



CIHI  
Snapshot  
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# Annual Statistics on Organ Replacement in Canada

## Dialysis, Transplantation and Donation, 2010 to 2019

This document provides a summary of 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 for end-stage kidney disease (ESKD), as well as for all solid organ transplantation, donation and patient outcomes in Canada over the 10 years between 2010 and 2019. An area of focus is living and deceased organ donors, including donor characteristics and organ-level information to provide insights beyond the number and rate of organ donation. The full range of statistics on which this summary is based is presented 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 ESKD and the corresponding tables and figures do not include Quebec because of ongoing under-reporting. For more information on under-reporting in CORR, please refer to *Data Quality Documentation for Users: Canadian Organ Replacement Register, 2010 to 2019 Data*.

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Canadian Institute  
for Health Information  
Institut canadien  
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## Key findings

- There were 40,734 Canadians (excluding Quebec) living with ESKD at the end of 2019, an increase of 33% since 2010.
- Looking at all solid organs, the deceased organ donor rate in Canada in 2019 (including Quebec) was 21.8 donors per million population, an increase of 59% since 2010. The living donor rate was 16.3 donors per million population, approximately the same as in 2010.
- In 2019, a total of 3,014 transplant procedures (all organs) were performed in Canada (including Quebec), an increase of 42% since 2010.

**Table** Organs transplanted, waiting lists and deaths on waiting list, by organ, Canada including Quebec, as of December 31, 2019\*

Organ type	Number of organs transplanted	Number of patients on waiting list		Number of patients who died on waiting list
		Total	Active	
Kidney	1,789	3,299	1,902	72
Liver	610	526	412	107
Heart	212	142	88	18
Lung	404	237	186	41
Pancreas	68	126	79	3
<b>Total†</b>	<b>3,084</b>	<b>4,352</b>	<b>2,685</b>	<b>249</b>

### Notes

\* This includes aggregate data from Transplant Québec to supplement national totals. Waiting list statistics for simultaneous kidney–pancreas (SKP) transplants are included in the pancreas section.

† The Total row includes intestines and other (non-SKP) combination organ transplants.

### Source

Canadian Organ Replacement Register, 2020, Canadian Institute for Health Information.

## Transplantation and donation in Canada<sup>i</sup>

In 2019, a total of 3,014 transplant procedures were performed in Canada (including Quebec), 229 more than in 2018. The number of transplants performed had increased over the previous 5 years, up from 2,359 in 2014. The 3,014 transplant procedures performed in 2019 resulted in the transplant of 3,084 solid organs. There were 4,352 people on a waiting list for an organ transplant, including 2,685 who were active on the list. In total, 249 people died while waiting for a transplant.

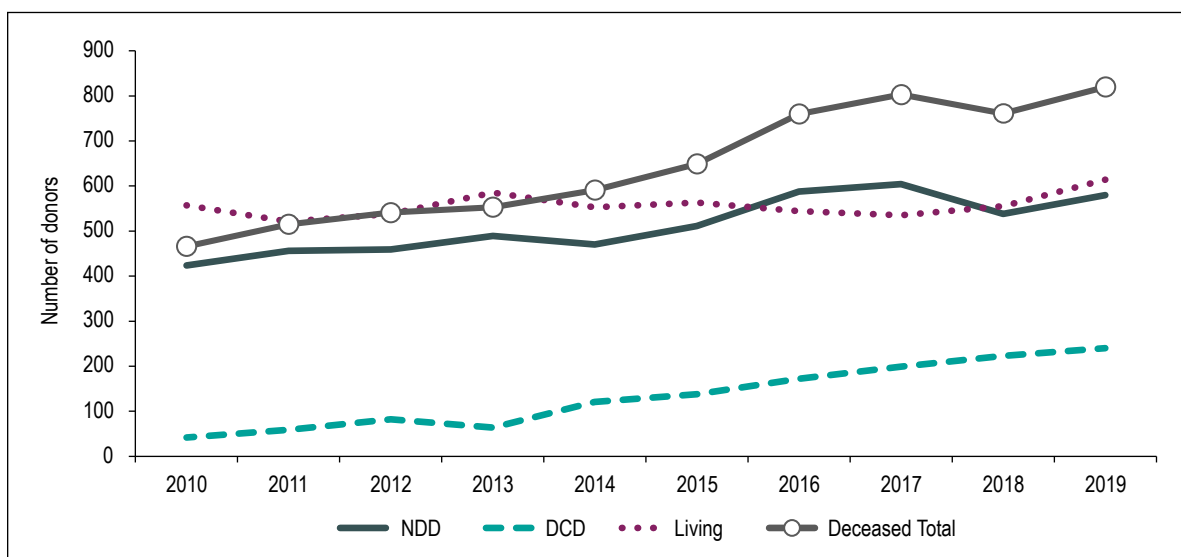
In 2019, there were 820 deceased organ donors in Canada (including Quebec), 58 more than the 762 reported in 2018. In addition, there were 614 living organ donors.

- Of the 820 deceased donors, 71% were donation after brain death (NDD, or neurological determination of death) and 29% were donation after cardio-circulatory death (DCD) (see the figure below). Over the 10 years studied, NDD donors increased by 37%, whereas DCD donors increased by 471%.

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

- The deceased donor rate was 21.8 donors per million population, an increase of 59% since 2010. This rate is comparable with rates in Australia (21.6 per million population) and the United Kingdom (24.9 per million population).<sup>1</sup>
- The living donor rate was 16.3 donors per million population. Canada has one of the higher living donation rates compared with other countries, but this rate has been approximately the same since 2010.
- The number of deceased donors increased 76% over the 10 years, from 466 in 2010 to 820 in 2019. The number of living donors was mostly steady over the same time period.
- 61% of deceased donors (excluding Quebec) were male. The average number of organs used for transplantation was 3 for all deceased donors and 4 for those age 39 and younger.
- 62% of living donors (excluding Quebec) were female. 57% of living organ donors were unrelated to the transplant recipient.

**Figure** Number of donors, by donor type and year, Canada including Quebec, 2010 to 2019



Type of donor	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Deceased (NDD and DCD)</b>	466	515	541	553	591	649	760	803	761	820
<b>NDD</b>	424	456	459	489	470	511	588	604	538	580
<b>DCD</b>	42	59	82	64	121	138	172	199	223	240
<b>Living</b>	557	521	538	585	553	563	544	535	555	614

#### Notes

NDD: Neurological determination of death (donation after brain death).

DCD: Donation after cardio-circulatory death.

1 deceased donor in 2018 had missing data regarding donor type (NDD or DCD) and was excluded.

#### Source

Canadian Organ Replacement Register, 2020, Canadian Institute for Health Information.

# End-stage kidney disease in Canada

## Trends in end-stage kidney disease

The need for renal replacement therapy in Canada is growing. The rate of new patients per million population starting renal replacement therapy increased on average 1.6% per year between 2010 and 2019. The 2019 rate in Canada (excluding Quebec) was 208 new patients per million population, with Manitoba and Newfoundland and Labrador having the highest rates of new patients per million population: 269 and 249, respectively. The number of patients receiving dialysis nearly doubled over 20 years, from 11,601 in 2000 to 23,125 in 2019. Of the 23,125 patients on dialysis last year, three-quarters were receiving institutional hemodialysis, the most expensive treatment option. Patients with ESKD in Canada who receive a transplant from a deceased donor will spend an average of 3.7 years on dialysis before receiving a transplant.

There is also positive progress in Canada. Between 2010 and 2019, there was a 15% increase in the proportion of new patients starting on a home dialysis therapy. The proportion of patients with late referral — those first seen by a nephrologist less than 90 days before starting dialysis — decreased from 30% to 25% over the same time period. Another measure of quality of care is not starting dialysis too early with respect to remaining kidney function. The proportion of patients with kidney function (represented by estimated glomerular filtration rate) equal to or greater than 15 ml/min/1.73m<sup>2</sup> when starting dialysis decreased from 14% to 8% over this time period. The proportion of patients with ESKD living with a functioning transplant increased from 40% in 2010 to 43% in 2019. The number of kidney transplants performed per year increased 41%. Also, the number of patients who received a pre-emptive kidney transplant (i.e., received a transplant without starting on dialysis first) increased from 136 in 2010 to 178 in 2019.

## Additional highlights for end-stage kidney disease

In 2019, there were 40,734 Canadians (excluding Quebec) living with ESKD, 56.8% of whom were receiving some form of dialysis. The remaining 43.2% had a functioning kidney transplant. Between 2010 and 2019, the number of Canadians living with ESKD increased 33% (from 30,736).

- In 2019, a total of 6,058 ESKD patients started renal replacement therapy (dialysis or transplant), an increase of 30% from 2010. The rate of new patients starting renal replacement therapy in 2019 was 208 patients per million population.
- More than half (55%) of ESKD patients who started renal replacement therapy were age 65 and older, and 62% were male.
- Approximately 36% of patients who started renal replacement therapy had diabetes as the main cause of their kidney failure.
- According to the latest available data from CORR, 43.9% of patients on dialysis treatments survived at least 5 years.
- The average age of patients receiving a deceased donor kidney transplant was 56, and 47.4% of patients were 60 and older.

- For patients with ESKD, transplantation generally has better patient outcomes than dialysis:
  - According to the latest available data from CORR on unadjusted 5-year patient survival, 41.5% of patients on hemodialysis survived at least 5 years, compared with 53.2% 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 from CORR on unadjusted 5-year graft survival, 79.8% of grafts for patients who received a kidney from a deceased donor survived at least 5 years, compared with 92.4% of grafts for patients who received a kidney from a living donor.

## Additional highlights from the annual statistics

### Liver

- There were 6,076 Canadians (excluding Quebec) living with a liver transplant in 2019.
- Cancer was the cause of liver failure for 23% of liver transplant patients between 2010 and 2019.
- According to the latest available data from CORR on unadjusted 5-year patient survival, 84.1% of patients who received a first liver transplant from a deceased donor survived at least 5 years.

### Heart

- There were 2,297 Canadians (excluding Quebec) living with a transplanted heart in 2019.
- Between 2010 and 2019, 20% 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 from CORR on unadjusted 5-year patient survival, 86.7% of patients who received a first heart transplant survived at least 5 years.

### Lung

- There were 2,034 Canadians (excluding Quebec) living with a lung transplant in 2019.
- Between 2010 and 2019, 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 24% of lung transplants.
- According to the latest available data from CORR on unadjusted 5-year patient survival, 62.5% of patients who received a first lung transplant from a deceased donor survived at least 5 years.

### Pancreas

- According to the latest available data from CORR on unadjusted 5-year graft survival, 100% 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 2000 and 2019, there were 54 such procedures performed in Canada (excluding Quebec), with half (50%) 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.

In addition to this summary, more detailed information and data tables are available online at [cihi.ca/corr](https://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](mailto:corr@cihi.ca).

## Reference

1. International Registry in Organ Donation and Transplantation. [Preliminary Numbers 2019](#). 2020.



**For data-specific information:**

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