

# Journal of Nephrologist



## The Iranian model as a potential solution for kidney shortage crisis

Bahar Bastani<sup>\*ID</sup>

Division of Nephrologist, Saint Louis University School of Medicine, Saint Louis, USA

### ARTICLE INFO

*Article type:*  
Editorial

*Article history:*  
Received: 3 May 2018  
Accepted: 9 July 2018  
Published online: 19 August 2018

*Keywords:*  
Kidney transplantation, Organ shortage, End-stage renal disease, Kidney donation, Compensation, Selling kidney

*Implication for health policy/practice/research/medical education:*

Increasing supply of kidneys, decreasing transplant wait time, reducing wait list, decreasing morbidity and mortality in end stage renal failure patients, decreasing cost to society.

*Please cite this paper as:* Bastani B. The Iranian model as a potential solution for kidney shortage crisis. J Nephrologist. 2018;7(4):220-223. DOI: 10.15171/jnp.2018.46.

April is Donate Life Month when we are all reminded to work collectively to increase the number of organ donors, both living and deceased donors, to help the ever increasing number of patients who are desperately waiting for life saving organs. As of the end of March 2018 a total of 125 602 patients are registered in the United States in wait list for an urgently needed lifesaving organ. Of them, around 103 000 are in wait list for kidney, around 14200 for liver, around 900 for pancreas, around 1700 for kidney/pancreas, around 4000 for heart, around 40 for heart/lung, and around 250 for intestine transplant (1). While a live donor can provide a kidney, and at times a lobe of liver, a deceased donor can provide 8 lifesaving organs, as well as, 2 corneas, skin and muscle, and turn around the life of another human being to a better life.

Kidney transplantation is the treatment of choice for eligible patients who have reached end-stage renal disease (ESRD). It significantly improves patient survival and quality of life, and reduces cost of health care when compared to dialysis. Six decades of success in the field of transplantation have made it possible to save thousands of lives every year. However, that success has been overshadowed by an ever-growing shortage of

organs in the recent years. The supply of kidneys available for transplant has barely increased, not enough to come close to the ever-increasing demand. Currently there are 104804 patients registered in the United States waiting for kidney or kidney-pancreas transplant. However, the supply of kidneys that stagnated around 16 000 to 17 000 per year (10 000-11 000 deceased donor and around 6000 live donor kidneys per year) in the decade between 2004 and 2014 has since then increased to near 20 000 kidneys (14 038 diseased donor and 5813 live donor kidneys) in 2017. The increase in supply was all due to increased availability of deceased donor kidneys from young drug overdosed deaths in the United States (1). According to the U.S. Centers for Disease Control and Prevention (CDC) and National Institute on Drug Abuse, there were 63 632 drug overdose deaths in the United States in 2016 (174 deaths per day) of which 42 249 (66.4%) were due to opioids overdose (2,3). Meanwhile, there has been a decline in the annual number of living donor kidneys from a peak of 6648 in 2004 to only 5813 in 2017. Moreover, while only 20% of the half million dialysis patients in the United States make it to transplant wait list, of those who make it to the wait list only around 20% may get a transplant, and around 4000 to 5000 die each

*\*Corresponding author:* Professor Bahar Bastani, Email: bastanib@slu.edu

year while waiting (an annual mortality rate of around 5% among patients waiting for a kidney), and another 4000 to 5000 patients are removed from the wait list every year since they have gradually got too sick to get a transplant (1). Thus, around 80% of our demand for kidneys is unmet every year (1,4). And it would still be unmet even if everyone in the country signed an organ donor card, because less than 1% of those who die each year do so under conditions that allow a successful transplant (5). That so many people are deprived every year from getting a transplant and remain on dialysis, die or are unlisted because of getting too sick while waiting is a tragedy. The simple fact is that an insufficient number of kidneys are donated each year to meet the increasing demand because the National Organ Transplant Act (NOTA), adopted in 1984, prohibits providing compensation to kidney donors except under very limited conditions that are not of help to most potential donors. The ever-widening gap between demand and supply has resulted in an illegal black market and unethical transplant tourism of global proportions.

The global organ shortage crisis has led to transplant tourism and a black market in kidneys that creates dangerously high risks for all involved. Rich patients from the United States, Canada, Europe, Japan, Australia, Saudi Arabia, and Oman travel to countries like China, the Philippines, Pakistan, India, Brazil, Bolivia, Iraq, Moldova, Peru, Turkey, and Colombia, and pay black market brokers tens to hundreds of thousands of dollars to buy kidneys (6). These kidneys are obtained from executed prisoners (around 90% of kidneys in China) or illegally obtained from desperately poor locals, with no guarantee that they will be informed of the medical or legal risks they are taking. The transplants are often performed under unsafe and questionable conditions without proper donor and recipient evaluation. Under such circumstances, recipients are at risk of getting suboptimal organs, transferable diseases (hepatitis B, hepatitis C, HIV, bacterial infections) and run a high risk that organ traffickers will cheat them. There is even a chance that they will be prosecuted for illegal activity once they return to their home countries. Donors run even higher risks, go without adequate post-operative care, are frequently cheated by organ brokers who do not pay them the money promised, and lack any form of legal remedy if cheated or mistreated, and run the risk of being arrested for having participated in an illegal activity.

The Iranian Model of regulated incentivized live kidney donation has evolved over the past 35 years and provides an example of a nation willing to take a novel, daring

approach to solving its kidney shortage (7,8). The result of the Iranian Model has not always been positive but, to its credit, the Iranian medical community has responded by continually adjusting the system to deal with problems as they arose—banning organ sales to foreigners, demanding more government benefits for both donors and recipients, and providing ever more comprehensive guidelines for the donor vetting process. Health authorities in Iran should continue to improve the system by alleviating the shortcomings of its program and through more vigilant enforcement of the existing laws, regulations, and guidelines. The system is clearly in need of better pre-donation evaluation and long-term follow up of donors, as well as more social support networks for donors, life-long health insurance, and more financial compensation for donors (9). The Iranian Model has achieved several important milestones that other nations should learn from:

1. Created a legal structure for enforceable donor/recipient contracts.
  2. Provided guidelines to help ensure informed consent for donors and their next of kin.
  3. Licensed NGOs (Anjomans) to provide free assistance to both recipients and donors in brokering transplant deals and applying for related government and charitable benefits.
  4. The requirement of the same citizenship between donors and recipients to prevent transplant-tourism and protects Iran's own ESRD patients from being excluded in favor of potentially higher paying foreigners.
  5. Initiated important data collection and studies to evaluate its system of paid donation.
  6. Funded through the government, all transplant related medical care cost is covered.
  7. Requirement that transplantations be performed at university hospitals and by qualified transplant teams.
- As a result of all these achievements, unlike anywhere else in the world, everyone who medically qualifies for a transplant in Iran can begin the process for getting one, and in some regions of the country there is even a waiting list for people who want to donate (8,10). While there is much room to improve the Iranian Model of regulated incentivized live kidney donation, with some significant revisions, the Iranian Model could serve as an example for how other countries could make significant strides to lessening their own organ shortage crises.

A legitimate concern regarding the Iranian Model of regulated incentivized live kidney donation is that it may harm development of an active deceased donor kidney transplant program. However, after the Iranian parliament passed the Organ Transplantation Brain

Death Act in the year 2000 that legalized deceased organ donation (11), in 2002 the Iranian Network for Transplant Organ Procurement was created. As a result of these developments there has been a steady rise in the number of deceased donor kidney transplantations in Iran. So that, while the total number kidney transplants increased from 1421 in the year 2000 to 2285 in the year 2010, the share of living unrelated transplants decreased from 86% in 2000 to 75% in 2006 and 69% in 2010. This change was mainly due to a significant increase in the number of diseased donor kidney transplants from 2.2% of all kidney transplants in 2000 to 13% of the annual kidney transplantations in 2006 (12), and 26% (7.9 per million population) in 2010 (8). In 2016 the number of kidney transplants from deceased donors was 17.5 per million population, and from living donors was 13.5 per million population in Iran (14). Thus, both the absolute and relative numbers of deceased donor transplants have increased in Iran over the past 2 decades. The main hurdles in the path of deceased donor transplantation in Iran has been deficiencies in the infrastructure and cultural barriers (73% refusal rate by the families of potential deceased donors) and not the availability of the paid kidney donation program (15).

Another frequently cited objection to the Iranian Model of regulated incentivized live kidney donation is that the donors are donating out of an urgent financially distressful situation. An important question to keep in mind is what such potential donors will do if deprived of the opportunity to donate in exchange for a financial incentive. What could they do instead to alleviate their financial predicament, prevent impending homelessness, help a sick relative, or avoid imprisonment for failure to pay a tort judgment? What other courses of action are available and at what cost to themselves and to the society? If the alternatives were incarceration, loss of a loved one, stealing, murder, suicide, or homelessness, then donating a kidney in exchange for a financial incentive and saving a life would be a more reasonable and honorable choice, even if the relief is partial or temporary in some cases.

To alleviate some of the short comings of the Iranian Model, the direct financial relationship between the potential donor and the recipient should be avoided by either changing the current scheme to a fully government compensated system, or alternatively by creating an organ bank run by state health authorities (Iranian Kidney foundation). Paid donors should not be allowed to choose their recipient. This decision should be completely at the discretion of the health authorities, local Anjomans and the transplant team, and based on the health condition

of the recipients and or compatibility of the donors (through a similar scoring/priority system as the one used by United Network for Organ Sharing [UNOS]). No alternatives or independent method for obtaining organs other than altruistic donations from family members should be allowed. Once such modifications are implemented there is a chance that the Iranian Model could become an example for other countries, but not before. Moreover, there should be comprehensive long-term follow up of paid donors. While the immediate cash provided often seems to alleviate urgent financial needs, more efforts are needed to help ensure long-term benefits.

#### Author's contribution

BB is the single author of the paper.

#### Conflicts of interest

The author declared no competing interests.

#### Ethical considerations

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

#### Funding/Support

None.

#### References

1. Organ Procurement and Transplantation Network. <https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/#>
2. Diversion Control Division – Opioid Addiction Resources.
3. National Institute on Drug Abuse - overdose death rates. <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>.
4. Bastani B. The worsening transplant organ shortage in USA: desperate times demand innovative solutions. *J Nephropathol*. 2015;4(4):105-109. doi:10.12860/jnp.2015.20
5. Sheehy E, Conrad SL, Brigham LE, et al. Estimating the Number of Potential Organ Donors in the United States. *N Engl J Med*. 2003; 349(7):667-74.
6. Shimazono Y. The state of the international organ trade: A provisional picture based on integration of available information. WHO Report 2007. <http://www.who.int/bulletin/volumes/85/12/06-039370/en/>
7. Ghods AJ, Savaj S. Iranian model of paid and regulated living-unrelated kidney donation. *Clin J Am Soc Nephrol*. 2006; 1(6):1136-45.
8. Mahdavi-Mazdeh M. The Iranian model of living renal transplantation. *Kidney Int*. 2012;82:627-634.
9. Hamidian Jahromi A, Fry-Revere S, Bastani B. A revised Iranian model of organ donation as an answer to the current organ shortage crisis. *Iranian J Kidney Dis*. 2015;9(5):354-360.

10. Fry-Revere S. *The Kidney Sellers: A Journey of Discovery in Iran*. Carolina Academic Press; 2014.
11. Islamic Republic of Iran Parliament. Deceased or Brain Dead Patients Organ Transplantation Act. H/24804-T/9929, June 4, 2000.
12. Einollahi B. Cadaveric kidney transplantation in Iran: Behind the Middle Eastern countries? *Iranian J Kidney Dis*. 2008;2(2):55-6.
13. Einollahi B, Nourbala MH, Bahaeloo-Horeh S, Assari S, Lessan-Pezeshki M, Simforoosh N. Deceased-donor kidney transplantation in Iran: trends, barriers and opportunities. *Indian J Med Ethics*. 2007;4(2):70-2.
14. International Registry in Organ Donation and Transplantation report on December 2017. <http://www.irodat.org/img/database/pdf/IRODaT%20newsletter%20Final%202016.pdf>
15. Khoddami Vishteh HR, Ghorbani F, Ghobadi O, Shafaghi S, Barbati MS, Rostami Louyeh A, et al. Causes and follow-up outcomes of brain dead patients in Shahid Beheshti University of Medical Sciences Hospitals. *Pejouhandeh* 2010;15(4):171-8.

**Copyright** © 2018 The Author(s); Published by Society of Diabetic Nephropathy Prevention. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.