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How Much Could We Invest in Deceased Donor Organ Procurement?

center for
**ABDOMINAL
TRANSPLANTATION**
at Saint Louis University Hospital





How Much is Spent Procuring DD Organs?

Organ	Organs in 2020	SAC		Total SACs	
Kidney	17583	\$	38,323	\$	673,833,309
Liver	8415	\$	26,000	\$	218,790,000
Lung	2539	\$	27,000	\$	68,553,000
Heart	3658	\$	28,000	\$	102,424,000
KP	827	\$	64,000	\$	52,928,000
Total				\$	1,116,528,309

The Life-Years Saved by a Deceased Organ Donor

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Introduction

Within the transplant community, the lack of suitable organs for transplantation is recognized as the most critical problem facing transplantation today. However, within the greater medical community at large, the relative role that the organ shortage plays in relation to other public health issues is uncertain. This is understandable for a number of reasons. First, transplantation, although with high visibility, is a low-volume medical endeavor; approximately 20 000 organ transplants are performed in the United States annually (1), and more than 80 000 individuals are currently waiting for transplants on various solid organ transplant lists. This contrasts with over 1 million coronary artery revascularization procedures performed annually (2). Second, there are no data quantifying the true impact of the organ shortage in terms of loss of life in a format that would allow ready comparisons to other public health problems such as the HIV epidemic, infectious diseases or heart disease.

How
Valuable are
DD Organs in
Life-years?

Organ	Life-years Gained	Organs in 2020	Total Life-years Gained
Kidney	7.2	17,583	126,598
Liver	16.9	8,415	142,214
Lung	2.1	2,539	5,332
Heart	14.5	3,658	53,041
KP	12.9	827	10,668
Total			337,852

How
Valuable are
DD Organs in
\$US?

Cost 1 Year of Hemodialysis	\$93,191
Life Years from DD Organs	337,852
Value in \$US	\$31,484,793,689

Cost of Transplant Care

Organ	Life-years Gained	Life-years No-TX	SAC	TX-cost	Post TX Maintenance Cost	Annual Cost No-TX	Net Lifetime Cost
Kidney	7.2	7.3	\$ 38,323	\$ 82,479	\$ 32,809	\$ 67,229	\$105,761
Liver	16.9	1.7	\$ 26,000	\$ 184,786	\$ 26,143	\$ 50,002	\$612,042
Lung	2.1	5.7	\$ 27,000	\$ 238,764	\$ 49,425	\$ 32,201	\$467,733
Heart	14.5	2.2	\$ 28,000	\$ 304,692	\$ 36,329	\$ 111,899	\$693,209
KP	12.9	7.4	\$ 64,000	\$ 110,326	\$ 32,019	\$ 48,959	\$462,015

Cost of Transplant Care

Organ	Organs in 2020	Net Lifetime Cost		Total Net Cost	
Kidney	17583	\$	105,761	\$	1,859,592,146
Liver	8415	\$	612,042	\$	5,150,336,796
Lung	2539	\$	467,733	\$	1,187,574,849
Heart	3658	\$	693,209	\$	2,535,756,693
KP	827	\$	462,015	\$	382,086,488
Total net Cost				\$	11,115,346,972

Return on Procurement Investment

Value		\$ 31,484,793,689
Total Net Cost		\$ 11,115,346,972
Gain		\$ 20,369,446,718

Conclusions

- Spending \$1.1B on DD organ procurement
 - Generates a gain (return on investment) of \$20.4B
 - How much might we be willing to pay to double the DD organ supply?
 - \$20.4B/year. 20 times what we pay today
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- We grossly underinvest in DD organ procurement
 - The Breakthrough Collaborative cost \$2.5M
 - The estimated gain: 41,000 life-years and \$2.5B in the years following

References

- Schnitzler MA, Whiting JF, Brennan DC, Lentine KL, Desai NM, Chapman W, Abbott KC, Kalo Z. The life-years saved by a deceased organ donor. Am J Transpl. September 2005;5:2289-2296.
- USRDS 2020 Annual Data Report: <https://adr.usrds.org/2020>. Accessed 2/1/2021
- Schnitzler MA, Skeans MA, Axelrod DA, Lentine KL, Randall HB, Snyder JJ, Israni AK, Kasiske BL. OPTN/SRTR 2016 Annual Data Report: Economics. Am J Transplant 2018; 18 Suppl 1: 464-503.
- [https://www.palmettogba.com/Palmetto/Providers.Nsf/files/Organ_Procurement_Organization_Rates_Effective_Jan_1_2020.pdf/\\$File/Organ_Procurement_Organization_Rates_Effective_Jan_1_2020.pdf](https://www.palmettogba.com/Palmetto/Providers.Nsf/files/Organ_Procurement_Organization_Rates_Effective_Jan_1_2020.pdf/$File/Organ_Procurement_Organization_Rates_Effective_Jan_1_2020.pdf) Accessed 2/1/2021
- Medicare Provider Reimbursement Manual, Part 1 – Chapter 31, Organ Acquisition Payment Policy, April 1, 2016.
- OPTN National Data: <https://optn.transplant.hrsa.gov/data/view-data-reports/national-data>. Accessed 2/1/2021