Equity and efficiency preferences of health policy makers in Austria - a stated preference analysis

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Introduction

- mental disorders impose manifold costs
- financial burden within EU, est. 3-4% GDP
- supposed to be the highest ranking cause of disease in HIC by 2020[1]
- 12 month prevalence within population of EU + Switzerland, Iceland, Norway, est. 38,2%[2]
- most neglected disease in global health

1 Commission of the European Communities. (2005). Green Paper: Improving the mental health of the population. Towards a strategy on mental health for the European Union. COM(2005) 484 final.

2 Wittchen et al. (2011). The size and burden of mental disorders an other disorders of the brain in Europe 2010. European Neuropsychopharmacology (2011) 21, 655-679.

Mental health in Austria

- > 10% of the population in treatment in 2009[3]
- 33.9% of new entrants into invaldity pension in 2008 due to mental disorders [out of 23,000 cases][4]
- treatment supply not efficient despite increase of expenses[5]

3 Prantner M. (2011). Werkstatt 2011 – Psychosoziale Gesundheits und Krankheit. Trend, Herausforderungen und Lösungsmodelle. Soziale Sicherheit: 11/2011, 522-525.

4 Leoni T. (2011). Fehlzeitenreport 2011 – Krankheits- und unfallbedingte Fehlzeiten in Österreich. Österreichiches Institut für Wirtschaftsforschung.

5 Eggerth A, Bednar W & Hagleitner J. (2009). Versorgung mit Psychotherapie 2009. Österreichische Bundesagentur für Gesundheit (ÖBIG).

Decision-making in health care

- Ad hoc, complex and multifaceted
  - changing health needs
  - technical development
  - limited health budgets

- Policymakers have to make effective and efficient choices between competing health care interventions

- Built upon multidisciplinary knowledge bases (public health, clinical medcine, ethics, social sciences, etc.)

Aims & approach

- Explore the criteria a diversity of national-level policy makers find important (while formulating plans on the extension and distribution of health care services with constrained resources) and subsequently map the implicit efficiency-equity trade-offs they make when making such decisions.

- Discrete Choice Experiments: analysis of how individuals make choices among alternatives
  - Decomposes the product or variable of interest into its' characteristics
- Construct Composite League Table (CLT) to rank interventions according to stated preferences

DCEs

- Independent variables = individual characteristics (attributes) of a product.

- Attributes: each have specific levels which are systematically varied and combined into a unique combination that describes product or treatment profile alternatives
  - Criteria are constant in each scenario, but the levels that describe each criterion may vary across options

- Respondent select their preferred option from sets of 'options'

DCEs continued

- We used a core set of preference criteria as attributes based on two literature reviews and adaptation proposed in focus groups of health programmers and experts within the initial three setting. This was in Nepal, Ghana, and a formal working session with 28 HTA experts at HTAi conference 200 (Mirelman et al. in a five country study; Baeten et al. on breast cancer; Baltussen et al, 2006 and 2007 on Nepal and Ghana).

- Six attributes were identified that represent key criteria used in health decisions and these have been included in the subsequent studies (Mirelman et al. 2012).

DCEs continued

- On the basis of five attributes at two levels and one attribute at three level yields 96 possible unique combinations for inclusion in the full experimental design, representing all possible combinations.

- To make administration more manageable and to avoid the use of blocking (as our expected sample size of experts was not large), Sawtooth Software (Orem, UT) was used to select 32 unique alternatives from the full design which led to 16 paired comparisons (representing an orthogonal array).

Model

- A traditional additive linear utility, where utility $U_{iq} = V_{iq} + \varepsilon_{iq} = \sum_{k=1}^{K} \beta_k X_{ikq} + \varepsilon_{iq}$

- A deterministic, V_{iq}, and a stochastic, ε_{iq}, component

- i is the choice alternative, k the attributes, q the individual and β_k are the utility parameters to be estimated.

- Assuming ε_{iq} to be independent and identically distributed (iid) extreme value type I the probability that individual q chooses alternative i from among a set of J alternatives is $P_{iq} = \dfrac{\exp(V_{iq})}{\sum_{j=1}^{J} \exp(V_{jq})}$ (McFadden, 1974)

- Unobserved heterogeneity modelled through a latent class conditional logit specification (with and without making the class probability a function of individual characteristics)
- Such model performed less well compared to the standard conditional logit model
- Observed heterogeneity incorporated through individual characteristics interactions

Sample & Attributes

- Respondents have been recruited from every administrative level, i.e., state level, provincial level as well as prefecture level.

- Four sessions with policy makers in health or health professionals were organized through workshops or conference, interviews and snowballing.

- All respondents had substantial experience with the conceptual framework of the experiment, and were familiar with economic evaluation studies.

- All returned a valid completed online questionnaire. Socio-demographic information was also collected to allow testing for systematic differences in preferences (i.e. preference heterogeneity) based on these characteristics.

- Attributes:
    - *Equity*: disease severity, age group, wts
    - *Efficiency*: total beneficiaries, individual benefits, cost-effectiveness

Table 1 Definition of criteria and level

Definition of criteria and level

Attribute	Level (regression variables)	Definition
Severity of disease	Not severe (NotSev)*	Remaining healthy life expectancy more than two years in absence of intervention, when acquiring/ having disease
	Severe (Sev)	Otherwise
Number of potential beneficiaries	Few (FewBen)*	Less than 100 000 (those, who could potentially benefit from intervention)
	Many (ManyBen)	Otherwise
Age of target group	Young (YoungAge)*	0-14 years
	Middle-age (MidAge)	15-59 years
	Elderly (OldAge)	60 years and older
Individual health benefits	Small (SmallBen)*	Less than five healthy life years on average for whole target group
	Large (LargeBen)	Otherwise
Willingness to subsidize others	Low level (WTSlow)*	Less than 70% of total health expenditures are financed from public funds
	High level (WTShigh)	Otherwise
Cost-effectiveness	Not cost-effective (notCE)*	Cost per DALY>1*GDP/capita
	Cost-effective (CE)	Cost per DALY<1*GDP/capita

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Sample Paired Comparison

If these were your only options, which would you choose? Check one of the options below:		
Severity of Disease	Not Severe. Health expectancy >2 years without intervention.	Severe. Health expectancy < 2 years without intervention.
Number of potential beneficiaries	Many (>100,000)	Few (<100,000)
Age of target group	Young (0 to 14 years)	Middle-age (15-59 years)
Individual health benefits	Large (> 5 healthy years)	Small (< 5 healthy years)
Willingness to subsidize others	Less than 70% of total health expenditure	More than 70% of total health expenditure
Cost-effectiveness	Not cost-effective (Cost / DALY > 1* GDP/cap)	Cost effective (Cost/ DALY < 1*GDP/cap)
	☐	☐

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Descriptive Statistics

Descriptive Statistics

	Frequency	.	Percent
Sex			
Male	*45*		*64%*
Experience			
More than 10 years experience (exp)	52		75%
Less than/equal 10 years experience (nonexp)	17		25%
Policymaker			
National (National)	6		8.7%
Regional (Regional)	28		40.6%
Researcher			
University Associates (UniAs)	10		14.5%
by attorney of Ministry of Health (MOHatt)	9		13.0%
Health care worker			
Hospital Associates (HospAs)	16		23.2%

Results I

Conditional logit estimation results with individual characteristics interactions

Equity attributes	
Severity of Disease	0.158
	(0.129)
Age of target group: Middle	0.243
	(0.161)
Age of target group: High	-0.755***
	(0.138)
Willingness to subsidize others	-0.251**
	(0.128)
Efficiency attributes	
Number of potential beneficiaries	0.645***
	(0.0998)
Individual health benefits	1.375***
	(0.214)
Cost-effectiveness	0.837***
	(0.119)
Interactions	
Age of target group: Middle * Male	-0.558***
	(0.180)
Individual health benefits * Male	-0.706***
	(0.227)
Severity * Experience(>10 years)	-0.392*
	(0.211)
Cost-effectiveness * Experience(>10 years)	-0.390**
	(0.190)
Willingness to subsidize * Regional Policy Maker	0.406**
	(0.172)
Severity * Regional Policy Maker	0.538**
	(0.221)
Number of potential beneficiaries * National Policy Maker	-0.541**
	(0.214)
Severity * National Policy Maker	1.533***
	(0.516)
Severity * University Associate	0.723**
	(0.299)
Willingness to subsidize * Ministry of Health attorney	0.378*
	(0.214)
Severity * Ministry of Health attorney	0.657**
	(0.289)
# individuals	69
Obs	2,208

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Results II

Predicted probabilities, % changes in predicted probs and efficiency/equity trade-off

	Predicted Prob	%Δ compared to base	Interventions Targeting Middle Age groups		.	Interventions Targeting High Age groups	
			%Δ by aggregate Eq and Eff attributes	Efficiency/Equity ratio		%Δ by aggregate Eq and Eff attributes	Efficiency/Equity ratio
Base alternative [a]	0.72						
Equity attributes							
Severity of Disease	0.771	7.03					
Age of target group: Middle	0.704	-2.22	4.48			-3.32	
Age of target group: High	0.640	-11.07					
Willingness to subsidize others	0.715	-0.64					
				4.99			-.6.37
Efficiency attributes							
Number of potential beneficiaries	0.775	7.69					
Individual health benefits	0.795	10.49	22.37			22.37	
Cost-effectiveness	0.786	9.13					

[a] Base alternative is based on setting all attributes at their mean

CLTs (Mid-Age & Old-Age)

- Following slides two CLTs based on conditional probabilities (however, unconditional probabilities show the same thing). In essence we compute the probability for each intervention to be picked as the most preferred if all intervention were available as alternatives in the same choice set.

- The Mid is for interventions that either Mid-age specific or generic (but computed for the Mid age attribute)
- The High is for interventions that either High-age specific or generic (but computed for the High age attribute)

CLT (Mid)

CLINICAL CONDITION	Intervention	Rank
Major depressive disorder	Older antidepressant drug medication (TCA)	1
Major depressive disorder	New er antidepressant drug medication	1
Major depressive disorder	Psychosocial treatment	1
MN of colon, rectum and anus	Surgery w ith/w ithout adjuvant treatment (a)	4
MN of the female breast	Surgery (Lumptectomy, Mastectomy) w ith adjuvant treatment (b)	4
MN of prostate	Monitor cancer (Watchful Waiting, Active Surveillance)	4
MN of prostate	Surgery w ith/w ithout adjuvant treatment (c)	4
Acute Myocardial Inarction (AMI)	Medication (aspirin, atenolol, streptokinase, tissue plasminogen activator)	4
Acute Myocardial Inarction (AMI)	Surgery (Primary angioplasty, primary stenting, percutaneous transluminal coronary angioplasty (PTCA))	4
Atherosclerosis	Medication (aspirin, atenolol, ACE inhibitors, Statins)	4
Atherosclerosis	Surgery (percutaneous transluminal coronary angioplasty - PTCA)	4
Angina pectoris (stable angina)	Angioplasty, Stenting	4
Angina pectoris (stable angina)	Surgery (Coronary artery bypass graft)	4
Diabetes mellitus type 2	Foot care (patient and provider education, foot examination, foot hygiene, apporpirate footw ear)	4
Diabetes mellitus type 2	Education (patient self-managment)	4
Suicide and intentional self-harm	Education, promote individual, family, community connectedness	4
Unhealthy diet	Reduce salt intake	17
MN of colon, rectum and anus	Screening (Fecal occult blood testing (FOBT), Colonoscopy, Sigmoidoscopy)	17
MN of the female breast	Screening (self-examination, clinical breast examination, ultrasound, mammography)	17
MN of prostate	Screening (Digital rectal exam (DRE), Prostate specific antigen test (PSA))	17
Hypertension	Medication (ACE inhibitors, beta-blockers)	17
High blood cholosterol	Medication (Statins)	17
Angina pectoris (stable angina)	Medication (Atenolol, ACE inhibitors, Beta-Blockers)	17
Asthma control	Medication (inhaled ipratropium bromide, rapid-acting bronchodilators, inhaled corticosteroid)	17
Chronic obstructive pulmonary disease (COPD) - Stage 1-2	Medication (inhaled ipratropium bromide, rapid-acting bronchodilators, inhaled corticosteroid)	17
Diabetes mellitus type 2	Glucose control (insulin, oral glucose-low ering agents)	17
MN of larynx and trachea, bronchus, lung	Surgery w ith/w ithout adjuvant treatment (a)	27
Chronic obstructive pulmonary disease (COPD) - Stage 3-4	Home oxygen therapy	27
Unhealthy diet	Promote healthy eating in school	29
Physical Inactivity	Promote physical activity in schools	29
Unhealthy diet	Provide health education in w orksites	31
Physical Inactivity	Offer counselling in primary care	31
Tobacco use	Raise tax on tobacco	33
Tobacco use	Enforce bans on tobacco advertising	33
Tobacco use	Enforce clean indoor air law	33
Harmful alcohol use	Raise tax on alcohol	33
Harmful alcohol use	Enforce bans on alcohol advertising	33
Unhealthy diet	Promote public aw areness about diet	33
Physical Inactivity	Promote physical activity in mass media	33
Alzheimer's disease & dementias (Stage 1)	Comprehensive in-home care	33
Cerebrovascular disease (acute treatment)	Medication (Aspirin, Heparin, rt-PA)	41
Cerebrovascular disease (prevention of recurrence)	Medication (Aspirin, dipyridamole, carotid endarterectomy)	41
Harmful alcohol use	Enforce drink-driving law s (breath-testing)	43
Alzheimer's disease & dementias (Stage 2)	Nursing home/hospital care	43
Chronic obstructive pulmonary disease (COPD) - Stage 3-4	Surgery (Lung volume reduction, lung transplant)	45

CLT (Old)

CLINICAL CONDITION	Intervention	Rank
Major depressive disorder	Older antidepressant drug medication (TCA)	1
Major depressive disorder	New er antidepressant drug medication	1
Major depressive disorder	Psychosocial treatment	1
MN of colon, rectum and anus	Surgery w ith/w ithout adjuvant treatment (a)	4
MN of the female breast	Surgery (Lumptectomy, Mastectomy) w ith adjuvant treatment (b)	4
MN of prostate	Monitor cancer (Watchful Waiting, Active Surveillance)	4
MN of prostate	Surgery w ith/w ithout adjuvant treatment (c)	4
Acute Myocardial Inarction (AMI)	Medication (aspirin, atenolol, streptokinase, tissue plasminogen activator)	4
Acute Myocardial Inarction (AMI)	Surgery (Primary angioplasty, primary stenting, percutaneous transluminal coronary angioplasty (PTCA))	4
Atherosclerosis	Medication (aspirin, atenolol, ACE inhibitors, Statins)	4
Atherosclerosis	Surgery (percutaneous transluminal coronary angioplasty - PTCA)	4
Angina pectoris (stable angina)	Angioplasty, Stenting	4
Angina pectoris (stable angina)	Surgery (Coronary artery bypass graft)	4
Diabetes mellitus type 2	Foot care (patient and provider education, foot examination, foot hygiene, apporpirate footw ear)	4
Diabetes mellitus type 2	Education (patient self-managment)	4
Unhealthy diet	Promote healthy eating in school	16
Physical Inactivity	Promote physical activity in schools	16
Unhealthy diet	Reduce salt intake	18
MN of colon, rectum and anus	Screening (Fecal occult blood testing (FOBT), Colonoscopy, Sigmoidoscopy)	18
MN of the female breast	Screening (self-examination, clinical breast examination, ultrasound, mammography)	18
MN of prostate	Screening (Digital rectal exam (DRE), Prostate specific antigen test (PSA))	18
Hypertension	Medication (ACE inhibitors, beta-blockers)	18
High blood cholosterol	Medication (Statins)	18
Angina pectoris (stable angina)	Medication (Atenolol, ACE inhibitors, Beta-Blockers)	18
Congestive Heart Failure (CHF)	Medication (ACE inhibitors, Beta-Blockers)	18
Asthma control	Medication (inhaled ipratropium bromide, rapid-acting bronchodilators, inhaled corticosteroid)	18
Chronic obstructive pulmonary disease (COPD) - Stage 1-2	Medication (inhaled ipratropium bromide, rapid-acting bronchodilators, inhaled corticosteroid)	18
Diabetes mellitus type 2	Glucose control (insulin, oral glucose-low ering agents)	18
Congestive Heart Failure (CHF)	Surgery (Coronary artery bypass graft)	29
MN of larynx and trachea, bronchus, lung	Surgery w ith/w ithout adjuvant treatment (a)	30
Chronic obstructive pulmonary disease (COPD) - Stage 3-4	Home oxygen therapy	30
Physical Inactivity	Offer counselling in primary care	32
Congestive Heart Failure (CHF)	Surgery (Heart transplant)	33
Tobacco use	Raise tax on tobacco	34
Tobacco use	Enforce bans on tobacco advertising	34
Tobacco use	Enforce clean indoor air law	34
Harmful alcohol use	Raise tax on alcohol	34
Harmful alcohol use	Enforce bans on alcohol advertising	34
Unhealthy diet	Promote public aw areness about diet	34
Physical Inactivity	Promote physical activity in mass media	34
Alzheimer's disease & dementias (Stage 1)	Comprehensive in-home care	34
Cerebrovascular disease (acute treatment)	Medication (Aspirin, Heparin, rt-PA)	42
Cerebrovascular disease (prevention of recurrence)	Medication (Aspirin, dipyridamole, carotid endarterectomy)	42
Harmful alcohol use	Enforce drink-driving law s (breath-testing)	44
Alzheimer's disease & dementias (Stage 2)	Nursing home/hospital care	44
Chronic obstructive pulmonary disease (COPD) - Stage 3-4	Surgery (Lung volume reduction, lung transplant)	46

Discussion

- Taking into account preferences of PMs impacts priority setting.

- In general two CLTs rank the same type of interventions apart form few interventions (around 5) that are different between the two CLTs. However, the actual rankings between the two tables can differ even for the same intervention.

- The type of intervention is colour coded so that it is easy to see which type of interventions rank high. E.g. mental health ranks quite high in both tables.

- Mental health is a sensitive area, often not prioritised
  - influenced by almost all governance sectors
  - controversies (e.g. effectiveness of some care)
  - DCE provides insights to face the growing burden of mental ill health

Conclusions

- When a country designs packages for health interventions or evaluates health system efforts in terms of equity and efficiency, DCE may be a valuable tool within the formal context of a deliberative process.

- Explicitly stated preferences may assist stakeholders at all levels to take difficult decisions and DCE results provide an insightful point for further studying and formalizing the rationales of decision makers and may contribute to further development of a rational policy process.

- Monitoring preferences over time would improve rational decision making and priority setting for countries to characterize their efficiency and equity tradeoffs, in a comparative context to their level of development and societal preferences.

Thank you for your attention!

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