

## Small changes to organ procurement system could lead to more life-saving transplants

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Slight changes to the system for allocating deceased-donor kidneys could result in higher rates of organ procurement and lead to more kidney transplants across the country, according to new research co-authored by an Indiana University Kelley School of Business professor.

"Any increase in supply will result in saved lives," said Rodney P. Parker, an associate professor of operations management at Kelley. "The lists of patients awaiting a [kidney](#) transplantation are lengthy and growing. Many of these patients undergo expensive and inconvenient dialysis treatment while waiting."

Parker and three other researchers studied three risk factors that explain the geographic differences in procuring deceased-donor kidneys across the United States: organ quality, the median wait time for donation and the degree of competition between transplantation centers in the area.

They found an expected annual increase in procured organs ranges from 58 (an increase of 0.5 percent of all procured kidneys) to 174 (an increase of 1.2 percent), depending on regional or national sharing.

In 2015, 87,538 patients with end-stage renal disease died while on dialysis (16.3 percent of all dialysis patients are awaiting kidney transplants), and 18,805 kidney transplantations were performed that same year. The majority, 13,132, came from cadaveric donors.

More than 100,000 people are waiting for a [kidney transplant](#) in the U.S,

with more than 3,000 patients added to the list each month, according to the National Kidney Foundation.

This study, which appears in the journal *Production and Operations Management*, is among the first to consider how to increase the supply of procured kidneys, rather than changing demand or considering different ways of allocating a fixed supply.

The researchers analyzed the effects of a 2014 policy change that allows lower-quality kidneys—considered the bottom 15 percent of available organs—to be immediately offered more widely in a region without seeking patients only in the local area.

They found that expanding the geographic range also could save lives of many who currently are less likely to receive a kidney based on where they live.

"The increase in supply is induced by the disparity in patient waiting times across different geographies," Parker said. "Thus, patients in areas with longer waiting times will benefit from this increase without adversely affecting the waiting times in the source areas. Overall, the gap in median waiting times between areas will narrow."

Parker and his colleagues concluded that transplant candidates living in less-populated areas may be more selective about the organ quality because waiting times are relatively short.

"When some cadaveric kidneys of lower quality become available, these kidneys may not be procured since the local [patients](#) can simply wait a short period for a superior quality kidney," he said. "However, those lower-quality kidneys would be highly sought in other areas where the waiting times are much longer, such as in California and New York.

"Patients already at the top of the list in the more congested areas (which have longer median waiting times) will already likely have a short time for the next available kidney, so they will likely not accept a poorer quality kidney," he added. "However, someone who is further down the list in these areas may recognize that they face a lengthy wait and be willing to accept such a kidney rather than face the grim prospect of a four-hour dialysis treatment three times per week, not to mention the expense and diminished health."

Cadaveric kidneys are initially made available to those living in one of 58 donor service areas around the country, before being then offered to those in a broader region of several donor service areas and, finally, nationally. Competition among 272 [transplant](#) programs across the country also contributes to outcomes.

Fourteen of the 58 donor service areas offered 129 or fewer kidneys in 2009, so if some organs are shared more broadly, then the expected increase in transplants could represent the addition of a small- to medium-sized donor service area.

Provided by Indiana University

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