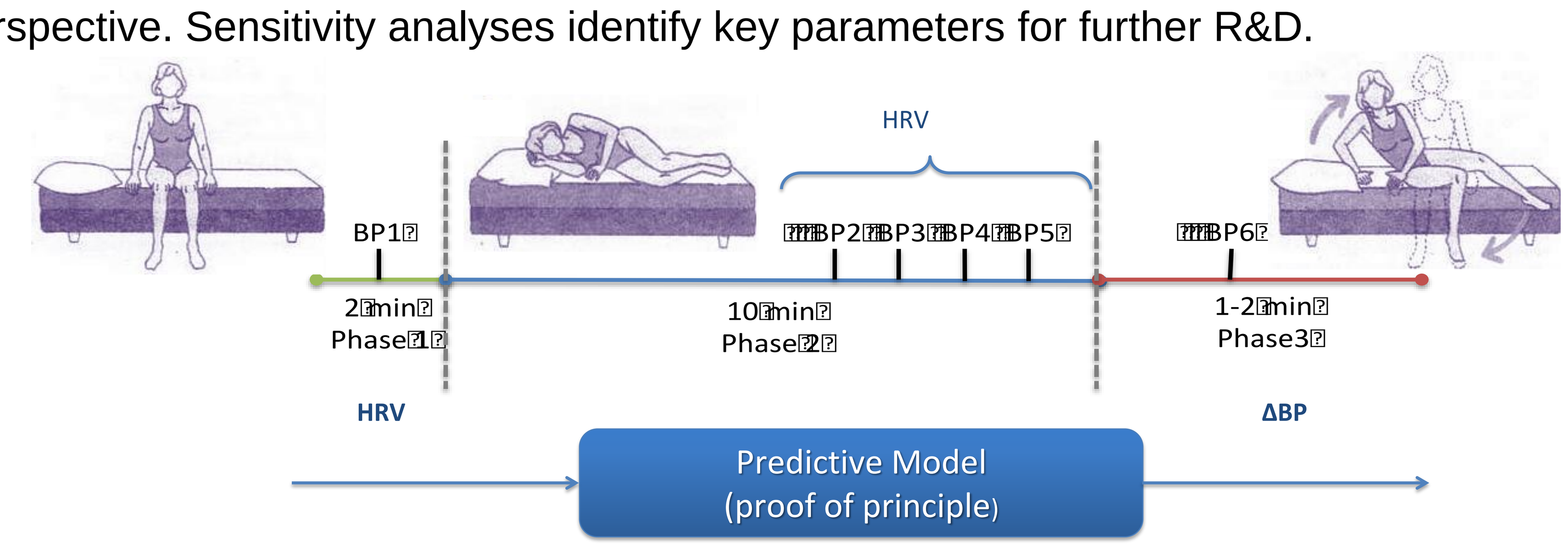

Figure 3: *Predicting Blood pressure after rising. Source: Sannino et al (2015). BMC Med Inform Decis Mak, Vol. 15, Num. S3, Open Access*

At the elicited 15.3% reduction in fall probability, the device is estimated to generate a 0.065 QALYs and save €209 (GBP 149) per person. The ICER would reach a 30.000 GBP/QALY-threshold at a reduction in falls probability of 5.8% and would be cost neutral at 13.7%. Healthcare costs associated with falls, falls incidence and falls recovery rate drive incremental healthcare costs. Utility estimates, not device performance, drive incremental effectiveness.

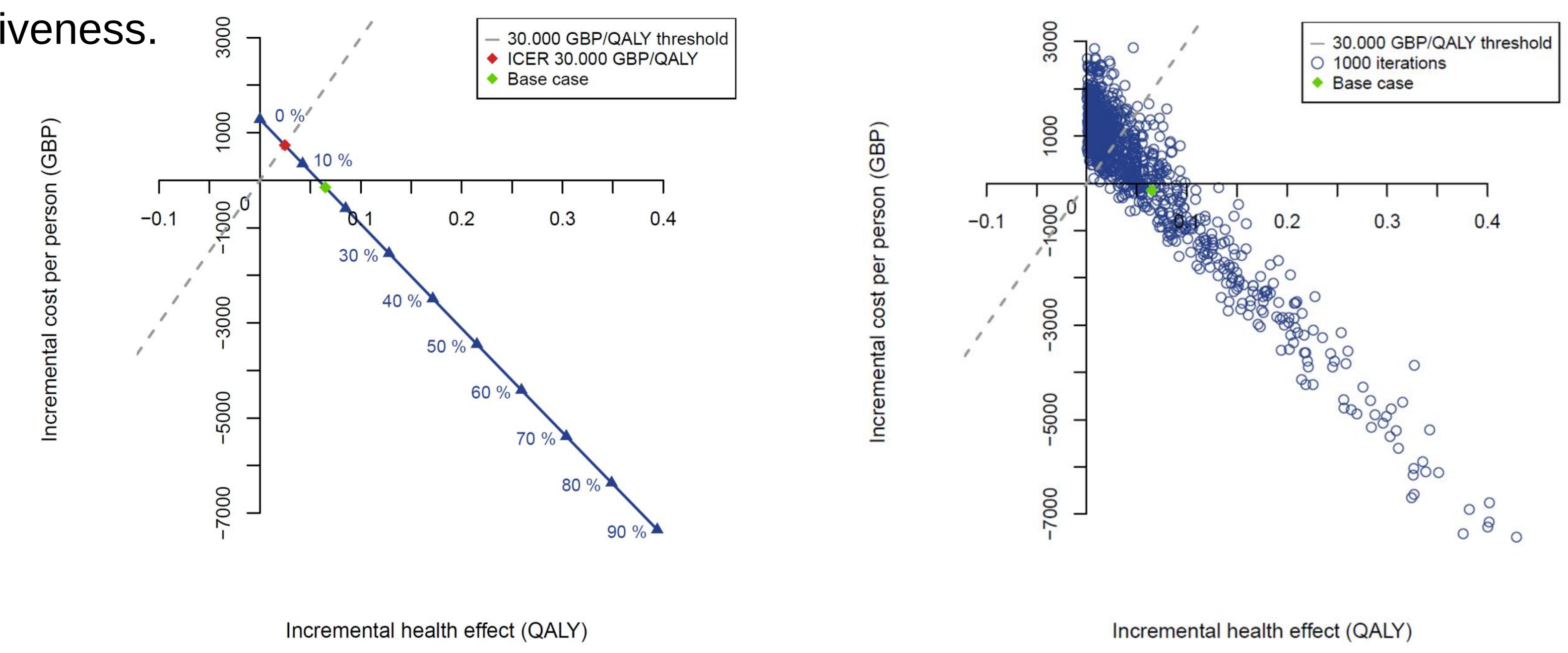

Figure 4: *Model output as generated for early assessment of falls prediction device*

Conclusion

The MAFEIP-tool, based on a flexible Markov structure, allows stakeholders of the EIP on AHA to estimate the health economic impact for a wide variety of interventions and target populations, and to extrapolate results across settings and over time. An interactive online user interface guides analyses to be done by non-experts with no to little external support. The default database that is incorporated reduces the initial data burden on the user.

As the tool allows for saving and updating parameter inputs when new evidence becomes available, and includes a comprehensive sensitivity analyses module, it facilitates early HTA - as shown in the case study. For the EIP on AHA, it allows for maximum consistency whilst minimizing duplication when monitoring and assessing the outcomes generated by the various interventions developed by the stakeholders of the Partnership.