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What Do Citizens Expect from Health Insurance? A Tale of Two Countries

by

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Introduction and motivation

Health insurance in Germany and the Netherlands

Econometric model

Data

The choice experiment in Germany

The choice experiment in the Netherlands

Germany and the Netherlands compared

Conclusions



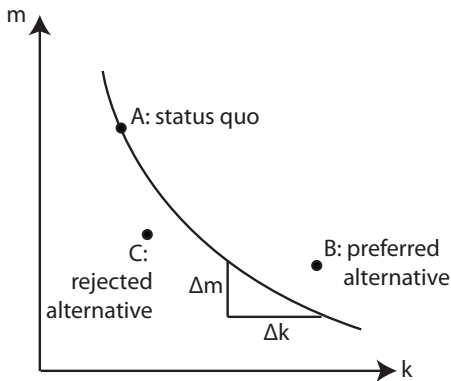
- ▶ Reforms of health insurance are under way or are envisaged
- ▶ However, acceptance by citizens is not evident
- ▶ Their **preferences** can hardly be inferred from observations (regulated contributions to health insurance, fixed tax price in NHS-type systems)
- ▶ Choice experiments measure stated preferences as a second-best alternative
- ▶ Here: Two discrete choice experiments (DCEs) performed in Germany (2005) and the Netherlands (2006, after a reform)



- ▶ Discrete choice experiments (DCEs) are based on Lancaster's (1966) theory of demand
- ▶ Consumers derive utility from **attributes of products**
- ▶ Theoretical foundation and pioneering applications by Louviere et al. (1982, 1983)
- ▶ Attribute levels can be combined freely to form hypothetical products, i.e. health insurance contracts in the present context



Experimental determination of marginal rate of substitution:



m : freedom of
physician choice
 k : additional service
provided by health insurer



Contingent valuation as the conventional alternative:

- ▶ keeps all attributes except price constant
- ▶ does not reflect real-life decisions, where all attributes usually vary
- ▶ invites strategic responses through fixation on price
- ▶ causes price to be the salient attribute, often resulting in excessive estimates of willingness to pay (WTP)
- ▶ is not helpful for the design of new products (reform of health insurance)



Objective of this talk:

- A: See how citizens' preferences can be expressed as willingness-to-pay values (compensation required, respectively) for attributes of health insurance
- B: Check for similarities and differences in preferences with regard to health insurance in two neighboring countries
- C: Find out in particular how Managed Care-type attributes are valued by the two populations to derive guidance for planned reforms

Health insurance in Germany and the Netherlands



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Aspect	Germany	The Netherlands
Choice of provider	free choice	gatekeeping
Choice of insurer	<ul style="list-style-type: none">- among 300 funds for incomes below 4,000 Euros per month- among private insurers for ca. 6 percent	<ul style="list-style-type: none">- no differentiation between public and private anymore from 2006
Reforms	<ul style="list-style-type: none">- in 2000, choice among funds- annual minor changes, much debate since	<ul style="list-style-type: none">- in 2006, major change, citizens must explicitly choose (new) contract- since 2006, freedom of contracting with providers



Random utility model (McFadden, 1974) implemented by mixed (random-coefficient) logit model,

$$U_{nit} = \beta'_n x_{nit} + \varepsilon_{nit}, \text{ with } \varepsilon_{nit} \stackrel{iid}{\sim} \text{extreme value} \quad (1)$$

Choice probability is given by,

$$P_n(y_n|b, W) = \int \prod_t \frac{e^{\beta'_n x_{nynt}}}{\sum_j e^{\beta'_n x_{njt}}} k(\beta_n|b, W) d\beta_n, \quad (2)$$

with $k(\beta_n|b, W)$ the prior distribution of β_n with parameters b and W , e.g. normal with mean b and variance W .



Joint posterior distribution:

- ▶ Assuming **independent priors** $k(b)$ and $k(W)$, the joint posterior distribution is given by

$$K(\beta_n \forall n, b, W | Y) \propto \prod_n L(y_n | \beta_n) k(\beta_n | b, W) k(b) k(W) \quad (3)$$

Additional assumption:

- ▶ $k(b)$ is **normally** and $k(W)$ **inverted Wishart** distributed to have conditional posteriors $b | \beta_n, W \sim N$ and $W | \beta_n, b \sim IW$
- ▶ Still, $\beta_n | b, W$ has to be simulated using **Gibbs sampling**
- ▶ We used 10^4 draws for inference (burn-in of 10^5 draws) after convergence was reached



Prior assumptions:

- ▶ β_n is assumed to be normally distributed, with exception
- ▶ Two attributes (deductible, premium) are expected to have **negative coefficients only**
- ▶ **Johnson's** S_B distribution preferred over (log-)normal prior:
 $R = \ln(r/[u - r])$, $r \sim N$; u : upper bound
- ▶ For some attributes we expect non-negative preferences, but some respondents may reveal zero weights
- ▶ Normal distributions **truncated at zero from below** are used in such cases



Characteristics	Germany			Netherlands		
	MN	MD	SD	MN	MD	SD
Age (in years)	55	56	13	49	48	15
Males	0.44	0.00	0.50	0.46	0.00	0.50
Married	0.62	1.00	0.48	0.70	1.00	0.46
Household members	2.66	2.00	1.35	2.86	2.00	1.31
Household income ^{a)}	2,114	2,250	983	2,431	2,250	1,027

^{a)} in Euros; household income was stated as income brackets

- ▶ Older age in Germany is due to the fact that individuals older than 25 years (members of social health insurance only) were interviewed (>18 in the Netherlands)
- ▶ Otherwise, the two samples are similar → chance to filter out *true* difference of preference (covariates are neglected)

The choice experiment in Germany I



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Attributes	Attribute levels
Physician choice	Free physician choice versus: physician list (LIST, \pm), gatekeeping (GATE, \pm), network (NETW, \pm)
Second opinion	10 Euros per quarter for additional opinion versus: one free second opinion per quarter (SECOP, 0^+)
Additional services	No particular services or information provided versus: counselor available on the telephone (PHONE, 0^+)
Incentives	No incentives (NOINCT) versus: bonus of 500 Euros for no claims (BONUS, 0^+), deductible of 500 Euros per year (DEDUC, $-$), bonus for preventive behavior (PREV, 0^+)
Contribution	Respondent's current annual premium (in Euros) versus: changes of ± 200 , ± 300 , ± 400 , and ± 500 Euros (PREM, $-$)

The choice experiment in Germany II



Attributes	Attribute levels: Example of decision card	
	Status quo contract	Alternative contract
Physician choice	Free physician choice	Physician list
Second opinion	10 Euros fee w/o referral	10 Euros fee w/o referral
Phone counselor	No free phone counselor provided by insurer	Free phone counselor provided by insurer
Incentives	No bonus system	Bonus of 500 Euros for no claims
Contribution	Your current annual contribution (in Euros)	Reduction by 500 Euros annually
I opt for...	the current policy <input type="checkbox"/>	this alternative <input type="checkbox"/>

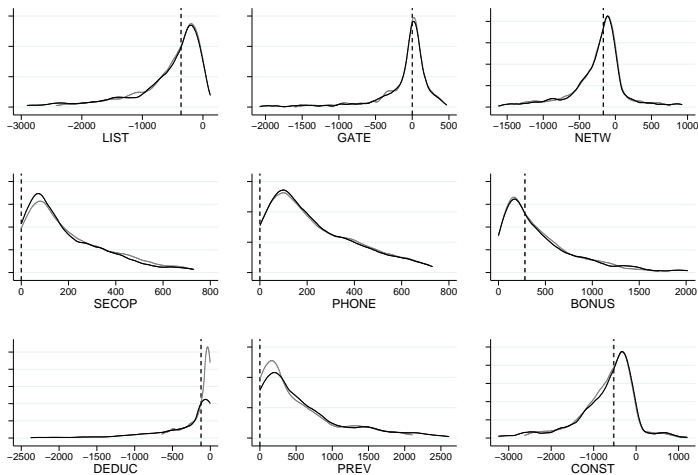
- ▶ **Note:** Participants were asked to determine their own (not employer's) contribution from their pay slips

The choice experiment in Germany III



- ▶ Two types of estimates based on 963 (of 1,003) respondents and $>7,100$ observations
- ▶ **'Fixed** coefficients' keeps all coefficients constant except the intercept; it amounts to a random-effects estimate
- ▶ **'Random** coefficients' has two variants, L (log-normal) and S_B (Johnson's S_B) prior for premium and deductible
- ▶ The S_B variant is deemed **preferable** in view of the long negative tails in the case of PREM and especially DEDUC

The choice experiment in Germany IV



Note: L specification in gray (only 25–95 percentile shown for DEDUC); SB specification in black

The choice experiment in Germany V



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Median WTP values are (in Euros per year):

- | | |
|---|-----------------|
| ▶ Accepting a physician list (LIST) | -363 |
| ▶ Accepting a gatekeeping option (GATE) | 0 |
| ▶ Participating in a physician network (NETW) | -166 |
| ▶ Second opinion free of charge (SECOP) | 141 |
| ▶ Extra phone service by health insurer (PHONE) | 163 |
| ▶ Bonus for no claims of 500 Euros (BONUS) | 280 |
| ▶ Deductible of 500 Euros (DEDUC) | -123 |
| ▶ Bonus for preventive behavior (PREV) | 0 ^{a)} |

^{a)} Negative values are assigned zero values (truncated normal prior)

The choice experiment in Germany VI



- ▶ The Germans **do not exhibit positive willingness to pay** for any of three Managed Care attributes (physician list, gatekeeping by primary physician, participating in a physician network)
- ▶ LIST and NETW even need to be compensated
- ▶ This is even more true of respondents with **chronic conditions**, likely due to the lock-in effect of Managed Care [McNeil/Zweifel (2010), Eur J Health Econ 12(1)].
- ▶ Except for SECOP and PHONE, preferences in Germany appear to be very heterogeneous
- ▶ A bonus for no claims has positive WTP, a deductible in the same amount, negative WTP

The choice experiment in the Netherlands I



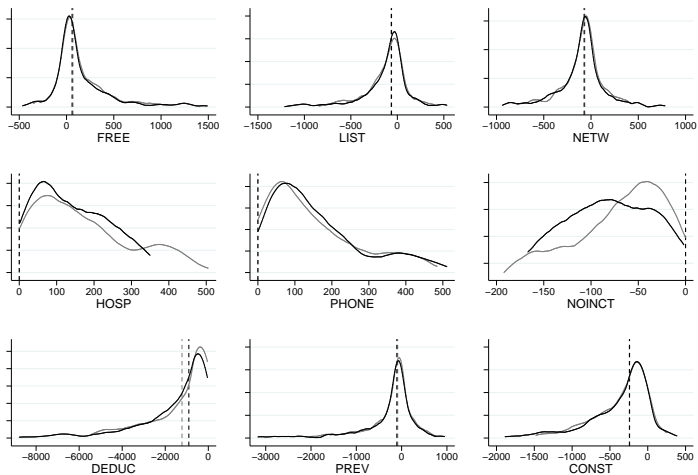
Adjustments:

- ▶ Status quo is **gatekeeping** rather than free physician choice, which becomes part of the alternative (FREE)
- ▶ Guaranteed access to a hospital within 4 weeks (HOSP) replaces free second opinion
- ▶ Status quo also contained a **bonus for no claims** at the time (max. 255 Euros/year); no incentives (NOINCENT) becomes part of the alternative

The choice experiment in the Netherlands II



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Note: L specification in gray (only 25–95 percentile shown for DEDUC); SB specification in black

The choice experiment in the Netherlands III



Median WTP values are (in Euros per year, status quo is gatekeeping):

- | | |
|---|------|
| ▶ Free physician choice (FREE) | 59 |
| ▶ Accepting a physician list (LIST) | -63 |
| ▶ Participating in a physician network (NETW) | -73 |
| ▶ Guaranteed access to hospital in 4 weeks (HOSP) | 0 |
| ▶ Extra phone service by health insurer (PHONE) | 0 |
| ▶ Discontinuing the bonus for no claims (BONUS) | 0 |
| ▶ Deductible of 500 Euros (DEDUC) | -905 |
| ▶ Bonus for preventive behavior (PREV) | -106 |

The choice experiment in the Netherlands IV



- ▶ The Dutch **do not exhibit positive willingness to pay** for the two remaining Managed Care attributes, LIST and NETW
- ▶ The compensation required for NETW (but not LIST) is higher among respondents with **chronic conditions** [McNeil/Zweifel (2010), Eur J Health Econ 12(1)]
- ▶ Although the Dutch are used to gatekeeping, they still have positive WTP for a return to free physician choice
- ▶ A deductible of 500 Euros is strongly resisted, contrary to a (smaller) bonus for no claims
- ▶ A bonus for preventive behavior (PREV) does not have a positive WTP value

Germany and the Netherlands compared I



Statistics	Germany			Netherlands		
	<i>RE</i>	<i>S_B</i>		<i>RE</i>	<i>S_B</i>	
	MN	MN	MD	MN	MN	MD
LIST ^{a)}	-348	-717	-363	-203	-460	-137
GATE ^{a)}	-107	-278	0	-69	-311	-59
NETW ^{a)}	-205	-197	-166	-152	-328	-128
PHONE	124	163	0	57	112	0
CONST	-482	-585	-523	-243	-353	-240

- ▶ **Note:** ^{a)} For the Netherlands, the transition from counterfactual FREE to e.g. LIST has estimated WTP of (GATE→FREE) plus (GATE→LIST), i.e. $203 = 69 + 134$ (RE values). Aggregation based on **individual-specific** values

Germany and the Netherlands compared II



- ▶ Both the Germans and the Dutch are found to **agree** that
 - ▶ **none of the three attributes** of Managed Care (LIST,NETW,GATE) are valued positively
 - ▶ compensation values are $LIST > NETW > GATE$
- ▶ GATE does not have to be compensated in Germany but in the Netherlands (where it is the status quo, in comparison with free physician choice)
- ▶ Free physician choice is **highly valued** in both countries; conversely, the physician list would have to be compensated most in both



- ▶ The Germans and the Dutch are found to differ in that
 - ▶ a bonus for preventive behavior is valued positively in Germany but not in the Netherlands
 - ▶ a 500 Euro deductible is rejected even more strongly in the Netherlands than in Germany
 - ▶ the preferences for the status quo would have to be overcome by a compensation of 523 Euros in Germany and 240 Euros in the Netherlands
- ▶ For a change to a full Managed Care alternative (LIST, GATE, NETW), the Germans would have to be compensated by a maximum of 1,050 Euros ($\approx 363+0+166+523$)
- ▶ For the same change (starting from GATE) the Dutch would require 470 Euros ($\approx 173+59+240$)



- ▶ **Preferences** of citizens for attributes of health insurance **can be inferred** from willingness-to-pay values, preferably using discrete choice experiments (DCEs)
- ▶ Two DCEs were performed, one in Germany 2005 (much debate about reform), the other in the Netherlands (2006, after information campaign and actual reform)
- ▶ (Hierarchical Bayes) mixed logit estimation was applied to accommodate **preference heterogeneity** among the insured



- ▶ The evidence suggests that **none of the three** Managed Care-type attributes (LIST,NETW,GATE) is valued positively by either the Germans or the Dutch. The two populations also appear to agree on their ranking
- ▶ However, the Dutch need to be compensated only about 50 percent as much for giving up their status quo contract, a likely reflection of the information campaign and their need to choose in the context of the 2006 reform
- ▶ Still, total compensation required for the full Managed Care alternative (LIST, NET, GATE + status quo) amounts to as much as 470 Euros/year in the Netherlands and even 1,050 Euros/year in Germany



- ▶ In the Netherlands, health insurers would have to **achieve cost savings** of some 600 Euros p.a. through Managed Care (at a loading of 20%) to win over a majority of the Dutch
- ▶ This is to be compared with per capita healthcare expenditure of some 4,800 Euros (of which only part is controlled by health insurers)
- ▶ In Germany, cost savings would have to amount to some 1,300 Euros, to be compared to about 4,500 Euros
- ▶ However, in both countries **there are minorities** who exhibit positive WTP for participating in physician networks; in Germany, for gatekeeping
- ▶ It would make sense to **offer these options** within social health insurance rather than imposing them on everybody