

Marlies Ahlert/Gundolf Gubernatis/Ronny Klein

Common Sense in Organ Allocation

Abstract: In a questionnaire study on organ allocation 348 students of medicine (102) and economics (246) at the universities of Halle (114 students) and Hannover (234 students) responded to questions concerning their basic attitudes toward alternative criteria of organ allocation. Medical criteria were widely accepted by the respondents. Considerations concerning the patient's value to society were seen as being of minor importance. With respect to reciprocity, we could detect a high share of respondents who would favor former living donors and discriminate against murderers. Among considerations of fairness, the criterion of waiting time gained the highest support. Furthermore, majorities favored the view that health-compromising behavior and differences in age should play a role. Economic considerations were strongly rejected as criteria of organ allocation.

1. Introduction

1.1 General Background

In political as well as professional circles allegedly common intuitions and allusions to shared values of the public at large are routinely invoked in support of some favored view or other. But such references are merely speculative. It is of general interest, therefore, to find out more about which basic values are actually guiding 'common sense' in evaluating so-called 'hard choices' if and when they have to be made by society. Typically, society is confronted with hard choices if the allocation of an essential, potentially lifesaving albeit scarce resource is at stake. For obvious reasons organ allocation is a paradigm case of such choices. But the case of organ allocation has not been used merely to trigger intuitions of a more general nature (what philosophers call an 'intuition pump'); to learn more about common views on organ allocation is of great interest in itself since organ transplantation is an increasingly important field .

1.2 Specific Background

Due to the scarcity of transplants, issues of justice and efficiency have been plaguing organ transplantation ever since its beginnings (for a very instructive early statement ten days after the first heart was transplanted, see Joshua Lederberg 1967). Nevertheless, physicians and politicians tend to take a specific answer to the problems of organ allocation for granted. The quasi-official statement of the WHO aptly summarizes the prevailing view: "In the light of the principles of distributive justice and equity, donated organs should be made available to

patients on the basis of medical need and not on the basis of financial or other considerations.”¹

That this statement does indeed express what the ‘principles of distributive justice and equity’ require is rather doubtful, however. For instance, if there are two equally suitable and needy potential organ recipients, one of whom has been a (registered) willing potential donor for a long time before he himself developed a condition requiring a transplant, while the other has rejected donation explicitly (and perhaps still does), is it then not rather unjust if the organ is allocated to the person unwilling to donate her cadaveric organs rather than to the willing donor? Reciprocity and reciprocal fairness seem to be severely violated by the practice of allocating organs merely according to medical needs. Since reciprocity and fairness are deeply entrenched considerations of justice and equity in other contexts, it seems puzzling that they do not play a crucial role in organ allocation. One may wonder whether, owing to a kind of professional bias, physicians ignore considerations of reciprocal fairness in organ allocation. Do only physicians and politicians support medical criteria, or does their approach express sentiments more widely shared by the public at large? Or, more generally, what are the basic values that guide what may be called ‘educated common sense’ in the forming of (ethical) preferences about how organs should be allocated?

1.3 Aims of the Study

By means of a standard questionnaire, we tried to learn more about the values that guide the ‘common sense of justice in organ allocation’ among students. We chose a sample of students for the simple reason that we could easily recruit them, but also because they represented reasonably well-educated and informed, yet nonprofessional individuals.

2. Methods

2.1 The Structure of the Questionnaire

In the process of compiling questions for the questionnaire, we tried to involve researchers with diverse backgrounds so as to have access to many different perspectives. Contributors to the questionnaire were members of a yearlong research group on ‘Making Choices’ at the ‘Center for Interdisciplinary Research’ (ZiF). They had their academic background in such diverse fields as economics, medicine, philosophy and psychology.²

¹ WHO 1991, 1471. Pope John Paul II expressed basically the same view in his speech at the World Congress of the Transplantation Society in Rome in August 2000.

² M. Ahlert (economics), K. Borchering (psychology), A. Diederich (psychology), G. Gubernatis (medicine), W. Güth (economics), M. Hild (philosophy), R. Klein (economics), H. Kliemt (philosophy), W. Neuefeind (economics) participated in the discussions.

The questionnaire contained four different types of questions:

Type 1 22 questions concerning various criteria of organ allocation followed the pattern: "Should x be considered, considered favorably, considered unfavorably." For example, question no. 2. reads as follows:

"The period of time a transplanted kidney keeps working properly depends, among other things, on the (histo)compatibility between recipient and organ. Should the expected survival time of the graft be considered favorably when choosing the recipient?"

yes, very strongly/yes, strongly/yes/no, don't consider/no, in no case

Type 2 11 questions followed the pattern: "What do you think about these statements? Do you agree or disagree?" For example, no. 25 reads as follows:

"My organs are mine and whatever I decide about their use is no concern of society." I strongly agree/agree/neutral/disagree/strongly disagree

Type 3 The respondents also had to decide on specific allocations in scenarios in which two or three patients, respectively, with different characteristics were competing for one organ.

Type 4 8 'profiling' questions concerning personal characteristics like age, sex, religious affiliation etc. were included as well.

2.2 Characteristics of the Sample

In all we asked 348 students of two German universities (N=348). Table 1 presents the number of participants classified according to university and subject of study (Table 1). A majority of the participants were students of economics, referred to below as economists, while all others were students of medicine, referred to as physicians.

	<i>Halle</i>	<i>Hannover</i>	Σ
<i>Economists</i>	87	159	246
<i>Physicians</i>	27	75	102
Σ	114	234	348

Table 1: Number of students classified according to university and subject of study

Due to the fact that only students were asked, our selection of participants was strongly biased with respect to education and age, compared to the population at large. The average age was 23 years. Slightly more men (59.1%) than women took part in the study. 61.6% of those who participated came from Hannover (HN), a town in a West German (former FRG) state, 2.4% from abroad and the rest from Halle, a town in an East, or new, German (former GDR) state. Of the participants 17.7% were Roman Catholic, 43.7% Protestant, 2.7% Muslim. 33.3% of the participants had no religious affiliation; for Halle this percentage was

64.0%. With respect to basic political leanings, 38.7% classified themselves as 'center', 37.8% as 'left-wing' and 23.1% as 'right-wing'. 81.5% of the participants declared that they were generally willing to donate organs. 25.2% of those said that they actually had a donor card.

2.3 Methods of Analysis

The questionnaire measured variables mostly on an ordinal level. We applied appropriate methods of descriptive statistics like frequency, median, mode, quartiles etc. to the results of the measurement. Furthermore, we used Mann-Whitney *U* tests and chi-square tests to detect group behavior—for instance differences between male and female respondents.

In order to detect clusters of similar response behavior, a cluster analysis was performed. To obtain comparable data, we first converted all variables to binary encoding³ and applied the simple matching procedure to create a similarity matrix. Then we used the complete linkage procedure to generate the clusters. With the help of a scree test, we 'decided' on three clusters which we called simply *A*, *B* and *C*.

3. Results

The thirty-three systematic questions were classified according to five value categories or dimensions, respectively, as follows: medical criteria, patient's value to society, reciprocity, fairness and economic aspects. Subsequently, the results for each dimension were summarized in tables demonstrating the distribution of the answers, the frequency of all 'yes'-items and the answers of special subgroups with statistically significant different frequencies (Prob. = 0.05).

3.1 Medical Criteria

According to the opinions expressed in the sample, nearly all of the medical criteria should be strongly considered (Table 2). These were: expected survival time of the transplanted kidney before failure (no. 2), improvement of the general state of health (no. 3), danger of irreversible damage to the patient (no. 4), mismatch-probability (i.e., the likelihood of finding a more suitable organ for the recipient within the next year) (no. 6) and the priority for children (no. 16). The criterion of psychical suffering under dialysis (no. 5), whose status as a purely medical criterion seems somewhat doubtful anyway, gained merely a narrow majority of 52%.

³ In transforming ordinal-scaled variables into binary, we applied methods as described in Fahrmeir/Hamerle/Tutz 1996, 447-448.

No.	Median 1./3. Quartile	Yes* (%)	Groups Yes* (%)
2	yes, strongly consider yes, very strongly consider/yes, strongly consider	96.8	Ha/Hn ^g (93.9/98.3) HaE/HnE ⁱ (92.0/98.1)
3	yes, strongly consider yes, strongly consider/yes, consider	88.4	M/F ^a (84.0/94.2) R/N ^b (92.6/83.2)
4	yes, strongly consider yes, strongly consider/yes, consider	95.6	M/F ^a (94.0/98.5)
5	yes, consider yes, consider/no, don't consider	52.0	-
6	yes, strongly consider yes, very strongly consider/yes, consider	94.5	R/N ^b (97.2/89.4)
16	yes, strongly consider yes, strongly consider/yes, consider	91.6	-

Table 2: Statistics on medical criteria

The differences between the response behavior of different groups were only small and the homogeneity of the answers within each group high.

3.2 Patient's Value to Society

When asked whether or not the 'patient's value to society' should play a role in organ allocation, almost all respondents strongly rejected this criterion (Table 3, no. 10). However, the majority of respondents did want to take a particular case into account, namely that of a patient who had to care personally for others (no. 11). It should be noted, though, that only 45.5% of the medical students would accept the 'obligation to care for others' as a criterion.

No.	Median 1./3. Quartile	Yes** (%)	Groups Yes** (%)
10	no, in no case no, don't consider/no, in no case	6.1	W/N ^j (3.7/9.7)
11	yes, consider yes, consider/no, don't consider	54.3	M/F ^a (84.0/94.2) P/E ^e (45.5/58.0)
20	yes, consider yes, consider/no, don't consider	54.9	Ha/Hn ^g (47.4/58.6) N/W ^f (45.9/58.4) HaE/HnE ⁱ (44.8/58.2)

Table 3: Statistics on criteria concerning patient's value

*Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

**Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

That a patient's ability to work would be restored was accepted as a relevant criterion by 54.9% of the respondents (no. 20). Here we detected a significant difference between the respondents from the new, or East, German and the West German states. Only among the West German students was there a majority of 58.4% who regarded the ability to go to back to work as sufficiently important to include it among the criteria of organ allocation. The detected difference in attitudes is underlined by the fact that this criterion was rejected by a majority of the students from Halle (though among them there were students from the former FRG) as well as by a majority of the students of economics from Halle.

3.3 Reciprocity

The topic of reciprocity was covered by questions 7, 8, 12, 22, 26, 32. The issue of whether or not an individual that had served as a living donor in the past should be treated with priority as a recipient of an organ was addressed by two questions. In question no. 7 the problem was presented in a quite detailed description of the situation, whereas no. 32 contained the rather short statement that a previous living donor should be treated with priority if he or she needed an organ. The responses were different (Table 4). A majority of 73.4% of all respondents wanted to give priority to patients who had served as living donors of a kidney for a person closely related to them. In contrast to responses to no. 7, only 50.0% of the respondents would agree with the statement in no. 32. Maybe this result was caused by the different formulations, the context of the questions, or the different categories of answers. This may show a sensitivity of responses to differences in the form and context of how the problem was presented.

Nevertheless, looking at the data more closely may provide some additional clues. There was a difference between the medical students from Halle and Hannover with respect to their answers to question no. 7. The medical students from Halle were the only group who did not accept that preferential treatment be given to former living donors. Statement no. 32 was not accepted by a majority among the subgroups of medical students, nor by respondents of the political 'left-wing/center', or students from the new German states.

No.	Median 1./3. Quartile	Yes* (%)	Groups Yes* (%)
7	yes, strongly consider yes, very strongly consider/no, don't consider	73.4	C/E ^c (82.6/70.7) Ha/Hn ^g (64.0/78.0) HaP/HnP ^h (40.7/79.7)
8	no, don't consider yes, consider/no, don't consider	43.8	-
12	no, don't consider no, don't consider/no, in no case	16.2	C/E ^c (24.6/13.1) P/E ^e (5.9/20.4) Ha/Hn ^g (10.5/19.0) HaE/HnE ⁱ (12.6/24.7) W/N ^j (11.7/27.9)
22	yes, consider yes, very strongly consider/no, don't consider	64.0	M/F ^a (67.5/58.2) C/E ^c (45.6/68.8) L/R ^d (60.2/76.9) P/E ^e (50.0/69.8) W/N ^j (60.2/79.0) K/N ^k (46.2/66.2)
26	neutral agree/disagree	30.3	M/F ^a (35.5/21.0)
32	agree agree/neutral	50.0	L/R ^d (46.4/62.3) P/E ^e (40.6/53.9) N/W ^f (42.0/53.4)

Table 4: Statistics on criteria of reciprocity

Most respondents did not want to give higher priority to patients who had registered their willingness to serve as cadaveric donors (nos. 8, 26). Quite surprisingly, the group that declared that they were willing to donate as well as the group that declared that they were not did not respond differently to questions 8 and 26.

Though only a minority agreed that patients who had saved somebody else's life (no. 12) should be favored, a sizeable percentage of respondents would discriminate against murderers (no. 22). We observed, however, that narrow majorities among Roman Catholics and respondents who were personally acquainted with patients on dialysis would reject this criterion.

3.4 Fairness, Equity, Equality

The inclusion of waiting time among the criteria of organ allocation seemed to be strongly supported (Table 5, no. 1). Most of the respondents would discriminate against patients who were coresponsible for their medical condition. Nearly 70% of them would also support such a criterion (no. 9).

*Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

Furthermore, there was no majority that would put patients who had already received an organ in the past at a disadvantage (no. 14). Neither would respondents treat with reduced priority those whose religious beliefs precluded them from donating organs (no. 17).

No.	Median 1./3. Quartile	Yes* (%)	Groups Yes* (%)
1	yes, strongly consider yes, very strongly consider/no, don't consider	90.2	Ha/Hn ^g (84.2/93.1) N/W ^f (86.2/92.8) HaP/HnP ^h (70.4/93.3)
9	yes, consider yes, strongly consider/no, don't consider	69.2	L/R ^d (66.1/83.3)
14	no, don't consider yes, consider/no, don't consider	33.7	Ha/Hn ^g (25.4/37.8)
11 15	yes, consider yes, strongly consider/yes, consider	75.1	C/E ^c (84.1/72.1) N/W ^f (60.3/83.3) Ha/Hn ^g (62.3/81.4) HaP/HnP ^h (51.9/86.5) HaE/HnE ⁱ (65.5/79.0)
17	no, don't consider yes, consider/no, in no case	32.7	C/E ^c (18.2/35.6)
18	no, don't consider yes, consider/no, in no case	30.3	M/F ^a (36.5/22.5) W/N ^j (28.2/41.9)
19	no, don't consider no, don't consider/no, in no case	23.7	M/F ^a (30.5/13.8) L/R ^d (19.7/39.7) W/N ^j (19.8/41.9)

Table 5: Statistics on criteria of fairness

If there was a marked age difference between two patients, most respondents would opt for the younger one (no. 15 focused on two patients, one aged 25 and one aged 65). The acceptance of this criterion was weakest with 51.9% among the medical students from Halle.

The balance of organs exchanged and received between countries belonging to Eurotransplant should not be taken into account (no. 18) and patients from outside the Eurotransplant network should not be discriminated against according to the views of most respondents (no. 19).

3.5 Economic Aspects

Table 6 shows that trading (buying and selling) in organs was strongly rejected by almost all participants in the study (nos. 13, 29). That robbery of organs may occur was commonly feared (no. 30). In a different but still economic vein,

*Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

the costs of dialysis were also rejected as a criterion by most of the respondents (nos. 20, 21). We did not identify any group with a majority accepting such economic criteria.

No.	Median 1./3. Quartile	Yes* (%)	Groups Yes* (%)
13	no, in no case no, don't consider/no, in no case	9.2	P/E ^e (2.0/12.2) Ha/Hn ^g (4.4/11.5) HaP/HnP ^h (0.0/2.7) HaE/HnE ⁱ (5.7/15.7) W/N ^j (5.8/16.1)
21	no, don't consider yes, consider/no, in no case	31.7	R/N ^b (27.2/38.4)
29	strongly disagree disagree/strongly disagree	3.8	R/N ^b (1.9/6.3)
30	strongly agree strongly agree/agree	93.9	-

Table 6: Statistics on economic criteria

3.6 Additional aspects

Most respondents were of the opinion that decision making concerning human organs was a private matter of the potential donor (Table 7, nos. 24, 25). In particular, those who themselves were not willing to donate their organs emphasized that such decisions were not society's business.

The results on whether or not donating organs was a duty owed to other people (no. 27) were ambiguous. But most of the medical students and those who were willing to donate organs themselves expressed their assent to this statement.

*Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

No.	Median 1./3. Quartile	Yes* (%)	Groups Yes* (%)
24	disagree disagree/strongly disagree	9.5	M/F ^a (14.5/2.2) W/N ^j (11.3/1.6)
25	agree strongly agree/agree	76.6	P/E ^e (69.6/79.5) W/N ^j (72.2/93.5)
27	neutral agree/neutral	47.7	P/E ^e (57.4/43.6) W/N ^j (55.3/16.4)
28	agree strongly agree/disagree	66.0	P/E ^e (57.4/43.6) N/W ^f (74.6/62.3)
31	strongly disagree disagree/strongly disagree	0.9	P/E ^e (57.4/43.6) W/N ^j (0.4/3.3)
33	neutral agree/disagree	34.0	R/N ^b (27.8/42.7) P/E ^e (11.8/43.5) N/W ^f (44.2/24.6) W/N ^j (29.2/50.0)
34	disagree neutral/disagree	23.8	R/N ^b (18.1/32.1) C/E ^c (11.8/25.9) P/E ^e (6.9/30.9) N/W ^f (31.1/17.8) W/N ^j (18.8/41.9)

Table 7: Statistics on criteria of additional aspects

A majority subscribed to the view that the donation of organs had to be a completely disinterested act (no. 28). Almost nobody believed that donation of organs was an act against 'the natural order' (no. 31).

Moreover, most of the respondents did not believe that there was a danger of premature removal of organs for people with a donor card (nos. 33, 34). Despite that, a large proportion of the respondents who were not willing to donate an organ and those from the new German states as well as nonphysicians had no trust in this regard.

4. Results of the Cluster Analysis Characteristics

Table 8 shows those items which are significantly different between clusters *A*, *B* and *C*. The largest group was represented by cluster *A* with 132 members. Clusters *B* and *C* were of nearly equal size (100 vs. 107). Cluster *B* differed from the others in all three characteristics. Students of medicine, women and those with 'left-wing' political leanings were overrepresented in this cluster. Except for 9 outliers, all participants could be allocated to one of the clusters.

*Sum of the frequencies of all 'yes'-items; a: male/female, b: religious beliefs/no religious beliefs, c: Roman Catholics/Protestants, d: political 'left-wing' plus 'center'/'right', e: physician/economist, f: new German states/West German states, g: Halle/Hannover, h: physicians from Halle/physicians from Hannover, i: economists from Halle/economists from Hannover, j: willingness to donate organs/no willingness, k: patients are known/not known

	Cluster A		Cluster B		Cluster C	
	N	%	N	%	N	%
Respondents* (N=339)	132		100		107	
Course of studies						
Physicians	35	26.5	41	41.0	26	24.3
Economists	97	73.5	59	59.0	81	75.1
Sex						
Male	82	63.6	47	47.5	66	62.9
Female	47	36.4	52	52.5	39	37.1
Political attitudes						
Left	43	34.1	48	50.5	32	30.5
Center	48	38.1	33	34.7	46	43.8
Right	35	27.8	14	14.7	27	25.7

Table 8: Characteristics of the clusters**

4.1 Response Behavior

Medical criteria. With respect to medical criteria, we did not find any differences in responses. These criteria were widely accepted by each cluster.

Patient's value to society. Table 9 shows the significant differences between the three clusters with respect to criteria concerning the patient's value to society. As compared to the other two, cluster *C* is characterized by the greatest support for including criteria related to the patient's value to society. The differences between clusters *A* and *B* were only small.

No.	Cluster	Median 1./3. Quartile	Yes [†] (%)
11	A	yes, consider yes, consider/no, don't consider	52.3
	B	no, don't consider yes, consider/no, don't consider	41.4
	C	yes, consider yes, consider/no, don't consider	67.9
20	A	no, don't consider yes, consider/no, don't consider	42.4
	B	yes, consider yes, consider/no, don't consider	53.5
	C	yes, consider yes, strongly consider/no, don't consider	70.8

Table 9: Cluster statistics on criteria of patient's value

Reciprocity. Differences in the assessment of the relevance of reciprocity were rather marked (Table 10). Again, cluster *C* differed clearly from the other

*9 outliers were removed from the analysis.

**Only variables with significant differences between the three clusters are listed. (chi-square test, Prob. 0.05).

[†]Sum of the frequencies of all 'yes'-items

clusters. Giving priority of access to living donors (nos. 7, 32) and to patients who carry a donor card (nos. 8, 26) was much more acceptable to members of this group than to members of the other clusters. Moreover, 30.2% of those in *C* would give priority to former life savers.

Cluster B was special in that a majority of its members supported the view that murderers should not be discriminated against.

<i>No.</i>	<i>Cluster</i>	<i>Median 1./3. Quartile</i>	<i>Yes* (%)</i>
7	A	yes, consider yes, strongly consider/no, don't consider	62.1
	B	yes, consider yes, strongly consider/no, don't consider	66.0
	C	yes, strongly consider yes, very strongly consider/yes, strongly consider	92.4
8	A	no, don't consider no, don't consider/no, don't consider	24.2
	B	no, don't consider yes, consider/no, don't consider	32.0
	C	yes, consider yes, strongly consider/yes, consider	78.3
12	A	no, in no case no, don't consider/no, in no case	6.8
	B	no, don't consider no, don't consider/no, in no case	8.1
	C	no, don't consider yes, consider/no, don't consider	30.2
22	A	yes, strongly consider yes, very strongly consider/no, don't consider	70.5
	B	no, don't consider yes, consider/no, don't consider	39.2
	C	yes, strongly consider yes, very strongly consider/yes, consider	77.9
26	A	neutral agree/disagree	25.8
	B	disagree neutral/strongly disagree	8.2
	C	agree agree/neutral	57.0
32	A	neutral agree/disagree	35.4
	B	neutral agree/disagree	33.7
	C	agree strongly agree/neutral	84.8

Table 10: Cluster statistics on criteria of reciprocity

*Sum of the frequencies of all 'yes'-items

Fairness, equity, equality. The criterion of waiting time was widely accepted by members of all clusters. Table 11 shows that the respondents in cluster *B* showed the weakest support for criteria related to 'fairness', understood in broad terms. Except for the criterion of age (no. 15), a majority in *B* rejected all of them. The differences between clusters *A* and *C* were only minor.

No.	Cluster	Median 1./3. Quartile	Yes* (%)
9	A	yes, strongly consider yes, strongly consider/yes, consider	81.1
	B	no, don't consider yes, consider/no, don't consider	44.0
	C	yes, strongly consider yes, very strongly consider/yes, consider	77.4
14	A	no, don't consider yes, consider/no, don't consider	42.4
	B	no, don't consider no, don't consider/no, in no case	16.2
	C	no, don't consider yes, consider/no, don't consider	37.4
15	A	yes, strongly consider yes, strongly consider/yes, consider	82.6
	B	yes, consider yes, consider/no, don't consider	57.6
	C	yes, consider yes, strongly consider/yes, consider	82.9
17	A	no, don't consider yes, consider/no, in no case	32.3
	B	no, don't consider no, don't consider/no, in no case	9.3
	C	yes, consider yes, strongly consider/no, don't consider	52.3
18	A	no, don't consider yes, consider/no, in no case	28.8
	B	no, don't consider no, don't consider/no, in no case	11.1
	C	yes, consider yes, consider/no, don't consider	50.9
19	A	no, in no case no, don't consider/no, in no case	23.5
	B	no, don't consider no, don't consider/no, in no case	9.1
	C	no, don't consider yes, consider/no, don't consider	37.7

Table 11: Cluster statistics on criteria of fairness

Economic aspects. Though we could detect some differences between the three clusters with respect to economic criteria, we found no majority in any of

*Sum of the frequencies of all 'yes'-items

the clusters for any of those criteria (Table 12). Again, the members of cluster *C* differed significantly in their response behavior from the members of the other clusters.

<i>No.</i>	<i>Cluster</i>	<i>Median 1./3. Quartile</i>	<i>Yes* (%)</i>
13	A	no, in no case no, in no case/no, in no case	3.0
	B	no, in no case no, don't consider/no, in no case	5.0
	C	no, don't consider no, don't consider/no, in no case	15.9
21	A	no, don't consider no, don't consider/no, in no case	21.2
	B	no, don't consider yes, consider/no, in no case	34.3
	C	no, don't consider yes, consider/no, don't consider	40.2
29	A	strongly disagree disagree/strongly disagree	1.5
	B	strongly disagree strongly disagree/strongly disagree	1.0
	C	strongly disagree disagree/strongly disagree	6.6

Table 12: Cluster statistics on economic criteria

Additional aspects. In cluster *C*, and only in this one, no majority could be found subscribing to the statement that donation of organs had to be entirely without self-interest (Table 13, no. 28). This was well in line with the fact that the respondents in *C* strongly endorsed criteria of reciprocity. In cluster *B* individuals expressed the least fear that organs might be removed prematurely (no. 34). This is probably a consequence of the high share of medical students present in that cluster aspiring to become physicians.

*Sum of the frequencies of all 'yes'-items

<i>No.</i>	<i>Cluster</i>	<i>Median 1./3. Quartile</i>	<i>Yes* (%)</i>
24	A	disagree disagree/strongly disagree	12.1
	B	disagree disagree/strongly disagree	2.0
	C	disagree disagree/strongly disagree	12.1
28	A	strongly agree strongly agree/agree	78.8
	B	agree strongly agree/neutral	73.5
	C	neutral agree/neutral	45.7
34	A	disagree agree/disagree	25.2
	B	disagree neutral/strongly disagree	10.2
	C	neutral agree/neutral	29.9

Table 13: Cluster statistics on additional aspects

5. Summary

The results of our opinion poll show that medical criteria were very widely accepted. With respect to nonmedical criteria consensus was less strong. The criterion of waiting time gained the highest support among considerations of fairness. Considerations concerning the patient's value to society were of minor importance. With respect to reciprocity, we noted a high share of respondents who would favor living donors, but discriminate against murderers. Respondents who would give priority to patients with a donor card were in the clear minority, however. Some majorities wanted to take health-compromising behavior and age differences into account. This confirms the results of a study by Sears et al. (2000) who concluded that the public may give patients with health-compromising behavior, like smokers, less priority than others. Economic considerations were widely and strongly rejected. In particular, and quite unsurprisingly, we could confirm a result of the study by Sears et al. (2000), namely that a patient's ability to pay should not be considered.⁴

The cluster analysis partitioned our sample into three groups. The respondents in cluster *B* stressed mainly medical criteria and criteria of waiting time. All other criteria were rejected or regarded as being of minor importance. It comes as no surprise that many physicians belonged to cluster *B*.

*Sum of the frequencies of all 'yes'-items

⁴ Because of space constraints, we cannot comment in any detail on the complementary studies by Anand/Wailoo 2000 and by Schmid et al. 2000 that also focus on determining values in organ allocation, though with somewhat different foci.

Apparently, the respondents in clusters *A* and *C* did not view the allocation of organs as a purely medical problem. They would typically consider criteria other than waiting time and medical aspects, too, including such criteria as age and the potential recipient's responsibility for his or her own health status. The members of Cluster *A*, which was the largest group among the clusters, included several more criteria of fairness than the others. Cluster *C* could be distinguished from *B* especially by the high acceptance rate of criteria of reciprocity and of the patient's value to society. Cluster *C* supported criteria of fairness, too.

Comparing the results of the questionnaire with the criteria that are incorporated in the procedure used by Eurotransplant for allocating kidneys, we found considerable agreement. First, the dominant view among the participants in our study was that medical criteria like HLA-match, which have been central to the Eurotransplant allocation procedure from its beginnings, should indeed play a crucial role in organ allocation. Second, which is again in full agreement with reformed Eurotransplant practice, the waiting time of a person was seen to be the most important individual criterion of fairness. Third, special rules for treating children and elderly patients, as considered by Eurotransplant, were deemed acceptable by students as well. Moreover, there was a broad rejection of purely economic considerations, which, again, is in line with the practice of Eurotransplant and the views formulated by the WHO.

Differences can be observed with respect to the criteria of regional and international input-output balances. These are included in the Eurotransplant algorithm, but students rejected 'collective' reciprocity as a criterion of organ allocation. At the same time, the participants in our questionnaire study were willing to view favorably considerations of interindividual reciprocity. However, they did not support a 'do ut des' priority model in which a person's registered willingness to donate an organ would lead to preferential treatment as a potential recipient (in that sense some of the views expressed in Gubernatis/Kliemt 2000 are refuted).

Though most of the participants in our questionnaire study expressed in one way or another that human organs should be allocated by attaching weight primarily to medical criteria, some also insisted that organs should not be allocated exclusively on that basis. According to the views expressed in the study—in addition to medical criteria, reciprocity like the priority for living donors—the discrimination against murderers and criteria of fairness like discrimination against health-compromising behavior and age should be taken into account to some extent.

In sum, our results are in conflict with the aforementioned ninth principle formulated by the WHO and with for instance German law, both requiring that organs be allocated exclusively according to medical criteria. The principles of collective reciprocity regional and national balances as included in the present practice of Eurotransplant, were rejected. But other than that, the present practice of Eurotransplant was strongly supported by the views of the participants in our study. In terms of rendering Eurotransplant even more acceptable to the general public, the present nonmedical criteria of collective reciprocity would have to be eliminated and perhaps some criteria of interindividual reciprocity be

included, though certainly not the criterion of a registered willingness to donate prior to a potential transplant.

Appendix: Questionnaire on Criteria for Organ Allocation

In recent years, organ transplants have proved very successful in medical treatment. As transplants are not available in sufficient numbers, they have to be allocated according to specific criteria. Below, a number of different conceivable criteria for organ allocation will be briefly explained to you. These include the histocompatibility of donor organ and recipient, which is crucial for the potential survival time of the transplanted organ, the waiting time of the recipient, the recipient's (healthy or unhealthy) behavior, his or her family commitments, the recipient's own willingness to become a donor, economic aspects, etc.

It is important for us to know whether or not, in your opinion, a specific criterion should be considered when choosing the recipient of a donated kidney. In answering the various questions, please think of potential recipients who may not differ, or differ only slightly, for any of the other criteria. Ask yourself whether and to what extent the criterion in question should be considered when making a decision and tick the appropriate box.

1. The waiting times of potential recipients of organs vary considerably in some instances. Should waiting time be considered favorably when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

2. The period of time a transplanted kidney keeps working properly depends, among other things, on the histocompatibility between recipient and organ. Should the expected survival time of the graft be considered favorably when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

3. Some recipients of organs experience a substantial improvement in their general condition. Should the anticipated improvement in their general state of health be considered favorably when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

4. Should the risk of serious, irreversible damage in case of continued dialysis be considered when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

5. Patients' coping with dialysis differs for every patient. Assume the extent of individual suffering can be ascertained by psychological tests. Should the extent of psychical suffering be considered when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

6. Owing to rare genetic characteristics of some patients, suitable organs are hard to find. In case a suitable organ becomes available for such a recipient, should this aspect be considered?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

7. Some patients have, as living donors, donated a kidney to a relative or friend and later lost their remaining kidney. Should the fact of a person having been a living donor be considered when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

8. Some patients were willing to donate an organ before they became acutely ill. Should their registered willingness to donate an organ be considered?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

9. Some patients in need of a transplant have been instrumental in bringing about their condition, for example by hazardous activities or an abuse of medication or drugs. Should their coresponsibility be considered unfavorably?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

10. Some patients fulfill a generally acknowledged, important social function. Should the aspect of a patient's value to society be considered when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

11. Some patients care for others, for example children or parents in need of care. Should such caregiving be considered when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

12. When someone, by an action that is completely unrelated to the donation of organs, has saved somebody else's life, should this fact be considered in organ allocation?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

13. Some patients would be willing to make a significant donation to charity if they can thereby increase their chances of being allocated an organ. Should donations to charity be considered favorably when choosing a recipient?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

14. In the area of kidney transplants there are many patients who have already received an organ, but have gone back on dialysis. Should the fact of a retransplant be considered unfavorably?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

15. If there are two equally suitable recipients, one 25, the other 65 years old, should lower age be considered?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

16. Children receiving dialysis are liable to suffer from serious developmental disorders. Should the fact that a patient is still in a process of physical development be considered?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

17. Should the fact that someone's religion precludes them from donating an organ be considered unfavorably in organ allocation?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

18. In the Eurotransplant network several European countries cooperate to enable the allocation of organs according to a combined waiting list. Should the fact that, in the past, one country has donated more organs than it received be considered favorably in the allocation of organs to recipients of this particular country?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

19. Should the fact that a patient is not a resident of a country that cooperates in the Eurotransplant network be considered unfavorably in organ allocation?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

20. Because of dialysis treatment, many patients cannot continue with their normal working life. Should the fact that a transplant would restore their ability to work be considered favorably?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

21. The medical costs incurred by dialysis and subsequent treatment vary from patient to patient. Should this fact be considered?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

22. Should the fact that a potential recipient of an organ has committed a murder be considered unfavorably in organ allocation?

yes, very strongly yes, strongly yes no, don't consider no, in no case
☐ ☐ ☐ ☐ ☐

23. Have any criteria you think important been insufficiently dealt with or omitted from the above questionnaire? If so, please write these down and give a brief description, as appropriate. What do you think about these statements? Do you agree or disagree?

24. After the death of a patient his or her organs become common property, and only society is authorized to decide what is to be done with them!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

25. My organs are mine and whatever I decide about their use is no concern to society!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

26. A person not willing to donate an organ has to wait longer for an allocation!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

27. The willingness to donate an organ is a duty owed to other people!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

28. The donation of an organ should always be a selfless act!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

29. To increase the availability of organs, they should be freely marketable!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

30. Trading in organs must be prevented at all cost since otherwise there will be a risk of organ robbery!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

31. Transplantation medicine constitutes such a serious violation of the natural order that we should dispense with it!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

32. A living donor should be given priority in case he or she needs a transplant!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

33. There is a grave risk that organs may be removed prematurely, before the patient is deceased.

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

34. The person carrying a donor card must be afraid that doctors will be more interested in his or her organs than in saving his or her life!

I strongly agree agree neutral disagree strongly disagree
☐ ☐ ☐ ☐ ☐

Decisionmaking Scenarios Part 1

Below, six scenarios will be described. For each scenario you have to decide which out of three patients should receive a kidney that is available for transplant. The patients are A, B and C. For the purpose of organ allocation, they show two characteristics:

Characteristic 1: histocompatibility

Histocompatibility between patient and donated kidney is defined by the number of matching antigen groups (HLA matches). Figures 0 to 6 are possible. 6 is optimal as it indicates that all 6 antigen groups match; 0 is the least optimal as it indicates that no antigen group matches. The more matches there are, the greater is the potential survival time of an organ. The percentage rate of kidneys still functioning after five years is as follows:

- 6 matches ca. 75%
- 5 matches ca. 70%
- 3 matches ca. 65%

Less than 3 matches change the negative trend only marginally.

According to the current state of medical treatment on average only 50% of transplanted kidneys are still functioning after ten years.

Characteristic 2: waiting time of patients

Patients A, B and C have been waiting for a kidney transplant for different periods of time. Waiting time spent by patients since the beginning of dialysis is counted in years.

The following table shows different combinations of histocompatibility and waiting time. Please decide which patient should, in your opinion, receive a kidney and tick the appropriate box:

	1 tick per scenario	patient	HLA matches in figures	waiting time in years
Scenario 1	<input type="checkbox"/>	A	5	2
	<input type="checkbox"/>	B	3	6
	<input type="checkbox"/>	C	4	4
Scenario 2	<input type="checkbox"/>	A	6	1
	<input type="checkbox"/>	B	3	3
	<input type="checkbox"/>	C	0	2
Scenario 3	<input type="checkbox"/>	A	5	2
	<input type="checkbox"/>	B	4	4
	<input type="checkbox"/>	C	2	8
Scenario 4	<input type="checkbox"/>	A	4	4
	<input type="checkbox"/>	B	2	8
	<input type="checkbox"/>	C	3	6
Scenario 5	<input type="checkbox"/>	A	0	4
	<input type="checkbox"/>	B	6	1
	<input type="checkbox"/>	C	4	2
Scenario 6	<input type="checkbox"/>	A	5	2
	<input type="checkbox"/>	B	3	6
	<input type="checkbox"/>	C	2	8

Decisionmaking Scenarios Part 2

Below, six scenarios will be described. For each scenario you have to decide which out of two patients should receive a kidney that is available for transplant. The patients are A and B and show three characteristics:

Characteristic 1: histocompatibility

Histocompatibility between patient and donated kidney is defined by the number of matching antigen groups (HLA matches). Figures 0 to 6 are possible. 6 is optimal as it indicates that all 6 antigen groups match; 0 is the least optimal as it indicates that no antigen group matches. The more matches there are, the greater is the potential survival time of an organ. The percentage rate of kidneys still functioning after five years is as follows:

- 6 matches ca. 70%
- 5 matches ca. 60%
- 3 matches ca. 55%

Less than 3 matches change the negative trend only marginally.

For the potential survival time of the organ some additional factors are important, however, such as the general condition of recipient and donor, the so-called cold ischemia time (when the organ was not supplied with blood before trans-

plantation), etc. According to the current state of medical treatment on average only 50% of transplanted kidneys are still functioning after 10 years.

Characteristic 2: waiting time of patients

Patients A, B and C have been waiting for a kidney transplant for different periods of time. Waiting time spent by patients since the beginning of dialysis is counted in years.

Characteristic 3: individual willingness to donate an organ

It will be indicated whether a patient, before the beginning of his or her illness, declared his or her willingness to become a donor after death.

Please decide which patients should, in your opinion, receive a kidney and tick the appropriate box:

	1 tick per scenario	patient	HLA matches in figures	willingness to donate an organ
Scenario 1	<input type="checkbox"/>	A	4	yes
	<input type="checkbox"/>	B	2	yes
Scenario 2	<input type="checkbox"/>	A	3	yes
	<input type="checkbox"/>	B	5	yes
Scenario 3	<input type="checkbox"/>	A	0	yes
	<input type="checkbox"/>	B	6	yes
Scenario 4	<input type="checkbox"/>	A	5	no
	<input type="checkbox"/>	B	3	no
Scenario 5	<input type="checkbox"/>	A	6	no
	<input type="checkbox"/>	B	0	no
Scenario 6	<input type="checkbox"/>	B	3	no
	<input type="checkbox"/>	C	2	no

Profiling Questions

In conclusion we would like to ask you some personal questions:

1. How old are you?years
2. Sex? m/f
3. Did you work before you went to university?
 - ☐ did not work
 - ☐ worked fulltime as
 - ☐ worked parttime as
 - ☐ other, please indicate

4. Where did you obtain your qualification for higher education?
☐ in the former GDR ☐ in the former FRG ☐ in a foreign country, please indicate
5. Do you affiliate with a religious community?
☐ Roman Catholic ☐ Protestant
☐ Muslim ☐ none
☐ other, please indicate
6. How would you describe your political leanings?
 left ☐ – ☐ – ☐ – ☐ – ☐ – ☐ – ☐ right
7. Do you know someone receiving dialysis treatment or who has undergone a kidney transplantation?
☐ yes, in my family ☐ yes, in my circle of friends and people I know ☐ yes, but don't know that person very well ☐ no
8. Would you be willing to donate an organ when you die?
☐ yes, I have a donor card ☐ yes, but I don't have a donor card ☐ probably yes
☐ probably no ☐ no, definitely not

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