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Introduction

Do not go gentle into that good night. . . . Rage, rage against the dying of the light.
Dylan Thomas

The organ transplantation policies adopted by the vast majority of the world's nations have failed. Although transplantation provides the best, and often the only, effective therapy for many otherwise fatal conditions, the great benefits transplantation could provide go largely unrealized because of failures in the organ acquisition process. In the United States, for example, more than 10,000 persons die every year either awaiting transplantation or as a result of deteriorating health exacerbated by the shortage of organs. More than 350,000 kidney patients receive dialysis treatment at an average annual cost of over $75,000. Similar statistics can be observed in many other wealthy countries. In poor countries, the problems are often masked by inadequate public health resources: countries in which dialysis is generally unavailable do not exhibit waiting lists because their end-stage renal disease patients die quickly. Patients needing transplants of organs other than kidneys receive less attention due to their smaller numbers, but in such cases no therapeutic alternative to transplantation, such as dialysis, exists. These patients usually die quickly, and thus receive less attention than those on dialysis.

Organ transplantation, especially in the cases of kidneys and livers, has shown itself to be by far the best medical response to a variety of life-threatening

conditions. Further, numerous studies have established the large financial savings many transplants provide, even in less-than-ideal patient populations. Patients receiving successful transplants often enjoy substantial improvements in the qualities of their lives, including being able to work, care for family members, and so on. As a result, it is nearly universally agreed that a large expansion in transplantation activity, at least for kidneys and livers, is unambiguously desirable from virtually any point of view. Further, it is nearly universally agreed that, on purely medical grounds, there exist sufficient, or more than sufficient, numbers of suitable organs, currently unutilized, which could in principle be used to support a large increase in transplant operations. Such an expansion would save many tens of thousands of lives annually and would reduce the burden on public health insurance funds by many billions of dollars or euros. Lives saved, pain eliminated, costs reduced—what could be more worthwhile? And yet, despite these essentially undisputed facts, the deaths, suffering, and costs continue, year after year, all over the world. How can this be?

The problems of organ transplantation and the shortages of organs represent perhaps the most complex and morally controversial medical issue aside from abortion and euthanasia. In the "organ problem," one comes face to face with such topics as the meaning of personhood, the proper treatment of the bodies of deceased persons, the ethics of rationing a life-saving yet extremely finite resource, the meaning and definition of death, the problems attendant on the mechanical maintenance of human life beyond its "natural" limits, black markets, and so on. Add to these very difficult questions the often conflicting religious and cultural traditions, and toss in many billions of dollars of public expenditure and powerful special interest groups, and one has a perfect recipe for conflict, controversy, and public policy gridlock.

Yet, it is the contention of this book that the problems of organ transplantation, and the shortages of organs for that purpose, are in no sense unsolvable. Although one may hope, and perhaps reasonably expect, that scientific advances such as cloning will one day allow transplant patients to receive tailor-made organs grown from their own cells, it is both unnecessary and irresponsible to fail to act now just because ultimately the problem may be resolved by technical means. Rather, we have the means now to resolve the shortage over a reasonable period if we choose to do so. The primary problems are not technological but are instead political and moral. Establishing this thesis is a primary purpose of this book.

As economists, we must confess to the typical economist's bias toward cynical, financially based explanations for human behavior. However, any prospect

for true reform, which we feel must include meaningful donor compensation, is dependent on taking the opposing arguments seriously and vanquishing them on their own terms. Hence, we cannot avoid entering the moral arena and battling the moral objections using the tools of ethics and philosophy. This book, therefore, is not solely composed of economic analyses and financial calculations.

Our conclusions are relatively simple: any practical solution to the organ shortages under current technological means must involve paying meaningful compensation to donors for their willingness to donate. All available evidence, fairly evaluated, suggests that compensation will be effective in greatly increasing the availability of organs for transplant. Compensation may be paid both to the families of deceased donors and to living donors (in the case of kidneys). We propose the establishment of public monopsony buyers for organs and argue that such a system may be adequately managed to produce greatly improved patient outcomes while saving money and avoiding serious moral failings. The distribution of organs will be handled on purely medical grounds, presumably within the existing national and international organ procurement systems. The probable levels of compensation necessary to secure substantially increased organ supplies are likely to be modest in comparison to the cost savings arising from expansion of transplantation, at least for kidneys and livers. In the case of kidneys, the costs of dialysis, its medical side effects, and the sizes of end-stage renal disease populations suggest that huge savings in both lives and medical expenditures are readily available. It is true that it will be more difficult to make such claims in the case of certain other transplants, such as lungs or hearts, and the resolution of such problems is important. However, the case for greatly expanded renal transplantation therapy is incontrovertible.

The proposal to compensate donors is, of course, an old one. Indeed, it is quite difficult to think of any other system where begging is the sole legal means of obtaining a supply of goods. From the perspective of the economist, price controls are the fundamental cause of the observed shortages, and very little convincing is necessary. For many physicians, medical societies, and sociologists, however, this linkage is not compelling. Many doctors, for example, argue that compensation would result in fewer organs or organs of poorer quality, undermining the entire transplantation system. Others suggest that any increase in the numbers of organs available would result in increased enrollment on transplant waiting lists. Still others suggest that many of those on renal transplant waiting lists are not legitimate candidates for transplants, so the extent of the alleged shortage is overblown. Some medical ethicists, while

perhaps accepting the potential of compensation to increase organ supply, reject the entire notion on moral grounds, often predicated on Kantian ideas of the objectification of the human body/human person. Others confuse the notion of compensating donors within a regulated, transparent public system with a Dickensian, free-for-all "organ bazaar," in which poor citizens of Third World nations are duped into selling parts of their bodies for the benefit of the undeserving wealthy. (Somewhat ironically, this is precisely the case today with the black market, a consequence of the current system.) These are deep waters, emotionally speaking—so deep that they have been sufficient to maintain the current procurement system despite its unsatisfactory performance. Our task in this book is to address each of these lines of argument with an effective refutation, and, because these are not entirely economic challenges, we cannot hope to vanquish them solely using economic arguments. But economics will be our primary tool, and for that we cannot apologize.

The format of the book reflects, to some degree, the evolution of the organ shortage problem itself. We begin in Chapter 2 with a history of transplantation medicine, highlighting those developments that made the miracle of human solid organ transplants possible. Our current system of unpaid donation evolved in an environment in which transplants from strangers were technically infeasible. When the family unit was itself the sole "organ procurement organization," the prohibition of compensation had no practical effect. The discovery of cyclosporin and similar drugs, however, pushed the state of the science well beyond the boundaries drawn by public policy. With the widespread public funding of hemodialysis therapy came the kidney transplant waiting list, now a baleful constant of modern life in industrialized countries.

Chapter 3 evaluates the consequences of this "altruistic" donation system. Several hundred thousand people have died awaiting transplants (primarily for kidneys) since 1980. Waiting lists are long in many (though not all) industrialized countries, especially for kidneys and livers. Severe shortages of organs have led to steadily decreasing standards for deceased donors, and despite continuous improvement in antirejection therapy and organ handling protocols, medical outcomes with substandard organs are generally worse. The proliferation of living-donor transplants stands as a testimony to the inability of many national authorities to increase postmortem sources to meet demands. Black or "gray" market transplant activities and so-called "transplant tourism" have become widespread.

Chapter 4 makes the medical and financial case for large increases in transplant activity. We review studies that examine in detail the social costs and

benefits of various transplants, and we find, consistent with overwhelming medical opinion, that transplantation is the best and most cost-effective treatment for a number of serious disorders. In the case of kidney transplants and end-stage renal disease, one can justify paying very large compensation to donors (or their families) based solely on savings to public health funds. Many billions of dollars or euros are lost every year through continued reliance on the current system of organ procurement. In contrast, it is more difficult to rationalize large increases in certain other transplant procedures purely based on direct medical cost effects. It is unlikely, given current technological constraints and life expectancies, that large expansions in heart-lung transplants will "pay for themselves" in this sense.

Chapter 5 considers the sources of the current crisis, with special emphasis on the role of the "price control" imposed by bans on donor compensation. We lay the blame for the shortage primarily on this aspect of the current system. However, it is not accurate to say that this prohibition is the only example of defective incentives in the organ procurement effort. The widespread use of monopsony structures in organ procurement, characterized by geographic exclusivity in donor recruitment, may also be problematic, as are other moral hazards endemic to the ways in which transplant centers and others are compensated. Public responses to the organ shortage, manifested in steadily rising rates of living-donor transplants, also present an obstacle, and we document a pattern of intertemporal substitution between deceased and living-donor organs. In particular, increases in deceased-donor organ supplies reduce future living-donor supplies to some degree, potentially undermining efforts to expand transplants through deceased-donor recruitment. A defective incentive to organ donation is also created by the rule that nondonors are treated the same as willing donors if they should ever need an organ. Finally, we examine the political economy of the shortage system and identify potential conflicts of interest among interested parties. Because organs are jointly supplied by deceased donors, increases in the numbers of deceased donors may also increase pressure to perform more transplants of other solid organs, increasing total medical costs. This fact may be relevant in explaining the public positions of some insurance funds in the compensation debate, at least in Europe. This effect should not apply to efforts to increase living-donor kidney supplies through compensation.

The poor performance of the organ procurement mechanism has given rise to many proposals for reform that fall short of donor compensation. Chapter 6 reviews what one might term "piecemeal" reform proposals, both implemented and hypothetical. Many such efforts have not been very useful, but several, such

as presumed consent, pairwise exchanges, and best practice efforts (such as the Organ Donor Breakthrough Collaborative, or ODBC, in the United States), have measurable benefits. Some possible innovations, such as donation to a waiting list, have yet to be evaluated in practice.

Chapter 7 addresses the moral and ethical issues surrounding the compensation proposal. As is clear from the preceding discussion, we cannot find these arguments persuasive. Human life is a very great value indeed, and it is surely incumbent on anyone arguing against donor compensation to make an extremely compelling case. As economists, we are admittedly consequentialists in these matters. In fact, we find the arguments presented by opponents of compensation to be very weak. It appears that much of the informed opposition may actually represent a deep and understandable aversion to the prospect of poor donors selling their organs for the benefit of wealthy patients, albeit this aversion is couched in an ethical language.

In Chapter 8 we come to the specifics of our proposal. We describe institutional arrangements for the introduction of compensation. We provide a simple mathematical analysis of the likely appearance of a socially directed monopsony procurement organization and establish several propositions regarding the forms compensation might take. We suggest that, in general, both living and deceased-donor kidneys would be rewarded by such an entity, and at differing levels, at least in the early stages and in countries with severe shortages. We review the limited empirical evidence relevant to the question of organ compensation rates, and we argue that payments are likely to be well below those levels at which cost savings are consumed in acquisition expenses. On the contrary, it is quite likely that organ acquisition will be cheaper under a compensation program. We review the performances of legal markets for other body parts, such as those for blood products and sperm, and find no inherent and obvious difficulty with a regulated compensation scheme. We also address the issue of the effect of offering compensation on altruistic donation levels. Criteria for organ recipients, as well as donor evaluation and enrollment, are also reviewed. We argue that the introduction of compensation for organ donation, for both deceased donors (all organs) and living donors (kidneys), could be implemented quickly in many countries. Trials are an obvious first step.

Chapter 9 summarizes our recommendations. On balance, we think it is fair to say that the existing system is unacceptable. Current procurement efforts do not utilize the strongest and most efficient means of obtaining additional organs for transplantation. Compensation will increase the number of organs available with no reduction in their quality. Huge amounts of money,

and many thousands of lives, could be saved by this reform. No person needs to be unfairly exploited to accomplish this. Indeed, it is the current system, with its unnecessary deaths, thriving black markets, and astronomical public costs, which represents exploitation in its most unjust sense. Of course, if everyone agreed with these opinions and with the evidence presented to support them, it would be difficult to see how the current system could have survived to the present day. That it has survived, however, is obvious. Explaining how we got to this point and, more importantly, how we can get away from it is our purpose. If this effort hastens the demise of the present system for obtaining organs for transplantation, then we shall be very glad indeed.