



CIHI
Snapshot
December 2017

Annual Statistics on Organ Replacement in Canada

Dialysis, Transplantation and Donation, 2007 to 2016

This summary document provides key findings from the latest annual statistics from the Canadian Organ Replacement Register (CORR) at the Canadian Institute for Health Information (CIHI). The statistics examine characteristics of and trends in dialysis, transplantation, donation and patient outcomes in Canada over the decade 2007 to 2016. Full statistics are presented as tables and figures in the companion data tables.

This summary document includes data for Quebec where possible in national totals for transplantation and organ donor statistics. Summary findings on end-stage kidney disease (ESKD) and corresponding tables and figures do not include Quebec because of ongoing under-reporting from this province. For more information on under-reporting in CORR, please refer to *Data Quality Documentation for Users: Canadian Organ Replacement Register, 2007 to 2016 Data*.



Canadian Institute
for Health Information
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Key findings

- The deceased organ donor rate in Canada in 2016 (including Quebec) was 20.9 donors per million population, an increase of 42% since 2007. The living donor rate was 15.0 donors per million population, a decrease of 11% since 2007.
- In 2016, a total of 2,835 transplant procedures were performed in Canada (including Quebec), an increase of 32% since 2007.
- As of December 31, 2016,
 - 3,421 patients were on a waiting list for a **kidney** transplant, an increase of 15% since 2007.
 - 433 patients were on a waiting list for a **liver** transplant, a decrease of 32% since 2007.
 - 189 patients were on a waiting list for a **heart** transplant, an increase of 64% since 2007.
 - 261 patients were on a waiting list for a **lung** transplant, an increase of 7% since 2007.
- There were 37,647 Canadians (excluding Quebec) living with ESKD at the end of 2016. This number had grown 36% since 2007.

End-stage kidney disease in Canada

In 2016, there were 37,647 Canadians (excluding Quebec) living with ESKD, 58.4% of whom were receiving some form of dialysis. The remaining 41.6% had a functioning kidney transplant.

- Of the 21,986 patients on dialysis, three-quarters were receiving institutional hemodialysis, the most expensive treatment option.
- In 2016, a total of 5,597 ESKD patients started renal replacement therapy (dialysis or transplant).
- More than half (53%) of the ESKD patients who started renal replacement therapy were age 65 and older.
- Approximately 38% of patients who started renal replacement therapy had diabetes as the main cause of their kidney failure.
- According to the latest available data, 44.3% of patients on dialysis treatments survived at least 5 years.
- According to the latest available data, 89.7% and 82.0% 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 57, and 49% of patients were 60 and older.

Transplantation and donation in Canadaⁱ

In 2016, a total of 2,835 transplant procedures were performed in Canada (including Quebec), 317 more than in 2015. The number of transplants performed had increased over the previous 5 years, up from 2,131 in 2011. The 2,835 transplant procedures performed in 2016 resulted in 2,906 solid organs being transplanted. A summary of transplanted organs over the last 2 years is presented below.

Table Organs transplanted in Canada, by organ type, 2015 and 2016

Organ type	Number of transplanted organs		Number of patients on waiting list as of December 31 [†]		Number of patients who died waiting for an organ transplant [‡]	
	2016	2015	2016	2015	2016	2015
Kidney	1,731*	1,515*	3,421	3,472	85	82
Liver	579	534	433	473	90	87
Lung	302	280	261	275	46	69
Heart	202	170	189	197	25	20
Pancreas*	92	76	165	170	10	3
Total	2,906	2,575	4,469	4,587	256	261

Notes

* Includes simultaneous kidney–pancreas (SKP) transplants.

† The total does not include patients on some waiting lists for combination transplants or intestines. For 2016, this represents 23 additional patients waiting for these types of transplants.

‡ The total does not include patients on some waiting lists for combination transplants. For 2016, this represents 4 additional patients who died while waiting for these types of transplants.

This table includes aggregate data from Transplant Québec to supplement national totals.

Source

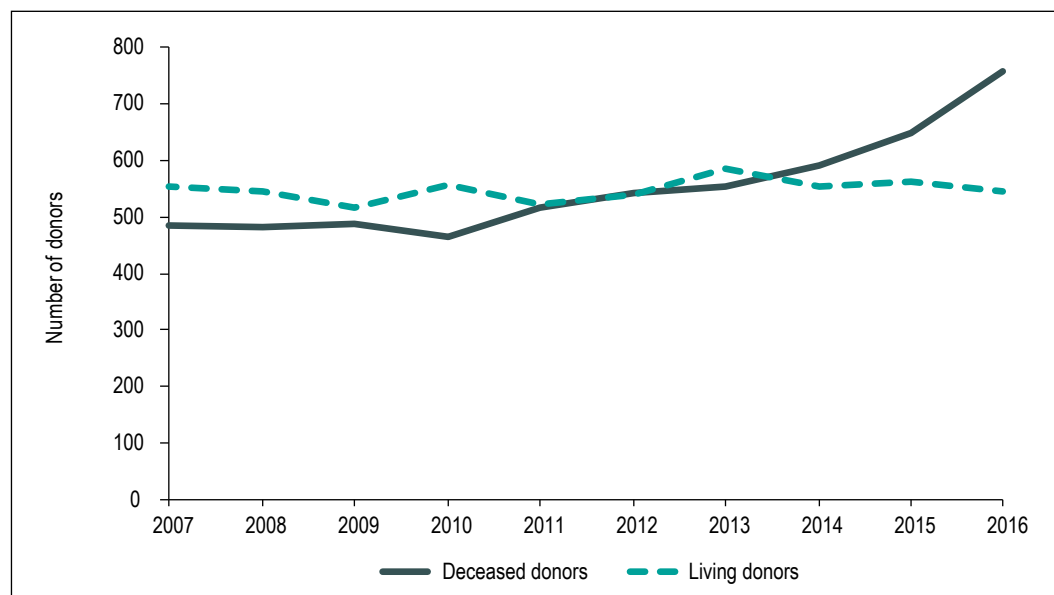
Canadian Organ Replacement Register, 2017, Canadian Institute for Health Information.

In 2016, there were 758 deceased organ donors in Canada (including Quebec), 109 more than the 649 reported in 2015. In addition, there were 544 living organ donors.

- The deceased donor rate was 20.9 donors per million population, an increase of 42% since 2007. The living donor rate was 15.0 donors per million population.
- In 2016, a total of 54% of living organ donors (excluding Quebec) were not related to the transplant recipient. Spouses accounted for 13% of these living donors, while the remaining 41% had no relationship with the organ recipient. This latter group had grown from 18% in 2007, in part due to the increased frequency of paired-exchange kidney transplants from living donors.
- The number of deceased donors increased 56% over the 10 years studied, from 485 in 2007 to 758 in 2016. The number of living donors was mostly steady over the same time period.

i. This section includes aggregate data from Transplant Québec to supplement national totals.

Figure 1 Number of donors, by donor type and year, Canada including Quebec, 2007 to 2016



Donor type	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Deceased	485	481	487	466	515	541	553	591	649	758
Living	554	546	516	557	521	538	585	553	563	544

Source

Canadian Organ Replacement Register, 2017, Canadian Institute for Health Information.

Trends in deceased organ donation and waiting lists

The number of deceased organ donors increased steadily from 2011 to 2016 (Figure 1), with 10% and 17% year-over-year increases in 2015 and 2016, respectively. This increase helps organ transplant programs meet their major goals of increasing the number of organ donors and reducing the number of patients on a waiting list for an organ transplant.

While a living donor provides a single organ for transplant, a deceased donor can provide up to 8 organs. Patients on a waiting list are in most cases waiting for organs from a deceased donor. The number of people on an organ transplant waiting list can be affected by several factors, including

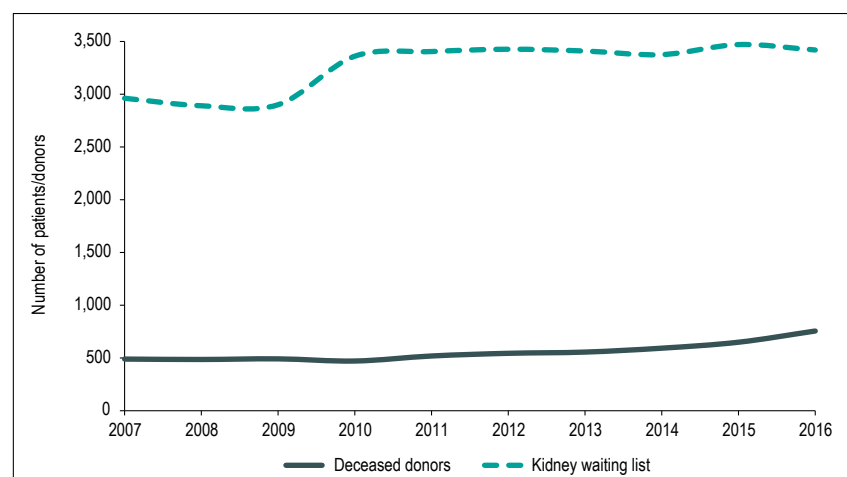
- Individuals newly placed on the waiting list;
- Graft failure among those who previously received a transplant;
- Death of individuals on the waiting list;
- Withdrawal from the waiting list;
- The number of deceased donor transplants performed; and
- Changes in the criteria needed to be put on a waiting list.

Figure 2 presents 10-year trends for the number of deceased donors and the number of patients on a waiting list for the 4 solid organs — kidneys, livers, hearts and lungs. Key findings include the following:

- **Kidneys** have the biggest differential between the number of deceased donors and the number of patients on a waiting list. There have been recent increases in the number of deceased donors in Canada, but there has not been a notable change in the number of patients on a waiting list. A deceased donor can donate kidneys to up to 2 patients.
 - Rates of ESKD in Canada increased over the 10 years studied, from 176.7 new patients per million population in 2007 to 200.2 new patients per million population in 2016.
- The increase in deceased donors in recent years was accompanied by decreases in the number of patients on a waiting list for both **liver** and **lung** transplants.
- For **hearts**, as for kidneys, the increase in deceased donors was not accompanied by notable changes in the number of patients on a waiting list.

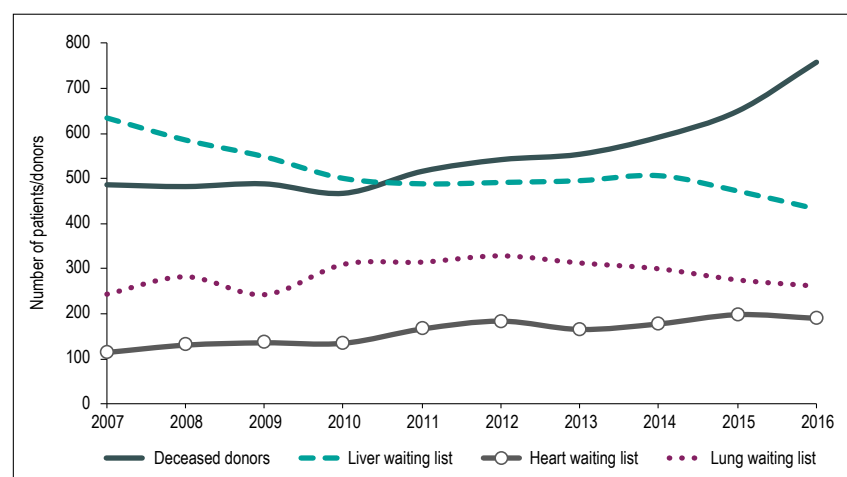
Figure 2 Number of deceased donors in a year and patients on a waiting list on December 31, by organ and year, Canada including Quebec, 2007 to 2016

a) Kidney



Number	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Deceased donors	485	481	487	466	515	541	553	591	649	758
Kidney waiting list	2,963	2,892	2,902	3,362	3,406	3,428	3,411	3,377	3,472	3,421

b) Extra-renal organs



Number	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Deceased donors	485	481	487	466	515	541	553	591	649	758
Liver waiting list	635	586	549	501	489	492	496	507	473	433
Heart waiting list	115	131	136	135	166	183	165	177	197	189
Lung waiting list	243	282	242	310	315	329	313	300	275	261

Note

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

Source

Canadian Organ Replacement Register, 2017, Canadian Institute for Health Information.

Additional highlights from the annual statistics

Kidney

- At the end of 2016, there were 37,647 Canadians (excluding Quebec) living with ESKD — up 36% from 27,737 in 2007. Of these patients, 21,986 were on dialysis and 15,661 were living with a functioning kidney transplant.
- Of the 5,597 patients who started renal replacement therapy in 2016, 75% received hemodialysis as their initial treatment.
- Between 2007 and 2016, the number of patients who started renal replacement therapy grew 26% (from 4,453 to 5,597). The population rate of new patients starting renal replacement therapy in 2016 was 200 patients per million population.
- For patients with ESKD, transplantation generally has better patient outcomes than dialysis:
 - According to the latest available data on unadjusted 5-year patient survival, 41.8% of patients on hemodialysis survived at least 5 years, compared with 56.4% of patients on peritoneal dialysis.
 - Patients who've had a kidney transplant may have the option to receive dialysis when the graft fails; therefore, survival can be measured for the graft. According to the latest available data on unadjusted 5-year graft survival, 82.0% of grafts for patients who received a kidney from a deceased donor survived at least 5 years, compared with 89.7% of grafts for patients who received a kidney from a living donor.

Liver

- There were 5,340 Canadians (excluding Quebec) living with a liver transplant in 2016.
- Cancer was the cause of liver failure for 21% of liver transplant patients between 2007 and 2016.
- According to the latest available data on unadjusted 5-year patient survival, 83.0% of patients who received a first liver transplant from a deceased donor survived at least 5 years.

Heart

- There were 2,064 Canadians (excluding Quebec) living with a transplanted heart in 2016.
- Between 2007 and 2016, 21% of heart transplants resulted from a weakening of the heart muscle that had become stretched and thinner (dilated cardiomyopathy).
- According to the latest available data on unadjusted 5-year patient survival, 87.9% of patients who received a first heart transplant survived at least 5 years.

Lung

- There were 1,573 Canadians (excluding Quebec) living with a lung transplant in 2016.
- Between 2007 and 2016, 34% 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 on unadjusted 5-year patient survival, 70.0% of patients who received a first lung transplant from a deceased donor survived at least 5 years.

Pancreas

- According to the latest available data on unadjusted 5-year graft survival, 85.7% 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 1997 and 2016, there were 53 such procedures performed in Canada (excluding Quebec), with more than half (51%) 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 cihi.ca/corr, in the form of special reports, Quick Stats (pre-formatted and interactive data tables) and reports from organ procurement organizations titled *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@cihi.ca.



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