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Attitudes of Germans towards distributive issues in the German health system*

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Abstract
Social health care systems are inevitably confronted with the scarcity of resources and the resulting distributional challenges. Since prioritization implies distributional effects, decisions on respective rules should take citizens' preferences into account. Thus, knowledge about citizens' attitudes and preferences regarding different distributional issues implied by the type of financing health care is necessary to judge the public acceptance of a health system. In this study we concentrate on two distributive issues in the German health system: First, we analyse the acceptance of prioritizing decisions concerning the treatment of certain patient groups, in this case patients who all need a heart operation. Here we focus on the fact that a patient is strong smoker or a non-smoker, the criteria of age or the fact that a patient has or does not have young children. Second, we investigate Germans' opinions towards income dependent health services. The results reveal strong effects of individuals' attitudes regarding general aspects of the health system on priorities, e.g. that individuals behaving health demanding should not be preferred. In addition, experiences of limited access to health services are found to have a strong influence on citizens' attitudes, too. Finally, decisions about different prioritization criteria are found to be not independent.

Keywords: health care priority-setting, distributive preferences, quality of health care
***JEL*:** I14, I18, D63, D71

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1 INTRODUCTION

Social health care systems are inevitably confronted with the scarcity of resources and the resulting distributional challenges. One measure to deal with financial pressure on the system is e.g. to reduce public coverage of treatments and to increase out of pocket payments. Such private payments are implemented in many health care systems. Criteria for prioritization are used, implicitly or explicitly, to define the border between public and private financing of health care. Since prioritization implies distributional effects not only on medical resources but also on health and quality of life, in our opinion decisions on respective rules should take citizens' preferences into account. Knowledge about citizens' attitudes and preferences regarding different distributional issues implied by the type of financing health care is necessary to judge the public acceptance of a health system.

Rules for rationing medical resources in public health systems require some ethical justification. There are several reasons derived from welfare economics why public preferences should be respected when allocation rules in public health systems are defined. On the one hand people are affected by the quality and extent of medical treatment as patients or potential patients. On the other hand people contribute to the financing of the public health system. From the perspective of Social Choice Theory, collective decisions on social institutions should be based on preferences of the citizens. In democratic societies the role of people as voters is important, too, and the acceptance of regulations of health provision by a majority of voters might be desirable. Thus, from the point of view of Public Choice Theory, governments, parties and the deciding committees should be informed about public opinion. In addition, German surveys show that a considerable share of the citizens claims that their preferences are considered or even that they have a voice in the committees where rules on allocation of medical treatments are decided (e.g. Diederich and Schreier 2010; Raspe and Stumpf 2013). An ethical justification of allocation rules may be reached by applying Rawls's concept of a reflective equilibrium (Rawls 1971). Following Elster (1995) public preferences should be included as one element of such a reflection process on finding ethically justified solutions. In our opinion this holds true particularly with regard to distributive justice in solving the scarcity problem of the public health system.

We investigate the opinions of the German public towards prioritization of medical services in the public health sector and on income dependent quality of medical treatment. Thus, two strands of literature build the basis for our analysis. First, empirical studies on prioritizing decisions, second, empirical research on the acceptance of income dependent health services.

Empirical surveys investigating public preferences for priorities in the public health system differ in their research objective and in the presentation of the problem to the subjects. Many studies try to elicit priority rankings for treatments of groups needing them or groups of patients characterized by certain attributes. Subjects are asked to rank treatments of patient groups with respect to their relative importance or they have to decide if certain groups of patients should receive preferred treatment. Examples of this kind of questions can be found e.g. in a representative German study by Raspe and Stumpf (2013). The authors report that priority setting in favor of treatment of children is the most accepted one. Majorities pro patients who are responsible for care of kids or relatives were observed, too. A majority also voted for lower priorities for patients who damaged their own health. This is in accordance to a tendency observed by

Müller and Groß (2010) in an earlier German representative survey. Schomerus et al. (2006) in a representative study using telephone interviews report a result pointing into the same direction. If money for medical care would have to be saved the disease most frequently named by subjects is alcoholism. Dolan and Tsuchiya (2005) report from a British study on rankings of patient groups where characteristics of patients were related to their past and expected future life span and health development in the past and with or without treatment in the future. They observe that subjects take past and expected future life years and respective health developments into account and that they prioritize younger over older.

These results have in common that they ask for a ranking and not for a choice between allocations defining the extent of medical care. In priority decisions opportunity costs of decisions are not presented to the subjects. In an experimental study on rationing of medical resources Ahlert and Funke (2012) observe that having to decide between abstract and hypothetical described patients knowing that the one not chosen will not receive the best or even no treatment influences the cognitive process of decision making. They conjecture that if opportunity costs consist of exclusion of treatments effectivity of treatment plays a prominent role as a decision criterion. Taking the different cognitive challenges of decisions on priorities versus decisions on allocations into account, there is no trivial mode to derive decisions on rationing of medical resources from priority rankings.

There are only a few German studies where questions are framed as decisions on allocations with opportunity costs defined by an exclusion from treatment or from public financing of the treatment. In a representative survey (Allianz 2009) subjects were confronted with the hypothetical policy that in the future some treatments will not be financed by the public insurance if people are older than some threshold, e.g. hip operations for women aged 65 or over. This policy was rejected by a clear majority of more than 80% of the subjects. 60% even strongly disagreed. Similarly Müller and Groß (2010) find that more that 80% reject age as criterion for rationing (the extent of rationing is not clearly defined in the question) compared to less than 30 % who are against rationing if patients have damaged their health e.g. by smoking or drinking alcohol.

There are some studies where questions are formulated such that they lie between the two extreme cases of ranking of options and exclusion of options. In a representative German study using computer aided personal interviews Diederich et al. (2009) ask subjects if certain groups of persons should receive preferred treatment. They instruct the interviewer that preferred means that this person is treated first. The other person is treated later or with viewer resources, but that it does not necessarily mean that this person will not be treated. Results related to groups of patients show (cf. Diederich and Schreier 2010) that strong majorities prefer persons with life threatening or acute diseases or children, whereas a majority does not prefer e.g. persons with children or with social responsibility (taking care of relatives). Except for the priorities for children they find no clear majority for the ranking of treatments of younger and older persons. About 50 % disagree to prefer younger to older people, more than 80% disagree to prefer people in the age span of working activity. With respect to health damaging behavior they use a different type of question and ask whether these people should make higher out of pocket payments. They report that in general a majority is of the opinion that these patients should contribute more money to their treatments than other patients. However, the kind of health damaging behavior seems to matter. Consumption of drugs, alcohol and smoking find

strong majorities, risky sports and sun bathing, too, whereas unhealthy diets and lack of movement do not.

Summarizing the findings from former studies so far we do not find a clear picture of the attitudes of the German public related to the priorities of young versus old, except for children. We also find mixed evidence with respect to priorities for patients with children or those taking care of some person. However, we find evidence that majorities would accept to posteriorize patients with health damaging behavior. In our case this applies to smoking.

Related to the distribution of opinions towards priorities in the German population there exists some literature taking personal characteristics of each subject into account including opinions she expresses. However, there are only a few studies investigating the impact of socio-economic variables on subjects' decisions, and additionally including items that represent attitudes towards different aspects of the health system and attitudes towards collective goals in society.

In their representative study Raspe and Stumpf (2013) check the impact of different variables on priority decisions, among them age, sex, social status, own health status, if respondents are overweight, smokers, or do not move much, if they are satisfied with the health supply, and if they judge the solidarity principle to be just. The only clear results the authors find is related to the posteriorizing of patients with a life style that imposes risks on their health. Respondents of age below 70, people who are content or very content with the health system, those who are in favor of a comprehensive public health service, and the group of smokers or overweight people or those who do not move much do significantly less often agree to the posteriorizing. Other variables did not turn out to be significant.

The second strand of literature focuses on the acceptance of income dependent health services. In Germany it is an important and controversial issue of public opinion whether it is just that persons with higher income can afford better health service than people with lower income. However, to the best of our knowledge this empirical research question has not been analyzed in a representative study so far. Thus we refer to some related literature on redistribution. As suggested by Meltzer and Richard (1983), current income affects individuals' preferences for redistribution. Individuals above mean income are supposed to oppose redistribution as they are expected to be net losers of redistribution. In contrast, individuals below average income should be in favor of redistribution as they are net beneficiaries. This theoretical result would imply that individuals with higher incomes should be in favor of income dependent health services since they are able to obtain private insurance more cheaply than redistributive public insurance. The related empirical evidence on income dependent preferences on redistribution is quite mixed (see for example Corneo and Grüner 2002; Alesina and Giuliano 2011). However, these findings do not account for individual's health status. According to Gouveia (1997) and Kifmann (2005), rational utility maximizing individuals not only focus on income but also on the ratio of their relative income position and their relative risk to fall ill when voting about the level of redistribution devoted to health. If their risk of falling ill is higher than their relative income position, they are expected to favor publicly financed health insurance as they might benefit irrespectively of their financial situation. In terms of income dependent health services, individuals do not only take their income position into account but also their relative risk of falling ill. Attitudes towards redistribution may differ between issues of different social services. According to Fong (2006) and Alesina and Angeletos (2005), subjects prefer a redistributive welfare state if recipients are not perceived to be responsible for their neediness, like in

cases of sickness. In terms of income dependent health services this means that if sick people are not responsible for their health status income dependent health services would be seen as unfair.

In this study we concentrate on distributive issues in the German health system. First, we analyze attitudes towards prioritizing decisions concerning the treatment of certain patient groups thereby contributing to the heterogeneous literature on prioritization criteria. Second, we investigate public acceptance of income dependent health services. To the best of our knowledge, this aspect has not been analyzed before. We use representative data from the International Social Survey Program (ISSP) of the year 2011 for Germany. Related to the first problem the survey contains questions on priority rankings of patients who all need a heart operation. We will not include different degrees of severity of the disease or other medical attributes as a characteristic. Hence a rather abstract and anonymous view on medical allocation problems is taken that is very different from the perspective of a physician who has to decide on treatments of specific patients dependent on medical criteria. Three scenarios are presented where two patients differ with respect to one criterion (the fact that a patient is strong smoker or a non-smoker, age or the fact that a patient has or does not have young children). These three characteristics of patient groups are representative of more general properties of patients that may have an influence on priority setting in society. Smoking represents personal characteristics where the person has at least some control and hence some responsibility for consequences on her health. Age stands for personal characteristics beyond the influence of an individual. Having children or not describes external effects on dependents and on society. To uncover acceptance of income dependent health services in the second problem, we draw on a question whether it is fair or unfair that individuals with higher incomes can afford better health services. Here the focus is on the issue of a personal entitlement and ability to use own financial resources for health services. Besides socio-demographic variables, we also include respondents' attitudes and opinions towards different aspects of the health system to investigate the preferences of the German public towards these issues.

In the next section we formulate some general hypotheses on the decision behavior of respondents concerning the issues mentioned above. In section 3 we explain our empirical strategy, describe the data, refine the hypotheses, and present some descriptive statistics. The results of the empirical analysis and interpretations are presented in section 4. Finally, section 5 concludes.

2 HYPOTHESES

Our analysis strives for exploring interrelations between opinions on priority setting in health care, justice intuitions, and other personal opinions or characteristics. According to philosophical categories (cf. Harsanyi 1955, 1978) individuals' perspectives on social problems can be separated into egoistic preferences and moral preferences. Within her egoistic preferences individuals strive for their own benefit, whereas their moral preferences focus on ethical aspects and the distribution of welfare within the whole social group. Both types of preferences may play a role of different strength and are aggregated by the decision maker. This means that we interpret observed preferences as a mixture of egoistic and moral preferences which the subject forms by weighing both aspects.

In order to detect the impact of an egoistic view we consider cases where subjects match the respective characteristics of some patient group. With regard to prioritizing decisions there exists empirical evidence by Alvarez and Rodríguez-Míguez (2011) from a study in Spain suggesting that subjects attach higher ranks to treatments of patients that are similar to their own medical condition. However, we generalize this finding in hypotheses with respect to socioeconomic characteristics. E.g. in the question of smoker versus non-smoker, we conjecture that smokers more often prefer the smoker than non-smokers do, and non-smokers more often prefer the non-smoker than smokers do. In the question of priorities between patients of age 30 vs. 70 we suppose that young people more often prefer the young patient than older subjects do, and old people more often prefer the older patient than young patients would do. In the question distinguishing between patients with or without children we suppose that people with children more often prefer patients with children than subjects without children do and subjects without children more often prefer patients without children than subjects with children do. With regard to the judgment on justice of the fact that people with higher income can afford better health service the similarity of respondent and patient group is related by own income. We hypothesize that income has a significantly positive impact on the acceptance of inequality in health service.

Related to moral judgments on prioritization an aversion to exclude patients from treatment and the relevance of different egalitarian norms have been observed in experimental studies in health economics (cf. e.g. Green 2009; Ahlert et al. 2013). Therefore, we conjecture that in all three prioritization scenarios many subjects reveal a preference for the answer "it should not make a difference". However there may be differences between the characteristics. If strict preferences are expressed, according to the insights from the literature overview, in case of smoking there seems to be a quite strong norm to assign priorities to the non-smoker, resulting in a quite large share of respondents voting for this option. However, in case of age we suppose a general weak tendency in society to prefer the younger patient; in case of patients with children we suppose that a small share in society prefers this group. With regard to the judgment on inequality of health treatment we assume that a majority of people have a preference for income independent treatment.

When weighing her egoistic and her moral preference the perceived public moral acceptability of reasons for prioritizing of certain patient groups may play a role for an individual's decision. We assume that smoking as an aspect of health damaging behavior is internalized as some moral reason for discrimination by smokers themselves. Thus we hypothesize that smokers show a strong tendency to the "no-difference" option in the smoker vs. non-smoker question. The public moral norm for priorities in case of age seems to be ambiguous in society with a weak tendency towards the young. Therefore, we assume some influence of the norm of preferring the younger also in judgments of older people. This may result in a larger share of older subjects choosing the no-difference option than the share of younger subjects choosing this option. In case of children vs. no-children we assume that there is a strong tendency towards "no-difference" in both groups, since preference for people with children has no large public support. Therefore the aspect of having children will probably not be used by many subjects with children as a justification to claim priorities for patients with children. We conjecture the analogous decision behavior for people without children; they will show a strong tendency towards no-difference. We assume that people with high income may also have internalized the norm of equal access to medical treatment to some extent and a large share will judge inequality to be unfair. However, we hypothesize that the weighing of egoistic and moral preferences will be

different between groups of high and low income, i.e. that subjects with low income will more often decide income dependent health care to be unfair.

3 DATA AND METHODS

3.1 Data

For empirically analyzing attitudes towards distributional issues we use data from the International Social Survey Programme (ISSP), 2011, Health and Health Care Module (ISSP Research Group 2013). The ISSP is a continuous programme of cross national annual surveys on specific topics in social science. Since the beginning of the programme in 1984, the health module was implemented for the first time in 2011. The empirical source provides individual data on health priorities and socioeconomic characteristics for representative samples of the population. In this paper Germany is in the spotlight and the data set for Germany contains about 1,681 respondents.

According to our aims, the empirical analysis is split into attitudes towards prioritizing decisions concerning the treatment of certain patient groups on the one side and acceptance of income dependent health services among German citizens on the other.

The data set contains three questions on priorities in case of a heart operation which are close to a ranking of groups of patients, but include some aspect of opportunity costs, too. Two equally sick patients are described who need the same heart operation. The subject is informed that they differ in one special aspect (smoker vs. non-smoker, age 30 vs. age 70, having children vs. no children). Then the respondent is asked who should be operated first or if there should be made no-difference. This formulation is a little different from the pure priority elicitation since the time sequence of the operations is indicated. No information is given on the expected time delay or if the treatment will be of lower quality. However, especially in case of a heart disease, respondents may think that having to wait longer on a heart operation imposes some additional burden of waiting and risk of complications or death on that patient. Thus some kind of opportunity costs may be perceived by the subjects. However the formulation of the question is far away from suggesting that the patient who has to wait longer will die before he receives the operation.

For the econometric analysis, we take the answers to these three questions as dependent variables indicating German's attitudes towards prioritization criteria.

To uncover the acceptance of income dependent health services in Germany, we use answers on a 5 item Likert scale between very fair (1) and very unfair (5). The categorical variable *judgment of inequality* will be used in the second part of the econometric analysis.[4]

As explanatory variables, we use socioeconomic characteristics, attitudes towards aspects of the health system, indicators for health behavior, indicators for health status and insurance coverage as well as variables covering collective goals. A description of the variables is presented in table 1.

[4] The exact wording in the questionnaire of the ISSP survey is: „Is it fair or unfair that people with higher incomes can afford better health care than people with lower incomes? (1) *very fair*, (2) *somewhat fair*, (3) *neither fair nor unfair*, (4) *somewhat unfair* and (5) *very unfair*", with *can't choose* also admissible. However, the latter are disregarded from the regression.

Table 1: Variable description

variable name	label
socioeconomic Variables	
female	female yes/no
age2	age>=30 and <40 years
age3	age>=40 and <50 years
age4	age>=50 and <65 years
age5	age>=65 years
working	currently in paid work yes/no
f_inc_eq1	net equivalent household income category 1 (< 750 €)
f_inc_eq2	net equivalent household income category 2 (750 € – 1,500 €)
f_inc_eq4	net equivalent household income category 4 (2,250 € – 3,000 €)
f_inc_eq5	net equivalent household income category 5 (>3,000 €)
edu2	lower or upper secondary school
edu3	post-secondary school, non-tertiary school
edu4	lower level tertiary or upper level tertiary
married	married yes/no
divorced	divorced yes/no
widowed	widowed yes/no
children1	one child in household yes/no
children2	2 children in household yes/no
children3	3 or more children in household yes/no
east	East German yes/no
attitudes towards aspects of the health system	
high confidence	high confidence with current health system yes/no
reform†	health system should be (completely) changed yes/no
limited services†	government should provide only limited services yes/no
inefficient health system†	health care system is inefficient yes/no
higher taxes†	willing to pay higher taxes to improve care system yes/no
no access*	no access to publicly funded health care if health demanding behavior y/n
reason: behavior*	severe health problems: reason health demanding behavior yes/no
reason: genes*	severe health problems: reason genes yes/no
reason: poverty*	severe health problems: reason poverty yes/no
best treatment*	would receive best available treatment if falling ill yes/no
health behavior	
cigarettes 1-5*	smokes between 1 to 5 cigarettes per day yes/no
cigarettes 6-10*	smokes between 6 to 10 cigarettes per day yes/no
cigarettes >10*	smokes more than 10 cigarettes per day yes/no
alcohol*	has more than several times a week 4 alcoholic drinks yes/no
health status and insurance coverage	
SAH	self-assessed-health: 1=very good to 5=very bad
hospital	hospital treatment within last 12 months yes/no
no treatment: waiting list†	did not get medical treatment: waiting list was too long yes/no
SHI	insured by social health insurance yes/no
SHI & private suppl.	SHI & private supplemental insurance yes/no
insurance civil servants	health coverage for civil servants yes/no
collective goals	
non profit	working in non-profit organization yes/no
religion	religious denomination yes/no

Note: *Variables which are included only in the estimations of prioritizing decisions, † variables exclusively included in the estimation equation for income dependent health services.

The group of socioeconomic variables covers gender, age, education, income, family and labor force status, number of children and a variable indicating East German residence. Within this

group of variables, we can test three of our motives discussed in the previous section. Regarding prioritization criteria, the egoistic hypothesis expects younger people to prefer more often the young patient than older subjects do, and old people to prefer more often the older patient than young patients. Accordingly, we expect the age variables (reference is *age1*) to significantly affect individual's attitudes towards the prioritization criteria of age. To investigate egoistic motives with respect to the criteria of having children or not, we refer to three indicator variables covering the number of children within the household (reference is *no children* within the household). The hypothesis in this case assumes families with children to be more in favor of patients with children than subjects without children and subjects without children to prefer more often patients without children. If moral motives of equal access prevail, the respective characteristics should not influence individual's attitudes towards prioritization.

In the question on income dependent health services, individual's income position should be of particular relevance. Income is divided into five income categories using the monthly net household income. Monthly net household income is adjusted by the square root of the number of household members to cover within household economies of scale (cf. Buhmann et al. 1988; Siciliani and Verzulli 2009). In addition, we refer to a relative income position compared to the median, with the 100–150 % interval of median net household equivalent income as reference category. Thus, according to the egoistic view, we hypothesize the acceptance of income dependent health services to increase with increasing income. If individuals value the moral motive of equal access to health care very strongly, income dependent health services should be treated as unfair, even by high incomes.

The second group of independent variables deals with specific attitudes towards various aspects of the health system. These variables are included to control for some general attitudes and their impact on prioritizing decisions and the acceptance of income dependent health services. The variable *high confidence* equals one if the respondent has (very) high confidence with the current health system. For prioritizing decisions (judgment of distribution justice), we expect individuals with high confidence to favor the no-difference option (neither nor respectively) due to the general trust in the system to choose the one who need it most (not the one with the highest income). The variables *reform, limited access, inefficient health system* and *higher taxes* are exclusively incorporated in the estimation of income dependent health services. In this group, the variable *limited access* covers the preference to reduce health services to a minimum. Individuals with this preference are assumed to judge income dependent health services as fair as they are able to obtain private coverage in accordance to their financial ability.

The empirical analysis of prioritizing decisions contains the variables *no access, reason: behavior, genes, poverty* and *best treatment* to control for general attitudes towards the health system. *No access* is expected to affect individual's attitudes towards the prioritizing criterion of smoking behavior. A tendency to deny access to publicly funded health services for those behaving health demanding is associated with a strong preference to favor the *non-smoker* over the *smoker.* The same holds true for the variable *reason: behavior* covering respondent's attitudes towards the reason of health problems. If respondents think that health problems arise because of health demanding behavior than they are more likely to give priority to the non-smoker than to the smoker. Finally, *best treatment* is an indicator whether the respondents think they are getting the best treatment if they are falling ill. People of this conviction are hypothesized to prefer the no-difference option in each of the priority criteria.

The next group of variables reflects respondent's health behavior and is considered only in the prioritizing decision case. From an egoistic perspective, smokers should prefer the smokers to be prioritized. However, we have conjectured before that smokers themselves may have internalized their health damaging behavior as a moral reason for discriminating them. Accordingly, we expect smokers to show a strong tendency to the *no-difference* option in the smoker vs. non-smoker question.

Moreover, we control for individual's health status and their type of insurance coverage in both distributional questions. Especially in the case of judgment of income dependent health services, the variable *no treatment: waiting list* is of particular interest. This variable covers the experience of respondents who did not get a medical treatment because the waiting list was too long. These experiences should negatively influence respondent's preferences regarding the judgment of income dependent health services. Finally, we control for the influence of collective goals, i.e. the effect of religiousness and whether a respondent works in a non-profit organization. The summary statistics for all independent variables are presented in table 2.

Table 2: Summary statistics

	N	*Mean*	*SD*	*Min*	*Max*
socioeconomic Variables					
female	1681	0.49	0.50	0	1
age2	1681	0.12	0.33	0	1
age3	1681	0.19	0.40	0	1
age4	1681	0.28	0.45	0	1
age5	1681	0.22	0.42	0	1
f_inc_eq1	1452	0.10	0.30	0	1
f_inc_eq2	1452	0.41	0.49	0	1
f_inc_eq4	1452	0.13	0.33	0	1
f_inc_eq5	1452	0.08	0.26	0	1
edu2	1673	0.15	0.35	0	1
edu3	1673	0.58	0.49	0	1
edu4	1673	0.25	0.43	0	1
married	1680	0.55	0.50	0	1
widowed	1680	0.07	0.26	0	1
divorced	1680	0.08	0.27	0	1
children1	1681	0.13	0.33	0	1
children2	1681	0.06	0.24	0	1
children3	1681	0.02	0.13	0	1
east	1681	0.34	0.47	0	1
attitudes towards aspects of the health system					
high confidence	1607	0.42	0.49	0	1
reform[†]	1621	0.43	0.50	0	1
limited services[†]	1582	0.19	0.39	0	1
inefficient health system[†]	1592	0.41	0.49	0	1
higher taxes[†]	1592	0.27	0.45	0	1
no access[*]	1585	0.40	0.49	0	1
reason: behavior[*]	1608	0.75	0.43	0	1
reason: genes[*]	1583	0.73	0.44	0	1
reason: poverty[*]	1603	0.51	0.50	0	1
best treatment[*]	1587	0.39	0.49	0	1
health behavior					
cigarettes 1-5[*]	1657	0.05	0.21	0	1
cigarettes 6-10[*]	1657	0.08	0.27	0	1
cigarettes >10[*]	1657	0.17	0.37	0	1
alcohol[*]	1681	0.06	0.24	0	1
health status and insurance coverage					
SAH	1663	3.03	0.89	1	5
hospital	1669	0.18	0.38	0	1
no treatment: waiting list[†]	1664	0.07	0.26	0	1
SHI	1648	0.82	0.39	0	1
SHI & private suppl.	1648	0.07	0.25	0	1
insurance civil servants	1648	0.05	0.21	0	1
collective goals					
non-profit	1505	0.21	0.41	0	1
religion	1680	0.65	0.48	0	1

Note: Data are weighted. [*]Variables which are included only in the estimations of prioritizing decisions, [†] variables exclusively included in the estimation equation for income dependent health services.

Overall, the data set consists of 1,681 individuals, 49 % of them are females. The most common income category is *f_inc_eq2* covering about 41 % of the respondents. In 13 % of the households one child is living, 6 % of the respondents have two children and only 2 % have three or more children in their household. While 42 % exhibit a (very) high confidence with the current health system, about 43 % think that the health system should be completely changed. In line with this figure, about 41 % think that the health system is inefficient. With respect to health damaging behavior, 40 % would refuse those individuals from publicly funded health services. A higher fraction of about 70 % believes that severe health problems are due to health damaging behavior or genes while poverty as another reason is less often chosen. In our sample, about 30 % are smokers, 17 % of them smoking more than ten cigarettes per day. Regarding health status and insurance coverage, the average self-assessed health status is about three, i.e. good. About 7 % of the respondents have experienced to be refused from medical treatment because the waiting list was too long. The underlying data set adequately covers the insurance coverage structure in Germany, i.e. 82 % are insured by the SHI.

3.2 Observations from descriptive statistics

Figure 1 to figure 3 presents the descriptive statistics for the three dependent variables dealing with prioritization criteria, each graph separated by characteristic of the respective patient group. Among the non-smokers, about 31 % give priority to non-smokers, whereas ca. 68 % are not willing to prioritize according to smoking behavior. Smokers are not going to receive any support from non-smokers. However, also in the group of smokers, the fraction voting for smokers to be treated first is negligible. In contrast, smokers obviously strongly tend to prefer the no-difference option, i.e. they do not give much weight to their egoistic preferences when decisions about priority of treatments have to be derived. These observations are in line with the hypotheses discussed before.

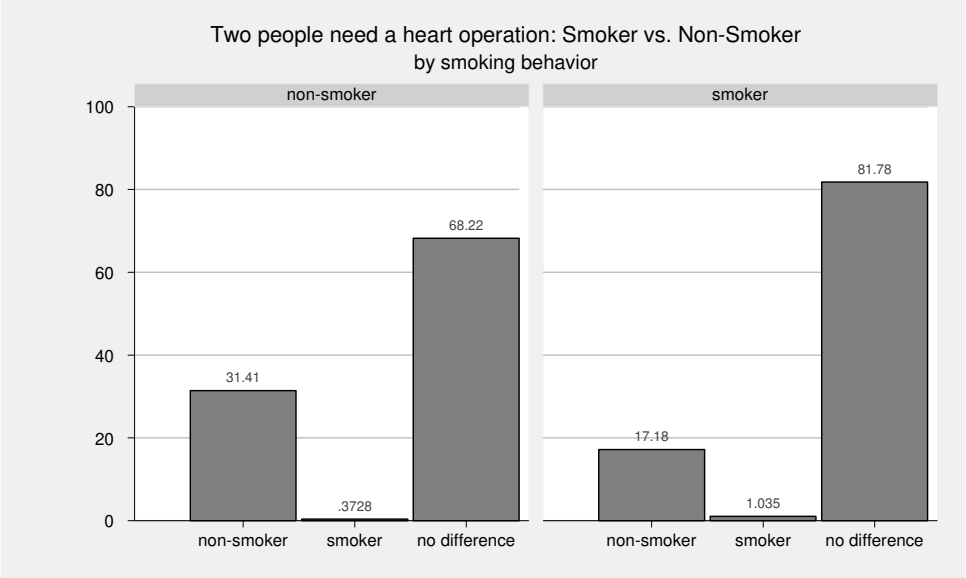

Figure 1: Prioritization criterion smoker

We see a similar pattern with regard to the priority criteria of age. Support to prioritize the old is somewhat higher than support for smokers, but remains on a very low level for both groups. About one third of the old give priority to the young while two thirds are not willing to accept age as a prioritization criterion. This observation changes slightly when young are considered. Almost 45 % of them attach priority to subjects that match their characteristics. The tendency

of the results confirm our hypotheses, however the extent of prioritization of the young is stronger than the expected vague priority.

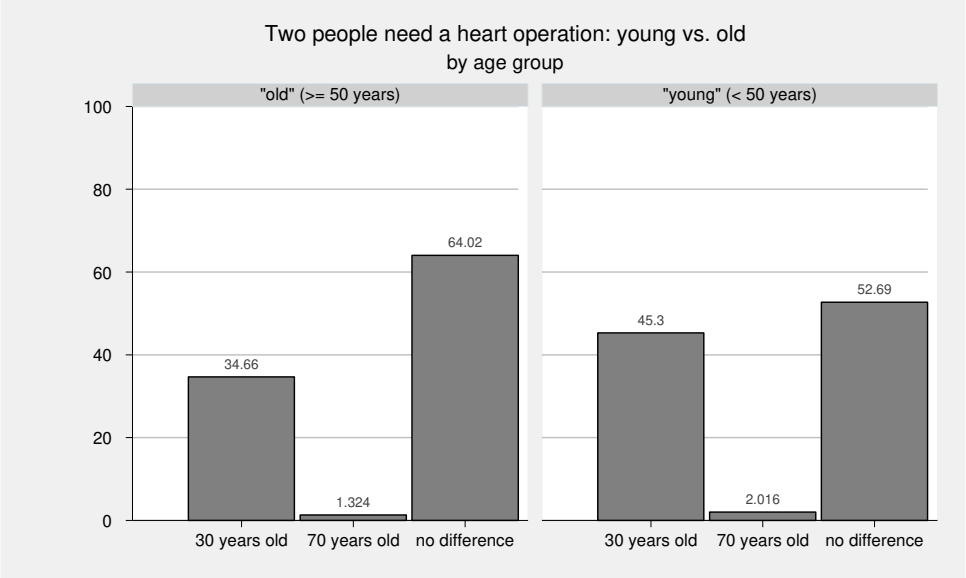

Figure 2: Prioritization criterion age

Finally, families without responsibility for small children seem not to find support within the German society to be treated first. This holds true for families with children as well as for families without children. The fraction devoted to subjects with children increases from 29 % in the subsample without children to about 34 % in the subsamples of families with children. Again, the option no-difference finds strong support indicating a rather strong aversion to make priority decisions according to the family status as conjectured in our hypotheses.

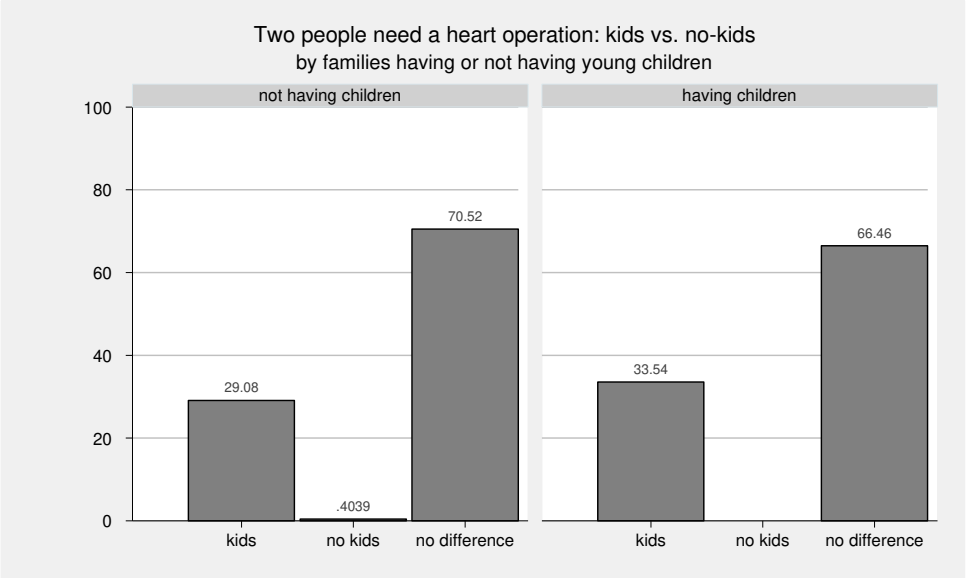

Figure 3: Prioritization criterion having children

Figure 4 presents the descriptive statistics for the variable *judgment of inequality,* separated by income categories. Across all income categories, people judge income dependent health services to be unfair. In total, almost 80 % think that is unfair that people with higher incomes can afford better health care. Even individuals in the highest income group are treating income dependent health services as unfair (about 70 %). However, the strength of aversion decreases

with increasing income, while still remaining on a very high level. Only about 7 % think that it would be fair if higher incomes get better health services. These observations confirm the tendency of our monotonicity hypotheses relating own income and the fairness judgment.

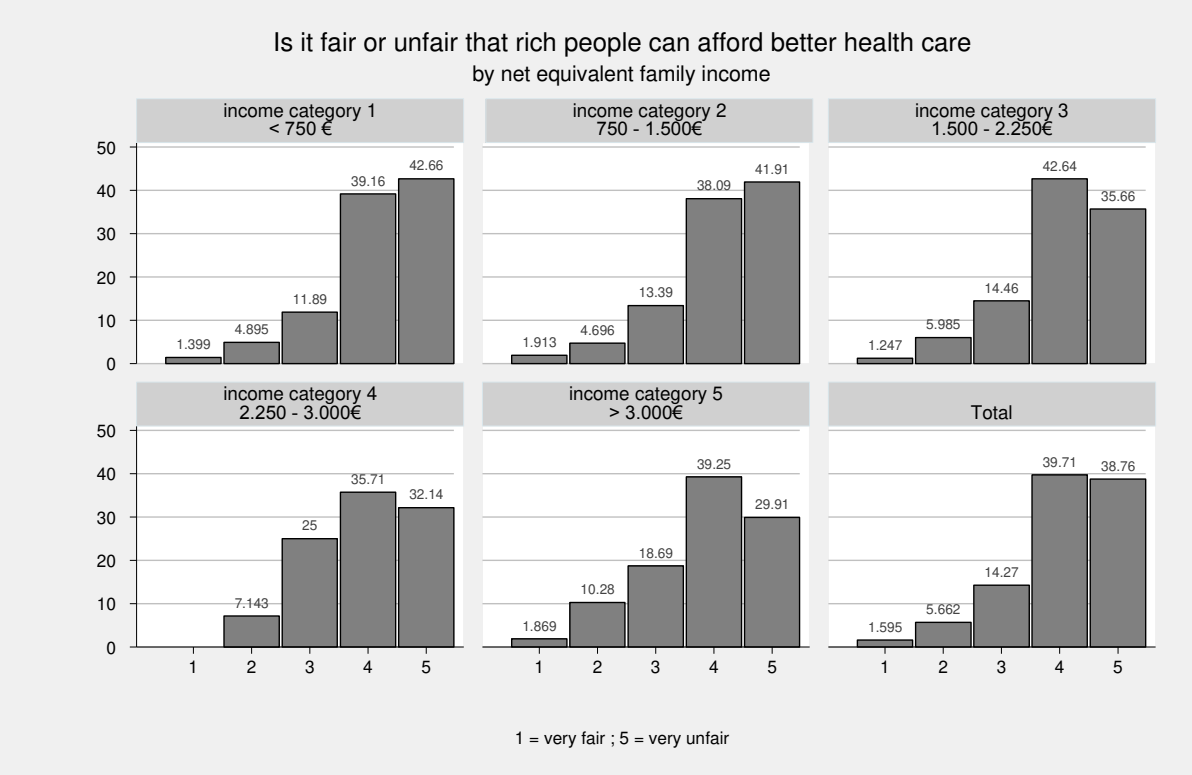

Figure 4: Judgment of inequality

3.3 Empirical Methods

In the first part, attitudes towards prioritizing criteria will be analyzed. The corresponding variables are categorical. However, the descriptive statistics for the three dependent variables of prioritizing decisions exhibits only very few answers in favor of smokers, old patients and families without children. Thus it seems critical to apply an ordered probit model for categorical variables in the econometric analysis. Accordingly, we drop the middle categories for all prioritizing decision questions resulting in three binary variables:

$$y_1 = \begin{cases} 1 & \text{non-smoker} \\ 0 & \text{no-difference} \end{cases}$$

$$y_2 = \begin{cases} 1 & \text{young} \\ 0 & \text{no-difference} \end{cases}$$

$$y_3 = \begin{cases} 1 & \text{having children} \\ 0 & \text{no-difference} \end{cases}$$

Simple binary probit models are used to analyze attitudes towards prioritizing criteria. The models take the following form:

$$y_i^* = \beta_0 + \beta_1' X_i + \varepsilon_i \tag{3.0}$$

where y_i^* is the latent variable, i.e. attitudes towards prioritizing criteria, that is linked to the three dependent variables covering attitudes towards the criteria smoking, age and children. The independent variables are covered by X_i and β reflects the parameters to be estimated.

Moreover the common assumptions regarding variance and the distribution of the error terms apply (cf. Long 1997).

However, there might be an overall correlation of attitudes towards prioritization among the three dependent variables. Hence, we apply a model for simultaneous equations in the second step. The advantage of these models is that we are able to estimate three equations that seem to be independent at the first view. The binary variables yield to a multivariate probit model. The multivariate probit is an extension of the bivariate probit model to more than two equations (cf. Greene and Hensher 2010). The equation system reads:[5]

$$
\begin{aligned}
& y^*_1 = \beta_1' X_{i1} + \varepsilon_{i1} && ; \mathrm{y}_1 = 1\left(y_1^* > 0\right) \\
& \vdots \\
& y^*_M = \beta_M' X_{iM} + \varepsilon_{iM} && ; \mathrm{y}_M = 1\left(y_M^* > 0\right)
\end{aligned} \tag{3.0}
$$

In our case, the equation system consists of three equations according to the three prioritizing decision (1) smoker vs. non-smoker, (2) young vs. old and (3) having children or not-having children. Hence, we have m = 1,…, 3 equations and i = 1,…,1,681 observations. The vector X_{im} includes the independent variables and β_m the associated parameters. The error terms $\left(\varepsilon_{i1},\ldots,\varepsilon_{iM}\right)$ are normally distributed with a constant variance (cf. Maddala 1983).

$$
\begin{aligned}
& E\left[\varepsilon_M \mid \mathrm{X}_1, X_2,\ldots,\mathrm{X}_M\right] = 0 \\
& Var\left[\varepsilon_M \mid \mathrm{X}_1, X_2,\ldots,\mathrm{X}_M\right] = 1 \\
& Cov\left[\varepsilon_L, \varepsilon_M \mid \mathrm{X}_1, X_2,\ldots,\mathrm{X}_M\right] = \rho_{LM} \\
& \varepsilon_M \sim N_M[0;\mathrm{R}]
\end{aligned} \tag{3.0}
$$

where R is the correlation matrix. The covariance between the error terms of equations L and M is ρ. ρ is statistically different from zero (i.e. a non-independence of the error terms) if unobserved factors significantly affect the probability that y_i = 1. Hence all equations can be estimated separately as single probit models but this might be inefficient as it ignores the correlation between the disturbances (cf. Greene and Hensher 2010; Maddala 1983).

In the second part of the empirical investigation ordered probit models are specified to analyze the acceptance of income dependent health services.[6] As the category *very fair* is only rarely depicted (see figure 4), we transform the original five-item Likert scale to a four-point categorical variable thereby combining the categories *very fair* and *somewhat fair* to one category. The new variable reads:

$$
judgment\ of\ inequality = \begin{cases} 1 & \text{very fair or somewhat unfair} \\ 2 & \text{neither fair nor unfair} \\ 3 & \text{somewhat unfair} \\ 4 & \text{unfair} \end{cases}
$$

The ordered probit model is a generalization of the simple probit model in eq. (3.0), where the latent variable y_i^* is linked to the variable *judgment of inequality*, i.e. a four-point categorical

[5] We do not expect a potential endogeneity of either of the dependent variables. Thus, we restrain from estimating a recursive multivariate probit model (cf. Maddala 1983) as this would require some theoretical advice on the dependency of the prioritizing decision questions.

[6] We also tested whether the parallel lines assumption of the standard ordered probit model holds or whether to apply a generalized ordered probit model. However, results of a likelihood-ratio test and a brant test were not able to reject the hypothesis of equal coefficients. Thus we proceed with the standard ordered probit model.

variable. Since the mean of the latent variable *judgment of inequality* is not identified, the ordered probit model assumes a constant variance of one. For the purpose of identification, the constant has to be defined to zero (cf. Long 1997).

4 RESULTS

According to our empirical strategy, the empirical analysis is split into two parts. First, attitudes towards prioritizing decisions concerning the treatment of certain patient groups are analyzed. Second, acceptance of income dependent health services among German citizens is investigated. In both cases we estimate one restricted model incorporating only the socioeconomic variables (see table 1) and one full model including all independent variables.

4.1 Prioritization attitudes

Smoking behavior as a prioritization criterion

First, we investigate the prioritizing decision regarding the criterion smoking. The results of single probit models for the *restricted* [1] and *full specification* [2] are presented in table 4. In both *specifications*, we find age to significantly affect the probability to choose the no-difference option. Thus, older citizens tend to choose the no-difference option while younger individuals are likely to prioritize non-smokers. Among the socioeconomic variables, education exhibits statistical significance. However, this effect diminishes if additional factors are included. Across both specifications, East Germans are more in favor to prioritize non-smokers than West Germans. Hence, personal responsibility seems to be more important in East Germany than in West Germany.

Among attitudes towards aspects of the health system, the variable *no access* positively affects the prioritizing decisions indicating a strong tendency to accept smoking as criterion to make a prioritization decision. Individuals not willing to provide access to publicly funded health services for subjects behaving health damaging strongly prioritize non-smokers to be treated first. In addition, respondents thinking that severe health problems arise from a health demanding behavior do more often prioritize non-smokers. This might be due to moral motives that individuals behaving health damaging do not deserve to be treated first because they are individually responsible.

Own health behavior is of particular relevance for the prioritizing decision between non-smoker and no-difference. The more cigarettes are smoked per day, the higher the probability to choose the no-difference option. This confirms our conjecture that smokers seem to value moral reasons quite strongly. They seem to be aware that smoking is publicly not accepted and that the majority of the public might be willing to discriminate smokers against non-smokers. May be they also accept their responsibility for health risks through smoking. Accordingly, choosing the no-difference option is a viable compromise between egoistic and moral considerations for smokers where they are not penalized for their own behavior.

We do not find individuals' health status or type of insurance coverage to significantly affect respondent's attitudes towards prioritization with respect to smoking behavior. Religiousness has a negative impact for non-smokers vs. no-difference. Thus, religious subjects show a tendency to reject smoking or health damaging behavior as a prioritization criterion.

Table 4: Estimation results single probit models – *non-smoker vs. no-difference*

	[1] restricted model		[2] full specification	
	Coeff.	*SE*	*Coeff.*	*SE*
female	-0.1267	(0.084)	-0.1916	(0.101)*
age2	-0.1626	(0.153)	-0.0810	(0.180)
age3	-0.3778	(0.153)**	-0.4657	(0.184)**
age4	-0.6222	(0.160)***	-0.7827	(0.195)***
age5	-0.4597	(0.192)**	-0.7995	(0.238)***
working	0.0866	(0.119)	0.0360	(0.150)
f_inc_eq1	0.0577	(0.160)	0.2248	(0.193)
f_inc_eq2	-0.1042	(0.103)	-0.1311	(0.122)
f_inc_eq4	0.1406	(0.131)	0.2153	(0.155)
f_inc_eq5	0.0310	(0.164)	0.0618	(0.194)
edu2	-0.4900	(0.390)	-0.0828	(0.525)
edu3	-0.7404	(0.382)*	-0.2830	(0.517)
edu4	-0.6969	(0.390)*	-0.3730	(0.524)
married	0.0800	(0.119)	0.0561	(0.137)
divorced	-0.0534	(0.179)	-0.1553	(0.222)
widowed	0.3599	(0.198)	0.4938	(0.234)**
children1	-0.0293	(0.128)	0.0323	(0.154)
children2	-0.0950	(0.181)	-0.0558	(0.220)
children3	-0.0189	(0.317)	0.1902	(0.348)
east	0.2201	(0.097)**	0.2884	(0.114)**
high confidence			0.0044	(0.101)
no access			0.6538	(0.097)***
reason: behavior			0.2978	(0.114)***
reason: genes			-0.1540	(0.108)
reason: poverty			-0.0221	(0.099)
best treatment			-0.0035	(0.106)
cigarettes 1-5			-0.5901	(0.251)**
cigarettes 6-10			-0.6394	(0.188)***
cigarettes >10			-0.7141	(0.149)***
alcohol			-0.0128	(0.216)
SAH			-0.0442	(0.062)
hospital			-0.1176	(0.134)
SHI			0.0876	(0.202)
SHI & private suppl.			0.0881	(0.256)
insurance civil servants			-0.0627	(0.300)
non profit	0.1848	(0.099)*	0.2446	(0.124)**
religion	-0.1373	(0.095)	-0.2424	(0.112)**
_cons	0.3326	(0.406)	-0.0480	(0.624)
N	1,200		979	
AIC	1358.1		1025.4	
BIC	1474.2		1211.1	
pseudo R-squared adj.	0.044		0.147	

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

Age as a prioritization criterion

In the second step, age as a characteristic that is beyond the influence of an individual is considered as a prioritizing criterion. Results for both, the *restricted* [1] and the *full specification*

[2] are presented in table 5. Age affects the probability to choose the no-difference option significantly in case of choosing between priority for the young and no-difference. Thus older individuals are more likely to opt for the no-difference option than individuals of the youngest age group. Accordingly, egoistic motives are stronger for the youngest age group. With respect to our general hypotheses, we find evidence that the moral norm of equal access is more likely to be applied by older subjects resulting to choose the no-difference option than by younger individuals. We also find individuals with higher income (*f_inc_eq4*, *f_inc_eq5*) to be significantly more in favor of prioritizing young. In contrast to the prioritization of non-smokers, East Germans more often prefer the no-difference option in prioritizing decisions according to age. These judgments seem to be consistent as the characteristic of age is not within the control of the patient whereas smokers are seen is seen to be responsible for the consequences of their behavior.

In the *full specification*, age still affects attitudes towards prioritizing young vs. no-difference. The hypothesis that the *young* might be more driven by egoistic motives than the old proves robust. The variable *no access* exhibits statistical significance also for the prioritizing decision regarding age. The attitude of restricting the access to public financed health services for individuals behaving health damaging results in a strong preference to prioritize young. Probably, this variable captures a more general willingness to prioritize (this will be analyzed in section 4.3). The conviction to get the best medical treatment in case of illness is associated with a strong preference to oppose prioritization with respect to age.

Neither health behavior nor health status nor type of insurance coverage exhibits any significance in the context of the prioritizing decision of age.

Table 5: Estimation results single probit models – *young vs. no-difference*

	[1] restricted model		[2] full specification	
	Coeff.	*SE*	*Coeff.*	*SE*
female	-0.1256	(0.078)	-0.0664	(0.091)
age2	-0.2907	(0.148)*	-0.3912	(0.170)**
age3	-0.5998	(0.148)***	-0.7329	(0.173)***
age4	-0.5801	(0.150)***	-0.6878	(0.176)***
age5	-0.4111	(0.181)**	-0.5149	(0.215)**
working	0.1573	(0.111)	0.1277	(0.131)
f_inc_eq1	0.0817	(0.153)	0.0775	(0.180)
f_inc_eq2	0.0967	(0.095)	0.0341	(0.108)
f_inc_eq4	0.2693	(0.124)**	0.1937	(0.140)*
f_inc_eq5	0.2938	(0.151)*	0.3793	(0.173)**
edu2	-0.8153	(0.414)**	-0.8520	(0.523)
edu3	-0.7633	(0.406)*	-0.8401	(0.515)
edu4	-0.7824	(0.412)*	-0.9229	(0.520)
married	0.1296	(0.110)	0.2037	(0.124)
divorced	0.0499	(0.163)	0.0558	(0.183)
widowed	0.5095	(0.184)***	0.5059	(0.207)*
children1	0.1830	(0.121)	0.2186	(0.139)
children2	0.0899	(0.167)	-0.1075	(0.196)
children3	-0.5295	(0.338)	-0.4251	(0.364)
east	-0.2104	(0.091)**	-0.2033	(0.104)*
high confidence			-0.0441	(0.091)
no access			0.3584	(0.088)***
reason: behavior			0.0931	(0.098)
reason: genes			-0.0230	(0.098)
reason: poverty			-0.0632	(0.089)
best treatment			-0.3458	(0.096)***
cigarettes 1-5			0.1236	(0.206)
cigarettes 6-10			-0.0844	(0.158)
cigarettes >10			0.0908	(0.120)
alcohol			-0.0129	(0.188)
SAH			-0.0513	(0.054)
hospital			-0.0572	(0.117)
SHI			-0.2581	(0.175)
SHI & private suppl.			0.1757	(0.229)
insurance civil servants			0.0434	(0.271)
non profit	-0.1409	(0.095)	-0.1431	(0.115)
religion	-0.0909	(0.090)	-0.1315	(0.102)
_cons	0.8266	(0.429)*	1.3347	(0.599)
N	1,198		977	
AIC	1597.4		1292.8	
BIC	1714.4		1478.4	
pseudo R-squared adj.	0.041		0.078	

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

Having children as a prioritization criterion

Finally, the criterion whether a patient is responsible for children or not is investigated. The results of probit models for the *restricted* and *full specification* can be found in table 6. In the *restricted* model, we find gender effects for the prioritizing decision between subjects having children and the option no-difference. Thus, females are less likely to give priority to families with children. This result is surprising as females are more likely to match the characteristics of this respective patient group. Whether a family has children or has no children within the household does affect their attitudes towards prioritizing subjects with children only in the case of one child within the household. Individuals with one child are more likely to give priority to subjects with children pointing again to some vague influence of egoistic motives, although the coefficient is only significant at the 10 % level. In addition, the results for family status (*married, divorced* and *widowed*) suggest that individuals with experience in partnership or family life are strongly in favor to give priority to subjects with children compared to the reference category – singles. Finally, religiousness influences the probability to prioritize subjects with children, indicating a high value religious people attach to the protection of families and children.

The same observation holds when considering the effects of having responsibility for children in the *full specification* [2]. Families with one child show a stronger tendency to prefer subjects with children. Compared to the estimation only including socioeconomic variables, the level of significance increases and supports our finding of egoistic motives among families with children.

Health behavior has no significant effect for the prioritizing decisions of patients with children. We do not find individuals' health status or insurance coverage to affect the decision on priorities. Again, being responsible for children is accepted by religious people as a priority criterion.

Attitudes towards family life and religion seem to be quite strongly related to the judgment that the external effects on the children ought to be considered when prioritizing between patients with or without responsibility for children.

Table 6: Estimation results single probit models – *having children vs. no-difference*

	[1] restricted model		[2] full specification	
	Coeff.	*SE*	*Coeff.*	*SE*
female	-0.2264	(0.081)***	-0.2249	(0.093)***
age2	-0.1806	(0.155)	-0.1449	(0.176)
age3	-0.3980	(0.157)**	-0.4201	(0.178)**
age4	-0.3440	(0.157)**	-0.3368	(0.181)*
age5	-0.2138	(0.187)	-0.1799	(0.219)
working	0.0005	(0.114)	0.0964	(0.135)
f_inc_eq1	0.1014	(0.157)	0.0116	(0.181)
f_inc_eq2	-0.0200	(0.098)	-0.1313	(0.110)
f_inc_eq4	0.1103	(0.129)	0.0707	(0.145)
f_inc_eq5	-0.1770	(0.166)	-0.1514	(0.183)
edu2	-0.4210	(0.367)	-0.4213	(0.470)**
edu3	-0.6705	(0.360)*	-0.5837	(0.462)***
edu4	-0.7297	(0.367)**	-0.6747	(0.469)***
married	0.2779	(0.116)**	0.2411	(0.128)*
divorced	0.3093	(0.172)*	0.2529	(0.191)
widowed	0.6021	(0.192)***	0.5400	(0.215)*
children1	0.2229	(0.123)*	0.2798	(0.139)**
children2	0.0615	(0.175)	0.0386	(0.201)
children3	-0.0474	(0.321)	-0.1121	(0.362)
east	0.0755	(0.095)	0.0597	(0.107)
high confidence			-0.0417	(0.092)
no access			0.3229	(0.090)***
reason: behavior			-0.0083	(0.101)
reason: genes			0.0280	(0.100)
reason: poverty			0.0194	(0.091)
best treatment			-0.0510	(0.097)
cigarettes 1-5			0.2336	(0.208)
cigarettes 6-10			-0.0161	(0.166)
cigarettes >10			0.0609	(0.123)
alcohol			-0.0071	(0.191)
SAH			0.0748	(0.056)
hospital			-0.0231	(0.121)
SHI			0.0515	(0.183)
SHI & private suppl.			-0.1635	(0.240)
insurance civil servants			0.3077	(0.270)
non profit	-0.0206	(0.098)	0.0265	(0.116)
religion	0.2684	(0.095)***	0.2296	(0.106)**
_cons	0.0105	(0.386)	-0.4267	(0.559)
N	1,204		986	
AIC	1460.1		1,222.4	
BIC	1577.3		1,408.4	
pseudo R-squared adj.	0.003		0.045	

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

Correlations between decisions on priorities

Attitudes towards prioritization according to the three criteria we have investigated separately before might be correlated. Decisions might be governed by some more general attitude of an individual to be willing to prioritize or not. Table 6 shows a cross tabulation of the three prioritization decisions which indicates a relationship between them.

Table 6: Cross tabulation of prioritization decisions

		[2] young vs. no-difference			[3] having children vs. no-difference		
		young	*no-diff.*	*sum*	*chil-dren*	*no-diff*	*sum*
[1] non-smoker vs. no-diff.	non-smoker	248	141	389	203	195	398
	no diff.	339	741	1080	238	843	1081
	sum	587	882	1469	441	1038	1479
[2] young vs. no-diff.	young				305	284	589
	no-diff				130	769	899
	sum				435	1053	1488

741 people choosing the no-difference option in the smoking question also choose the no-difference option in the prioritization question regarding age, 843 people choose the no-difference option in the smoking and having children question. The comparison between the criteria age and having children yields similar results. Overall, 38 % of the respondents always choose the no-difference option indicating a general aversion to make priority decisions. On the contrary, some individuals accept every reason for prioritizing. The highest consensus can be found between age and having children (305 respondents). About 9 % are accepting smoking, age and having children as prioritization criteria. Hence, in the next step we apply a model for simultaneous equations to account for unobserved correlations among prioritization decisions. Tables 7 and 8 present the results of multivariate probit models for the *restricted* model and the *full specification*.

The estimation results for both restricted and full specifications indicate that decisions on prioritization criteria are not independent and the proposed multivariate probit model results in efficiency gains compared to separate probit estimations. As it becomes clear from the bottom of both tables, the pairwise correlations between the three prioritizing decisions ρ are significantly positive. A positive correlation coefficient indicates that unobservable factors influence both decisions in the same direction. The correlation remains highly significant even when controlling for attitudes towards aspects of the health system, health behavior, health status and insurance coverage as well as collective goals. The positive correlation between equation [1] (non-smoker vs. no-difference) and equation [2] (young vs. no-difference) as well as between equation [1] and equation [3] (having children vs. non-difference) is of similar magnitude suggesting that there exists a general attitude to set priorities according to the criteria smoking and age which is not covered by our data. The correlation between equation [2] and equation [3] is somewhat higher. Hence, decisions to prioritize or not are even stronger correlated between the

criteria age and having children. This result is in line with the cross tabulation presented before and the descriptive statistics in section 3.

Table 7: Estimation results of the multivariate probit model – *restricted*

	[1] non-smoker vs. no-difference		[2] young vs. no-difference		[3] having children vs. no-difference	
	Coeff.	*SE*	*Coeff.*	*SE*	*Coeff.*	*SE*
female	-0.0940	(0.089)	-0.1225	(0.082)	-0.2527	(0.089)***
age2	-0.1836	(0.164)	-0.3550	(0.161)**	-0.2527	(0.170)
age3	-0.3494	(0.161)**	-0.6023	(0.158)***	-0.4475	(0.177)**
age4	-0.6225	(0.169)***	-0.5568	(0.157)***	-0.3575	(0.173)**
age5	-0.4520	(0.204)**	-0.3577	(0.191)*	-0.1878	(0.207)
working	0.0907	(0.132)	0.1739	(0.121)	0.0440	(0.126)
f_inc_eq1	0.0310	(0.172)	0.0474	(0.165)	0.0905	(0.174)
f_inc_eq2	-0.1394	(0.111)	0.0898	(0.101)	-0.0175	(0.106)
f_inc_eq4	0.1102	(0.140)	0.2340	(0.132)*	0.1333	(0.141)
f_inc_eq5	-0.0357	(0.178)	0.2558	(0.161)	-0.0876	(0.167)
edu2	-0.5417	(0.368)	-0.7757	(0.475)	-0.2683	(0.407)
edu3	-0.7608	(0.358)**	-0.7331	(0.468)	-0.4510	(0.399)
edu4	-0.7103	(0.369)*	-0.7315	(0.474)	-0.5305	(0.408)
married	0.0439	(0.128)	0.1079	(0.116)	0.2872	(0.129)**
divorced	-0.0984	(0.196)	0.0378	(0.173)	0.3077	(0.190)
widowed	0.3266	(0.223)	0.4616	(0.194)**	0.5925	(0.214)***
children1	-0.0475	(0.140)	0.2345	(0.128)*	0.1773	(0.134)
children2	-0.1380	(0.199)	0.0378	(0.188)	0.0958	(0.196)
children3	-0.0826	(0.394)	-0.6293	(0.380)*	-0.1508	(0.400)
east	0.2011	(0.102)*	-0.1997	(0.097)**	0.0795	(0.101)
non profit	0.1435	(0.108)	-0.0923	(0.104)	-0.0084	(0.106)
religion	-0.1611	(0.103)	-0.0981	(0.096)	0.2693	(0.103)***
_cons	0.3843	(0.388)	0.7573	(0.489)	-0.2223	(0.419)
ρ ([1], [2])	0.437	(0.046)				
ρ ([1], [3])	0.466	(0.047)				
ρ ([2], [3])	0.624	(0.037)				
N	1,112					
AIC	3763.3					
BIC	4109.3					
pseudo R-squared adj.	0.232					

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Comparing the results of the multivariate probit models to the estimation of single probit models shows some differences regarding the level of significance of the coefficients while the magnitude of the coefficients are almost not changing. This figure again supports the use of the multivariate probit model to estimate the prioritizing decisions. We still find strong negative effects for females for the decision to prioritize subjects with children against those without children. The effect remains significant even when including further control variables in the full specification model. The effect of age continues to prevail in both multivariate probit models. Especially for the decision to give priority to young subjects compared to choose the no-difference option, young people are more likely to prefer the young subject whereas older subjects tend to choose the no-difference option. The findings of the multivariate probit model

support the results derived from single probit models that young subjects seem to decide quite egoistically favoring patients of their own age group. On the contrary, moral motives seem to predominate egoistic motives for older subjects.

In contrast to the models not accounting for correlated decisions, family status does not exhibit statistical significance (*full specification*). Furthermore, the effect of children diminishes in case of prioritizing subjects with children. Based on the results of the multivariate probit model we have to reject our previous findings that families with children give high value to some egoistic preferences. Whether an individual has children or does not have children doesn't affect her attitude concerning the prioritization of subjects with children. Hence, egoistic motives seem not to be of large relevance for this group. As assumed in the hypotheses section, the aspect of having children is not used by many subjects as a justification for egoistic preferences indicating that people with children perceive that they do not have large support within the German society.

In line with the results of single probit models, the variables *no access* and *reason: behavior* have a significant positive effect. The conviction that health problems arise from health damaging behavior and that these subjects should not be treated by publicly funded institutions results in a strong tendency to prioritize non-smokers. Interestingly, the effect of *no access* can also be found for the prioritizing decision of young and subjects with children. An intuitive conclusion is that this variable covers a general tendency to accept every criterion to prioritize, as summarized before.

Finally, smokers exhibit a higher probability to choose the no-difference option than non-smokers. This effect becomes even stronger the more cigarettes per day are smoked. Thus, the results from the single probit models are strongly supported by the estimates of multivariate probit models.

Summarizing the results for Germans attitudes towards prioritizing, first, we find evidence that decisions about different prioritizing criteria are not independent. There seems to be an overall general attitude whether a person is willing to prioritize or whether this person wants every individual to be treated equally. There is evidence that this conviction strongly affects an individual's preferences towards prioritization with respect to all three considered criteria. Second, results indicate that young individuals prioritize egoistically. Furthermore, individuals behaving health damaging show a strong preference for the no-difference option indicating strong moral motives. Moreover, subjects with children do not find strong support within the German society. This criterion is not accepted to make decisions on who should be treated first.

However, we are restricted to observable factors and to variables conducted in the survey. Of course, the strong tendency to the no-difference option could also be due to the fact that respondents would prefer more medical indicators to be considered in the scenarios when they have to decide on priorities, and not socioeconomic factors.

Table 8: Estimation results of the multivariate probit model – *full specification*

	[1] non-smoker vs. no-difference		[2] young vs. no-difference		[3] having children vs. no-difference	
	Coeff.	*SE*	*Coeff.*	*SE*	*Coeff.*	*SE*
female	-0.1650	(0.115)	-0.0792	(0.098)	-0.2477	(0.104)**
age2	-0.0943	(0.198)	-0.4463	(0.189)**	-0.1788	(0.200)
age3	-0.4842	(0.204)**	-0.7464	(0.192)***	-0.4770	(0.205)**
age4	-0.8001	(0.209)***	-0.6812	(0.187)***	-0.2967	(0.203)
age5	-0.7784	(0.268)***	-0.5427	(0.231)**	-0.1275	(0.239)
working	0.1010	(0.185)	0.1171	(0.145)	0.1687	(0.150)
f_inc_eq1	0.2225	(0.212)	0.0582	(0.202)	0.0472	(0.207)
f_inc_eq2	-0.1578	(0.137)	0.0570	(0.118)	-0.1010	(0.124)
f_inc_eq4	0.1998	(0.181)	0.1444	(0.148)	0.1254	(0.165)
f_inc_eq5	0.0306	(0.217)	0.3117	(0.190)	-0.0171	(0.185)
edu2	-0.1601	(0.550)	-0.7620	(0.656)	-0.2301	(0.519)
edu3	-0.2606	(0.540)	-0.7106	(0.649)	-0.3854	(0.520)
edu4	-0.3717	(0.547)	-0.7913	(0.652)	-0.4894	(0.526)
married	0.0209	(0.150)	0.2021	(0.136)	0.2376	(0.148)
divorced	-0.2007	(0.272)	0.0932	(0.199)	0.2359	(0.225)
widowed	0.4503	(0.283)	0.5112	(0.226)**	0.5287	(0.247)**
children1	0.0517	(0.177)	0.2283	(0.154)	0.2394	(0.155)
children2	0.0307	(0.243)	-0.0720	(0.216)	0.1876	(0.238)
children3	0.1019	(0.459)	-0.6123	(0.479)	-0.0385	(0.429)
east	0.2864	(0.125)**	-0.1759	(0.113)	0.0361	(0.121)
high confidence	0.0125	(0.115)	-0.0566	(0.098)	0.0138	(0.103)
no access	0.6902	(0.112)***	0.3327	(0.098)***	0.3678	(0.100)***
reason: behavior	0.3096	(0.131)**	0.0864	(0.108)	-0.0274	(0.110)
reason: genes	-0.1299	(0.124)	-0.0290	(0.108)	0.0248	(0.113)
reason: poverty	-0.0103	(0.111)	-0.0306	(0.098)	0.0219	(0.103)
best treatment	0.0211	(0.120)	-0.3304	(0.103)***	-0.1267	(0.112)
cigarettes 1-5	-0.6828	(0.287)**	0.1391	(0.230)	0.2169	(0.233)
cigarettes 6-10	-0.6959	(0.222)***	-0.1919	(0.182)	-0.0344	(0.187)
cigarettes >10	-0.7240	(0.167)***	0.0838	(0.127)	-0.0037	(0.139)
alcohol	-0.0429	(0.245)	-0.0525	(0.215)	-0.0848	(0.232)
SAH	-0.0448	(0.072)	-0.0725	(0.060)	0.0801	(0.060)
hospital	-0.1479	(0.160)	-0.0302	(0.129)	0.0335	(0.139)
SHI	0.1042	(0.253)	-0.2341	(0.193)	0.0727	(0.207)
SHI & private suppl.	0.0221	(0.315)	0.1756	(0.253)	-0.2490	(0.275)
insurance civil servants	-0.1485	(0.349)	0.0896	(0.303)	0.3677	(0.298)
non profit	0.2265	(0.140)	-0.0964	(0.126)	0.0036	(0.128)
religion	-0.2801	(0.126)**	-0.1043	(0.110)	0.2213	(0.122)*
_cons	-0.1173	(0.712)	1.2254	(0.729)*	-0.7172	(0.618)
ρ ([1], [2])	0.462	(0.057)***				
ρ ([1], [3])	0.494	(0.058)***				
ρ ([2], [3])	0.626	(0.043)***				
N	927					
AIC	3082.4					
BIC	3633.2					
pseudo R-squared adj.	0.371					

Standard errors in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.2 Judgment of distributional justice

In the second part of this paper, we focus on income dependent health services and whether German citizens treat this aspect as fair or unfair. This question is of particular importance as the social health care system – like others – is confronted with the scarcity of resources and cutbacks of health services are discussed from time to time. As a consequence, individuals are forced to obtain private coverage which results in distributional challenges.

The generated four-point categorical variable *judgment of inequality* is estimated by an ordered probit model once including only socioeconomic variables [1] and once controlling for a full list of other controls. Results are presented in table 9.

Females are found to significantly grade income dependent health services as unfair. This result is in line with more general literature about redistribution indicating a higher preference for distributional justice among females (cf. Alesina and Giuliano 2011; Guillaud 2012). The influence of egoistic motives can only partially be confirmed. Of the four income categories, only individuals of category four (i.e. incomes between 2,250 € and 3,000 €) differ in their judgment on distribution justice. This group shows a tendency to assess income dependent health services as fair, although the variable exhibits only weak statistical significance (10 % level in the full specification). Hence, moral motives seem to predominate and even individuals with higher incomes classify income dependent health services as unfair although they would benefit. In line with the descriptive statistics presented in section 3, a majority of individuals exhibit norms of equal access to medical services and claims income dependent health services to be unfair. Other socioeconomic variables are not found to affect the judgment of distribution justice.

More interestingly, attitudes on specific aspects of the health system have a strong impact on individuals' preferences. Individuals with high confidence in the current health system are more likely to say that income dependent health services are fair, thereby contradicting our expectation that this conviction should result in indifference. The preference to reduce health services to a minimum (*limited services*) is associated with an attitude to favor income dependent health services. These respondents seem to favor a health system where individuals are able to top up public health services by private coverage according to their financial situation. For *reform* and *higher taxes* we find positive effects. A desire to completely change the current health system in Germany is connected to an aversion against income dependent health services and inequality. One explanation might be, that the request for reforms is implies by the opinion that the differentiation between public and private health insurance in Germany must be changed. In accordance to this, individuals who are willing to accept higher taxes to improve the health care system in Germany treat income dependent health services as unfair. This is consistent with the observations related to *reform*, as higher taxes imply a higher share of redistribution devoted to public health care. The results of publicly insured subjects (*SHI*) support this conclusion. Compared to privately insured, income dependent health services are more likely to be judged as unfair among publicly insured. Finally, *no treatment: waiting list* covers experiences of respondents who did not get a medical treatment because the waiting list was too long. This experience of unequal treatment has a strong effect on individual's judgment of fairness, leading to a strong aversion of income dependent health services.

Summarizing, the results for judgment of fairness of income dependent health service shows that individuals are not mainly egoistically motivated. Instead, moral norms of equal treatment seem to dominate. Moreover, socioeconomic factors do only weakly explain attitudes. General

attitudes and experiences with the health care system as well as own health status seem to be more relevant. The willingness to change the health system and a higher preference for redistribution devoted to the health system help to understand distributional preferences. In contrast, an attitude to reduce health services to a minimum is associated with a tendency to favor private additional coverage.

Table 9: Estimation results of ordered probit models for judgment of inequality

	[1]		[2]	
	judgment of inequality		*judgement of inequality*	
	Coeff.	*SE*	*Coeff.*	*SE*
female	0,2346	(0,066)***	0,1791	(0,075)**
age2	0,0185	(0,132)	-0,1346	(0,150)
age3	0,1431	(0,124)	0,0884	(0,142)
age4	0,0887	(0,128)	-0,0451	(0,149)
age5	0,2639	(0,155)*	0,1059	(0,182)
working	0,0140	(0,091)	0,0113	(0,106)
f_inc_eq1	0,1042	(0,129)	0,0753	(0,156)
f_inc_eq2	0,0708	(0,079)	0,0478	(0,089)
f_inc_eq4	-0,2137	(0,100)**	-0,1979	(0,112)*
f_inc_eq5	-0,2053	(0,131)	-0,1585	(0,145)
edu2	-0,5731	(0,396)	-0,3311	(0,518)
edu3	-0,5981	(0,394)	-0,5263	(0,518)
edu4	-0,6942	(0,399)*	-0,5909	(0,524)
married	0,0513	(0,092)	0,1064	(0,106)
divorced	-0,0236	(0,133)	0,0950	(0,145)
widowed	0,1147	(0,161)	0,2328	(0,187)
children1	-0,0651	(0,101)	-0,0633	(0,115)
children2	-0,2965	(0,138)**	-0,1978	(0,153)
children3	0,2684	(0,263)	0,1917	(0,254)
east	0,0729	(0,075)	0,0956	(0,085)
non profit	0,1658	(0,082)**	0,2138	(0,098)**
religion	-0,1674	(0,076)**	-0,1190	(0,083)
high confidence			-0,1840	(0,084)**
reform			0,3229	(0,083)***
limited services			-0,2062	(0,091)**
inefficient health system			-0,0273	(0,081)
higher taxes			0,1359	(0,081)*
SAH			0,0987	(0,046)**
hospital			0,1931	(0,095)**
no treatment: waiting list			0,3096	(0,157)**
SHI			0,5440	(0,132)***
SHI & private suppl. Insurance			0,5240	(0,182)***
insurance civil servants			0,3996	(0,197)**
N	1,249		1,033	
AIC	3,009,5		2,421,7	
BIC	3,137,8		2,599,6	
pseudo R-squared adj.	0,007		0,032	

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

4.3 Discussion

The results presented so far and their implications should be discussed precisely. Therefore, we analyze the willingness to prioritize in more detail.

There is a general tendency to prioritize or to choose the no-difference option as the correlations and the results of the multivariate probit models suggest. Thus, table 10 presents result of two probit models with *prioritize* [1] and *change* [2] as dependent variables.

Table 10: Estimation results of probit models for general prioritizing attitudes

	[1] *prioritize*		[2] *change*	
	coeff.	*SE*	*coeff.*	*SE*
female	-0,271	(0,158)*	-0,011	(0,090)
age2	-0,185	(0,295)	-0,411	(0,170)**
age3	-0,624	(0,292)**	-0,493	(0,172)***
age4	-0,781	(0,304)**	-0,541	(0,173)***
age5	-0,538	(0,362)	-0,405	(0,210)*
working	0,089	(0,224)	0,170	(0,129)
f_inc_eq1	0,093	(0,290)	-0,130	(0,178)
f_inc_eq2	-0,126	(0,187)	-0,000	(0,108)
f_inc_eq4	0,119	(0,259)	0,230	(0,143)
f_inc_eq5	0,374	(0,312)	0,251	(0,178)
edu2	-0,472	(0,947)	-0,846	(0,490)*
edu3	-0,849	(0,939)	-0,827	(0,480)*
edu4	-0,873	(0,946)	-0,995	(0,487)**
married	0,446	(0,220)**	-0,050	(0,122)
divorced	0,191	(0,323)	-0,268	(0,181)
widowed	1,033	(0,356)***	0,100	(0,209)
children1	0,398	(0,238)*	0,023	(0,139)
children2	-0,073	(0,336)	-0,130	(0,199)
children3	0,057	(0,546)	-0,533	(0,350)
east	0,076	(0,181)	-0,021	(0,104)
high confidence	0,079	(0,159)	0,013	(0,090)
no access	0,925	(0,152)***	-0,262	(0,088)***
demanding behavior	0,172	(0,178)	0,044	(0,097)
genes	-0,266	(0,172)	0,119	(0,099)
poverty	-0,051	(0,157)	-0,054	(0,088)
best treatment	-0,299	(0,172)*	-0,213	(0,095)**
SAH	-0,152	(0,098)	0,046	(0,055)
hospital	0,009	(0,205)	-0,141	(0,117)
SHI	0,208	(0,344)	-0,324	(0,177)*
SHI & private suppl.	0,057	(0,489)	0,251	(0,235)
insurance civil servants	0,325	(0,525)	0,208	(0,275)
non profit	-0,006	(0,198)	-0,060	(0,114)
religion	0,012	(0,180)	-0,079	(0,102)
_cons	-0,000	(1,081)	1,146	(0,571)**
pseudo R-squared adj.	0.029		0.008	
AIC	604.37		1,303,24	
BIC	460.14		1,468,44	
ll	-196.07		-617,62	
N	514		952	

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

The variable *prioritize* equals one, if an individual accepts every criterion to deviate from the no-difference option and zero otherwise. In contrast, *change* covers those individuals who changed their decisions across the three prioritizing decisions. About 9 % prioritize in every scenario whereas about 40 % have differentiated attitudes towards prioritization and choose differently in different prioritization decisions.

The probability to accept every criterion to prioritize is affected by gender, age, family status and attitudes towards aspects of the health system. In detail, females are less likely to always prioritize. The same is true for individuals in age group three and four. In contrast, married and widowed subjects strongly tend to prioritize according to the criteria smoking, age and subjects with children. As suggested in section 4.1, individuals who do not want that individuals with health damaging behavior are treated by the public health system are strongly in favor to prioritize. The intuition that this variable is a strong indicator of some general form of prioritizing attitude is supported by estimation [1].

In line with the results provided in column one, individuals are less likely to change their decisions with age. Thus, older subjects have a tendency to stay with the same option in each scenario. We also find education to affect the probability to change. The higher the education status, the less likely individuals are to change their decision about prioritization from scenario to scenario and the more likely they are to stay with one specific conviction. Finally, the variable *no access* indicates a general tendency to consistently choose one option. In combination with the results for *prioritize* this means to accept each of the three criteria to prioritize.

5 CONCLUDING REMARKS

The attitudes of the German public towards prioritization in the public health sector can be characterized by a general reluctance to define strict priorities. Many respondents choose the no-difference option in one, two or all three of the considered scenarios. About 38% of the respondents always choose the no-difference option, whereas only 9% always vote for priorities. There are differences in attitudes between the criteria offered, i.e. smoker vs. non-smoker, age, and having children or not. The most accepted criterion for posteriorizing is smoking. This is in accordance to results of the empirical analysis revealing strong effects of individuals' attitudes regarding general aspects of the health system on priorities, e.g. that individuals behaving health demanding should not be preferred. Related to the weight individuals attach to egoistic preferences in priority judgments we only find clear evidence that young respondents tend to prefer young patients more often than older respondents do. The criterion of having children does not seem to be a generally accepted reason for priority setting in the German society. Only respondents with one children and religious people reveal some tendency to favor a patient who is responsible for children. Our results representative for the German public opinion suggest that voters may not approve a health policy implementing priority setting with respect to personal characteristics of patients except perhaps for some posteriorizing of smokers.

About 75 % of the Germans exhibit a strong aversion against income dependent health services. This seems to be quite a strong result, since the quality of treatment in the German health system depends on the insurance status (public and/or private) and on willingness to pay for additional service. This opinion is related to the status of public insurance, negative experience of limited access to health treatment, low confidence in the system and the desire to reform it. A health

policy strengthening the differences in quality of health care between patients with different insurance status or income would probably be rejected by a majority of the German public.

The high shares of no-difference answers in the prioritization decisions may on the one hand indicate that many people are convinced that it is appropriate to apply equal treatment norms. Under this assumption the votes for no-difference and deviations in favor of some group of patients are analyzed and interpreted in this paper. On the other hand by choosing no-difference respondents can avoid making a hard decision. If one wants to go a research route beyond pure priority judgments towards rationing decisions as they have to be made in the public health system scenarios have to be designed differently. As we have argued before, decisions on rationing cannot be derived uniquely from priority judgments. Opportunity costs of decisions have to be made more prominent and different qualities and quantities of treatments and modes of financing have to be modelled, too. However, this kind of analysis in not feasible with the data offered by the ISSP survey. There is some evidence that subjects start to think differently about priorities if a rationing decision is inevitable. It seems that facing concrete scarcity constraints subjects learn to accept some kind of rationing. If one wants to elicit the public preferences on rationing of health care an impulse to start this learning process has to be given in the questionnaire. The necessity of an impulse to think about rationing and not only about priorities holds also true for the public reflection process.

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