

# New research offers solution to reduce organ shortage crisis

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Eighteen people die every day waiting for transplants, and a new patient is added to the organ transplant list every 10 minutes. Much of the problem surrounds the lack of registered donors.

New research in the *INFORMS journal Management Science* provides incentives that could lead to a solution and ultimately save lives.

The study looks at national transplant data from the Organ Procurement and Transplantation Network (OPTN). Ultimately, the researchers—Tinglong Dai of Johns Hopkins University, Ronghuo Zheng of The University of Texas at Austin, and Katia Sycara of Carnegie Mellon University—concluded that the solution is a two-part method: a combination of the donor-priority rule, and instituting a freeze-period. To test their solution, the researchers created a simulated organ market.

The donor-priority rule allows registered organ donors to cut in line and move to the top of the list should they need a [transplant](#) in the future. The researchers found an unintended consequence of the donor-priority rule: those with a higher risk of needing [organ transplants](#) were more likely to sign up to become organ donors. By adding a freeze-period, individuals are not entitled to a higher spot on the donor's list until they've been on the registry for a specific span of time.

"When the donor-priority rule and freeze-period are imposed together the average quality of donated organs is restored. The freeze-period makes it more time-consuming to get on the list deterring people from using the organ-donation system to solely get to the top of the list if they need to, whereby increasing the amount of unhealthy donations," said Dai, a professor in the Carey Business School at Johns Hopkins University.

"When a stronger incentive is given to high-risk individuals it results in reduction of organ quality," added Dai. "Such problems can outweigh the

potential gain for the registry. These people are pressured into donating because they need a donation themselves and there is a slim chance they'll get it if they don't register."

The biggest benefit of the proposed combination would come from increasing the average patient's life expectancy. In one simulation, an organ from a healthy donor is estimated to add an average of 18 years to someone's life, at a value of \$50,000 a year; an organ from a sick [donor](#) is estimated to add only 10 years.

"By adding the freeze period restriction, it helps rebalance the incentive structure and can guarantee a boost in organ supply without compromising organ quality. The change would boost social welfare by \$235 million a year," continued Dai.

**More information:** Tinglong Dai et al, Jumping the Line, Charitably: Analysis and Remedy of Donor-Priority Rule, *Management Science* (2019). DOI: [10.1287/mnsc.2018.3266](https://doi.org/10.1287/mnsc.2018.3266)

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