

# Trends in Organ Donation and Transplantation in the United States, 1996–2005

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**Key words:** Allocation, OPTN, organ donation, SRTR, survival rates, waiting list

## Introduction

This brief overview of solid organ transplantation in the United States is produced as part of the 2006 *OPTN/SRTR Annual Report*. The *Annual Report* is prepared by the Scientific Registry of Transplant Recipients (SRTR) in collaboration with the Organ Procurement and Transplantation Network (OPTN) under contract with the Health Resources and Services Administration (HRSA). The report gathers a large amount of information on many aspects of solid organ transplantation in one publication, making it a valuable resource for patients, the transplant community, the public and the Federal Government.

The 2006 SRTR Report on the State of Transplantation comprises nine articles devoted to specific topics in solid organ transplantation. Each article was written by a group of experts in the field of transplantation and provides a comprehensive look at the current state of transplantation and trends over the past decade. The text and figures in these articles are based on recent SRTR analyses and the extensive reference tables of the 2006 *Annual Report*, which were prepared by the Arbor Research Collaborative for Health (formerly known as the University Renal Research and Education Association, or URREA), which with the University of Michigan has been the contractor for the SRTR since October 2000. These nine articles and the data tables on which they are based are included in the *Annual Report* and are available online, at the websites of the SRTR and OPTN ([www.ustransplant.org](http://www.ustransplant.org) and [www.optn.org](http://www.optn.org)).

## Summary Statistics on Organ Transplantation in the United States

As of the end of 2004 there were 153 245 people living with a functioning organ transplant in the United States.

This number reflects an increase by about 1.8% over the prior year and a 1.7-fold increase since 1996.

The total number of organs transplanted annually increased from 26 541 in 2004 to 27 527 in 2005, an increase of 986 (4%). The transplanted organs with the highest percentage increases were intestine (31%) and lung (20%), as shown in Table 1. These organs came from 14 488 organ donors in 2005, 335 more donors than in 2004 (2%). The increase in the total number of donors resulted from a substantial increase of 443 (6%) deceased donors and a slight decrease of 108 (2%) living donors. This is the first time in the past decade that a decrease in the number of living donors was observed from one year to the next. A deceased donor usually provides several organs to benefit multiple patients with organ failure. The organ donation and transplantation collaborative initiatives of the Division of Transplantation at HRSA have successfully focused on increasing the number of deceased donors and on the number of organs per donor by working with professionals at organ procurement organizations, donor hospitals and transplant centers (1).

Overall there were approximately 90 000 people registered on organ waiting lists at the end of 2005 (63 814 actively waiting and 26 053 with 'inactive' status), a 5% increase over the number of people waiting for an organ at the end of 2004. The overall percentage of wait-listed patients with inactive status rose from 14% in 1996 to 29% in 2005; percentages vary considerably by organ. The largest increase was in the number of people on the kidney transplant waiting list, increasing by 8% from 57 389 in 2004 to 62 294 in 2005, a net addition of 4905 candidates (Table 2). This large waiting list is in part due to the cumulative effect of the imbalance between supply of organs and demand (need) for organs over past years. The net change in the total number of candidates on the waiting list at year-end from one year to the next provides an indication of the balance between supply and demand during that year. A net growth indicates that the waiting time on average increases, whereas a decline in the number of patients on the waiting list projects a shortening of average waiting times. Figure 1 shows that for 2004–2005, the organ supply fell short of the increasing need not only for kidneys but also to a lesser degree for livers (by 1%, or 117 livers) and pancreata. By contrast, there is good news for other organs, particularly for lungs and hearts, for which organs both the supply and demand increased and the size of the waiting list decreased. From 2004 to 2005, the size of the heart,

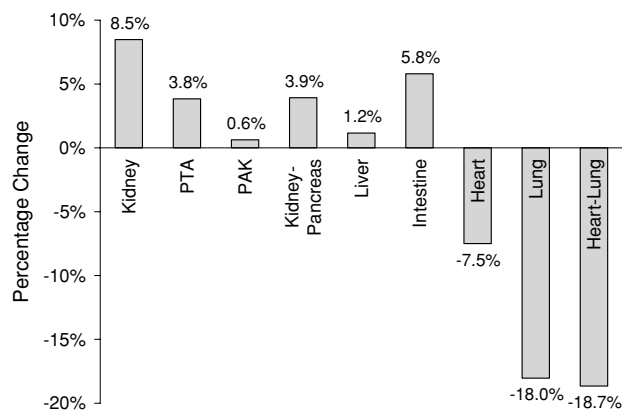
**Table 1:** Growth in number of transplanted and recovered organs, 2004–2005

| Organs transplanted |        |        |                | Organs recovered from deceased donors |        |        |                |
|---------------------|--------|--------|----------------|---------------------------------------|--------|--------|----------------|
| Transplanted organs | 2004   | 2005   | Percent change | Recovered organs                      | 2004   | 2005   | Percent change |
| Total               | 26 541 | 27 527 | 3.7%           | All DD organs                         | 25 221 | 26 910 | 6.7%           |
| Deceased donor      | 19 551 | 20 635 | 5.5%           |                                       |        |        |                |
| Living donor        | 6 990  | 6 892  | −1.4%          |                                       |        |        |                |
| Kidney              | 15 674 | 16 072 | 2.5%           | Kidney                                | 12 570 | 13 313 | 5.9%           |
| Deceased donor      | 9 027  | 9 509  | 5.3%           |                                       |        |        |                |
| Living donor        | 6 647  | 6 563  | −1.3%          |                                       |        |        |                |
| Pancreas            |        |        |                | Pancreas (all)                        | 2 010  | 2 034  | 1.2%           |
| PTA                 | 130    | 129    | −0.8%          |                                       |        |        |                |
| PAK                 | 419    | 343    | −18.1%         |                                       |        |        |                |
| Kidney-pancreas     | 880    | 896    | 1.8%           |                                       |        |        |                |
| Liver               | 5 779  | 6 000  | 3.8%           | Liver                                 | 6 404  | 6 784  | 5.9%           |
| Deceased donor      | 5 457  | 5 679  | 4.1%           |                                       |        |        |                |
| Living donor        | 322    | 321    | −0.3%          |                                       |        |        |                |
| Intestine           | 52     | 68     | 30.8%          | Intestine                             | 168    | 185    | 10.1%          |
| Heart               | 1 961  | 2 063  | 5.2%           | Heart                                 | 2 096  | 2 220  | 5.9%           |
| Lung                | 1 168  | 1 405  | 20.3%          | Lung                                  | 1 973  | 2 374  | 20.3%          |
| Deceased donor      | 1 153  | 1 404  | 21.8%          |                                       |        |        |                |
| Living donor        | 15     | 1      | −93.3%         |                                       |        |        |                |
| Heart-lung          | 37     | 32     | −13.5%         | Heart-lung                            | NA     | NA     | NA             |

Source: 2006 OPTN/SRTR Annual Report, Tables 1.2 and 1.7.

lung and heart-lung waiting lists dropped by 8%, 18% and 19%, respectively. The dramatic changes for lungs can be largely attributed to a new deceased donor lung allocation policy that was implemented in May 2005. The allocation policy was changed from a system based on waiting times to one based on net survival benefit from transplantation and medical urgency (waiting list mortality risk) (2).

Continuing a trend extending back more than 10 years, the transplant candidate population is increasingly older (Figure 2). In 1996, 7% of the overall waiting list candidates were 65 or older; in 2005, that percentage was 13%. The proportion of candidates aged 50–64 rose as well, from 34% in 1996 to 44% in 2005. The percentages of candi-



Source: 2006 OPTN/ SRTR Annual Report, Table 1.3.

**Figure 1:** Change in numbers of patients on waiting lists, 2004–2005.

dates in every age group below 50 years, including pediatric candidates (under 18 years), have dropped over the decade.

Key outcomes after transplantation include (1) survival of transplant recipients and (2) the function of transplanted grafts. Table 3 displays 1- and 5-year unadjusted patient survival for all transplant recipients by organ, using the most recent cohort for which adequate follow-up exists. The cohort used to compute 1-year survival consists of recipients transplanted in 2003–2004, while the cohort for 5-year survival is based on recipients transplanted in 1999–2004. One-year patient survival rates were highest for kidney and pancreas recipients, ranging from about 95% to 98%; corresponding survival for liver, intestine and heart recipients was approximately 87–91%, about 85% for lung,

**Table 2:** Waiting list candidates (active and inactive combined), 2004–2005

| Organs          | End of Year |        | Percent change |
|-----------------|-------------|--------|----------------|
|                 | 2004        | 2005   |                |
| Total           | 85 610      | 89 884 | 5.0%           |
| Kidney          | 57 389      | 62 294 | 8.5%           |
| PTA             | 502         | 521    | 3.8%           |
| PAK             | 971         | 977    | 0.6%           |
| Kidney-pancreas | 2 381       | 2 474  | 3.9%           |
| Liver           | 16 967      | 17 168 | 1.2%           |
| Intestine       | 191         | 202    | 5.8%           |
| Heart           | 3 210       | 2 970  | −7.5%          |
| Lung            | 3 828       | 3 139  | −18.0%         |
| Heart-lung      | 171         | 139    | −18.7%         |

Source: 2006 OPTN/SRTR Annual Report, Table 1.3.

PTA = pancreas transplant alone; PAK = pancreas after kidney.

**Table 3:** Unadjusted 1- and 5-year patient survival by organ

| Organ transplanted    | 1-year survival | 5-year survival |
|-----------------------|-----------------|-----------------|
| Kidney                |                 |                 |
| Deceased donor        | 94.7%           | 80.7%           |
| Living donor          | 98.0%           | 90.4%           |
| Pancreas alone        | 94.9%           | 90.2%           |
| Pancreas after kidney | 95.5%           | 83.6%           |
| Kidney-pancreas       | 95.1%           | 85.8%           |
| Liver                 |                 |                 |
| Deceased donor        | 86.9%           | 73.4%           |
| Living donor          | 91.2%           | 76.8%           |
| Intestine             | 87.5%           | 50.2%           |
| Heart                 | 88.1%           | 73.7%           |
| Lung                  | 84.9%           | 51.6%           |
| Heart-lung            | 66.7%           | 43.6%           |

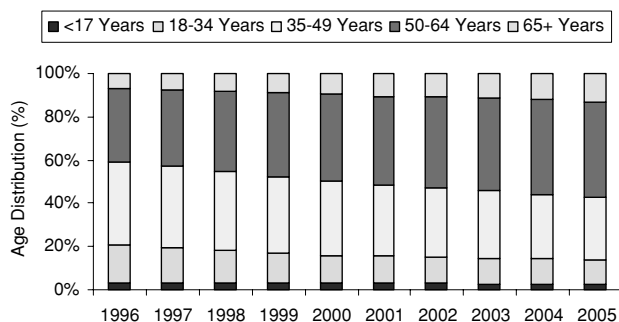
Source: 2006 OPTN/SRTR Annual Report, Table 1.13.

and lowest for the small number of heart-lung recipients with approximately 67% surviving at 1 year.

Table 4 shows the percentage of transplanted organs that are still functioning (graft survival) 1 and 5 years after transplantation by type of organ. Like patient survival, graft survival is calculated based on the same most recent cohorts for which sufficient follow-up was available. Graft survival rates are lower than corresponding patient survival rates because patients may survive a graft failure by receiving a second transplant or with an alternative therapy, such as dialysis for kidney transplant recipients or insulin therapy for pancreas transplant recipients.

### Transplantation at a Glance

The full-page figures at the end of this article (Figures 3–10) offer ‘dashboard’ views of the state of transplantation for different organs. Sets of summary graphics are included for six organs (kidney, pancreas, liver, intestine, heart and lung) as well as two common multi-organ procedures (simultaneous pancreas-kidney and pancreas after kidney). For this overview, we have omitted separate figures for heart-lung transplants, given the extremely small numbers



Source: 2006 OPTN/ SRTR Annual Report, Table 1.3.

**Figure 2:** Age distribution on waiting lists, all organs, 1996–2005.

**Table 4:** Unadjusted 1- and 5-year graft survival by organ

| Organ transplanted         | 1-year survival | 5-year survival |
|----------------------------|-----------------|-----------------|
| Kidney                     |                 |                 |
| Deceased donor             | 89.5%           | 67.1%           |
| Living donor               | 95.1%           | 80.3%           |
| Pancreas alone             | 72.8%           | 53.4%           |
| Pancreas after kidney      | 78.7%           | 56.4%           |
| Kidney-pancreas (kidney)   | 91.8%           | 76.3%           |
| Kidney-pancreas (pancreas) | 85.2%           | 71.1%           |
| Liver                      |                 |                 |
| Deceased donor             | 82.4%           | 67.4%           |
| Living donor               | 84.0%           | 68.8%           |
| Intestine                  | 78.5%           | 40.1%           |
| Heart                      | 87.5%           | 72.6%           |
| Lung                       | 83.3%           | 48.9%           |
| Heart-lung                 | 64.1%           | 41.5%           |

Source: 2006 OPTN/SRTR Annual Report, Table 1.13.

of these procedures. Below we describe the three graphs shown for each organ.

### Number of transplants and size of active waiting list

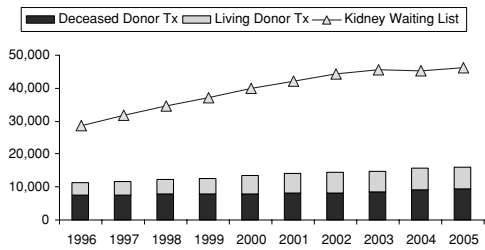
These figures compare, for each of the last 10 years, the size of the active waiting list and the number of transplants performed. The size of the waiting list is a snapshot of the number of candidates active on the waiting list at the end of the year, although additional patients were listed or removed at some time during the year. The number of transplants includes all transplants performed over the year. This difference in ways of counting explains why for some organs (e.g. lung), the number of transplants performed during a certain year may exceed the number of people awaiting that organ on the last day of the same year. Other instances of the narrowing gap between waiting list size and number of transplant reflect changes in allocation policy and wait-listing practices.

### Age distribution of recipients and active waiting list

In this overview, we have grouped all pediatric patients (<18 years) together, for ease of viewing. The OPTN/SRTR Annual Report data tables (and the accompanying text analyzing them) break this group out into several age groups: <1 year, 1–5 years, 6–10 years and 11–17 years. See ‘Pediatric Transplantation in the United States, 1996–2005’, an accompanying article in this report, for details (3). Here we have included only the data for 1996 and 2005; additional detail may be found in the organ-specific articles of this report (4–6).

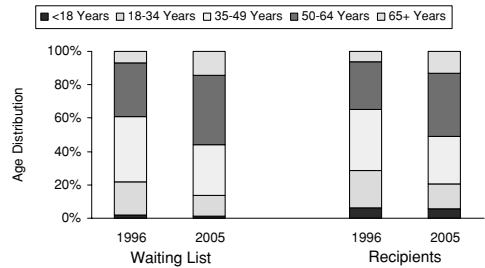
### Unadjusted patient and graft survival

These overview figures show survival of the transplanted organ (graft) and survival of transplant recipients (patient) at various time points following transplantation: 3 months, 1 year, 3 years and 5 years. The figures are based on information about the most recent cohorts possible that still allow sufficient follow-up time for data collection and ascertainment.



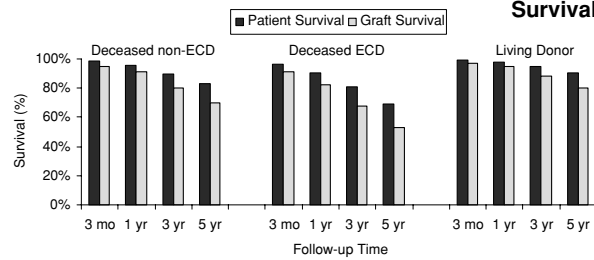
### Number of Transplants and Size of Active Waiting List.

There is a very large gap between the number of patients waiting for a transplant and the number receiving a transplant. This gap has been widening, which means that the waiting times from listing to transplant continue to increase. Living donor transplants had increased until 2004 while deceased donor transplants increased gradually to 2005. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 5.1a.



### Age Distribution of Recipients and Active Waiting List.

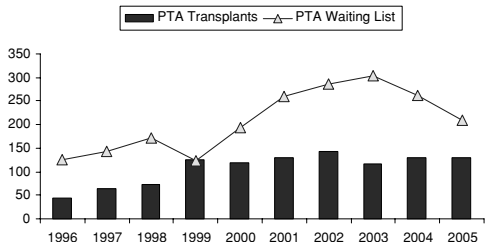
During the past decade the age distribution of candidates on the waiting list has changed such that older candidates now make up a much larger fraction of patients actively awaiting an organ. The same pattern is observed for transplant recipients except that ages <35 years show a greater representation than on the waiting list. Source: 2006 OPTN/SRTR Annual Report, Tables 5.1a, 5.4a, 5.4b, 5.4c.



### Unadjusted Patient and Graft Survival.

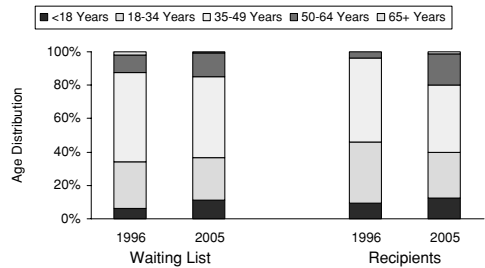
Patient survival in recent years has been improving. Five-year patient survival percentages based on transplants during 1999-2004 are clearly higher for living donors (90%) than for standard donor deceased donors (83%) and lowest among deceased donors (69%). Graft survival is lower since patients may live on dialysis or receive another transplant after graft failure. Source: 2006 OPTN/SRTR Annual Report, Tables 5.10a, 5.10b, 5.10c, 5.14a, 5.14b, 5.14c.

Figure 3: Kidney transplantation at a glance.



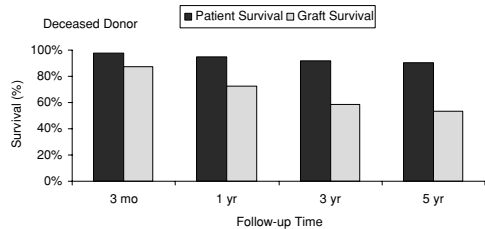
### Number of Transplants and Size of Active Waiting List.

The number of patients on the waiting list for a pancreas transplant alone has decreased since 2003, which resulted in a narrowing gap between the number of patients waiting for a pancreas transplant alone (PTA) and the number receiving one. However, this gap was still present in 2005. The number of PTA per year has been stable in recent years. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 6.1a.



### Age Distribution of Recipients and Active Waiting List.

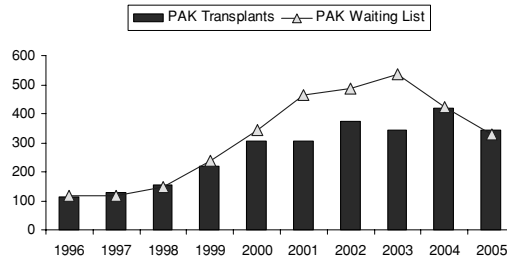
For PTA, more pediatric candidates were wait-listed and received a transplant in 2005 than in 1996. At the same time, the fraction of recipients over age 50 has grown. Pediatric diabetic patients rarely have kidney failure before age 18, but they are candidates for PTA. Source: 2006 OPTN/SRTR Annual Report, Tables 6.1a, 6.4.



### Unadjusted Patient and Graft Survival.

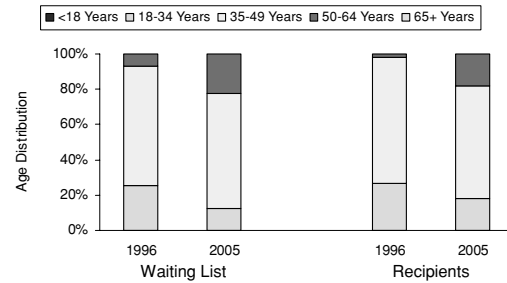
For PTA transplants, patient survival in recent years has been excellent; such patients do not usually have advanced kidney failure. The five-year patient survival is 90%. Graft survival is considerably lower since patients may live after graft failure through treatment with insulin. Source: 2006 OPTN/SRTR Annual Report, Tables 6.10, 6.14.

Figure 4: Pancreas transplantation alone at a glance.



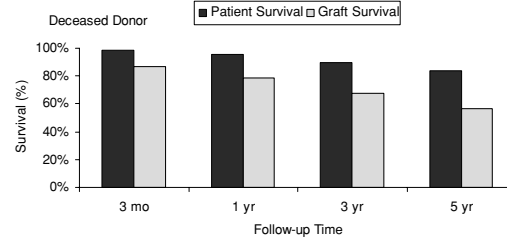
**Number of Transplants and Size of Active Waiting List.**

As with PTA, the number of patients on the waiting list for a PAK transplant has decreased since 2003. The gap between candidates and recipients decreased too. The number receiving a transplant matched the number of candidates at the end of 2004 and 2005. The number of PAK transplants has decreased in 2005 from its highest level of the decade in 2004. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 7.1a.



**Age Distribution of Recipients and Active Waiting List.**

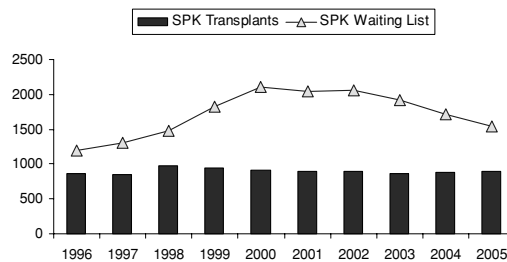
For PAK, more patients over 50 were wait-listed and received a transplant in 2005 than in 1996. At the same time fewer candidates and recipients were in the age group of 18-34. Since recipients are mostly type 1 diabetics, the ages below 18 and above 65 are virtually unrepresented. Recipients include transplants from both living and deceased donors. Source: 2006 OPTN/SRTR Annual Report, Tables 7.1a, 7.4.



**Unadjusted Patient and Graft Survival.**

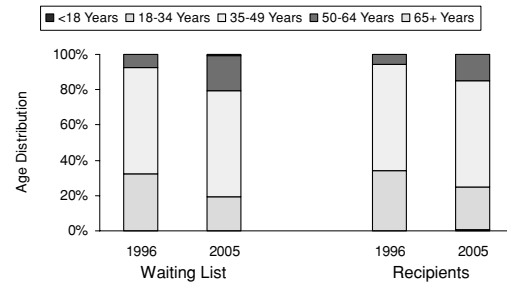
For PAK transplants, patient survival has been similar to that seen for simultaneous kidney-pancreas transplant recipients. Five-year patient survival is 84%. Graft survival is considerably lower since patients may live after graft failure through treatment with insulin. Source: 2006 OPTN/SRTR Annual Report, Tables 7.10, 7.14.

**Figure 5: Pancreas after kidney transplantation at a glance.**



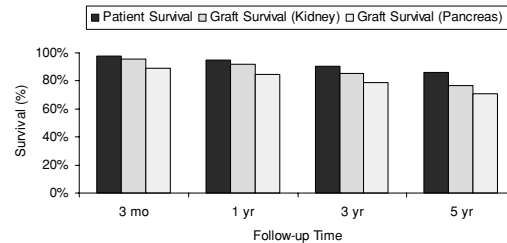
**Number of Transplants and Size of Active Waiting List.**

SPK accounts for the large majority of all pancreas transplants and has been stable over the last decade. The gap between the number of patients waiting for a transplant and the number receiving a transplant has been large, but has substantially decreased since 2000. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 8.1a.



**Age Distribution of Recipients and Active Waiting List.**

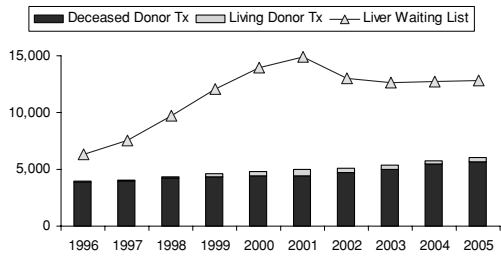
For SPK transplantation, a greater fraction of patients over age 50 were wait-listed and received a transplant in 2005 than in 1996. At the same time, fewer candidates and recipients were in the 18-34 age group. Since recipients are mostly type 1 diabetics, the ages below 18 and above 65 are virtually unrepresented. Recipients include transplants from both living and deceased donors. Source: 2006 OPTN/SRTR Annual Report, Tables 8.1a, 8.4.



**Unadjusted Patient and Graft Survival.**

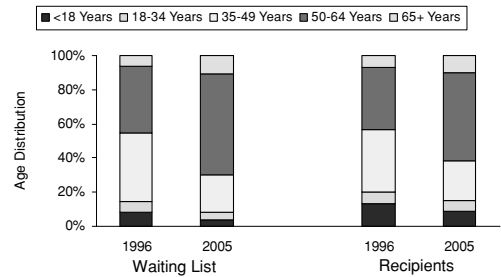
Patient survival has improved for SPK recipients in recent years. All SPK transplants are from deceased donors and their five-year patient survival is 86%. Graft survival is lower since patients may live after graft failure through treatment with insulin. Source: 2006 OPTN/SRTR Annual Report, Tables 8.10, 8.14.

**Figure 6: Simultaneous pancreas-kidney transplantation at a glance.**



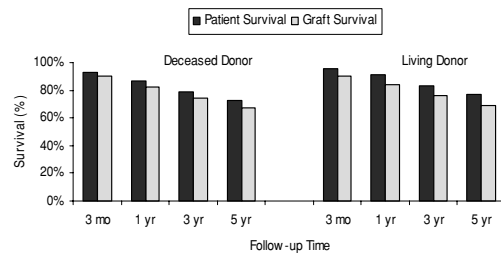
### Number of Transplants and Size of Active Waiting List.

The large increase in the number of patients awaiting a liver transplant has stabilized since 2002, when the MELD/PELD system began. The number receiving a deceased donor liver transplant has gradually increased, more steeply in 2004 and 2005. The gap between the numbers of candidates and recipients has been slowly shrinking since 2002. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 9.1a, 9.1b.



### Age Distribution of Recipients and Active Waiting List.

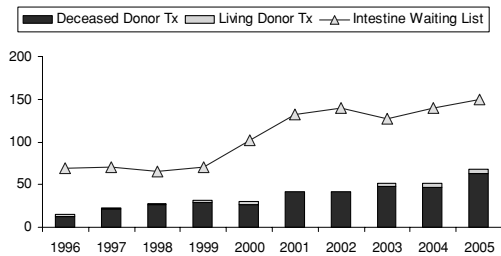
The numbers of candidates and recipients age 35-49 have remained fairly constant over the decade, but the age groups proportion by both measures has declined. Recipients include transplants from both living and deceased donors. Source: 2006 OPTN/SRTR Annual Report, Tables 9.1a, 9.4a, 9.4b.



### Unadjusted Patient and Graft Survival.

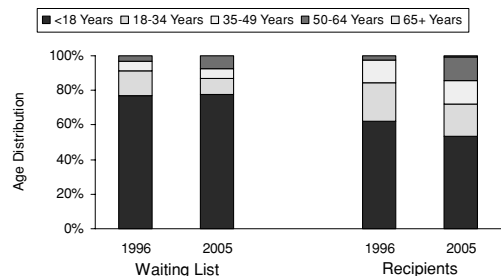
Patient survival in recent years has been improving for both deceased donors and living donors, with 73% and 77% of patients, respectively, alive five years following transplantation. Graft survival is lower since patients may live after graft failure through repeat liver transplantation. Source: 2006 OPTN/SRTR Annual Report, Tables 9.10a, 9.10b, 9.14a, and 9.14b.

Figure 7: Liver transplantation at a glance.



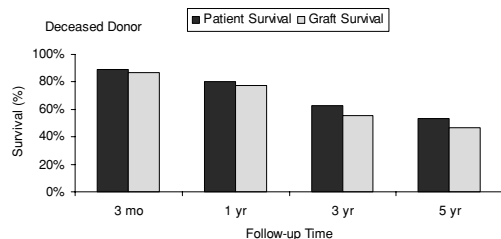
### Number of Transplants and Size of Active Waiting List.

The numbers of patients on the intestine waiting list and the number receiving a transplant both approximately doubled between 1996 and 2005. The difference between the number of candidates and transplant recipients has been increasing through the second half of the decade. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 10.1a.



### Age Distribution of Recipients and Active Waiting List.

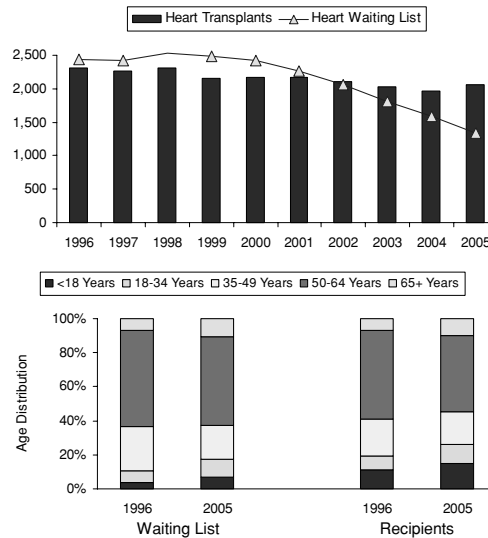
About 75% of intestine candidates have been in the pediatric age group. The small group of candidates in the age group >50 years doubled during the decade. Adult recipients make up a greater portion of recipients than candidates. The age group older than 50 shows a large increase during the decade in both categories. Source: 2006 OPTN/SRTR Annual Report, Tables 10.1a, 10.4.



### Unadjusted Patient and Graft Survival.

One-year patient survival reached 80% in 2005; however, longer-term survival at 5 years is 53%. Graft survival is lower, as patients may survive graft failure through parenteral alimentation or retransplantation. Source: 2006 OPTN/SRTR Annual Report, Tables 10.10, 10.14.

Figure 8: Intestine transplantation at a glance.

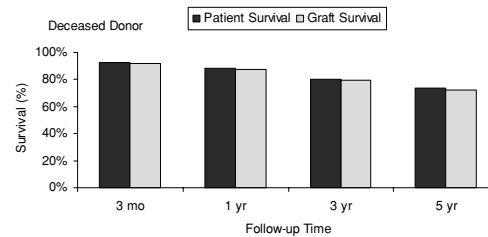


**Number of Transplants and Size of Active Waiting List.**

The number of heart transplants increased in 2005 after several years of gradual reduction. The number of patients awaiting a heart has decreased steeply since 2000, likely reflecting improvements in medical therapy. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 11.1a.

**Age Distribution of Recipients and Active Waiting List.**

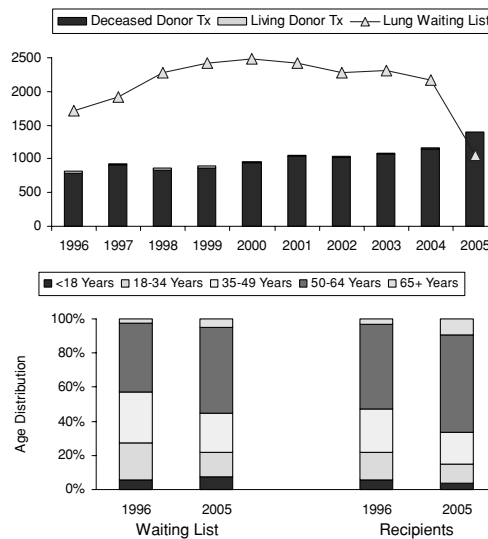
Trends in the age distribution of wait-listed candidates show that the ages below 34 and above 65 years have increased, while ages 35-64 years are less represented. The pattern of trends for transplant recipients is similar although the ages below 35 years have larger percentages than on the waiting list. Source: 2006 OPTN/SRTR Annual Report, Tables 11.1a, 11.4.



**Unadjusted Patient and Graft Survival.**

Patient survival has been improving in recent years for heart recipients. At one and five years following heart transplantation 88% and 74% of patients, respectively, are alive. Graft survival is very similar because very few patients may receive a second heart transplant after graft failure. Source: 2006 OPTN/SRTR Annual Report, Tables 11.10, 11.14.

Figure 9: Heart transplantation at a glance.

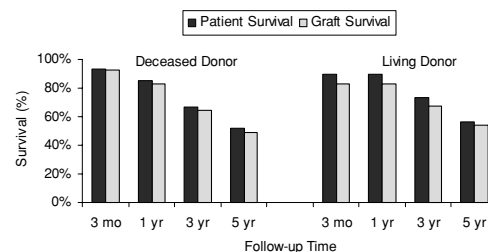


**Number of Transplants and Size of Active Waiting List.**

The number of lung transplants has increased steeply in the last year. The number of patients awaiting a transplant dropped steeply in 2005 after a stable pattern during the prior seven years. This sharp reduction is largely attributable to changes in allocation policy, which now considers urgency and benefit rather than time spent waiting. Source: 2006 OPTN/SRTR Annual Report, Tables 1.7, 12.1a.

**Age Distribution of Recipients and Active Waiting List.**

The lung waiting list shows a mixed trend in age distribution, with increasing percentages of candidates who are pediatric or older than 50. Candidates 18-49 years old show a corresponding reduction in the percentage of the waiting list. The pattern for transplant recipients shows similarly a strong increase for ages above 50 years, but the decrease in percentages for younger ages includes pediatric ages. Recipients include transplants from both living and deceased donors. Source: 2006 OPTN/SRTR Annual Report, Tables 12.1a, 12.4a, 12.4b.



**Unadjusted Patient and Graft Survival.**

Patient survival has been improving in recent years for both deceased and living donor lung transplant recipients. At one year following deceased donor and living donor lung transplantation 85% and 89% of patients, respectively, were alive. With the recent good results at one year, it is hoped that longer term patient survival will improve. Graft survival is very similar because very few patients may live after graft failure through a second lung transplant. Source: 2006 OPTN/SRTR Annual Report, Tables 12.10a, 12.10b, 12.14a, 12.14b.

Figure 10: Lung transplantation at a glance.

## Articles in the 2006 SRTR Report on the State of Transplantation

The graphics above give a quick view of the major trends addressed and analyzed in each of the organ-specific articles of this report. Articles on kidney and pancreas (4), liver and intestine (5) and heart and lung (6) provide detailed trends in donation, waiting time, allocation, post-transplant outcomes and the demographics of both candidates and recipients. Additionally, these articles supplement the reporting of 10-year trends with updates on recent changes in allocation policy, immunosuppression, clinical practice and other areas relevant to the transplantation of different organ types.

In this year's report, the three organ-specific articles are preceded by a review of trends in organ donation and utilization (7) including recent efforts to increase the number of donors, and an article devoted to the particular outcomes and policy concerns of pediatric transplantation (3).

This year's report concludes with three 'special-focus' articles that look closely at issues of recent interest to the transplant community. An article on organ acceptance rates (8) examines what happens when transplant centers turn down kidneys offered by an organ procurement organization, as low acceptance rates may contribute to inefficiency in organ distribution. An article on geographic variability in access to kidney transplantation (9) examines rates in wait-listing, receiving a living donor kidney transplant, and receiving a deceased donor kidney transplant after being placed on the waiting list, identifying wide disparities in access across the United States. Finally, an article on repeat transplantation (10) focuses on the growing trend of same-organ retransplantation and its effects on the transplant community as a whole and on individual recipients, who are more likely to have inferior outcomes following retransplantation. These articles all include special analyses performed by the SRTR and touch on topics that are timely and have implications for policy and clinical practice.

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This study was approved by HRSA's SRTR project officer. HRSA has determined that this study satisfies the criteria for the IRB exemption described in the 'Public Benefit and Service Program' provisions of 45 CFR 46.101(b)(5) and HRSA Circular 03.

*Note on sources:* The articles in this report are based on the reference tables in the 2006 OPTN/SRTR Annual Report, which are not included in this publication. Many relevant data appear in the figures and tables included here; other tables from the Annual Report that serve as the basis for this article include the following: Tables 1.1–1.4, 1.7, 1.13, 1.14, 5.1a, 5.10a–c, 5.14a–c, 5.4a–c, 6.1a, 6.10, 6.14, 6.4, 7.1a, 7.10, 7.14, 7.4, 8.1a, 8.10, 8.14, 8.4, 9.1a–b, 9.10a–b, 9.14a–b, 9.4a–b, 10.1a, 10.10, 10.14, 10.4, 11.1a, 11.10, 11.14, 11.4, 12.1a, 12.10a–b, 12.14a–b and 12.4a–b. All of these tables may be found online at: <http://www.ustransplant.org>.

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