9. Allocating Organs
Fairness, Transparency, and Responsibility

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1. Introduction

Since organ transplantation was first developed as a treatment option for organ failure there has been a mismatch between the number of patients needing organs and the number of organs available (Gain et al. 2016).[1] This mismatch has persisted over time and is a feature of all organ transplant systems irrespective of their consent model – opt-in, opt-out or mandatory choice (see chapter 2 in this book) – and irrespective of whether the system allows monetary compensation to organ donors or the families of dead donors. The mismatch is likely to increase as the indications for organ transplants continue to widen and bridging technologies become available which enable very ill patients to be stabilized and maintained while they wait for a transplant. This means that organs are a scarce, non-fungible resource and that allocation decisions have to be made concerning which of the many patients who need an organ should have priority when an organ becomes available. For life-saving organs, allocation decisions will inevitably mean that some patients receive organs and have their life extended, whereas others never receive an organ and die as a result of organ failure.

The difficulty determining an ethically justifiable way of allocating organs has generated a huge literature, and I don't pretend to present any new and truly original arguments in this chapter or to reference every important source on the topic. Every conceivable argument will already have been suggested, discussed and criticized somewhere in the literature (for an overview of the various arguments in the literature, see articles by Childress (1987, 1989, 2001) and Gutmann and Land (1997)). Nevertheless, there is value in providing a systematic account of the arguments and their ethical and pragmatic strengths and weaknesses.[2] While this may not allow us to design the

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[1] Bone marrow transplantation is also a form of organ donation, but issues about the allocation of bone marrow transplants fall outside the scope of this chapter because 1) bone marrow donation is almost always live donation, 2) bone marrow is a renewable resource, and 3) the scarcity in bone marrow availability is primarily due to problems in identifying a suitable donor and not due to the in principle unavailability of a donor.

[2] A 'systematic account' here means an account based on a reasonably comprehensive review of the literature on the allocation of organs for transplant leading to a list of proposed, discussed and/or

perfect system of organ allocation, it will allow us to reject some suggested allocation criteria as unsustainable, identify the limitations of other criteria, and therefore narrow the area in which to search for a justifiable and defensible set of allocation criteria. As Calabresi and Bobbitt wrote more than 40 years ago in *Tragic Choices*, their seminal book on kidney dialysis and transplants, this chapter does not seek "to resolve tragic choices by means of discoveries of new methods, but to make it possible for us to get a clearer view of the state of affairs that troubles us" (1978: 195). Similarly, Childress writes:

> There is, I believe, a wide range of ethically acceptable policies, at least in principle; which policies should have priority will depend on considerations of ethical preferability and political feasibility. Excluding policies that would seriously violate fundamental ethical principles, society still has to choose policies that best express the whole constellation of ethical principles, including ideals, and that can actually be implemented. (1987: 86)

It is also important to note that the design and implementation of an organ allocation scheme in a particular country or region will inevitably be influenced by the basic structure of the health care system, and by the more general approach taken to allocation of health care resources and social resources in general in that system. When people decide to become organ donors in a well-governed health care system they decide to interact with an organ donation and transplant system, except in the relatively rare cases of directed living donation. Organ donation takes place in a complex network involving the potential donor, the recipient, the system, and the health care professionals in the system (Jonsen 2012). This means that the decisions people make to become donors, or to allow organ retrieval from their dead relatives, at least partly rely on their perception of the system and not only on their desire to help other people. A person who perceives the system as unjust or corrupt is probably less likely to become or remain a donor. This link between trust in the system and willingness to donate is also evidenced in a recent meta-synthesis of the qualitative literature on this topic (Shaw et al. 2013; Schwettman 2015). The system may also be seen as an embodiment of solidarity and notions of reciprocity, where people are willing to donate because they or their loved ones may at some point need an organ. If that is part of the motivation, discovering that the system is deliberately subverted and exploited by some actors may also undermine willingness to donate (Boulware 2007). Thus, as a precondition for maximizing donations, it is vital not only that the allocation system and its processes are fair, but also that they are seen to be fair by the population of potential donors. Perceptions of fairness may differ between different countries and health care systems. In some circumstances establishing robust, un-corruptible allocation processes may be more important than getting the allocation criteria absolutely right. The establishment of officially mandated and supported donation and transplant systems also means that transplantable organs become a social good. The system organizes and governs the transactions between donors, health care institutions and recipients on

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actually used allocation considerations and criteria that can be ordered under and encompassed by a reasonably small number of headings, i.e. the list of allocative criteria presented in the section on 'allocative criteria'.

behalf of the community, and not as a set of commercial exchanges (Task Force on Organ Transplantation 1986). This entails that the generally accepted principles for the allocation of social goods apply prima facie to the allocation of organs, unless there are specific reasons to deviate from them.

2. Allocative Criteria

Allocation of organs is in practice achieved through waiting list systems, where potential recipients for an organ are ranked according to a set of criteria. Some of the criteria are specific to the particular organ to be transplanted – e.g. size matters for paediatric transplantation of some organs, and immunological match matters for many – and some criteria are not specific to the organ but to the patient / recipient, such as time on the waiting list, or the urgency of the transplant need. Several criteria may be combined into one overall score to determine priority on the waiting list. For instance, the Lung Allocation Score (LAS), developed by the US Organ Procurement and Transplantation Network, is used both in the US and by Eurotransplant in Europe[3] to allocate lung transplants (OPTN 2020, Eurotransplant 2020). The LAS calculation looks simple:

> 10.1.F The LAS Calculation
> The LAS calculation uses all of the following measures:
> Waiting List Urgency Measure, which is the expected number of days a candidate will live without a transplant during an additional year on the waiting list.
> Post-transplant Survival Measure, which is the expected number of days a candidate will live during the first year post-transplant.
> Transplant Benefit Measure, which is the difference between the Post-transplant Survival Measure and the Waiting List Urgency Measure.
> Raw Allocation Score, which is the difference between Transplant Benefit Measure and Waiting List Urgency Measure.
> To determine a candidate's LAS, the Raw Allocation Score is normalized to a continuous scale of zero to 100.
> The equation for the LAS calculation is:
> LAS = 100*(PTAUC -2*WTAUC+730) / 1095 (OPTN 2020: 220)

However, this apparent simplicity is deceptive. The above LAS formula is followed by 30 pages of instructions on how to calculate the PTAUC and the WTAUC based on a long list of clinical information including: Date of birth, Lung diagnosis, Height and Weight, Diabetes, Supplemental oxygen requirement, Six minute walk distance (6MWT), Pulmonary artery systolic pressure, Pulmonary artery mean pressure, Forced vital capacity, Serum creatinine, Mean pulmonary capillary wedge pressure, Functional status, Need for assisted ventilation, Current lowest and highest PCO2, Bilirubin, Duration of ventilation, Coagulopathy, Extracorporeal support, and 6MWT*end-saturation (cp. Eurotransplant 2020).

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[3] Covering Austria, Belgium, Croatia, Germany, Hungary, Luxembourg, Slovenia, and The Netherlands.

A number of what we may call recipient-related allocative criteria have been discussed in the literature, although not all of these have ever been implemented in any officially adopted allocation system. The criteria can be broadly categorized as:

1	Medically related Criteria
a)	Medical Need
b)	Likelihood of Match
c)	Magnitude of Likely Medical Benefit
d)	Responsibility for Health State
2	Social Criteria
a)	Social Need
b)	Desert / Social Merit
c)	Future Social Contribution
d)	Time on Waiting List
e)	Wider Social Justice Issues
f)	Local or National Preference

Table 1: Recipient-related allocative criteria in organ donation

Many of the social criteria, apart from 'time on waiting list' and 'national preference,' were proposed and discussed early in the history of organ transplantation but have since fallen out of favour (Annas 1985). In the following, we will analyse the arguments for and against each of these criteria, and the problems in operationalizing them when moving from direct comparisons between a small number of potential recipients to a system that may have to allocate one organ within a pool of thousands of possible recipients.

2.1 Medical Criteria

The perhaps most intuitively appealing criterion is medical need. It seems prima facie obvious that we should allocate an available organ to the patient who has the greatest medical need, or at the very least that need should play a major role in our allocation decisions. Need is, however, not a simple concept, even if we restrict it to 'medical need'. The size of the medical need for an organ has at least two separable elements: 1) the severity of the current health state, and 2) the urgency of the transplant. That these may diverge can be seen if we consider a situation in which one patient is in a very bad, but stable, health state, while another patient is in a less serious health state now, but has the prognosis of an imminent deterioration leading to death. The first patient has a large need and therefore a strong claim to an organ even if that health state is currently stable, but so does the second patient, who needs the transplant urgently. The grounding of their need is just different. If we prioritize urgency too much, then stable but very ill patients will have difficulty getting transplants, and if we do not prioritize urgency enough, more people will die while on the waiting list.

Prioritization of urgency is illustrated in the rules for allocation of livers of Scandiatransplant, the transplant allocation organization for the Nordic countries and Estonia. These rules identify a class of 'High urgent calls' and specify that any available, suitable liver must be allocated to those patients: High urgent call (HU)

- An acute liver failure patient who is at a risk to die within few days (no prior liver disease)
- Need for re-transplantation within 2 weeks after transplantation (includes primary nonfunctioning graft)
- If several HU calls exist at the same time, the first one has priority over later HU call. This is also true if the second centre has a local donor
- Within 72 hours after HU call, every centre has an obligation to offer available livers for the recipient centre
- The first available donor liver with compatible AB0 blood group must be offered to recipients on HU call. (Scandiatransplant 2017a: 225)

A third, partly separable component of need is the availability of alternatives. In some circumstances an organ transplant it the best option for a patient, i.e. a kidney transplant is the best treatment option for many patients currently on dialysis, but there is at least one alternative, i.e. in this example staying on dialysis. Given the scarcity of organs we could argue that alternatives should always be pursued first, and that only patients for whom there are (no longer) any alternatives should be allocated an organ. But, such a policy is potentially counterproductive, because those patients who have run out of other options, e.g. dialysis or left ventricular assist devices, are likely to be much more ill than those who are stable on an alternative treatment, and therefore less likely to benefit from a transplant. There is also a considerable overlap between not having any other options and urgency. The likelihood of finding a matching organ for a particular recipient depends not only on the characteristics of the donor pool, but also on the degree to which a potential recipient has been immunologically sensitized to other tissue types than his or her own. Such sensitization can come about if the patient has had prior blood transfusions, previous transplants, or in some cases as a result of pregnancy and childbirth. The more tissue types a patient is sensitized to, the fewer organs will be a possible match for that patient. Highly sensitized patients may thus be 'stuck on the waiting list' indefinitely unless they get priority whenever an organ that matches their sensitization pattern becomes available. The magnitude of the likely medical benefit has traditionally been very important in the allocation of organs because long-term organ survival can only be achieved if the organ is not immunologically rejected by the recipient's body. Immunosuppression was not very advanced in the early days of organ transplantation, meaning that the tissue-type match between the donor organ and recipient was a very important factor in predicting organ survival and thus medical benefit. As immunosuppression methods have improved, the tissue-type match has become less important, and this has meant that other factors that may influence the medical benefit have become more prominent in discussions about allocative criteria, e.g. age, co-morbidity, ability to adhere to future treatment etc. Some of these other factors are potentially controversial because they may be seen to involve some form of problematic discrimination. For example, using age as a criterion for priority may be seen as ageist (on the general issue of using age as a resource allocation criterion, see Daniels 1988; Harris 1994; Callahan 1995; Williams 1997; Holm 2013; and chapter 12 in this book). Ability to adhere to future treatment is also a potentially problematic criterion: partly because it is not obvious how to assess this objectively; partly because some factors that might influence this ability, such as having cognitive deficits or being homeless, do not seem like the kind of conditions that should affect a person's claim to treatment for an important health need. One version of the ability-to-adhere argument focuses on persons whose behaviour have contributed to their current health state, and where the likelihood of long-term transplant success will be affected if they continue to behave in the same way. It is argued that such patients should be given lower priority, or not put on the waiting list at all, unless they cease their problematic behavior and there is some evidence that they won't start again. This argument is forward-looking: it does not justify lower priority because previous behaviour led to the transplant need, but because future similar behaviour would affect the likelihood of long-term medical benefit. This was for instance discussed in relation to the famous Manchester United and Northern Ireland footballer George Best, who received a liver transplant following liver failure caused by alcoholic liver cirrhosis. He was only put on the waiting list for a transplant after he became abstinent, but the media queried whether he would (or could) remain abstinent after the transplant (Murnane 2015). A possible consistency problem affects this kind of reasoning, because we do not seem to apply it across the board in health care (Douglas 2017). Playing many kinds of sports at elite level is a strong risk factor for ligament damage in the knee, and continuing to play at elite level after ligament surgery is an even stronger risk factor for a recurrence. However, we do not normally make it a condition of access to surgery that elite athletes give up their sport. It is important to distinguish this argument from the notion that a potential recipient's personal responsibility for being in a health state that requires an organ transplant reduces the strength of their claim to an organ. According to the latter argument, for instance, patients with alcoholic liver cirrhosis should have a lower priority on the waiting list for liver transplants, or should perhaps not be put on the waiting list at all. The patient who is deemed to carry some personal responsibility is often compared unfavourably to the 'innocent victim of disease'. In its pure form the personal responsibility argument is exclusively backward-looking, in contrast to the forward-looking ability-to-adhere argument. The argument has some intuitive appeal, but on closer inspection it is highly problematic. There are three main problems. The first two are deeply philosophical: we must first decide which kind of responsibility is relevant – causal responsibility, moral responsibility, or blameworthiness (see Holm 2008); then, we must decide how to apportion the relevant degree of responsibility or blame across a diverse range of actions, habits and lifestyles that have led to the need for a transplant. Where some are single, clearly autonomous acts, some may involve addiction or weakness of will (Douglas 2017), and some are lifestyles or habits formed either early in life and/or are common in the environment the person lives in.

Neither of these are trivial problems, since the causal networks leading to the final health state are often highly complex. The third problem is most often raised as a charge of arbitrariness: Why single out behaviour X as a case of personal responsibility leading to lower priority, when behaviours Y, Z etc. also generate bad health states and need for treatment? This charge can be general, or specific to organ transplants, and it is often supported by the observation that the behaviours that are singled out, such as alcohol abuse, smoking, or a sedentary lifestyle, are all to some degree already socially stigmatized.

2.2 Social Criteria

Social need, desert, merit and future social contribution have all been proposed as allocative criteria. Here, the idea is that we should, for instance, give (some) priority to patients who have many dependants, who have made a significant social contribution for which they deserve credit, or who are likely to make major contributions in the future. These proposals are problematic, partly because we usually do not apply them in other areas of health care, and partly because it is nearly impossible to define fair and non-arbitrary criteria for which social contributions should count as meritorious in this context. While we might be able to identify slackers who have contributed very little to anything, there is no simple metric by which we can compare entrepreneurial, sporting, political, homemaking and other prima facie valuable social contributions and decide who is most deserving overall. A particular type of the desert/merit/contribution argument focuses narrowly on contributions to the organ donation and transplant system itself. One version focuses on actual contribution and argues that persons who have been living donors should have priority on the waiting list if they ever need an organ. This seems straightforward: living donors have contributed significantly and have a legitimate expectation that society reciprocates in some way. But there are still issues that need to be resolved, especially in relation to whether having been a donor of one organ or part of an organ should give priority on all transplant lists, or just the list for the organ in question. I.e. should a live liver-lobe donor only have priority in relations to livers, or also in relation to kidneys, hearts etc.? Restricting priority to only the organ in question may seem natural, but it does require justification. One possible argument is that, by becoming a donor, the person has given up a good organ which could have saved them from needing the organ later, but this argument only works for paired organs and not if the condition leading to the need for a transplant would have affected both paired organs, as many conditions leading to kidney failure do. Thus, in many cases the donor who is now a potential recipient would still need a transplant even if they had not donated. Therefore, basing priority on the willingness to make a significant sacrifice for others would seem like a more solid argument, and that points towards priority on all waiting lists. Another version argues that persons who are merely willing to donate should get priority over persons who are not willing to donate. In practical terms this might mean that being on the donor register gives a person priority. This can be justified from considerations of reciprocity or solidarity, or as a way to deter 'free-riders' who are happy to accept the benefits of the social practice of donation and transplantation but not willing to contribute. Israel has implemented such a system, which gives priority not only to the willing donor but also to their family members (Quigley et al. 2012; Lavee/Brock 2012). Clearly, being willing to contribute as a donor at least potentially contributes to maintaining an effective donation and transplant system, so it is not directly affected by the relevance and arbitrariness concerns that undermine general merit and social contribution proposals. It is, however, affected by what is in some way the reverse problem: why single out this contribution among the many relevant contributions to the system. Signing up to the organ donor registry is not particularly onerous, and donating after death does not affect the donor's welfare, so the 'cost' to the donor is low, although the benefit to the recipient is large.[4] What is relevant to the donor's claim to priority is what they are willing to, or actually do, give up, and that is not much. Blood donors, tax payers, donors to relevant health charities, volunteers in the hospital and many others also contribute directly, and not as employees, to the possibility of having a donation and transplantation system, physically or financially or both; and some of these contributions are more burdensome than being on the donor register. So, why should they not count towards priority in organ allocation? The policy of also giving priority to family members of potential donors raises issues of justice. Why should those who do not have family members have their priority reduced? Giving priority to family members of potential donors also encourages strategic behaviour by those who have family members who can be predicted to potentially need an organ transplant in the future (Quigley et al. 2012; Lavee/Brock 2012).Time on the waiting list could be conceptualized as a medical criterion by making it a component of medical need. Just as your need increases if it is urgent, it increases if you have had to wait a long time and suffer the consequences of that wait. It is, however, perhaps more straightforward to see time on the waiting list as a social criterion, reflecting the view that society ought to (be able to) treat people at the point where their health needs occur. If society cannot provide treatment when a patient needs it and the patient has to go on a waiting list the strength of the claim to be provided treatment increases vis a vis society as time goes by and treatment is still not provided, and the comparative strength of the claim vis a vis other patients with a need for a transplant increases in the same way. This is supported by the intuitive appeal of the idea that if we have two identical patients on the waiting list and one has waited much longer than the other we should give an available organ to the patient who has waited the longest. If we accept this argument and give extra priority according to time on the waiting list, we need to be aware that there is some evidence that the decision concerning when to put a particular patient on the waiting list for a transplant may be potentially biased. It has, for instance been shown that white patients in dialysis are put on the waiting list earlier and more frequently than black patients in the USA. This has led the US Organ Procurement and Transplantation Network to move from time on waiting list to time in dialysis as the relevant criterion for priority for a kidney transplant (Zhang et al. 2018). Wider social justice issues are also potentially important when deciding on allocative criteria. If we find that a particular set of criteria lead to an unequal distribution of organs between age groups (where age does not affect outcome), ethnic groups, socioeconomic groups, or geographically defined groups etc. it raises the question whether these inequalities also constitute an injustice that should be rectified, and if so how rectification should be achieved. Organs for transplant are a social good distributed by official societal agents (see above); and if we have good reasons to think that equality in distribution is in general important between a specific set of groups, then those reasons transfer to distribution and allocation of organs. Some unequal distributions are at least partially explainable by differences in organ donation. In many countries there are, for instance differences in donation rates between different ethnic groups. Because tissue types are distributed differently in different ethnic groups, this may lead to a difficulty in

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[4] There may be costs to the family in that the hospital processes around the death of a known organ donor differs from the processes where organ donation is not taking place, but a lot can and should be done to minimize these differences.

finding well matched organs for potential recipients in those groups. But it is important to see that such group differences in donation rates cannot in themselves justify group differences in transplantation rates. Being a member of a group with a low donation rate does not affect the claim to equal treatment a patient would have as a citizen and eligible beneficiary of a health care system. Even if the low donation rate in the group is due to wilful refusal to donate and therefore ethically problematic, an individual member of the group would not be responsible for how other group members acted. This does not mean that we should not target group differences in donation rates and try to raise donation rates.[5] If group inequalities do exist, it may be necessary in some cases to change the weighting of the allocation criteria that gives rise to the differences. There is also strong evidence from the USA that the differences in transplantation rates between ethnic groups have many other and more problematic causes. This evidence is summarized by Zhang et al. in relation to kidney transplants:

> […] there are racial and ethnic disparities at each step of the kidney transplant process. Black patients are less likely to be referred for transplant, complete the evaluation process if referred, be placed on the waiting list, and receive a transplant compared to white patients. In addition, Hispanics have historically had lower transplant rates after waitlisting. Disparities are the result of many potential factors, such as poverty, geography, limited education about transplant, physician bias, and other system-level factors, such as federal policies that guide US organ allocation. (2018: 1937, references in original removed)

Similar problems can be found in many other countries and localities, including the UK (Davies 2006). Donation and transplant systems are almost always geographically bounded, and most often the boundaries follow existing internal or international boundaries. This raises the question of the eligibility for organ allocation of recipients who do not reside within the boundaries of the system. If the system retrieves organs exclusively[6] from those who are resident, should it also allocate them exclusively to residents? If organs are unsuitable for anyone on the 'residents' waiting list', they should clearly not be wasted but offered to neighbouring systems or to non-residents – but that is the easy case where nothing is sacrificed by allocating the organ to a non-resident. The difficult questions are: 1) whether non-residents should be allowed on the waiting list for organs; and if so, 2) whether they should receive the same priority as residents? The organ allocation system in the USA originally implemented a rule that only five per cent of available organs from dead donors could be used for transplantation of non-residents, but this hard limit has since been replaced by the publication of an annual report on residence and citizenship status of recipients. In the first 19 months of operation of the new policy, less than one per cent of organs from dead donors were transplanted into non-resident recipients (Glazier et al. 2014).

From a cosmopolitan point of view, residence should not matter, and we should probably in principle introduce a global donation and transplant system. But this is unlikely to happen any time soon, so we will have to answer the question for the

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[5] In all groups, as long as we have a scarcity of organs.

[6] The rare organ may be retrieved from a tourist riding a motorcycle without a helmet, but for all practical purposes the donor pool comprises those who are ordinarily resident.

present context with multiple geographically bounded systems. The limited time an explanted organ can be kept viable for transplant will set practical limits on the possible geographical extension of organ sharing schemes, but these geographical time, and by implication distance, limits will not be co-extensive with national or regional borders. The question of the ethical relevance of national or regional borders therefore remains. On the one hand, this is a question of political philosophy; on the other hand, a matter of pragmatism.

Let us take the pragmatic argument first: if a large proportion of donated organs are allocated to non-residents this may undermine the willingness to donate, especially if these non-residents pay large amounts of money for the transplants and thereby enrich health care institutions and famous surgeons. If there is evidence that this is, or is likely to become, the case, there is an argument for controlling the access of non-residents to organ transplants. The argument in political philosophy concerns which of the many social goods a society/state distributes that can be legitimately restricted to the residents of that society (Cohen 2014). This question is still unresolved and subject to fundamental disagreements.In international transplant organizations, issues of justice may also arise if some member countries become net exporters of organs, and others net importers. This may undermine the support for the scheme over time, and some schemes have implemented 'payback' rules to mitigate these issues. An example is the payback scheme for livers in Scandiatransplant. Here, the center retrieving the organ must allocate it to patients elsewhere if they meet certain criteria, but it is guaranteed later payback in the form of an organ of a similar, specified quality. If the criteria for required export are fulfilled and the organ is exported, the following rule applies: "The organ is accepted and exported. Payback with first available AB0 identical liver, quality according to written rules." (Scandiatransplant 2017b)

2.3 Are all Justifiable Allocation Criteria Compossible?

If more than one criterion is justifiably relevant to allocative decisions, the question arises whether the multiple criteria are compossible. Can we design a decision-making system which ensures that they are all fully satisfied at the same time, or will there necessarily be trade-offs between the criteria, so that not all are fully met? This has been discussed in relation to the criteria of medical need, likely medical benefit, time on waiting list, and wider social justice. Focusing only on the maximization of likely medical benefit as the basis for allocation will provide the biggest 'bang for the buck,' but it seems unfair in several respects (for other problems in pursuing this goal see Birch/Gafni 2006). Transplanting patients with urgent need, or larger needs because of co-morbidity, will often mean trading off some likely benefit because the success of the transplant is more uncertain. But these patients seem to have as strong a prima facie claim to an organ as any other patients, and potentially a stronger claim if they are unlikely to survive long enough to receive an organ in the future. Similarly, as already discussed above, focusing exclusively on likely medical benefit will often mean that patients belonging to ethnic minorities will be much less likely to receive a transplant than patients belonging to the majority population. This again seems deeply unjust; the prima facie claim of an ethnic minority patient is as good as the claim of any other patient. Other examples can be given where different fairness-related criteria may come into conflict. This indicates that unless we design an allocation system that only has one criterion, or one with a hierarchical set of criteria whereby lower criteria only come into play when the higher criteria have been fully (or in a sufficientarian system, sufficiently) met, then there will have to be trade-offs between criteria.

Because the criteria are based on very different ethical considerations, there is unlikely to be any 'in principle' solution to how such trade-offs should be evaluated. Let us for instance imagine that we have an additive point system in which priority is decided by adding the points achieved in four distinct criteria. We can model the effects of such a system with different point weights for each criterion and screen out those weightings that are dominated in the sense that one or more criteria will be less well met without the other criteria being more well met.[7] But we will still be left with a large set of weightings leading to widely differing allocation priorities, forcing us to make difficult decisions. What we really need is a convincing argument that, in this particular context, meeting Criterion X is twice as important as meeting Criterion Y, but it is difficult to see what such an argument could be.

Let us for instance look at the 2013 point system for allocating kidneys in the USA, where points are used to allocate priorities within four groups of waitlisted candidates.

Factor	Points Awarded
For qualified time spent waiting	1 per year (as 1/365 per day)
Degree of sensitization (CPRA)	0–202
Prior living organ donor	4
Pediatric candidate if donor Kidney Donor Profile Index (KDPI)*[8] <0.35	1
Pediatric candidate (age 0–10 yr at time of match) when offered a zero antigen mismatch	4
Pediatric candidate (age 11–17 yr at time of match) when offered a zero antigen mismatch	3
Share a single HLA-DR mismatch with donor	1
Share a zero HLA-DR mismatch with donor	2

Table 2: Priority point system for new kidney allocation (modified from Israni et al. 2014)

In this system some of the factors giving priority are related to medical need, some to likelihood of benefit, and one to prior contribution, but the number of points they each confer seem to be largely arbitrary. Why give one point per year on the waiting list

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[7] This could be put more formally as the point that any weighting of criteria that is not an actual Pareto optimal change from a 'no weighting' position is automatically ruled out as ethically unacceptable because such a weighting implies that someone will be harmed, without any additional benefit being gained by anyone else. Many weightings will lead to changes from the 'no weighting' position that are potentially Pareto optimal, e.g. some will be harmed and others benefited, but those who are benefited can fully compensate those who are harmed. Such weightings are not dominated by the no weighting position and can therefore not be a priori ruled out as ethically unacceptable.

[8] KDPI predicts post-transplant survival of the organ. The KDPI ranges from 0.0–1.0 and a lower KDPI is better.

and not two? Why does having been a living donor only count for four points? And why does degree of sensitization dominate all other considerations? There are undoubtedly answers to these questions, but the important thing to note is that all of these answers are contestable.The observation above that we will always have to make difficult judgments, even if we can model the effects of a particular (change in an) organ allocation system, is evidenced by the change to the kidney allocation system (KAS) in the USA that produced the priority point system outlined above. The changes were made in order to reduce disparities between ethnic groups and to increase the chance of highly sensitized patients receiving an organ (Health Resources and Services Administration 2014). Modelling of the effects show that these objectives were very likely achieved to some degree, but that ethnic disparities remain. The modelling does, however, also indicate that the change led to fewer transplants in patients older than 50 years of age (Israni et al. 2014). Deciding whether the benefits of less ethnic disparity are worth the costs to older potential recipients is quite difficult to judge and may depend on the specific context in the USA.

One way of avoiding having to solve these issues is to argue that we should give up trying to achieve a complete ranking because 1) there are fundamental theoretical disagreements about what is just and fair, and 2) all weightings are to some degree arbitrary. Instead, we should decide what it is a reasonable benefit to gain from an organ transplant, either in terms of pure life-extension or some composite of life-extension and quality of life/welfare, and give everyone who passes the threshold of reasonable benefit in relation to a specific organ an equal chance to get that organ, for instance through a lottery (Savulescu 2002). (On the general use of lotteries as allocation mechanisms of social goods see Duxbury 2002). It is however not clear that this would solve the problem: while the proposal makes a compromise between allocation according to need and allocation according to likely benefit, it in no way encompasses other considerations that are at least potentially justifiable, such as length on waiting list or urgency. Another approach is to rely on the public's view of how these trade-offs should be made. This approach is problematic, however, even if we accept the premise that these matters should be decided by public or citizen opinion. The main problem is that there is good evidence that the public does not have one, univocal view on these matters, that the variation in views is at least partly correlated with respondent characteristics such as gender, race and age, and that the public endorses some allocation criteria that are ethically problematic, such as the 'worthiness' of recipients (Stahl et al. 2008; Tong et al. 2010; Umgelter et al. 2015; Oedingen et al. 2019).

3. Organ Allocation Systems and the Incentive to Retrieve Organs

Promoting organ transplantation, having conversations with patients and families about donation, and retrieving organs from donors require financial and staff resources. Ethically speaking, institutions ought to see organ retrieval as an important activity simply because transplantation saves lives and relieves suffering, but this ethical incentive may not be enough to sustain institutional commitment. The transplant system therefore needs to create a systemic institutional incentive structure that makes organ retrieval an attractive activity. One way this has been implemented is by giving some priority to patients registered on the waiting list in the retrieving institution, or in the case of kidney donation, allowing the institution to retain one of the kidneys for transplant into the highest-ranked patient on the local waiting list. Other systems have operated 'payback' schemes, where the institution that provides an organ to the pool is guaranteed to receive a similar organ within a certain timeframe. Thus, the institution participates both in the costly and non-prestigious retrieval as well as in the lucrative and prestigious transplantation. Providing such local incentives for organ retrieval is distinct from the justice- and/or ownership-based considerations concerning local or national priority discussed above. Whether to implement such incentives in organ allocation systems depends primarily on the evidence for their effectiveness. If it can be shown that local incentives increase organ retrieval, we have an argument for introducing them. If it can be shown that they increase organ retrieval so much that everyone who would have got an organ without the local incentives in the system still gets an organ, we have a very strong argument, since no one has been made worse off and some have benefited from the introduction of the incentives (i.e. they lead to an actual Pareto-optimal change). Furthermore, since all of those who benefit from organ transplants are likely to belong to the Rawlsian group of 'the worst off' (Rawls 1971), any inequalities introduced by the incentives are unlikely to constitute a social injustice.

4. Organ Allocation in the Future

In the future, we may reach a situation where it becomes possible to increase the number of available organs to a level that converts the organ allocation problem from one of material scarcity (i.e. lack of organs) to the much more common health care problem of financial scarcity. This might come about if we have an effective market in organs, through xenotransplantation (see chapter 16 in this book), or through the growing of organs from human stem cells in animals or completely ex vivo (see chapter 17 in this book). It is, however, unlikely to come about through an optimization of current practices of organ donation and retrieval. This means that although organs will be, or can be made available for transplant, they are likely to be priced according to the current pharmaceutical industry model of value-based pricing, and that they are therefore going to be (very) expensive. How should we think about organ allocation in this situation? The first thing to note is that our elaborate systems for organ allocation and sharing within countries and across borders will become redundant. But the allocative perspective will also change: The main difference is that in the current situation there will always be another potential recipient who can be helped and 'produce' medical benefit by getting the organ, and who has an almost as strong claim according to the criteria of the system. Because organs are non-fungible, giving an organ to one person therefore always involves not giving it to someone else and depriving that person of potentially life-saving benefits. Using money for a transplant does not in the same way directly deprive someone else of the benefits of a transplant: the alternative use of the resource might have been another organ transplant, but it might just as well have been hundreds of visits to a dental hygienist. If organs become easily available, we should therefore think of their allocation as a normal case of priority setting for expensive, potentially life-saving treatments. The patient needing an organ will be in the same position as the patient needing an expensive, potentially curative cancer treatment. The approach to this kind of priority setting varies between countries and health care systems, but a main difference to the current way of conceptualizing organ allocation is that the focus will move from thinking about how to rank individual patients in order of priority to thinking of delineating criteria that define the group of patients who will get access to a particular kind of transplant. In the UK, devising such criteria may be very dependent on incremental cost-effectiveness ratios and Quality Adjusted Life Years (QALY) calculations because this is the preferred method used by *The National Institute for Health and Care Excellence* (NICE). Whereas in Germany, pure effectiveness considerations will play a much more decisive role along the lines of the preferred method of the *Institut für Qualität und Wirtschaftlichkeit im Gesundheitswesen* (IQWiG). Despite these differences in approach, the changes in allocation approach are likely to have major clinical effects in all countries where organ transplant is financially possible within the overall financial envelope of the health care system. This will affect patients in different ways. Those patients who fall within the pre-defined groups of eligibility will have a much better experience. They will have a direct claim to be provided a transplant, and they will not experience the long and anxious wait on a waiting list but will instead be booked in for a planned, elective transplant. For those patients who fall outside the group of eligible patients as defined by the health care system, their situation will be more ambiguous. If they can afford it, they will be able to buy a transplant at a private hospital; but if they cannot, they may effectively be denied any chance of a transplant.

5. Conclusion

The allocation of organs for transplant will continue to be an area of contention as long as there is a material scarcity of transplantable organs. This contention is intensified because allocation decisions are sometimes tragic choices that determine who gets a chance to live, and who must die. It is therefore fully understandable that there is a continuous push in the public debate and in academic work, including work in philosophy and ethics, for a principled solution that will once and for all provide a fair system of organ allocation. However, the analysis in this chapter shows that it is unlikely that a fair solution based only on principled considerations will ever be achieved. Although many suggested criteria for priority to receive an organ can be shown to be unjustifiable, especially some of the proposed social criteria, we are still left with a number of criteria that all have plausible ethical justifications – but justifications that do not flow from one, underlying master ethical principle. Furthermore, these justifiable criteria are not compossible because, when the criteria are applied to a large pool of potential transplant recipients, better fulfilling one criterion always means that another criterion is less fully met. A choice will therefore always have to be made about how to weigh different criteria, or to put it slightly differently, how to balance different criteria against each other. And such weighing and balancing will always be inherently contestable.

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