U.S. HUMAN ORGAN PROCUREMENT: THE WELFARE EFFECTS OF FINANCIAL INCENTIVES

by

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(Under the Direction of Arthur Snow)

ABSTRACT

Each day 17 people die while waiting for an organ, over 6,000 a year. These tragic deaths are needless given that thousands more organs housed in the cadavers of medically acceptable potential donors, over six times more than the number of potential organ candidates, are buried each year. Yet this very wastefulness, the presence of such substantial potential supply, strongly suggests that the organ shortage is a rectifiable situation. Current organ procurement policy, by insisting that financial incentives to encourage organ supply are unethical and illegal, has created and sustained our country's unfortunate and costly organ shortage.

INDEX WORDS: organ procurement, transplantation, organ transplant, organ shortage, organ market

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CHAPTER 1

INTRODUCTION

1.1 Demand for Transplantable Organs

It wasn't so long ago that organ failure was a terminal illness, a condition with no treatment, no antidote, no cure. Seemingly healthy individuals could suddenly fall ill, seeking a doctor's explanation for a sudden rapid decline in health. A diagnosis of organ failure was a shock so complete, so irreversible, that it was nearly unthinkable. Over just a few decades we have witnessed a medical miracle. Now people suffering organ failure have a solution in the form of transplantation, with its promise of an almost complete return to health. Organ failure is no longer tantamount to a death sentence. The wonders of technology and years of medical research have given rise to advanced transplant techniques – ventilators, respirators, tissue matching, and immuno-suppressant drugs have transformed organ transplantation from the pages of science fiction into a commonplace and safe, life-saving procedure. Yet delving a little deeper, reality often diverges from expectations. Over the years the number of patients on organ waiting lists has soared to over 88,000 (http://www.unos.org/ 2005). Sadly, only one out of three of these patients will ever receive a transplant due to the critical shortage of organ donors in this country (Beard, Kaserman et al. 2004).

Each day 17 people die while waiting for an organ, over 6000 a year (Kyriazi 2005). These tragic deaths are needless given that thousands more organs housed in the cadavers of medically acceptable potential donors, over six times more than the number of potential organ

candidates, are buried each year (Kyriazi 2005). Yet this very wastefulness, the presence of such substantial supply capacity, strongly suggests that the organ shortage is a rectifiable situation. Somehow there must be a way to redistribute all the available healthy organs to needy recipients. It is becoming increasingly transparent that the failure of organ supply to reach organ demand can be blamed on the United States' woefully misguided organ procurement policy. I propose that the liberation of market forces in organ procurement is the remedy needed for this condition.

1.2 U.S. Organ Shortage

It is common for those discussing the organ shortage to overlook the difference between the transplant waiting list and the annual growth in the waiting list. The distinction is key – the latter is a flow and the former is the sum (with adjustments) of past flows, a stock. To properly analyze the market implications of current organ procurement policy and the possibility of positive prices for organ collection rates, all data must be in terms of flows (Kaserman and Barnett 2002). For example, the number of organs donated in a certain year corresponds to the horizontal intercept of the market supply curve. Since positive prices for transplantable organs are currently proscribed, the supply curve is flat along the horizontal axis from the origin to this intercept. Excluding living donors from a potential organ market, the relevant quantity is simply the number of cadaveric organs supplied in one year; in 1998, 8938 cadaveric kidneys were supplied (Kaserman and Barnett 2002). Since a shortage is measured as the difference between quantity demanded and quantity supplied, we must compare this number to the quantity demanded in the same year. The quantity demanded of kidneys at the legal zero price level, the horizontal intercept of the corresponding yearly total demand curve, is determined by adding the

annual growth in the kidney waiting list to annual attrition. This quantity is readily available by summing the amount of cadaveric and living donor kidneys supplied for actual use in transplantation plus the remaining shortage, all in a given year. Following this formula, the kidney demand intercept in 1998 was 19,378 (Kaserman and Barnett 2002).

The gap between the intercepts of the supply and demand curves reveals a cadaveric kidney shortage in 1998 of 10,440 (Kaserman and Barnett 2002). However, this estimate, while accurate, does not fully represent the true magnitude of the undersupply of transplantable organs. No one number, however imposing, can do justice to the staggering suffering felt by organ failure patients on waiting lists. The costs, both tangible and emotional, associated with organ shortages are felt not just by the individual patients and their families, but also by society at large (Cohen 1989). Current organ procurement policy, by insisting that financial incentives to encourage organ supply are unethical and illegal, has created and sustained this unfortunate and costly shortage.

CHAPTER 2

LEGAL AND POLITICAL ENVIRONMENT

2.1 Legislative History

In the early days of organ transplantation, the late 1950s and 1960s, the industry was virtually unregulated. Activities relating to procurement and distribution were loosely managed and run by physicians and hospital staff. At this time transplant procedures were limited to kidney nephrectomies, and even those were still considered largely experimental. An unofficial altruistic organ donation system (so named due to its total reliance on the altruism of donors) was logical and effective when the only organs available were housed in live kidney donors. Families were often able to cajole within their immediate circles (if needed) to find a suitable donor to save the life of a loved one. The development of immunosuppressive drugs, especially cyclosporine-A, revolutionized the whole transplantation process. After these remarkable drugs were developed, the possibility of harvesting cadaveric organs became reality (Cohen 1989). As technological advances rendered more and more organs feasible for transplantation, demand for transplant procedures soared, underscoring the need for a more efficient organizational structure. It became readily apparent that some sort of legal framework was needed, and soon, to provide structure and oversight to the donation and distribution processes (Gorsline and Johnson 1994).

The first laws pertaining to organ transplantation were adopted on a state-by-state basis during the 1960s to facilitate organ donation and help alleviate the burgeoning cadaveric organ shortage. In 1968 the National Conference of Commissioners on Uniform State Laws approved

the Uniform Anatomical Gift Act (UAGA), which was ratified in all 50 states and District of Columbia by 1972 (Cate 1994). In order to fulfill its purpose of expediting organ donation, the UAGA needed to clarify the issue of cadaveric property rights. While the issue of human property rights may seem straightforward, it has long been an extremely cloudy and contested matter. American courts have traditionally followed old English common law that property rights do not exist in corpses. In fact, American law has deemed that absolute property rights do not apply to the human body whatsoever (Gorsline and Johnson 1994). The UAGA effectively assigned property rights of one's bodily remains to the person himself or herself by designating that all adults have the right to choose to bequeath parts of their body (anatomical gifts) for the purpose of transplantation or medical research (Gorsline and Johnson 1994). Furthermore, the UAGA gave people a legal right to make their intentions regarding organ donation clear before death, via a will or donor card signed by two witnesses, and irrevocable postmortem. According to the law, such a decision to supply one's own organs "does not require the consent or occurrence of any person after the donor's death" (Cate 1994). If and only if the deceased's donation intentions are not laid out explicitly in writing do the next-of-kin have the right to consent to or deny organ donation (Cate 1994). In other words, the common practice of seeking surviving relatives' consent prior to removing cadaveric organs when the deceased's wishes are verifiably documented is not only unnecessary but illegal under the UAGA.

The issue of organ transplantation returned to Congress' attention in the early 1980s for several reasons. Despite its good intentions, the UAGA had not alleviated the nation's organ shortage; in fact, alarmingly, the shortage was growing more rapidly then ever. As a result, the public, and in turn Congress, was becoming increasingly aware of the plight of families affected by the cold reality of organ waiting lists (Gorsline and Johnson 1994). Heart-wrenching stories

of the deteriorating health of once vital individuals and the helplessness of their loved ones opened the eyes of millions of television viewers and magazine and newspaper readers. Concerns over the havoc wreaked by a lack of available organs led one physician, Dr. H.Barry Jacobs, to establish the short-lived International Kidney Exchange Ltd., a renal brokerage firm. Dr. Jacob's brainchild was a not-for-profit organization that sought to match up paying organ recipients (generally funded by third parties) with financially compensated organ suppliers (Kyriazi 2005). Many people were appalled by this foray into organ selling, and the medical community in particular was united in its outrage.

Congress passed the National Organ Transplant Act (NOTA) under considerable pressure from lobbyists representing the American Medical Association to officially proscribe organ sales and put an end to Dr. Jacob's kidney brokerage (Gorsline and Johnson 1994). NOTA resoundingly and unequivocally squelched all existing or subsequent organ market activity, making it a felony to "knowingly acquire, receive, or otherwise transfer any human organ for valuable consideration for use in human transplantation" (Kaserman and Barnett 2002). The consequences of violating this stipulation are a prison term of up to five years and/or a maximum fine of $50,000 (Kaserman and Barnett 2002).

Although it appears NOTA's true fundamental justification was to abolish organ selling, the legislation had other, more progressive objectives, calling for more efficiency and coordination of organ procurement and a greater degree of oversight and equity in allocation. The important 1984 Act dictated the structure and funding of many public and private organizations involved in organ procurement and distribution. In response to NOTA's stipulations, the federally funded Division of Organ Transplant was created as an autonomous agency within the Department of Health and Human Services to serve as the hub of transplant-

related administrative activities (Cate 1994). The agency's major duties include managing grants and contracts of private non-profits in the transplantation industry, fostering public and professional educational campaigns, and conducting research to further advances in transplantation science and technology. Furthermore, the entire transplantation industry is now largely organized according to NOTA's stipulations (Cate 1994).

While NOTA provided the organ transplantation industry with structure and oversight, it did nothing to halt the country's persistent organ shortage. Ascribing the shortage to ineffective state laws, the National Conference of Commissioners on Uniform State Laws passed a revised Uniform Anatomical Gift Act in 1987. The major thrust of the 1987 UAGA was to increase organ supply by simplifying and facilitating the organ donation process. It made a person's wish to donate easier to relay by suspending the requirement that a valid donor card need be signed in front of two witnesses. In the same vein, the donor's choice is given priority over any family objections. Furthermore, it is required that a designated member of a hospital's staff must ask all admitted patients if they are organ donors for purpose of documentation; if the reply is negative, then the option of donation must be discussed (Gorsline and Johnson 1994). Although routine inquiry and request duties are legally required, failure to comply is punishable only by administrative sanctions. Due to this lack of civil or criminal liability, many requirements initiated by the UAGA are not enforced and thus not observed in practice (Kaserman and Barnett 2002).

2.1 Current Procurement Regulations

Current organ procurement and allocation activities proceed in accordance with the 1987 UAGA, NOTA, and state laws, resulting in an intricate interplay of numerous public and private agencies. What follows is a brief explanation of the steps involved in transplant organ administration under the current procurement policy, officially known as express donation. The process begins as individual transplant physicians determine which of their patients qualify for organ-replacement surgery (Kaserman and Barnett 2002). Approved patients are added to a national listing of transplant candidates. The Organ Procurement and Transplantation Network, funded by the Division of Organ Transplant, established this computerized registry but subsequently relinquished its control to the United Network of Organ Sharing (UNOS). A private, non-profit organization funded by federal grants, UNOS manages the allocation and distribution of collected organs to candidates on the list (Cate 1994). Once patients are on the list, they can do little but hope for the speedy receipt of a well-matched organ. However, the wait for an organ is rarely brief.

Organs deemed suitable for transplantation must be donated by physically healthy, cancer-and-infection-free individuals who are pronounced brain-dead in a hospital (Cohen 1989). Under current law, qualified personnel are required to approach family members of such individuals to seek permission of organ removal. Organ procurement organizations (OPOs), private, non-profit, federally funded agencies operating in exclusive geographic regions, provide hospitals with trained personnel for this purpose (Gorsline and Johnson 1994). Approximately 25-50% of the families of potential donors actually agree to the purely altruistic terms of donation (Beard, Kaserman et al. 2004). When one of these rare organs becomes available, it is

collected by the area's OPO, screened, and entered into UNOS's system for distribution. UNOS continuously analyzes the potential fit between organs and transplant candidates, ultimately making assignments based on organ-specific formulae that account for tissue and blood type, patient health status, and length of time on the waiting list (Gorsline and Johnson 1994).

When a patient finally receives an allocated organ, the cost of the transplant operation is almost always borne by a third party. Nephrectomies have been federally funded by the Health Care Financing Administration under the End Stage Renal Disease Program since 1972. Other transplant operations are routinely covered under most insurance policies. Concurrently, neither transplant providers nor patients bear the costs of transplantation (Kaserman and Barnett 2002).

CHAPTER 3

EXPRESS DONATION

3.1 Reliance on Altruism and Educational Spending

Since market forces are strictly prohibited under NOTA, donor altruism is the only available means to bring supply in line with demand. Certainly there is no doubt that altruism is an admirable and powerful motivator in many circumstances. Charities provide exceptional services out of altruistic desires, people compassionately give succor and solace to the poor and the hopeless without seeking compensation; the world is unmistakably a better place in so many ways because of the kind, thankless acts of strangers. But is express donation, with its blind adherence to altruism as the sole motivating force, truly a responsible public policy? Each year thousands of men, women, and children die unnecessarily on organ waiting lists. And each year 100 times this number of life-giving organs are buried because people refuse to become donors. or allow the organs of a loved one to be donated (Beard, Kaserman et al. 2004). This tragic phenomenon has gone hand-in-hand with express donation for as long as the policy has been in existence. It has persisted despite continually evolving state laws encouraging donation and steadily increasing spending on donation awareness campaigns. In fact, it seems the government's answer to the glaring under-supply of transplantable organs has been to throw money at it, including money to fund research on why people do not donate, money to OPOs to try to encourage donation, money to train medical professionals on effective ways to identify and approach donors, money to erect billboards and outreach programs to make people aware of the

problem (Beard, Kaserman et al. 2004). It seems that the only people not receiving this money are exactly the ones who would benefit most from it – organ donors. Organ providers are allotted absolutely no compensation whatsoever in exchange for their own highly valuable organs (Beard, Kaserman et al. 2004).

3.2 Policy Failure

Surveys continually show that a majority of Americans would not only be willing, but would prefer, to donate their organs at death. According to a 1993 Gallup poll, 85% of Americans approve of the idea of donation and 69% would wish to donate after their passing (Abadie and Gay 2004). Yet only 28% of American have signed an organ donor card or indicated a positive donation preference on a driver's license (Abadie and Gay 2004). Moreover, only about 1% of hospital deaths result in organ collection (Kaserman and Barnett 2002). So how can we explain the dichotomy between survey results and reality, especially when so much effort and resources are devoted to increasing donation rates? The most obvious cause of this country's alarming organ shortage is the legally fixed zero-price of organs. This "altruistic" policy has essentially eradicated a functioning market for organs and no other non-market motivating force, including altruism, has been able to even come close to offsetting this loss (Beard, Kaserman et al. 2004).

Currently, over 88,800 patients suffering organ failure are on organ transplant waiting lists (http://www.unos.org/ 2005). Half of these individuals are not expected to receive an organ in time, amounting to 17 deaths every day (Kyriazi 2005). -Express donation proponents insist that the shortage can be resolved without switching to another organ procurement policy. They

have adhered to the same argument for decades: that altruism and increased educational expenditures are all that is needed to boost organ supply enough to meet demand. Government has responded to calls for increased educational spending by funding numerous public and professional awareness campaigns (Beard, Kaserman et al. 2004). A 2004 empirical study conducted by Beard, Kaserman and Saba examined the efficacy of educational spending. The authors found that, ceteris paribus, neither professional nor public educational expenditures are statistically significant in determining organ donation rates. In fact, while point estimates representing the effect of educational spending were not significantly different from zero, they suggest that over $21,000 in professional spending or upwards of $55,000 in public spending would be needed to coax just one additional person to donate. These amounts are far above any estimate of market clearing prices for transplantable organs (Beard, Kaserman et al. 2004).

These empirical findings bolster theoretical explanations for why donation awareness programs have proven ineffective. Public educational expenditures are likely to be particularly ineffective for several reasons. First, there is no way to target specific donors. Since only a tiny fraction (roughly 1%) of all deaths occur under circumstances that would allow for proper organ collection (Kaserman and Barnett 2002), expenditures directed at the general population are inevitably wasteful. Furthermore, even if potential donors have received and heeded an awareness campaign for the need for donors, the message is sure to fade over time, quite likely before the actual donation decision needs to be made.

Diminishing returns will also play a role as funds continue to be directed towards both public and professional donation promotions. The benefits of educational expenditures, which have been present for well over a decade, have likely already accrued and the impact of further spending is certain to be small and decreasing (Beard, Kaserman et al. 2004). Indeed, the

manner in which medical personnel identify and approach potential donors and donor families has improved greatly in the last ten years. Yet organ collection rates have remained flat (Kaserman and Barnett 2002). At this point it seems clear that devoting more funds to educational promotions is an improvident and futile way to increase organ supply.

CHAPTER 4

Non-Market Policy Proposals

It has become obvious to numerous influential thinkers and leaders that express donation, with its utter and complete reliance on donor altruism, is not working. For some, the idea of instituting an organ market is too radical a notion. Thus, there are two main non-market policy alternatives that have been widely proposed – required choice and presumed consent. Many countries around the world, as the issue of organ shortages is truly a global problem, have already adopted these systems with varying degrees of success.

4.1 Required Choice

Required choice mandates that every individual make a conscious documented choice about their donation preferences. Arguably, if as many people favor organ donation as is continually reported in surveys, forcing the public to formally state their donation preferences in a legally binding manner should undoubtedly increase organ collection. If a potential donor's intentions are readily obtainable post-mortem, medical personnel can eschew the daunting task of seeking approval of potential donors' next-of-kin for organ harvesting, and surviving family members can be free from doubt over their loved one's true wishes. Proposals to require individuals to state their choice whether to become an organ donor or not when they obtain their driver’s licenses or file tax returns have been instituted in several states including Georgia, Texas and Colorado (Kyriazi 2005). Unfortunately, these initiatives are not yet legally binding. For

example, an affirmation on a driver's license does not bind an individual to donate his or her organs upon death, and family approval is still sought regardless of the person's clearly documented intentions. As a result, organ collection rates have failed to rise in response to required choice laws (Kaserman and Barnett 2002).

4.2 Presumed Consent

A stronger alternative to required choice, the policy of assuming a willingness to donate in the absence of explicit evidence to the contrary is known as presumed-consent, conscription, or escheatage. The idea is that medical personnel will be able to presume donation consent (on the part of the deceased and surviving family) unless there is evidence to the contrary. This addresses two major shortcomings of the current system – the dichotomy between the number of registered donors and those who say they wish to become donors, and more importantly, the failure of medical personnel to seek family permission for organ removal. Given that a majority of people approve of organ donation, presumed-consent could overcome a major hurdle in organ collection by removing the physician's onerous responsibility of asking grieving family members to donate the organs of their loved one (Abadie and Gay 2004).

Unlike other theorized alternatives, presumed-consent is actually an established organ donation policy throughout much of the world, which allows for a great deal of insight into the reality and efficacy of this system of organ donation. Many countries, especially those in continental Europe, have adopted a broad range of presumed-consent policies in the hope that stricter donation laws would solve the problem of organ shortfalls (Abadie and Gay 2004). Presumed-consent policies exist in a spectrum, but they primarily vary across two main

dimensions; the ease in which people can opt out of automatic donation, and the number of parties (family members) allowed to object to organ collection (Abadie and Gay 2004). In its strictest form, presumed-consent legislation requires organ harvesting of all potential donors, regardless of the deceased's actual willingness to donate or the compliance of next-of-kin. A looser interpretation could bear more similarity to express donation. In actuality, while presumed consent legislation is generally written in accordance with the strictest form of the policy, it is practiced with a softer approach (Kaserman and Barnett 2002). Not a single presumed-consent country operates an organ draft (although a draft could feasibly be interpreted in many laws), allowing people a way to opt out of donation. People can join a national registry or make a pre-mortem written declaration of their intentions to abstain from organ donation. Family approval is also sought before organ extraction, and family members are often given the final say. In fact, Austria is the sole exception, treating all deceased individuals as donors, despite family disapproval, as long as the individual has not elected to join a do-not-harvest list (Abadie and Gay 2004).

Empirical analyses of the effectiveness of organ donation policies, such as the study conducted by Abadie and Gay in 2004, reveal that countries with the most strictly interpreted presumed-consent legislation have most effectively increased donation rates. Holding other factors affecting donation rates constant (i.e. GDP, national health expenditures, religiousness, educational attainment, and number of potential donors), presumed-consent countries boast higher collection rates than those with express donation policies. Furthermore, the most successful presumed-consent policies are also as a rule the most stringent, in which it is more difficult or costly to opt out and family members are given little input into the donation process (Abadie and Gay 2004).

While presumed-consent legislation has proved more effective than express consent, the policy has many drawbacks. First and most importantly, presumed-consent has not resolved the globally persistent problem of organ shortages. Spain and Austria have the highest organ collection rates per capita in the world and yet they still experience sizable transplant organ deficits (Kaserman and Barnett 2002). Apparently, an organ donation policy that effectively addresses the shortfall in supply has yet to be implemented.

Even if presumed-consent was capable of eliminating organ shortfalls, there would likely still be considerable ethical resistance to the policy. By making silence on the issue of organ donation tantamount to consent, presumed-consent is seen by many ethicists as unacceptably hindering individual autonomy. The American public seems to agree with the medical ethicists; a national survey conducted by UNOS found that over half of respondents believed that physicians should not be allowed to remove organs without the donor's express permission (Barnett and Blair 1996). Any policy proposal facing this much public disapproval is bound to be politically infeasible. Indeed, the trend in many European countries is turning away from presumed-consent (Kaserman and Barnett 2002).

CHAPTER 5

MARKET OPPOSITION

5.1 Procurement vs. Distribution

There are many misconceptions about the nature and functions regarding a potential organ market that are common in the general public and reinforced by policymakers and even scholarly journals. These misconceptions necessitate a thorough clarification of the true structure and functions of a proposed market, reflecting the general consensus among economists. Foremost of concern is the meaning of the term organ market. As used by economists, an organ market generally refers solely to a market for organ procurement and does not include a market for organ distribution (Barnett and Blair 1996). One of the most prominent aversions to market involvement in the transplantation industry has been the belief that organ candidates themselves would have to bid for the receipt of a needed organ. For example, Siminoff's primary objection to an organ market is the payments patients would make in order to receive an organ for transplant, the consequences of which would undoubtedly lead to issues of inequitable allocation (skewed heavily in favor of the most affluent individuals) and place undue strain on patients (Siminoff, Gordon et al. 2001).

Such arguments are based on erroneous assumptions. While patients suffering organ failure are obviously the recipients of organs under any policy structure, they are not the parties directly represented in a market demand curve. According to current policy, OPOs have first access to donated organs. These firms then distribute the acquired organs to transplant centers

and receive payment in return to cover organ procurement expenditures. Transplant hubs distribute organs according to the terms established by UNOS. Thus, transplant centers act as agents for organ candidates, placing orders for organs and providing payment (federally funded and sanctioned) for the receipt of organs. Indeed, the exception to the zero price level codified by NOTA is the legal exchange of funds between transplant centers and OPOs. Proposed organ markets would not alter the fundamental setup of organ procurement and distribution. Therefore, the parties providing payment for positively priced organs would be insurance companies, governmentally run transplant centers and procurement firms, and Medicare or Medicaid (Kaserman and Barnett 2002). Since patients serve only to indirectly demand organs, no money would be exchanged between organ suppliers and final organ recipients.

Great strides have been made in ensuring that the distribution of organs is done with the clear intention of fairness, without regard to the income level or eminence of any organ candidate (Barnett, Saliba et al. 2001). The issue of organ distribution is thus appropriately left in the hands of policymakers. But given the ineffectiveness of express donation organ collection and the presence of excess supply capacity, the subject of organ procurement seems ripe for the scrutiny of economists. There is absolutely no reason why the adoption of an organ acquisition market would have any impact on organ allocation. If anything, organ allocation would be more just and equitable, since the introduction of a market should greatly increase the number of organs supplied, eschewing the difficult decisions of who should receive any one organ (Barnett, Saliba et al. 2001).

It follows that sources of funding for transplant surgeries would be unchanged as a result of the formation of an organ market. Yet the belief that an organ market would adversely effect lower-income individuals is quite pervasive. As has already been established, private insurance

companies or the Health Care Financing Administration almost always foot the entire organ transplant bill. The existence of third-party payments ensures that patients in any income bracket would not have to pay the cost of organ procurement or any other transplant-related expense (Kaserman and Barnett 2002).

5.2 Living Donors

Another point of clarification is the type of organs included in a proposed market. Generally, with some notable exceptions, when economists refer to an organ market, the market in question is limited to cadaveric organs. A cadaveric organ procurement market would be less ethically contentious than a living donor organ market (Barnett and Blair 1996). Furthermore, the equilibrium price level generated from a cadaveric organ market is likely to be relatively quite low and would be most effective in lowering the costs of transplantation (Adams, Barnett et al. 1999). Indeed, the adoption of this type of market is expected to lower the total medical costs of treating organ failure patients by a substantial margin (Kaserman and Barnett 2002).

5.3 Black Markets

Since organ commerce has been sporadically accepted in several countries, most notably in India and Iran, the temptation is to use evidence from these sales as a benchmark by which to judge (or at least cast light on) the proposed U.S. organ procurement market. The problem is that organ markets in these countries operate under drastically different circumstances than found in the U.S. Obviously the state of health care and transplant surgeries in third world countries

cannot be compared to those of a highly developed nation. Furthermore, the organ markets active in India and Iran were not solely organ procurement markets, most importantly, because organ sales have never been expressly legal in any country (Kaserman and Barnett 2002). Iraq and India both chose not to enforce prohibition of organ payments over periods of time, but the resulting organ exchanges were neither legally sanctioned nor federally funded or documented; in other words, they were and continue to be black markets. It is fundamentally erroneous to draw parallels between underground and legal markets (Kaserman and Barnett 2002).

An underground organ market is similar to any other illegal black market in its inherent perils. For example, the current prohibition of drugs in the U.S. (and alcohol in the1920s) has spawned a huge preponderance of violence that affects everyone involved in the market, both buyers and sellers, not to mention innocent bystanders. This is true in underground organ exchanges as well. The illegality of the exchanges gives rise to covert organ removal operations that are often dangerous and undertaken by only the most desperate individuals. This is certainly true of the widely cited organ trafficking in Iran and India (Goyal, Mehta et al. 2002). Few legitimate hospitals or medical facilities have participated in live donor organ removals meant for profitable exchange. Just because police and government officials chose to ignore black market transactions does not mean that people seeking payment could supply organs in an established, safe procedure (Kaserman and Barnett 2002). Much like abortion surgeries prior to Roe v. Wade, the organ removals are covert, shady, often unsafe operations performed by poorly trained doctors (if they are doctors at all) using substandard tools and equipment. It's no wonder that only poverty-stricken individuals in dire need of money would choose to donate organs under such dismaying conditions (Goyal, Mehta et al. 2002).

Another by-product of black markets is price inflation. This is especially pronounced with the existence of a highly inelastic demand curve. People in desperate need of something, in this case, perhaps, the most essential good of all – an organ, will be willing to pay extremely high prices to receive what they desire. The price some live organ donors receive is misleading and does not accurately represent the true market-clearing price determined by a legal organ market. At a statutory price of zero, those willing to supply an organ in the black market can hold out for the price corresponding to demand at that particular level. Figure 1 illustrates this phenomenon of black-market price exploitation. Point B, the black-market price of a kidney, reveals the desperation of organ-failure patients in the face of the acute organ shortage, and accompanying waiting lists, by demonstrating how far those with the means to pay for an organ are willing to go. I have used an estimated black-market price of $5 million since a recent ebay seller pawning his own kidney attracted bids of over $5 million before being revealed as a scam artist (Beard, Kaserman et al. 2004). As shown, this price is substantially higher than the expected equilibrium price, C, generated by a legal organ procurement market.

Another factor to consider is that a legal cadaveric organ market would avoid all of the ethical and economic woes of an underground organ market, which deals mostly in live donors with the lure of immediate payments. Gone completely would be the threats of coercion, violent or economic, that are so prevalent among the organ exchanges in India (Goyal, Mehta et al. 2002). By legalizing only cadaveric organs, one could ensure that the ensuing market-clearing price would fall well below the underground price level (Barnett and Blair 1996).

5.4 Ethical Arguments

While market forces pose a potentially powerful solution to the transplantable organ shortage, a market regime is not without its detractors. However, most arguments against the legalization of an organ procurement market tend to be illogical, nebulous and unverifiable. Such arguments are nevertheless commonly accepted because they are philosophical in nature, focusing on the author's (often a credible figure in the medical community) general unease with the morality of organ markets. A common cry against market forces is the unsavory commodification of human organs, and thus, human life (Radcliffe-Richards 1996). Such outrage against commodification is indeed a genuine moral position, and is not likely to be dissuaded by rational analysis. But it is only fair that those upholding this view are consistent; life insurance policies, salaries fostered through the job market, and blood sales must be just as equally abhorred since all of these serve to place a monetary value on human life or human contributions. Most crucially, staunch supporters of the moral superiority of the express donation system must take responsibility for the consequences of the current regime. They must clearly enunciate their position that a policy that gives rise to such an acute organ shortage costing thousands of lives each year is ethically preferable to an alternative policy that has the promise of eradicating waiting lists for every life-saving transplantable organ (Radcliffe-Richards 1996).

Another widespread ethical concern is the fear that organ markets would exploit the poor. As we have already established, this fear is actually a misconception of how an organ market would function. If a market for organ distribution were being proposed instead of a market for organ procurement, it would be quite reasonable to expect the proportion of low-income

transplant recipients to decline sharply (Barnett and Blair 1996). But since the proposed market would serve solely to acquire organs for use in transplant surgeries subject to third-party payments, the percentage of low-income organ recipients would not change. Furthermore, individuals of all socioeconomic status would be better off after the introduction of market forces since a reduction in the organ shortage will allow for more transplant surgeries.

The idea that the poor could be economically coerced into selling organs against their true wishes is another point of moral contention. Such an inherently paternalistic argument is economically unsound. Defenders of this view, often medical practitioners or ethicists, are effectively saying that poor people should not be able to decide for themselves if they want to voluntarily enter into a market exchange. The Pareto principle presumes that each person is the sole judge of his or her own welfare. Assuming that one's own personal values or judgements match up with anyone else's and then thrusting these beliefs on a whole society is not just something we should not do, it is something we simply cannot do. By engaging in a market exchange, a person is signaling that he or she expects to be better off after the exchange is completed. The denial of market activities on moral grounds of economic coercion almost always has the ironic consequence of making the "protected" party worse off (Radcliffe-Richards, Daar et al. 1998). What right do ethicists have to deny individuals, especially the poor, the right to receive financial compensation for the donation of a good, especially one as highly valuable and as sorely needed as a human organ?

CHAPTER 6

THE MARKET FOR CADAVERIC ORGAN PROCUREMENT

The application of supply and demand necessitates the analysis of a single economic good. In the case of transplantable organs, a generalized demand curve could suffice if different organs could be substituted for one another, but as this is obviously not the case we need to focus on the market for one specific organ as a representative of many distinct organ markets. Kidneys commonly serve this purpose and are the obvious choice for a proxy organ for several reasons. First of all, Medicare's End Stage Renal Disease Program sponsored nephrectomies at a time when lung, heart, liver, and other organ transplants were still in the experimental stage. Thus, as more cadaveric organs became available and viable for safe transplantation, the collection and funding of other organs grew out of the standard already established from years of kidney procurement. While there are currently pronounced shortages for all transplantable organs, the demand and subsequent shortage of cadaveric kidneys is the most acute (Kaserman and Barnett 2002). Ultimately, there is no reason why an economic analysis focusing on kidneys should not apply to all transplantable organs. The major issues that differentiate kidneys from other organs – dialysis as a somewhat sustainable alternative to transplantation and the greater feasibility of living donors – affect the intercept and shape of the kidney demand curve but do not impede a comparative analysis in any fundamental way (Cohen 1989).

6.1 Demand

. Since 1972 the End Stage Renal Disease Program has insured that all costs of nephrectomies are borne by the government (Kaserman and Barnett 2002). As mentioned previously, most insurance companies incur the costs of other transplant operations. These third-party payments have made patients' costs of transplantation negligible. In effect, organ demanders are organ procurement organizations who purchase organs for transplant patients (Barnett, Saliba et al. 2001). It is straightforward that those suffering organ failure have an almost perfectly inelastic demand for a transplantable organ. Clearly, dialysis is a poor and costly alternative to transplantation; in both the short and long runs, dialysis patients would benefit immensely from nephrectomy. Thus, the demand curve for organ failure patients can be considered perfectly inelastic (Cohen 1989).

Despite recent technological advances in the field of transplant medicine, the costs of organ transplantation remain high. Assuming that any market-clearing price will be positive, the formation of an organ market will only increase marginal costs of transplantation . Since OPOs' demand for organs is surely responsive (even if only slightly) to changes in cost, quantity demanded may be expected to fall in response to market initiation. However, one must consider how the introduction of a market would affect the marginal cost of medical care for organ-failure patients, of which transplantation is only one part. Due to long waiting lists, over 250,000 individuals suffering from end-stage renal disease are currently forced to subsist on dialysis (Adams, Barnett et al. 1999). A large percentage of these dialysis patients would assuredly receive, and immensely benefit from, transplants if there were a greater availability of kidneys. It has been estimated that successful transplantation could save approximately $60,000 in

dialysis costs over a period of five years (Kaserman and Barnett 2002). Given that the market-clearing price of an organ is less than $60,000, it is reasonable to assume that, based on cost savings alone, OPOs should prefer transplantation over dialysis. Furthermore, since the free market cost of a kidney (or any other organ) is quite likely to be well under this amount, the added expense of compensating donors (or rather their estate) for the use of their organs is merely a small fraction of the total cost of transplantation. Such a slight price rise is unlikely to offset the demand for the receipt of an organ. Therefore, overall price elasticity of demand is presumably quite minimal. Indeed, the number of organs demanded is likely to be constant or nearly constant over a wide range of positive prices (Barnett and Blair 1996). It is possible that some positive price elasticity will result from stringent conditions for admittance to organ waiting lists, insurance companies' treatment of an organ transplant as a last resort, and, in the case of kidneys, the unpleasant but nonetheless extant alternative of dialysis treatments (Kaserman and Barnett 2002).

6.2 Supply

Express donation mandates that the transplantable kidney supply be coincident with the horizontal axis. Although supply would presumably begin to rise after the point where altruistic donations cease, this is suppressed under current procurement policy which has set the legal price of organs at zero. While the nature of the free-market supply curve is in some respects a matter of speculation, some of its characteristics can be carefully hypothesized. It is almost certain that supply would begin to slope upwards as positive prices induce increased quantity supplied.

The suppressed supply curve is likely to exhibit relatively high price elasticity when compared with demand. This is straightforward simply because, aside from transplantation and medical research, there are no other recognizable uses for cadaveric organs. This is especially true in the U.S., where Judeo-Christian tradition praises organ donation as a generous and worthy deed. While some cultures, like Japanese, for instance, maintain that a body must be buried with all its organs intact, there is no such insistence in the Western world (Abadie and Gay 2004). Since there are really no alternative uses for cadaveric organs aside from transplantation or medical research, people who deny permission to donate are actually throwing away a valuable economic resource. It follows that the opportunity cost of organ donation should be extremely low, approaching zero. Coupling the low opportunity cost with considerable excess supply capacity leads one to the reasonable conclusion of a relatively price elastic supply curve over a fairly wide range of prices.

However, since a cadaveric organ procurement market dictates that surviving family members of a deceased donor (and not the physical donor himself or herself) are the actual organ suppliers, the grief of those individuals suffering such a terrible loss is a complicating factor that must be addressed. To many people, the body of their departed loved one is considered somewhat sacred. Asking a heartbroken individual for permission to "plunder" the body of a loved one who has just died in order to save some other stranger's life seems incredibly insensitive and even cruel. Indeed, for many physicians the task of seeking family permission to harvest organs is considered particularly appalling, so much so that such requests are often simply not made (Cohen 1989). Obviously, it is important to frame the collection request in a compassionate and sensitive way that respects the dignity of the recently departed and acknowledges the grief of those mourning a fresh loss. OPO members are trained in this matter

and are often currently called upon by hospitals to approach families and make the donation request (Kaserman and Barnett 2002). People's fears and objections over donation are now, to a certain extent, addressed. For instance, families can be assured that bodily disfigurement will not occur as a result of organ extraction, and that the viability of an open casket funeral following donation will remain unchanged. Yet, given our daunting organ shortage, it is apparent that more must be done to overcome objections and make the donation request less painful, both for grieving families and for hospital staff who must make the difficult request. By allowing the natural phenomenon of positive, market-determined prices to apply to transplantable organs, hospital staff and OPOs would have something to offer potential suppliers in exchange for highly valuable and life-saving organs. Giving suppliers some known tangible recognition for their generosity in the form of a payment to the deceased's estate may be sufficient to overcome their natural resistance. After all, it has already been established that Americans overwhelmingly approve of donation. Market-based payments would simply ease the donation process along at the time when the decision to donate must actually be made.

Exactly how elastic the supply curve really is will influence the slope of the supply curve, and thus the intersection of supply and demand and the market clearing price level of procured organs. As expected, such an important point of distinction is a matter of much spirited speculation. Adams, Barnett and Kaserman were the first and, as yet, the only economists to contribute solid empirical evidence to the debate. In order to generate a illustrative supply schedule of cadaveric kidneys, the authors conducted a survey on a broad swath of students at Auburn University, posing questions of the students' knowledge of procurement procedures and their willingness to supply a kidney at different price levels, including zero. The results indicate that an increase in the legal price of kidneys from $0 to $1000 would induce a 117% jump in the

number of organs supplied. Such a dramatic increase in the availability of cadaveric kidneys, when extended to the general population, would more than eliminate the annual shortage and take a large chunk out of the cumulative waiting list (Adams, Barnett et al. 1999). Although the survey was rather limited in it's sample (college students) and thus may be somewhat limited in its scope, it is not unreasonable to assume that a $1000 price level is a valid estimate for equilibrium in a cadaveric organ procurement market (Kaserman and Barnett 2002). Furthermore, many other economists, such as Peters, Beard, Saba and others, have come to a consensus that a relatively low price, specifically under $5000 or approximately $1000, is a good estimate of the true market-clearing level (Kaserman and Barnett 2002). It is very likely that such a small payment to organ donors is all that is needed to spur supply sufficiently to meet demand.

6.3 Supply Discontinuity

While most people would likely view positive prices as an incentive to supply organs, it is possible that some people who would willingly donate organs for purely altruistic reasons may be so completely offended by positive prices that they will refuse to donate after the formation of an organ procurement market. These "market averse" individuals would not donate organs at any price if a non-zero price level is in place. Such a phenomenon would cause a discontinuous supply curve, as the supply-curve intercept at zero price level lies to the right of the beginning of the continuos supply curve (Kaserman and Barnett 2002). Surveys indicate that a small but perceptible proportion of the population is indeed offended by the prospect of market exchanges extending to human organs (Kaserman and Barnett 2002). It is worth noting that in this case financial and altruistic incentives are not mutually exclusive; positive prices do not have

to detract from the inner pleasure derived from the act of giving life through supplying precious organs. However, the intervention of market forces can be expected to change the perceived value of organs. When people are motivated through generosity and altruism to donate without any expectation of compensation, the value attached to the act of donation can be construed to be priceless; donated organs are seen as an invaluable gift that will save other's lives. By attaching a market-derived positive price to donated organs, the "gift of life" is in many ways diminished, no longer priceless and only as valuable as the going rate for organs. This problem is only compounded by the fact that the market-clearing price is expected to be quite low, as equilibrium prices reflect market determinants and not the enormous value realized by transplant recipients (Adams, Barnett et al. 1999).

An important question is not only the size of this market-averse group but also whether the majority of individuals holding this view would agree to supply at some price despite their discomfort. The portion of the population that is market-averse has been estimated to be small; the percentage of these individuals that maintain their aversion in the presence of increasingly higher compensation is even smaller (Kaserman and Barnett 2002). Given the environment of an organ procurement market and the corresponding shapes of the supply and demand curves, the effects of supply discontinuity can be properly analyzed. As low price elasticity of demand leads to a steep demand curve, even a large leftward shift in supply would not have much effect on the equilibrium quantity of organs supplied, especially given the relatively high price elasticity of supply. In other words, even if market aversion were actually prevalent, the advantages of a market regime in eliminating the organ shortage would remain intact (Kaserman and Barnett 2002). The fact that aversion to market forces appears to be uncommon provides further reassurance to the viability and of an organ procurement market.

6.4 Equilibrium and Welfare Costs

A supply and demand diagram of the hypothesized legalized market in cadaveric kidneys is shown in Figure 1. The steep slope of demand and the gentle rise of supply represent the best available estimates of the relative price elasticities for cadaveric kidney supply and demand. Point A is the annual number of altruistically donated kidneys under express altruistic donation procurement while point E indicates the total number of kidneys demanded per year at the zero price. As mentioned previously, point B, represents the black-market price of a kidney. The gap between A and D represents the U.S. kidney shortage; the number of kidneys demanded exceeded quantity supplied by approximately 10,000 in 1998 (Kaserman and Barnett 2002).

Obviously, a shortage of this magnitude will generate substantial welfare costs, shown graphically as triangles X plus Y in Figure 1. Based on the best assessments of the elasticities of supply and demand, the black-market estimated price is $5 million (Kaserman and Barnett 2002). Given the annual kidney shortage of approximately 10,000, it is possible to arrive at a rough approximation of the welfare cost caused by a zero-price ceiling.

I've used two different approaches to estimate this deadweight loss. The first method of estimation is quite straightforward. To find the total welfare cost, triangle X plus triangle Y, one can simply sum the areas of the two triangles. Using the formula of a triangle (½ * base * height) for the area, the area of Y is 5 million[1], while the area of X is 25 billion[2]. Summing these areas yields an annual total welfare cost of 25,005,000,000, or just over 25 billion.

An alternative approach would be to measure the area of the larger triangle ABE and then subtract from this the area of triangle ACE. Unfortunately, since the exact slope of the demand

[1] ½ * 10,000 * 1,000
[2] ½ * 10,000 * 4,999,000

curve is unavailable, it is impossible to make this simple calculation geometrically. However, this area can be estimated using other, non-graphical sources. Consider that ABCD represents the value that could be gained if all renal-failure patients currently unable to receive an organ underwent successful kidney transplantation. This value should reflect the reduction in non-transplant medical expenses such as dialysis, the gain of productive, healthy individuals to society and the workforce, and ideally, the lessening of emotional strain and turmoil for patients who would otherwise suffer long, uncertain periods on organ waiting lists. All of these variables necessitate a rather complex computation; I have simplified matters by basing my estimate on the quality-added adjusted life year (QALY). As John Nyman explains in "The Value of Health Insurance: The Access Motive," the QALY puts a quantitative value on an added year of life. As the measurement is quality-adjusted, it also represents the numerical gain of drastically improving an individual's quality of life for one year (Nyman 1999). Nyman surmises that, based on extensive review of the value of life literature, the QALY is approximately $100,000 (Nyman 1999). Since nephrectomies could save many people from dying while on waiting lists and greatly improve the quality of life of others subsisting on dialysis, the QALY seems like a very good approximation of the gain to society represented in Figure 1 as ABCD. Multiplying the $100,000 QALY by the average kidney transplant survival rate of 16.4 years[3] yields an expected welfare gain of $16.4 million per kidney transplant. When this number is multiplied by the kidney shortage of just over 10,000, the value of ABCD comes to $1.64 billion. It is now a

[3] A study conducted in 2000 using data from UNOS concluded that 50% of kidneys transplanted from living donors are expected to develop failure in 21.6 years while 50% of cadaverically procured kidneys are expected to fail within 13.8 years (Hariharan et al. 2000). Given that 2/3 of transplantable kidneys currently come from cadaveric donors (Hariharan et al. 2000), I performed a weighted average to arrive at the expected survival rate of 16.4 years.

simple matter to subtract the area of triangle Z,[4] to arrive at an estimate of the per annum total welfare cost of approximately $16.4 billion.

Thus, the annual estimated deadweight loss of the express donation procurement policy, for kidneys alone, falls between $16 and $25 billion. This substantial sum, well over 1% of total national health expenditures as of 1998 (http://www.cms.hhs.gov/statistics/nhe/projections-2003/t2.asp 2004)[5], represents the yearly loss to society of a kidney shortage spawned by a misguided proscription on positive prices. Furthermore, these estimates of the welfare cost are almost certainly biased downward. Waiting lists have become so bloated with desperate patients that the requirements for becoming a potential organ recipient have become increasingly stringent. Transplant physicians have been forced to strictly enforce screening criteria for potential transplant recipients, turning away many patients who would otherwise be viable candidates, and leaving them with no real hope of ever becoming well (Barnett, Blair et al. 1992). It seems clear that current procurement policy and the subsequent shortage have resulted in an environment in which organ demand has been artificially curtailed. To come closer to the true excess burden generated by market prohibition, one should consider the true suppressed demand curve, which must lie to the right of observed demand.

[4] ½ * 10,000 * 1,000 = 5 million

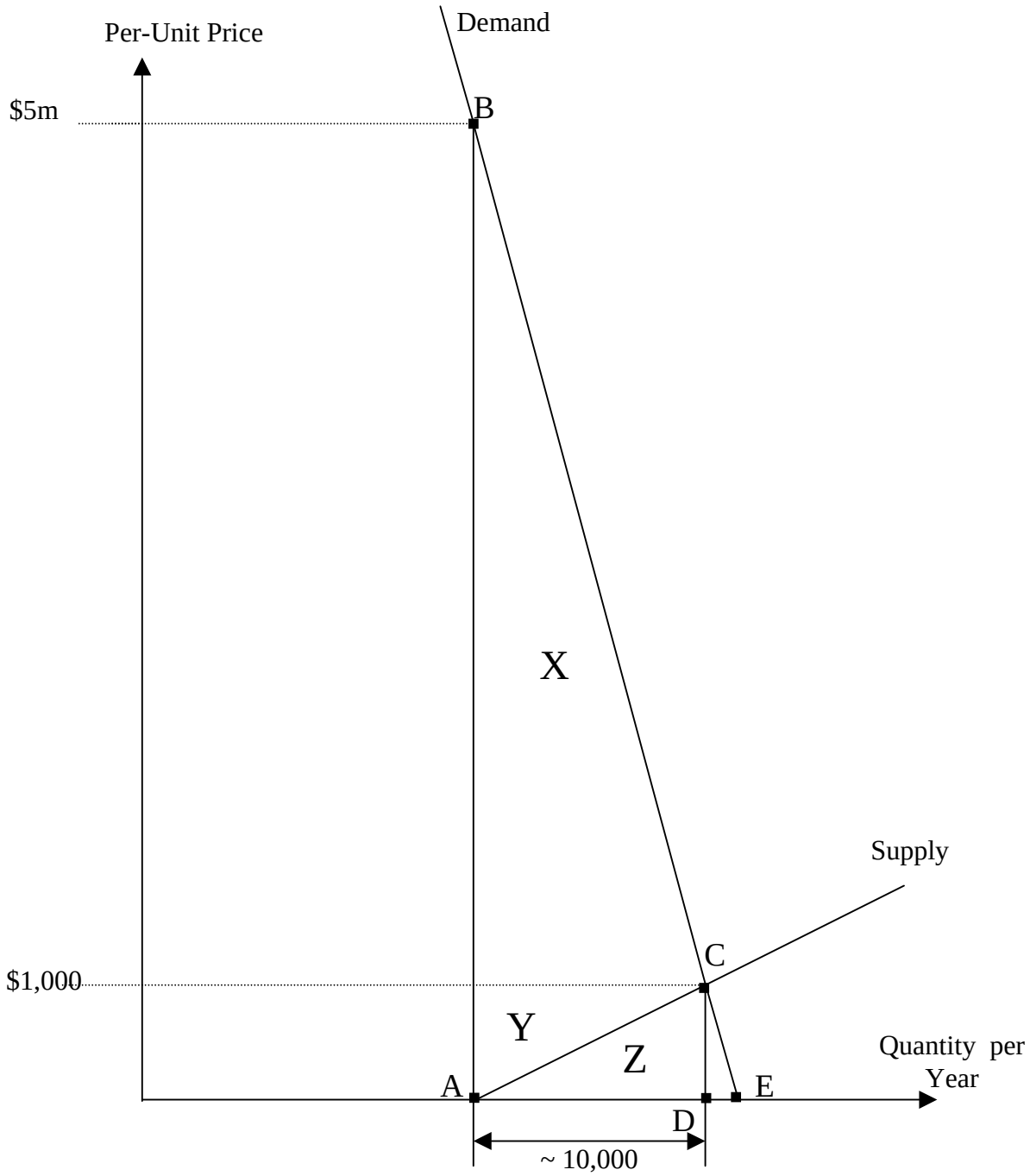
[5] National health expenditures (NHE) were approximately $1.15 trillion in 1998. $16 billion is 1.4 % of NHE; $25 billion is 2.8% of NHE.

CHAPTER 7

SUMMARY

Given the likely shapes of the supply and demand curves, it is apparent that the imposition of a zero price level is, if not the main cause of the U.S. organ shortage, certainly a large contributing factor. Excess supply capacity guarantees that there are more than enough potential suppliers to meet demand at any market-determined price. Legalization of market procurement transactions would automatically decrease the shortage as market forces strive towards equilibrium. By fostering a kidney shortage that results in over 6,000 deaths each year, express donation has given rise to welfare costs that would be completely eliminated with the implementation of a cadaveric procurement market. Specifically, the excess burden engendered by express donation is estimated at approximately $16-25 billion per year, although the true loss to society is likely even higher. Our current "altruistic system", by prohibiting equilibrium-seeking market forces, essentially maintains and assures that supply and demand will never meet to alleviate our country's pronounced and tragic organ shortage.

Figure 1 THE CADAVERIC KIDNEY PROCUREMENT MARKET



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"Table 2: National Health Expenditure Amounts and Average Annual Percent Change by Type of Expenditure: Selected Calendar Years 1990-2013" (2004), Centers for Medicare & Medicaid Services, http://www.cms.hhs.gov/statistics/nhe/projections-2003/t2.asp. **July 2005**.

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