



**CIHI Snapshot**

# Treatment of End-Stage Organ Failure in Canada, Canadian Organ Replacement Register, 2005 to 2014

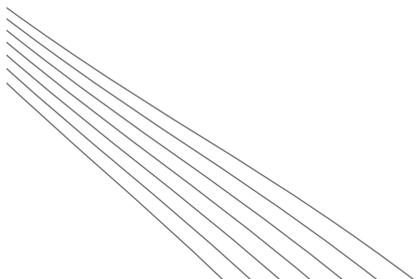
This document provides key findings from the latest annual statistics from the Canadian Organ Replacement Register (CORR) at the Canadian Institute for Health Information (CIHI). This release provides updated tables and figures, which were previously published in CORR's *Treatment of End-Stage Organ Failure in Canada* annual report, in a more accessible format. The statistics examine characteristics and trends for dialysis, organ transplantation and donation, as well as patient outcomes, in Canada over the decade 2005 to 2014, presented as [tables and figures](#).

## Summary

In 2014, there were 35,281 Canadians (excluding Quebec)<sup>i</sup> living with end-stage kidney disease (ESKD), 58.6% of whom were receiving some form of dialysis. The remaining 41.4% had a functioning kidney transplant.

- Of the 20,690 patients on dialysis, more than three-quarters were receiving institutional hemodialysis, the most expensive treatment option.
- There were 5,269 newly diagnosed ESKD patients reported in 2014.
- More than half (53%) of the newly diagnosed ESKD patients were 65 and older.
- Approximately 36% of the newly diagnosed patients had diabetes as the main cause of their kidney failure.
- According to the latest available data, 43.2% of patients on dialysis treatments survived at least 5 years.
- According to the latest available data, 90.8% and 81.4% of kidneys transplanted into adults from living and deceased donors, respectively, were still functioning at least 5 years after transplant.
- The average age of patients receiving a deceased donor kidney transplant was 55, and nearly 45% of patients were 60 and older.

i. Due to ongoing under-reporting of ESKD records from Quebec, data from this province is not included in statistics for ESKD and dialysis treatments. Quebec data is included in statistics for transplants and donors of kidneys, livers, hearts, lungs, pancreases and intestines. For more information on under-reporting in CORR, please refer to *Data Quality Documentation for Users: Canadian Organ Replacement Register, 2005 to 2014 Data*.



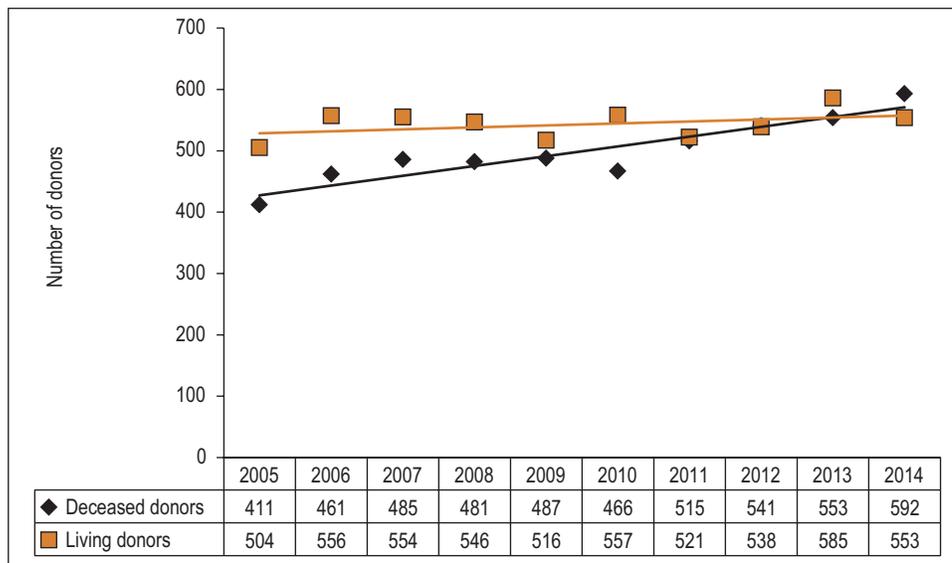
In 2014, a total of 2,356 transplant procedures were performed in Canada (including Quebec), approximately the same number as in 2013. The number of transplants performed has increased over the last 5 years, up from 2,093 in 2009. The 2,356 transplant procedures performed in 2014 resulted in 2,433 solid organs being transplanted, as highlighted below:

- Kidneys: 1,430<sup>ii</sup>
- Livers: 537
- Lungs: 226<sup>iii</sup>
- Hearts: 161<sup>iv</sup>
- Pancreases: 79<sup>v</sup>
- Altogether, 4,514 patients were waiting for a solid organ transplant at the end of 2014.
- In 2014, a total of 278 Canadians died waiting for an organ transplant.

In 2014, there were 592 deceased organ donors in Canada (including Quebec), 39 more than the 553 reported in 2013. In addition, there were 553 living organ donors.

- The deceased donor rate was 16.7 donors per million population, an increase of 31% since 2005. The living donor rate was 15.6 donors per million population.
- A living donor provides a single organ for transplant, but a deceased organ donor can provide up to 8 organs.
- In 2014, a total of 40% of living organ donors were not related to the transplant recipient. Spouses accounted for 11.6% of living donors, while the remaining 28% had no relationship with the organ recipient. This latter group has grown from 15.1% in 2005, in part due to the increased frequency of living donor paired exchange kidney transplants.
- The number of deceased donors increased 44% over the 10-year period, from 411 in 2005 to 592 in 2014 (Figure 1). The number of living donors has been mostly steady over the same time period.

**Figure 1** Number of donors, by donor type and year, Canada including Quebec, 2005 to 2014



**Source**

Canadian Organ Replacement Register, 2015, Canadian Institute for Health Information.

ii. The kidney transplant total includes 54 simultaneous kidney–pancreas transplants and is also supplemented with 94 kidney transplants from Transplant Québec’s statistics.  
 iii. The lung transplant total is supplemented with 2 transplants from Transplant Québec’s statistics and 4 transplants from the Southern Alberta Organ and Tissue Donation Program’s statistics.  
 iv. The heart transplant total is supplemented with 4 transplants from Transplant Québec’s statistics.  
 v. The pancreas transplant total is supplemented with 1 transplant from Transplant Québec’s statistics.

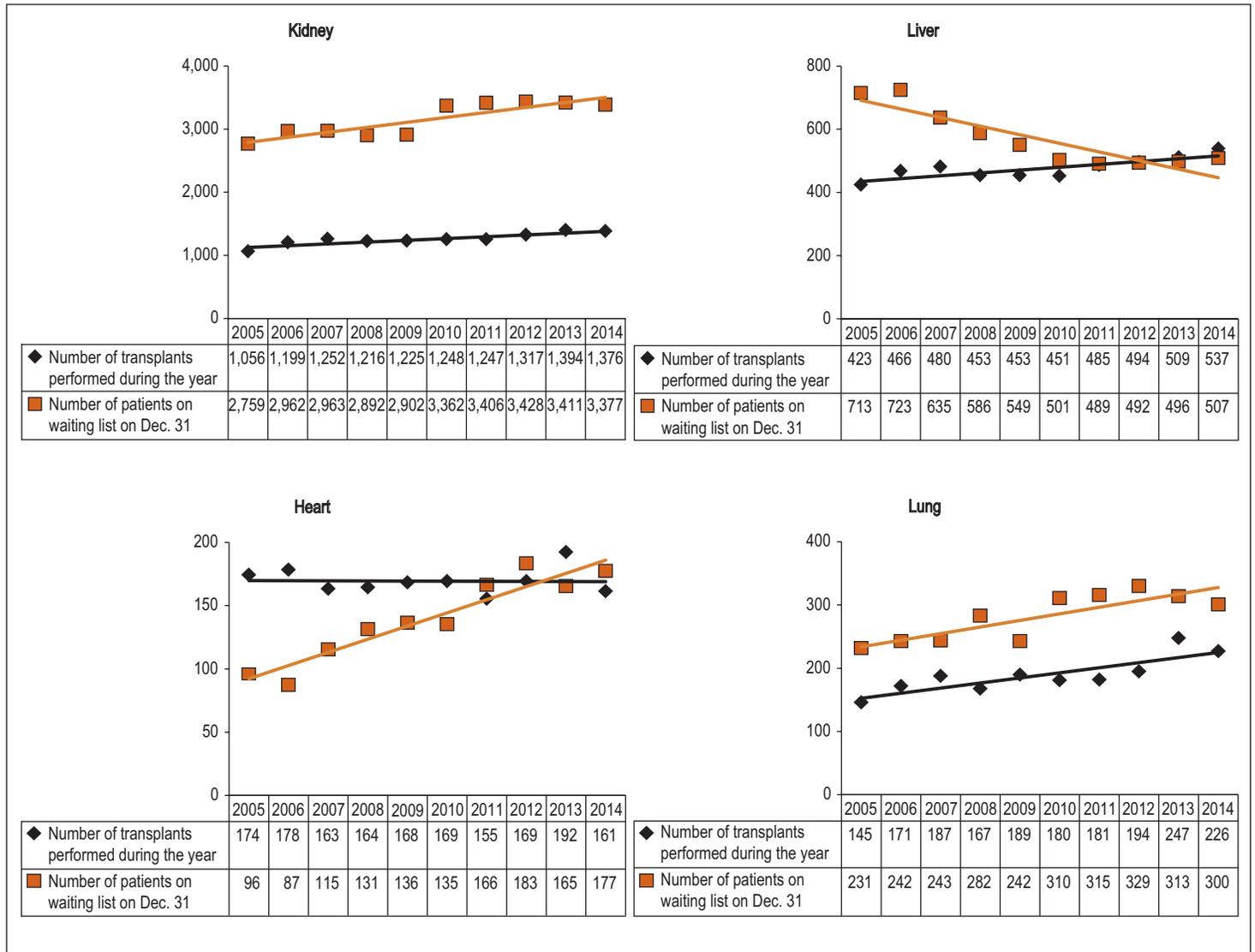
## Trends in solid organ transplants and waiting lists

2 meaningful measures related to solid organ transplantation are the number of people on a waiting list for an organ and the number of transplants performed in a year. The number of people on an organ transplant waiting list can be affected by several factors, including individuals newly placed on the waiting list, graft failure for those who previously received a transplant, death of individuals on the waiting list, withdrawal from the waiting list, the number of transplants performed and changes in the criteria needed to be put on a waiting list. The number of transplants performed in a year can also be affected by several factors, including the number of organs available for transplant (from both living and deceased donors) and how efficiently available organs are used (e.g., matching of compatible donor to recipients, success of transplant procedures).

Figure 2 presents annual transplant and waiting list statistics — including trend lines by organ type — for kidneys, livers, hearts and lungs. When the number of transplants per year is smaller than the number on the waiting list of the previous year, there is a backlog of patients waiting for an organ across years. Key findings include the following:

- **Kidneys** have the biggest differential between the number of transplants performed and the number of patients on a waiting list. The number of patients on the waiting list is approximately 2.5 times higher than the number of transplants performed (Figure 2, Kidney).
- Significant numbers of both **kidney** and **liver** transplants have been from living donors.
- For **kidneys**, both the number on the waiting list and the number of transplants performed steadily increased over the 10-year period (Figure 2, Kidney).
- Similarly, both the number on the waiting list and the number of **lung** transplants performed steadily increased over the 10-year period (Figure 2, Lung).
- For **livers**, the number of transplants performed over the 10-year period increased, whereas the number on the waiting list steadily decreased (Figure 2, Liver). Since 2012, the number of transplants performed in a year has exceeded the number of patients waiting for a liver at the end of the year.
- For **hearts**, the number of transplants performed over the 10-year period was steady, whereas the number on the waiting list steadily increased (Figure 2, Heart). In 2011, 2012 and 2014, the number of patients on the waiting list at the end of the year exceeded the number of transplants performed in that year.

**Figure 2** Number of transplants performed in a year and patients on waiting list on December 31, by organ and year, Canada including Quebec, 2005 to 2014



**Note**  
The kidney figure does not include simultaneous kidney–pancreas (SKP) transplants in the transplant and waiting list values.

**Source**  
Canadian Organ Replacement Register, 2015, Canadian Institute for Health Information.

## Additional highlights from the annual statistics

### Kidney

- At the end of 2014, 35,281 Canadians (excluding Quebec) were living with ESKD. This number has grown 38% since 2005, from 25,653.
- Of these patients, 20,690 were on dialysis and 14,591 were living with a functioning kidney transplant.
- In total, 5,269 patients started renal replacement therapy in 2014, with 77% receiving hemodialysis as their initial treatment.
- According to the latest available data of unadjusted 5-year patient survival, 41.0% of patients on hemodialysis treatments survived at least 5 years, approximately 12% fewer patients than the 52.5% of patients on peritoneal dialysis.
- There were 1,430 kidneys transplanted, including simultaneous kidney–pancreas (SKP) transplants, an increase of 29% over the 1,109 in 2005.
- On December 31, there were 3,473 patients waiting for a kidney or SKP transplant.
- A total of 67 patients died while waiting for a kidney transplant in 2014.
- According to the latest available data of unadjusted 5-year graft survival, 90.8% of kidneys transplanted into adults from living donors survived at least 5 years, approximately 9% more than the 81.4% of kidneys from deceased donors.

### Liver

- There were 6,146 Canadians living with a liver transplant in 2014.
- In 2014, 537 liver transplants were performed, 27% more than the 423 performed in 2005.
- On December 31, there were 507 patients waiting for a liver transplant.
- A total of 119 patients died while waiting for a liver transplant in 2014.
- Hepatitis C was the cause of liver failure for 20% of liver transplant patients between 2005 and 2014.
- According to the latest available data of unadjusted 5-year patient survival, 81.8% of patients who received a first liver transplant from a deceased donor survived at least 5 years.

### Heart

- There were 2,590 Canadians living with a transplanted heart.
- A total of 157 heart-only transplants were performed.
- On December 31, there were 177 Canadians waiting for a heart transplant.
- A total of 22 Canadians died while on the heart transplant waiting list in 2014.
- Between 2005 and 2014, 21% of heart transplants resulted from narrowing of the coronary arteries (ischemic cardiomyopathy).
- According to the latest available data of unadjusted 5-year patient survival, 85.3% of patients who received a first heart transplant survived at least 5 years.

### Lung

- There were 1,631 Canadians living with a lung transplant in 2014.
- In 2014, 220 lung transplants were performed, 89% of which were double-lung transplants. Since 2005, the number of lung transplants has grown 52%.
- On December 31, there were 300 Canadians waiting to receive a lung transplant.
- A total of 70 Canadians died while waiting for a lung transplant.
- Between 2005 and 2014, 29% of lung transplants resulted from lung tissue scarring with no known cause (idiopathic pulmonary fibrosis). Emphysema and chronic obstructive pulmonary disease (COPD) were the causes of an additional 25% of lung transplants.
- According to the latest available data of unadjusted 5-year patient survival, 65.6% of patients who received a first lung transplant from a deceased donor survived at least 5 years.

### Pancreas

- There were 78 pancreatic transplants performed in 2014. Of these, 54 were simultaneous kidney–pancreas transplants.
- A total of 153 Canadians were waiting for a pancreas transplant.
- According to the latest available data of unadjusted 5-year graft survival, 91.3% of simultaneous kidney–pancreas transplants survived at least 5 years.

### Small intestine

- Small intestine transplantation is an emerging and evolving field with the potential to improve the outcomes of children and adults with intestinal failure in Canada. Between 1995 and 2014, there were 52 such procedures performed in Canada, with more than half (54%) of the recipients younger than age 18.

## Conclusion and additional information

End-stage organ failure presents complex issues and challenges for Canadian patients, clinicians and health care systems. Treatment options continue to evolve, and organ donation practices and processes are continuously examined to optimize outcomes. It is only through the ongoing and systematic collection of data that sound information can be produced to assist with decision-making. These statistics provide information that may help to improve the health of Canadians with end-stage organ failure.

In addition to these annual summary statistics, more information and data tables are available online at [www.cihi.ca/corr](http://www.cihi.ca/corr), in the form of special reports (Analysis in Brief reports) and reports from the organ procurement organizations entitled *e-Statistics on Organ Transplants, Waiting Lists and Donors*.

If you have questions about these annual statistics or would like further information, please write to CORR at [corr@cihi.ca](mailto:corr@cihi.ca).