Social Preferences for Health Care Interventions:
The SoPHI ("Social Preferences for Health Care Interventions") Study

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Introduction & Background

Empirical Evidence on "Social Value Drivers":

¬ **Attributes of the Health Condition**
  - ¬ individual valuation of health conditions
  - ¬ severity of the condition
  - ¬ unmet medical need
  - ¬ urgency of an intervention
  - ¬ capacity to benefit from an intervention

¬ **Attributes of the Persons Afflicted**
  - ¬ non-discrimination (and claims-based approaches)
  - ¬ age (and fair innings)
  - ¬ other patient attributes
  - ¬ fairness objectives

Based on a comprehensive literature review, the Swiss HTA project, and an expert consensus on valuation principles for ultra-rare disorders, we developed the protocol of the **"Social Preferences for Health Care Interventions"** or **SoPHI Study** as a discrete choice experiment (DCE).

Limitations of the Relevant Literature:

¬ limited in size and / or scope
¬ impaired by framing effects and unstable preferences
¬ sometimes not choice-based experiments
¬ sometimes of questionable methodology
¬ often imposed a "zero sum" assumption
¬ *ex ante* severity of health state probably best documented attribute ("contextual variable"), but distinct difficulties to quantify effects

Cost Attribute (payment vehicle in most studies)
Typically reflecting an individual health state valuation (/WTP) perspective, whereas citizens' "social WTP" for coverage of health care programs under a collectively financed health scheme might be more relevant

Governance

ESPM (European Social Preference Measurement)
Project Group: Scientific Steering Committee

¬ **Silvio Garattini** (Mario Negri Institute, Milan / Italy)
¬ **Sören Holm** (U of Manchester / England)
¬ **Peter Kolominsky** (U of Erlangen / Germany)
¬ **Deborah Marshall** (U of Calgary / Canada)
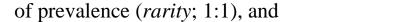¬ **Erik Nord** (U of Oslo / Norway)
¬ **Ulf Persson** (IHE, Lund / Sweden)
¬ **Maarten Postma** (U of Groningen / The Netherlands)
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¬ **Michael Schlander** (DKFZ & U of Heidelberg / Germany)
¬ **Steven Simoens** (U of Leuven / Belgium)
¬ **Oriol de Sola-Morales** (IISPV, Barcelona / Spain)
¬ **Harry Telser** (Polynomics / Switzerland)
¬ **Keith Tolley** (Tolley HE, Buxton / England)
¬ **Mondher Toumi** (U Aix-Marseille / France)

Objectives & Methods

Primary Study Objective(s):

¬ To investigate how the **general public valuates selected attributes of health care interventions** (incl. their interaction), with special emphasis on prevalence ("rarity"), and
¬ to assess the **sensitivity of preferences to potential framing effects** (the level reflection and information offered to respondents).

Design Elements:

¬ **Representative Swiss population sample** (n=1501)
¬ **Discrete Choice Experiment (DCE)** design
¬ **Perspective on costs:** WTP_public as payment vehicle
¬ **Utility** comparator: health states derived from EQ-5D-5L
¬ Initial **"Preference Formation Phase"**
¬ Additional **socioeconomic questions**
¬ **Testing for potential cognitive overload**
  Pre-tests: qualitative (n=10, "think aloud") and quantitative (n=201)
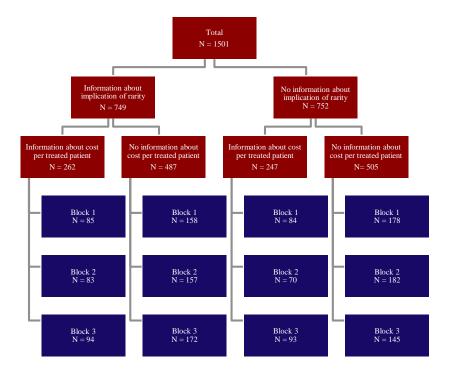¬ **Econometric evaluation**

Study Population and Subsamples (to control for framing effects):

Respondents (n=1,501) were randomized into 2 x 2 groups, which differed
¬ by one additional item to reflect on the implications of prevalence (*rarity*; 1:1), and
¬ by information on implied extra cost *per patient* of new treatment (1:2):

Attributes included in SoPHI Study:

1. **Severity** of the initial health state: life expectancy (i.e., *ex ante*, before / without an intervention)
2. **Severity** of the initial health state: health-related quality of life (i.e., *ex ante*, before / without an intervention)
3. **Effectiveness** of intervention ("new treatment"): life expectancy gained
4. **Effectiveness** of intervention (new treatment"): health-related quality of life gained
5. **Age** of patients (or "fair innings")
6. **Rarity** of disorder (i.e., prevalence or number of persons benefitting)
7. **Incremental Cost** of intervention ("new treatment"): perspective of a compulsory health scheme (OKP), i.e., payment vehicle = social willingness-to-pay

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Primary Results & Key Observations

Stated Preferences regarding Rare Disorders:

Stated Preferences during Preference Formation Phase
[regarding acceptance of higher cost for rare disorder treatments; subsample randomized to reflect on the statements depicted above]

The "Rarity" Attribute and Framing Effects:

The valuation of an intervention decreased with decreasing prevalence of the disorder. This effect was smaller than the decrease of prevalence, so that **by implication the accepted *cost per patient* increased with rarity**.
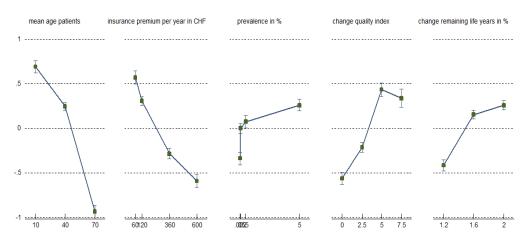
In order to increase awareness of respondents of the high cost per patient in the rare and ultra-rare cases, we enhanced the Main Survey by a subgroup with additional information on implied cost per patient – which, however, in the main survey had a small impact on valuation only.

Reflection on the implications of "rarity" influenced the valuation of the attribute, i.e., respondents who were exposed to more information showed a smaller decrease of utility with decreasing prevalence.

Model Selection:

We estimated a separate model for each attribute, investigating how well a linear model specification approximates the flexible function of the dummy model:

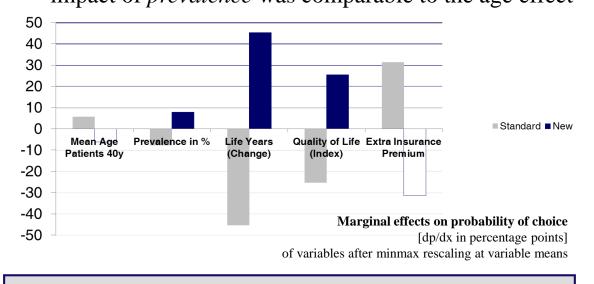**Flexible Functional Form** (with dummy variables):

The figure below illustrates the point estimates with 95% confidence intervals of the change in utility for each attribute level.

The variables *mean age of patients* and *prevalence* [%] required a nonlinear variable specification. According to the Main Model that we specified, the marginal utility for an additional year of life is decreasing with the total number of years.

Interaction Effects:

Inclusion of interaction effects did not improve model fit based on BIC. Therefore, we did not include interactions in our Main Model.

Importance of Attributes:

¬ the marginal effect of each variable depends on the overall utility level and is not constant
¬ variables with the highest impact on choice probability were *change* in *remaining life years*, the *quality of life* index, and *insurance premium* per year
¬ the negative marginal effect for *older people* was three times larger compared to middle-aged people
¬ impact of *prevalence* was comparable to the age effect

Marginal effects on probability of choice
[dp/dx in percentage points]
of variables after minmax rescaling at variable means

Conclusions

Our discrete choice experiment (DCE) – using a payment vehicle from the citizen's perspective – provides empirical support for the contribution to social value by all attributes tested, **implying that the accepted cost per patient may indeed increase with decreasing prevalence**. Further studies seem warranted to confirm the observed effect in other settings.