



## Tárgytematika

EÖTVÖS LORÁND TUDOMÁNYEGYETEM  
TÁTK Egészségpolitika és Egészség-gazdaságtan Tanszék  
(TÁTK-EGPOL-TANSZ)

2019/20/2

Tárgynév:	<b>Methodology of economic modelling in health care (2)</b>
Tárgykód:	<b>HCP211</b>
Tárgyfelelős neve:	<b>Nagy Balázs Dr.</b>
Tárgy követelménye:	<b>Kollokvium (5)</b>
Tárgy heti óraszáma:	<b>3/0/0</b>

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### Oktatás célja:

#### **Basics to the course**

No. of credits: 4

Type: seminar

Pre-requisites: Methodology of economic modelling in health care 1

Time-schedule: 2nd year 2nd semester of MSc in Health Policy Planning and Financing

Venue: 0.99

Time: Wednesdays, 9.00 - 11.30 (unless stated otherwise!)

Module leader: dr. Balázs Nagy

#### **Student learning goals & Brief summary of topics covered**

The module is designed for students who wish to learn advanced modelling approaches, techniques and applications for health care decision analysis. During the semester economic models related to strategic pricing, risk sharing arrangements, health care investment and public health decisions are investigated, and students get insight into advanced modelling techniques supporting health care decisions, as discrete event simulation, Markov simulation and probabilistic sensitivity analysis. By the end of the module students will be familiar with health care modelling methods applicable to a large scale of decision making situations and will be able to understand and interpret the fundamentals of some advanced modelling techniques.

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### Tantárgy tartalma:

#### **Themes**

- Strategic pricing of health care technologies



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### Tantárgy tartalma:

- Go-no decision in R&D decisions
- Cost-benefit analysis of hospital investment
- Modelling public prevention programmes
- Probabilistic sensitivity analysis
- Discrete event simulation models
- Markov simulation models

Schedule no. of seminar	l e c t i m e e r
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### Tantárgy tartalma:

	<p>1 1 k a h o F application of models for pricing decisions 2 bor r u t a r n y</p>
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### Tantárgy tartalma:

<b>8.00-10.15</b>	Models supporting pharma industry decisions
'ELTE' model application for pricing decisions	
2	K a h o  F application of models in R&D bor tary
<b>8.00-10.15</b>	Guide to decision models in the pharma industry
'ELTE' model application for R&D decisions	



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### Tantárgy tartalma:

	N a t g y  F Introduction B a r u a z s y
3	Schedule, tasks, scoring system, groups, recap & the net benefit concept requirements, schedule, recap



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### Tantárgy tartalma:

4	R 6 tm á k Meory of stochastic sensitivity analysis a E d h t
	Concept of PSA
	Method and process



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### Tantárgy tartalma:

5	R e s t a n k M a E r c h t	practice of stochastic sensitivity analysis
Parameters for PSA		
Programming in VBA		



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### Tantárgy tartalma:

no. of seminar	learning objective
	1 e t ch t m m e e r
6	V a l u e  o f  R a n t e s t a n a l y s i s  application of stochastic sensitivity analysis results
	Concept of VIA
	Applications of VIA



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## Tantárgy tartalma:

Modelling long-term outcomes of diabetes	Markov individual simulation modelling Measures of diabetes
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2019/20/2

### Tantárgy tartalma:

Syreon Diabetes Model

	D i s c r e t e  e M v o g n n d a r s i p m A u n e a t t i o n  m o d e l s
8	A discrete event simulation modelling
Logic, structure, technical challenges	



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2019/20/2

### Tantárgy tartalma:

9	C o s t - b e n e f i t  a ž e h ň ð é h y á p r á h š p í t a l  i n v e s t m e n
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**Tantárgy tartalma:**

Model of dental care investment



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### Tantárgy tartalma:

10	C o n f e r e n c e  o f  t h é 4 t h ú  A g p a r r í l a n  I S P O R  c h a p t e r
	networking in health policy and economics



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### Tantárgy tartalma:

Facultative program: 1-1 bonus points for presence and presentation

	M o d e l l i n g	
11	p N u e b m e i s t h p M e a r y h a l i a n t e r v e n t i o n s	public health modelling
Cost-effectiveness of smoking cessation		



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### Tantárgy tartalma:

12	P r e s e n t a t N o b s t h assessment B M b ý z s g r e m a r k s
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### Számonkérési és értékelési rendszere:

#### Assessment

Student assessment consists of four components:



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### **Számonkérési és értékelési rendszere:**

- student activity during the semester
- presentation
- written test exam
- assignment

Activity during the semester (max. 10 points):

- 5 points for not missing more than 2 seminars
- 5 points for valid comments and questions during the seminars deserve 0.5 point each. One can collect max 1 point on each seminar ; ask the lecturer at the end of seminar or via email to make a note of your points or use the forum on Coospace

Presentations in groups (max. 20 points)

- max. 20 points per presentation (i.e. max 60 for 3 persons) which can be shared as the group decides. If you wish to share points unequally let the lecturer know at the date of the presentation
- the presentation will have to summarize the main messages of the reading in maximum 12 minutes
- each member of the group (max. 3 persons) takes part in the presentation

Written exam (max. 30 points)

- students need to be familiar with new modelling terms and methods used throughout the module and their interpretation. The assessment is carried out through test, brief exercises and/or short essays.

Modelling assignment (max. 40 points):

Students are assigned to work on a modelling problem with the techniques that were presented them during the classes.

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### **Kötelező irodalom:**

#### **Handbooks available at ELTE library**

Michael F. Drummond, Mark J. Sculpher, George W. Torrance, Bernie J. O'Brien, and Greg L. Stoddart.: Methods for the Economic Evaluation of Health Care Programmes.

Alastair M. Gray, Philip M. Clarke, Jane L. Wolstenholme, and Sarah Wordsworth: Applied Methods of



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### Kötelező irodalom:

Cost-effectiveness Analysis in Healthcare.

Andrew Briggs, Mark Sculpher, Karl Claxton. Decision Modelling for Health Economic Evaluation. Oxford University Press, 2006. ISBN 0-19-852662-8 ISBN 978-019-852662-9

Johanesson, Magnus: Theory and Methods of Economic Evaluation of Health Care. Kluwer Academic Publishers, 1996 – this is not on the reading list but provides a very useful summary of various issues we discuss during the module.

### Compulsory reading

Alastair M. Gray, Philip M. Clarke, Jane L. Wolstenholme, and Sarah Wordsworth: Applied Methods of Cost-effectiveness Analysis in Healthcare. 2011, Handbooks in Health Economic Evaluation, volume 3

**Chapter 10: Representing uncertainty in decision analytic models. pg. 249-266**

**Chapter 11: Presenting cost effectiveness results. pg. 267-300**

Andrew Briggs, Mark Sculpher, Karl Claxton. Decision Modelling for Health Economic Evaluation. Oxford University Press, 2006. ISBN 0-19-852662-8 ISBN 978-019-852662-9

**Chapter 3. Further developments in decision analytic models for economic evaluation pg. 45-76**

**Chapter 4. Making decision models probabilistic pg. 77-120**

**Chapter 5. Analysing and presenting simulation output from probabilistic models pg. 121-164**

**Chapter 6. Decision-making, uncertainty and the value of information pg. 165-200**

Brennan A Chick SE, and Davies R. A taxonomy of model structures for economic evaluation of health technologies. *Health Economics* 2006, 15: 1295-1310.

### Recommended reading

Elisabeth Fenwick, Karl Claxton, Mark Sculpher: Representing uncertainty: the role of cost-effectiveness acceptability curves. *Health Economics*. 10: 779–787 (2001)

J Karnon Alternative decision modelling techniques for the evaluation of health care technologies: Markov processes versus discrete event simulation. *Health Economics* 12: 837–848 (2003)

Jaime J. Caro, Jörgen Möller, Denis Getsios: Discrete Event Simulation: The Preferred Technique for Health Economic Evaluations? *Value in Health* 2010

Susan Griffin, Karl Claxton, PhD, Neil Hawkins, Mark Sculpher: Probabilistic Analysis and Computationally Expensive Models: Necessary and Required? Volume 9, Number 4, 2006 *Value in Health*



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### Kötelező irodalom:

Robin C Purshouse, Petra S Meier, Alan Brennan, Karl B Taylor, Rachid Rafia: Estimated effect of alcohol pricing policies on health and health economic outcomes in England: an epidemiological model. *Lancet* 2010; 375: 1355–64

Agathe Le Lay et al.: Can discrete event simulation be of use in modelling major depression?; *Cost Effectiveness and Resource Allocation* 2006, 4:19

Milton C. Weinstein, Bernie O'Brien, John Hornberger, Joseph Jackson, Magnus Johannesson, Chris McCabe, Bryan R. Luce: Principles of Good Practice for Decision Analytic Modeling in Health-Care Evaluation: Report of the ISPOR Task Force on Good Research Practices—Modeling Studies. *Value in Health* Volume 6 • Number 1, 2003

### Readings for presentations

1. Hui-Chu Lang: Willingness to Pay for Lung Cancer Treatment. *Value in Health* Volume 13 Number 6 (2010)
2. C. Bruce Baker, Michael T. Johnsrud, M. Lynn Crismon, Robert A. Rosenheck and Scott W. Woods: Quantitative analysis of sponsorship bias in economic studies of antidepressants. *British Journal Of Psychiatry* (2003) , 183 , 498 - 506
3. T.G.K. Bentley, K.M. Kuntz, J.S. Ringel: Bias Associated with Failing to Incorporate Dependence on Event History in Markov Models. *Medical Decision Making* 2010 30: 651
4. R van Ewijk Long-term health effects on the next generation of Ramadan fasting during pregnancy. *Journal of Health Economics* 30 (2011) 1246– 1260
5. W. Ungar Challenges in Health State Valuation in Paediatric Economic Evaluation. Are QALYs Contraindicated? *Pharmacoeconomics* 2011 (8):641-52
6. Purshouse RC, Meier PS, Brennan A, Taylor KB, Rafia R. Estimated effect of alcohol pricing policies on health and health economic outcomes in England: an epidemiological model. *Lancet*. 2010
7. Smith, Gordon C. S. ; Pell, Jill P. Parachute Use To Prevent Death And Major Trauma Related To Gravitational Challenge: Systematic Review Of Randomised Controlled Trials. *BMJ: British Medical Journal*, 2003, Vol.327(7429), pp.1459-1461
8. Simon Dixon, Louise Longworth, Allan Wailoo: Assessing technologies at the end of life: A review of empirical evidence. Report by the decision support unit. School of Health and Related Research, University of Sheffield. 26 November 2009
9. Nelson, Jon P., Estimating the Price Elasticity of Beer: Meta-Analysis of Data with Heterogeneity, Dependence, and Publication Bias (January 14, 2013). Available at SSRN: <http://ssrn.com/abstract=2200492> or <http://dx.doi.org/10.2139/ssrn.2200492>



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### Kötelező irodalom:

10. Jenny Williams, Anne Line Bretteville-Jensen, Does liberalizing cannabis laws increase cannabis use?, Journal of Health Economics, Volume 36, July 2014, Pages 20-32, ISSN 0167-6296, <http://dx.doi.org/10.1016/j.jhealeco.2014.03.006>
11. D. Lee, R. R. Pate, C. J. Lavie, X. Sui, T. S. Church, S. N. Blair: Leisure-Time Running Reduces: All-Cause and Cardiovascular Mortality Risk. Journal of the American College of Cardiology vol. 64 , no. 5, 2014 <http://content.onlinejacc.org/mobile/article.aspx?articleid=1891600&resultClick=1>
12. Reidar P. Lystad and Benjamin T. Brown: “Death is certain, the time is not”: mortality and survival in Game of Thrones Injury Epidemiology (2018) 5:44 <https://doi.org/10.1186/s40621-018-0174-7>
13. Adam Hartley, Mit Shah, Alexandra N Nowbar, Christopher Rajkumar, James P Howard, Darrel P Francis: Key opinion leaders' guide to spinning a disappointing clinical trial result. BMJ 2018;363:k5207 doi: 10.1136/bmj.k5207 (Published 13 December 2018)