



Canadian Organ Replacement Register  
Annual Report: Treatment of End-Stage Organ  
Failure in Canada, 2004 to 2013

Report

April 2015

Types of Care



Canadian Institute  
for Health Information

Institut canadien  
d'information sur la santé



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Better data. Better decisions.  
Healthier Canadians.

## Our Mandate

To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

## Our Values

Respect, Integrity, Collaboration,  
Excellence, Innovation

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# Summary<sup>i</sup>

*Treatment of End-Stage Organ Failure in Canada, 2004 to 2013* reports on data from the Canadian Organ Replacement Register (CORR) at the Canadian Institute for Health Information (CIHI). The report examines dialysis, organ transplantation and donation characteristics, trends and patient outcomes in Canada during the decade 2004 to 2013.

**In 2013, there were 41,931 Canadians living with end-stage kidney disease (ESKD); 57.5% were receiving some form of dialysis. The remaining 42.5% had a functioning kidney transplant.**

- Of the 24,114 patients on dialysis, more than three-quarters were receiving institutional hemodialysis, the most expensive treatment option.
- There were 5,333 newly diagnosed ESKD patients reported in 2013.
- More than half (53%) of the newly diagnosed ESKD patients were 65 and older.
- Nearly 36% of the newly diagnosed patients had diabetes as the main cause of their kidney failure.
- For the latest available data of unadjusted five-year patient survival, 44.8% of patients on dialysis treatments survived at least five years.
- The average age of patients receiving a deceased donor kidney transplant was 55, and nearly 42% of patients were 60 and older.

For the latest available data of unadjusted five-year graft survival, 89.2% and 82.6% of kidneys transplanted into adults from living and deceased donors, respectively, survived at least five years.

**In 2013, a total of 2,367 transplant procedures were performed, an increase of 6% over 2012. The number of transplants performed has increased annually over the last five years, up from 2,076 in 2008. The 2,367 transplant procedures performed in 2013 resulted in 2,432 solid organs being transplanted, as highlighted below:**

- Kidneys: 1,419<sup>ii</sup>
- Livers: 509
- Lungs: 247
- Hearts: 192
- Pancreases: 65<sup>iii</sup>

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i. In 2011, 2012 and 2013, there was known under-reporting of incident dialysis cases in several provinces. Counts of organ donors and transplants from Quebec have been supplemented with additional data from Transplant Québec. For additional information, see Section 1.2.

ii. The kidney transplant total includes 44 simultaneous kidney–pancreas transplants, and is also supplemented with 58 kidney transplants and 5 simultaneous kidney–pancreas transplants from under-reporting in Quebec.

iii. The pancreas transplant total is supplemented with five kidney–pancreas transplants and one pancreas-only transplant from under-reporting in Quebec.

**In 2013, there were 553 deceased organ donors in Canada, 12 more than the 541 reported in 2012. In addition, there were 588 living organ donors.**

- While a living donor provides a single organ for transplant, a deceased organ donor can provide up to eight organs.
- The number of deceased organ transplants also increased between 2012 and 2013, with 130 more organs being transplanted.
- In 2013, a total of 43.5% of living organ donors were not related to the transplant recipient. Spouses accounted for 13.3% of living donors, while the remaining 30.2% had no relationship to the organ recipient. This latter group has grown from 14% in 2004, possibly reflecting the increased frequency of living donor paired exchange kidney transplants.



# Highlights<sup>iv</sup>

*Treatment of End-Stage Organ Failure in Canada, 2004 to 2013* draws on data from the Canadian Institute for Health Information (CIHI) Canadian Organ Replacement Register (CORR), primarily for the years 2004 through 2013 (the most current year available). The report examines dialysis and transplantation characteristics, trends and patient outcomes in Canada during that period.

The information presented is relevant to a wide array of stakeholders. Individuals interested in health system policy, as well as clinical and service management related to end-stage organ failure, will find the report useful, as will individuals and groups generally interested in end-stage organ failure in Canada.

## 2013 Overview

- In 2013, 5,333 patients started renal replacement therapy (RRT).
- The 1,141 organ donors (living and deceased) resulted in 2,367 solid organ transplant procedures.
- There were 15.7 deceased organ donors per million population, an increase of 22% since 2004. The living donor rate was 16.7 donors per million population.
- Altogether, 4,433 patients were waiting for a solid organ transplant at the end of the year.
- A total of 246<sup>v</sup> Canadians died waiting for an organ transplant.

## Diabetes and ESKD

- Diabetes continued to be the most frequently reported primary cause of ESKD, accounting for 36% of incident patients in Canada.
- The self-reported prevalence of diabetes increased by 60% between 2003 and 2013 from 1.2 million to 2.0 million.<sup>1</sup> The prevalence of ESKD increased by 42% during the same time frame.
- The increase in self-reported prevalence of diabetes between 2003 and 2013 was most striking for patients age 45 to 64 and age 65 and older, at 62% and 74%, respectively.<sup>1</sup> During the same time frame, ESKD increased for patients in these age groups, at 46% and 66%, respectively.
- The percentage of incidence for adult dialysis patients with a primary diagnosis of diabetes increased between 2004 and 2013 by 19% and 15% for patients receiving hemodialysis and peritoneal dialysis, respectively.
- Between 2004 and 2013, the prevalence rate per million population of patients with diabetes as a primary diagnosis increased by 36%.

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iv. In 2011, 2012 and 2013, there was known under-reporting of incident ESKD cases in several provinces. Counts of organ donors and transplants from Quebec have been supplemented with additional data from Transplant Québec. For additional information, see Section 1.2.

v. Total includes 38 patient deaths in Quebec, as reported in Transplant Québec's Statistiques officielles 2013.

- Among prevalent patients in 2013 with a primary diagnosis of diabetes, 62% were being treated with hemodialysis and 26% had transplants.
- Between 2004 and 2013, the percentage of adult kidney transplant recipients with a primary diagnosis of diabetes who received a kidney from a deceased donor increased by 61%. Over the same time period, the percentage of these transplant recipients who received a kidney from a living donor increased by 13%.

## Kidney

- At the end of 2013, 41,931 Canadians were living with ESKD. Since 2004, this number has grown 35% from 30,953.
- Of these patients, 24,114 were on dialysis and 17,817 were living with a functioning kidney transplant.
- In total, 5,333 patients started RRT in 2013, with 77% receiving hemodialysis as their initial treatment.
- For the latest available data of unadjusted five-year patient survival, 42.7% of patients on hemodialysis treatments survived at least five years, approximately 12% fewer patients than the 54.5% of patients on peritoneal dialysis.
- There were 1,419 kidneys transplanted, including simultaneous kidney–pancreas (SKP) transplants, an increase of 32% over the 1,074 in 2004.
- On December 31, there were 3,382 patients waiting for a kidney or SKP transplant.
- A total of 88 patients died while waiting for a kidney transplant in 2013.
- For the latest available data of unadjusted five-year graft survival, 89.2% of kidneys transplanted into adults from living donors survived at least five years, approximately 7% more than the 82.6% of kidneys from deceased donors.

## Liver

- There were 5,833 Canadians living with a liver transplant.
- In 2013, 509 liver transplants were performed, 22% more than the 417 performed in 2004.
- On December 31, there were 498 patients waiting for a liver transplant.
- A total of 86 patients died while waiting for a liver transplant in 2013.
- Hepatitis C was the cause of liver failure for 21% of liver transplant patients between 2004 and 2013.
- For the latest available data of unadjusted five-year patient survival, 83.9% of patients who received a first liver transplant from a deceased donor survived at least five years.

## Heart

- There were 2,611 Canadians living with a transplanted heart.
- A total of 192 heart-only transplants were performed.
- On December 31, there were 167 Canadians waiting for a heart transplant.
- A total of 20 Canadians died while on the heart transplant waiting list in 2013.

- Between 2004 and 2013, 21% of heart transplants resulted from narrowing of the coronary arteries (ischemic cardiomyopathy).
- For the latest available data of unadjusted five-year patient survival, 89.9% of patients who received a first heart transplant survived at least five years.

## Lung

- There were 1,524 Canadians living with a lung transplant.
- In 2013, 247 lung transplants were performed, 86% of which were double lung transplants. Since 2004, the number of lung transplants has grown 86%.
- On December 31, there were 314 Canadians waiting to receive a lung transplant.
- A total of 52 Canadians died while waiting for a lung transplant.
- Between 2004 and 2013, 28% 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.
- For the latest available data of unadjusted five-year patient survival, 65.9% of patients who received a first lung transplant from a deceased donor survived at least five years.

## Pancreas

- There were 59 pancreatic transplants performed in 2013. Of these, 44 were simultaneous kidney–pancreas transplants.
- A total of 177 Canadians were waiting for a pancreas transplant.
- For the latest available data of unadjusted five-year graft survival, 86.7% of simultaneous kidney–pancreas transplants survived at least five years.

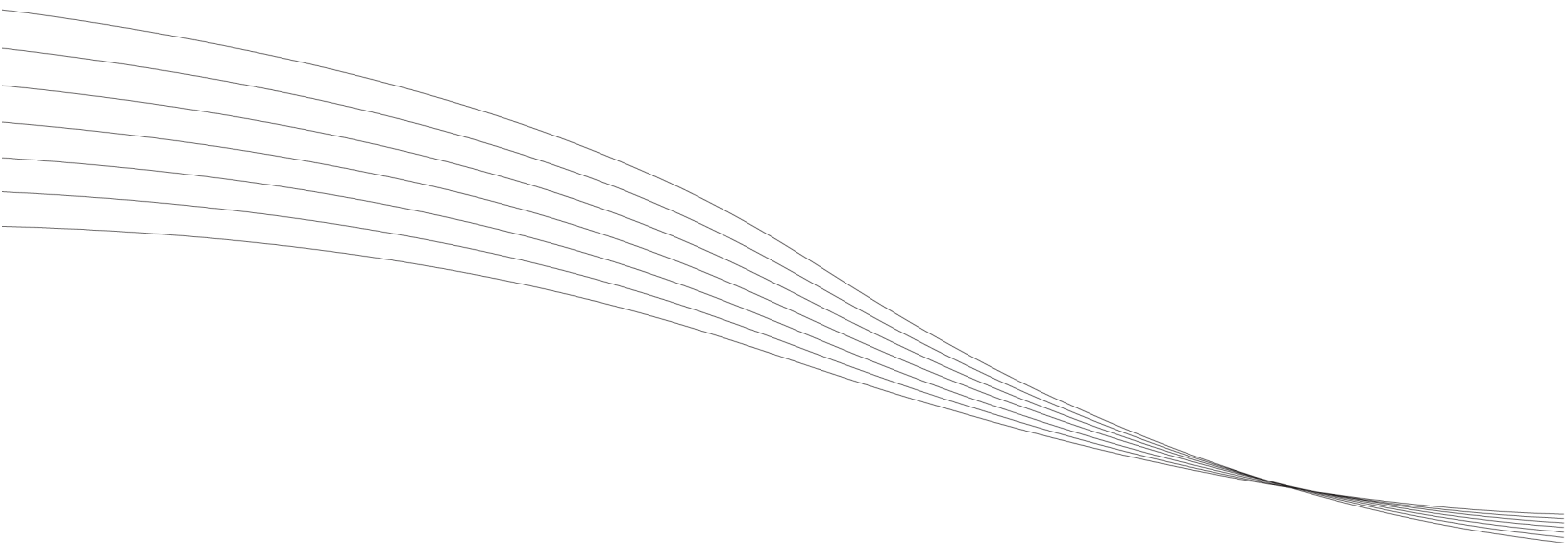
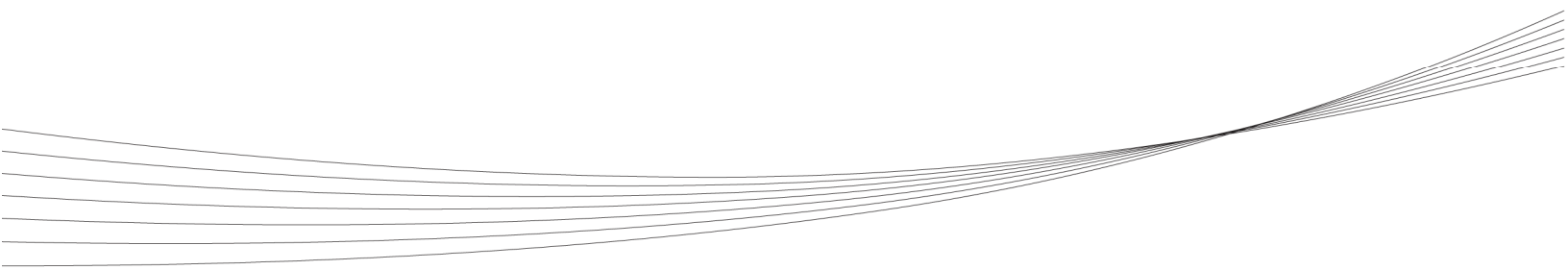
## Small Intestine

- 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 1994 and 2013, there were 56 such procedures performed in Canada, with more than half (57%) of the recipients younger than age 18.

End-stage organ failure presents complex issues and challenges for Canadian patients, clinicians and the health care system. 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. It is the intent of this report to provide information that may help to improve the health of Canadians with end-stage organ failure.

In addition to this annual summary report, 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 this report or would like further information, please write to CORR at [corr@cihi.ca](mailto:corr@cihi.ca).





# Chapter 1—Introduction





# 1 Introduction

The Canadian Organ Replacement Register (CORR) is a pan-Canadian information system for organ failure in Canada. The current mission of CORR is to provide pan-Canadian information on vital organ replacement therapy in Canada, with the goal of enhancing treatment, research and patient care. The CORR Inc. Board of Directors is responsible for providing strategic advice to the register (for a membership list of the Board of Directors as of December 1, 2014, see Appendix A). The Canadian Institute for Health Information (CIHI) manages CORR operations, data and reporting.

In various forms, there has been a Canadian register of renal failure statistics since the early 1970s. The first renal failure registry in Canada started in 1972 under the leadership of Dr. Arthur Shimizu. In 1973, the registry transferred to Statistics Canada, with the collaboration of the Kidney Foundation of Canada. Its first report was produced in 1974. After the first annual report in 1974, the Canadian Renal Failure Register, as it was then called, developed more detailed annual reports of dialysis and kidney transplantation activity. The operation of the project faltered briefly in the late 1970s but was reinstated in 1980 under a new partnership formed among the Kidney Foundation of Canada, Health Canada and Statistics Canada, with guidance from the Canadian Society of Nephrology.

In 1987, the register was expanded to include data on extra-renal organ transplants. In 1995, responsibility for CORR transferred to CIHI, which maintains numerous health system–related pan-Canadian data holdings. Current and historical CORR data and reports are available from CIHI.

## 1.1 Data Sources

CORR collects data from hospital dialysis programs, regional transplant programs, organ procurement organizations (OPOs) and kidney dialysis services offered at independent health facilities. For a list of the facilities reporting to CORR, please refer to Appendix B. Data within the database is collected and reported on a calendar-year basis (January 1 to December 31), as is the practice in other international registries reporting on end-stage organ failure. This allows for reporting of international comparisons.

Patients are tracked from their first treatment for end-stage organ failure (dialysis or transplantation) to their death, unless they become lost to follow-up. Only treatments provided in Canada are included in this report. For the purposes of recording continuity of care, however, CORR does capture out-of-country transfers when informed by reporting facilities.

At present, CORR does not receive individual patient data for those wait-listed for transplant. Aggregate counts of patients waiting for solid organ transplants are provided on a semi-annual basis by the eight OPOs responsible for maintaining wait lists. The OPOs that contribute wait-list counts are BC Transplant, Southern Alberta Organ and Tissue Donation Program (Calgary), HOPE Edmonton, the Saskatchewan Transplant Program (Saskatoon and Regina), Transplant Manitoba—Gift of Life, the Trillium Gift of Life Network (Ontario), Transplant Québec and the Nova Scotia Multi-Organ Transplant Program (for the Atlantic region). A complete list of the OPOs is provided in Appendix C.

Annual population estimates used for calculating age- and province-specific rates were obtained from Statistics Canada.

## 1.2 Under-Reporting Across Canada

A summary of all known under-reporting issues is presented in the Data Completeness table below. Under-reporting is summarized by province, year and type of data.

Since 2011, Quebec has had increased under-reporting due to administrative issues. CIHI is working with Quebec sites to improve reporting for future years.

In 2013, Quebec dialysis data was 40% complete, with an estimated 600 incident records missing. Transplant data was 89% complete. Missing records for donor, waiting list and waiting list deaths were supplemented by aggregate data from Transplant Québec.

Also in 2013, there was missing dialysis data from Manitoba, New Brunswick and, to a very minor extent, Ontario. Manitoba, New Brunswick and Ontario incident dialysis records were 41%, 41% and 99% complete, respectively.

### Data Completeness

	2011	2012	2013
<b>Dialysis*</b>	<p><u>Quebec</u>:* Approximately 84% complete Missing an estimated 170 incident cases Missing an undetermined number of death reports</p>	<p><u>Quebec</u>:* Approximately 49% complete Missing an estimated 560 incident cases Missing an undetermined number of death reports</p>	<p><u>Quebec</u>:* Approximately 40% complete Missing an estimated 600 incident cases Missing an undetermined number of death reports</p> <p><u>Manitoba</u>: Approximately 41% complete Missing an estimated 160 incident cases</p> <p><u>New Brunswick</u>: Approximately 41% complete Missing an estimated 63 incident cases</p>

(cont'd on next page)



	2011	2012	2013
<b>Dialysis* (cont'd)</b>			<u>Ontario:</u> Approximately 99% complete Missing an estimated 28 incident cases
<b>Transplants</b>	No known missing records	<u>Quebec:</u> 95% complete Missing 21 kidney transplants, 3 lung transplants Complete data on heart, liver and pancreas transplants	<u>Quebec:</u> 89% complete Missing 58 kidney transplants, 5 kidney–pancreas transplants, 1 pancreas-only transplant Complete data on heart, liver and lung transplants
<b>Living Donors</b>	No known missing records	<u>Quebec:</u> Totals are supplemented with aggregate data of 10 donors from Transplant Québec	<u>Quebec:</u> Totals are supplemented with aggregate data of 15 donors from Transplant Québec
<b>Deceased Donors</b>	No known missing records	<u>Quebec:</u> Results are supplemented with aggregate data of 120 donors from Transplant Québec	<u>Quebec:</u> Results are supplemented with aggregate data of 165 donors from Transplant Québec
<b>Waiting List</b>	No known missing records	<u>Quebec:</u> Results are supplemented with aggregate data from Transplant Québec: 923 kidney, 118 liver, 60 heart, 109 lung, 31 pancreas/kidney–pancreas	<u>Quebec:</u> Results are supplemented with aggregate data from Transplant Québec: 782 kidney, 100 liver, 46 heart, 88 lung, 26 pancreas/kidney–pancreas
<b>Waiting List Deaths</b>	No known missing records	<u>Quebec:</u> Totals are supplemented with aggregate data from Transplant Québec: 24 kidney, 19 liver, 4 heart, 22 lung	<u>Quebec:</u> Totals are supplemented with aggregate data from Transplant Québec: 19 kidney, 7 liver, 7 heart, 7 lung

**Note**

\* The estimate of missing incident cases assumes approximately 1,100 incident cases in Quebec annually.

Missing incident dialysis data affects the prevalence data in these provinces and Canada overall. For Quebec, totals for transplant and organ donor activity are also affected. As a result, trends must be interpreted with care.

The impact of the missing Quebec data is most apparent on dialysis incident counts and rates. The impact on overall prevalence counts and rates is difficult to determine, since the undercounts of both Quebec incident cases and deaths partially offset each other. Prevalence reflects the number of persons living with a condition at a specific point in time. The under-reporting of incident cases in Quebec and the unreported number of deaths from Quebec have offsetting effects, resulting in an undetermined true impact on prevalence.

To the extent possible, the numbers reported in selected tables are supplemented with aggregate data obtained from Transplant Québec (as indicated in the Data Completeness table above). Readers should interpret results supplemented with aggregate data with caution because this data is not subject to the same CORR-specific quality control checks as data submitted directly to CORR. For the remainder of the report, no additional adjustments were made to account for the missing data. Notes have been added, where appropriate, to indicate incomplete data.

### 1.3 Data Quality

Ensuring data quality is an ongoing CORR activity. This includes the annual evaluation of the database against CIHI's Data Quality Framework and the subsequent production of a data quality report, *Data Quality Documentation for Users: Canadian Organ Replacement Register, 2004–2013 Data*.

With the exception of the problems identified in Section 1.2, there are no known coverage issues for 2013 CORR data. The program area is aware of all hospitals that should report to CORR. While completeness has improved over time, the proportion of records with unknown values continues to exceed 10% for selected data fields. In 2013, primary diagnosis was missing or unknown in 13% of incident dialysis patients, and cause of graft failure was missing or unknown in nearly half of transplant recipient records. Users should consider this when interpreting trends.

CORR is a longitudinal database that monitors patient treatment changes over time. It is therefore important to note that all data presented in this report is subject to change based on future data submissions or corrections. Analytical conventions used in this report may vary from previously published reports. Discrepancies from previously published reports may reflect database updates and/or differences in analytical approaches.

Please see *Data Quality Documentation for Users: Canadian Organ Replacement Register, 2004–2013 Data* for further detail regarding the completeness and coverage of reporting in CORR.

### 1.4 Organization of the Report

This report summarizes information on end-stage organ failure treatments in Canada. Chapters 2 to 8 report on the following topics:

- Renal replacement therapy for ESKD patients (dialysis and kidney transplant)
- Liver transplantation
- Heart transplantation
- Lung transplantation
- Pancreas transplantation
- Intestinal transplantation
- Donors

Appendix A provides a list of members of the CORR Inc. Board of Directors.

Appendix B provides information on Canadian transplant programs, including which solid organ transplants they perform; it also lists the Canadian hospitals and independent health care facilities that provide dialysis treatment in Canada.

The OPOs that provide organ donation statistics to CORR are listed in Appendix C.

A glossary of the terms used in this report is provided in Appendix D.

Analytical methods used in this report, as well as population figures used for Canada, are provided in Appendix E.

A list of the primary diagnosis codes captured by CORR can be found in Appendix F.

## 1.5 Provincial Data

Throughout this report, province-level data is presented. Users should note the distinction between province of treatment, which generally reflects service availability, and province of patient residence. In general, dialysis patients from Yukon are managed in British Columbia; those in the Northwest Territories and Nunavut are managed in Alberta; and Prince Edward Island patients are managed in Nova Scotia.

## 1.6 Small Cell Sizes

Due to the nature of the material reported by CORR, there are instances when cells with fewer than five observations are reported. Published small cells are reviewed with CIHI statisticians to minimize the risk of re-identification.

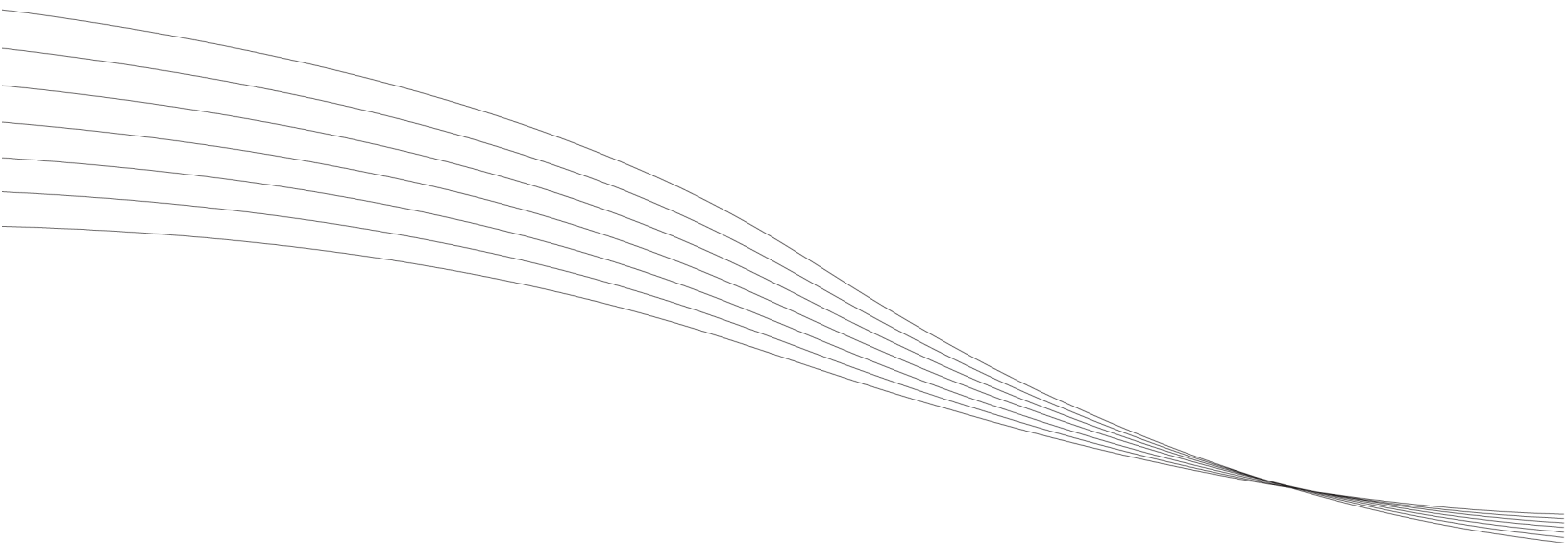
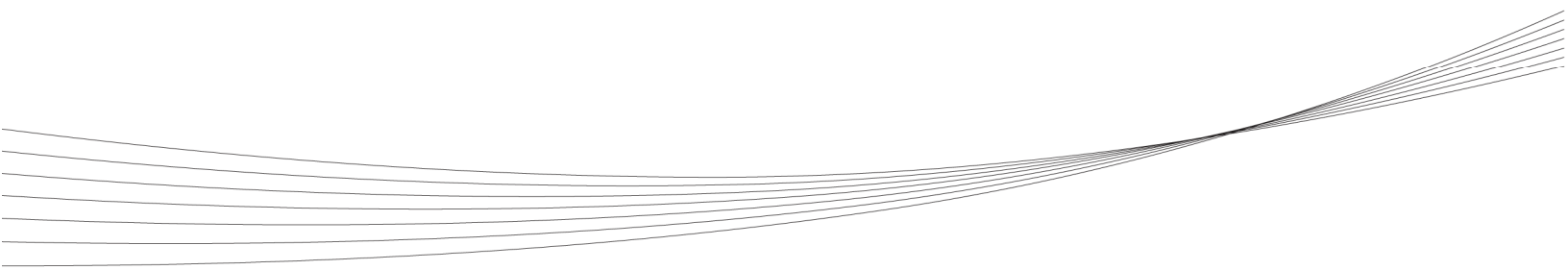
## 1.7 Age Group Reporting

Throughout the report, data is presented by age group. The choice of age groups is not always consistent and may be influenced by therapeutic interest (e.g., activity levels or pediatric versus adult) or analytical limitations; age groups may also be chosen to facilitate international comparisons (e.g., incidence and prevalence rates). As used in this report, pediatric patients are those patients younger than age 18.

## 1.8 Additional Information

In addition to this annual summary report, 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 data provided by the OPOs entitled *e-Statistics on Organ Transplants, Waiting Lists and Donors*. These e-Statistics reports provide the latest summary statistics on transplant, donor and waiting list data, including the number of patients who died while waiting for a vital organ transplant.

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





## Chapter 2—Renal Replacement Therapy for End-Stage Kidney Disease



## 2 Renal Replacement Therapy for End-Stage Kidney Disease

This section presents trends about end-stage kidney disease (ESKD) patients who are newly diagnosed each year (incidence), as well as the total number of patients being treated for ESKD in Canada at a given point in time (prevalence). Renal replacement therapy (RRT) encompasses those being treated for kidney failure with dialysis or with functioning transplants. The section includes ESKD patient characteristics, such as age at initiation of treatment, most responsible diagnoses for renal failure and modality of initial treatment. The intent of the information is to support the various programs providing care to ESKD patients in Canada and to help inform decision-making at clinical, facility and health system policy levels.

### 2.1 Incident ESKD RRT Patients

An *incident patient* refers to a new case within the population with a defined disease that requires treatment. In the case of CORR, these are patients with ESKD who began RRT (either dialysis or kidney transplantation) for the first time during the calendar year. Incidence is usually presented as a rate per million population (RPMP), or the relative proportion of people in the population who are newly diagnosed. The trends in incident ESKD patients in Canada are presented by age groups over time in the figures and tables below.

There were 5,333 newly diagnosed patients with ESKD reported to CORR in 2013, an increase of nearly three-quarters over the number reported in 1994 (Table 1).

In 2013, more than half (53%) of incident patients were age 65 and older, and an additional 35% were age 45 to 64.

Provincially, in 2013, the highest incidence RPMP occurred in Ontario (206.6) (Table 2).

The highest RPMP of newly diagnosed ESKD continued to be among those age 75 and older (Figure 1). This age group also had the largest rate increase over the reporting period, a trend that began in the 1980s and continued until 2001, when the incident RPMP reached 771.8. From 1994 until 2001, the rate of incidence among patients age 75 and older increased 1.6 times. Starting in 2005, incidence rates among older age groups slowly declined. Incidence rates among those patients age 45 to 64 increased from 186.3 in 1994 to a peak of 217.3 in 2000. Since 1997, the incidence rates in this age group have remained relatively stable and declined in recent years. Over the 20-year period considered, incidence rates among those younger than age 45 remained relatively unchanged.

At the end of 2013, 77% of all new patients initiated treatment on hemodialysis (HD),<sup>vi</sup> a level that has remained virtually unchanged since 2004 (Table 3). While HD was consistently utilized as the primary modality of treatment, the number of new patients receiving peritoneal dialysis (PD)<sup>vii</sup> as an initial treatment also remained consistent through the time period. The use of pre-emptive transplants increased over time, from 130 in 2004 to 206 in 2013.

Age of incidence also influences the initial treatment (Table 4). In 2013, 64% of incidence patients age 20 to 44 started with hemodialysis, while among those age 65 and older, the proportion was 83%. Pre-emptive transplant as an initial treatment was highest among younger age groups and declined with patient age.

When dialysis was used to treat incident patients in 2013, all provinces used HD the majority of the time, with Newfoundland and Labrador having the highest proportion of HD (91%). The highest proportion of patients treated by continuous ambulatory peritoneal dialysis (CAPD) was observed in New Brunswick (26%) (Table 5).

Incidence rates by primary diagnosis are presented in Table 6. Diabetes continued to be the most frequently reported primary cause of ESKD, accounting for 36% of incident patients in Canada.

A patient who starts dialysis less than 90 days after first seeing a nephrologist is considered a late referral patient. This characteristic is considered a measure of how well the early stages of kidney disease are managed. An earlier referral allows for better management of the disease and may influence patient survival. In 2013, 27% of incident patients were late referrals, down from 36% in 2004 (Table 7). This improvement can be seen in nearly all provinces. Table 8 presents late referral status by primary diagnosis. In 2004, 37% of patients with a primary diagnosis of diabetes were late referrals, while in 2013 only 16% were considered late referrals.

Table 9 presents selected characteristics of HD and PD patients. In 2013, the average age of incident HD patients was 65, and the average age of PD patients was 61. Patients 65 and older accounted for 58% of incident HD patients, while males accounted for 63%.

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vi. Hemodialysis works by circulating the blood through special filters outside the body. The blood flows across a filter, along with solutions that help remove toxins. In general, this form of dialysis is performed in a health care facility.

vii. Peritoneal dialysis filters waste using a peritoneal membrane inside the abdomen. The abdomen is filled with special solutions that help remove toxins. The solutions remain in the abdomen for a time and are then drained out. There are two types of peritoneal dialysis—continuous ambulatory peritoneal dialysis and automated peritoneal dialysis. This form of dialysis can be performed at home.



**Table 1: Incident End-Stage Kidney Disease Patients by Age Group, Canada, 1994 to 2013  
(Number, Rate per Million Population, Percentage of Total)**

	Age 0–19			Age 20–44			Age 45–64			Age 65–74			Age 75+			Total	
	N	RPMP	%	N	RPMP	%	N	RPMP	%	N	RPMP	%	N	RPMP	%	N	RPMP
<b>1994</b>	69	8.7	2.2	628	53.8	20.2	1,112	186.3	35.8	880	430.5	28.3	419	300.6	13.5	<b>3,108</b>	<b>107.2</b>
<b>1995</b>	98	12.3	3.0	633	54.1	19.2	1,117	181.8	33.9	940	454.4	28.5	508	352.6	15.4	<b>3,296</b>	<b>112.5</b>
<b>1996</b>	69	8.6	2.0	638	54.5	18.0	1,238	195.9	34.9	1,003	480.2	28.3	596	399.9	16.8	<b>3,544</b>	<b>119.7</b>
<b>1997</b>	90	11.2	2.3	695	59.2	17.6	1,315	202.1	33.2	1,144	542.5	28.9	714	461.9	18.0	<b>3,958</b>	<b>132.3</b>
<b>1998</b>	86	10.7	2.0	685	58.5	16.2	1,416	211.0	33.5	1,198	563.2	28.3	848	530.9	20.0	<b>4,233</b>	<b>140.4</b>
<b>1999</b>	90	11.3	2.0	716	61.2	15.7	1,483	213.9	32.6	1,251	585.8	27.5	1,008	610.5	22.2	<b>4,548</b>	<b>149.6</b>
<b>2000</b>	103	12.9	2.2	676	57.8	14.2	1,556	217.1	32.7	1,296	603.9	27.3	1,122	657.4	23.6	<b>4,753</b>	<b>154.9</b>
<b>2001</b>	103	12.9	2.1	603	51.5	12.0	1,588	214.3	31.7	1,356	627.5	27.1	1,359	771.3	27.1	<b>5,009</b>	<b>161.5</b>
<b>2002</b>	86	10.8	1.7	631	53.7	12.5	1,564	203.8	31.1	1,373	631.3	27.3	1,380	759.0	27.4	<b>5,034</b>	<b>160.5</b>
<b>2003</b>	85	10.8	1.7	593	50.5	11.6	1,669	210.3	32.6	1,390	634.6	27.2	1,378	734.6	26.9	<b>5,115</b>	<b>161.6</b>
<b>2004</b>	74	9.4	1.4	626	53.2	12.0	1,729	211.0	33.2	1,342	606.4	25.8	1,436	744.8	27.6	<b>5,207</b>	<b>163.0</b>
<b>2005</b>	98	12.5	1.9	608	51.6	11.5	1,682	199.1	31.8	1,399	625.6	26.5	1,502	758.0	28.4	<b>5,289</b>	<b>163.9</b>
<b>2006</b>	85	10.9	1.6	636	54.0	11.8	1,793	205.8	33.1	1,367	601.4	25.3	1,531	750.1	28.3	<b>5,412</b>	<b>165.9</b>
<b>2007</b>	74	9.4	1.3	645	55.4	11.7	1,833	203.9	33.2	1,408	603.8	25.5	1,554	739.5	28.2	<b>5,514</b>	<b>167.4</b>
<b>2008</b>	80	10.2	1.5	632	54.2	11.5	1,856	200.9	33.7	1,387	577.2	25.2	1,551	720.1	28.2	<b>5,506</b>	<b>165.2</b>
<b>2009</b>	81	10.3	1.4	588	50.2	10.4	1,950	205.9	34.6	1,402	563.5	24.9	1,620	736.5	28.7	<b>5,641</b>	<b>167.2</b>
<b>2010</b>	73	9.3	1.3	612	52.0	10.7	1,980	204.8	34.7	1,413	548.7	24.8	1,626	722.6	28.5	<b>5,704</b>	<b>167.1</b>
<b>2011*</b>	60	7.7	1.1	634	53.5	11.3	1,928	196.5	34.4	1,411	527.1	25.2	1,575	685.9	28.1	<b>5,608</b>	<b>162.6</b>
<b>2012*</b>	84	10.7	1.5	572	47.7	10.4	1,939	196.3	35.4	1,376	485.2	25.1	1,510	642.3	27.6	<b>5,481</b>	<b>157.1</b>
<b>2013*</b>	62	7.9	1.2	576	48.0	10.8	1,844	185.6	34.6	1,348	448.8	25.3	1,503	632.5	28.2	<b>5,333</b>	<b>151.7</b>

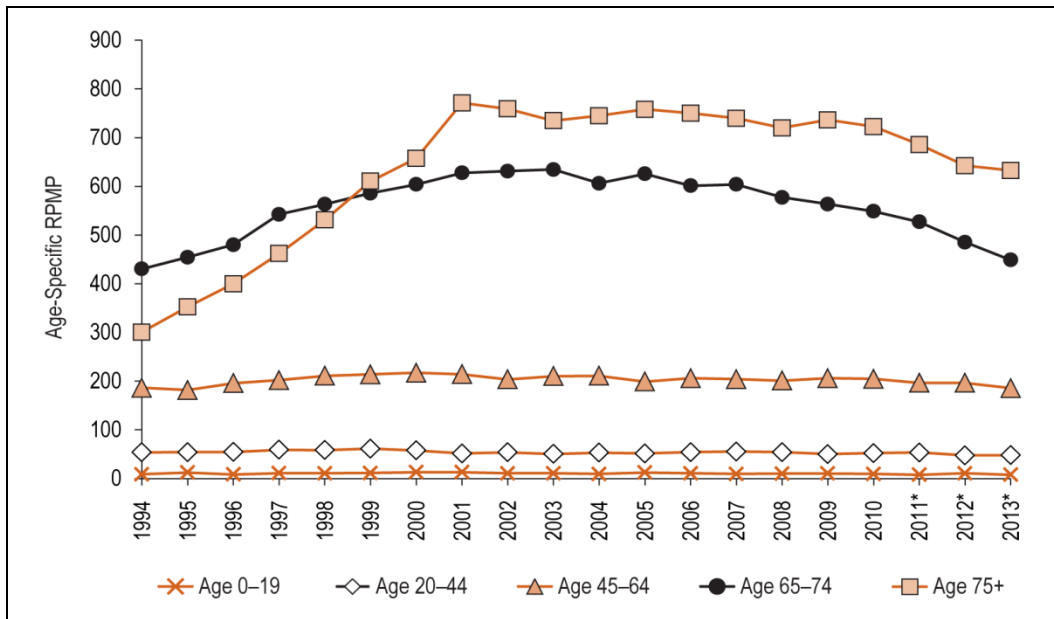
**Note**

\* For a summary of under-reporting by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

Figure 1: Incident End-Stage Kidney Disease Patients, Age-Specific Rate per Million Population, Canada, 1994 to 2013\*



**Note**

\* For a summary of under-reporting by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 2: Incident End-Stage Kidney Disease Patients by Province/Territory, Canada, 2004 to 2013  
(Number, Rate per Million Population)**

		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>B.C./Y.T.</b>	N	669	636	700	718	697	762	749	777	884	912
	RPMP	158.2	148.4	161.2	165.4	157.8	169.8	164.1	168.6	189.8	197.5
<b>Alta./ N.W.T./Nun.</b>	N	462	530	483	524	481	527	490	506	530	564
	RPMP	141.1	159.2	140.1	146.0	131.0	140.0	129.0	131.2	134.2	137.4
<b>Sask.</b>	N	191	171	183	195	177	200	158	174	214	181
	RPMP	191.9	172.0	185.7	195.0	174.6	194.2	151.3	164.5	198.2	163.3
<b>Man.*</b>	N	230	234	297	251	284	283	299	264	288	123
	RPMP	196.5	198.7	252.2	210.2	235.5	231.6	242.2	211.1	227.3	97.2
<b>Ont.*</b>	N	2,211	2,269	2,309	2,363	2,288	2,362	2,495	2,521	2,505	2,797
	RPMP	178.4	180.9	182.0	184.7	176.9	180.7	188.6	188.5	185.5	206.6
<b>Que.*</b>	N	1,014	1,046	1,052	1,064	1,101	1,064	1,049	929	639	443
	RPMP	134.4	137.7	137.5	138.4	142.0	135.9	132.7	116.4	79.3	54.3
<b>N.B.*</b>	N	158	123	141	112	148	130	134	123	134	43
	RPMP	210.3	163.6	188.2	150.2	198.1	173.5	178.0	162.8	177.3	56.9
<b>N.S./ P.E.I.</b>	N	157	187	166	199	224	188	200	174	178	166
	RPMP	146.1	173.8	154.7	185.3	208.2	174.2	183.8	159.4	162.6	152.9
<b>N.L.</b>	N	115	93	81	88	106	125	130	140	109	104
	RPMP	222.4	180.2	158.9	173.7	209.3	245.6	254.3	274.2	212.6	197.5
<b>Canada</b>	<b>N</b>	<b>5,207</b>	<b>5,289</b>	<b>5,412</b>	<b>5,514</b>	<b>5,506</b>	<b>5,641</b>	<b>5,704</b>	<b>5,608</b>	<b>5,481</b>	<b>5,333</b>
	<b>RPMP</b>	<b>163.0</b>	<b>163.9</b>	<b>165.9</b>	<b>167.4</b>	<b>165.2</b>	<b>167.2</b>	<b>167.1</b>	<b>162.6</b>	<b>157.1</b>	<b>151.7</b>

**Note**

\* For a summary of under-reporting by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 3: Incident End-Stage Kidney Disease Patients by Initial Treatment, Canada, 2004 to 2013  
(Number, Rate per Million Population, Percentage of Total)**

Initial Treatment		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>HD Home</b>	N	9	3	19	17	24	26	21	25	22	32
	RPMP	0.3	0.1	0.6	0.5	0.7	0.8	0.6	0.7	0.6	0.9
	%	0.2	0.1	0.4	0.3	0.4	0.5	0.4	0.5	0.4	0.6
<b>HD Institutional</b>	N	4,084	4,146	4,298	4,362	4,313	4,396	4,511	4,460	4,294	4,058
	RPMP	127.8	128.5	131.7	132.5	129.4	130.3	132.2	129.3	123.1	115.4
	%	78.4	78.4	79.4	79.1	78.3	77.9	79.1	79.5	78.3	76.1
<b>CAPD</b>	N	731	707	661	685	704	776	684	688	666	668
	RPMP	22.9	21.9	20.3	20.8	21.1	23.0	20.0	20.0	19.1	19.0
	%	14.0	13.4	12.2	12.4	12.8	13.8	12.0	12.3	12.2	12.5
<b>APD</b>	N	253	272	271	272	297	260	299	243	316	369
	RPMP	7.9	8.4	8.3	8.3	8.9	7.7	8.8	7.0	9.1	10.5
	%	4.9	5.1	5.0	4.9	5.4	4.6	5.2	4.3	5.8	6.9
<b>Pre-Emptive</b>	N	130	161	163	178	168	183	189	192	183	206
	RPMP	4.1	5.0	5.0	5.4	5.0	5.4	5.5	5.6	5.2	5.9
	%	2.5	3.0	3.0	3.2	3.1	3.2	3.3	3.4	3.3	3.9
<b>Total</b>	<b>N</b>	<b>5,207</b>	<b>5,289</b>	<b>5,412</b>	<b>5,514</b>	<b>5,506</b>	<b>5,641</b>	<b>5,704</b>	<b>5,608</b>	<b>5,481</b>	<b>5,333</b>
	<b>RPMP</b>	<b>163.0</b>	<b>163.9</b>	<b>165.9</b>	<b>167.4</b>	<b>165.2</b>	<b>167.2</b>	<b>167.1</b>	<b>162.6</b>	<b>157.1</b>	<b>151.7</b>

**Notes**

\* For a summary of under-reporting by province and year, see Section 1.2.

HD: Hemodialysis; CAPD: Continuous ambulatory peritoneal dialysis; APD: Automated peritoneal dialysis; Pre-Emptive: Pre-emptive kidney transplant.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 4: Incident End-Stage Kidney Disease Patients by Year, Age Group and Initial Treatment Modality, Canada, 2004 to 2013 (Number)**

Age Group	Initial Modality	2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
		N = 5,207	N = 5,289	N = 5,412	N = 5,514	N = 5,506	N = 5,641	N = 5,704	N = 5,608	N = 5,481	N = 5,333
0–19	HD	33	45	59	39	35	51	38	26	35	26
	PD	29	33	15	15	33	21	19	14	18	12
	Pre-Emptive	12	20	11	20	12	9	16	20	31	24
20–44	HD	416	433	440	441	431	406	421	436	407	366
	PD	155	134	145	134	146	121	136	141	115	147
	Pre-Emptive	55	41	51	70	55	61	55	57	50	63
45–64	HD	1,287	1,225	1,340	1,381	1,381	1,427	1,495	1,452	1,443	1,339
	PD	392	366	368	377	389	428	381	379	406	411
	Pre-Emptive	50	91	85	75	86	95	104	97	90	94
65–74	HD	1,118	1,140	1,122	1,166	1,124	1,133	1,165	1,186	1,133	1,081
	PD	212	250	231	230	248	251	234	208	233	244
	Pre-Emptive	12	9	14	12	15	18	14	17	10	23
75+	HD	1,239	1,306	1,356	1,352	1,366	1,405	1,413	1,385	1,298	1,278
	PD	196	196	173	201	185	215	213	189	210	223
	Pre-Emptive	1	0	2	1	0	0	0	1	2	2
Total	HD	4,093	4,149	4,317	4,379	4,337	4,422	4,532	4,485	4,316	4,090
	PD	984	979	932	957	1,001	1,036	983	931	982	1,037
	Pre-Emptive	130	161	163	178	168	183	189	192	183	206

**Notes**

\* For a summary of under-reporting by province and year, see Section 1.2.

HD: Hemodialysis; PD: Peritoneal dialysis; Pre-emptive: Pre-emptive kidney transplant.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 5: Incident Patients by Initial Treatment and Province/Territory, Canada, 2013  
(Number, Percentage of Total)**

Initial Treatment		Province/Territory									Canada
		B.C./ Y.T.	Alta./ N.W.T./ Nun.	Sask.	Man.*	Ont.*	Que.*	N.B.*	N.S./ P.E.I.	N.L.	
<b>HD</b>	N	649	442	138	87	2,174	345	31	131	93	<b>4,090</b>
	%	71.5	77.8	76.2	70.7	77.8	77.5	72.1	78.4	91.2	<b>77.0</b>
<b>CAPD</b>	N	153	98	41	25	267	41	11	23	9	<b>668</b>
	%	16.9	17.3	22.7	20.3	9.5	9.2	25.6	13.8	8.8	<b>13.0</b>
<b>APD</b>	N	63	8	1	2	287	5	1	2	0	<b>369</b>
	%	6.9	1.4	0.6	1.6	10.3	1.1	2.3	1.2	0	<b>7.0</b>
<b>Pre-Emptive</b>	N	43	20	1	9	68	54	0	11	0	<b>206</b>
	%	4.7	3.5	0.6	7.3	2.4	12.1	0	6.6	0	<b>4.0</b>
<b>Total</b>	<b>N</b>	<b>908</b>	<b>568</b>	<b>181</b>	<b>123</b>	<b>2,796</b>	<b>445</b>	<b>43</b>	<b>167</b>	<b>102</b>	<b>5,333</b>

**Notes**

\* For a summary of under-reporting by province and year, see Section 1.2.

HD: Hemodialysis; CAPD: Continuous ambulatory peritoneal dialysis; APD: Automated peritoneal dialysis; Pre-emptive: Pre-emptive kidney transplant.

Percentages may not add up to 100 because of rounding.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 6: Incident End-Stage Kidney Disease Patients by Primary Diagnosis, Canada, 2004 to 2013  
(Number, Rate per Million Population)**

Diagnosis		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>Glomerulonephritis</b>	N	679	595	617	615	598	625	616	615	594	566
	RPMP	21.3	18.4	18.9	18.7	17.9	18.5	18.1	17.8	17.0	16.1
	%	13.0	11.3	11.4	11.2	10.9	11.1	10.8	11.0	10.8	10.6
<b>Diabetes</b>	N	1,799	1,845	1,857	1,921	1,936	1,938	2,030	2,002	2,120	1,915
	RPMP	56.3	57.2	56.9	58.3	58.1	57.4	59.5	58.1	60.8	54.5
	%	34.6	34.9	34.3	34.8	35.2	34.4	35.6	35.7	38.7	35.9
<b>Renal Vascular Disease</b>	N	954	1,023	1,060	991	1,014	1,079	1,045	927	830	785
	RPMP	29.9	31.7	32.5	30.1	30.4	32.0	30.6	26.9	23.8	22.3
	%	18.3	19.3	19.6	18.0	18.4	19.1	18.3	16.5	15.1	14.7
<b>Polycystic Kidney Disease</b>	N	222	269	258	233	219	205	235	220	227	226
	RPMP	6.9	8.3	7.9	7.1	6.6	6.1	6.9	6.4	6.5	6.4
	%	4.3	5.1	4.8	4.2	4.0	3.6	4.1	3.9	4.1	4.2
<b>Drug Induced</b>	N	93	103	91	124	108	113	120	106	97	99
	RPMP	2.9	3.2	2.8	3.8	3.2	3.3	3.5	3.1	2.8	2.8
	%	1.8	2.0	1.7	2.3	2.0	2.0	2.1	1.9	1.8	1.9
<b>Pyelonephritis</b>	N	229	197	189	214	197	196	184	235	127	114
	RPMP	7.2	6.1	5.8	6.5	5.9	5.8	5.4	6.8	3.6	3.2
	%	4.4	3.7	3.5	3.9	3.6	3.5	3.2	4.2	2.3	2.1
<b>Other<sup>†</sup></b>	N	519	576	618	563	667	664	709	815	658	907
	RPMP	16.2	17.8	18.9	17.1	20.0	19.7	20.8	23.6	18.9	25.8
	%	10.0	10.9	11.4	10.2	12.1	11.8	12.4	14.5	12.0	17.0
<b>Unknown/Not Reported</b>	N	712	681	722	853	767	821	765	688	828	721
	RPMP	22.3	21.1	22.1	25.9	23.0	24.3	22.4	20.0	23.7	20.5
	%	13.7	12.9	13.3	15.5	13.9	14.6	13.4	12.3	15.1	13.5

**Notes**

\* For a summary of under-reporting by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 7: Incident End-Stage Kidney Disease Patients With Late Referral Status,\* by Province/Territory and Canada, 2004 to 2013 (Percentage)**

Province	2004	2005	2006	2007	2008	2009	2010	2011 <sup>†</sup>	2012 <sup>†</sup>	2013 <sup>†</sup>
<b>B.C./Y.T.</b>	34.7	31.2	29.7	31.0	32.9	33.8	29.9	34.0	30.0	28.7
<b>Alta./N.W.T./Nun.</b>	40.1	34.1	39.0	30.5	32.9	31.4	30.3	27.4	27.2	28.0
<b>Sask.</b>	36.8	34.5	40.5	27.5	29.6	28.5	31.2	31.5	26.7	25.8
<b>Man.<sup>†</sup></b>	38.4	33.0	33.7	32.2	25.0	29.1	28.6	26.2	25.5	19.4
<b>Ont.<sup>†</sup></b>	35.8	35.9	33.3	31.6	31.9	31.6	29.7	29.4	24.7	27.5
<b>Que.<sup>†</sup></b>	37.8	33.1	33.3	32.7	29.2	27.9	30.7	27.3	30.8	31.4
<b>N.B.<sup>†</sup></b>	31.3	37.5	39.4	38.5	32.0	34.4	34.4	32.2	28.2	35.0
<b>N.S./P.E.I.</b>	30.6	31.3	25.4	26.2	26.1	26.7	23.5	20.4	22.2	19.4
<b>N.L.</b>	36.1	29.4	22.1	25.0	30.1	26.2	26.2	27.0	27.6	16.8
<b>Canada</b>	<b>36.3</b>	<b>34.2</b>	<b>33.4</b>	<b>31.3</b>	<b>31.0</b>	<b>30.8</b>	<b>29.8</b>	<b>29.2</b>	<b>26.7</b>	<b>27.4</b>

**Notes**

\* Patients with a late referral status started dialysis less than 90 days after first seeing a nephrologist.

† For a summary of under-reporting by province and year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 8: Incident End-Stage Kidney Disease Patients With Late Referral Status,\* by Primary Diagnosis, Canada, 2004 to 2013 (Percentage)**

Diagnosis <sup>‡</sup>	2004	2005	2006	2007	2008	2009	2010	2011 <sup>†</sup>	2012 <sup>†</sup>	2013 <sup>†</sup>
<b>Glomerulonephritis</b>	32.5	30.9	30.0	27.6	24.7	26.8	25.0	28.8	24.5	23.7
<b>Diabetes</b>	27.6	25.9	25.4	23.2	22.0	22.8	21.9	19.4	16.5	16.5
<b>Renal Vascular Disease</b>	37.1	32.1	33.1	28.8	26.7	25.8	23.3	24.4	23.5	19.3
<b>Polycystic Kidney Disease</b>	15.3	11.0	9.4	8.7	8.5	8.8	11.1	8.5	12.7	6.3
<b>Drug Induced</b>	41.4	25.0	34.1	36.8	29.7	23.1	24.8	31.0	28.1	31.6
<b>Pyelonephritis</b>	39.5	36.0	30.4	30.9	38.5	36.2	36.6	36.8	38.8	29.8
<b>Other<sup>†</sup></b>	58.3	59.1	56.1	54.3	56.3	54.3	54.3	51.4	50.7	52.6
<b>Unknown/Not Reported</b>	50.3	53.5	48.0	47.1	48.1	48.4	47.9	43.3	42.3	44.8
<b>All Incident Patients</b>	<b>36.3</b>	<b>34.2</b>	<b>33.4</b>	<b>31.3</b>	<b>31.0</b>	<b>30.8</b>	<b>29.8</b>	<b>29.2</b>	<b>26.7</b>	<b>27.4</b>

**Notes**

\* Patients with a late referral status started dialysis less than 90 days after first seeing a nephrologist.

† For a summary of under-reporting by province and year, see Section 1.2.

‡ For a complete list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



Table 9: Adult Incident Dialysis Patients, Selected Characteristics, Canada, 2004 to 2013

		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*	
HD	Mean Age (Years)	65.0	65.2	65.1	65.0	65.3	65.4	65.4	65.3	65.1	65.5	
	Age 65+ (%)	57.9	59.4	57.9	57.8	57.8	57.9	57.2	57.5	56.6	57.9	
	Male (%)	59.6	60.2	59.6	62.0	60.8	59.8	61.0	62.3	63.3	63.2	
	Diabetes (%)	45.0	46.0	48.0	49.3	48.9	50.3	51.5	53.7	53.9	53.4	
	Mean Comorbidity Index <sup>†</sup>	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.3	2.1	2.1	
	Mean BMI	27.4	27.5	27.7	27.6	28.2	28.2	28.4	28.3	28.8	29.1	
	Mean eGFR <sup>‡</sup>	9.7	10.1	10.1	10.1	10.4	10.6	10.6	10.4	10.4	10.3	
	Late Referral (%) <sup>§</sup>	41.0	39.4	37.6	35.7	35.5	35.5	34.2	33.2	30.8	32.3	
	<b>Access Type (%)</b>											
	Catheter	73.2	73.3	74.5	76.2	78.9	79.5	77.1	80.8	80.7	79.6	
	AV Fistula	17.6	19.2	18.7	18.4	15.9	15.8	17.1	15.7	16.1	16.9	
	AV Graft	2.1	1.5	1.6	1.5	1.5	1.2	1.2	0.8	1.0	1.5	
	Unknown/Not Reported	7.1	6.0	5.2	3.9	3.6	3.5	4.5	2.7	2.2	1.9	
	PD	Mean Age (Years)	60.2	61.3	60.6	61.1	60.8	61.9	61.7	60.9	61.9	61.3
Age 65+ (%)		42.6	47.0	44.0	45.6	44.6	45.8	46.1	43.2	45.8	45.3	
Male (%)		56.8	60.2	55.0	58.4	57.3	57.8	59.6	60.2	60.5	60.9	
Diabetes (%)		43.4	45.1	43.2	43.8	42.9	44.5	47.0	45.4	51.9	50.0	
Mean Comorbidity Index <sup>†</sup>		1.3	1.4	1.2	1.3	1.1	1.1	1.3	1.2	1.2	1.1	
Mean BMI		26.5	26.8	27.2	27.1	27.5	28.0	27.5	27.3	27.9	27.5	
Mean eGFR <sup>‡</sup>		9.9	10.1	10.0	10.5	10.7	10.8	10.9	10.1	10.0	9.9	
Late Referral (%) <sup>§</sup>		15.8	11.4	12.1	11.3	10.4	10.1	8.6	9.1	6.7	7.4	

**Notes**

\* For a summary of under-reporting by province and year, see Section 1.2.

† The index assigns each of the 14 comorbid conditions collected in CORR a weight from 1 to 10. The possible range is from 0 to 32.

‡ Estimated glomerular filtration rate as determined by the Modification of Diet in Renal Disease (MDRD) formula (mL/min/1.73 m<sup>2</sup>).

§ Patients who first see a nephrologist less than 90 days before starting dialysis.

HD: Hemodialysis; PD: Peritoneal dialysis; BMI: Body mass index; Catheter: Central venous catheter; AV fistula: Arteriovenous fistula; AV graft: Arteriovenous graft.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

## 2.2 Prevalent ESKD RRT Patients

*Prevalence*, by definition, is the number of people or proportion of people in the entire population who are found with a defined disease at a specified point in time. For CORR, this is the number of patients who are alive and receiving RRT (dialysis or transplant) for ESKD on December 31 of a given year. Prevalence is usually presented as RPMP, or the relative proportion of people in the population living with the cited disease.

In this section, the trends in ESKD prevalent patients in Canada are presented over time in the following figures and tables.

As of December 31, 2013, there were 41,931 people in Canada being treated for ESKD, with 57.5% (24,114) on dialysis and 42.5% (17,817) living with a functioning kidney transplant (Table 10). Since 1994, the prevalence rate for patients being treated by dialysis has increased 123%, from 307.3 RPMP to 685.9 RPMP (Figure 2). During the same period, the prevalence rate of patients with functioning kidney transplants more than doubled, from 236.5 RPMP to 506.8 RPMP.

Table 11 provides prevalence rates by age. Over the 20-year period, prevalence rates increased in all age groups except among those age 0 to 19.

Prevalence rates in 2013 were highest in Newfoundland and Labrador and Manitoba (1,560.7 and 1,530.4 RPMP, respectively, Table 13).

In 2013, HD provided in an institutional setting was the most common form of RRT across the country (45%), followed by transplant (42%) (Table 14).

In 2013, in Nova Scotia/Prince Edward Island, Alberta/Northwest Territories/Nunavut, Quebec and British Columbia/Yukon, transplant was the leading treatment seen in prevalent patients with ESKD (55%, 48%, 46 and 45%, respectively) (Table 15). The percentage of patients with transplant as a treatment was lowest in Newfoundland and Labrador and Manitoba (34%).

Tables 16 and 17 examine prevalence rates by primary diagnosis. Between 2004 and 2013, the prevalence rate of patients with diabetes as a primary diagnosis increased by 36%. In 2013, diabetic nephropathy accounted for the largest proportion of all prevalent patients (27%), followed by patients with glomerulonephritis (22%).

Among prevalent patients in 2013 with a primary diagnosis of diabetes, 62% were being treated with HD and 26% had transplants (Table 18). Overall, patients with diabetic nephropathy accounted for 36% of HD patients. For patients with a primary diagnosis of glomerulonephritis, 61% had a functioning kidney transplant, representing 31% of all transplant patients.

Table 19 summarizes changes in prevalence by examining flows into and out of treatment.

**Table 10: Prevalence Rate for Patients on Dialysis or With a Functioning Transplant in Canada, 1994 to 2013 (Rate per Million Population, Percentage of Total)**

	Dialysis			Functioning Transplants			Total	
	Number	RPMP	%	Number	RPMP	%	Number	RPMP
<b>1994</b>	8,912	307.3	56.5	6,859	236.5	43.5	<b>15,771</b>	<b>543.8</b>
<b>1995</b>	9,674	330.1	56.9	7,318	249.7	43.1	<b>16,992</b>	<b>579.9</b>
<b>1996</b>	10,483	354.0	57.3	7,805	263.6	42.7	<b>18,288</b>	<b>617.6</b>
<b>1997</b>	11,676	390.4	58.6	8,258	276.1	41.4	<b>19,934</b>	<b>666.5</b>
<b>1998</b>	12,775	423.6	59.3	8,778	291.1	40.7	<b>21,553</b>	<b>714.7</b>
<b>1999</b>	13,888	456.8	59.8	9,333	307.0	40.2	<b>23,221</b>	<b>763.8</b>
<b>2000</b>	14,918	486.1	60.0	9,928	323.5	40.0	<b>24,846</b>	<b>809.6</b>
<b>2001</b>	16,011	516.1	60.4	10,491	338.2	39.6	<b>26,502</b>	<b>854.3</b>
<b>2002</b>	16,983	541.3	60.7	11,011	351.0	39.3	<b>27,994</b>	<b>892.3</b>
<b>2003</b>	17,906	565.6	60.8	11,554	364.9	39.2	<b>29,460</b>	<b>930.5</b>
<b>2004</b>	18,892	591.4	61.0	12,061	377.5	39.0	<b>30,953</b>	<b>968.9</b>
<b>2005</b>	19,791	613.3	61.1	12,610	390.8	38.9	<b>32,401</b>	<b>1,004.0</b>
<b>2006</b>	20,551	629.9	60.8	13,238	405.8	39.2	<b>33,789</b>	<b>1,035.7</b>
<b>2007</b>	21,171	642.9	60.3	13,951	423.6	39.7	<b>35,122</b>	<b>1,066.5</b>
<b>2008</b>	21,746	652.5	59.9	14,581	437.5	40.1	<b>36,327</b>	<b>1,090.0</b>
<b>2009</b>	22,512	667.2	59.6	15,230	451.4	40.4	<b>37,742</b>	<b>1,118.6</b>
<b>2010</b>	22,885	670.6	59.1	15,864	464.9	40.9	<b>38,749</b>	<b>1,135.5</b>
<b>2011*</b>	23,457	680.3	58.7	16,485	478.1	41.3	<b>39,942</b>	<b>1,158.3</b>
<b>2012*</b>	23,863	684.1	58.2	17,146	491.6	41.8	<b>41,009</b>	<b>1,175.7</b>
<b>2013*</b>	24,114	685.9	57.5	17,817	506.8	42.5	<b>41,931</b>	<b>1,192.6</b>

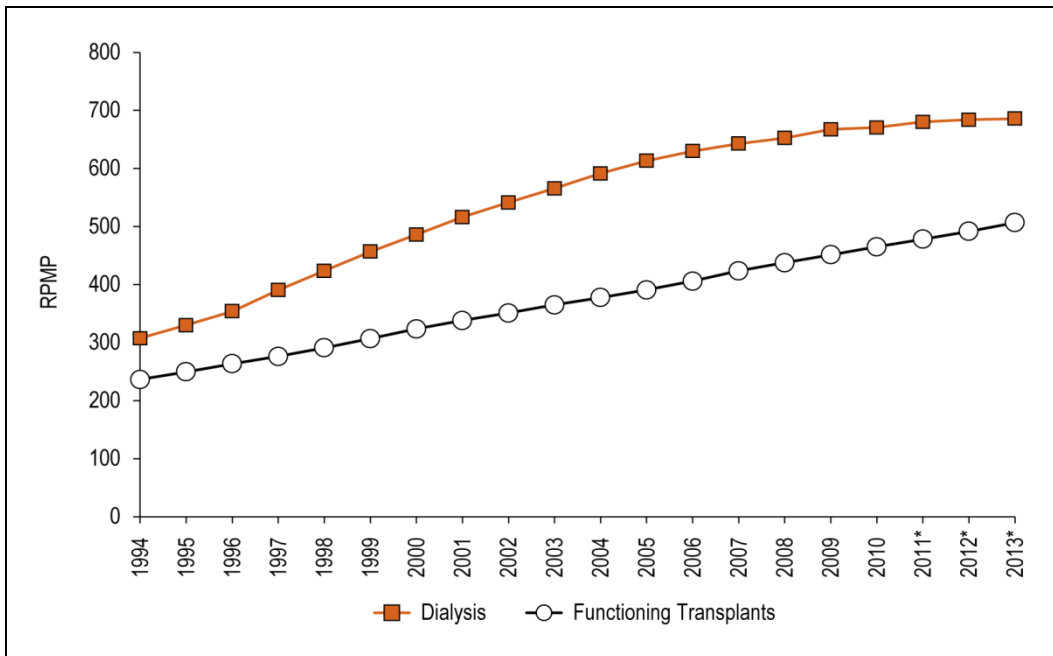
**Note**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

Figure 2: Prevalence Rate for Patients on Dialysis or With a Functioning Transplant in Canada, 1994 to 2013\* (Rate per Million Population)



**Note**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 11: Prevalent End-Stage Kidney Disease Patients by Age Group, Canada, 1994 to 2013  
(Number, Rate per Million Population)**

	Age 0–19		Age 20–44		Age 45–64		Age 65–74		Age 75+		Total	
	N	RPMP	N	RPMP	N	RPMP	N	RPMP	N	RPMP	N	RPMP
<b>1994</b>	475	60.0	5,086	435.5	6,047	1,012.9	2,896	1,416.7	1,267	908.8	<b>15,771</b>	<b>543.8</b>
<b>1995</b>	491	61.7	5,263	450.0	6,497	1,057.5	3,237	1,564.9	1,504	1,043.8	<b>16,992</b>	<b>579.9</b>
<b>1996</b>	486	60.8	5,414	462.1	7,114	1,125.8	3,506	1,678.7	1,768	1,186.2	<b>18,288</b>	<b>617.6</b>
<b>1997</b>	499	62.3	5,636	480.1	7,783	1,195.9	3,882	1,840.8	2,134	1,380.5	<b>19,934</b>	<b>666.5</b>
<b>1998</b>	524	65.4	5,844	499.0	8,422	1,255.1	4,232	1,989.7	2,531	1,584.4	<b>21,553</b>	<b>714.7</b>
<b>1999</b>	537	67.2	6,008	513.9	9,124	1,316.1	4,572	2,141.0	2,980	1,804.9	<b>23,221</b>	<b>763.8</b>
<b>2000</b>	561	70.3	6,122	523.8	9,846	1,373.5	4,916	2,290.5	3,401	1,992.7	<b>24,846</b>	<b>809.6</b>
<b>2001</b>	565	70.9	6,192	528.5	10,502	1,417.0	5,287	2,446.5	3,956	2,245.1	<b>26,502</b>	<b>854.3</b>
<b>2002</b>	564	70.9	6,272	533.7	11,079	1,443.5	5,577	2,564.2	4,502	2,476.0	<b>27,994</b>	<b>892.3</b>
<b>2003</b>	563	71.2	6,308	536.7	11,725	1,477.5	5,944	2,713.7	4,920	2,622.9	<b>29,460</b>	<b>930.5</b>
<b>2004</b>	553	70.4	6,306	536.3	12,446	1,519.2	6,241	2,820.3	5,407	2,804.3	<b>30,953</b>	<b>968.9</b>
<b>2005</b>	560	71.5	6,341	538.6	13,040	1,543.7	6,562	2,934.5	5,898	2,976.4	<b>32,401</b>	<b>1,004.0</b>
<b>2006</b>	556	71.1	6,377	541.3	13,707	1,573.2	6,823	3,001.7	6,326	3,099.2	<b>33,789</b>	<b>1,035.7</b>
<b>2007</b>	552	70.2	6,337	543.9	14,324	1,593.5	7,236	3,102.8	6,673	3,175.6	<b>35,122</b>	<b>1,066.5</b>
<b>2008</b>	544	69.2	6,365	545.5	14,938	1,617.3	7,479	3,112.3	7,001	3,250.5	<b>36,327</b>	<b>1,090.0</b>
<b>2009</b>	548	69.7	6,316	539.0	15,559	1,643.0	7,927	3,186.2	7,392	3,360.7	<b>37,742</b>	<b>1,118.6</b>
<b>2010</b>	538	68.5	6,294	534.4	16,095	1,664.5	8,250	3,203.8	7,572	3,364.9	<b>38,749</b>	<b>1,135.5</b>
<b>2011*</b>	504	64.3	6,323	533.3	16,505	1,682.2	8,707	3,252.5	7,903	3,441.5	<b>39,942</b>	<b>1,158.3</b>
<b>2012*</b>	493	63.0	6,324	527.4	16,835	1,704.6	9,140	3,223.1	8,217	3,495.1	<b>41,009</b>	<b>1,175.7</b>
<b>2013*</b>	474	60.4	6,307	526.0	17,068	1,717.8	9,558	3,182.4	8,524	3,587.2	<b>41,931</b>	<b>1,192.6</b>

**Note**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 12: Prevalent End-Stage Kidney Disease Patients by Age Group and Province/Territory, Canada, 2013 (Number, Percentage)**

Province/Territory		Age 0–19	Age 20–44	Age 45–64	Age 65–74	Age 75+	Total
<b>B.C./Y.T.</b>	N	61	821	2,279	1,347	1,139	<b>5,647</b>
	%	1.1	14.5	40.4	23.9	20.2	<b>100</b>
<b>Alta./N.W.T./Nun.</b>	N	69	826	1,898	832	624	<b>4,249</b>
	%	1.6	19.4	44.7	19.6	14.7	<b>100</b>
<b>Sask.</b>	N	7	258	568	247	216	<b>1,296</b>
	%	0.5	19.9	43.8	19.1	16.7	<b>100</b>
<b>Man.*</b>	N	36	355	853	419	273	<b>1,936</b>
	%	1.9	18.3	44.1	21.6	14.1	<b>100</b>
<b>Ont.*</b>	N	192	2,460	7,035	3,988	3,702	<b>17,377</b>
	%	1.1	14.2	40.5	22.9	21.3	<b>100</b>
<b>Que.*</b>	N	78	1,093	3,030	1,973	1,989	<b>8,163</b>
	%	1.0	13.4	37.1	24.2	24.4	<b>100</b>
<b>N.B.*</b>	N	0	126	361	209	178	<b>874</b>
	%	0	14.4	41.3	23.9	20.4	<b>100</b>
<b>N.S./P.E.I.</b>	N	30	246	687	354	250	<b>1,567</b>
	%	1.9	15.7	43.8	22.6	16.0	<b>100</b>
<b>N.L.</b>	N	1	122	357	189	153	<b>822</b>
	%	0.1	14.8	43.4	23.0	18.6	<b>100</b>
<b>Canada</b>	<b>N</b>	<b>474</b>	<b>6,307</b>	<b>17,068</b>	<b>9,558</b>	<b>8,524</b>	<b>41,931</b>
	<b>%</b>	<b>1.1</b>	<b>15.0</b>	<b>40.7</b>	<b>22.8</b>	<b>20.3</b>	<b>100</b>

**Note**

\* Reported values may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

Percentages may not add up to 100 because of rounding.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 13: Prevalent End-Stage Kidney Disease Patients by Province/Territory, Canada, 2004 to 2013 (Number, Rate per Million Population)**

Province/Territory		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>B.C./Y.T.</b>	N	3,978	4,144	4,340	4,510	4,643	4,885	5,039	5,209	5,466	5,647
	RPMP	941.0	967.0	999.6	1,038.7	1,051.2	1,088.2	1,104.0	1,130.4	1,173.3	1,222.6
<b>Alta./N.W.T./Nun.</b>	N	3,081	3,243	3,356	3,482	3,562	3,686	3,816	3,914	4,067	4,249
	RPMP	941.0	973.9	973.2	970.5	970.3	979.5	1,004.8	1,014.9	1,029.4	1,035.3
<b>Sask.</b>	N	980	1,014	1,056	1,116	1,138	1,205	1,197	1,247	1,304	1,296
	RPMP	984.5	1,020.0	1,071.7	1,115.8	1,122.7	1,169.8	1,146.5	1,178.8	1,207.5	1,169.4
<b>Man.*</b>	N	1,388	1,446	1,523	1,574	1,645	1,742	1,838	1,896	1,971	1,936
	RPMP	1,186.1	1,228.0	1,293.1	1,318.3	1,363.9	1,425.6	1,488.8	1,516.1	1,555.6	1,530.4
<b>Ont.*</b>	N	12,417	13,110	13,703	14,242	14,759	15,309	15,797	16,345	16,787	17,377
	RPMP	1,002.0	1,045.3	1,080.1	1,113.1	1,140.9	1,171.4	1,194.2	1,222.2	1,242.9	1,283.6
<b>Que.*</b>	N	6,487	6,750	7,060	7,373	7,649	7,898	7,970	8,135	8,129	8,163
	RPMP	860.0	888.4	922.7	959.1	986.5	1,008.8	1,008.1	1,019.5	1,009.2	1,000.9
<b>N.B.*</b>	N	792	802	847	855	870	891	899	902	930	874
	RPMP	1,054.1	1,066.5	1,130.6	1,146.8	1,164.4	1,188.8	1,194.1	1,194.0	1,230.2	1,156.0
<b>N.S./P.E.I.</b>	N	1,165	1,224	1,241	1,307	1,380	1,408	1,437	1,480	1,531	1,567
	RPMP	1,083.9	1,137.5	1,156.7	1,216.9	1,282.5	1,304.7	1,320.5	1,356.2	1,398.4	1,442.9
<b>N.L.</b>	N	665	668	663	663	681	718	756	814	824	822
	RPMP	1,286.2	1,294.7	1,300.8	1,308.9	1,344.7	1,410.8	1,478.6	1,594.3	1,607.3	1,560.7
<b>Canada</b>	<b>N</b>	<b>30,953</b>	<b>32,401</b>	<b>33,789</b>	<b>35,122</b>	<b>36,327</b>	<b>37,742</b>	<b>38,749</b>	<b>39,942</b>	<b>41,009</b>	<b>41,931</b>
	<b>RPMP</b>	<b>968.9</b>	<b>1,004.0</b>	<b>1,035.7</b>	<b>1,066.5</b>	<b>1,090.0</b>	<b>1,118.6</b>	<b>1,135.5</b>	<b>1,158.3</b>	<b>1,175.7</b>	<b>1,192.6</b>

**Note**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 14: Prevalent End-Stage Kidney Disease Patients by Type of Treatment, Canada, 2004 to 2013 (Number, Rate per Million Population, Percentage of Total)**

Type of Treatment <sup>†</sup>		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>HD Home</b>	N	369	485	572	638	717	785	842	925	968	1,042
	RPMP	11.6	15.0	17.5	19.4	21.5	23.3	24.7	26.8	27.8	29.6
	%	1.2	1.5	1.7	1.8	2.0	2.1	2.2	2.3	2.4	2.5
<b>HD Institutional</b>	N	14,949	15,614	16,205	16,642	17,038	17,646	17,957	18,504	18,712	18,823
	RPMP	467.9	483.8	496.7	505.3	511.2	523.0	526.2	536.6	536.5	535.4
	%	48.3	48.2	48.0	47.4	46.9	46.8	46.3	46.3	45.6	44.9
<b>CAPD</b>	N	1,659	1,611	1,553	1,576	1,602	1,573	1,523	1,472	1,469	1,492
	RPMP	51.9	49.9	47.6	47.9	48.1	46.6	44.6	42.7	42.1	42.4
	%	5.4	5.0	4.6	4.5	4.4	4.2	3.9	3.7	3.6	3.6
<b>APD</b>	N	1,915	2,081	2,221	2,315	2,389	2,508	2,563	2,556	2,714	2,757
	RPMP	59.9	64.5	68.1	70.3	71.7	74.3	75.1	74.1	77.8	78.4
	%	6.2	6.4	6.6	6.6	6.6	6.6	6.6	6.4	6.6	6.6
<b>Transplant</b>	N	12,061	12,610	13,238	13,951	14,581	15,230	15,864	16,485	17,146	17,817
	RPMP	377.5	390.8	405.8	423.6	437.5	451.4	464.9	478.1	491.6	506.8
	%	39.0	38.9	39.2	39.7	40.1	40.4	40.9	41.3	41.8	42.5
<b>Total</b>	<b>N</b>	<b>30,953</b>	<b>32,401</b>	<b>33,789</b>	<b>35,122</b>	<b>36,327</b>	<b>37,742</b>	<b>38,749</b>	<b>39,942</b>	<b>41,009</b>	<b>41,931</b>
	<b>RPMP</b>	<b>968.9</b>	<b>1,004.0</b>	<b>1,035.7</b>	<b>1,066.5</b>	<b>1,090.0</b>	<b>1,118.6</b>	<b>1,135.5</b>	<b>1,158.3</b>	<b>1,175.7</b>	<b>1,192.6</b>

**Notes**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting by province and year, see Section 1.2.

† HD: Hemodialysis; CAPD: Continuous ambulatory peritoneal dialysis; APD: Automated peritoneal dialysis.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.



**Table 15: Prevalent End-Stage Kidney Disease Patients by Type and Province/Territory of Treatment, Canada, 2013 (Number, Percentage)**

Type of Treatment <sup>†</sup>	Province/Territory									Canada	
	B.C./ Y.T.	Alta./ N.W.T./ Nun.	Sask.	Man.*	Ont.*	Que.*	N.B.*	N.S./ P.E.I.	N.L.		
<b>HD Home</b>	N	115	143	25	30	616	66	13	18	16	<b>1,042</b>
	%	2.0	3.4	1.9	1.5	3.5	0.8	1.5	1.1	1.9	<b>2.5</b>
<b>HD Institutional</b>	N	2,196	1,647	647	1,014	8,031	3,748	449	599	492	<b>18,823</b>
	%	38.9	38.8	49.9	52.4	46.2	45.9	51.4	38.2	59.9	<b>44.9</b>
<b>CAPD</b>	N	220	114	78	82	581	326	43	26	22	<b>1,492</b>
	%	3.9	2.7	6.0	4.2	3.3	4.0	4.9	1.7	2.7	<b>3.6</b>
<b>APD</b>	N	595	292	91	146	1,283	226	46	62	16	<b>2,757</b>
	%	10.5	6.9	7.0	7.5	7.4	2.8	5.3	4.0	1.9	<b>6.6</b>
<b>Transplant</b>	N	2,521	2,053	455	664	6,866	3,797	323	862	276	<b>17,817</b>
	%	44.6	48.3	35.1	34.3	39.5	46.5	37.0	55.0	33.6	<b>42.5</b>
<b>Total</b>	<b>N</b>	<b>5,647</b>	<b>4,249</b>	<b>1,296</b>	<b>1,936</b>	<b>17,377</b>	<b>8,163</b>	<b>874</b>	<b>1,567</b>	<b>822</b>	<b>41,931</b>

**Notes**

\* Reported values may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

† HD: Hemodialysis; CAPD: Continuous ambulatory peritoneal dialysis; APD: Automated peritoneal dialysis.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 16: Prevalent End-Stage Kidney Disease Patients by Primary Diagnosis, Canada, 2004 to 2013 (Number, Rate per Million Population, Percentage of Total)**

Diagnosis		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>Glomerulonephritis</b>	N	7,294	7,484	7,687	7,858	8,058	8,312	8,546	8,751	8,925	9,102
	RPMP	228.3	231.9	235.6	238.6	241.8	246.4	250.4	253.8	255.9	258.9
	%	23.6	23.1	22.8	22.4	22.2	22.0	22.1	21.9	21.8	21.7
<b>Diabetes</b>	N	7,721	8,195	8,677	9,085	9,476	9,922	10,289	10,660	11,243	11,545
	RPMP	241.7	253.9	266.0	275.9	284.3	294.1	301.5	309.1	322.3	328.4
	%	24.9	25.3	25.7	25.9	26.1	26.3	26.6	26.7	27.4	27.5
<b>Renal Vascular Disease</b>	N	4,000	4,237	4,457	4,629	4,756	4,955	5,022	5,092	5,065	5,049
	RPMP	125.2	131.3	136.6	140.6	142.7	146.9	147.2	147.7	145.2	143.6
	%	12.9	13.1	13.2	13.2	13.1	13.1	13.0	12.7	12.4	12.0
<b>Polycystic Kidney Disease</b>	N	2,168	2,345	2,470	2,589	2,706	2,803	2,908	2,997	3,063	3,154
	RPMP	67.9	72.7	75.7	78.6	81.2	83.1	85.2	86.9	87.8	89.7
	%	7.0	7.2	7.3	7.4	7.4	7.4	7.5	7.5	7.5	7.5
<b>Drug Induced</b>	N	439	466	489	526	537	565	604	615	620	634
	RPMP	13.7	14.4	15.0	16.0	16.1	16.7	17.7	17.8	17.8	18.0
	%	1.4	1.4	1.4	1.5	1.5	1.5	1.6	1.5	1.5	1.5
<b>Pyelonephritis</b>	N	2,175	2,200	2,244	2,318	2,344	2,361	2,365	2,439	2,404	2,360
	RPMP	68.1	68.2	68.8	70.4	70.3	70.0	69.3	70.7	68.9	67.1
	%	7.0	6.8	6.6	6.6	6.5	6.3	6.1	6.1	5.9	5.6
<b>Other<sup>†</sup></b>	N	3,510	3,754	3,956	4,130	4,358	4,591	4,749	5,067	5,217	5,612
	RPMP	109.9	116.3	121.3	125.4	130.8	136.1	139.2	146.9	149.6	159.6
	%	11.3	11.6	11.7	11.8	12.0	12.2	12.3	12.7	12.7	13.4
<b>Unknown/Not Reported</b>	N	3,646	3,720	3,809	3,987	4,092	4,233	4,266	4,321	4,472	4,475
	RPMP	114.1	115.3	116.8	121.1	122.8	125.5	125.0	125.3	128.2	127.3
	%	11.8	11.5	11.3	11.4	11.3	11.2	11.0	10.8	10.9	10.7
<b>Total</b>	<b>N</b>	<b>30,953</b>	<b>32,401</b>	<b>33,789</b>	<b>35,122</b>	<b>36,327</b>	<b>37,742</b>	<b>38,749</b>	<b>39,942</b>	<b>41,009</b>	<b>41,931</b>
	<b>RPMP</b>	<b>968.9</b>	<b>1,004.0</b>	<b>1,035.7</b>	<b>1,066.5</b>	<b>1,090.0</b>	<b>1,118.6</b>	<b>1,135.5</b>	<b>1,158.3</b>	<b>1,175.7</b>	<b>1,192.6</b>

**Notes**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 17: Prevalent End-Stage Kidney Disease Patients by Primary Diagnosis and Province/Territory, Canada, 2013 (Number, Rate per Million Population, Percentage of Total)**

Province/Territory		Glomerulonephritis	Diabetes	Renal Vascular Disease	Polycystic Kidney Disease	Drug Induced	Pyelonephritis	Other <sup>†</sup>	Unknown/Not Reported	Total
<b>B.C./Y.T.</b>	N	1,246	1,233	774	418	80	237	821	838	<b>5,647</b>
	RPMP	269.8	267.0	167.6	90.5	17.3	51.3	177.8	181.4	<b>1,222.6</b>
	%	22.1	21.8	13.7	7.4	1.4	4.2	14.5	14.8	<b>100</b>
<b>Alta./N.W.T./Nun.</b>	N	1,066	1,215	357	339	49	271	563	389	<b>4,249</b>
	RPMP	259.7	296.0	87.0	82.6	11.9	66.0	137.2	94.8	<b>1,035.3</b>
	%	25.1	28.6	8.4	8.0	1.2	6.4	13.3	9.2	<b>100</b>
<b>Sask.</b>	N	269	412	107	85	18	95	190	120	<b>1,296</b>
	RPMP	242.7	371.7	96.5	76.7	16.2	85.7	171.4	108.3	<b>1,169.4</b>
	%	20.8	31.8	8.3	6.6	1.4	7.3	14.7	9.3	<b>100</b>
<b>Man.*</b>	N	460	756	133	99	29	97	270	92	<b>1,936</b>
	RPMP	363.6	597.6	105.1	78.3	22.9	76.7	213.4	72.7	<b>1,530.4</b>
	%	23.8	39.0	6.9	5.1	1.5	5.0	13.9	4.8	<b>100</b>
<b>Ont.*</b>	N	3,532	5,102	2,313	1,274	227	880	2,161	1,888	<b>17,377</b>
	RPMP	260.9	376.9	170.9	94.1	16.8	65.0	159.6	139.5	<b>1,283.6</b>
	%	20.3	29.4	13.3	7.3	1.3	5.1	12.4	10.9	<b>100</b>
<b>Que.*</b>	N	1,817	2,032	978	584	163	560	1,175	854	<b>8,163</b>
	RPMP	222.8	249.2	119.9	71.6	20.0	68.7	144.1	104.7	<b>1,000.9</b>
	%	22.3	24.9	12.0	7.2	2.0	6.9	14.4	10.5	<b>100</b>
<b>N.B.*</b>	N	200	227	116	88	14	48	116	65	<b>874</b>
	RPMP	264.5	300.2	153.4	116.4	18.5	63.5	153.4	86.0	<b>1,156.0</b>
	%	22.9	26.0	13.3	10.1	1.6	5.5	13.3	7.4	<b>100</b>
<b>N.S./P.E.I.</b>	N	322	367	172	196	33	106	223	148	<b>1,567</b>
	RPMP	296.5	337.9	158.4	180.5	30.4	97.6	205.3	136.3	<b>1,442.9</b>
	%	20.5	23.4	11.0	12.5	2.1	6.8	14.2	9.4	<b>100</b>
<b>N.L.</b>	N	190	201	99	71	21	66	93	81	<b>822</b>
	RPMP	360.7	381.6	188.0	134.8	39.9	125.3	176.6	153.8	<b>1,560.7</b>
	%	23.1	24.5	12.0	8.6	2.6	8.0	11.3	9.9	<b>100</b>
<b>Canada</b>	<b>N</b>	<b>9,102</b>	<b>11,545</b>	<b>5,049</b>	<b>3,154</b>	<b>634</b>	<b>2,360</b>	<b>5,612</b>	<b>4,475</b>	<b>41,931</b>
	<b>RPMP</b>	<b>258.9</b>	<b>328.4</b>	<b>143.6</b>	<b>89.7</b>	<b>18.0</b>	<b>67.1</b>	<b>159.6</b>	<b>127.3</b>	<b>1,192.6</b>
	<b>%</b>	<b>21.7</b>	<b>27.5</b>	<b>12.0</b>	<b>7.5</b>	<b>1.5</b>	<b>5.6</b>	<b>13.4</b>	<b>10.7</b>	<b>100</b>

**Notes**

\* Reported values may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 18: Prevalent End-Stage Kidney Disease Patients by Treatment, Age Group, Sex and Primary Diagnosis, Canada, December 31, 2013 (Number, Rate per Million Population, Percentage of Total)**

		HD	PD	TX	Total*
<b>Total</b>	<b>N</b>	<b>19,865</b>	<b>4,249</b>	<b>17,817</b>	<b>41,931</b>
	<b>RPMP</b>	<b>565.0</b>	<b>120.9</b>	<b>506.8</b>	<b>1,192.6</b>
<b>Age Group</b>					
<b>Age 0–19</b>	N	50	31	393	<b>474</b>
	RPMP	6.4	3.9	50.0	<b>60.4</b>
	%	0.3	0.7	2.2	<b>1.1</b>
<b>Age 20–44</b>	N	1,987	545	3,775	<b>6,307</b>
	RPMP	165.7	45.5	314.9	<b>526.0</b>
	%	10.0	12.8	21.2	<b>15.0</b>
<b>Age 45–64</b>	N	6,474	1,600	8,994	<b>17,068</b>
	RPMP	651.6	161.0	905.2	<b>1,717.8</b>
	%	32.6	37.7	50.5	<b>40.7</b>
<b>Age 65–74</b>	N	4,961	1,083	3,514	<b>9,558</b>
	RPMP	1,651.8	360.6	1,170.0	<b>3,182.4</b>
	%	25.0	25.5	19.7	<b>22.8</b>
<b>Age 75+</b>	N	6,393	990	1,141	<b>8,524</b>
	RPMP	2,690.4	416.6	480.2	<b>3,587.2</b>
	%	32.2	23.3	6.4	<b>20.3</b>
<b>Sex</b>					
<b>Female</b>	N	8,058	1,775	6,744	<b>16,577</b>
	RPMP	454.6	100.1	380.5	<b>935.2</b>
	%	40.6	41.8	37.9	<b>39.6</b>
<b>Male</b>	N	11,795	2,469	11,073	<b>25,337</b>
	RPMP	676.6	141.6	635.2	<b>1,453.5</b>
	%	59.4	58.2	62.1	<b>60.4</b>
<b>Diagnosis<sup>†</sup></b>					
<b>Glomerulonephritis</b>	N	2,738	767	5,597	<b>9,102</b>
	RPMP	77.9	21.8	159.2	<b>258.9</b>
	%	13.8	18.1	31.4	<b>21.7</b>
<b>Diabetes</b>	N	7,138	1,423	2,984	<b>11,545</b>
	RPMP	203.0	40.5	84.9	<b>328.4</b>
	%	35.9	33.5	16.7	<b>27.5</b>
<b>Renal Vascular Disease</b>	N	3,190	668	1,191	<b>5,049</b>
	RPMP	90.7	19.0	33.9	<b>143.6</b>
	%	16.1	15.7	6.7	<b>12.0</b>
<b>Polycystic Kidney Disease</b>	N	836	247	2,071	<b>3,154</b>
	RPMP	23.8	7.0	58.9	<b>89.7</b>
	%	4.2	5.8	11.6	<b>7.5</b>
<b>Drug Induced</b>	N	333	66	235	<b>634</b>
	RPMP	9.5	1.9	6.7	<b>18.0</b>
	%	1.7	1.6	1.3	<b>1.5</b>

(cont'd on next page)

**Table 18: Prevalent End-Stage Kidney Disease Patients by Treatment, Age Group, Sex and Primary Diagnosis, Canada, December 31, 2013 (Number, Rate per Million Population, Percentage of Total) (cont'd)**

		HD	PD	TX	Total*
<b>Total</b>	<b>N</b>	<b>19,865</b>	<b>4,249</b>	<b>17,817</b>	<b>41,931</b>
	<b>RPMP</b>	<b>565.0</b>	<b>120.9</b>	<b>506.8</b>	<b>1,192.6</b>
<b>Diagnosis<sup>†</sup> (cont'd)</b>					
<b>Pyelonephritis</b>	<b>N</b>	813	161	1,386	<b>2,360</b>
	<b>RPMP</b>	23.1	4.6	39.4	<b>67.1</b>
	<b>%</b>	4.1	3.8	7.8	<b>5.6</b>
<b>Other</b>	<b>N</b>	2,349	449	2,814	<b>5,612</b>
	<b>RPMP</b>	66.8	12.8	80.0	<b>159.6</b>
	<b>%</b>	11.8	10.6	15.8	<b>13.4</b>
<b>Unknown</b>	<b>N</b>	2,468	468	1,539	<b>4,475</b>
	<b>RPMP</b>	70.2	13.3	43.8	<b>127.3</b>
	<b>%</b>	12.4	11.0	8.6	<b>10.7</b>

**Notes**

\* Reported values may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

HD: Hemodialysis; PD: Peritoneal dialysis; TX: Transplant.

Percentages may not add up to 100 because of rounding.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Table 19: End-Stage Kidney Disease Patient Flows by Treatment, Canada, 2004 to 2013**

		2004	2005	2006	2007	2008	2009	2010	2011*	2012*	2013*
<b>Dialysis</b>	January 1, Prevalence	17,906	18,892	19,791	20,551	21,171	21,746	22,512	22,885	23,457	23,863
	Incident Dialysis	5,077	5,128	5,249	5,336	5,338	5,458	5,515	5,416	5,298	5,127
	Deaths	3,244	3,383	3,518	3,631	3,735	3,620	3,803	3,730	3,582	3,517
	Net Transplants <sup>†</sup>	659	645	771	845	759	774	970	734	858	824
	Net Migrations <sup>‡</sup>	188	201	200	240	269	298	369	380	452	535
	December 31, Prevalence	18,892	19,791	20,551	21,171	21,746	22,512	22,885	23,457	23,863	24,114
<b>Transplant</b>	January 1, Prevalence	11,554	12,061	12,610	13,238	13,951	14,581	15,230	15,864	16,485	17,146
	New Transplants	1,086	1,122	1,262	1,328	1,278	1,282	1,287	1,257	1,319	1,307
	Deaths	258	244	302	288	303	302	309	314	353	337
	Return to Dialysis	294	320	319	317	332	319	335	318	300	294
	Net Migrations <sup>‡</sup>	27	9	13	10	13	12	9	4	5	5
	December 31, Prevalence	12,061	12,610	13,238	13,951	14,581	15,230	15,864	16,485	17,146	17,817

**Notes**

\* Reported values for 2011, 2012 and 2013 may be slightly lower as a result of under-reporting of incident dialysis cases in some provinces and unreported incident dialysis cases and deaths from Quebec. For a summary of under-reporting of incident dialysis cases by province and year, see Section 1.2.

† Transplants minus patients returning to dialysis because of failed transplants.

‡ Includes patients who left the country, recovered function, were lost to follow-up or withdrew from treatment.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

## 2.3 Facility Profiles

Each HD treatment is provided at a dialysis station, which treats one patient at a time. The number of HD stations available for treatment is a relatively crude indicator of the system's capacity to treat those with ESKD in a facility, region or province (Table 20).

Ontario had the highest number of patients per station, with 4.8, followed closely by Saskatchewan (4.5), while New Brunswick (2.8) and Prince Edward Island (2.3) had the lowest number of patients per station (Table 20).

**Table 20: Point Prevalent Hospital, Independent Health Facility and Community Centre Hemodialysis Patients, by Province of Treatment and Stations, Canada, 2013 (Number)**

Province of Treatment*	Stations <sup>†</sup> (N)	Patients (N)	Patients per Station	Population	Stations per Million Population
B.C./Y.T.	563	2,196	3.9	4,618,678	121.9
Alta./N.W.T/ Nun.	392	1,647	4.2	4,104,202	95.5
Sask.	144	647	4.5	1,108,303	129.9
Man.	262	1,014	3.9	1,265,015	207.1
Ont.	1,671	8,031	4.8	13,537,994	123.4
Que.	NR	NR	NR	NR	NR
N.B.	161	449	2.8	756,050	212.9
N.S.	145	553	3.8	940,789	154.1
P.E.I.	35	82	2.3	145,237	241.0
N.L.	127	492	3.9	526,702	241.1
<b>Total</b>	<b>3,500</b>	<b>15,111</b>	<b>4.3</b>	<b>27,002,970</b>	<b>129.6</b>

### Notes

\* British Columbia provides treatment for patients from Yukon. Alberta provides treatment for patients from the Northwest Territories and Nunavut.

† Number of stations reported is incomplete from New Brunswick and Quebec. This table includes information about stations located in, and patients being treated at, full-care hospitals, independent health facilities and community centres. Satellite stations refer to a facility where nephrology inpatient services are *not* on site. This includes mobile dialysis services and dialysis services provided at independent health facilities.

NR: Not reportable because of significant incomplete data from Quebec.

### Sources

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

## 2.4 Outcomes

The factors associated with the survival of patients receiving dialysis treatment are well documented.

Table 21 presents unadjusted patient survival rates by dialysis treatment. Long-term survival rates have been gradually improving.

In general, both age and primary diagnosis affect survival of dialysis patients (figures 3 to 8).

Approximately 85% of dialysis patients younger than 18 survive at least five years, while 27% of patients older than 75 survive at least five years (Figure 3).

Patients with renal vascular disease, drug-induced renal failure and diabetes have the lowest five-year survival rates, at 38%, 41% and 42%, respectively (Figure 6). The longest five-year survival rate is seen among patients with a primary diagnosis of polycystic kidney disease (76%) and glomerulonephritis (66%).

**Table 21: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Dialysis Patients, Canada, 2004 to 2013 (Percentage)**

		2004	2005	2006	2007	2008	2009	2010	2011 <sup>†</sup>	2012 <sup>†</sup>	2013 <sup>†</sup>
<b>All Dialysis</b>	N	5,077	5,128	5,249	5,336	5,338	5,458	5,515	5,416	5,298	5,127
	3 Months	94.4	94.3	94.3	94.5	94.0	94.3	94.0	92.9	93.6	92.3
	1 Year	83.2	83.2	83.5	83.9	83.2	84.2	83.8	83.8	84.5	—
	3 Years	60.2	61.1	60.6	62.3	61.3	63.7	65.2	—	—	—
	5 Years	42.3	43.1	42.6	44.3	44.8	—	—	—	—	—
<b>HD</b>	N	4,093	4,149	4,317	4,379	4,337	4,422	4,532	4,485	4,316	4,090
	3 Months	93.5	93.3	93.5	93.8	93.0	93.4	92.9	91.8	92.4	90.9
	1 Year	81.3	81.0	81.6	82.2	81.1	82.1	81.9	81.7	82.3	—
	3 Years	57.9	58.9	58.5	60.1	58.7	61.2	63.5	—	—	—
	5 Years	40.4	41.8	40.7	42.8	42.7	—	—	—	—	—
<b>PD</b>	N	984	979	932	957	1,001	1,036	983	931	982	1,037
	3 Months	98.4	98.5	98.0	98.1	98.1	98.4	98.9	98.2	98.5	98.0
	1 Year	90.9	92.4	92.5	92.1	92.4	93.3	92.3	93.6	94.1	—
	3 Years	69.8	70.8	70.4	72.7	72.6	74.4	73.0	—	—	—
	5 Years	50.3	48.7	51.7	51.7	54.5	—	—	—	—	—

### Notes

\* Survival rates may be affected by unreported deaths from Quebec.

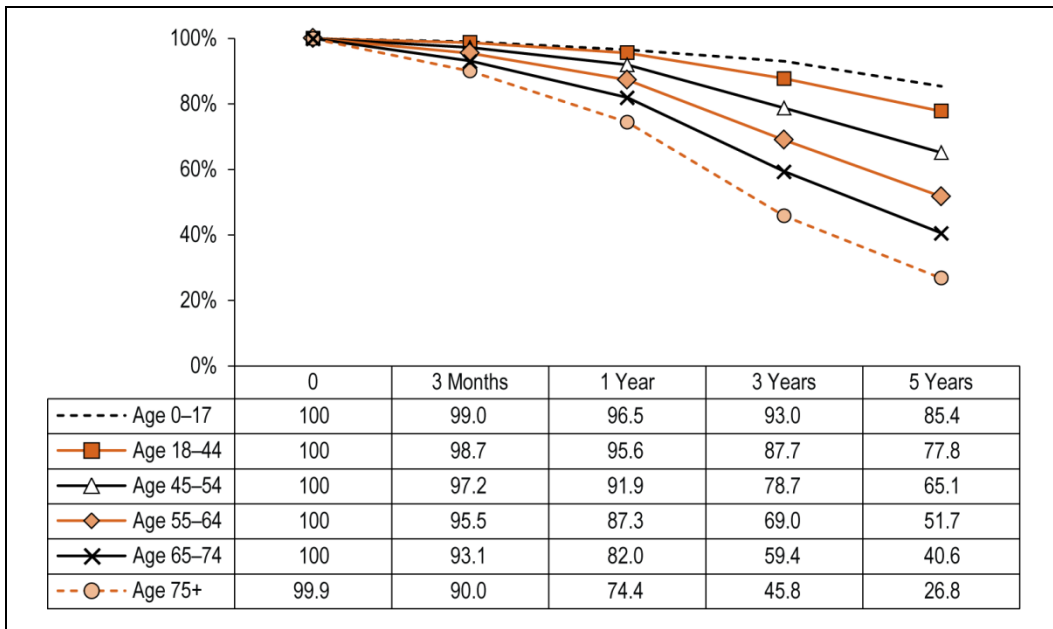
† For a summary of under-reporting by province and year, see Section 1.2.

HD: Hemodialysis; PD: Peritoneal dialysis.

### Source

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 3: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Dialysis Patients, by Age Group, Canada, 2004 to 2013 (Percentage)**



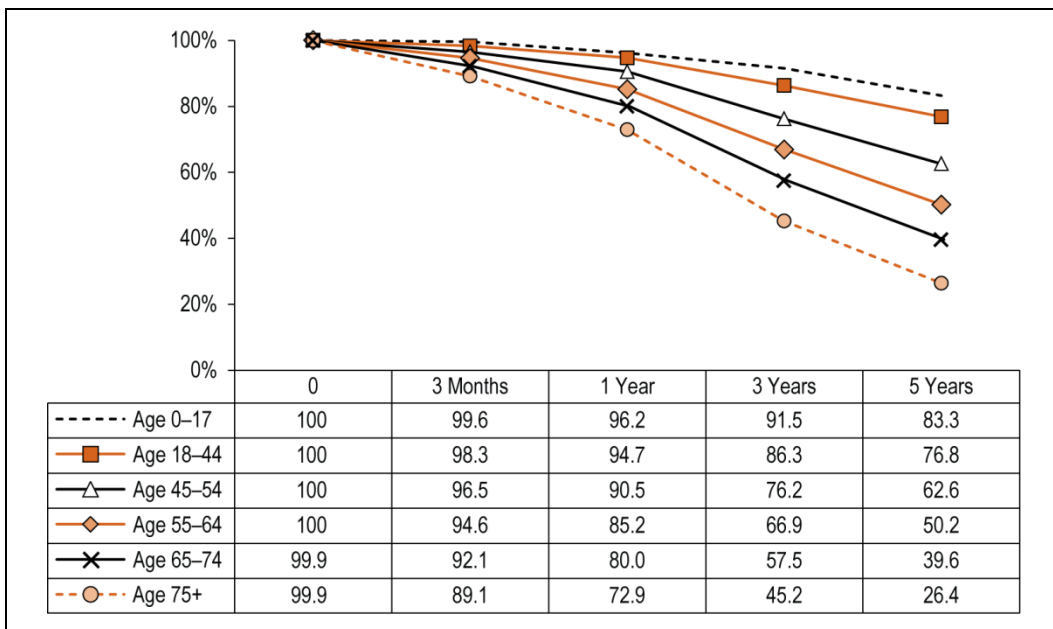
**Note**

\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 4: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Hemodialysis Patients, by Age Group, Canada, 2004 to 2013 (Percentage)**



**Note**

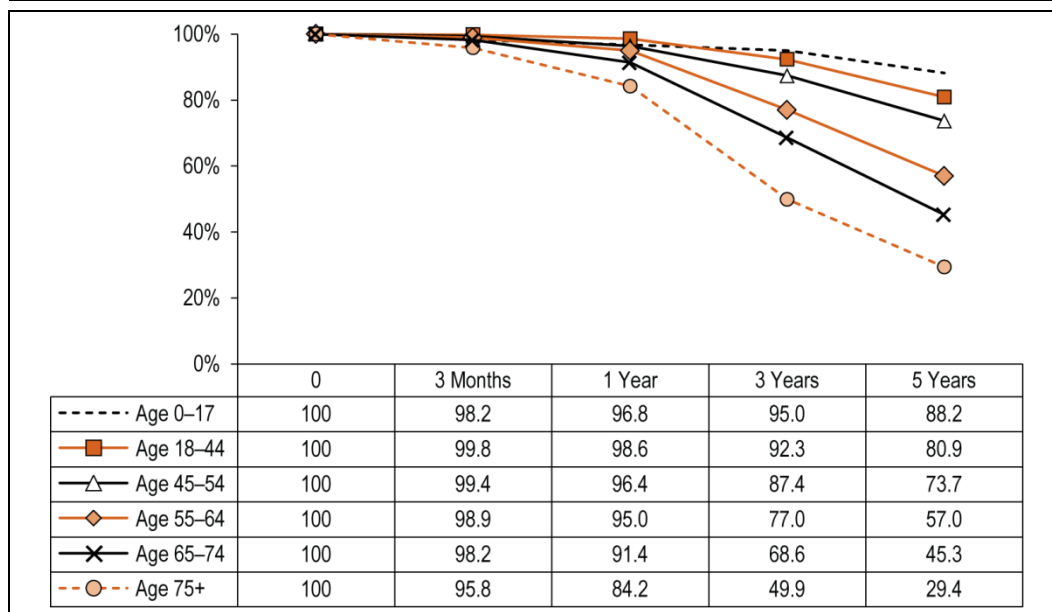
\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



**Figure 5: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Peritoneal Dialysis Patients, by Age Group, Canada, 2004 to 2013 (Percentage)**



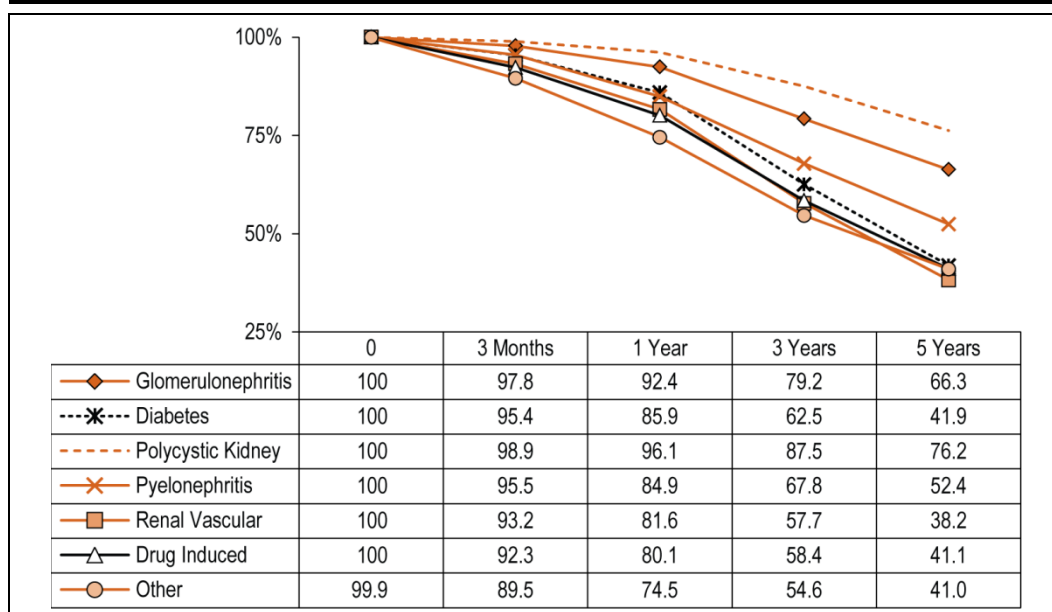
**Note**

\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 6: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Dialysis Patients, by Cause† of Kidney Failure, Canada, 2004 to 2013 (Percentage)**



**Notes**

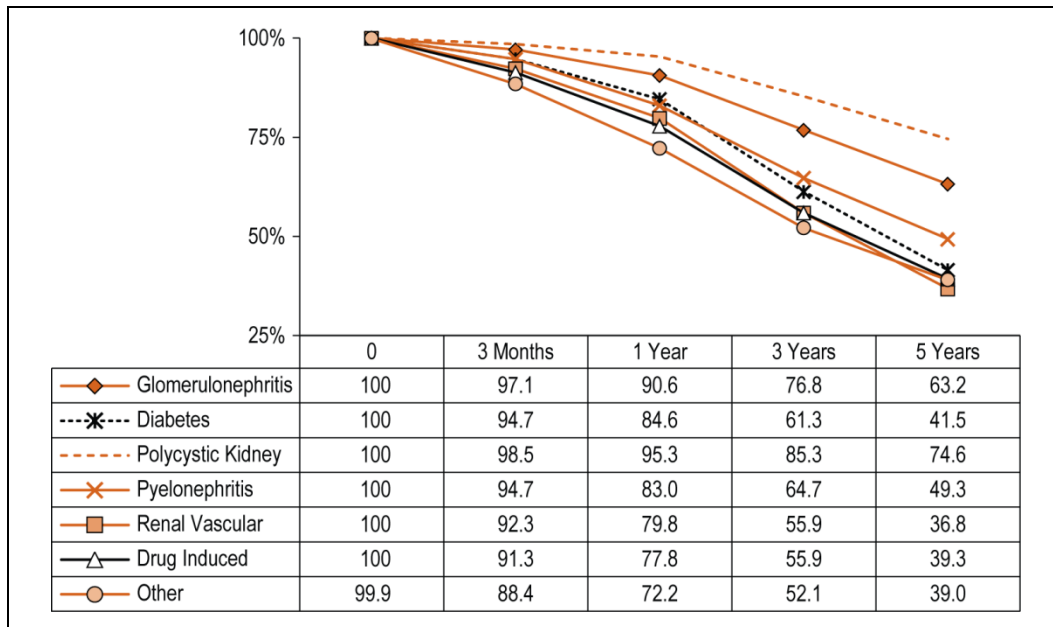
\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 7: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Hemodialysis Patients, by Cause† of Kidney Failure, Canada, 2004 to 2013 (Percentage)**



**Notes**

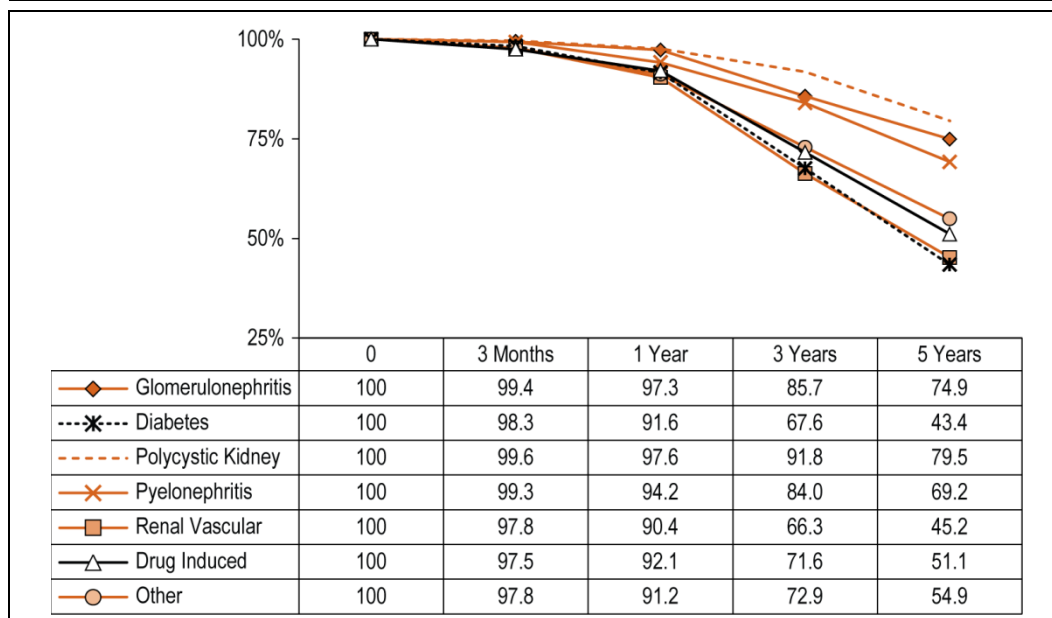
\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 8: Unadjusted Three-Month and One-, Three- and Five-Year Survival Rates\* in Peritoneal Dialysis Patients, by Cause† of Kidney Failure, Canada, 2004 to 2013 (Percentage)**



#### Notes

\* Survival rates may be affected by under-reporting of incident dialysis cases in some provinces and unreported deaths from Quebec in 2011, 2012 and 2013. For a summary of under-reporting by province and year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

#### Source

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

## 2.5 Kidney Transplantation: Adult Recipients

Kidney transplantation is the preferred treatment for the majority of ESKD patients. There have been improvements in both the short- and long-term survival of the kidney allograft and overall improved patient survival. However, kidney transplant activity is dependent on the availability of organs. Living organ donation has greatly improved the situation of limited availability of deceased donor organs. It has played an increasingly important role in kidney transplantation over the last decade.

This section presents transplantation activity among adult kidney recipients (age 18 and older) in the last decade in Canada. Outcomes of kidney transplantation are examined using an adjusted regression analysis, which helps identify risk factors associated with an increased risk of death after kidney transplant.

In 2013, there were 25 active kidney transplant programs in Canada operating in seven provinces.

At the end of 2013, there were 3,277 people (adult and pediatric) waiting for a deceased donor kidney transplant (Table 22).

**Table 22: Kidney Transplant\* Waiting List at December 31 and Waiting List Deaths, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012 <sup>†</sup>	2013 <sup>†</sup>
<b>Waiting List</b>	2,872	2,759	2,962	2,963	2,892	2,902	3,362	3,406	3,428	3,277
<b>Deaths on Waiting List</b>	55	66	70	46	58	76	82	80	84	88

**Notes**

\* Includes both adult and pediatric patients.

† Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. Statistiques officielles 2013. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

During the 10-year period, there were 11,521 kidney transplant procedures registered in CORR (Table 23). Of these, 1,148 (10%) were re-transplants. Of the 10,303 kidney-only first transplants, 61% utilized deceased-donor kidneys. Ontario and Quebec surgeons performed the most deceased-donor kidney transplants over the decade (2,802 and 1,972, respectively) (Table 24). Ontario saw the highest number of living-donor kidney transplants (1,979) over the decade (Table 25), followed by British Columbia (890). Since 2006, the number of living-donor kidney transplants has been stable, fluctuating between 435 and 477 transplants each year.

For the most recent three-year period, 2011 to 2013, the median wait time for a deceased-donor kidney transplant (excluding pre-emptive transplants) was 4.0 years (Table 26). The longest median wait times were in Manitoba (4.8 years) and British Columbia (4.5 years). The shortest median wait time of 2.7 years was observed in Nova Scotia.

Since 2004, the proportion of recipients older than age 60 receiving a kidney transplant from a deceased donor has increased from 31% to 42%; a similar trend was observed for living-donor transplants (14% to 21%) (Table 27). The average age of recipients of deceased donor kidneys increased from 51 to 55 (Table 27). Glomerulonephritis continued to be the predominant diagnosis among adult kidney transplant recipients (308) (Table 28).

Figures 9 and 10 present graft survival rates by age for living-donor kidney recipients and deceased-donor kidney recipients, respectively.

**Table 23: Kidney Transplants\* by Year and Donor Type, Adult Recipients, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012 <sup>†</sup>	2013 <sup>†</sup>	Total
<b>Kidney-Only, First Graft, Deceased Donor</b>	514	504	606	631	634	667	646	683	712	705	<b>6,302</b>
<b>Kidney-Only, First Graft, Living Donor</b>	345	370	415	413	409	403	413	404	392	437	<b>4,001</b>
<b>Kidney Combination, First Graft, Deceased Donor<sup>‡</sup></b>	3	5	10	8	9	11	7	6	5	6	<b>70</b>
<b>Re-Transplants</b>	104	104	119	133	114	91	125	103	136	119	<b>1,148</b>
<b>Total</b>	<b>966</b>	<b>983</b>	<b>1,150</b>	<b>1,185</b>	<b>1,166</b>	<b>1,172</b>	<b>1,191</b>	<b>1,196</b>	<b>1,245</b>	<b>1,267</b>	<b>11,521</b>

**Notes**

\* Excludes simultaneous kidney–pancreas transplants. See Chapter 6.

† For a summary of under-reporting by year, see Section 1.2. Counts do not include missing transplant data.

‡ Includes kidney–liver, kidney–lung, kidney–heart and kidney–bowel combination transplants.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 24: Deceased-Donor Kidney Transplants\* by Year and Province of Treatment, Adult Recipients, Canada, 2004 to 2013 (Number)**

Province of Treatment	2004	2005	2006	2007	2008	2009	2010	2011	2012 <sup>†</sup>	2013 <sup>†</sup>	Total
<b>B.C.</b>	52	40	61	61	83	54	89	91	107	108	<b>746</b>
<b>Alta.</b>	67	83	78	71	66	61	74	74	58	80	<b>712</b>
<b>Sask.</b>	18	15	21	21	21	14	—	—	8	7	<b>125</b>
<b>Man.</b>	13	6	22	27	24	22	33	17	23	18	<b>205</b>
<b>Ont.</b>	208	206	243	291	253	323	308	296	371	303	<b>2,802</b>
<b>Que.</b>	196	173	197	204	217	207	172	206	174	226	<b>1,972</b>
<b>N.S.</b>	35	49	67	52	49	50	49	74	69	48	<b>542</b>
<b>Total</b>	<b>589</b>	<b>572</b>	<b>689</b>	<b>727</b>	<b>713</b>	<b>731</b>	<b>725</b>	<b>758</b>	<b>810</b>	<b>790</b>	<b>7,104</b>

**Notes**

\* Excludes simultaneous kidney–pancreas transplants. See Chapter 6. Includes first transplants and re-transplants.

† For a summary of under-reporting by year, see Section 1.2. Counts do not include missing transplant data.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 25: Living-Donor Kidney Transplants by Year and Province of Treatment, Adult Recipients, Canada, 2004 to 2013 (Number)**

Province of Treatment	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>B.C.</b>	74	70	98	100	75	87	89	94	80	123	<b>890</b>
<b>Alta.</b>	61	50	46	60	51	40	66	54	64	61	<b>553</b>
<b>Sask.</b>	12	11	9	7	13	1	3	2	4	8	<b>70</b>
<b>Man.</b>	12	19	24	21	17	18	20	19	24	18	<b>192</b>
<b>Ont.</b>	157	186	206	199	211	224	208	199	189	200	<b>1,979</b>
<b>Que.*</b>	38	46	47	44	47	39	51	43	44	36	<b>435</b>
<b>N.S.</b>	23	29	31	27	39	32	29	27	30	31	<b>298</b>
<b>Total</b>	<b>377</b>	<b>411</b>	<b>461</b>	<b>458</b>	<b>453</b>	<b>441</b>	<b>466</b>	<b>438</b>	<b>435</b>	<b>477</b>	<b>4,417</b>

**Note**

\* For a summary of under-reporting by year, see Section 1.2. Counts do not include missing transplant data.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 26: Dialysis Duration Prior to First Kidney Transplant by Province of Treatment, Adult Kidney Transplant Recipients, Canada, 2011 to 2013**

	B.C.	Alta.	Sask.	Man.	Ont.	Que.*,†	N.S.	Canada
<b>Duration on Dialysis (Median Days), Deceased Donor</b>	1,642	1,314	1,380	1,740	1,499	1,297	922	<b>1,417</b>
<b>Duration on Dialysis (Median Days), Deceased Donor, No Pre-Emptive</b>	1,642	1,351	1,499	1,746	1,510	1,489	993	<b>1,476</b>
<b>Duration on Dialysis (Median Days), Living Donor</b>	237	343	594	441	335	173	364	<b>324</b>
<b>Duration on Dialysis (Median Days), Living Donor, No Pre-Emptive</b>	585	621	659	632	536	659	469	<b>581</b>

**Notes**

\* For a summary of under-reporting by year, see Section 1.2. Results do not include missing transplant data.

† In 2012, Quebec introduced a new kidney allocation algorithm. As a result, median times on dialysis are higher than reported in earlier reports.

In the calculation of median days on dialysis, pre-emptive kidney transplant recipients were given a value of 0 for their wait time.

A patient who receives a pre-emptive transplant has not been treated with dialysis prior to the transplant.

There were 3,350 adult first kidney transplants performed in Canada between 2011 and 2013; of these, 581 were pre-emptive transplants.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 27: Adult Kidney Transplant Recipients, Selected Characteristics, First Graft, Canada, 2004 to 2013 (Number, Percentage)**

Donor	Characteristic	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	
Deceased	Percentage Male	62.1	63.9	61.9	63.8	65.0	63.6	63.6	64.7	63.9	64.8	
	Percentage Age 60+	30.6	29.5	29.7	34.9	35.8	37.5	39.4	42.7	34.7	42.3	
	Average Age	51.2	51.8	51.9	53.4	53.2	53.8	54.2	54.5	53.5	55.0	
	Age Standard Deviation	13.2	12.4	12.7	12.8	13.0	12.9	12.7	12.9	12.2	12.6	
	<b>Cause of ESKD<sup>†</sup> (%)</b>											
	Diabetes	14.5	17.5	17.0	21.6	23.5	19.8	24.3	26.9	23.7	23.3	
	Renal Vascular	13.2	10.6	10.7	9.1	10.1	9.1	9.8	11.6	11.6	11.5	
	Glomerulonephritis	36.4	30.3	31.0	28.3	27.2	30.7	29.4	24.2	25.5	27.6	
	Other <sup>†</sup>	31.9	37.5	37.2	36.6	33.6	33.5	32.8	33.8	33.6	33.6	
	Unknown Diagnosis	4.1	4.1	4.1	4.4	5.6	6.9	3.7	3.5	5.6	3.9	
	Median Peak PRA	2	3	0	0	0	2	1	1	3	6	
	Peak PRA >50% (%)	7.3	7.5	2.2	6.5	7.2	10.6	11.1	9.4	10.2	12.1	
	Duration of Dialysis (Median Days)	1,305	1,261	1,283	1,338	1,199	1,252	1,381	1,334	1,445	1,467	
Living	Percentage Male	59.1	63.0	62.4	63.4	59.9	59.6	65.6	60.4	63.0	61.3	
	Percentage Age 60+	14.5	14.6	14.7	18.6	19.3	21.6	26.4	20.5	22.4	21.1	
	Average Age	44.6	46.6	45.4	46.0	46.8	47.0	48.4	46.5	47.7	47.5	
	Age Standard Deviation	13.2	12.6	13.1	13.8	13.4	13.6	14.2	14.1	14.1	13.2	
	<b>Cause of ESKD<sup>†</sup> (%)</b>											
	Diabetes	16.8	16.5	13.3	16.9	14.7	16.6	15.3	16.8	16.6	19.0	
	Renal Vascular	4.6	5.7	7.2	7.7	7.3	6.9	6.5	5.9	4.6	6.6	
	Glomerulonephritis	38.0	31.1	35.4	29.1	29.3	28.0	32.0	31.7	25.3	25.6	
	Other <sup>†</sup>	35.7	41.1	36.1	36.6	41.1	38.5	34.4	34.9	41.3	38.2	
	Unknown Diagnosis	4.9	5.7	8.0	9.7	7.6	9.9	11.9	10.6	12.2	10.5	
	Median Peak PRA	0	0	0	0	0	1	0	0	1	0	
	Peak PRA >50% (%)	5.0	4.2	1.9	4.5	8.4	8.1	5.9	7.4	8.7	7.9	
	Duration of Dialysis (Median Days)	343	286	314	304	356	285	280	302	320	329	

**Notes**

\* For a summary of under-reporting by year, see Section 1.2. Counts do not include missing transplant data.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

PRA: Panel reactive antibody.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 28: Kidney Transplant Recipients\* by Age Group and Primary Renal Diagnosis Category, Adult Recipients, First Graft, Canada, 2013 (Number)**

	Age 18–44	Age 45–54	Age 55–64	Age 65+	Total <sup>†</sup>
<b>Glomerulonephritis</b>	110	66	90	42	<b>308</b>
<b>Pyelonephritis</b>	22	9	7	9	<b>47</b>
<b>Polycystic Kidney Disease</b>	14	58	45	30	<b>147</b>
<b>Renal Vascular Disease</b>	22	27	22	40	<b>111</b>
<b>Diabetes</b>	49	60	81	59	<b>249</b>
<b>Other<sup>‡</sup></b>	79	43	57	33	<b>212</b>
<b>Unknown/Not Reported</b>	21	24	19	10	<b>74</b>
<b>Total</b>	<b>317</b>	<b>287</b>	<b>321</b>	<b>223</b>	<b>1,148</b>

**Notes**

\* Based on patients with first grafts. Both diagnoses provided at incident dialysis treatment and subsequent diagnoses at time of kidney transplant are included in this table.

† For a summary of under-reporting by year, see Section 1.2. Counts do not include missing transplant data.

‡ For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 29: Unadjusted Three-Month and One-, Three- and Five-Year Graft Survival Rates in Adult Kidney Transplant Recipients, First Graft, Canada, 2004 to 2013 (Percentage)**

		2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*
<b>Deceased Donor</b>	N	517	509	616	639	643	678	653	689	717	711
	3 Months	95.0	96.1	95.5	96.4	95.6	95.3	97.4	97.0	97.4	96.6
	1 Year	91.7	92.3	93.2	93.1	92.1	92.5	94.8	92.9	94.8	—
	3 Years	85.5	85.6	86.2	87.0	86.6	87.9	90.0	—	—	—
	5 Years	78.1	79.9	81.2	81.4	82.6	—	—	—	—	—
<b>Living Donor</b>	N	345	370	415	413	409	403	413	404	392	437
	3 Months	98.5	97.8	97.6	98.8	97.8	98.8	98.1	98.3	98.7	99.3
	1 Year	98.3	95.7	96.4	96.6	96.3	97.5	96.1	97.5	97.7	—
	3 Years	94.5	91.9	93.3	92.7	93.2	94.5	93.9	—	—	—
	5 Years	89.8	88.9	88.0	87.9	89.2	—	—	—	—	—

**Note**

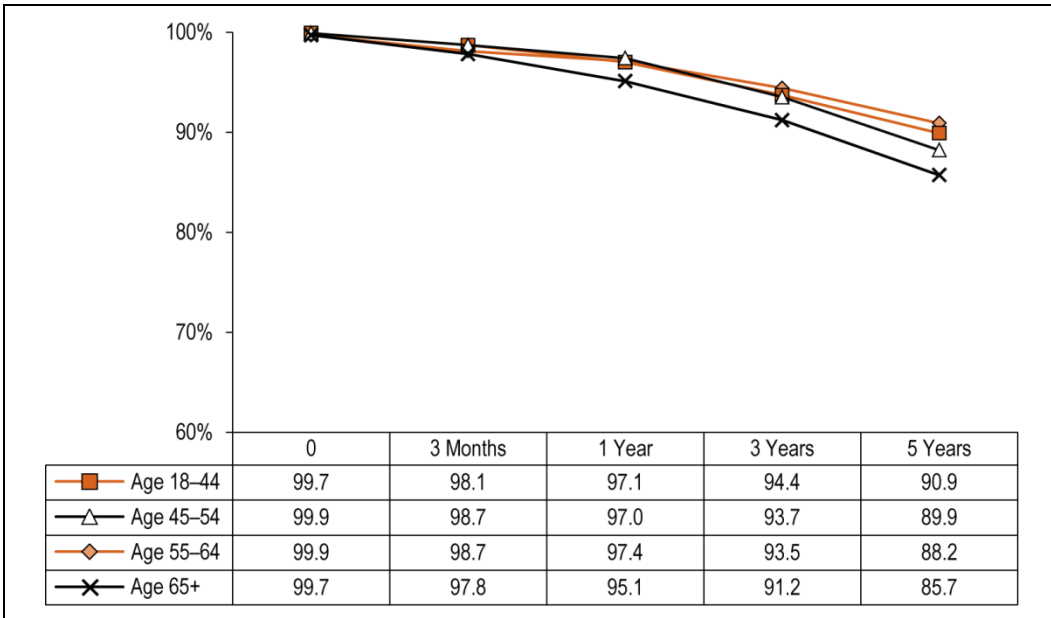
\* Survival rates may be affected by unreported kidney transplants and deaths from Quebec in 2012 and 2013. For a summary of under-reporting by year, see Section 1.2. Results do not include missing transplant data.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



**Figure 9: Unadjusted Three-Month and One-, Three- and Five-Year Graft Survival Rates in Adult Kidney Transplant Patients, First Graft, Living Donor, by Age at Transplant, Canada, 2004 to 2013 (Percentage)**



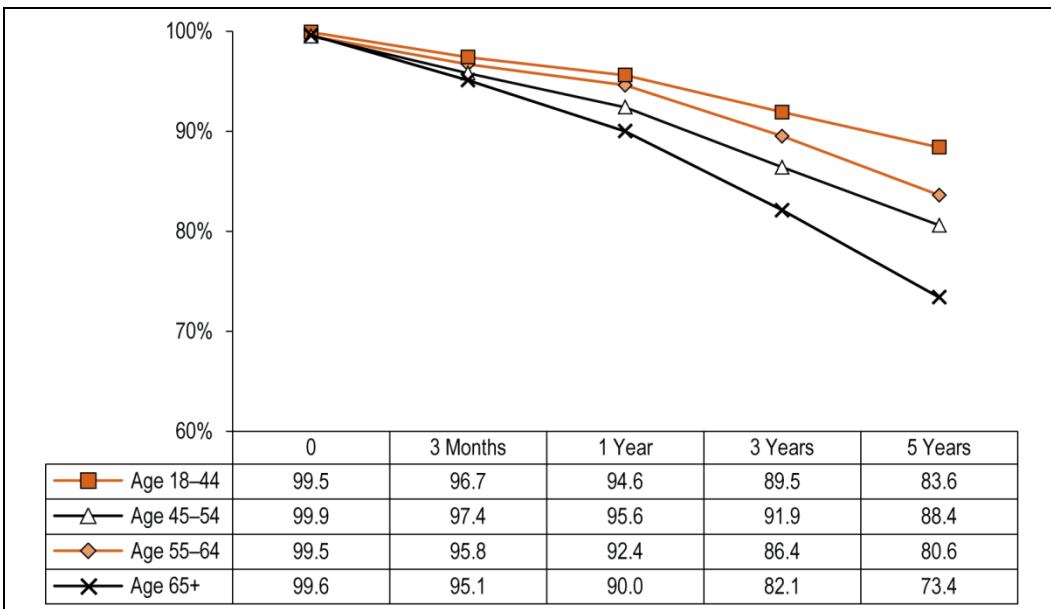
**Note**

Survival rates may be affected by unreported kidney transplants and deaths from Quebec in 2012 and 2013. For a summary of under-reporting by year, see Section 1.2. Results do not include missing transplant data.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 10: Unadjusted Three-Month and One-, Three- and Five-Year Graft Survival Rates in Adult Kidney Transplant Patients, First Graft, Deceased Donor, by Age at Transplant, Canada, 2004 to 2013 (Percentage)**



**Note**

Survival rates may be affected by unreported kidney transplants and deaths from Quebec in 2012 and 2013. For a summary of under-reporting by year, see Section 1.2. Results do not include missing transplant data.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

## 2.6 Kidney Transplantation: Pediatric Kidney Transplants

In this section, pediatric patients are defined as those younger than age 18.

Pediatric ESKD patients present different treatment challenges than adult patients. Transplantation has become the treatment of choice for this patient population. The trends in kidney transplantation for pediatric patients in Canada are presented in tables 30 to 34. Throughout the decade, there were 525 first graft transplants and 33 re-transplants on pediatric recipients (Table 30). There was no distinct trend for transplants utilizing living-donor or deceased-donor organs.

**Table 30: Kidney Transplants by Year, Donor Type and Re-Transplants, Pediatric Recipients, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>First Graft, Deceased Donor</b>	19	39	22	42	24	31	28	29	31	19	<b>284</b>
<b>First Graft, Living Donor</b>	37	29	26	21	23	18	25	18	19	25	<b>241</b>
<b>Re-Transplants</b>	5	5	1	4	3	4	4	4	2	1	<b>33</b>
<b>Total</b>	<b>61</b>	<b>73</b>	<b>49</b>	<b>67</b>	<b>50</b>	<b>53</b>	<b>57</b>	<b>51</b>	<b>52</b>	<b>45</b>	<b>558</b>

**Note**

\* Missing data from Quebec in 2012 and 2013; the number of pediatric recipients is unknown. For a summary of under-reporting by year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 31: Pediatric Kidney Transplants by Age Group and Province of Treatment, Canada, 2004 to 2013 (Number, Percentage)**

		B.C.	Alta.	Sask.	Man.	Ont.	Que.*	N.S.	Total
<b>Age 0–4</b>	N	10	15	—	3	39	19	10	<b>96</b>
	%	14.5	21.4	—	8.8	16.7	16.8	30.3	<b>17.2</b>
<b>Age 5–10</b>	N	14	11	—	7	39	26	9	<b>106</b>
	%	20.3	15.7	—	20.6	16.7	23.0	27.3	<b>19.0</b>
<b>Age 11–17</b>	N	45	44	5	24	156	68	14	<b>356</b>
	%	65.2	62.9	100	70.6	66.7	60.2	42.4	<b>63.8</b>
<b>Total</b>	<b>N</b>	<b>69</b>	<b>70</b>	<b>5</b>	<b>34</b>	<b>234</b>	<b>113</b>	<b>33</b>	<b>558</b>

**Note**

\* Missing data from Quebec in 2012 and 2013; the number of pediatric recipients is unknown. For a summary of under-reporting by year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 32: Dialysis Duration in Days Prior to First Kidney Transplant, Pediatric Recipients, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*
<b>Duration on Dialysis (Median Days), Deceased Donor</b>	586	625	631	422	344	265	524	599	0 <sup>†</sup>	119
<b>Duration on Dialysis (Median Days), Deceased Donor, Excluding Pre-Emptive</b>	705	770	649	558	373	286	614	762	380	521
<b>Duration on Dialysis (Median Days), Living Donor</b>	264	107	144	137	66	197	228	0 <sup>†</sup>	0 <sup>†</sup>	99
<b>Duration on Dialysis (Median Days), Living Donor, Excluding Pre-Emptive</b>	414	349	271	483	258	297	304	339	396	557

**Notes**

\* Missing data from Quebec in 2012 and 2013; the number of pediatric recipients is unknown. For a summary of under-reporting by year, see Section 1.2.

† More than half of the transplants were pre-emptive.

In the calculation of median days on dialysis, pre-emptive kidney transplant recipients were given a value of 0 for their wait time.

A patient who receives a pre-emptive transplant has not been treated with dialysis before the transplant.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 33: Pediatric Kidney Transplant by Age Group and Primary Renal Diagnosis Category, Canada, 2004 to 2013\***

Primary Renal Diagnosis Category	Age 0–4		Age 5–10		Age 11–17	
	N	%	N	%	N	%
Alport Syndrome	0	0	0	0	6	1.8
Cystinosis	0	0	4	3.8	18	5.5
Dysplasia/Hypoplasia	26	27.7	20	19.0	32	9.8
Posterior Urethral Valves	9	9.6	7	6.7	10	3.1
Obstructive Uropathy	<5	..	<5	..	12	3.7
Vesicoureteric Reflux	<5	..	<5	..	12	3.7
Polycystic Kidneys	<5	..	<5	..	8	2.5
Nephronophthisis	<5	..	8	7.6	17	5.2
Other Congenital/Hereditary	11	11.7	<5	..	10	3.1
Other Pyelonephritis	0	0	<5	..	7	2.1
Glomerulonephritis	11	11.7	13	12.4	35	10.7
Focal Sclerosis	4	4.3	6	5.7	19	5.8
Autoimmune Disease	0	0	0	0	19	5.8
Hemolytic Uremic Syndrome	<5	..	7	6.7	5	1.5
Other <sup>†</sup>	9	9.6	13	12.4	41	12.6
Unknown	16	17.0	15	14.3	75	23.0
<b>Total Patients</b>	<b>94</b>	<b>100</b>	<b>105</b>	<b>100</b>	<b>326</b>	<b>100</b>

**Notes**

\* Missing data from Quebec in 2012 and 2013; the number of pediatric recipients is unknown. For a summary of under-reporting by year, see Section 1.2.

† For a list of all primary diagnoses captured by CORR, see Appendix F.

.. Percentage suppressed to ensure confidentiality.

Based on patients with first grafts. Both diagnoses provided at incident dialysis treatment and subsequent diagnoses at time of kidney transplant are included in this table.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 34: Unadjusted Three-Month and One-, Three- and Five-Year Graft Survival Rates in Pediatric Kidney Transplant Recipients, First Graft, Canada, 2004 to 2013 (Percentage)**

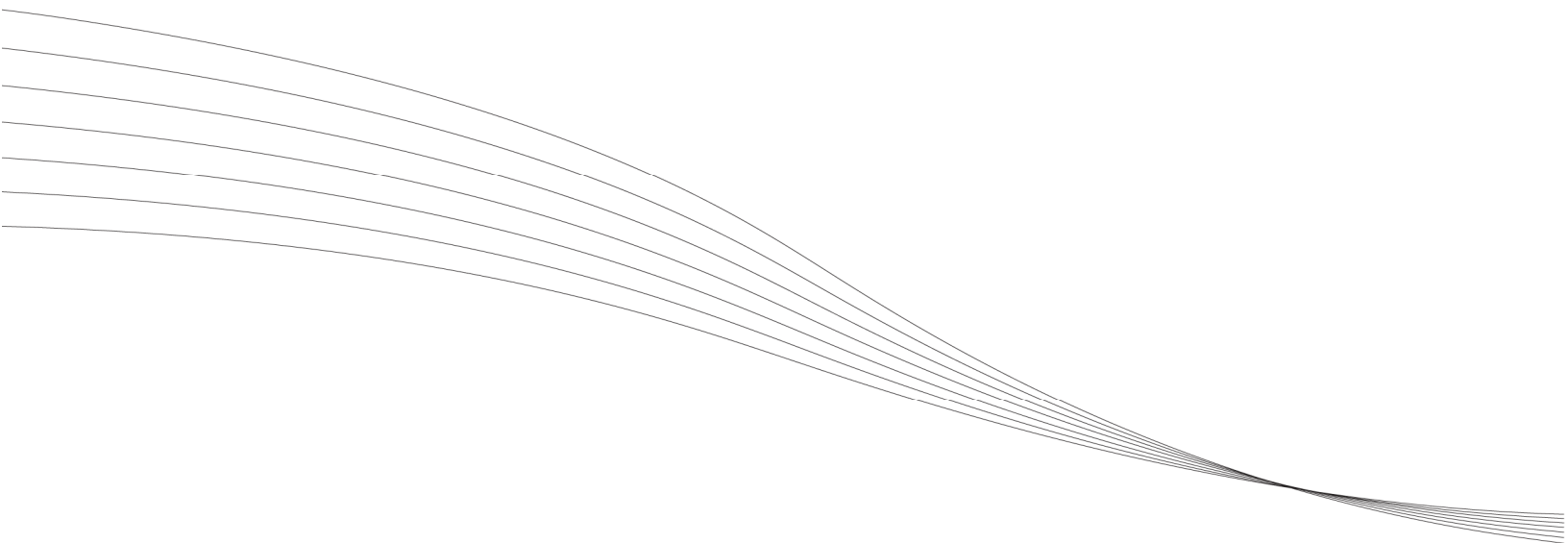
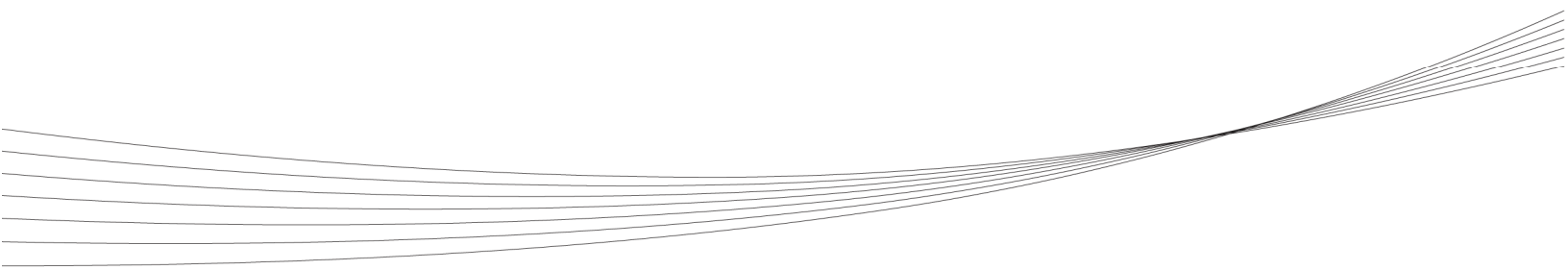
		2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*
<b>Deceased Donor</b>	N	19	39	22	42	24	31	28	29	31	19
	3 Months	94.7	97.4	95.5	95.2	100	96.8	100	96.6	93.5	94.7
	1 Year	94.7	97.4	90.9	95.2	95.8	96.8	100	96.6	93.5	—
	3 Years	94.7	92.3	77.3	90.4	87.5	90.3	89.3	—	—	—
	5 Years	89.5	89.7	77.3	83	66.7	—	—	—	—	—
<b>Living Donor</b>	N	37	29	26	21	23	18	25	18	19	25
	3 Months	100	96.6	100	100	95.7	100	96.0	100	100	94.4
	1 Year	100	96.6	100	100	95.7	100	96.0	100	100	—
	3 Years	100	93.1	92.3	100	95.7	100	96.0	—	—	—
	5 Years	89.2	93.1	84.6	100	91.3	—	—	—	—	—

**Note**

\* Survival rates may be affected by unreported kidney transplants and deaths from Quebec in 2012 and 2013. For a summary of under-reporting by year, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.





## Chapter 3—Liver Transplantation







### 3 Liver Transplantation

The science of liver transplantation experienced a paradigm shift in 1989, when the first living-donor partial liver transplant was performed in the United States. In Canada, the first living-donor parent-to-child liver transplant followed in 1993, with the first living-donor adult-to-adult liver transplant in Canada in 2000. Advances in immunosuppression have dramatically enhanced patient survival. Beginning in the 1980s, improvements in organ preservation and surgical techniques worked together to improve graft and patient survival. Given these developments, liver transplantation is now considered the optimal form of therapy for end-stage liver disease. This section presents Canadian liver transplantation activity in the last decade, from 2004 to 2013.

Before 2007, the number of people waiting for a liver transplant climbed each year, with the highest number in 2006, at 723 patients (Table 35). In 2013, there were 498 people on the waiting list for a liver transplant (Table 35).

The decade spanning 2004 to 2013 saw 4,631 liver transplants registered with CORR; 85% of patients who received a first liver received it from a deceased donor (Table 36). During that period, the proportion of first transplants from living donors fluctuated between a low of 14% and 17%. While most of the transplants were liver only, combination transplants accounted for 2% of the performed transplants (Table 37).

Among recipients younger than 10, biliary atresia was the predominant cause of end-stage liver failure. Among recipients age 35 to 59, the most commonly reported diagnosis was hepatitis C (Table 38).

The medical status of liver disease patients is part of the clinical decision-making algorithm. Status 1 (at home), 1T (at home with tumour) and 2 (hospitalized) patients are considered non-urgent. In contrast, Status 3 (in ICU), 3F (in ICU and fulminant) and 4 (in ICU, intubated, ventilated and fulminant) are considered urgent. In general, 84% of liver transplant recipients receiving a first graft in the past decade were considered non-urgent (Status 1 and 2) (Figure 11).

The crude RPMP of liver transplant recipients was highest in Alberta (15.5) and Ontario (14.2) and lowest in Saskatchewan/Manitoba (4.2) (Figure 12).

Unadjusted patient survival rates for liver transplant patients remained relatively stable over the last decade. Three-year survival varied between 82% and 87%; five-year survival was somewhat lower (between 77% and 84%) (Figure 13). One-year survival has been increasing steadily over the past decade, with an increase of nearly 6% since 2004.

In 2013, there were 5,833 patients in Canada living with a transplanted liver (Table 39).

**Table 35: Liver Transplant Waiting List at December 31 and Waiting List Deaths, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>Age 0–17</b>	37	32	36	19	16	17	22	21	43	20	<b>263</b>
<b>Age 18+</b>	630	681	687	616	570	532	479	468	449	478	<b>5,590</b>
<b>Waiting List</b>	667	713	723	635	586	549	501	489	492	498	<b>5,853</b>
<b>Deaths on Waiting List</b>	96	141	120	77	92	91	74	93	62	86	<b>932</b>

**Note**

\* Results are supplemented with data from Transplant Québec. For more details see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 36: Liver Transplants by Year, Donor Type, Age Group and Re-Transplants, Canada, 2004 to 2013 (Number)**

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>Pediatric: Age 0–17</b>	First Graft, Deceased Donor	15	34	25	28	27	31	22	34	27	23	<b>266</b>
	First Graft, Living Donor	12	8	9	15	9	9	14	14	15	18	<b>123</b>
	Re-Transplants	3	9	8	6	7	7	6	5	4	6	<b>61</b>
<b>Adults: Age 18+</b>	First Graft, Deceased Donor	318	296	324	342	318	324	331	349	350	364	<b>3,316</b>
	First Graft, Living Donor	42	52	58	56	59	48	50	50	63	52	<b>530</b>
	Re-Transplants	27	24	42	33	33	34	28	33	35	46	<b>335</b>
<b>Total, All Ages</b>		<b>417</b>	<b>423</b>	<b>466</b>	<b>480</b>	<b>453</b>	<b>453</b>	<b>451</b>	<b>485</b>	<b>494</b>	<b>509</b>	<b>4,631</b>

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 37: Combination Liver Transplants, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>Liver Only</b>	414	416	447	468	442	440	442	481	484	498	<b>4,532</b>
<b>Liver Combinations</b>	3	7	19	12	11	13	9	4	10	11	<b>99</b>
<b>Total</b>	<b>417</b>	<b>423</b>	<b>466</b>	<b>480</b>	<b>453</b>	<b>453</b>	<b>451</b>	<b>485</b>	<b>494</b>	<b>509</b>	<b>4,631</b>

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 38: Primary Diagnosis\* for Liver Transplant Recipients, First Graft, by Age Group, Canada, 2004 to 2013 (Percentage)**

	Age <1	Age 1–10	Age 11–17	Age 18–34	Age 35–59	Age 60+	Total
<b>Primary Biliary Atresia</b>	53.1	25.9	3.7	1.2	0.2	0.2	<b>2.6</b>
<b>Hepatitis C</b>	0	0	0	2.3	27.5	17.1	<b>21.0</b>
<b>Hepatitis B</b>	0	0	1.2	6.1	4.9	4.4	<b>4.5</b>
<b>Other Hepatitis</b>	2.1	4.6	12.3	14.1	3.2	2.5	<b>3.9</b>
<b>Alcoholic Cirrhosis</b>	0	0	0	0.9	16.0	17.2	<b>14.1</b>
<b>Cryptogenic Cirrhosis</b>	0	0	3.7	3.2	2.8	4.0	<b>3.0</b>
<b>Cancer</b>	1.4	8.6	3.7	6.1	16.0	24.8	<b>16.7</b>
<b>Metabolic Disorders</b>	6.3	10.9	6.2	6.9	2.1	1.9	<b>2.8</b>
<b>Cholestatic Liver Disease</b>	3.5	6.3	23.5	26.2	11.0	9.5	<b>11.5</b>
<b>Unknown/Missing</b>	21.7	23.0	17.3	4.6	1.8	1.7	<b>3.5</b>
<b>Other*</b>	11.9	20.7	28.4	28.5	14.6	16.7	<b>16.4</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

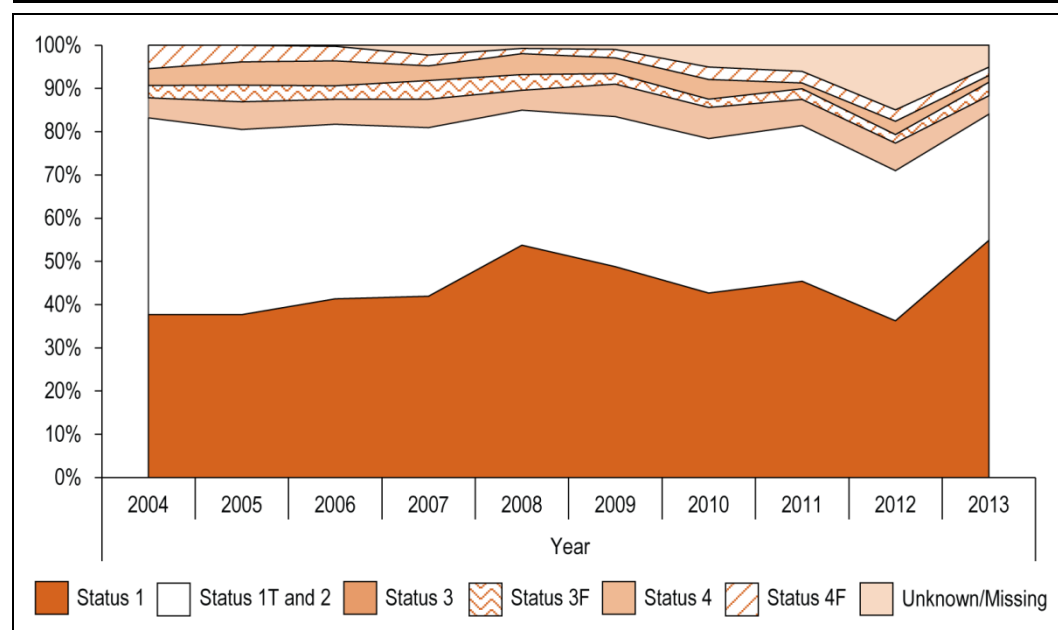
**Note**

\* For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 11: Distribution of Liver Transplants by Medical Status at Transplant, Canada, 2004 to 2013**



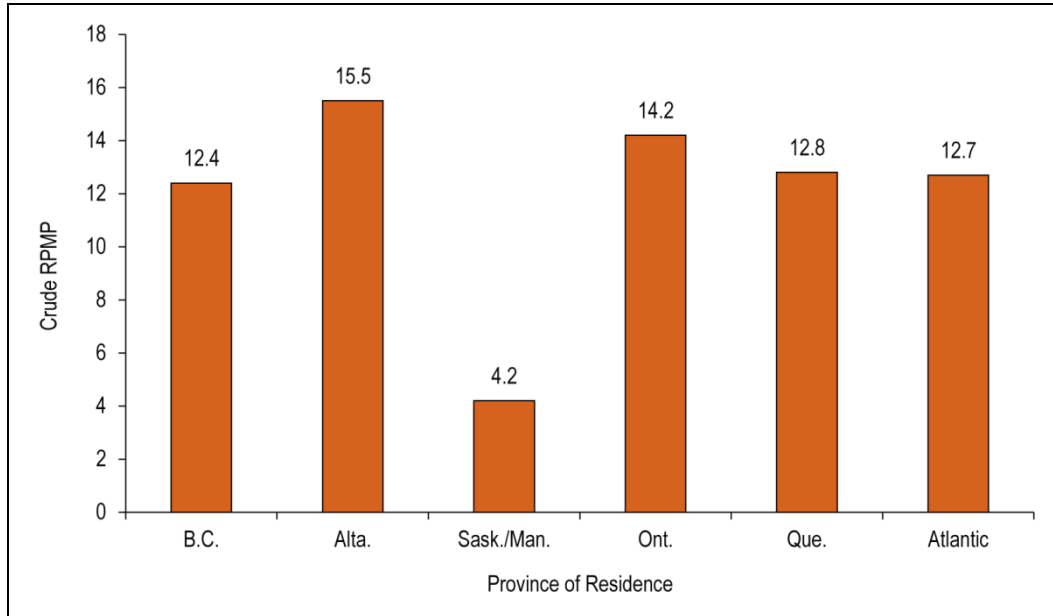
**Note**

Because of differences in classification, records from Ontario in 2013 were excluded.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 12: Liver Transplant Recipients by Province of Residence, Canada, 2013  
(Crude Rate per Million Population)**



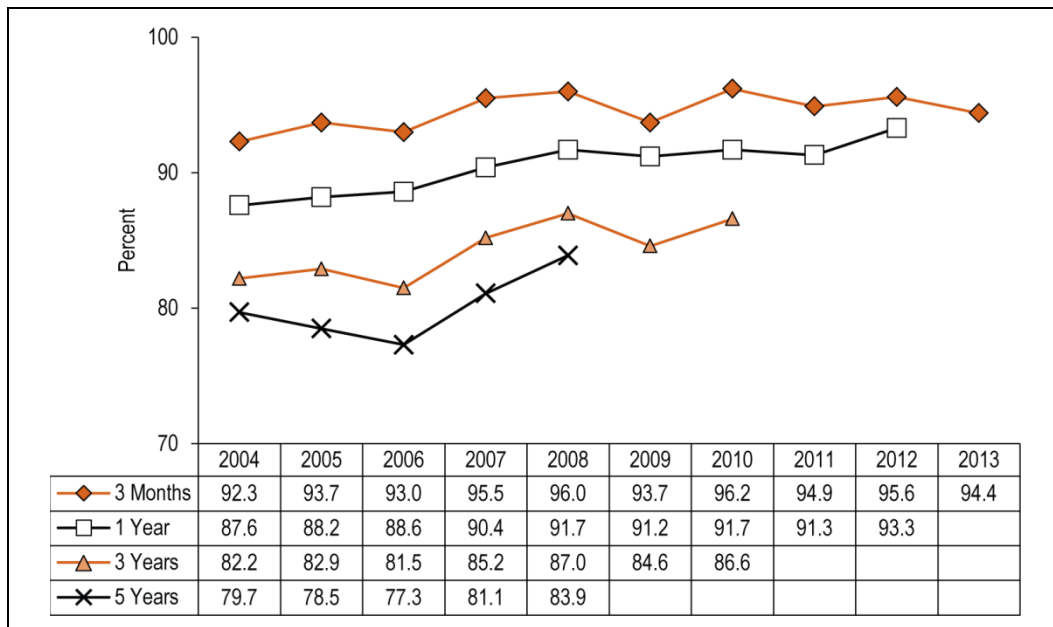
**Note**

Data from the Atlantic provinces was combined, as was data from Saskatchewan and Manitoba, because of small numbers.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 13: Unadjusted Three-Month and One-, Three- and Five-Year Patient Survival Rates for Deceased-Donor Liver Transplant Recipients, First Graft, Canada, 2004 to 2013 (Percentage)**



**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 39: Prevalent Liver Transplant Patients, by Province of Treatment/Follow-Up, Canada, 2004 to 2013 (Number)**

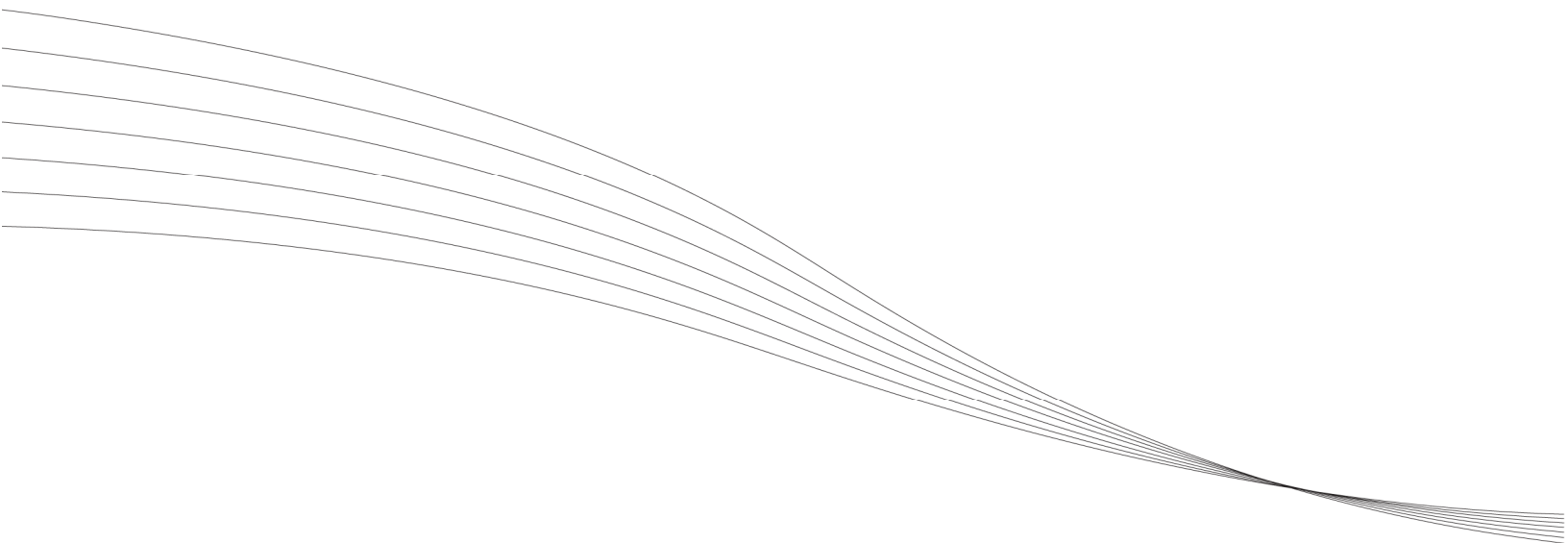
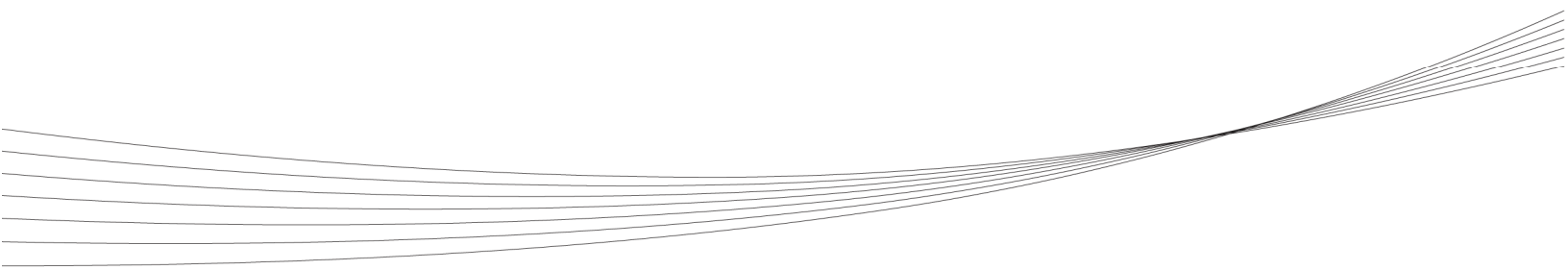
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>B.C.</b>	306	328	351	382	415	434	474	503	546	577
<b>Alta.</b>	466	491	537	558	574	601	635	669	697	734
<b>Sask.</b>	42	46	51	61	67	75	75	73	69	68
<b>Man.</b>	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
<b>Ont.</b>	1,647	1,767	1,886	2,033	2,155	2,281	2,416	2,561	2,731	2,869
<b>Que.</b>	774	825	870	932	999	1,059	1,105	1,156	1,195	1,267
<b>N.B.</b>	<5	<5	0	<5	<5	<5	<5	<5	<5	<5
<b>N.S.</b>	196	210	228	243	260	278	287	300	303	314
<b>N.L.</b>	<5	<5	<5	<5	<5	<5	<5	<5	0	0
<b>Total</b>	<b>3,437</b>	<b>3,673</b>	<b>3,928</b>	<b>4,213</b>	<b>4,474</b>	<b>4,732</b>	<b>4,997</b>	<b>5,267</b>	<b>5,545</b>	<b>5,833</b>

**Note**

Cell values from 1 to 4 are suppressed in accordance with CIHI's privacy policy.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.





## Chapter 4—Heart Transplantation







## 4 Heart Transplantation

Heart transplantation is the treatment of last resort for people with heart failure. In Canada, heart transplants are the third most common organ transplant operation, after kidney and liver transplants. This section discusses the trends in heart transplantation procedures and outcomes in Canada over the decade from 2004 to 2013.

There were 167 people on the waiting list for a heart transplant in 2013. Between 2004 and 2013, there were 1,675 heart transplants registered in CORR, including 59 re-transplants. The number of transplants performed each year fluctuated from a low of 143 in 2004 to a high of 192 in 2013. Children accounted for 19% (299) of all first graft heart transplants over the decade. The largest number of first transplants was performed on recipients between age 35 and 59 (807), followed by those age 60 and older (337) (Table 41). The crude RPMP for heart transplants varied from 4.6 to 6.8 across Canada (Figure 14).

Persons on the waiting list for a heart transplant are categorized according to their medical status at the time of transplant. Status 1 and 2 patients are classified as non-urgent and may be at home or in hospital. Status 3, 3B and 4 patients are in the most urgent need of a transplant. Status 3A and 3B patients may be in the ICU or on inotropic drugs to strengthen heart muscle contractions, while Status 4 patients are already in the ICU with ventilator support. With the exception of 2008, more than half of all heart transplants have been classified as urgent in the last decade (Figure 15).

Survival rates generally showed continued improvement for much of the period under examination (Figure 16). In 2010, 82% of recipients survived the first three years, and five-year survival also improved from 75% to 90% between 2004 and 2008.

In 2013, there were 2,611 Canadians living with a heart transplant.

**Table 40: Heart Transplant Waiting List at December 31 and Deaths, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>Age 0–17</b>	6	9	7	13	17	12	14	23	23	21	<b>145</b>
<b>Age 18+</b>	119	87	80	102	114	124	121	143	160	146	<b>1,196</b>
<b>Waiting List</b>	125	96	87	115	131	136	135	166	183	167	<b>1,341</b>
<b>Deaths on Waiting List</b>	26	27	13	19	14	30	22	25	15	20	<b>211</b>

### Note

\* Results are supplemented with data from Transplant Québec. For more details see Section 1.2.

### Sources

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 41: Heart Transplants by Year, Age Group and Re-Transplants, Canada, 2004 to 2013 (Number)**

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>Pediatric: Age 0–17</b>	First Graft Age <1	14	15	17	7	16	17	5	8	7	7	<b>113</b>
	First Graft Age 1–10	7	8	7	9	6	11	12	10	8	10	<b>88</b>
	First Graft Age 11–17	9	9	9	11	15	9	9	8	9	10	<b>98</b>
<b>Adults: Age 18+</b>	First Graft Age 18–34	13	18	27	14	19	17	21	12	16	16	<b>173</b>
	First Graft Age 35–59	66	85	91	85	75	78	73	78	81	95	<b>807</b>
	First Graft Age 60+	30	33	20	31	30	33	47	27	41	45	<b>337</b>
<b>Re-Transplants</b>		4	6	7	6	3	3	2	12	7	9	<b>59</b>
<b>Total</b>		<b>143</b>	<b>174</b>	<b>178</b>	<b>163</b>	<b>164</b>	<b>168</b>	<b>169</b>	<b>155</b>	<b>169</b>	<b>192</b>	<b>1,675</b>

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 42: Primary Diagnosis\* for Heart Transplant Recipients, Canada, 2004 to 2013 (Percentage)**

	Age <1	Age 1–10	Age 11–17	Age 18–34	Age 35–59	Age 60+	Total
<b>Congenital</b>	35.2	23.1	13.6	12.0	3.2	0	<b>7.5</b>
<b>Cardiomyopathy Unspecified</b>	6.6	4.4	11.7	9.8	11.4	9.8	<b>10.2</b>
<b>Dilated Cardiomyopathy</b>	9.0	7.7	18.4	24.5	21.8	17.3	<b>19.3</b>
<b>Idiopathic Cardiomyopathy</b>	4.9	13.2	3.9	15.8	10.1	11.5	<b>10.4</b>
<b>Ischemic Cardiomyopathy</b>	0	0	1.0	4.9	24.7	41.2	<b>21.4</b>
<b>Unknown/Not Reported</b>	21.3	28.6	29.1	3.8	3.6	3.7	<b>7.8</b>
<b>Other*</b>	23.0	23.1	22.3	29.3	25.3	16.4	<b>23.5</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

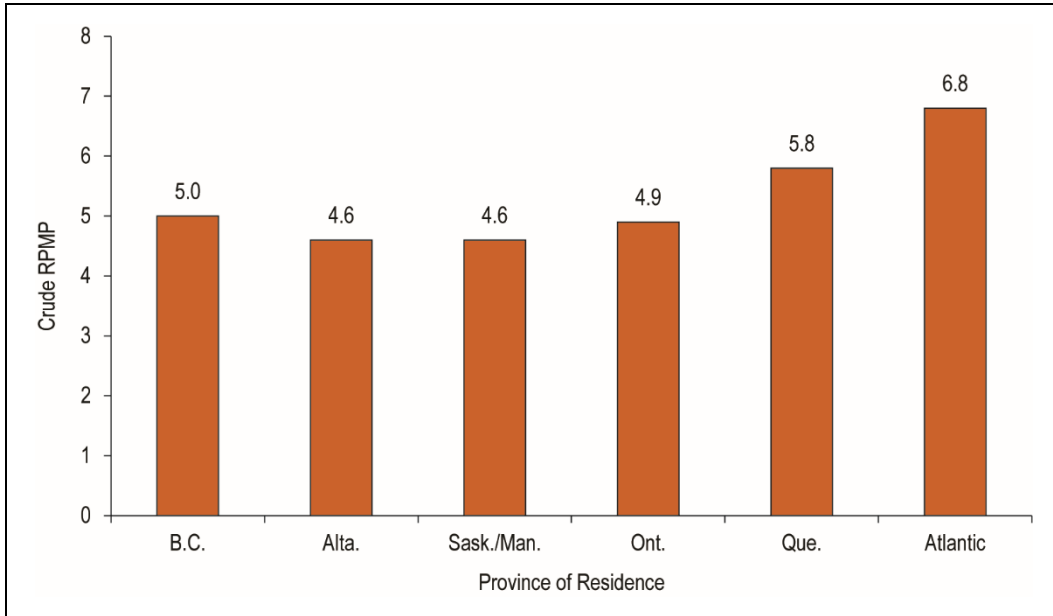
**Note**

\* For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 14: Heart Transplant Recipients by Province of Residence, Canada, 2013  
(Crude Rate per Million Population)**



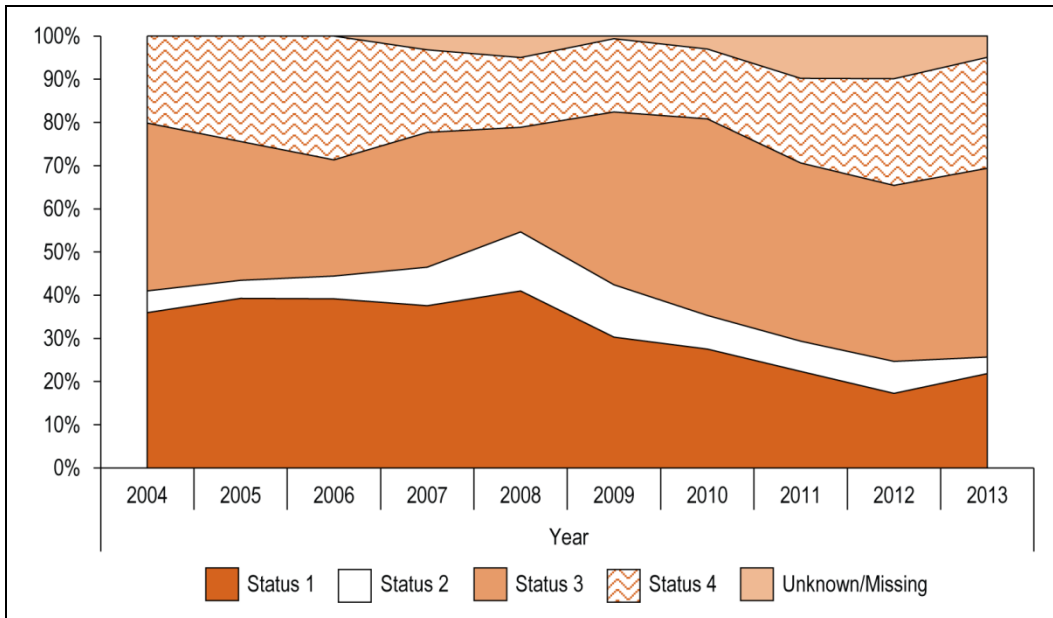
**Note**

Data from the Atlantic provinces was combined, as was data from Saskatchewan and Manitoba, because of small numbers.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 15: Distribution of Heart Transplants by Medical Status\* at Transplant, Canada, 2004 to 2013**



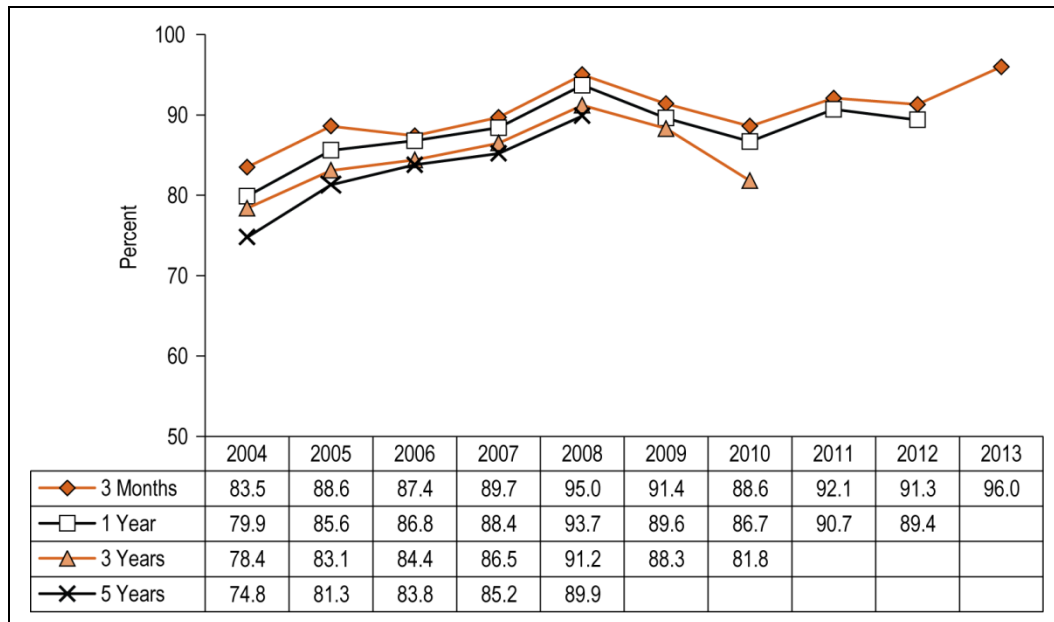
**Note**

\* Status 1: At home; Status 2: Hospitalized; Status 3: Hospitalized in ICU receiving inotropes, younger than age 6 months or with rapid deterioration; Status 4: In ICU with mechanical/ventilatory support; Unknown: Status not provided.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 16: Unadjusted Three-Month and One-, Three- and Five-Year Patient Survival Rates for Heart Transplant Recipients, First Graft, Canada, 2004 to 2013 (Percentage)**



**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 43: Prevalent Heart Transplant Patients, by Province of Treatment/Follow-Up, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>B.C.</b>	181	191	198	211	225	226	238	246	253	265
<b>Alta.</b>	293	319	343	357	371	396	414	434	456	471
<b>Sask.</b>	14	14	15	16	20	22	22	21	21	21
<b>Man.</b>	5	<5	<5	<5	<5	<5	8	9	8	7
<b>Ont.</b>	720	751	778	810	844	884	924	947	987	1,040
<b>Que.</b>	484	493	503	524	558	592	613	633	648	674
<b>N.S.</b>	103	106	108	111	114	122	124	127	130	133
<b>Canada</b>	<b>1,800</b>	<b>1,878</b>	<b>1,949</b>	<b>2,032</b>	<b>2,135</b>	<b>2,245</b>	<b>2,343</b>	<b>2,417</b>	<b>2,503</b>	<b>2,611</b>

**Note**

Cell values from 1 to 4 are suppressed in accordance with CIHI's privacy policy.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



## Chapter 5—Lung Transplantation





## 5 Lung Transplantation

The first single-lung transplant procedure in Canada was performed in 1983, followed by the first bilateral lung transplant in 1986. Since then, outcomes for lung transplant recipients have continued to improve for several reasons: better organ preservation techniques, improvements in pre- and peri-operative care, better follow-up medical management of recipients and advances in immunosuppression. Lung transplant activity almost doubled in the last decade in Canada. This section presents the evolving landscape of lung transplant procedures in Canada during the decade from 2004 to 2013.

There were 314 people on the waiting list for a lung transplant in 2013. Between 2004 and 2013, there was an increase in the annual number of lung transplants performed in Canada. During the decade, there were 1,791 lung transplants, with a large increase in 2013 over 2012 (247 and 191, respectively) (Table 45). Of the 247 reported lung transplants performed in 2013, 86% were bilateral lung transplants (Table 46). Since 2004, the number of bilateral lung transplants has increased by 116%, from 98 to 212. Single-lung transplant volumes have been steady over the past decade, averaging 28 procedures per year (Table 46).

In 2013, Ontario and Alberta had the highest rates of lung transplantation, at 7.7 RPMP each (Figure 17).

Rates of patient survival for lung transplant generally show a slight increasing trend (Figure 18). Three-year survival increased from 71% to 74% between 2004 and 2010. Similarly, five-year survival increased from 60% to 66% between 2004 and 2008. Three-month and one-year survival showed similar improvements (92% to 93% from 2004 to 2013, and 81% to 87% from 2004 to 2012, respectively).

There were 1,524 Canadians living with a transplanted lung in 2013 (Table 48).

**Table 44: Lung Transplant Waiting List at December 31 and Waiting List Deaths, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>Bilateral Lung</b>	155	188	147	183	147	137	178	188	174	242	<b>1,739</b>
<b>Single Lung</b>	22	29	84	51	129	104	125	122	144	67	<b>877</b>
<b>Heart–Lung</b>	4	14	11	9	6	1	7	5	11	5	<b>73</b>
<b>Total</b>	<b>181</b>	<b>231</b>	<b>242</b>	<b>243</b>	<b>282</b>	<b>242</b>	<b>310</b>	<b>315</b>	<b>329</b>	<b>314</b>	<b>2,689</b>
<b>Deaths on Waiting List</b>	43	43	35	43	44	44	51	68	69	52	492

**Note**

\* Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 45: Lung Transplants by Year, Age Group and Re-Transplants, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013	Total
<b>First Graft, Age 18+</b>	128	137	166	179	156	178	174	173	182	226	<b>1,699</b>
<b>First Graft, Age 0–17</b>	3	5	4	4	6	4	3	5	1	7	<b>42</b>
<b>Re-Transplants</b>	2	3	1	4	5	7	3	3	8	14	<b>50</b>
<b>Total</b>	<b>133</b>	<b>145</b>	<b>171</b>	<b>187</b>	<b>167</b>	<b>189</b>	<b>180</b>	<b>181</b>	<b>191</b>	<b>247</b>	<b>1,791</b>

**Note**

\* Missing data for three lung transplants in Quebec in 2012.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 46: Lung Transplants by Transplant Type, Canada, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013	Total
<b>Bilateral Lung</b>	98	119	129	152	135	153	153	165	157	212	<b>1,473</b>
<b>Single Lung</b>	30	19	35	32	28	31	25	13	31	35	<b>279</b>
<b>Living-Donor Lobar</b>	2	1	1	0	0	0	0	1	0	0	<b>5</b>
<b>Heart–Lung</b>	3	6	6	3	4	5	2	2	3	0	<b>34</b>
<b>Total</b>	<b>133</b>	<b>145</b>	<b>171</b>	<b>187</b>	<b>167</b>	<b>189</b>	<b>180</b>	<b>181</b>	<b>191</b>	<b>247</b>	<b>1,791</b>

**Note**

\* Missing data for three lung transplants in Quebec in 2012.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



**Table 47: Primary Diagnoses\* for Lung Transplant Recipients, First Graft, Canada, 2004 to 2013<sup>†</sup> (Number, Percentage)**

	Bilateral Lung		Single Lung		Heart-Lung	
	N	%	N	%	N	%
<b>Congenital</b>	6	0.4	0	0	6	17.1
<b>Alpha-1-Antitrypsin Deficiency</b>	55	3.8	9	3.1	0	0
<b>Cystic Fibrosis</b>	356	24.5	11	3.8	2	5.7
<b>Emphysema/Chronic Obstructive Pulmonary Disease</b>	335	23.1	105	36.2	5	14.3
<b>Idiopathic Pulmonary Fibrosis</b>	373	25.7	127	43.8	3	8.6
<b>Primary Pulmonary Hypertension</b>	66	4.5	3	1.0	5	14.3
<b>Unknown/Not Reported</b>	40	2.8	5	1.7	3	8.6
<b>Other<sup>‡</sup></b>	221	15.2	30	10.3	11	31.4
<b>Total</b>	<b>1,452</b>	<b>100</b>	<b>290</b>	<b>100</b>	<b>35</b>	<b>100</b>

**Notes**

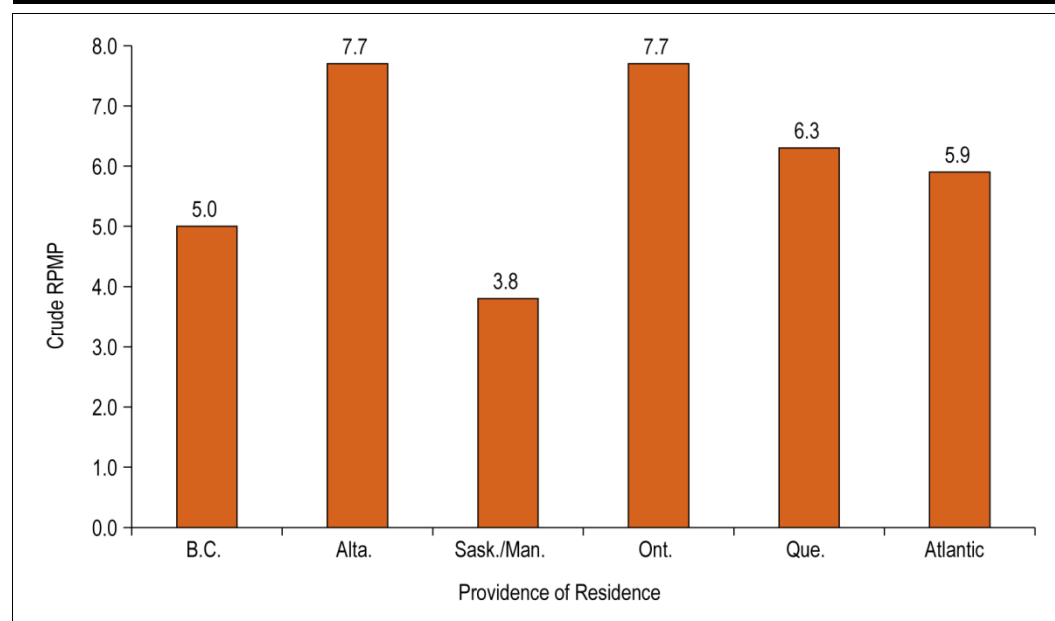
\* More than one diagnosis can be reported for a patient.

† Missing data for three lung transplants in Quebec in 2012.

‡ For a list of all primary diagnoses captured by CORR, see Appendix F.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

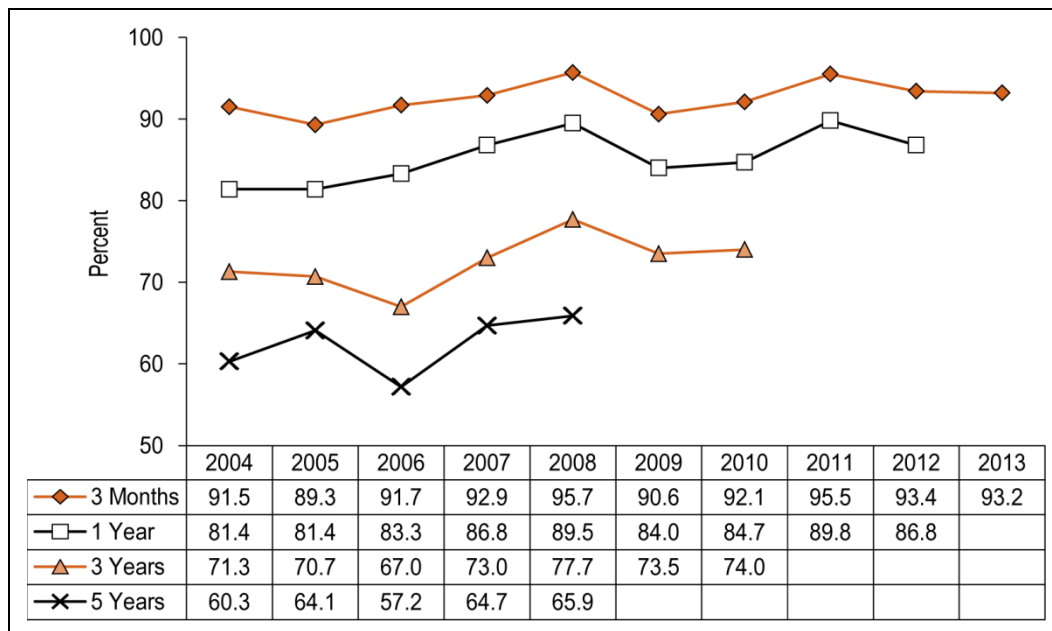
**Figure 17: Lung Transplant Recipients by Province of Residence, Canada, 2013 (Crude Rate per Million Population)****Note**

Data from the Atlantic provinces was combined, as was data from Saskatchewan and Manitoba, because of small numbers.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information; Statistics Canada.

**Figure 18: Unadjusted Three-Month and One-, Three- and Five-Year Patient Survival Rates\* for Lung Transplant Recipients, First Graft, Deceased-Donor Lungs, Canada, 2004 to 2013 (Percentage)**



**Note**

\* Survival rates may be affected by unreported lung transplants in Quebec in 2012 and unreported deaths in Quebec in 2011, 2012 and 2013. For more details, see Section 1.2.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Table 48: Prevalent Lung Transplant Patients, by Province of Treatment/Follow-Up, 2004 to 2013 (Number)**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013
<b>B.C.</b>	57	61	65	74	83	79	85	92	103	120
<b>Alta.</b>	148	168	187	206	222	225	244	260	272	279
<b>Sask.</b>	5	5	6	8	15	29	28	27	22	20
<b>Man.</b>	60	58	61	65	66	63	65	66	65	67
<b>Ont.</b>	330	362	409	476	516	558	589	644	691	765
<b>Que.</b>	157	155	169	186	192	211	224	235	248	273
<b>Canada</b>	<b>757</b>	<b>809</b>	<b>897</b>	<b>1,015</b>	<b>1,094</b>	<b>1,165</b>	<b>1,235</b>	<b>1,324</b>	<b>1,401</b>	<b>1,524</b>

**Note**

\* Missing data for three lung transplants in Quebec in 2012.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.



## Chapter 6—Pancreas Transplantation





## 6 Pancreas Transplantation

ESKD patients with underlying diabetes generally have two serious conditions, each of which may require different treatments. For kidney failure, patients need RRT. For diabetes, therapy must regulate glycemia. Pancreas transplantation offers those with type 1 diabetes the prospect of insulin independence and the stabilization of some diabetes-related complications. As such, it provides stable, long-term normoglycemia with normal or near-normal glucose tolerance, while avoiding hypoglycemic episodes. There are three types of pancreas transplants. The most common procedure is simultaneous kidney–pancreas transplantation (SKP) for ESKD recipients. Pancreas transplant after kidney transplant (PAK) and pancreas transplant alone (PTA) are less common. The introduction of cyclosporin and anti-T-cell agents, new surgical techniques and refined patient-selection criteria all contributed to improved outcomes for pancreatic transplantation.

The number of individuals on the waiting list for a pancreas transplant in 2013 was 177 (Table 49). Of those on the waiting list, 59% were waiting for a simultaneous kidney–pancreas transplant.

During the decade from 2004 to 2013, there were 700 pancreas transplants performed in Canada (Table 50). The majority of the transplants performed (72%) were SKP procedures. Table 51 summarizes islet cell transplants, a medical procedure that involves replacing the insulin-producing cells of the pancreas (islet cells) that are destroyed in people with type 1 diabetes. Since 2004, 411 procedures have been performed on 311 patients (in general, patients receive two procedures).

More pancreas transplantations in Canada have been performed on men than women (Figure 19).

Rates of patient survival for simultaneous kidney–pancreas transplant are presented in Figure 20. Declining longer-term survival rates have been observed, with three-year survival decreasing from 96% to 90% between 2004 and 2010 and five-year survival decreasing from 96% to 87% between 2004 and 2008.

**Table 49: Pancreas Transplant Waiting List at December 31, Canada, 2004 to 2013**

Transplant	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>SKP</b>	103	132	113	126	103	56	107	108	122	105	<b>1,075</b>
<b>PAK/PTA</b>	51	63	63	55	32	42	68	63	58	72	<b>567</b>
<b>Total</b>	<b>154</b>	<b>195</b>	<b>176</b>	<b>181</b>	<b>135</b>	<b>98</b>	<b>175</b>	<b>171</b>	<b>180</b>	<b>177</b>	<b>1,642</b>

### Notes

\* Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

SKP: Simultaneous kidney–pancreas transplant; PAK: Pancreas after kidney transplant; PTA: Pancreas transplant alone.

### Sources

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 50: Pancreas Transplants by Year, Canada, 2004 to 2013 (Number)**

Transplant	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*	Total
<b>SKP</b>	47	53	55	50	63	48	50	54	42	44	<b>506</b>
<b>PAK</b>	11	12	13	13	18	19	19	12	24	15	<b>156</b>
<b>PTA</b>	3	6	5	6	3	2	5	3	5	0	<b>38</b>
<b>Total</b>	<b>61</b>	<b>71</b>	<b>73</b>	<b>69</b>	<b>84</b>	<b>69</b>	<b>74</b>	<b>69</b>	<b>71</b>	<b>59</b>	<b>700</b>

**Notes**

\* Missing data for five SKPs and one PTA in Quebec in 2013.

SKP: Simultaneous kidney–pancreas transplant; PAK: Pancreas after kidney transplant; PTA: Pancreas transplant alone.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

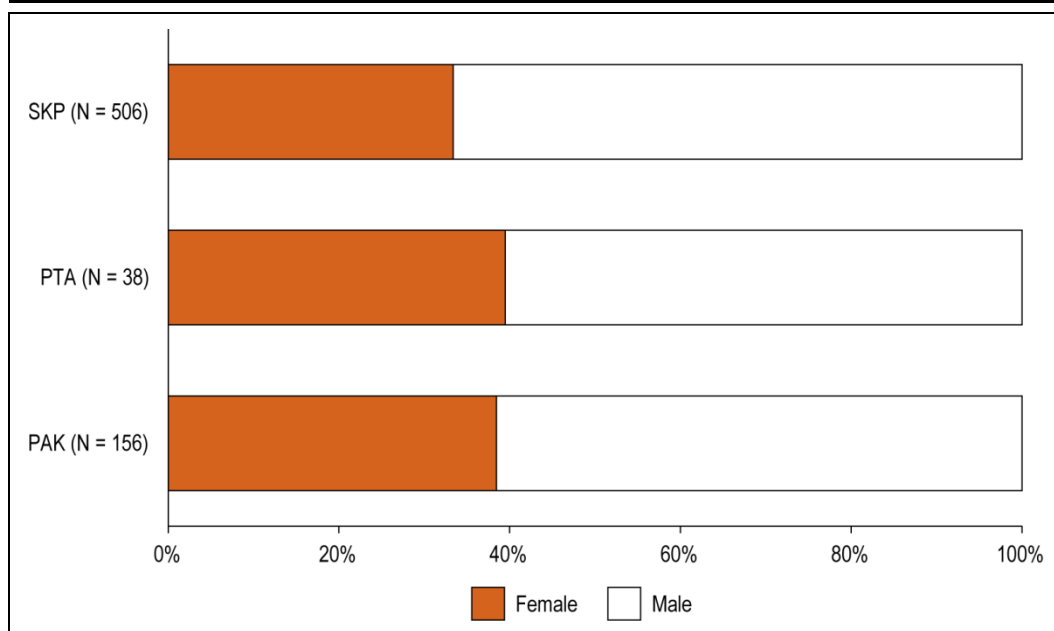
**Table 51: Islet Cell Transplants in Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<b>Patients</b>	25	28	31	18	28	29	32	27	49	44	<b>311</b>
<b>Procedures</b>	39	39	39	25	35	38	44	36	62	54	<b>411</b>

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 19: Pancreas Transplant Recipients by Type and Recipient Sex, First Graft, Canada, 2004 to 2013 (Percentage)**



**Notes**

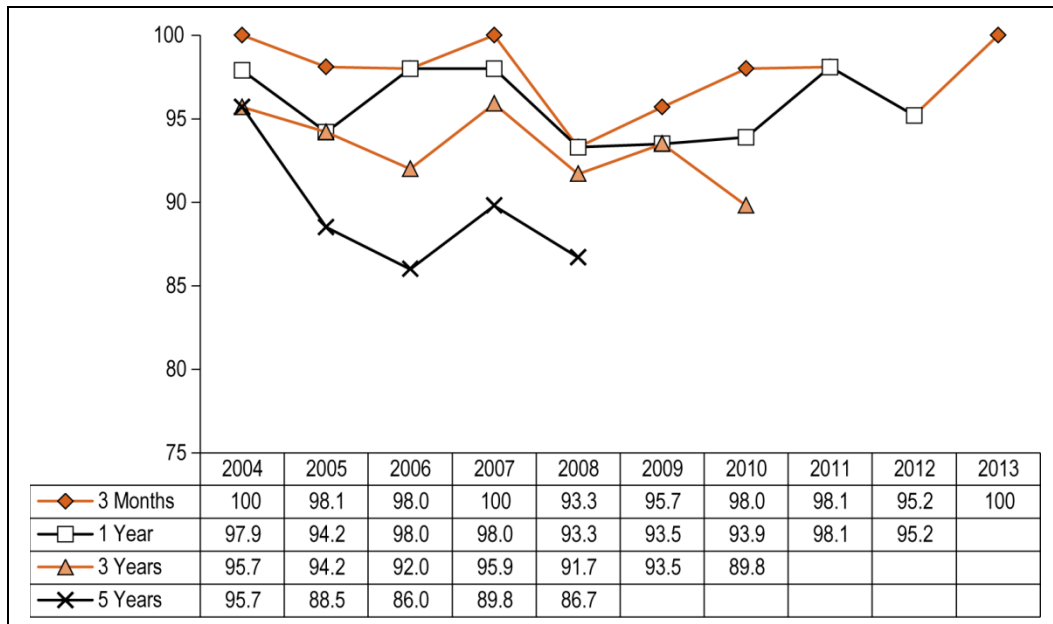
Missing data for five SKPs and one PTA in Quebec in 2013.

SKP: Simultaneous kidney–pancreas transplant; PAK: Pancreas after kidney transplant; PTA: Pancreas transplant alone.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

**Figure 20: Unadjusted Three-Month and One-, Three- and Five-Year Graft Survival Rates in Simultaneous Kidney–Pancreas Transplant Recipients, by Year of Transplant, First Graft, Canada, 2004 to 2013 (Percentage)**

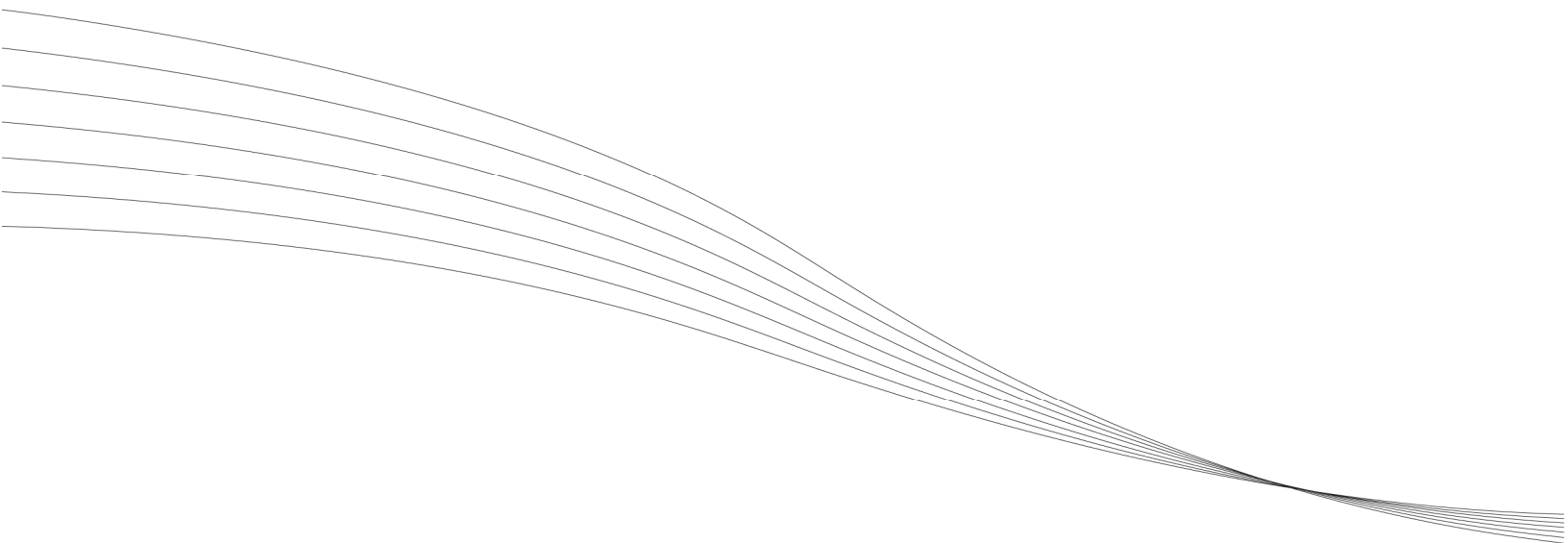
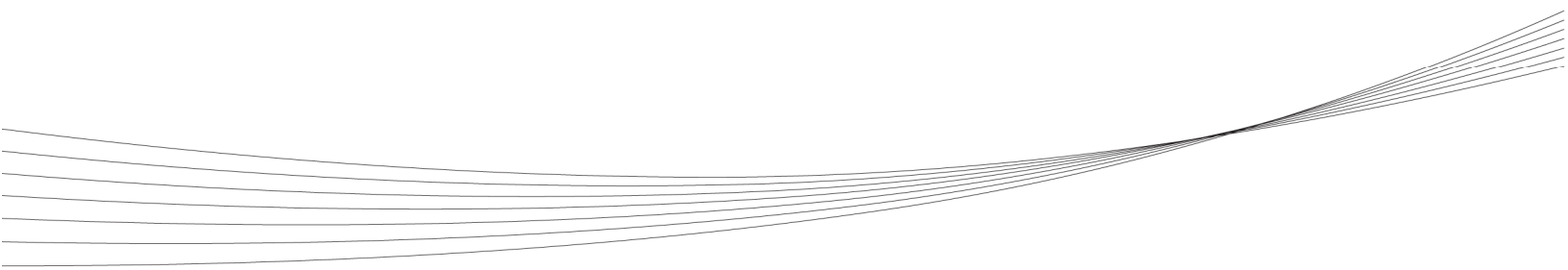


**Note**

Missing data for five SKPs in Quebec in 2013.

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.







## Chapter 7—Intestinal Transplantation





## 7 Intestinal Transplantation<sup>viii</sup>

Small intestine transplantation is an evolving surgical procedure used in the management of intestinal failure in children and adults. In spite of recent advances, intestinal transplantation is currently a therapeutic option only for patients with increasing intestinal failure despite total parenteral nutrition (TPN). It is not yet an alternative for patients who are doing well on TPN.

Since 1994, there have been 56 intestinal transplants reported to CORR (Table 52). The transplants were almost evenly split between pediatric patients and adult recipients (57% versus 43%). The majority of liver–small intestine transplants were performed on pediatric patients (84%).

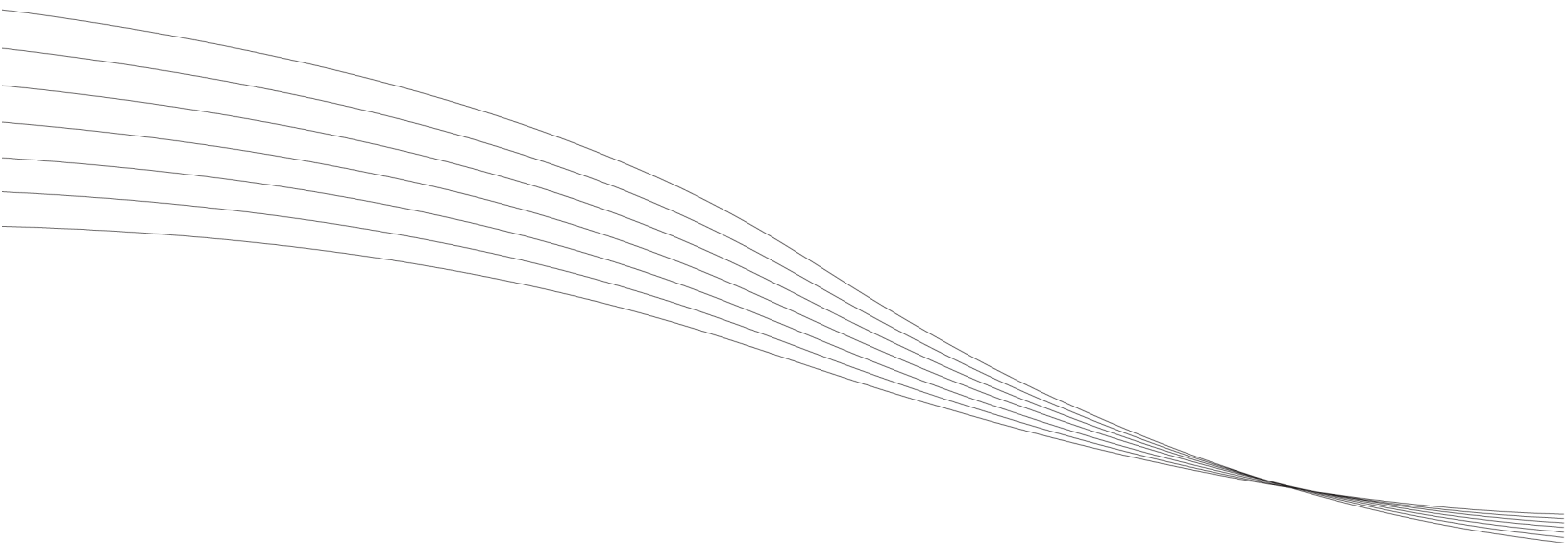
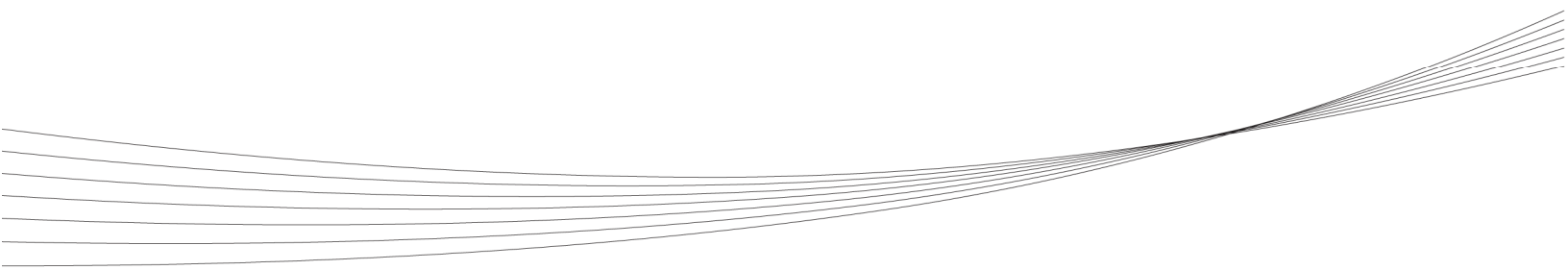
**Table 52: Intestinal Transplants by Transplant Period and Age Group, Canada, 1994 to 2013 (Number)**

Type of Transplant	1994–2003		2004–2013		Total		
	Age 0–17	Age 18+	Age 0–17	Age 18+	Age 0–17	Age 18+	All Ages
<b>Multi-Visceral</b>	2	4	5	5	7	9	16
<b>Isolated Small Intestine</b>	7	3	1	8	8	11	19
<b>Liver–Small Intestine</b>	7	1	9	2	16	3	19
<b>Kidney–Small Intestine</b>	0	1	0	0	0	1	1
<b>Liver–Kidney–Small Intestine</b>	1	0	0	0	1	0	1
<b>Total</b>	<b>17</b>	<b>9</b>	<b>15</b>	<b>15</b>	<b>32</b>	<b>24</b>	<b>56</b>

**Source**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

viii. The information on intestinal transplantation is restricted in content by the small number of intestinal transplants. In this section, the time period of observation differs from the remainder of the report in that it is expanded to include the years between 1994 and 2013.





## Chapter 8—Donors





## 8 Donors<sup>ix</sup>

Overall, the number of Canadian organ donors increased from 887 in 2004 to 1,141 in 2013, a relative increase of 29% (Figure 21). During that same period, both the number of deceased and living donors generally increased, and in 2013 living donors outnumbered deceased donors (588 versus 553). As a result of this increase in donors, transplant procedures increased 32%, from 1,779 in 2004 to 2,367 in 2013 (Figure 22).

Between 2004 and 2013, 37% of living donors in Canada were unrelated (the definition of unrelated includes spouses). The proportion of unrelated donors has increased from 27% of living donors in 2004 to 44% in 2013 (Table 55).

### A Note About Deceased-Donor Rates

In Canada, deceased organ donors are defined as donors from whom at least one organ was recovered and transplanted. This definition is more conservative than that used in the United States by the United Network of Organ Sharing, which includes donors whose organs were recovered but not transplanted.

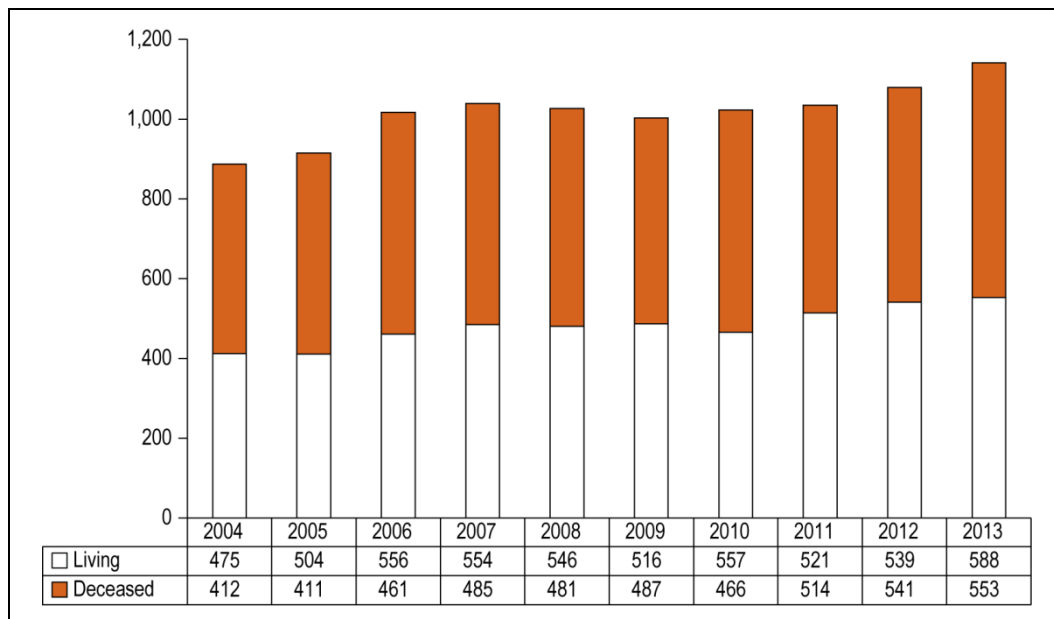
Currently, the deceased donor rate per million population (DRPM) remains the most commonly used metric of deceased organ donation activity in Canada and internationally. The deceased DRPM does not take into account variation in the number of potential organ donors who die in hospital. This number can be influenced by a variety of socio-demographic and non-health system related factors. As such, the deceased DRPM may vary between countries or regions for reasons other than the efficiency of the health care system in identifying and obtaining consent for deceased organ donation. The extent to which socio-demographic and non-health system related factors may influence the deceased DRPM in different regions within the same country has not been well studied. If the population in a given region or country is relatively constant over time, the deceased DRPM may provide valuable information regarding longitudinal changes in organ donation activity within a given region.

The overall deceased DRPM for Canada in 2013 was 15.7, the highest rate achieved during the 10-year period and 22% above the rate recorded in 2004 (Figure 23). The living DRPM was 16.7. Figures 24 and 25 provide corresponding regional donor rates.

In December 2014, CIHI released a report titled *Deceased Organ Donor Potential in Canada*. This study examined data on more than 100,000 hospital deaths per year and found significant variation across Canada in the ratio of potential to actual donors. The report also found that approximately two-thirds of deceased patients who are eligible to donate do not convert into actual donors. This report can be found on CIHI's website at [www.cihi.ca](http://www.cihi.ca).

ix. Given the importance of donor numbers and donor rates, some of the tables in this chapter have been supplemented with numbers from Transplant Québec's *Statistiques officielles 2013*.

Figure 21: Number of Canadian Organ Donors by Donor Source (Deceased or Living), 2004 to 2013



**Note**

Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

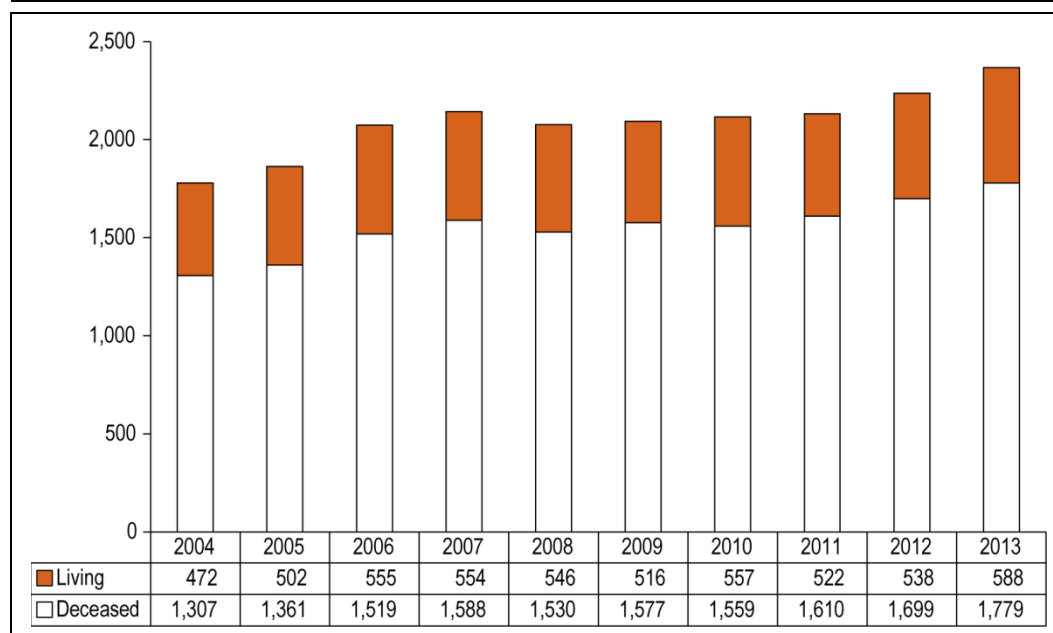
Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.



**Figure 22: Number of Solid Organ Transplants by Donor Source (Deceased or Living), Canada, 2004 to 2013**



**Note**

Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 53: Number of Deceased Donors by Age Group, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>Age 0–17</b>	29	47	41	53	49	39	34	43	50	31	<b>416</b>
<b>Age 18–39</b>	114	99	115	108	131	125	138	128	146	136	<b>1,240</b>
<b>Age 40–49</b>	86	83	102	101	92	86	82	97	102	99	<b>930</b>
<b>Age 50–54</b>	43	51	53	60	50	51	74	55	60	64	<b>561</b>
<b>Age 55–59</b>	46	44	48	52	58	53	42	60	69	60	<b>532</b>
<b>Age 60+</b>	94	87	102	111	101	133	96	131	114	163	<b>1,132</b>
<b>Total</b>	<b>412</b>	<b>411</b>	<b>461</b>	<b>485</b>	<b>481</b>	<b>487</b>	<b>466</b>	<b>514</b>	<b>541</b>	<b>553</b>	<b>4,811</b>

**Note**

\* Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 54: Number of Living Donors by Age Group, Canada, 2004 to 2013**

	2004	2005	2006	2007	2008	2009	2010	2011	2012*	2013*	Total
<b>Age 0–39</b>	190	180	218	199	188	169	192	189	207	192	<b>1,924</b>
<b>Age 40–49</b>	151	159	163	178	178	171	170	144	129	172	<b>1,615</b>
<b>Age 50–54</b>	61	66	66	78	86	72	73	85	75	85	<b>747</b>
<b>Age 55–59</b>	34	48	49	68	56	54	64	60	66	56	<b>555</b>
<b>Age 60+</b>	22	23	32	31	37	50	58	43	52	68	<b>416</b>
<b>Unknown</b>	17	28	28	—	1	—	—	—	10	15	<b>99</b>
<b>Total</b>	<b>475</b>	<b>504</b>	<b>556</b>	<b>554</b>	<b>546</b>	<b>516</b>	<b>557</b>	<b>521</b>	<b>539</b>	<b>588</b>	<b>5,356</b>

**Note**

\* Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Table 55: Living Donor by Relationship of Donor to Recipient, Canada, 2004 to 2013**

	Parent	Sibling	Offspring	Other Related <sup>†</sup>	Spouse	Unrelated	Total
<b>2004</b>	83	149	69	48	58	68	<b>475</b>
<b>2005</b>	76	150	76	40	86	76	<b>504</b>
<b>2006</b>	70	159	85	83	80	79	<b>556</b>
<b>2007</b>	88	149	85	40	91	101	<b>554</b>
<b>2008</b>	75	171	62	38	86	114	<b>546</b>
<b>2009</b>	74	120	76	46	96	104	<b>516</b>
<b>2010</b>	81	126	82	44	81	143	<b>557</b>
<b>2011</b>	68	132	51	46	85	139	<b>521</b>
<b>2012*</b>	82	107	88	31	74	147	<b>539</b>
<b>2013*</b>	83	128	70	36	78	178	<b>588</b>

**Notes**

\* Totals are supplemented with data from Transplant Québec. For more details, see Section 1.2.

† Family members such as aunts, uncles or cousins.

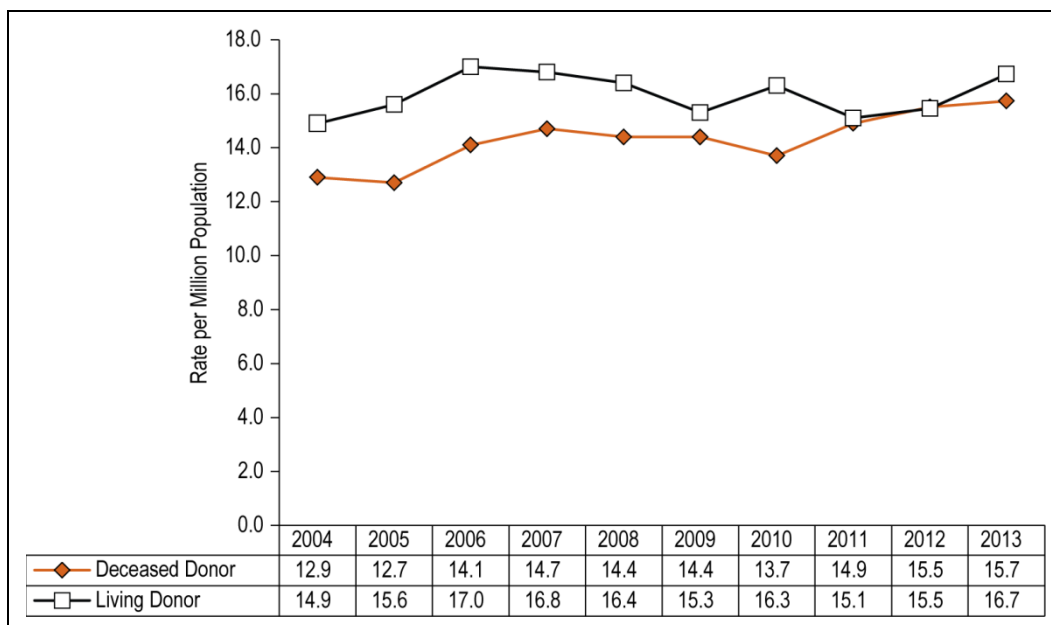
**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.

**Figure 23: Donor Rate per Million Population, by Donor Source (Deceased or Living), Canada, 2004 to 2013**



**Note**

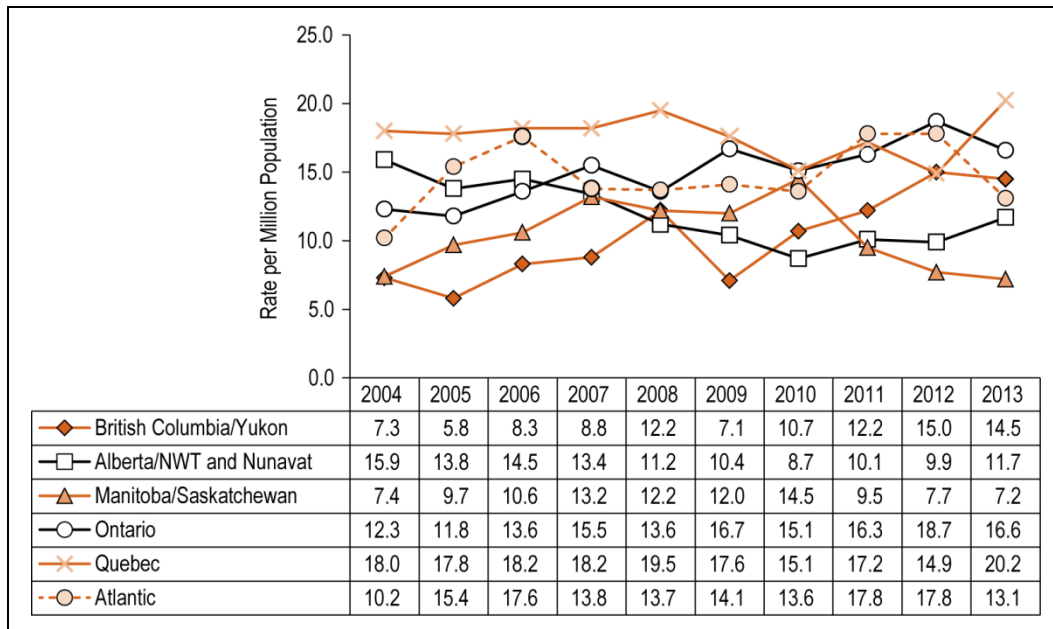
Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf). February 2014. Accessed January 8, 2015.

Figure 24: Deceased Donor Rate per Million Population by Region, Canada, 2004 to 2013



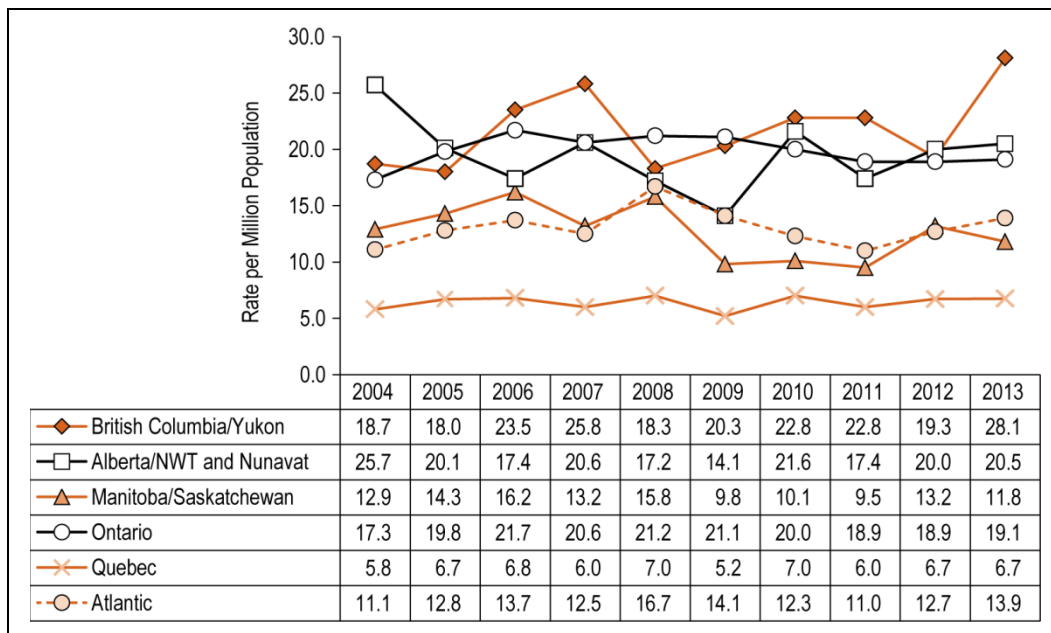
**Notes**

Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.  
Atlantic includes New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.

**Sources**

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.  
Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).  
February 2014. Accessed January 8, 2015.

**Figure 25: Living Donor Rate per Million Population, by Region, Canada, 2004 to 2013**



#### Notes

Results are supplemented with data from Transplant Québec. For more details, see Section 1.2.

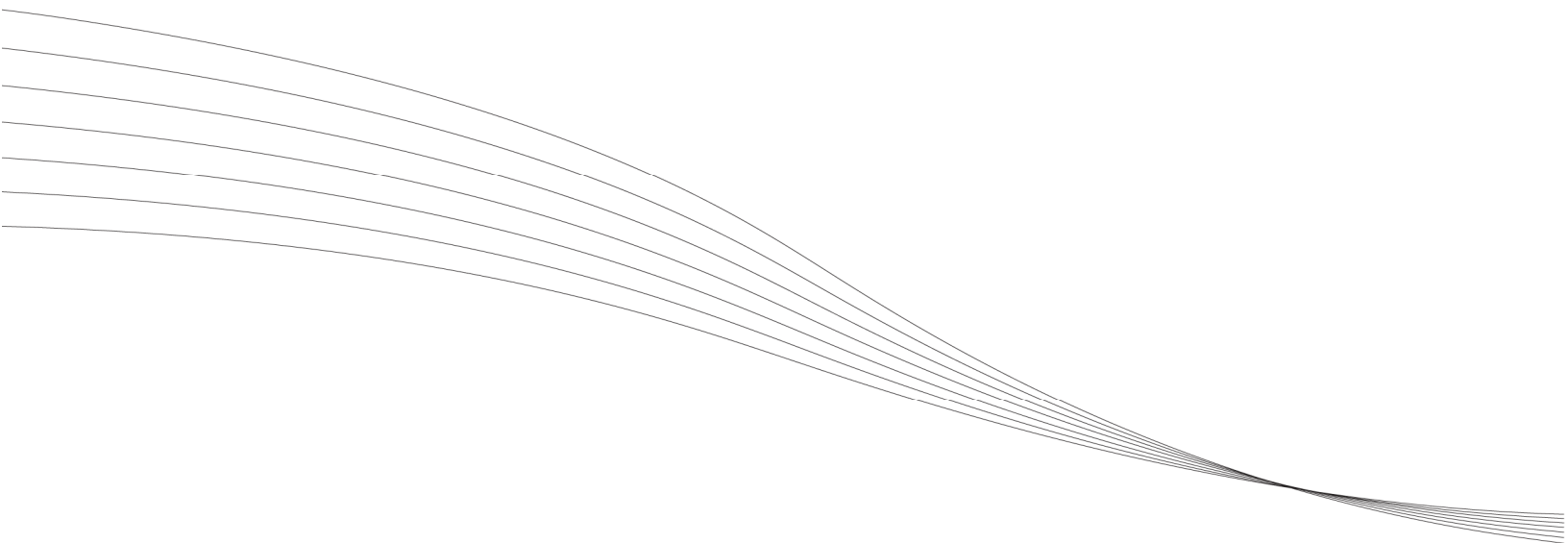
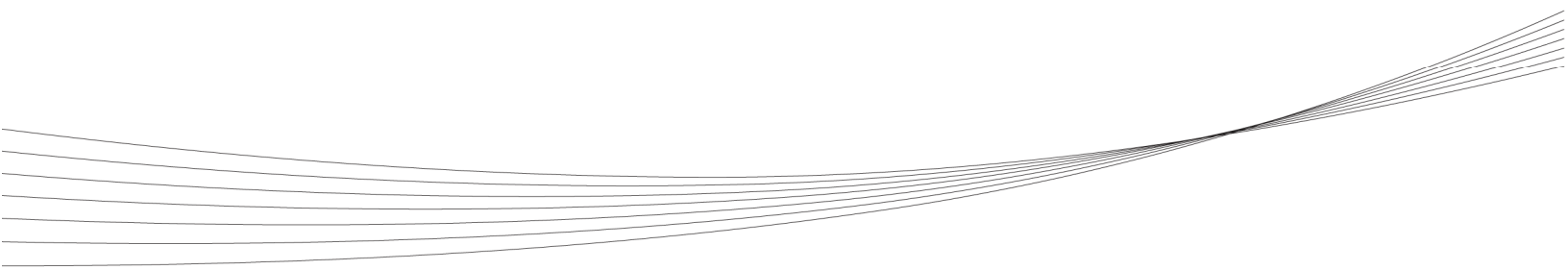
Atlantic includes New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.

#### Sources

Canadian Organ Replacement Register, 2014, Canadian Institute for Health Information.

Transplant Québec. *Statistiques officielles 2013*. [http://www.transplantquebec.ca/sites/default/files/statistiques\\_2013\\_3.pdf](http://www.transplantquebec.ca/sites/default/files/statistiques_2013_3.pdf).

February 2014. Accessed January 8, 2015.





# Appendices







# Appendix A—Canadian Organ Replacement Register Board of Directors

## CORR Board of Directors (December 1, 2014)

- Dr. Joseph Kim, Canadian Society of Transplantation—President
- Dr. Scott Klarenbach, Canadian Society of Nephrology—Vice President
- Dr. Louise Moist, Canadian Society of Nephrology—Past President
- Dr. Joanne Kappel, Canadian Society of Nephrology
- Dr. Daniel H. Kim
- Dr. Jean-Philippe Lafrance, Quebec Society of Nephrology
- Dr. Susan M. Samuel
- Dr. Lianne Singer
- Dr. Manish M Sood
- Dr. Jean Tchervenkov, Quebec Society of Transplant
- Ms. Alison Thomas
- Ms. Kim Young, Canadian Blood Services

The CORR Board of Directors and CIHI would like to thank Mr. Peter Houtt from the Kidney Foundation of Canada for his tremendous dedication and contributions as a long-serving board member acting as secretary/treasurer. With his passing in 2014, both organizations have lost an invaluable colleague and friend.



## Appendix B—Canadian Transplant Hospitals, Renal Programs and Independent Health Facilities Providing Dialysis to Chronic Renal Failure Patients as Reported to CORR

Hospital/Facility	Types of Transplants Performed in 2013								Dialysis Programs in 2013			
	Kidney	Liver	Heart	Heart/ Lung	Lung	Intestine/ Multi- Visceral	Pancreas/ Kidney– Pancreas	Islet Cell	HD	Home HD Training <sup>†</sup>	PD	Home PD Training
<b>Northwest Territories</b>												
Stanton Territorial Health Authority*									X			
Hay River Health Authority*									X			
<b>British Columbia<sup>†</sup></b>												
Abbotsford Regional									X		X	X
B.C. Children's	X								X		X	X
Kelowna General									X	X	X	X
Nanaimo Regional									X		X	X
Kootenay-Boundary Regional									X	X	X	X
Penticton Regional									X		X	X
University of Northern B.C.									X	X	X	X
Royal Columbian									X	X	X	X
Royal Inland									X	X	X	X
Royal Jubilee									X	X	X	X
St. Paul's	X		X						X	X	X	X
Surrey Memorial									X			
Vancouver General	X	X			X		X	X	X		X	X
<b>Alberta</b>												
SARP, Foothills Medical	X						X		X	X	X	X
NARP, University of Alberta	X	X	X	X	X	X	X	X	X	X	X	X
Alberta Children's Hospital	X								X		X	X
<b>Saskatchewan</b>												
Regina General									X	X	X	X
St. Paul's	X								X	X	X	X
<b>Manitoba</b>												
Brandon Regional									X			
Children's Hospital of Winnipeg	X								X		X	X
Health Sciences Centre	X			X	X				X	X		
Seven Oaks General									X	X	X	X
St. Boniface General									X		X	X

(cont'd on next page)

Canadian Organ Replacement Register Annual Report:  
Treatment of End-Stage Organ Failure in Canada, 2004 to 2013

Hospital/Facility	Types of Transplants Performed in 2013								Dialysis Programs in 2013			
	Kidney	Liver	Heart	Heart/ Lung	Lung	Intestine/ Multi- Visceral	Pancreas/ Kidney- Pancreas	Islet Cell	HD	Home HD Training <sup>†</sup>	PD	Home PD Training
<b>Ontario</b>												
Bayshore Centre Dialysis Brockville*									X			
Bayshore Centre Dialysis Stoney Creek*									X			
Brantford General*									X			
Children's Hospital of Eastern Ontario									X		X	X
Cornwall Dialysis Clinic*									X			
Credit Valley									X	X	X	X
Dialysis Management Clinics Inc.—Pickering*									X			
Dialysis Management Clinics Inc.—Markham*									X			
Dialysis Management Clinics Inc.—Peterborough*									X			
Grand River									X	X	X	X
Halton Healthcare Services									X			
McMaster Children's									X		X	X
Hospital for Sick Children	X	X	X		X				X	X	X	X
Niagara Health System									X	X	X	X
Hôtel-Dieu Grace									X	X	X	X
Humber River Regional									X	X	X	X
Kingston General	X								X	X	X	X
Lake of the Woods*									X			
Lakeridge Health									X	X	X	X
LHSC—University	X	X	X				X		X			
LHSC—Victoria									X	X	X	X
North Bay General									X		X	
Orillia Soldiers' Memorial									X	X	X	X
Ottawa—Carleton Dialysis Clinic*									X			
Ottawa Hospital	X								X	X	X	X
Peterborough Regional Health									X		X	X
Renfrew Victoria									X		X	
Sault Area Hospitals— Plummer Memorial									X		X	X
Scarborough— General Division									X		X	X
Sheppard Centre*									X			
St. Joseph's (Hamilton)	X								X	X	X	X
St. Joseph's (Toronto)									X		X	X
St. Michael's	X								X	X	X	X
Health Sciences North									X	X	X	X
Sunnybrook Health Centre									X	X	X	X
Sussex Centre*									X			
Thunder Bay Regional— McKellar Site									X	X	X	X
Timmins and District									X		X	X

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Appendix B—Canadian Transplant Hospitals, Renal Programs and Independent Health Facilities  
Providing Dialysis to Chronic Renal Failure Patients as Reported to CORR

Hospital/Facility	Types of Transplants Performed in 2013								Dialysis Programs in 2013			
	Kidney	Liver	Heart	Heart/ Lung	Lung	Intestine/ Multi- Visceral	Pancreas/ Kidney– Pancreas	Islet Cell	HD	Home HD Training <sup>†</sup>	PD	Home PD Training
<b>Ontario (cont'd)</b>												
Toronto East General									X	X		
Toronto General— University Health Network	X	X	X		X	X	X		X	X	X	X
University of Ottawa Heart Institute			X									
William Osler									X			
Mckenzie Richmond Hill									X		X	X
<b>Quebec</b>												
Aurores boréales									X		X	
Charles-LeMoynes									X		X	X
CHUS—Fleurimont	X								X		X	X
C.H. de Granby									X			
C.H. de Verdun									X		X	X
Chicoutimi									X		X	
C.H. de la région de l'Amiante*									X			
CHUM—Notre-Dame	X				X		X		X	X	X	X
CHUM—Saint-Luc		X							X		X	X
C.H. régional de Trois-Rivières									X		X	X
Cité de la Santé de Laval									X	X	X	X
CHUQ—Hôtel-Dieu	X								X	X	X	X
C.H. régional de Lanaudière									X		X	
CSSS de Gatineau-Hull									X		X	X
CSSS de Rimouski-Neigette									X		X	X
CSSS du lac Témiscamisque									X			
CSSS du Suroît									X		X	X
CSSS de la Vallée-de-l'Or									X		X	X
CSSS Haut-Richelieu– Rouville									X		X	X
CSSS de Rouyn-Noranda									X			
CSSS de Saint-Jérôme									X		X	X
CSSS de Sorel-Tracy									X		X	X
Hôtel-Dieu d'Arthabaska*									X			
Hôtel-Dieu de Lévis									X		X	X
Institut de cardiologie de Montréal			X									
IUCPQ			X									
Lakeshore									X			
Maisonneuve-Rosemont	X								X	X	X	X
Montréal Children's, McGill	X								X		X	X
Montréal General, McGill									X	X	X	X
Pierre-Le Gardeur									X			
Rivière-Rouge*									X			
Royal Victoria, McGill	X	X	X				X		X		X	X
Sacré-Cœur de Montréal									X		X	X
Sainte-Croix*									X		X	

(cont'd on next page)

Canadian Organ Replacement Register Annual Report:  
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Hospital/Facility	Types of Transplants Performed in 2013								Dialysis Programs in 2013			
	Kidney	Liver	Heart	Heart/ Lung	Lung	Intestine/ Multi- Visceral	Pancreas/ Kidney- Pancreas	Islet Cell	HD	Home HD Training†	PD	Home PD Training
<b>Quebec (cont'd)</b>												
Sainte-Justine	X	X	X						X		X	X
Sir Mortimer B. Davis— Jewish General Hospital									X		X	X
St. Mary's									X		X	X
<b>New Brunswick</b>												
Chaleur Regional									X		X	
Edmundston									X	X	X	X
Dr.-Georges-L.-Dumont									X	X	X	X
Saint John Regional									X	X	X	X
St. Joseph's*									X			
<b>Nova Scotia</b>												
Cape Breton Regional									X		X	X
IWK Grace Health	X								X		X	X
Queen Elizabeth II	X	X	X				X		X	X	X	X
Yarmouth Regional									X			
<b>Newfoundland and Labrador</b>												
Central Newfoundland Regional									X			
Eastern Health									X	X	X	X
Western Memorial Regional									X		X	

**Notes**

\* Independent health facilities.

† Home HD training is provided at the main dialysis facility or affiliated community dialysis centres.

HD: Hemodialysis; PD: Peritoneal dialysis.

# Appendix C—Canadian Organ Procurement Organizations

## **British Columbia**

BC Transplant Society  
West Tower, 3rd Floor  
555 12th Avenue West  
Vancouver, British Columbia V5Z 3X7  
[www.transplant.bc.ca](http://www.transplant.bc.ca)

## **Alberta**

Southern Alberta Organ and Tissue Donation Program—Calgary  
(SAOTDP)

Foothills Medical Centre Site  
1403 29th Street North West  
Calgary, Alberta T2N 2T9

HOPE Program—Edmonton  
University of Alberta Hospital  
Transplant Services  
Walter C. Mackenzie Centre  
8440 112th Street  
Edmonton, Alberta T6G 2B7

## **Saskatchewan**

Saskatchewan Transplant Program  
Provincial Office  
St. Paul's Hospital  
1702 20th Street West  
Saskatoon, Saskatchewan S7M 0Z9

Saskatchewan Transplant Program  
Regina Office  
Regina General Hospital  
1440 14th Avenue  
Regina, Saskatchewan S4P 0W5

## **Manitoba**

Transplant Manitoba—Gift of Life Program  
Health Sciences Centre  
820 Sherbrook Street, Room GE441  
Winnipeg, Manitoba R3A 1R9

### **Ontario**

Trillium Gift of Life Network  
522 University Avenue, Suite 900  
Toronto, Ontario M5G 1W7  
[www.giftoflife.on.ca](http://www.giftoflife.on.ca)

### **Quebec**

Transplant Québec  
Head Office  
4100 Molson Street, Suite 200  
Montréal, Quebec H1Y 3N1  
[www.quebec-transplant.qc.ca](http://www.quebec-transplant.qc.ca)

Transplant Québec  
Québec Office  
2700 Jean-Pierre Street, Suite 170  
Québec, Quebec G2C 1S9

### **New Brunswick**

New Brunswick Organ and Tissue Procurement Program  
Department of Health, Hospital Services Branch  
P.O. Box 5100  
Fredericton, New Brunswick E3B 5G8  
[www.gnb.ca/0051/0217/organ/index-e.asp](http://www.gnb.ca/0051/0217/organ/index-e.asp)

### **Nova Scotia**

Multi-Organ Transplant Program  
Queen Elizabeth II Health Sciences Centre  
1278 Tower Road, P.O. Box 9000  
6 South, Room 291  
Victoria Building  
Halifax, Nova Scotia B3H 2Y9  
[www.motphalifax.net](http://www.motphalifax.net)

### **Newfoundland and Labrador**

Organ Procurement and Exchange of Newfoundland and Labrador (OPEN)  
Health Sciences Centre  
300 Prince Phillip Parkway  
St. John's, Newfoundland and Labrador A1B 3V6



## Appendix D—Glossary and Commonly Used Acronyms

**body mass index (BMI):** Body mass index is a relationship between weight and height that is associated with body fat and health risk. The equation for BMI is body weight in kilograms divided by the square of height in metres. In the Canadian weight classification system, four categories of BMI ranges are defined:

- Underweight (BMI less than 18.5)
- Normal weight (BMI 18.5 to 24.9)
- Overweight (BMI 25 to 29.9)
- Obese (BMI 30 and higher)

**diabetes:** A disease caused by the lack of insulin in the body or the body's inability to properly use normal amounts of insulin.

- **type 1:** Occurs when the pancreas no longer produces any or produces very little insulin. The body needs insulin to use sugar for energy. Approximately 10% of people with diabetes have type 1 diabetes.
- **type 2:** Occurs when the pancreas does not produce enough insulin or when the body does not use the insulin that is produced effectively. Approximately 90% of people with diabetes have type 2 diabetes.

**dialysis:** A type of renal replacement therapy, whereby the blood is cleaned and wastes and excess water are removed from the body. Sometimes dialysis is a temporary treatment. However, when the loss of kidney function is permanent, as in end-stage kidney disease, dialysis must be continued on a regular basis. The only other treatment for kidney failure is kidney transplantation. There are two kinds of dialysis: hemodialysis and peritoneal dialysis.

- **hemodialysis:** The blood is cleaned by being passed through a machine that contains a dialyser. The dialyser has two spaces separated by a thin membrane. Blood passes on one side of the membrane and dialysis fluid passes on the other. The wastes and excess water pass from the blood through the membrane into the dialysis fluid, which is then discarded. The cleaned blood is returned to the bloodstream.

### Commonly Used Acronyms

**APD:** automated peritoneal dialysis

**CAPD:** continuous ambulatory peritoneal dialysis

**COPD:** chronic obstructive pulmonary disease

**CORR:** Canadian Organ Replacement Register

**ESKD:** end-stage kidney disease

**HD:** hemodialysis

**ICU:** intensive care unit

**OPO:** organ procurement organization

**PAK:** pancreas after kidney transplantation

**PD:** peritoneal dialysis

**PMP:** per million population

**PTA:** pancreas transplant alone  
(isolated pancreas transplantation)

**RRT:** renal replacement therapy

**SD:** standard deviation

**SKP:** simultaneous kidney–pancreas transplantation

- **peritoneal dialysis:** The peritoneal cavity inside the abdomen is filled with dialysis fluid, which enters the body through a permanently implanted catheter. Excess water and wastes pass from the blood through the lining of the peritoneal cavity (the peritoneum) into the dialysis fluid. This fluid is then drained from the body and discarded. In most cases, this treatment can be performed without assistance from hospital personnel.

**end-stage kidney disease:** A condition in which the kidneys are permanently impaired and can no longer function normally to maintain life.

**estimated glomerular filtration rate (eGFR):** Estimated rate in mL/min/1.73 m<sup>2</sup> of the volume of plasma filtered by the kidney. Rates of filtration have been calculated from serum creatinine using the Modification of Diet in Renal Disease (MDRD) Study equation. eGFR is used to determine renal function.

**graft survival:** Graft survival refers to whether an organ is still functioning at a certain time after transplantation.

**median waiting time:** This statistic reports the middle waiting time value for recipients of an extra-renal transplant. It means that half the recipients waited less than this value and the remaining half waited more than the value. CORR does not have patient-level data for patients who were listed for a transplant but did not receive a transplant. Thus, these waiting times provide only a partial picture. For kidney transplant patients, time between first dialysis and first kidney transplant is used.

**medical urgency status code:** Liver, heart and lung patients are assigned a status code at the time of their listing for a transplant. This status code corresponds to their medical condition and how urgently they require transplantation. The status codes are updated regularly until a patient receives a transplant. CORR collects the initial listing status and the status at the time of transplant.

**new patient:** A patient with end-stage kidney disease who began renal replacement therapy for the first time (either dialysis or renal transplantation) in the calendar year. Also known as an incident patient (see Section 2.1).

**organ donor:** A person who donates one or more organs that are used for transplantation. Organ donors may be deceased or living.

- **deceased donor:** A person for whom neurological death has been determined, consent has been obtained and organs are offered for transplantation. Neurological determination of death means that there is an irreversible absence of clinical neurological function as determined by definite clinical and/or neuro-imaging evidence. Within CORR, deceased donors are defined as those donors who originated in Canada and who had at least one solid organ used for transplantation. Solid organs that can be donated after death include the heart, liver, kidneys, pancreas, lungs, intestine and stomach.
- **living donor:** A donor with a biological (related) and/or emotional (unrelated) relationship to the transplant recipient. Living donors most commonly donate one of their kidneys. A lobe of the liver, a lobe of the lung or a segment of the pancreas or the intestine may also be donated by a living donor. At the time of this report, living pancreas and intestine transplants have not been performed in Canada.

**organ procurement organization:** An organization responsible for coordinating the recovery and distribution of organs from deceased donors in its province or region. Since not all provinces in Canada perform extra-renal transplants, OPOs from across the country coordinate their activities to ensure that those patients on the extra-renal organ transplant waiting lists who most urgently require a transplant are offered a suitable organ first.

**organ transplant waiting list:** A list of patients awaiting organ transplantation. Lists are maintained by the OPOs. Information on urgent liver and heart patients is shared across provinces. Each list identifies active and on-hold patients.

- **active patient:** A patient on the organ transplant waiting list who can receive a transplant at any time.
- **on-hold patient:** A patient on the organ transplant waiting list who cannot receive a transplant for medical or other reasons for a short period of time.

**organ transplantation:** Surgical procedure that involves transplantation of organs or parts of organs recovered from deceased or living donors to recipients with end-stage organ failure. Organs that can be transplanted include the heart, liver, kidneys, pancreas, lungs, intestine and stomach. The single-organ kidney transplant is the most commonly performed transplant procedure. In rare cases, two or more organs may be transplanted. Organs used in these transplants may be from one or more donors.

- **combination organ transplantation:** Surgical procedure that involves transplantation of organs or parts of organs to recipients who have more than one organ with end-stage organ failure. The most frequent examples of combination transplants in Canada are kidney–liver and kidney–heart transplants, where patients have end-stage kidney failure along with liver or heart failure. Organs used in these transplants are usually from the same donor.
- **islet cell transplantation:** A medical procedure that involves replacing the insulin-producing cells of the pancreas (islet cells), which are destroyed in people with type 1 diabetes. In Canada, islet cells are retrieved from the pancreas of deceased organ donors, although they may be preserved for a period of time prior to being used for transplantation. Islet cell transplants are captured within CORR.
- **kidney transplantation:** A procedure during which one or two kidneys from a deceased organ donor or one kidney from a living organ donor are surgically recovered and implanted into a person with end-stage kidney disease. Not all persons with end-stage kidney disease are candidates for kidney transplantation. Most people with end-stage kidney disease receive dialysis prior to a kidney transplant.
- **multi-visceral transplantation:** A rare surgical procedure that involves transplantation of the liver, small intestine, pancreas, stomach and duodenum (also known as a cluster transplant).
- **pre-emptive kidney transplant:** An organ transplant that includes a kidney, where the patient has not been treated with dialysis prior to the transplant.

**patient survival:** Patient survival refers to whether a transplant recipient is still alive at a certain time after transplantation.

**prevalent patient:** A patient who is alive and receiving renal replacement therapy for end-stage kidney disease on December 31 of a given year, regardless of date of initiation of treatment. Counts of prevalent patients are obtained from treatment hospitals providing patient status change data and facilities on the year-end hemodialysis facility profile and peritoneal facility profile.

**registered patient:** A patient who began renal replacement therapy for end-stage kidney disease for the first time in 1981 or thereafter and is registered in CORR. The progress of registered patients is monitored each year.

**renal replacement therapy:** Procedures of hemodialysis, peritoneal dialysis and kidney transplantation, which in part temporarily or permanently replace a person's failed kidneys.

# Appendix E—Analytical Methods

## Age Calculation

The computation of patient age is based on a count of months between birthdate and treatment date, which is then divided by 12. This calculation yields a whole number in years. For donors, age is collected in terms of a code (e.g., *newborn, days, months, years*) and unit (e.g., 2, 12, 35), as birthdate is not part of the donor data set. For the purposes of this report, donor age is converted to a year-based whole number.

## Incident ESKD RRT Patients

Counts and rates are based on patients registered during a given calendar year (January 1 to December 31). An incident patient must start RRT for ESKD in a Canadian facility. Patients who began RRT for ESKD outside of Canada but are subsequently treated in Canada are included in registered and prevalent, but not incident, counts.

## Organ Recovery Rates

Organ recovery rates (deceased) described in the report are based on organs recovered and transplanted from deceased donors identified in Canadian hospitals.

## Patient and Graft Survival

Unadjusted survival probabilities (expressed as percentages from 0 to 100) are calculated using the Kaplan–Meier method. The cohorts are dialysis and transplant patients who started dialysis or received a first graft between 2003 and 2012. For dialysis survival, patients were censored at first kidney transplant, lost to follow-up, left the country or recovered function. For transplant graft survival, patients were censored if they withdrew, were lost to follow-up or left the country.

## Population Estimates Used in Rate Calculations

Rates presented in this report are either crude or age specific and are not age standardized.

$$\text{Crude rate} = (\text{number of cases} / \text{population}) \times 1,000,000$$

$$\text{Age-specific rate} = (\text{number of cases in age group} / \text{population of age group}) \times 1,000,000$$

All Canadian population estimates are from the Statistics Canada CANSIM Table 051-0001 and are based on total population figures for July 1.

Province	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>B.C.*</b>	4,227,592	4,285,510	4,341,681	4,342,039	4,417,017	4,488,860	4,564,233	4,607,987	4,658,674	4,618,678
<b>Alta.†</b>	3,274,349	3,329,790	3,448,406	3,587,925	3,671,210	3,763,284	3,797,591	3,856,350	3,950,791	4,104,202
<b>Sask.</b>	995,391	994,126	985,386	1,000,139	1,013,620	1,030,129	1,044,028	1,057,884	1,079,958	1,108,303
<b>Man.</b>	1,170,268	1,177,556	1,177,765	1,193,932	1,206,100	1,221,964	1,234,535	1,250,574	1,267,003	1,265,015
<b>Ont.</b>	12,392,721	12,541,410	12,686,952	12,794,689	12,936,296	13,069,182	13,227,791	13,372,996	13,505,900	13,537,994
<b>Que.</b>	7,542,760	7,598,146	7,651,531	7,687,125	7,753,470	7,828,879	7,905,679	7,979,663	8,054,756	8,155,334
<b>Atlantic‡</b>	2,343,235	2,343,969	2,331,769	2,326,107	2,329,624	2,337,561	2,352,324	2,357,325	2,363,409	2,368,778
<b>Canada</b>	<b>31,946,316</b>	<b>32,270,507</b>	<b>32,623,490</b>	<b>32,931,956</b>	<b>33,327,337</b>	<b>33,739,859</b>	<b>34,126,181</b>	<b>34,482,779</b>	<b>34,880,491</b>	<b>35,158,304</b>

**Notes**

\* Includes Yukon.

† Includes the Northwest Territories and Nunavut.

‡ Includes New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador (see breakdown below).

**Source**

Statistics Canada.

Atlantic Provinces	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<b>N.B.</b>	751,384	752,006	749,168	745,561	747,147	749,468	752,838	755,455	755,950	756,050
<b>N.S./P.E.I.</b>	1,074,824	1,076,002	1,072,924	1,074,016	1,076,036	1,079,168	1,088,205	1,091,292	1,094,800	1,086,026
<b>N.L.</b>	517,027	515,961	509,677	506,530	506,441	508,925	511,281	510,578	512,659	526,702
<b>Total</b>	<b>2,343,235</b>	<b>2,343,969</b>	<b>2,331,769</b>	<b>2,326,107</b>	<b>2,329,624</b>	<b>2,337,561</b>	<b>2,352,324</b>	<b>2,357,325</b>	<b>2,363,409</b>	<b>2,368,778</b>

**Source**

Statistics Canada.

## Prevalent Patients

Prevalent patient numbers at year-end are based on the patient-level data, which includes registered patients with CORR. These are called prevalent registered patients, while prevalent ESKD patients present facility numbers, which are obtained on year-end when the facility profiles are provided by Canadian renal programs. Within these questionnaires, centres are asked to record the number of patients by their modality at year-end. These counts are compared against registered patients within CORR. Over time, the numbers yielded from the facility profiles and patient-level data within CORR have become nearly identical to the dialysis counts. Although converging over time, the counts of patients with a functioning kidney transplant from the facility profile and the patient-level data are still divergent. As such, the facility profiles might continue to provide the most comprehensive picture of the burden of ESKD on the health care system.

## Primary Diagnosis

For extra-renal transplant recipients, primary diagnosis is based on the diagnosis made at the time of the patient's first transplant. In some cases, most usually for liver transplant recipients, more than one diagnosis may be recorded. For kidney transplant recipients, primary diagnosis is based on the diagnosis provided at the time of incident dialysis treatment, as well as diagnosis at the time of kidney transplant for non-pre-emptive kidney transplants.

## Registered Patients

Registered patients are patients for whom CORR has patient-level information; the term includes patients who are being treated at a Canadian renal program with dialysis at year-end or who have a functioning kidney transplant at year-end. Prevalent registered patients were presented in Section 2.2. The prevalent number of registered patients in CORR may vary from prevalent counts provided in the annual facility profiles for the following reasons: not all patients will be registered in CORR because they may have started treatment prior to January 1, 1981; incident patients have been under-reported by some reporting centres; and deaths are suspected to be under-reported to CORR, potentially inflating numbers of living patients.

## Transplant Recipients

Information presented on transplant recipients in this report looks at recipients of first grafts of a specific organ where transplants occurred at a Canadian transplant facility. Tables and figures presented in chapters 3 to 7, inclusive, refer to either transplant procedures or recipients, with the latter counting patients only one time for their first organ-specific graft. Recipient characteristics and province-specific rates are based on transplant recipients.

## Waiting List

Data reported on patients waiting for transplants comes from counts provided by provincial and regional OPOs. Patient-level data is not available. For patients waiting for a kidney transplant, the definition of a pediatric patient was changed in 2002 from younger than 15 to younger than 18. This definition is now in line with the definition of pediatric patient used for extra-renal transplants.

## Waiting Times

Waiting times are calculated for patients who received extra-renal transplants and do not include patients who died while waiting or who withdrew from the list because they became too sick to undergo a transplant. There is currently no national source of information on wait times for all patients listed for transplantation.

For patients who received a kidney transplant, a proxy measure of waiting time (that is, time spent on dialysis pre-transplant) is used. While this approach avoids the problem of incomplete data on waiting list start dates for prospective kidney transplant recipients within CORR, it does not factor in the waiting time for patients who were listed for a kidney transplant but for whom no transplant occurred. A wait time of 0 is allocated to patients who received a pre-emptive kidney transplant.





## Appendix F—Primary Diagnoses Captured by CORR

The tables below list the diagnostic categories that are captured by CORR for primary diagnosis. The tables are organized by organ.

### End-Stage Kidney Disease

Primary Diagnosis Codes—End-Stage Kidney Disease	
<b>Generic</b>	
00	Chronic renal failure—etiology uncertain
<b>Glomerulonephritis/Autoimmune Diseases</b>	
05	Mesangial proliferative glomerulonephritis
06	Minimal lesion glomerulonephritis
07	Post-strep glomerulonephritis
08	Rapidly progressive glomerulonephritis
09	Focal glomerulosclerosis—adults
10	Glomerulonephritis, histologically <b>not</b> examined
11	Severe nephrotic syndrome with focal sclerosis (pediatric patients)
12	IgA nephropathy—proven by immunofluorescence (not code 85)
13	Dense deposit disease—proven by immunofluorescence and/or electron microscopy (MPGN type II)
14	Membranous nephropathy
15	Membranoproliferative mesangiocapillary glomerulonephritis (MPGN type I)
16	Idiopathic crescentic glomerulonephritis (diffuse proliferative)
17	Congenital nephrosis or congenital nephrotic syndrome (pediatric only)
19	Glomerulonephritis, histologically examined—specify
73	Polyarteritis
74	Wegener’s granulomatosis
84	Lupus erythematosus
85	Henoch–Schönlein purpura
86	Goodpasture syndrome
87	Scleroderma
88	Hemolytic uremic syndrome (Moschcowitz syndrome)
<b>Nephropathy, Drug Induced</b>	
30	Nephropathy caused by drugs or nephrotoxic agents, cause not specified
31	Nephropathy due to analgesic drugs
32	Nephropathy due to cisplatin
33	Nephropathy due to cyclosporin A
39	Nephropathy caused by other specific drug—specify

(cont'd on next page)

<b>Primary Diagnosis Codes—End-Stage Kidney Disease (cont'd)</b>	
<b>Polycystic Kidney</b>	
41	Polycystic kidneys, adult type (dominant)
42	Polycystic kidneys, infantile and juvenile types (recessive)
<b>Congenital/Hereditary Renal Diseases</b>	
21	Pyelonephritis/interstitial nephritis associated with neurogenic bladder
22	Pyelonephritis/interstitial nephritis due to congenital obstructive uropathy with or without vesicoureteric reflux
24	Pyelonephritis/interstitial nephritis due to vesicoureteric reflux without obstruction
40	Cystic kidney disease, type unspecified
41	Polycystic kidneys, adult type (dominant)
42	Polycystic kidneys, infantile and juvenile types (recessive)
43	Medullary cystic disease, including nephronophthisis
49	Cystic kidney disease, other type—specify
50	Hereditary familial nephropathy, type unspecified
51	Hereditary nephritis with nerve deafness (Alport syndrome)
52	Cystinosis
53	Oxalosis
54	Fabry disease
55	DRASH syndrome
58	Posterior urethral valves
59	Hereditary nephropathy, other—specify
60	Congenital renal hypoplasia—specify
61	Oligomeganephronic hypoplasia
62	Segmental renal hypoplasia (Ask-Upmark kidney)
63	Congenital renal dysplasia with or without urinary tract malformation
66	Syndrome of agenesis of abdominal muscles (prune belly syndrome)
<b>Diabetes</b>	
80	Diabetic nephropathy associated with type 1
81	Diabetic nephropathy associated with type 2
<b>Renal Vascular Disease</b>	
70	Renal vascular disease, type unspecified
71	Malignant hypertension (no primary renal disease)
72	Renal vascular disease due to hypertension (no primary renal disease)
73	Polyarteritis nodosa
78	Atheroembolic renal disease
79	Renal vascular disease, classified (nephrosclerosis, renal vascular thrombosis)
<b>Other</b>	
20	Pyelonephritis/interstitial nephritis, cause not specified
23	Pyelonephritis/interstitial nephritis due to acquired obstructive uropathy—specify
25	Pyelonephritis/interstitial nephritis due to urolithiasis

(cont'd on next page)

Primary Diagnosis Codes—End-Stage Kidney Disease (cont'd)	
Other (cont'd)	
29	Pyelonephritis, other causes
56	Sickle cell nephropathy
57	Wilms' tumour
82	Multiple myeloma
83	Amyloid
89	Multi-system disease, other—specify
90	Cortical or acute tubular necrosis
91	Tuberculosis
92	Gout
93	Nephrocalcinosis and hypercalcemic nephropathy
94	Balkan nephropathy
95	Kidney tumour
96	Traumatic or surgical loss of kidney
97	HIV nephropathy
99	Other identified renal disorders—specify

## Liver Transplant

Primary Diagnosis Codes—Liver Transplant	
Acute Hepatic Failure (Fulminant)	
01	Hepatitis, type A
02	Hepatitis, type B
61	Hepatitis, type C
58	Hepatitis, type non-A, -B, -C
35	Hepatitis with delta
05	Toxics
04	Drug induced, other
56	Drug induced, acetaminophen
47	Other/fulminant hepatic failure (including Budd–Chiari syndrome and Wilson disease)
Chronic Hepatic Failure	
12	Budd–Chiari syndrome
36	Byler disease (intra-hepatic cholestasis)
09	Cirrhosis, alcoholic
10	Cirrhosis, other
08	Cryptogenic cirrhosis
49	Post-necrotic cirrhosis
07	Primary biliary cirrhosis
14	Secondary biliary cirrhosis
45	Drug induced, other

(cont'd on next page)

<b>Primary Diagnosis Codes—Liver Transplant (cont'd)</b>	
<b>Chronic Hepatic Failure (cont'd)</b>	
42	Hepatitis, type A
43	Hepatitis, type B
60	Hepatitis, type C
59	Hepatitis, type non-A, -B, -C
51	Neonatal hepatitis
06	Autoimmune chronic active hepatitis
13	Primary biliary atresia
11	Sclerosing cholangitis
46	Toxic
15	Watson–Alagille disease (arterio-hepatic dysplasia)
62	Polycystic liver disease
64	Non-alcoholic steatohepatitis (NASH)
<b>Hepatic Tumours</b>	
50	Angiosarcoma
17	Cholangiocarcinoma
18	Fibrolamellar hepatoma
16	Hepatocellular carcinoma
19	Metastatic tumour
53	Hepatic tumour, other
<b>Metabolic Disorders</b>	
20	Alpha-1-antitrypsin deficiency
28	Crigler–Najjar syndrome
21	Glycogen storage disease
23	Hemochromatosis
27	Hyperlipoproteinemia type 2
24	Niemann–Pick
26	Phenylketonuria
25	Protoporphyrinemia
29	Tyrosinemia
22	Wilson disease
34	Metabolic disorder, other
<b>Other Primary Diagnosis</b>	
30	Congenital hepatic fibrosis
31	Caroli disease
32	Cystic disorders
52	Thrombosed hepatic artery
98	Unknown/missing
99	Other

## Heart Transplant

Primary Diagnosis Codes—Heart Transplant	
32	Cardiomyopathy
29	Dilated cardiomyopathy
01	Idiopathic cardiomyopathy
30	Other dilated cardiomyopathy—specify
33	Metabolic/genetic cardiomyopathy
34	Cardiomyopathy related to muscular dystrophy
35	Drug-induced cardiomyopathy (chemotherapy)
12	Restrictive cardiomyopathy
31	Hypertrophic cardiomyopathy
24	Myocarditis
07	Coronary artery disease (ischemic cardiomyopathy)
04	Valvular heart disease
23	Acute myocardial infarction
15	Congenital heart disease—specify
16	Congenital heart disease—acyanotic lesions
17	Congenital heart disease—cyanotic lesions
36	Metabolic disorder
37	Cardiac tumour
38	Refractive arrhythmia
39	Muscular dystrophy
98	Unknown
99	Other—specify

## Lung, Heart–Lung Transplant

Primary Diagnosis Codes—Lung, Heart–Lung Transplant	
08	Eisenmenger syndrome
11	Idiopathic pulmonary fibrosis
13	Emphysema
15	Lung failure due to congenital disease
17	Primary pulmonary hypertension
18	Chronic obstructive lung disease
19	Alpha-1-antitrypsin deficiency
20	Cystic fibrosis
22	Bronchiectasis
26	Sarcoidosis
27	Asbestosis
28	Bronchiolitis obliterans
32	Cardiomyopathy—not specified
98	Unknown
99	Other—specify

## Pancreas Transplant

Primary Diagnosis Codes—Pancreas Transplant	
01	Chronic pancreatitis
02	Diabetes type 1
03	Pancreatectomy
04	Cystic fibrosis
05	Trauma
06	Diabetes type 2
07	Pancreatic cancer
08	Bile duct cancer
98	Unknown
99	Other—specify

## Reference

1. Statistics Canada. Table 105-0501: Health indicator profile, annual estimates, by age group and sex, Canada, provinces, territories, health regions (2013 boundaries) and peer groups, occasional. [http://cansim2.statcan.ca/cgi-win/cnsmcgi.pgm?LANG=E&RegTkt=&C2Sub=&C2DB=PRD&ROOTDIR=CII/&ResultTemplate=CII/CII\\_FLst&SrchVer=2&ChunkSize=50&CIITables=2969](http://cansim2.statcan.ca/cgi-win/cnsmcgi.pgm?LANG=E&RegTkt=&C2Sub=&C2DB=PRD&ROOTDIR=CII/&ResultTemplate=CII/CII_FLst&SrchVer=2&ChunkSize=50&CIITables=2969). Accessed February 3, 2015.

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