



The Canadian Institute for Health Information (CIHI) has published *Deceased Organ Donor Potential in Canada*, examining data on more than 100,000 hospital deaths a year between 2008 and 2012. The purpose of the study was to estimate how many patients who die in Canadian hospitals are clinically eligible to be organ donors and how effectively health systems across the country convert these potential donors into actual donors.

Key Findings

- With evolving practice in deceased organ donation and expanding eligibility criteria, Canada could greatly increase its ability to meet the growing demand for organs, the study found.
- Using hospital discharge data to estimate potential donors, and after adjusting the numbers to provide more conservative estimates, the study found that only about one-third of potential donors become actual donors nationally.
 - The study estimated that two-thirds of potential deceased donors—approximately 1,050—do not become actual donors.
 - Since each deceased donor provides 3.4 organs on average, this could potentially translate into more than 3,570 organs available for transplant if donors were better identified and managed through the appropriate steps of organ donation.
 - This estimate rises to more than 4,600 additional organs when less strict eligibility criteria that are more reflective of current medical practice in organ donation are used for the calculation.
 - The additional organs could considerably reduce Canada's organ transplant waiting list (4,612 people as of 2012, the majority of whom were waiting for kidney transplants).
- The study identified 2 areas where there is strong potential to increase the number of donors and where there is wide variation in practice across Canada: donation after cardiocirculatory death (DCD) and older donors.

Donation after cardiocirculatory death

DCD—also known as non-heart-beating death—involves patients with a severe brain injury or other terminal condition who have no chance of recovery but do not meet the formal criteria for brain death. With organ shortages, many countries have expanded organ donor practice beyond brain death cases to include DCD. In Canada, adoption of this practice is relatively recent:

- As of 2012, 5 Canadian provinces practised DCD:
 - British Columbia (13% of all deceased organ donors)
 - Alberta (3%)
 - Ontario (24%)
 - Quebec (4% [as of 2011])
 - Nova Scotia (6%)

- There are slightly more potential donors after cardiocirculatory death than after brain death; however, the study found that patients with non-heart-beating deaths were 6 times less likely to become organ donors than those with brain deaths.
- There is potential to increase DCD in Canada, where it accounted for 17% of all deceased donors in 2012. In comparison, more than 40% of deceased donors in the United Kingdom experienced a cardiocirculatory death.

Donation among older patients

The study found that Canadian jurisdictions are more likely to identify and procure organs from younger donors than from older donors. Conversion rates of potential donors into actual donors were 4 times as high for potential donors younger than 50 than for those age 60 to 69. There is also significant international and provincial variation in the number of donors age 60 and older:

- Overall, 23% of Canadian donors were 60 and older between 2008 and 2012. In comparison, up to 45% of deceased donors in Spain were 60 and older in 2009. Spain is considered a world leader in deceased organ donation.
- Within Canada, Quebec had the highest percentage of donors 60 and older, at 34%, followed by Nova Scotia at 26%.
- In contrast, fewer than 10% of deceased donors in Alberta and Manitoba were 60 and older.

Provincial conversion rates

Variation among provinces in conversion rates (potential donors becoming actual donors) suggests there is room for improvement and opportunity to learn from best practices:

- Quebec's unadjusted conversion rate (21%) was more or less twice as high as the rate in the Prairies (Alberta: 11%; Saskatchewan: 10%, Manitoba: 10%).

Organization of care

The study found that the way care is organized at both the hospital level and the system (or province) level can have an impact on organ donation:

Community hospitals

- In Ontario, teaching hospitals were 60% more likely to convert potential donors into actual donors than community hospitals. However, 54% of potential donors identified in the study died in community hospitals. The study makes this comparison for Ontario only, where comprehensive organ retrieval data is mandatory and available for analysis.
- A separate Quebec study published by the Collège des médecins du Québec found similar results: close to a third of potential donors died in non-teaching hospitals without trauma units or donor coordinators.

Access to mechanical ventilation for patients in the intensive care unit

- 40% to 50% of acute care patients with brain or cardiocirculatory deaths did not become potential donors because they were not mechanically ventilated.

Organ donor support staff

- The data suggests that round-the-clock donor support staff may help improve donor conversion rates. In Ontario, where comprehensive procurement data is available to CIHI, potential donors who died during the day were 50% more likely to become actual donors than those who died in the evening.
- The study found that the majority of deceased organ donors were Caucasian or of unspecified ethnicity. There may be potential to increase deceased donors through culturally sensitive discussions around organ donation.
 - Over the study period, 91% of donors were Caucasian, which was higher than their proportion in the Canadian population at large (81%).
 - Manitoba had the greatest donor diversity (75% Caucasian or unspecified), with non-Caucasian donors being largely Aboriginal.
- Spain is a world leader in organ donation. For example, in the Spanish model, physicians integrate donation as part of end-of-life care.

Data and information gaps

The study noted that eligibility criteria for organ donation are not consistent across the country and that more comparable information is required to better understand performance in organ donation:

- In Canada, provinces and territories determine their criteria based on Canadian standards from 2007, which are open to interpretation.
- In Australia, New Zealand and the U.K., donor criteria are regularly updated and publicly reported.
- There is a lack of comparable data in Canada on donor identification, referral and consent rates, in addition to hospital-level donor procurement data. This information would help shed light on some of the barriers to donation and on where improvements can be made.

Methodology

The study examined data from 2 sources: the Canadian Organ Replacement Register and the Hospital Morbidity Database.

The study looked at 4 years of data (from 2008 to 2011) in Quebec and 5 years of data (from 2008 to 2012) in all other provinces except Prince Edward Island to examine deceased donor potential and to estimate conversion rates. P.E.I. and the territories were excluded from analyses due to low numbers of donors and the absence of transplant programs in these jurisdictions.

The discharge abstract data used in the Hospital Morbidity Database is not as complete as the patient's original medical chart and may not capture all of the clinical information required to assess donor suitability. Estimates from medical chart reviews conducted in 3 jurisdictions resulted in potential donor numbers that were 26% to 54% lower than the figures reported provincially in this study. As a result, potential numbers were adjusted by 50% where indicated at the pan-Canadian level to provide more conservative estimates of potential donors.

The methods used for this study have the benefit of being comprehensive (i.e., they captured all patients in all Canadian hospitals), economical and repeatable over time for trending purposes.