Economic and Health Consequences of Selling a Kidney in India

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Context  Many countries have a shortage of kidneys available for transplantation. Paying people to donate kidneys is often proposed or justified as a way to benefit recipients by increasing the supply of organs and to benefit donors by improving their economic status. However, whether individuals who sell their kidneys actually benefit from the sale is controversial.

Objective  To determine the economic and health effects of selling a kidney.

Design, Setting, and Participants  Cross-sectional survey conducted in February 2001 among 305 individuals who had sold a kidney in Chennai, India, an average of 6 years before the survey.

Main Outcome Measures  Reasons for selling kidney, amount received from sale, how money was spent, change in economic status, change in health status, advice for others contemplating selling a kidney.

Results  Ninety-six percent of participants sold their kidneys to pay off debts. The average amount received was $1070. Most of the money received was spent on debts, food, and clothing. Average family income declined by one third after nephrectomy (P<.001), and the number of participants living below the poverty line increased. Three fourths of participants were still in debt at the time of the survey. About 86% of participants reported a deterioration in their health status after nephrectomy. Seventy-nine percent would not recommend that others sell a kidney.

Conclusions  Among paid donors in India, selling a kidney does not lead to a long-term economic benefit and may be associated with a decline in health. Physicians and policy makers should reexamine the value of using financial incentives to increase the supply of organs for transplantation.

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tion of the poor, that the poor do not
overcome poverty as a result of the sale,
and that this practice prevents a na-
tional cadaveric transplant program
from being established.4,9,15,22-32 Crit-
ics also view kidney sales not as ex-
pressions of individual autonomy but
rather as acts of desperation by impov-
ished individuals.9 Moneylenders may
also be more aggressive in demanding
payment from debtors who live in areas
where kidneys are sold to pay off debts.9
Middlemen in particular are criticized
as misleading potential donors about
what a nephrectomy involves and keep-
ing a large share of the payment. In re-
terior to this concern, some clinics
purchased organs directly from do-
nors.5,6 A 1994 law banned the sale of
kidneys and further required that all
transplant centers have an authoriza-
tion committee review potential living-
unrelated donations to ensure that do-
nations were made out of altruism and
not for commercial reasons.33,34 Anec-
dotal reports suggest that sales of kid-
nies continue despite this law.9,16,33,34
Kidneys are sold to pay off debts.9
the Middle East, South Africa, China, and
Pakistan.4,16,35

The value of using financial incen-
tives continues to be controversial de-
spite some qualitative reports indicat-
ing that donors who sell their kidney
do not benefit and may actually be
harmed.9,11,16,21,31,32,35-41 We sought to
contribute to this debate by quantifi-
ing the economic and health conse-
quences of selling a kidney among a
large sample of sellers.

**METHODS**

**Participants**

The study was conducted during Feb-
ruary 2001 in Chennai (formerly called
Madras), a large city of 6 million people
that is the capital of the state of Tamil
Nadu in southern India. Adult resi-
dents of Chennai were eligible for in-
clusion if they had sold a kidney. Be-
cause most of these transplants are done
in secrecy, written records are often un-
available. We therefore relied on snow-
ball sampling, a standard method for
contacting difficult-to-reach popula-
tions for face-to-face interviews.52 We
used newspaper articles and informa-
tion provided by transplant profession-
als to identify neighborhoods of Chen-
nai where sellers resided. A team of 8
Tamil-speaking research assistants iden-
tified participants by going door to door
in these neighborhoods. They also
asked each interviewed participant for
names and locations of other people
who had sold a kidney. Answers ranged
from next-door neighbors to people liv-
ing in neighborhoods more than 15 km
away. Each identified neighborhood
was revisited until no more eligible par-
ticipants were found.

**Interview**

The research assistants explained the
nature of the study, obtained in-
fomed written consent, verified that
participants had nephrectomy scars,
and asked the participants the follow-

ers were used to refine the ques-
tions. This study was approved by the
institutional review board of the Uni-
versity of California, San Diego.

**Statistical Analysis**

Data are presented by using standard
descriptive statistics (mean, median,
range, and proportions). We used the
paired t test to compare family income
before and after nephrectomy (Stata,
version 6; Stata Corp, College Station,
Tex). Monetary figures were first ad-
justed for inflation by using the In-
dian consumer price index and then
converted from rupees to dollars by us-
ing the exchange rate at the time of the
interview ($1 =45 rupees).43-45 The pov-
erty line for Tamil Nadu is $538 a year
for an average-sized family.46

**RESULTS**

**Participant Characteristics**

Of 305 eligible sellers identified, all
agreed to participate (TABLE 1). Sixty
percent of female participants and 93%
of male participants worked as labor-
ers or street vendors. Seventy percent
of participants sold their kidneys
through a middleman, and 30% sold di-
rectly to a clinic.

**Reasons for Selling a Kidney**

Almost all the participants sold their
kidneys to pay off debts (TABLE 2).
Food and household expenses, rent,
mariage expenses, and medical ex-
spenses were the most common sources
of these debts. When asked a separate
question about wanting to help a sick
person with kidney disease, 95% of par-
ticipants said this was not a major fac-
tor in their decision to sell.

<table>
<thead>
<tr>
<th>Participant Characteristics</th>
<th>N = 305</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (Median, Range)</td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>35 (35, 20-55)</td>
</tr>
<tr>
<td>Female, %</td>
<td>71</td>
</tr>
<tr>
<td>Education, y</td>
<td>2.7 (0, 0-12)</td>
</tr>
<tr>
<td>Annual family income, $</td>
<td>420 (381, 0-1730)</td>
</tr>
<tr>
<td>Income below poverty line, %</td>
<td>71</td>
</tr>
<tr>
<td>Time since nephrectomy</td>
<td>6.0 y (6.4 y, 2 wk-19 y)</td>
</tr>
<tr>
<td>No. of people in household</td>
<td>4.2 (4.0, 1-8)</td>
</tr>
</tbody>
</table>
Forty-seven participants noted that their spouse had also sold a kidney. The other 221 married participants (159 female participants and 62 male participants) were asked why they sold rather than their spouse. The most common responses by female participants were that their husbands were the breadwinners (30%) or were ill (28%). The most common responses by male participants were that they sold voluntarily (52%) or that their wives were ill or pregnant (19%). Two female participants stated that they had been forced by their husbands to sell a kidney.

**Amount Received From Sale**

The amount promised for selling a kidney averaged $1410 (range, $450-$6280), while the amount actually received averaged $1070 (range, $450-$2660). Both middlemen and clinics promised on average about one third more than they actually paid.

**How Money Was Spent**

Most of the money received was spent on debts (60%), food and clothing (22%), or marriage (5%). Only 11% was retained as cash equivalents (cash, jewelry, bank deposit, or other investment).

**Change in Economic Status**

Although the economic status of individuals in Tamil Nadu has improved throughout the last decade, many of the participants reported a worsening of their economic status. Among all participants, the average annual family income declined from $660 at the time of nephrectomy to $420 at the time of the survey, a decrease of one third (P<.001). The percentage of participants below the poverty line increased from 54% to 71% (P<.001). Of the 292 participants who sold a kidney to pay off debts, 216 (74%) still had debts at the time of the survey.

**Change in Health Status**

Participants rated their health status before and after nephrectomy by using a 5-point Likert scale ranging from excellent to poor (Table 3). Forty participants (13%) reported no decline in their health after nephrectomy, 117 (38%) reported a 1- to 2-point decline, and 147 (48%) reported a 3- to 4-point decline. Of all participants, 50% complained of persistent pain at the nephrectomy site and 33% complained of long-term back pain.

**Advice for Others**

Participants were asked what advice they would give someone else with the same reasons they had for selling. Of 264 participants who answered this question, 79% would not recommend selling a kidney, while 21% would.

**Time Since Nephrectomy vs Participant Responses**

Increased time since nephrectomy was associated with a larger amount received from selling a kidney and a larger decline in economic status. The 47 participants who sold a kidney more than 10 years ago received $1603 compared with $975 for participants who sold within the last 10 years (P<.001). Participants who sold more than 10 years ago also reported a 56% decline in annual family income compared with a 29% decline among participants who sold more recently (P<.001). There was no relationship between time since nephrectomy and reasons for selling, how the money was spent, changes in health status, and advice for others.

## Change in Economic Status

<table>
<thead>
<tr>
<th>Health Before Nephrectomy</th>
<th>Health After Nephrectomy, No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
</tr>
<tr>
<td>Fair</td>
<td>0</td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
</tr>
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**Comment**

We found widespread evidence of the sale of kidneys by poor people in India despite a legal ban on such sales. In a 1-month period, we were easily able to identify and interview more than 300 individuals who sold a kidney. Selling a kidney did not lead to a long-term economic benefit for the seller and was associated with a decline in health status.

**Importance of Results**

Our quantitative findings, along with those of previous qualitative studies,9,16,31,32,34,35 undercut 5 key assumptions made by supporters of the sale of kidneys. First, although paying people to donate may have increased the supply of organs for transplantation, the financial incentive did not supplement underlying altruistic motivations. Only 5% of participants said wanting to help a sick person was a major factor in their decision to sell. Second, selling a kidney did not help poor donors overcome poverty. Family income actually declined by one third, and most participants were still in debt and living below the poverty line at the time of the survey. Third, regardless of these poor economic outcomes, sellers arguably have a right to make informed decisions about their own bodies. However, most participants did not recommend that others sell a kidney, which suggests that potential donors would be unlikely to sell a kidney if they were better informed of the likely outcomes.

Table 2. Reasons for Selling a Kidney*

<table>
<thead>
<tr>
<th>Reason</th>
<th>No. (%)</th>
</tr>
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<tbody>
<tr>
<td>Pay off debts</td>
<td>292 (96)</td>
</tr>
<tr>
<td>Food/household expenses</td>
<td>160 (55)</td>
</tr>
<tr>
<td>Rent</td>
<td>71 (24 )</td>
</tr>
<tr>
<td>Marriage expenses</td>
<td>65 (22 )</td>
</tr>
<tr>
<td>Medical expenses</td>
<td>54 (18 )</td>
</tr>
<tr>
<td>Funeral expenses</td>
<td>23 (8)</td>
</tr>
<tr>
<td>Business expenses</td>
<td>23 (8)</td>
</tr>
<tr>
<td>Other debts</td>
<td>49 (17 )</td>
</tr>
<tr>
<td>Future marriage expenses</td>
<td>10 (3)</td>
</tr>
<tr>
<td>for daughters</td>
<td></td>
</tr>
<tr>
<td>Extra cash</td>
<td>4 (1)</td>
</tr>
<tr>
<td>Start business</td>
<td>2 (1)</td>
</tr>
<tr>
<td>Other reason</td>
<td>3 (1)</td>
</tr>
</tbody>
</table>

*Percentages do not add up to 100% because some participants had more than 1 reason for selling or more than 1 source of debt.
Fourth, safeguards such as eliminating middlemen or having an authorization committee did not appear to be effective. Middlemen and clinics paid less than they promised, and the authorization committees did not ensure that donations were motivated by altruism alone. Fifth, nephrectomy was associated with a decline in health status. Previous qualitative reports suggest that a diminished ability to perform physical labor may explain the observed worsening of economic status. Persistently poor and decline in health status have not been reported in previous long-term follow-up of volunteer donors in developed countries.

Our findings have important implications for developing and developed countries. In developing countries such as India, potential donors need to be protected from being exploited. At a minimum, protection might involve education about the likely outcomes of selling a kidney. Some have commented that rather than protecting poor people, authorization committees simply provide a cover for illegal cash-for-kidneys deals. Indian legislators should consider modifying the 1994 transplantation act to prevent the sale of organs under such cover. Physicians and policy makers need to work together to develop alternatives for treating renal failure patients. A national cadaveric program is needed, as is an increased emphasis on primary prevention of common diseases that lead to kidney failure. Since paying off debts was the most common reason for selling a kidney, social and economic efforts to reduce or prevent indebtedness are also essential. In developed countries such as the United States, our findings may give pause to efforts to provide financial incentives to encourage donation. In particular, our findings raise concerns about whether providing financial incentives may be viewed by the public as taking advantage of poor families. If perceptions about transplantation are adversely affected, such incentives may actually lead to fewer total donations.

A majority of donors were women. Given the often weak position of women in Indian society, the voluntary nature of some donations is questionable. In fact, 2 participants said that their husbands forced them to donate. Because the interviews were generally conducted with other family members present, other participants may have been reluctant to mention being forced to donate. In the United States, women are also more likely to be donors than men, but in both countries, men are more likely to receive transplants.

**Limitations**

Several alternative interpretations of our results must be considered. First, our findings may simply represent general declines in the economic and health status of poor people in India and not declines linked to the sale of a kidney. However, although data on self-reported health status are lacking, per capita income for Tamil Nadu has increased by 10% over the last 5 years and by 7% over the last 10 years after adjustment for inflation. Additionally, the proportion of people living below the poverty line has declined by more than 50% since 1988.

Second, participants may have overestimated their economic and health status before nephrectomy. Among poor people in India, virtually all financial transactions are conducted in cash, and bank accounts are nonexistent. As a result, there are no written financial records that can be used to independently verify participant responses. Written medical records are similarly lacking. However, participant responses to questions about their current economic and health status would not be susceptible to a similar recall bias. According to these responses, we can still conclude that participants have debt, live in poverty, have a fair to poor health status, and would not recommend that others sell a kidney.

Third, the adverse experiences of our participants may not represent those of other sellers. For example, some sellers may have obtained such a large economic benefit that they moved out of the low-income neighborhoods that were the focus of our study. However, no interviewed participant mentioned such individuals when asked for locations of other people who had sold a kidney. In addition, our findings are consistent with those of other qualitative reports. These alternative interpretations could be further addressed in studies involving a comparison group, prospective follow-up, independently verified measures of economic and health status, and additional geographic areas. Other topics not explored in this study include the nature of any relationship between participants and recipients, the reasons sellers failed to realize an economic benefit, the reasons their health deteriorated, the reasons the amount received for selling has declined, and the perspectives and roles of recipients, transplant surgeons, middlemen, and donors’ families.

**CONCLUSION**

The sale of kidneys by poor people in India does not lead to a tangible benefit for the seller. The value of paying for donations must be reexamined in light of these findings. Although patients with kidney failure deserve access to optimal treatment, such treatment should not be based on the exploitation of poor people.

**Author Contributions:** Study concept and design: Goyal, Mehta, Sehgal. Acquisition of data: Goyal. Analysis and interpretation of data: Goyal, Schneiderman, Sehgal. Drafting of the manuscript: Goyal, Mehta, Sehgal. Critical revision of the manuscript for important intellectual content: Goyal, Mehta, Schneiderman, Sehgal. Statistical expertise: Goyal, Sehgal. Administrative, technical, or material support: Mehta. Study supervision: Sehgal.

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**REFERENCES**

CONSEQUENCES OF SELLING A KIDNEY


