

# *Investigation into Enhancing the Motivation and Distribution System for Organ Donation in China*

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**Abstract:** With the aging of the population and the improvement of organ transportation technology, the demand of organs such as kidney, cornea, liver, and heart are increasing dramatically. Until February 29, 2024, there are in total 51196 volunteers who have done their donation, 157204 organs have successfully transported to the patients in need. However, under the great increase in the demand of organ donation, the supply of organ is still way above the amount of demand. In China, only 0.05% of the population have registered of being a volunteer in organ donation. The great shortage becomes more significant after China banned the use of organs from executed prisoners as a source of organ donation since 2015. Under the circumstances of having shortage of organ donation, it becomes more important for a country to have clear incentive and allocation mechanisms in organ donation. In this essay, the result would be carried out through comparing the incentive mechanisms of organ donation in Spain, the USA and China, find out the advantages of mechanisms in Spain and the USA, the potential issues of organ donation system in China. As a result, find valid approaches for the improvements of Chinese organ donation system.

**Keywords:** Organ donation, incentive mechanism, allocation mechanism, health system, contrastive argument

## 1. Introduction

As research and innovation in immunotherapy and medical technology have advanced, a landmark was achieved in 1954 when American surgeon Dr. Joseph Murray performed the first successful kidney transplant. This pioneering operation paved the way for organ transplantation to become the primary therapeutic approach for individuals suffering from organ failure or irreversible organ conditions. According to China Organ Donation Administrative Center, there are in total over 157 thousand organs have already transplanted to the patients in need, which in other word, there are over 157 thousand of people in China could have the chance to enjoy their second life due to organ donation and transplantation. The sources of transplanted organs include living donors and cadaver donors, and in this essay, all the points and results are mainly based on organ donations from cadaver donors.

In 2019, the number of organ donations per million people is 50.0 in Spain, 36.0 in the USA, and 4.0 in China [1]. Among all countries in the world, Spain has always been the top of the number of organ donations per million people. Whereas China, although it has the great number of organ

donations and its number of organ transplantation has become the second place in the world, China's organ donation per million people is the bottom among all countries.

Chinese government has published several policies to increase the number of organ donations to meet great demand of organs in China, but the effect of the policies is not significant over time. Before 2015, the main sources of organ donation in China in from executed prisoners. However, due to moral problems and higher possibility of infectious disease from prisoners' organs, Chinese government banned the use of executed organs since 2015. After the banning, the shortage of supply of organ in China becomes ever more significant. Every year there are about 1.5 millions of patients who are waiting for a suitable organ transplantation to save their life, but only about 10 thousand of the patients could have the surgery of organ transplantation. The main reasons could be categorized into two aspects, individual traditional moral thoughts and the country's immature organ donation incentive and allocation mechanism. The first aspect is the moral thoughts in China that big proportion of people believes that their body is given by their parents and the world, it is very disrespect to their parents if they die with an incomplete body. Such moral thoughts is nearly impossible to be eliminated within a short time, but with the spread of education, it could be reduced over time. And second, the lack of specific incentive and allocation mechanism makes people have low willing in organ donation. In the case, improvements of incentive and allocation mechanism of organ would be an important factor in improving rate of organ donation in China. With comparing the relative organ donation mechanisms in America and Spain, this essay would then work out an improvement of mechanism for Chinese organ donation system, aim to find ways to increase the number of organ donation per million people in China, and help more patients to have the chance of having a second life.

## 2. Case Description

The organ donation system in Spain would be a valid case for the improvement of mechanisms in China. In 2019, the number of organ donation per million people (PMP) reached 50 in Spain. The value of PMP in Spain kept increasing since 1960s, when the first kidney transplantation surgery was done in Madrid, and since then, the PMP in Spain has always been the top countries in the world. The success in organ donation in Spain is mainly contributed by its clear laws and mechanism related to organ donation.

The Spanish Congress passed the Organ Donation and Organ Transplant Decree 30 in 1979, which clarified the regulations on organ procurement and transplantation. And the Royal Decree 2070 published in 1999, more specifically regulated the methods of organ procurement, clinical applications of donated organs, and the coordination between organ donation and transplantation. The two decrees clarified most of the details in the process of organ donation and increased the utilization of donated organs to their maximum. The first law among decree 30 published in 1979, identified that all the organs donated in Spain must be used with the aim of treatments to other patients, and have the results in improving the quality of living for the organ receiver after transplantation. In addition, after published the relative laws, Spanish government also made great effort in the implementation of the laws, including banning all the smuggling of organ in Spain, which made it one of the least organs smuggling countries in the world.

In addition to publishing the decrees, in 1989 Spain also established National transplant organization, and developed the network of organ donation. There are 17 autonomous regions in Spain, each with its own parliament, government, budget and resources. And the Spanish National Health system has characteristics: all residents have the right to access to medical services, all services are welfare which is free to residents. In the whole process of organ donation and transplantation, the local public health system the last step, which is also the step that directly in touch with patients and organ donors [2]. The staff in local public health system that relative to organ donations are all professional surgeon developed and trained by Spanish National Transplantation Organization, and

at the same time, all the surgeons are responsible for all the process of organ donation of their patients, from the donation to transplantation [3].

In addition, Spanish organ donation mechanism is using the opt-out mechanism, which means that all the residents in Spain are default they agree that their organs would be donated after their death, unless they clarified they do not want to have organ donated. If the donor writes in the testament that they want to be a organ donor For the ones that died in accidents such as car crush in a young age, their organ would be high quality organs to the receivers. Under the mechanism, the number supplied of organs significantly increased in Spain, and the donation opt-out mechanism as well as the relative laws and decrees in Spain have made great success in past few decades. The success Spain made are then well known in the world as ‘Spain model’ and has been learned and copied by many countries in the world [4].

Another case would be the allocation mechanism in the USA. As there are strict timeliness in the process of organ donation to transportation and transplantation, the mechanism of allocation of donated organs would be significant to the organ active and be valid to transplant. In the USA, Michigan, the priority of organ transplantation depends not only on the emergency of patients, but also the distance of transporting the organs. Experts would record the one-way distance from the donor hospital to the hospital that doing the transplantation surgery, and then assume a minimum travel mechanism that could calculate the minimum distance and find the vehicle that could transport the organ within the shortest time. In addition, the process of organ transportation would also have the company of two professional organ transplantation surgeons to track the status of the organ [5]. With the minimum travel model and allocation mechanism, the utilization of organs and the success rate of organ transplantation in Michigan has increased significantly, and at the same time, more spending on transportation are also save by mechanism.

### 3. Analysis on the Problems

The problem of organ donation is the great shortage between the number of organs supplied and the number of organs that patients demand. Under the shortage of organs, some economists believes that the regulating role of prices in the market should be brought into the play, which means to charge high prices on organs [6]. However, the proposal is soon rejected as it is against ethics and human rights. In fact, the main factor that leads to the shortage in organ donation is mainly the failure in transform potential donors to actual donor. In China, there is not strict and clear law or well preformed organ donation system, which makes the development in organ donation and transplantation even harder to achieve.

According to the survey ‘public attitudes toward organ donation’ in 2011, performed by the National Health and Family Planning Commission in China, about 30.1 % of the residents refused to donate their organs due to the distrust to donation organizations. Residents are afraid that their organs may be sell with high price to smugglers, instead to saving the patients in need. And in Guangdong, the percentage is 81%. At the same time, according to local medias’ reports, there are indeed some Red Cross in Guangdong and Jiangsu asked local hospitals’ donation about a hundred thousand after every success organ transplantation surgery, and the specific accounts are confidential [7]. With the distrust to organ donation organizations, it would be hard for residents to voluntarily donate their organs after their death. Thus, it would be essential to ban the phenomenon of organ trade in China to increase the number of organ donation.

In addition, still a great proportion of residents in China refused to register in organ donation due to traditional concepts. In traditional Chinese concepts, people’s life and body are given by their parents, it would be disrespectful to their parents if they donate their organs to others. And some believe that if their body is not complete when they die, they cannot have the samsara of their life. It is hard to eliminate or reduce the effects of traditional concepts on organ donation by rules or laws,

mechanisms, which makes it a tough issue in the process of improving the number of organ donation in China.

From another perspective, the immature and imperfect organ donation and transplantation system also makes it hard to reduce the great organ gap in China. Until 2021, there are only about 2500 qualified organ donation coordinators in China. Without enough organ donation coordinators, the whole process from organ donation to transplantation could not tracked with professional organ donation group. Thus, the utilization of organs may be limited as the activity of organs could not always be controlled in a good state. Furthermore, organ donations or transplantations could not be done without professional organ donation coordinators. Only 2500 coordinator in a big country would limit the number of donations to a great extent. According to China Organ Donation Newsletter, there are in total 6653718 registered donors until December 31, 2023. The data in another aspect shows that each organ donation coordinator would be responsible to over 2600 donors, and there may be more than 2600 as families may sign for organ donation after one's death. The lack of coordinators could make the patients who need the organs in emergency lose their chances to survive.

#### 4. Suggestions

Based on China's national conditions, the through a case study of the incentive mechanism and allocation mechanism of organ donation in Spain and the United States, as well as an analysis of the existing problems in China and the feasibility of other countries' mechanisms, relevant suggestions to help increase the number of organ donations would be given in the following parts of this essay.

Improve the allocation system of organ donation. In China, there isn't a specific allocation mechanism that could calculate the minimum travel distance and time. The organs donated in China are usually transported though cars and airplanes, which makes the time travel much longer. Whereas in the USA, most the organs needed in emergency are transported through helicopters, which is much faster than cars and airplanes. Thus, in order to decrease the time of organ transportation, China could also run a minimum travel distance mechanism, and develop helicopters as a way of transportation.

Improve the network of organ donation and transplantation. It is vital to improve the number of organ donation coordinators and quality of the donation system. China could use 'Spain model' for reference, establish the network of organ donation. The success in organ donation in Spain is mainly due to its donation network. Every surgeon works relative to intensive care in Spain would have to train for organ donation and transplantation. Similar training could also be done in China, requiring all the surgeons get proper training on the organ donation and transplantation procedures would increase the quality of organ transplantation to large extent.

Preform opt-out mechanism. As people still have the right to refuse the donation, the human right for the ones with traditional thoughts would be respected. And at the same time, for the individuals that may die for accidents in a young age, opt-out mechanism would then make their high quality organs available for the patients, and therefore could increase the number of organ donations.

Set strict laws and incentive mechanisms. On December 4, 2023, Premier Li Qiang of The State Council signed an order of The State Council, promulgation of the "Regulations on Human Organ Donation and Transplantation", which will come into effect on May 1, 2024 [8-9]. This would be a good beginning of improving Chinese laws relative to organ donation. Moreover, the regulation on organ smuggling and any illegal use of organs should be forbidden strictly. Strict regulations would not only increase the utilization of organs, but also increase people's willing in organ donation. In addition, incentive mechanisms would also be significant to improve people's willingness in organ donation. There could be both material incentives and spiritual incentives. The priority right or low fee in using blood or organs could be given to the ones who voluntarily become an organ donor. And the certificate of merit could also be given to the donors or their family as the spiritual incentives. Under the incentives, people's willingness could be increased significantly.

Improve social education on organ donation. Some people refuse to donate their organs due to lack of understanding on the importance of organ donation [10]. More relative knowledge about organ donation could be taught in schools as open class, and therefore could be helpful in transferring the students to potential donors, and eventually become registered donors in the future. In addition, relative education could also help the residents to reduce the effects of traditional thoughts and enabling people to have more willing in organ donation.

## 5. Conclusion

Under the circumstances of Chinese organ supply and demand ratio of 1 to 300,000, it becomes more vital for the nation to improve the system of organ donation. By comparing with the organ donation mechanisms in Spain and the USA, it is quite obvious to find the potential problems of Chinese organ donation system. Currently in China, the main issues would be that only low proportion of the residents in China are well known about the process and importance of organ donation. In addition, the China National Health System did not pay enough attention on the improvement of organ donation and transplantation, relative laws and rules are not strict and performed well within the country, a lot of illegal behaviors, such as organ selling are still performing in black markets.

After clarifying all the main issues in Chinese organ donation system, the improvements could be carried out by focusing on each issue. For the improvements of allocation mechanism, China could learn from the USA's organ allocation, also called the minimum distance mechanism, which could ensure the organs' activity on the road, and increase the utilization of donated organs. For the improvements of laws and incentive mechanisms, it would be a great choice for China to learn from 'the Spain Model'. The strict laws and well-developed organ donation organization in Spain would be a valid approach for China to improve its organ donation system, and the opt-out mechanism is a significant factor that helps China to increase its number of organ donation per million people. Lastly, increase the social education on organ donation to increase the popularity of organ donation, and let people well known about organ donation.

This essay mainly summarized the possible approaches for China to enhance its organ donation system and aim to make any improvements in Chinese organ donation systems through theoretically demonstration. In the future, hope the suggestions above in this essay could be used as improvements in the system, increase the number of organ donation per million people in China, and may more patients in China could be cured through developed system of organ donation.

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