


Heterogeneity of Market Structures in the Iranian Model of Kidney Transplantation

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The Iranian model of kidney transplantation (IMKT) is an example of a legal system of compensated, living, and unrelated renal donation. This study demonstrates its heterogeneity regarding prerequisites, restrictions, and policies for matching donors and recipients with an emphasis on the case of Mashhad, in which the Iranian Kidney Foundation (IKF) received criticism about the kidney market. The IKF in Mashhad strives to prevent the poor from imprudently selling their own kidneys by informing them about the consequences of a kidney transplant, resolving their financial needs, and imposing several legal obstacles before a transplant is allowed. We show that the IMKT does not fully eliminate excess demand for kidneys, although it significantly decreases demand so that Iran has the shortest waiting list in the world. Nevertheless, the relative number of kidney transplants, especially from deceased donors, are higher in Mashhad compared to the average of other centers in Iran, as almost forty percent of renal patients on the active waiting list get a kidney each year.

KEY WORDS: live kidney transplant, Iranian model of Kidney Transplant, kidney market, Iranian Kidney Foundation, compensated organ donation

Introduction

The Iranian model of kidney transplantation (IMKT hereafter) has been relatively successful in overcoming the severe scarcity of kidneys. It is a state-funded system of compensated, living, renal transplant, established in 1988, in which the government pays for all transplant-related expenses. The legal kidney market in Iran led not only to the alleviation of the black market but also to the decrease of the waitlist for patients requiring a kidney transplant such that most Iranian kidney transplant candidates, regardless of their socioeconomic class, have access to a new kidney (Mahdavi-Mazdeh, 2012).

In Iran, a patient can receive a kidney from either a live or deceased donor. Once brain death is medically confirmed, organs and tissues of deceased donors are used either with their previous consent, that is, written consent or a signed donor card, or by the next of kin (Larijani, Zahedi, & Taheri, 2004).¹ A live donation can be from a related donor, which is mostly noncompensated, or from a nonrelated donor, which is almost always compensated. Kidneys donated from a deceased donor are transplanted locally, regionally, and nationally based on the *Guideline for the Allocation of Kidneys from Deceased Donors* (Transplantation Organs Unit, 2011).

Typically, a local medical university selects a kidney transplant patient from the official waiting list for a deceased donor, according to his/her priority score. Patient scoring on the waiting list is based on the number of months on dialysis, the number of months with an active medical record, the quality of the match, the panel reactive antibody, the level of medical emergency, the age, an identical or compatible blood type, and whether the patient has donated before. If multiple potential recipients have the same rating, the decision is referred to the Renal Transplant Scientific Committee, which consists of three renal transplant surgeons, three to five transplant specialists, a nephrologist, a kidney transplant specialist, an anesthesiologist, and a head nurse.

There is still no law in Iran for living donor transplants. The essential protocol from the MHME, dated 29 April 2006, legalized and allows kidney transplants from a living donor. Article 7 of this protocol states in detail the requirements for the nonrelated living donor, including age; written consent of the donor, spouse, and parents (if he/she is single); and physical and mental health. Moreover, the Department of Philosophy, Ethics, and Biological Sciences at the Iranian Academy of Medical Sciences issued the Professional Codes of Organ Transplantation in 2008 stating that living kidney donation is generally accepted and that monetary payment to the donor as a reward, as gratitude, or as a gift is not considered to be immoral.

In order to manage the donor kidney market, the IKF in Tehran announces a new official kidney price every few years. Most IKF branches in each province recognize the official kidney price as its floor price and accept an extra payment above this threshold, which is discussed directly between the patient and the donor. The compensation for donors formally includes this agreed upon price plus a reward, called the Gift of Altruism, which is an additional fixed rate of 10 million IRR (about 240 USD), provided by the Charity Foundation for Special Diseases (CFSD).

Nevertheless, the IMKT in Iran is not functioning at the same standard in all cities. There are currently 30 kidney transplant centers in the country, with 12 centers in Tehran and 18 centers in other provinces. The local IKF in the provincial centers, despite their similarities, have notable differences in their matching requirements and their recognition of the market price for a kidney.

On the one extreme, the IKF in Shiraz does not recognize a market for organs, and it gets kidneys only from close relatives or deceased donors rather than from compensated, nonrelated, live donors. Incidentally, Shiraz has the highest rate of deceased donors among the main kidney transplant centers in Iran based on the latest statistics from the Iranian Society of Organ Donation.² On the other extreme, the IKF in some other cities, for example, Tehran, unofficially recognizes an additional payment above the official kidney price but does not document it. Donors and recipients privately exchange money under the table despite having signed an agreement assuring that no payment is being made over the official rate.

This paper fills an essential gap in the literature by evaluating the IMKT, a homogeneous system intended to function entirely the same throughout the

country. We acknowledge its heterogeneity and discuss differences in practicing the model, with an emphasis on the case of Mashhad.

Kidney Transplants in Mashhad

More than 2,500 renal patients had a kidney transplant between 1985 to 2017 at the Montaserie Organ Transplant Hospital in Mashhad (Montaserie Organ Transplant Hospital, n.d.). We collected a dataset of all kidney transplants, from a live or a deceased donor, conducted in Mashhad between 2008 to 2016, and got similar data on the total number of kidney transplants from live or deceased donors in Iran from the Iranian Society of Organ Donation.³ Figures 1 and 2 compare these numbers and provide a broad, relative picture of the kidney market in Mashhad.

The registration process for both donors and recipients is relatively easy. Each end-stage renal disease patient under age 70 who does not have a willing, related donor and who meets the requirements of the MHM is referred through a nephrologist's letter to the IKF in Mashhad to go on the waiting lists to get a kidney from either a live or deceased donor (Transplantation Management Unit, 2012). Concurrently, each volunteer kidney donor between 22 and 40 years of age registers with the IKF after undergoing preliminary medical tests and brings a notarized consent for himself/herself and his/her family.

There are four different matching lines for each blood type, and the IKF in Mashhad usually matches each donor with a renal patient having the same blood type on the active waiting list based on a first come, first served priority. However, the IKF in Tehran cares about blood type compatibility, rather than similarity. This different matching policy shrinks the four waiting lines to one line of patients with different blood types. There is no official data on waiting times in different transplant centers in Iran, but the average waiting time for a kidney transplant is between 12 and 18 months.⁴

In contrast to the common viewpoint, the IMKT did not entirely eliminate the waiting list for a kidney; however, it reduced it significantly so that Iran has the shortest waiting list in the world. At present, 8,600 renal patients are waiting for a kidney transplant in Iran.⁵ Patients on the supplemental list were waiting to get the approval of the Renal Transplant Scientific Committee to get on the active waiting list. This decreased in 2017 to 828 patients, in total; 188 patients on the active list, and 640 patients on the supplemental list.⁶ About 37 percent of renal patients on the active waiting list in Mashhad were fortunate enough to receive a kidney; while in 2017, almost 41 percent of them received a kidney, which is much higher than similar ratios in Iran.

As shown in Figure 3, the ratio of kidney transplants from deceased donors to total kidney transplants in Mashhad had always been much higher than the average of the ratio in Iran until 2013. After a decline in 2014 and 2015, the IKF in Mashhad changed its policy to direct patients to obtain a kidney from a deceased patient instead of a live donor. This new policy already shows beneficial results in 2016 and 2017 with a significant increase in the relative number of transplants

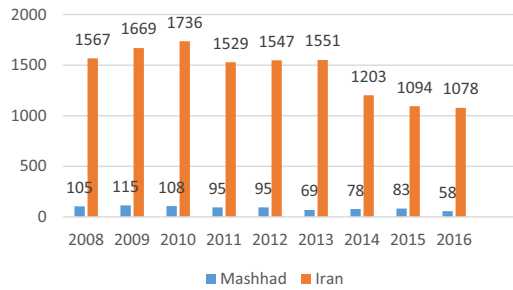


Figure 1 Number of Kidney Transplantations from Live Donors in Mashhad and Iran.

from deceased donors rising to 69 and 66 percent of total kidney transplantations, respectively.

Despite its success, the IMKT has some weaknesses (Aramesh, 2014) such as a stigmatization against donors (Nayebpour & Koizumi, 2018), which deters donors from following up on their medical status and from participating in organ commercialization and commodification (Griffin, 2007). In addition, the exploitation of socially disenfranchised donors (Khetpal & Mossialos, 2018), and disrespect of the human integrity of donors dissuades participation (Gordon & Gill, 2013). However, the Montaserie Organ Transplantation Hospital in Mashhad tries to overcome these shortcomings by giving donors more than money.

To assist recipients and donors, Montaserie Organ Transplantation Hospital holds obligatory training classes for patients and their family members. In these classes, they discuss the necessity of continuous and periodic follow-up medical examinations, the risks of transplant, symptoms of transplant rejection, the need for the postgraft regimen, and the limitations/risks/ability for posttransplant pregnancy. Moreover, they talk about the differences in renal transplant from a live or deceased donor in terms of risk factors and waiting time. Furthermore, in these classes, a psychologist assesses the patient's intelligence and the level of his/her family's support. The IKF removes patients from the kidney transplant waiting list who do not actively participate in these classes (Transplantation Organs Unit, 2011).

In addition to donor and patient matching, the IKF in Mashhad also gives monthly allowances and provides food, clothing, school bags, shoes, transportation costs, and stationery for its covered patients. Moreover, if an indigent patient cannot afford to purchase a kidney, the IKF, with the support of other charity organizations, pays the price to the donor.

The IMKT functions effectively and admirably in Mashhad (Fry-Revere, 2014) using transparent and formal side payments through the IKF. While IKF branches in other cities do not track side payments, the IKF in Mashhad is the only center that documents the entire transaction, including the extra money beyond the official price, in order to avoid fraudulent or excessive price increases. Following the initial registration, a renal patient pledges in cash half the official price of a kidney

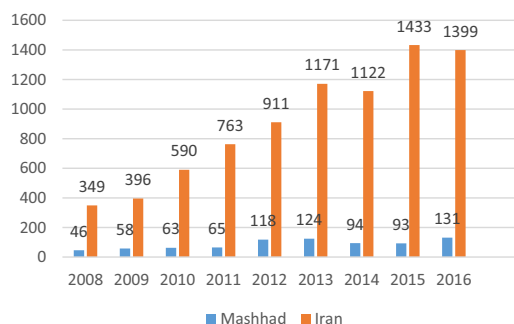


Figure 2 Number of Kidney Transplantations from Deceased Donors in Mashhad and Iran.

to the IKF in Mashhad. Once the patient is matched to a donor, and they both agree upon a price, the patient pays the remaining price of the kidney to the IKF with a check. After the transplant, the IKF transfers the entire payment from the patient to the donor.

As a charity organization, the IKF neither receives financial interest, nor benefits from any monetary transactions. Although there is no official ceiling price, the IKF in Mashhad informally strives to convince and incentivize the donor not to ask a high price in order to keep the price between the low official price, which is rarely realized, and a high free market price that is typically obtained in Tehran. For instance, in cases where the donor is especially willing to donate, the IKF might not connect the donor with the CFSD to get his/her gift of altruism.

The kidney market in Mashhad is more efficient than Shiraz because patients do not wait for a deceased donor while they are suffering the pain of dialysis, and faster medical care decreases the IKF's cost of care. It is also more restrictive than Tehran because it informally puts a ceiling price on kidneys to prevent it from becoming inaccessible for most of the patients, who are generally as poor as the donors.

The IKF in Mashhad informs both donors and patients that it will not endorse any under-the-table payments. As a result, patients have no incentive to give an

Table 1. Different Aspects of Heterogeneity of Iranian Model of Kidney Transplantation

Provinces	Additional Payment Recognition	IKF Involvement in Money Transaction	Responsible Body for Costs of Medical Tests	Legal Requirements for Donation	Matching Criteria for Blood Type	Duration of Transplant Process
Tehran (Tehran)	No	Partial	Patient	Less restricted	Compatibility	3–4 months
Mashhad (Khorasan Razavi)	Yes	Complete	Donor	More restricted	Similarity	20–40 days
Shiraz (Fars)	No	No	Patient	Extremely restricted	Similarity	–

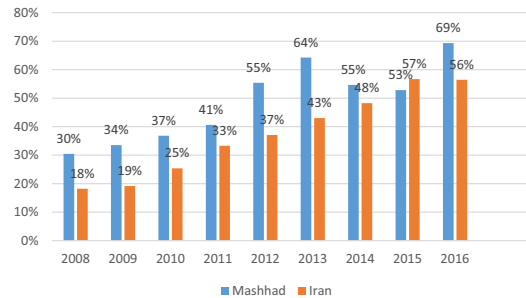


Figure 3 Percentage of Kidney Transplantations from a Deceased Donor in Mashhad and Iran.

additional payment after the transplant; however, they also have no reason to pay in advance, as the donor might refuse to donate his/her kidney after payment. Donors also know that any unauthorized payment is not enforceable, so they are more likely to trust a nonincentive compatible offer. Therefore, it is not guaranteed that under-the-table payment does not take place in the kidney market in Mashhad, but it is less likely compared to the IKF in Tehran, which does not get involved in the monetary transactions.

In Mashhad, kidney sales are generally more restricted. Nationally, the legal age for kidney donation is between 22 and 40 years, while in Mashhad, it is between 25 and 38 years. In general, married donors must submit a notary's consent for themselves and their spouse. However, women in Mashhad, whether married or not, must also submit their parental notary's consent to the IKF. In Tehran, both married and divorced women can donate their kidneys without parental consent through a court order. However, in Mashhad, divorced donors must provide their divorce letter to the IKF in order to receive approval. In addition, potential donors suspected of mental disorders are referred to the Forensic Medicine Authority to confirm their mental health, which authorizes whether they can decide to sell their organ.

Moreover, in Mashhad, the donor covers the cost of the medical tests required for donation, which is lower compared to Tehran; whereas, in Tehran, the organ recipient is responsible for those costs. Furthermore, the kidney transplant process in Tehran takes between 20 and 40 days, while it takes between 3 and 4 months in Mashhad. The additional restrictions in Mashhad are intended to make the process of live kidney donation more costly and to discourage the poor from selling their kidney imprudently. Table 1 summarizes the different aspects of the heterogeneity of IMKT.

Discussion

Most of the papers in the literature do not sufficiently address the heterogeneity of the IMKT within the country. In this paper, we tried to clarify the differences in the kidney markets in Iran, with an emphasis on the market in Mashhad.

The IKF in Mashhad, especially in recent years, has received criticism on ethical grounds about the Iranian model of the kidney market regarding the stigmatization of donors, disrespect toward their integrity, and the commercialization and commodification of their body organ. In order to minimize these critics, Mashhad strives to prevent the poor from selling their kidney by informing them beforehand about the consequences of kidney transplantation. However, Mashhad also endeavors to resolve the financial needs of the poor by providing alternative supportive measures. Moreover, the IKF in Mashhad significantly reduces patient exploitation in an unrestricted market by involving itself with the financial transaction between donors and recipients.

In conclusion, most of the ethical concerns raised about the IMKT do not apply in the case of Mashhad, and it performs better than the other IKF organizations in Iranian cities. The strengths of the IKF Mashhad organization are twofold: First, it is fully involved in all monetary transactions between donors and recipients, which protects the patients from being exploited. Second, it established several legal restrictions before donation is allowed, and provided complete information about the consequences of kidney transplantation, which decreases the potential for unwise kidney donations and gives donors the opportunity to decide deliberately and with full awareness.

The primary weakness of the IKF in Mashhad is its inefficient matching mechanism, which operates against patients with a rare blood type. Nevertheless, the kidney market in Mashhad could be a model for organ transplantation in other places, which could save the lives of numerous patients.

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Notes

Conflicts of Interest: None.

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1. In Iran, the Ministry of Health and Medical Education (MHME) hereafter, has the responsibility to allocate kidney transplants from deceased donors; however, it can delegate this responsibility to the local medical universities, if needed.
2. <https://ehda.center/PKVpjA> (in Persian).
3. <https://ehda.center/PKVpjA> (in Persian).
4. <https://www.isna.ir/news/97110402289/> (in Persian).
5. <https://www.isna.ir/news/98031004171/> (in Persian).
6. <https://www.isna.ir/news/96050201284/> (in Persian).

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