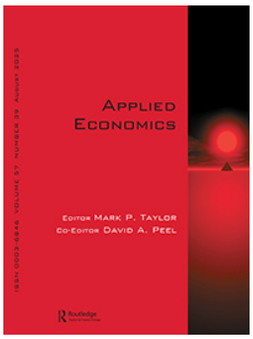

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Less is more: consumers' preferences for value-based insurance design – evidence from a discrete choice experiment

Tess L. C. Bardy [a,b] and Stefan Boes [b]

[a]Groupe Mutuel SA, Martigny, Switzerland; [b]Faculty of Health Sciences and Medicine, Center for Health, Policy, and Economics, University of Lucerne, Lucerne, Switzerland

ABSTRACT

Value-based insurance design (VBID) can shape health systems to be centred on value by promoting high-value and disincentivizing low-value care use. However, in choice-based insurance systems, concerns arise that individuals might oppose the implementation of VBID. This paper aims to elicit consumers' preferences for VBID in Switzerland. We fielded a discrete choice experiment and applied mixed logit modelling to estimate individuals' willingness-to-pay (WTP) for selected VBID elements. The results suggest a status quo bias in health insurance decision-making and resistance to higher cost-sharing or restrictions on low-value care. Posterior WTP distributions reveal substantial preference heterogeneity, which we characterize along the countries' three language regions and individuals' background characteristics. Based on the results, tailored communication strategies could be developed to help shape future health policy and support the integration of VBID in basic insurance.

HIGHLIGHTS

- Value-based insurance can improve health outcomes and avoid wasteful health spending
- We study individuals' preferences for value-based insurance design
- Swiss individuals show heterogeneous preferences and generally favour the status quo
- Value-based insurance can receive favourable support if compensated by lower premiums
- Understanding differences in preferences will help implement value-based insurance

KEYWORDS

Value-based health insurance; health plan choice; consumer preferences; discrete choice experiment; mixed logit model

JEL CLASSIFICATION

D81; D83; I13

I. Introduction

Wealthy nations' health systems are facing new economic challenges. The United States (US) spends more on healthcare than any other country in the world, and yet the health system fails to achieve commensurate health outcomes (OECD 2022). Switzerland's health system, often considered a model for the US (Okma and Crivelli 2013), also faces spiralling healthcare costs. Despite universal health insurance coverage, more and more Swiss consumers cannot afford necessary care due to increasing out-of-pocket expenditures and insurance premiums (Guessous et al. 2012; OECD 2021). One reason for the discrepancy between health spending and outcomes is the significant amount of money spent on low-value care, i.e. services that provide little or no benefit to patients or even cause harm. Low-value care is estimated to contribute to about $350 billion annually in the US (Perez, Gosdin, Pintor, et al. 2019). In Switzerland, 22 to 30% of medical services are estimated to be unnecessary (Reich et al. 2014), i.e. between $18 and 25 billion every year (1 USD ≈ 1 CHF).

Driven by patients' expectations, information disparities, and incentives set by the prevailing fee-for-service payment systems (Omar 2017), low-value care, including overdiagnoses and overtreatments, not only leads to wasteful spending but may also negatively impact the overall quality of care due to an inefficient distribution of scarce healthcare resources. With a pressing need to curb costs and improve access and efficiency within health systems, reducing low-value care should be a high priority for policymakers (Mafi et al. 2017). Identifying and reducing low-value care can result in substantial savings and create headroom for

CONTACT Tess L. C. Bardy tessbardy@gmail.com Groupe Mutuel SA, Rue des Cèdres 5, Martigny 1919, Switzerland; Faculty of Health Sciences and Medicine, Center for Health Policy, and Economics, University of Lucerne, Alpenquai 4, Lucerne 6005, Switzerland

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resource shifts to high-value services, as recently experienced in the US (Born, Kool, and Levinson 2019a; Colla et al. 2017). While a large body of literature supports rethinking cost-sharing to encourage the use of appropriate care and improve public health outcomes, progress remains slow (Omar 2017).

Value-based insurance design (VBID) has been proposed in the literature as a specific mechanism to incorporate value-based incentives in a health system (Braithwaite and Rosen 2007; Chernew, Rosen, and Fendrick 2007; Fendrick and Chernew 2006; Ndukwe, Fendrick, and Udow-Phillips 2014). There are different forms of VBID, but the common principle is to reduce cost-sharing or provide supplemental benefits to incentivize the use of services with strong evidence of clinical benefit (i.e. high-value care) and increase cost-sharing for low-value care to ensure more effective services provision and achieve cost savings. Several public and private sector implementations of VBID, especially in the US, have shown promising results as cost-neutral or cost-saving alternatives while improving patient outcomes, particularly in contexts like medication adherence (Agarwal, Gupta, and Fendrick 2018; Katz 2020; van der Nat 2022). More broadly, value-based health care (VBHC) is seen as a strategy to address inefficiencies in health systems by aligning payment with outcomes (Porter and Lee 2013; Smith et al. 2023). However, critics caution that successful implementation depends heavily on data infrastructure, system-level coordination, and consumer engagement and that equity concerns and resistance to change can hinder progress (Smith et al. 2023; Tsevat and Moriates 2018).

To date, most research on VBID has focused on the US health system, and evidence of consumers' preferences for VBID is scarce (van der Nat 2022). Given the complexity of health plan designs and the need for informed decision-making (Porter and Lee 2013), it is necessary to understand consumers' preferences better and whether specific design elements would receive favourable support from the population (Smith et al. 2023). This seems particularly important given that VBID can direct consumers' healthcare consumption in certain directions, which they may or may not be willing to accept (Perez, Gosdin, Pintor, et al. 2019), even if the shift towards more high-value care in the health system would generate collective benefits. For example, consumers expressed scepticism when faced with different VBID scenarios in a US survey (van der Nat 2022), implying that efforts are needed to engage consumers to reduce wasteful healthcare consumption through value-based principles. Our study aims to expand the current evidence base and elicit consumers' preferences for selected VBID elements in Switzerland, specifically health plan features that aim to promote the use of high-value and disincentivize the use of low-value care.

Switzerland provides an interesting setting to study VBID. Its choice-based health insurance system requires consumers to purchase basic health insurance from a regulated set of plans, as defined in the *Swiss Federal Law on Compulsory Health Care* (Tsevat and Moriates 2018). Embedded in a managed competition market structure, health insurance premiums are community-rated and allowed to differ only by three age groups (children, adolescents, adults) within a premium region, but premiums can vary across insurers and depend on the level of cost-sharing and type of health plan (free-choice of provider vs. managed care plans). Cost-sharing includes a basic deductible of CHF 300 per year and five voluntary higher deductible levels up to CHF 2500 per year for adolescents and adults, and there is a 10% copayment above the deductible level with a stop-loss at CHF 700 per year, effectively constraining maximum spending. Basic insurance covers a comprehensive set of inpatient and outpatient services, including pharmaceutical products. Related to VBID, the Swiss health insurance law allows for a differentiation of copayments for drugs where multiple products with the same active ingredient are available, in which case copayments can be 20% on the more expensive drugs. For further details, see FOPH (2025) de Pietro et al. (2015), and Schmid, Beck, and Kauer (2018).

Another salient feature of the Swiss landscape relevant to our study is the Smarter Medicine – Choosing Wisely initiative that emerged in 2014 (www.smartermedicine.ch.), calling healthcare providers to identify and consequently reduce the use of low-value services (ABIM Foundation, ACP Federation, European Federation of Internal

Medicine 2025; Aubert et al. 2023; Born, Kool, and Levinson 2019; Smarter Medicine - Choosing Wisely Switzerland 2018). Based on the lessons of this initiative, the Swiss Society of General Internal Medicine has determined 'Top 5' lists of low-value services in hospital and ambulatory care for purchasers to target for reduction (Aubert et al. 2023). Low-value care examples in Switzerland include obtaining imaging studies during the first six weeks in patients with non-specific low back pain or performing prostate cancer screening for men over 75. These services offer little clinical value, expose patients to unnecessary risks, and collectively contribute to wasteful spending. However, evidence on the restraining impacts of the initiative is limited, which may be a consequence of missing demand-side incentives.

A broader VBID implementation within Switzerland's health system could provide a cost-neutral or even cost-saving alternative to current health plans and enhance access to and use of high-value care. However, Switzerland's direct democracy, with the possibility of starting referendums and popular initiatives, challenges many health system reforms. For example, more systematic integration of managed care models in the health insurance law was rejected with a clear majority by popular vote in 2012, despite the Federal Council, the Parliament, and most political parties supporting the reform (Votation 2023). Thus, learning more about the public's preferences for VBID seems imperative. To this end, we fielded a discrete choice experiment (DCE) as part of a representative survey showing participants a sequence of alternative health plans with VBID-related attributes compared to their current health plan. We focused on higher (lower) copayments for low- (high-) value care and a stricter application of cost-effectiveness criteria in drug disbursement. These criteria are listed in the health insurance law to determine whether new or existing health services or pharmaceutical products can be covered in the basic health insurance scheme but progress on their widespread application remains slow (De Pietro et al. 2015; van der Nat 2022).

The results of our analyses offer three important insights: 1) Individuals have a clear preference for their status quo health plan irrespective of the alternatives given to them in the various choice options. 2) Participants would have to be compensated for the disutility from higher copayments (i.e. discouraging low-value care use) and a stricter drug disbursement by CHF 26–28 per month in health insurance premiums (around 7.5% of the average adult premium in 2022), while the willingness-to-pay (WTP) for a zero copayment on high-value care is estimated at CHF 16 per month. 3) Posterior estimates of the WTP distributions for the VBID attributes show substantial preference heterogeneity, especially regarding the disincentives for low-value care and value-based constraints on drug disbursement. For example, we find that WTP for the tested VBID elements is higher in the French-speaking part of Switzerland than in the German- or Italian-speaking parts – a result that is in line with results found in previous research on opinions regarding health and social policies between Switzerland's linguistic regions (Brügger, Lalive, and Zweimüller 2009; Eugster et al. 2011, 2017). We further characterize the heterogeneity in the WTP distributions by using regression analysis to assess the association with needs- and preference-based factors and socio-economic characteristics. This analysis identifies age, recent healthcare utilization, risk and time preferences, and insurance literacy as important correlates of the WTP for alternative health plan attributes.

Understanding the heterogeneity in preferences for different VBID elements helps policymakers shape future health policy in Switzerland and take informed next steps in reforming the health insurance system. Integrating more value-based incentives in basic health insurance offers a promising alternative to current health plans to increase the effectiveness and efficiency of service provision and increase value in the health system. The *Swiss Federal Law on Compulsory Health Care* allows VBID elements, but implementation has been restricted to a few pharmaceutical products. Our estimates suggest that constraints on consumers' freedom of choice in VBID plans could receive favourable support. However, higher cost-sharing on low-value care would have to be associated with cost-savings for consumers relative to the basic plans – again, a feasible proposition within the current regulations. Given the substantial variation in preferences and WTP found in our study, VBID embedded within the set of alternative health plans

or as part of specific managed care models while keeping basic plans would likely generate welfare gains. The factors identified in the analysis driving higher or lower WTP for VBID could serve as a basis for developing such models and rolling out targeted communication strategies to promote the uptake of VBID-based health plans.

The remainder of the paper is structured as follows. The next two sections describe the design of the DCE, the data collection, and our modelling approach to infer the WTP for selected VBID elements. Section IV presents the results, and Section V concludes.

II. Design of the discrete choice experiment

DCEs can elicit individuals' preferences for health interventions or programmes (Soekhai et al. 2019) and for addressing policy concerns (Clark et al. 2014). DCEs are a stated-preference method where individuals choose between options defined by attributes. This way, individuals can state their preferences for hypothesized or not-yet-existing commodities. DCEs are grounded in random utility and consumer demand theory, which assume that individuals choose the alternative among a set of available options that gives them the highest utility (Ryan and Gerard 2003).

Selection of attributes and levels

Based on the literature on VBID and the specific features of the Swiss health insurance system, we tested three attributes in the DCE: disbursement of medicines, yearly copayments, and yearly deductibles. These attributes proved relevant for choosing health plans in Switzerland, and especially the former two can incorporate value-based elements (Becker and Zweifel 2008).

The levels of the attributes were chosen based on the current political debate and in dialogue with an expert panel to ensure their realism. Each year, Swiss consumers can select their deductible to be CHF 300 (basic), 500, 1000, 1500, 2000, or 2500. Once this level is reached, they face a 10% copayment capped at CHF 700. The recent debate offers opportunities for VBID by adapting these cost-sharing features. On the one hand, insurers suggest increasing the maximum deductible to CHF 5000. On the other hand, the Swiss parliament proposes a reduction of the deductible to CHF 0 and copayments to 0% for effective preventive medicine (2022). While a zero-deductible plan could be interpreted as encouraging high-value care, and a 5000-deductible as discouraging the use of low-value care, the link to high- and low-value care may not be entirely clear, and the two alternatives may just be seen as a refinement of cost-sharing in response to moral hazard. However, given that both options are currently part of the public discussion, we included the deductible attribute in our DCE.

We tested preferences for a copayment of 0% for high-value services and a copayment of 20% up to a maximum of CHF 1400 for low-value services. Since not all consumers may be aware of what high- and low-value care entails, we framed the two in terms of their cost-benefit ratio. As in other OECD countries, drug disbursement is often based on value (Thomson, Schang, and Chernew 2013), and the Swiss legal framework foresees that only medicines that fulfill the criteria of effectiveness, appropriateness, and cost-effectiveness should be reimbursed by basic health insurance. Especially for products where generics are available, the cost-effectiveness criterion is already applied, at least partly, but there is still room for improvement with the application of stricter admission rules. Therefore, we included a shift in disbursement to drugs with the highest cost–benefit ratio as an attribute in the DCE.

The attributes, attribute levels, and description of the DCE in general was shared with ten experts on the Swiss health insurance system from academia (OECD 2021), the insurance industry (Okma and Crivelli 2013), federal and cantonal regulators (Okma and Crivelli 2013), and health insurance comparison platforms (Okma and Crivelli 2013). Written feedback was collected and led to smaller adjustments in the wording of the DCE, and levels of the copayment attribute to include different caps depending on the copayment rate.

We also included the monthly health insurance premium as the price attribute. Since our DCE design was based on comparisons with the status quo, following Becker and Zweifel (2008), we considered changes in health insurance premiums from CHF −50, −25, 0, +25, and + 50 per month compared to the insurance premium that the respondent currently pays for his or her health plan. Table 1

Table 1. Discrete choice experiment: attributes of health insurance plans and levels.

Attributes		Levels
Disbursement of medicines	Status quo	According to the current list of disbursed medicines
	Alternative	When several medicines are available, only the one with the highest benefit compared to its cost is reimbursed
Yearly copayment	Status quo	10% with a maximum of CHF 700
	Alternatives	(1) 0% for health services with a high value compared to their cost; 10% with a maximum of CHF 700 otherwise
		(2) 20% for health services with a low value compared to their cost up to CHF 1400; 10% with a maximum CHF 700 otherwise
Yearly deductible	Status quo	Current deductible: CHF 300, 500, 1000, 1500, 2000, or 2500
	Alternatives	(1) CHF 0
		(2) CHF 5000
Monthly premium	Status quo	Your current monthly premium
	Alternatives	(1) Decrease in monthly premium by CHF 50
		(2) Decrease in monthly premium by CHF 25
		(3) Increase in monthly premium by CHF 25
		(4) Increase in monthly premium by CHF 50

CHF = Swiss franc.

provides an overview of the attributes, and their levels, included in the DCE.

Design of choice sets

Each choice set in the DCE consisted of two health insurance plans (see Table 2 for an example). Model A represents the respondent's current health insurance plan (status quo), whereas Model B represents the alternative health plan with VBID elements. In the DCE, we varied one or two attribute levels in Model B compared to Model A to reduce choice complexity. Since an opt-out alternative may unduly limit the usefulness of the data in our setting, and we included the respondent's current health plan as one of the two alternatives, we did not include such an option in the DCE (Veldwijk et al. 2014).

We used Ngene 1.1 (Volpp et al. 2012) to generate a D-efficient design for the questionnaire, resulting in a total of 32 choice sets that we divided into four blocks. Each questionnaire contained eight choice sets, to which we added one randomly selected set a second time to test respondents' consistency. Choice consistency was observed in 85% of the respondents, and all our results are robust to the exclusion of individuals with inconsistent results (see also below). We randomized the choices of alternative appearances to reduce learning and fatigue effects. Each of the four blocks was pilot tested with a seed sample of 600 individuals. No changes in the design of the DCE were needed after the pilot test, and we included the pilot data in the final dataset.

Mixed logit modeling

Because preferences for VBID are likely to differ across individuals, also depending on their current health plans, we used a mixed logit model to approximate preferences for VBID elements, accounting for individual heterogeneity; for a detailed description of mixed logit models, see McFadden and Train (2000). The mixed logit model allows for additional sources of preference heterogeneity by including random individual-specific preference parameters and exploring the within-variation in the data (Samuelson and Zeckhauser 1988). Thus, variation in attributes and observation of repeated choices by the same respondents is a crucial aspect. Following Hole & Kolstad (Seth et al. 2020), the mixed logit specification can be written as:

Table 2. Example of a choice card.

	Model A	Model B
Disbursement of medicines	According to the current list of disbursed medicines	When several medicines are available, only the one with the highest benefit compared to its cost is reimbursed
Yearly copayment	10% with a maximum of CHF 700 per year	10% with a maximum of CHF 700 per year
Yearly deductible	Your current yearly deductible	CHF 5000
Monthly premium	Your current monthly premium	Your current monthly premium
Your choice:	☐	☐

$$U_{ijt} = \alpha_i p_{ijt} + x'_{ijt}\beta_i + \varepsilon_{ijt};\ j = 1, 2;\ t = 1, 2, \ldots, 9 \quad (1)$$

where U_{ijt} denotes the utility that individual i derives from alternative j in choice set t; p_{ijt} is the premium attribute; x_{ijt} is the vector of VBID attributes; and ε_{ijt} is a random term, which is assumed to be independently extreme value type-I distributed. We also include an alternative-specific constant in the vector x_{ijt} to account for general preferences for the status quo (Samuelson and Zeckhauser 1988; Seth et al. 2020). α_i and β_i denote the individual-specific preference parameters, and β_i are assumed to follow normal distributions with means and standard deviations estimated using maximum simulated likelihood methods.

We derive the WTP from the preference space estimates because this regime yields a better fit to our data than estimation in the WTP space (Hole and Kolstad 2012). In the estimation, we specified $-\alpha_i$ to follow a log-normal distribution as individuals are assumed to derive a negative utility from increasing premiums, and all random parameters are allowed to correlate with each other.

While the parameters β_i describe the marginal utility of the different health plan attributes, they are usually easier to interpret in monetary terms and as marginal rate of substitution, relative to the parameter α_i, to describe the individuals' willingness-to-pay (WTP) per unit of each attribute. This ratio has a natural interpretation in our design relative to the status quo since premiums are compared to the current plan. Derived from contingent valuation theory, WTP assesses how much a consumer is willing to pay for a specific attribute, keeping the level of utility the same. WTP can be positive or negative depending on whether an individual derives a utility or a disutility from the given attribute. Using the routines described in Hole and Kolstad (Hole and Kolstad 2012), we derived individual-level predictions of the random parameters and then compute the individual-level WTPs by dividing the predictions ofβ_i by the predictions premium (price) parameters α_i. Even though we constrain α_i to be log-normally distributed, the mean of the ratio may not describe the mean WTP in the sample. Instead, we report the median (quartiles) of the distribution of estimated individual-level WTPs, and we use median regressions to assess the association of different background characteristics with the WTPs.

Finally, the vector of attributes x_{ijt} includes an alternative-specific constant to control for general preference for the status quo as opposed to the alternative health plan; see also de Bresser et al. (De Bresser, Knoef, and Van Ooijen 2022) for a related modelling approach to derive the WTP for in-kind and in-cash home care insurance.

III. Data

Survey and sample

The DCE was included in the 2021 Swiss Health Insurance Literacy Survey administered by the University of Lucerne. This online survey gathered a total of 6036 participants aged between 26 and 75, living in Switzerland's German-, French-, and Italian-speaking parts. The data collection was outsourced to intervista AG, a private market research company that operates under the General Data Protection Law and the Federal Act on Data Protection in Switzerland. No ethical approval for the study was needed according to the responsible cantonal ethics committee.

The survey included questions about respondents' health and healthcare utilization and their sociodemographic backgrounds, such as age, education, and nationality. The questionnaire was available in German, French, and Italian after translation by two native speakers in each language and according to the guidelines provided by Epstein et al. (Epstein, Santo, and Guillemin 2015). The survey also included an information experiment to test hypotheses about the Swiss population's health insurance literacy. For this study, we focus on data from the control group ($N = 2024$) to avoid any biases in preferences derived from the DCE. Respondents were randomly assigned to the groups ensuring the representativeness of our sample. The context provided to the control group is described in Appendix 1.

The sample was based on a random draw from intervista's online panel with over 120,000 actively recruited persons. To ensure the representativeness of the sample for the Swiss population, quotas for gender, age, region, and

education were used. Due to oversampling of certain groups, especially those in the Italian-speaking region, we employed sample weights in all our analyses.

Variable definitions

We relate the preferences and WTP of individuals for the different attributes of health plans to several background characteristics obtained from the survey. Regarding personal background, we include sociodemographic characteristics (age, gender, nationality, monthly household income, education) and health-related variables. We measure health using the number of doctor visits in the year prior to the interview and whether respondents have any chronic health conditions. We also expect higher cost-sharing as part of VBID plans to be valuable for individuals who are more willing to take risks or are more future-oriented. The measure of risk aversion in our survey is based on the question: 'Would you consider yourself a person who is fully prepared to take risks, or do you try to avoid risk?' (Hwang 2021). For time preferences, we ask, 'Would you consider yourself a person who is fully prepared to give up something today and benefit from it in the future?' (Baillon et al. 2022; Bauer, Chytilová, and Miguel 2020). For both items, responses are collected on a 5-point scale from 'not prepared at all' (coded as 1) to 'fully prepared' (coded as 5).

Due to the importance of reference points when stating preferences, we included questions about the respondents' current health insurance situation: deductible level, health plan type, and out-of-pocket expenditures. Moreover, we decided to include a measure of the respondents' subjective knowledge of the Swiss health insurance system. Previous work suggests that individuals with inadequate health insurance literacy experience difficulties in making informed health plan decisions (Porter and Lee 2013), which likely affects their preferences for VBID elements. While insurance literacy spans several domains, we used a simple subjective statement from the survey: 'Would you say that your knowledge of the Swiss health insurance system is very good or not good at all?' Answers to this question are reported on a 5-point scale from 1, referring to 'not good at all', to 5, 'very good'.

IV. Results

Background characteristics of the sample

Table 3 shows summary statistics of our sample. Sociodemographic, health-related, and preference-related characteristics are reported overall and linguistic region. Of the 2024 respondents, the majority are from the German-speaking area of Switzerland, followed by the French- and Italian-speaking regions. The gender and age distributions overall and by language region are comparable to official statistics (Federal Statistical Office, 2021; Federal Statistical Office, 2021), and about one-third of the sample has completed a tertiary degree. The average number of doctor visits also corresponds to statistics reported in other sources (für 2018), in absolute numbers and relative magnitude compared to the country's three language regions. The proportion of respondents with chronic health conditions is lowest in the Italian-speaking part, with about 29.2%, and higher in the French-speaking (35.8%) and German-speaking (39.3%) parts.

Regarding health insurance choices, deductibles of CHF 300 and CHF 2500 are the most represented, as well as the family doctor health plan. Again, this corresponds to our expectations and the official statistics of the basic health insurance scheme (Karle, Kirchsteiger, and Peitz 2015). The median respondent has less than CHF 500 of out-of-pocket expenditures per year, which is slightly higher in the French- and German-speaking parts than in the Italian-speaking region, consistent with the statistics on health care utilization. On average, respondents are more risk-averse than risk-seeking (mean = 2.3, standard deviation = 1.1), and show low present bias (mean = 3.3, standard deviation = 1.1). Statistical tests on differences between the language regions are reported in the last column using Fisher's exact test (for categorical variables) and iterative proportional fitting (for continuous variables). The results indicate that for many characteristics, there are significant differences between language regions, likely related to preferences for VBID. For this reason, we will investigate the preference parameters and WTP estimates overall and by linguistic area.

Table 3. Background characteristics of the sample.

	All	German	French	Italian	*p*
Female	49.3	48.6	51.7	47.8	0.505
Age					<0.01
26–44	40.2	38.5	43.7	46.1	
45–64	43.1	43.8	41.6	41.0	
65–75	16.7	17.6	14.6	12.9	
Non-Swiss	8.8	7.0	10.0	26.7	<0.01
Tertiary education	35.9	33.7	41.6	39.4	<0.01
Monthly income in CHF					0.114
< 4500	18.5	17.6	18.6	30.9	
4500 – 5999	19.9	19.9	19.6	20.2	
6000 – 8999	30.8	31.3	31.7	20.0	
≥9000	30.8	31.1	30.2	28.9	
Number of doctor visits†	3.9 (5.2)	4.0 (5.2)	3.8 (5.3)	3.6 (5.4)	0.940
Chronic health condition[a]	37.9	39.3	35.8	29.2	0.070
Type of health plan[b]					<0.01
Basic	18.7	16.6	23.7	22.8	
HMO	8.5	10.8	3.1	4.1	
Telemedicine	16.1	17.4	12.1	17.5	
Family doctor	52.6	52.1	55.1	47.8	
Yearly deductible in CHF[c]					<0.01
300	38.4	39.4	35.8	36.4	
500	10.1	8.6	14.3	10.5	
1 000	3.4	3.7	2.8	2.5	
1 500	6.9	6.8	7.9	3.7	
2 000	3.4	3.7	2.6	1.8	
2 500	36.0	35.7	34.7	44.1	
Out-of-pocket health expenditures in CHF[d]					0.878
None	9.8	9.7	9.9	10.6	
1–299	26.2	26.5	24.6	30.2	
300–499	19.3	19.4	20.1	15.6	
500–999	19.7	19.2	22.2	16.0	
1000 – 1499	10.2	10	10.2	13.0	
≥1500	9.2	9.8	7.8	8.1	
Health insurance literacy†	3.4 (0.8)	3.4 (0.8)	3.4 (0.9)	3.3 (1.0)	0.174
Financial risk-taking†	2.3 (1.1)	2.4 (1.1)	2.3 (1.2)	2.4 (1.2)	<0.01
Time preferences†	3.3 (1.1)	3.4 (1.0)	3.1 (1.2)	3.2 (1.2)	<0.01
Number of individuals	2024	1298	521	205	

Source: Swiss Health Insurance Literacy Survey 2021. Notes: Reported numbers are weighted sample proportions, or sample means and standard deviations (in brackets) for variables marked with †, in total and by language region (German, French, Italian). Weights were used to reflect oversampling for selected population groups. Income Information not available for 331 individuals. Missing data in variables marked with † excluded (90). Type of health plans: 'basic' refers to free choice of providers; managed care plans composed of HMO, telemedicine, or family doctor; category 'other' with 35 responses not shown. Number of responses in category 'don't know' not shown for variables a) 43, b) 47, c) 38, and d) 111. Health insurance literacy on a scale from 1 = very bad to 5 = very good. Willingness to take financial risks and willingness to sacrifice something today to benefit in the future (time preferences) on a scale from 1 = completely unwilling to 5 = completely willing. The last column shows *p*-values for chi-squared tests of the null hypothesis of equal distributions (means) of a characteristic between the three language regions.

Mixed logit estimates and WTP for VBID

Estimates from the mixed logit model are reported in Table 4. All mean estimates of the preference parameters have the expected sign, i.e. individuals dislike an increase in premiums and, on average, prefer a decrease in cost-sharing elements rather than an increase. Respondents also show resistance to restricting medication reimbursement. The median WTP for reducing the deductible to CHF 0 is CHF 29.8 per month, while a decrease in copayments from 10% to 0% is valued at about CHF 19.4 per month. Respondents dislike the increase in cost-sharing features. In particular, the median WTP for a CHF 5000 deductible is negative, showing that the median respondent would trade off such a high-deductible plan at a premium reduction of almost CHF 160 per month. Resistance to higher copayments of 20% and stricter application of value-based principles in drug disbursement are found to be less strong, with premium reductions of CHF 32–42 per month for the median respondent.

The differences in respondents' WTP for deductibles and copayments may be due to the marginal price of healthcare consumption associated with these two cost-sharing elements. While a change in deductibles affects the initial full price of care that patients need to pay out-of-pocket,

Table 4. Mixed logit estimates and median WTP for VBID elements.

		All		German		French		Italian	
		β	WTP	β	WTP	β	WTP	β	WTP
Model B (alternative to status quo)		−1.591***	*-46.8*	−1.490***	*-42.4*	−1.752***	*-52.3*	−1.864***	*-44.6*
		(0.145)	*[−108.2; −16.4]*	(0.169)	*[−107.6; −13.3]*	(0.288)	*[−100.8; −19.7]*	(0.492)	*[−88.6; −18.0]*
VBID elements									
Copayment	0% high-value care	0.567***	*19.4*	0.561***	*18.6*	0.664**	*21.1*	0.459	*9.1*
		(0.110)	*[13.3; 21.5]*	(0.125)	*[12.0; 22.1]*	(0.201)	*[18.1; 22.0]*	(0.317)	*[5.5; 14.9]*
	20% low-value care	−0.989***	*-41.9*	−0.958***	*-42.2*	−1.200***	*-46.2*	−0.679	*-25.0*
		(0.149)	*[−50.3; −21.5]*	(0.180)	*[−52.5; −8.1]*	(0.288)	*[−51.7; −17.9]*	(0.505)	*[−29.5; −3.1]*
Drug disbursement based on value		−0.909***	*-32.0*	−0.810***	*-29.3*	−1.536***	*-51.7*	−0.543	*-13.5*
		(0.138)	*[−40.4; −17.9]*	(0.163)	*[−37.7; −15.1]*	(0.317)	*[−56.8; −35.2]*	(0.424)	*[−23.0; −5.6]*
General cost-sharing									
Deductible	CHF 0	1.176***	*29.8*	1.021***	*27.6*	1.837***	*44.7*	0.820**	*11.0*
		(0.098)	*[23.6; 49.0]*	(0.110)	*[21.6; 42.7]*	(0.214)	*[39.7; 68.4]*	(0.314)	*[−6.7; 44.0]*
	CHF 5000	−4.144***	*-156.6*	−4.107***	*-158.0*	−4.903***	*-165.3*	−4.033***	*-114.3*
		(0.264)	*[−176.5; −105.3]*	(0.290)	*[−181.1; −101.6]*	(0.630)	*[−176.8; −134.1]*	(0.755)	*[−126.1; −91.3]*
Monthly premium		−3.647***		−3.674***		−3.521***		−3.323***	
		(0.063)		(0.081)		(0.095)		(0.142)	
Log-likelihood value		−7084.5		−5182.7		−1578.1		−293.3	
Number of individuals		2024		1298		521		205	

Source: Swiss Health Insurance Literacy Survey 2021.

The table shows the results of mixed logit models for the choice of model B vs. A using the nine choices per individual included in the experiment. Explanatory variables include the attributes listed in Table 1 and a preference parameter for model B. The mixed logit allows for variation in the coefficients by individual assuming a normal distribution for each attribute's coefficient (log-normal for the monthly premium). The *β* column shows the estimated mean coefficients of these distributions. The WTP column reports the median values of the negative ratio of the individual-level predictions of the random coefficients for the health plan attributes and the monthly premium to derive the individual-level WTP estimates (in CHF per month). The first and third quartiles of the individual WTP estimates are shown in square brackets; see also Figure 1, and Table A2/Figure A1 in the appendix for further details on the individual-level WTP distributions. Estimated standard deviations of the distributions for each attribute's coefficient are reported in Table A1 in the appendix. Standard errors clustered at the individual level are shown in parentheses. Estimates are obtained for the overall sample, and separately by language region (columns German, French, Italian).

Significance levels: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

copayments refer to the care price once the deductibles are exhausted. Another explanation, consistent with the results for stricter drug disbursement, is the role of loss aversion and a higher degree of uncertainty attached to the inclusion of a high-deductible health plan (e.g. Karle et al. (Basten and Betz 2013)).

Regarding differences between language regions, the median WTP estimates are largest in absolute magnitude for respondents in the French-speaking part of Switzerland and smallest for those in the Italian-speaking part. This holds for the VBID elements, zero- or high-deductible plans, and mostly also for the general preference for their current instead of the alternative plan. On the other hand, preferences for changes in monthly premiums are almost identical across the three language regions. This suggests that individuals in the French-speaking region have stronger preferences for or against the VBID features of health plans, while the utility associated with premium changes seems similar across language regions. This result aligns with previous literature that shows stronger opinions of individuals living in the French-speaking part, for example, regarding social policies (Basten and Betz 2013; Eugster et al. 2011).

The alternative-specific intercept in the model is negative for Model B across all language regions, indicating that, on average, respondents selected their current health plan more frequently. Status quo bias (Samuelson and Zeckhauser 1988; Seth et al. 2020) is one possible explanation. However, preference for the current plan instead of the hypothetical alternative plan could also be related to the attributes offered in our DCE or individuals' cognitive processing of uncertain alternatives compared to the known status quo.

In addition to the median values in the distribution of individual-level WTP estimates, Table 4 also reports the first and third quartiles of the WTP distributions for the different health plan attributes (in square brackets). The results indicate substantial individual-level heterogeneity, e.g. for the general preference for the current over the hypothetical plan (range CHF 16.4 to 108.2 reduction in monthly premiums between the upper and the lower quartile) or the high-deductible plan (reduction range CHF 100.3 to 176.5). In the appendix, we also report the results for the conditional logit specifications under the assumption of homogeneous preferences, which show lower fit

overall and by region. Moreover, the results also highlight differences in the mean vs. the median WTP estimates between the conditional and mixed logit models, indicating again the role of individual heterogeneity in preferences for the alternative health plan attributes.

The heterogeneity is confirmed empirically in the estimated standard deviations, which underline that preferences for the VBID elements vary widely between respondents (see Table A1 in the appendix). Standard deviations are large compared to the mean estimates of the parameters, showing substantial

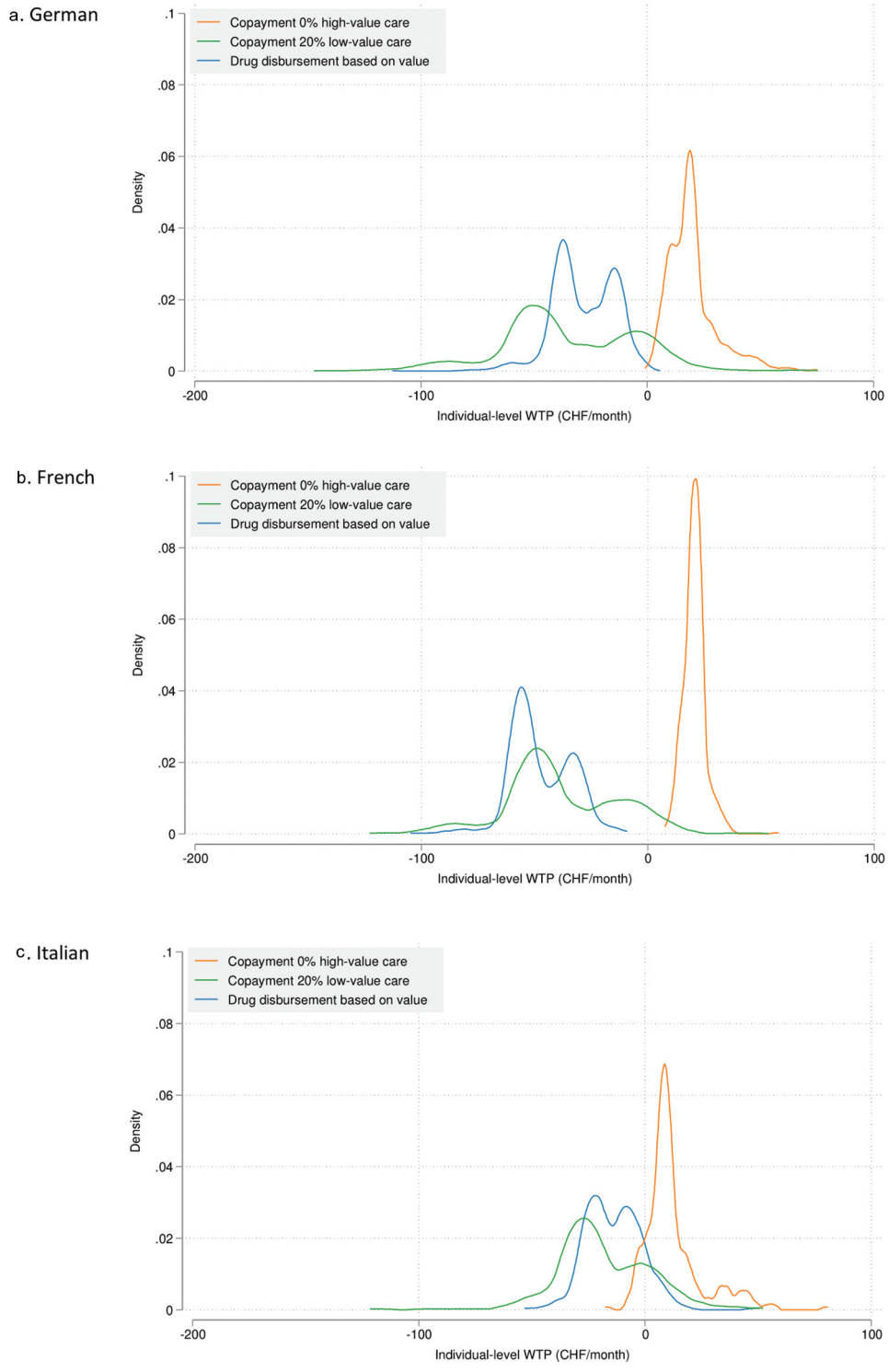

Figure 1. Distribution of individual-level WTP for VBID elements.

heterogeneity in preferences. In Figure 1, we show kernel densities of the posterior estimates of the individual-level WTP for health insurance plan attributes related to VBID (differentiated copayments for low- and high-value care, stricter disbursement of drugs). Several additional insights can be derived from these distributions. First, the WTP for a 0% copayment for high-value care is positive for almost all respondents (with some exceptions in the Italian-speaking part), and the distribution is relatively narrow, indicating less uncertainty about this value-based attribute in a health plan and relatively homogeneous positive utility derived from having this feature.

Second, the distributions for negative value-based incentives, i.e. attributes that restrict consumers, are much more dispersed, indicating more uncertainty about the value of such features. While the distribution of WTPs for stricter disbursement of drugs is negative for almost all respondents (again, with some exceptions in the Italian-speaking region), the WTP for the 20% copayment for low-value care is widely distributed. Even though the largest parts are in the negative range, for a non-negligible fraction of respondents, the estimates show a positive WTP (13.4% in the German-speaking region, 6.9% in the French-speaking region, and 18.5% in the Italian-speaking region). A possible explanation for this result is that some individuals indeed believe that the utilization of low-value care should be penalized with higher copayments, and, therefore, they do not express an aversion against such a plan feature. Another possible explanation picks up a recent discussion in the Swiss health system about cost containment and increasing responsibility of the population to pay higher shares out-of-pocket instead of payments via mandatory health insurance (Schindler et al. 2018). Third, the kernel density estimates confirm the pattern observed in Table 4 for the median estimates by language region. Respondents in the French-speaking part seem to have the strongest preferences for (or against) VBID elements, while respondents from the Italian-speaking part have lower WTPs in absolute terms. At the same time, we observe the widest dispersion of WTPs in the German-speaking region, suggesting significant heterogeneity in preferences for VBID elements for this part of the population.

Assessing heterogeneity in preferences for VBID elements

To better understand the preference heterogeneity for VBID elements, we investigate to what extent individual-specific WTPs depend on background characteristics of respondents. Using the posterior WTP estimates per individual as the outcome variables, we apply median regressions to study the association with sociodemographic, health-related, and preference-related factors (Table 5).

Overall, age and health-related factors (measured by the yearly deductible, the presence of a chronic health condition, or the number of doctor visits) are found to show the highest relative importance in predicting WTP for all three dimensions: lowering or raising copayments depending on the value of care, and stricter disbursement of drugs. However, other factors also play a role, such as respondents' nationality, which could be related to insurance literacy (and similar arguments as for age), or risk and time preferences, which are likely related to assessing the consequences of VBID. Given missing information in some of the covariates (mostly the monthly household income variable), the sample size for the median regressions is smaller than that for the mixed logit regressions. In terms of the direction of associations, the main insights can be summarized as follows:

Sociodemographic characteristics – older respondents have a significantly lower WTP for the alternative health plan than younger respondents, generally and when looking at the specific VBID attributes. Female respondents have a higher WTP for the alternative plan and a high-deductible plan, but otherwise, we do not find evidence for gender differences. There are also little differences in the WTP for VBID elements by household income and educational background. Non-Swiss have a higher WTP for a zero-deductible plan than Swiss respondents, but other differences in WTP estimates by nationality turn out to be insignificant in the multiple linear regressions, consistent with our argument above that nationality may be related to other factors, such as health insurance literacy.

Health-related characteristics – overall, having an alternative health plan in the current insurance scheme is associated with a higher openness, and thus WTP, for an alternative plan also in our DCE.

Table 5. Median regressions for the individual-level WTP for health plan attributes.

		VBID elements			General cost-sharing	
		Copayment			Deductible	
	Model B (alternative)	0% high-value	20% low-value	Drug disbursement based on value	CHF 0	CHF 5000
Female	3.227	−0.119	1.098	2.092*	1.459	5.339*
	(2.819)	(0.245)	(0.892)	(0.931)	(0.854)	(2.592)
Age (base: 26–44)						
45–64	−15.29***	0.188	−7.597***	−3.960***	−2.615*	−5.701
	(3.086)	(0.311)	(1.889)	(1.141)	(1.212)	(3.867)
65–75	−25.61***	−0.107	−9.642***	−3.250**	−3.396**	−6.304
	(5.051)	(0.323)	(1.851)	(1.259)	(1.272)	(3.784)
Non-Swiss	7.724	0.316	1.518	0.810	4.489**	−8.301
	(5.743)	(0.571)	(2.192)	(1.585)	(1.717)	(5.318)
Tertiary education	0.735	−0.590	2.318*	1.195	−0.712	4.742
	(2.906)	(0.328)	(1.099)	(0.988)	(0.862)	(2.643)
Monthly income in CHF (base: < 4500)						
4500 – 5999	−0.0433	−0.239	−0.731	1.640	0.233	−2.478
	(4.830)	(0.317)	(1.135)	(1.203)	(1.079)	(3.586)
6000 – 8999	1.790	0.185	−1.582	1.564	1.401	−5.180
	(4.460)	(0.347)	(1.295)	(1.284)	(1.013)	(3.042)
≥9000	1.852	0.0157	−2.001	3.106*	2.170	−5.790
	(4.533)	(0.358)	(1.417)	(1.331)	(1.307)	(3.398)
Number of doctor visits	−0.416	0.0336	−0.107	−0.0136	0.0970	0.0701
	(0.263)	(0.0203)	(0.0566)	(0.0617)	(0.0935)	(0.179)
Chronic health condition	5.054	0.0856	0.462	2.708*	1.294	3.338
	(3.423)	(0.263)	(1.057)	(1.107)	(0.907)	(2.460)
Type of health plan (base: Basic)						
HMO	25.81***	−0.900*	2.170	3.884*	0.537	10.19
	(5.105)	(0.432)	(2.576)	(1.930)	(1.823)	(5.679)
Telemedicine	13.18**	−0.984	−1.253	3.076	3.711**	2.968
	(4.224)	(0.504)	(1.976)	(1.670)	(1.264)	(4.514)
Family doctor	16.19***	−0.637**	0.576	3.119**	−0.0204	3.034
	(3.540)	(0.243)	(0.892)	(1.016)	(1.000)	(2.380)
Yearly deductible in CHF (base: 300 or 500)						
1000 or 1500	12.81*	0.963**	1.065	−1.935	2.511	−3.127
	(6.326)	(0.341)	(2.353)	(1.654)	(1.662)	(4.258)
2000 or 2500	19.44***	−1.228*	13.15***	4.257**	1.792	15.44**
	(3.724)	(0.509)	(2.184)	(1.332)	(1.270)	(5.008)
Out-of-pocket health expenditures in CHF (base: None)						
1–499	−7.355	0.426	0.0648	1.126	0.374	−2.385
	(4.721)	(0.718)	(2.681)	(2.133)	(1.483)	(7.372)
500–1499	−9.240	0.449	−1.971	−0.539	1.787	−10.59
	(5.348)	(0.722)	(2.612)	(2.156)	(1.496)	(7.255)
≥1500	−10.56	0.210	−2.269	0.624	0.0535	−8.052
	(6.604)	(0.911)	(2.873)	(2.401)	(1.809)	(7.858)
Health insurance literacy	4.996**	−0.156	0.542	0.872	0.435	2.994
	(1.739)	(0.151)	(0.618)	(0.556)	(0.538)	(1.615)
Financial risk-taking	5.561***	0.0129	1.412*	0.389	−0.0601	2.303
	(1.396)	(0.133)	(0.568)	(0.508)	(0.442)	(1.337)
Time preferences	7.237***	−0.0193	0.766*	1.287**	0.847*	1.471
	(1.403)	(0.108)	(0.389)	(0.425)	(0.367)	(0.919)
Language region (base: German)						
French	−2.668	0.269	−0.724	−1.186	1.043	−4.331
	(3.266)	(0.258)	(0.968)	(0.943)	(1.111)	(2.542)
Italian	6.855	−0.142	0.325	0.572	−1.429	−0.124
	(4.944)	(0.463)	(2.144)	(1.691)	(0.895)	(4.439)
Constant	−111.0***	19.97***	−44.29***	−44.94***	24.26***	−169.5***
	(9.331)	(0.975)	(3.876)	(3.155)	(2.766)	(10.06)
Number of individuals	1595	1595	1595	1595	1595	1595

Source: Swiss Health Insurance Literacy Survey 2021. *Notes*: The table shows the estimated coefficients from linear regressions for the posterior estimates of the individual-level WTP for health insurance plan attributes obtained after mixed logit regressions in the pooled sample; see also Table 5 in the main text and Figure A1 in the appendix. For details on the explanatory variables, see Table 2 (missing data and don't know categories are excluded from the output for conciseness). Robust standard errors are shown in parentheses.
Significance levels: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

However, we do not find systematic preferences for a specific VBID element, perhaps related to the uncertainty about the mechanisms of VBID. Similarly, individuals with a higher insurance deductible have a higher WTP for the alternative plan. However, here we find higher WTP specifically for the 5000-deductible plan, higher copayments for low-value care, and for the stricter

disbursement of drugs. In contrast to the random forests, chronic health conditions and previous health care utilization do not seem to be systematically associated with the WTP estimates in the multiple linear regressions, again likely due to other factors correlated with health care needs and insurance preferences.

Preference-related characteristics – as expected, individuals with a lower risk aversion significantly prefer higher cost-sharing elements. Forward-looking individuals tend to favour a stricter disbursement of medicines based on value and not solely on the price and a low copayment.

V. Conclusions

VBID aims to enhance value for money in a health system by aligning patient cost-sharing with the treatment's benefit rather than its cost alone (Volpp, Loewenstein, and Asch 2012). However, in choice-based health insurance systems, knowing if consumers would support value-based insurance implementation or related initiatives is essential (Bardy and Boes 2024; van der Nat 2022). We contribute to the literature by focusing on consumers' preferences for VBID elements. To this end, we fielded a DCE to examine the WTP for reductions in cost-sharing that aim to promote the use of high-value care and for higher cost-sharing or restrictions on access to discourage the use of low-value care. We find that the Swiss exhibit a strong predilection for their existing health plans. Still, individuals would be willing to trade off higher cost-sharing or more restrictive value-based access to medicines as long as these initiatives would lead to lower monthly premiums relative to existing health plans. Moreover, our results show substantial preference heterogeneity, by age but also other socioeconomic, health-and insurance knowledge-related characteristics. Additionally, regional variations emerged, with WTP for VBID highest in the French-speaking part of Switzerland.

These findings have implications for the design and implementation of VBID programmes, particularly within the Swiss health insurance system. The robust preference for the status quo reflects the inherent resistance to changing the health insurance scheme, which has been revealed in public votes before, e.g. the clear rejection by the population against the stricter implementation of managed care in the Swiss Health Insurance Act in 2012 (Votation 2023). This emphasizes the necessity of effective communication strategies to inform individuals about VBID's benefits. Policymakers and healthcare providers must address and carefully communicate why some treatments are deemed low-value and how VBID can lead to superior health outcomes and possibly lower costs. An important result is the heterogeneity in preferences and the regional variation in WTP, underlying the need for understanding demographic groups and local contexts, despite the uniform Swiss regulatory framework. While region-specific VBID models might be challenging due to national regulations, these differences can still guide tailored communication, patient education, and engagement strategies. Policymakers should consider these regional and demographic nuances when formulating national policies regarding VBID and possible implementation steps.

Furthermore, the finding that individuals require compensation for perceived negative VBID attributes suggests potential hurdles in VBID implementation. Policymakers should consider devising strategies to assist those who might struggle with increased copayments, particularly those from low-income households or with chronic conditions that necessitate frequent care, where it may be challenging to differentiate between high- and low-value care without imposing an additional burden on patients. The finding indicates the need for policies that balance utilizing suitable cost-effectiveness criteria in drug disbursement without causing such undue burden.

Our analysis also highlights the importance of health insurance literacy (HIL) in shaping preferences for alternative health plans. Policymakers should contemplate initiating programmes to improve the public's understanding of health insurance, with a focus on older individuals and those with lower education levels (Bardy 2024). Such efforts could help individuals better comprehend health plan attributes, potentially enhancing their acceptance of new programmes, such as VBID. Although the results on the role of HIL in determining preferences for specific VBID attributes are inconclusive, the

complex landscape of VBID calls for a continuous monitoring and evaluation of VBID implementation. This includes collecting data on patient satisfaction, health outcomes, and cost savings under VBID and using this data to make necessary adjustments to improve VBID programmes continually.

Several aspects emerge from our analysis for further research. A clear theme is value perceptions, with individuals exhibiting strong preferences for their current plan and requiring compensation for perceived negative VBID attributes. These perceptions should be explored more in-depth, investigating what drives them and how they can be influenced. Relatedly, we have a limited understanding of the extent that different designs of VBID will impact health outcomes and costs. Sound evidence of these impacts will help better communicate the benefits of VBID implementations in insurance schemes. Importantly, while our design and choice of attributes might raise doubts about their understandability for the participants, it mimics the complex nature of health insurance choice in the Swiss basic health insurance system, using a similar framing. Thus, the results depicting a strong status quo bias for the current health insurance plan might again be related to low HIL. Future research could further explore the link between HIL and VBID acceptance and the effectiveness of interventions aimed at improving literacy.

Last, the regional differences in VBID preferences guide practical implementation and communication strategies. For instance, the stronger aversion to VBID among respondents in French-speaking regions suggests a need for more robust communication emphasizing transparency, equity, and clinical rationale, such as using health technology assessments, to justify coverage decisions. In contrast, individuals in Italian-speaking regions displayed greater openness to VBID principles, potentially enabling earlier pilot projects or more ambitious designs in these areas. This heterogeneity indicates that while a uniform VBID model may be necessary under federal regulation, communication and framing strategies should be adapted regionally, considering prevailing attitudes towards healthcare solidarity and cost control. Furthermore, the observed preference uncertainty signals that broad educational efforts will be essential to improve the understanding and acceptance of VBID across all population segments.

Our study also comes with limitations. First, our preference measurements apply to the local population and cannot be translated without assumptions to other populations. While the Swiss health system has its particularities, our results also offer relevant insights for other countries with similar structures, such as the US or the Netherlands. Second, the alternative plans in the DCE are hypothetical. While we chose attributes and levels to resemble current political discussions and the feasibility of implementation within the Swiss health insurance law, individuals may still find it challenging to form preferences over hypothetical health plans, and thus preferences might look different when confronted with real choices. Pilot-testing of innovative models is specifically allowed in the health insurance law, which we would recommend gaining a deeper understanding of the public's preferences for VBID. Third, and relatedly, the VBID elements tested in our study might not cover all relevant aspects of VBID that individuals might consider in their preferences. More research is needed to understand preferences for other aspects of VBID better. Fourth, the results are derived using a mixed logit model. While these are common approaches in analysing DCE data, their parametric assumptions may influence the results. Fifth, even though our sample has been chosen representatively by gender, age, and region of living, specific subgroups might still be underrepresented, especially 'hard-to-reach' populations.

In conclusion, implementing value-based consumer incentives in the Swiss health insurance system presents a set of challenges. By conducting the first study on the Swiss population's preferences for VBID elements in the basic health insurance scheme, we provide valuable information for policymakers as they navigate the complexities of VBID implementation in the Swiss system. Most importantly, considering the regional and demographic heterogeneity in preferences in the Swiss population, our findings highlight that effective communication strategies targeting specific groups of the population are needed for VBID adoption to be successful and to help direct consumers' choice towards more high-value care and less wasteful spending on low-value care.

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ORCID

Tess L. C. Bardy http://orcid.org/0000-0002-0071-3508
Stefan Boes http://orcid.org/0000-0001-5478-9105

Data availability statement

The data that support the findings of this study are available free of charge upon request after signing a data contract with the Center for Health, Policy and Economics (CHPE) at the University of Lucerne, Switzerland. Contact by email via chpe@unilu.ch with a brief description of the planned research and dissemination of results. Restrictions apply to the availability of data as provided by intervista AG. Data users may gain access to datasets only after accepting an agreement to use and cite the data in a proper fashion, for scientific research and education within an academic framework, and following typical scientific, ethical norms of conduct. However, all datasets will be available from the corresponding author upon reasonable request.

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