DO MODELS HELP FOR REIMBURSEMENT DECISIONS?

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STARTING POINT

Different standards for HTAs*
EUNetHTA Core model**
Modelling is no fixed content in an assessment***
Economic models are usually not transferable between countries
*Drummond M, Brandt A, Luce B, Rovira J. Standardizing methodologies for economic evaluation in health care. Practice, problems, and potential. Int J Technol Assess Health Care 1993; 9: 26-36.
**http://www.eunethta.net
***e.g. drug see http://www.ispor.org/sigs/HTA_EBR/methodologiesForDrugs.asp

PROBLEM

Modelling
- ❍ **Takes time**
- ❍ **Costs money**
- ❍ **Results have to be explained and are often not understood**
- ❍ **Input defines the output**

DOMAINS of HTA (EUNETHTA)

1. Current use of the technology (implementation level)
2. Description and technical characteristics of technology
3. Safety
4. Effectiveness
5. Costs, economic evaluation often modelling!
6. Ethical aspects
7. Organisational aspects
8. Social aspects
9. Legal aspects

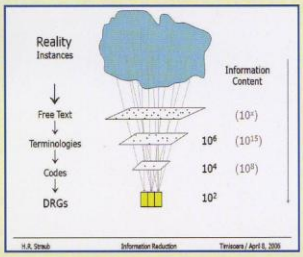
MODEL - DEFINITION

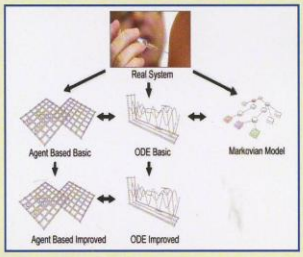
Eykhoff (1974) defined a mathematical model as ‚a representation of the essential aspects of an existing system (or a system to be constructed) which presents knowledge of that system in usable form.
A mathematical model usually describes a system by a set of variables and a set of equations that establish relationships between the variables. Engineers can build a descriptive model of the system as a hypothesis of how the system could work, or try to estimate how an unforeseeable event could affect the system.
In general, model complexity involves a trade-off between simplicity and accuracy of the model*.
*http://en.wikipedia.org/wiki/Mathematical_model

Occam's Razor is a principle particularly relevant to modelling; the essential idea being that among models with roughly equal predictive power, the simplest one is the most desirable.

PRO

Explicit / transparent
- ❍ Reduction of complexity
- ❍ Lack of evidence
- ❍ Uncertainty
- ❍ Parameters and ranges
- ❍ Indirect comparison
- ❍ Comparative effectivness
- ❍ Relative effectivness





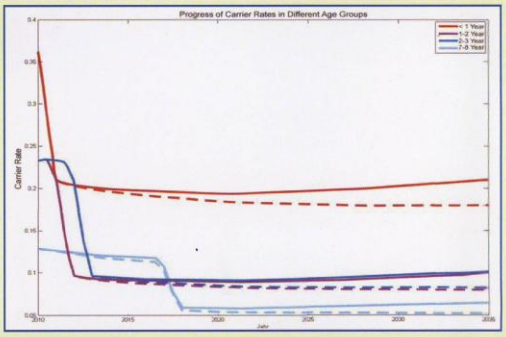
CON

- ❍ Contraintuitive results possible
- ❍ Complex methodology
- ❍ „expert tool"
- ❍ Interpretation of results unclear
- ❍ Predictive power unclear
- ❍ Point estimates always false
- ❍ Critical appraisal difficult
- ❍ Costly / resource consuming

EXAMPLE

MODEL OF PVC-7 VACCINATION in AUSTRIA*

Vaccination reduces rates of carriers in population
Development for children under 10 years of age is shown
Dotted lines:
Stable population assumed
Full lines:
Prognosis of population development according Statistik Austria - growth of population due to immigration - is included
Markov model cannot show this effect
Differential equation model can incorporate population dynamics
Agent based model can additionally reproduce herd immunity and serotyp shifting
*http://www.hauptverband.at/mediaDB/656180_Pneumokokken_Kinder_Simul_Bericht_15_02_2010_end.pdf (in German)



EXPECTATION OF DECISION MAKERS

Support for formulary placement decisions by
- ❍ Estimation of the financial impact
- ❍ Estimation of health benefit
- ❍ Priorisation by comparing relative value

PREFERENCES
- ❍ Software to test model themselves (MS-EXCEL preferred)
- ❍ Tailored model for the target population

Economic models: Managed Care decision makers perception and use ; O'Day K., Reeder CE, Bramley T, Meissner B; ISPOR Atlanta May 18th (Poster)

DISCUSSION

Point estimates are always wrong! - but:
- ❍ Uncertainty is shown - risk of a decision becomes apparent
- ❍ Lack of evidence is shown - applications can be scrutynised and „promises" questio-ned
- ❍ Questions can be adressed where RCTs or other real live trials are not possible
- ❍ Comparative effectivness
- ❍ Relative effectivness
- ❍ Long time effects

CONCLUSION

GP FOR THE USE OF MODELS IS NEEDED

Use of models is complex and needs special knowledge.
Willingness to pay threshhold should not be used, as point estimates are always false
Sensitivity testing shows main influencing factors - Uncertainity and lack of evidence gets transparent

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