



Snapshot
December 2018

Annual Statistics on Organ Replacement in Canada

Dialysis, Transplantation and Donation, 2008 to 2017

Following are 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 from 2008 to 2017. Full statistics are presented as tables and figures in the companion data tables. New this year are tables and figures on 10-year survival, kidney function when patients started dialysis, vascular access type for patients receiving hemodialysis and deceased donor type (brain and cardiac death), as well as longer trending of patient populations.

This 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, 2008 to 2017 Data*.



Canadian Institute
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Key findings

- At the end of 2017, there were 38,833 Canadians (excluding Quebec) living with ESKD — up 35% from 28,665 in 2008.
- Between 2008 and 2017, the number of patients who started kidney replacement therapy grew 27% (from 4,406 to 5,599).
- Of the 5,599 patients who started kidney replacement therapy in 2017, 74% received hemodialysis as their initial treatment.
- The deceased organ donor rate in Canada in 2017 (including Quebec) was 21.9 donors per million population, an increase of 51% since 2008. The living donor rate was 14.6 donors per million population, a decrease of 11% since 2008.
- In 2017, a total of 2,930 transplant procedures were performed in Canada (including Quebec), an increase of 41% since 2008.
- At the end of 2017, there were 2,827 patients active on the waiting list for a solid organ transplant and 1,506 patients on the waiting list and on hold.ⁱ A total of 242 patients died while waiting for an organ transplant in 2017.

End-stage kidney disease in Canada: A patient's journey



Alina's story

Alina is a fictional 61-year-old woman from Alberta who recently learned that she has ESKD — her kidneys are functioning at 15% of normal capacity and nearing the definition of kidney failure. She will need to decide whether she wants to pursue kidney replacement therapy (dialysis or kidney transplantation) or non-dialysis supportive care. Alina has had diabetes for many years, which is the cause of her ESKD. Alina has received information from her provider about her condition and the treatments available, and she's also consulted statistics to learn more about ESKD and its treatments in Canada.

i. A patient who is on hold cannot receive a transplant for medical or other reasons for a short period of time.

- **ESKD in Canada:**ⁱⁱ In 2017, 5,599 Canadians were newly diagnosed with ESKD. Overall, 38,833 people were living with ESKD that year — 0.14% of the total population. The rate of new patients with ESKD has gone up by 36% in the last 20 years.
- **Cause of ESKD:** Diabetes is the most common cause of ESKD in Canada, accounting for approximately 39% of all new diagnoses.
- **Kidney replacement therapy:** Treatment of ESKD has been growing significantly for many years. The number of people receiving kidney replacement therapy for ESKD has increased by 131% over the last 20 years, with 38,833 Canadians receiving these therapies in 2017.



Alina needs to decide which treatment option is best for her. Dialysis, which entails artificially cleaning the blood, can take the form of hemodialysis or peritoneal dialysis.

Hemodialysis (HD) involves delivering blood from the body into a machine (a dialyzer) where it's exposed to a filter and dialyzing fluid that removes waste. HD in a hospital is the most common form of dialysis; from a health care system perspective, it's also the most expensive treatment option. An alternative is home HD, where patients have the necessary equipment in their home. A key consideration when receiving HD is the type of access used to connect the patient's blood circulation to the dialyzer. The preferred access type is to surgically create a direct connection between an artery and vein in the arm, known as an arteriovenous fistula, which has a lower risk of infection than a catheter.

Peritoneal dialysis (PD) involves inserting dialyzing fluid into the peritoneum (abdomen) where waste products from the blood pass into the fluid; this fluid is then changed 4 to 6 times a day (or overnight, using a machine). PD, like home HD, is a home-based dialysis treatment. Home-based dialysis options are encouraged, as they help patients maintain their independence and lower the impact of dialysis on patients' lives.

ii. Quebec is excluded from all Canadian statistics in Alina's story because of under-reporting in recent years.

- **Dialysis as a kidney replacement therapy:** Approximately 58% of all patients living with ESKD were on some form of dialysis in 2017.
- **In-centre HD:** Three-quarters of these patients received HD treatments in a hospital or dialysis centre.
- **Home HD:** Only about 1% of new patients started on this treatment.
- **Vascular access for HD:** Only about 16% of dialysis patients started HD with a fistula.
- **Patient outcomes for HD:** 43% of patients who received HD survived longer than 5 years; this proportion has increased 6% since 2012, though age and the cause of ESKD can affect this probability.
- **PD:** About 23% of new patients started on PD in 2017, up from 20% in 2008.
- **Patient outcomes for PD:** 55% of patients who received PD survived longer than 5 years; this proportion has increased 7% since 2012, though age and the cause of ESKD can affect this probability.



Alina's other option for kidney replacement therapy is a transplant. Her doctor tells her that if she is a candidate — that is, she has no health condition that prohibits this option — kidney transplant is associated with the greatest survival and quality of life. A transplanted kidney can restore kidney function until it fails. The biggest consideration is the availability of donor kidneys. A person who needs a kidney transplant can receive one from a living or deceased donor. The donor and the recipient need to be blood type and immune compatible before the transplant can occur.

Living donation: Alina would need to find a donor for a living donor transplant. If she is a transplant candidate and able to find a willing and medically suitable donor who is not a match for her, she can look into the kidney paired donation program to see if she and her donor are compatible with another pair in the program.

Deceased donation: A living donor provides a single organ for transplant, but a deceased organ donor can provide up to 8 organs, including 2 kidneys. To receive a deceased donor kidney, candidates are put on a waiting list.

- **Kidney transplantation as a kidney replacement therapy:** In Canada, 16,338 patients had a functioning kidney transplant in 2017. This made up 42% of all patients receiving treatment for ESKD.
- **Living kidney donation:** 421 living donor kidney transplants were performed in Canada in 2017. Canada has among the higher living donation rates compared with other countries, but this rate has gone down by 11% over the last 10 years.
- **Patient outcomes after living kidney transplant:** 92% of people who received a living donor kidney transplant still had a functioning kidney after 5 years.
- **Deceased kidney donation:** 1,008 deceased donor kidney transplants were performed in Canada in 2017. The rate of deceased donation in Canada was 21.9 per million population — an increase of 51% over the previous 10 years and comparable with rates in Australia (20.7 per million population) and the United Kingdom (23.1 per million population).¹
- **Waiting lists:** At the end of 2017, there were 1,663 patients active on the waiting list. The most recent data shows that patients who started with dialysis spent an average of 3.8 years on dialysis before receiving a kidney transplant.
- **Patient outcomes after deceased kidney transplant:** 82% of people who received a deceased donor kidney transplant still had a functioning kidney after 5 years.



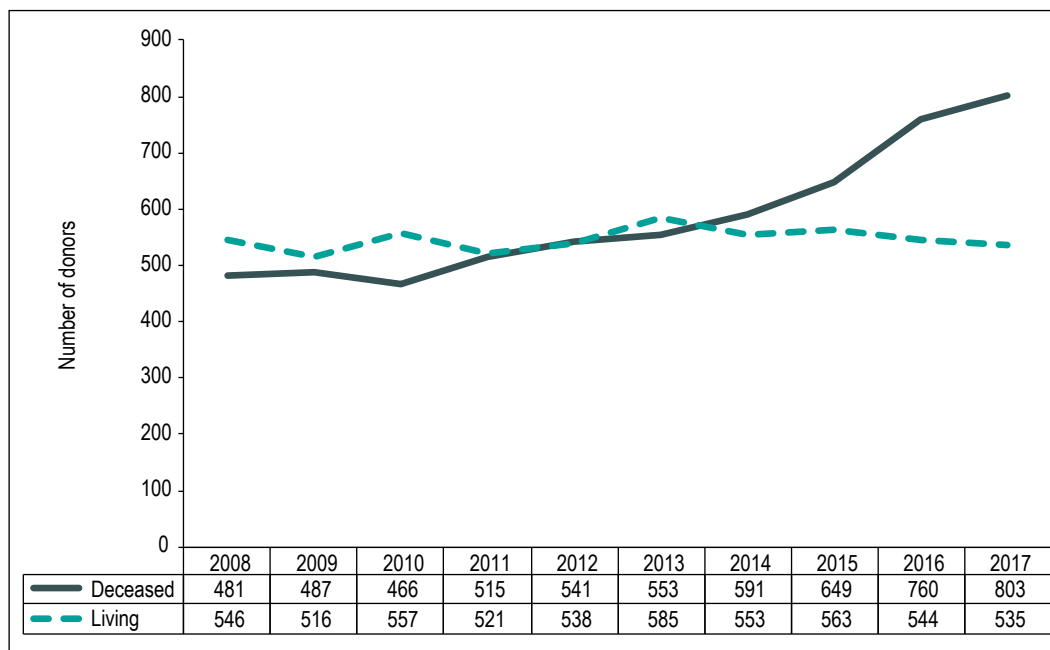
With these statistics and supporting information on kidney replacement therapies, Alina has a better understanding of her options. She's also able to look at statistics for her own province of Alberta. She uses this information, along with the clinical information provided by her nephrologist and support workers, to select the kidney replacement therapy that best suits her health and lifestyle.

Transplantation and donation in Canadaⁱⁱⁱ

In 2017, a total of 2,930 transplant procedures were performed in Canada (including Quebec), 95 more than in 2016. The number of transplants performed had increased over the previous 5 years, up from 2,235 in 2012. In 2017, there were 803 deceased organ donors in Canada (including Quebec), 43 more than the 760 reported in 2016. In addition, there were 535 living organ donors.

- The deceased donor rate was 21.9 donors per million population, an increase of 51% since 2008. The living donor rate was 14.6 donors per million population.
- In 2017, 52% of living organ donors (excluding Quebec) were not related to the transplant recipient.

Figure Number of donors, by donor type and year, Canada including Quebec, 2008 to 2017



Source
Canadian Organ Replacement Register, 2018, Canadian Institute for Health Information.

iii. Where possible (number of transplants performed and waiting lists), this section includes aggregate data from Transplant Québec to supplement national totals.

Liver

- There were 5,626 Canadians (excluding Quebec) living with a liver transplant in 2017.
- In 2017, 464 liver transplants were performed, 2% fewer than the 474 performed in 2016.
- On December 31, there were 239 patients active on the waiting list for a liver transplant and 82 patients on hold.
- A total of 64 patients died while waiting for a liver transplant in 2017.
- Cancer was the cause of liver failure for 22% of liver transplant patients between 2008 and 2017.
- According to the latest available data on unadjusted 5-year patient survival, 87.7% of patients who received a first liver transplant from a deceased donor survived at least 5 years.

Heart

- There were 2,150 Canadians (excluding Quebec) living with a transplanted heart in 2017.
- In 2017, 164 heart transplants were performed, 6% more than the 155 performed in 2016.
- On December 31, there were 63 patients active on the waiting list for a heart transplant and 23 patients on hold.
- A total of 16 patients died while waiting for a heart transplant in 2017.
- Between 2008 and 2017, 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, 84.6% of patients who received a first heart transplant survived at least 5 years.

Lung

- There were 1,725 Canadians (excluding Quebec) living with a lung transplant in 2017.
- In 2017, 295 lung transplants were performed, 18% more than the 251 performed in 2016.
- On December 31, there were 141 patients active on the waiting list for a lung transplant and 49 patients on hold.
- A total of 30 patients died while waiting for a lung transplant in 2017.
- Between 2008 and 2017, 35% 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 24% of lung transplants.
- According to the latest available data on unadjusted 5-year patient survival, 68.7% of patients who received a first lung transplant from a deceased donor survived at least 5 years.

Pancreas

- There were 72 pancreas transplants performed in 2017. Of these, 42 were simultaneous kidney–pancreas transplants.
- On December 31, there were 68 patients active on the waiting list for a pancreas transplant and 62 patients on hold.
- According to the latest available data on unadjusted 5-year graft survival, 85.3% 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 1998 and 2017, there were 53 such procedures performed in Canada (excluding Quebec), with nearly half (51%) of the recipients younger than age 18.

Additional information

In addition to these annual summary statistics, more information and data tables are available online at www.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.

Appendix: Text alternative for figure

Figure Number of donors, by donor type and year, Canada including Quebec, 2008 to 2017

| Type of donor | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Deceased | 481 | 487 | 466 | 515 | 541 | 553 | 591 | 649 | 760 | 803 |
| Living | 546 | 516 | 557 | 521 | 538 | 585 | 553 | 563 | 544 | 535 |

Source

Canadian Organ Replacement Register, 2018, Canadian Institute for Health Information.

Reference

1. International Registry in Organ Donation and Transplantation. [Preliminary Numbers 2017](#). June 2018.



For data-specific information:

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