

MATERNAL MORTALITY IN CANADA

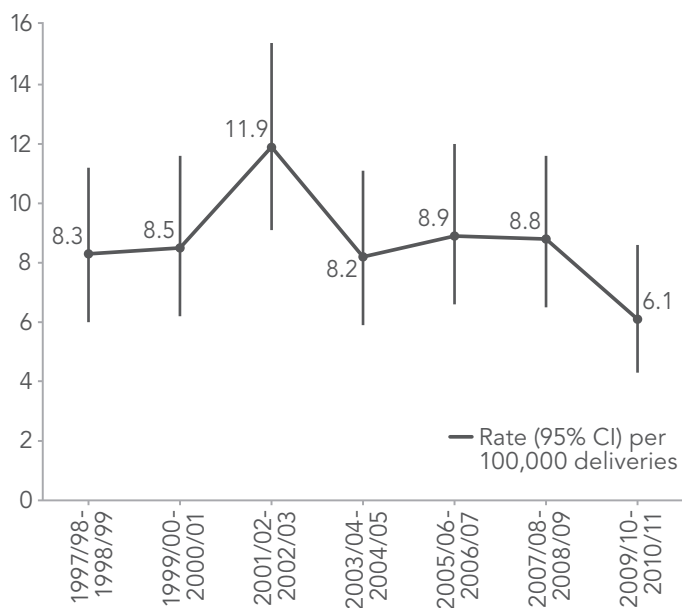
SUMMARY OF RESULTS (EXCLUDES QUEBEC)

- In 2009/10-2010/11, there were 6.1 (95% CI: 4.3-8.6) maternal deaths per 100,000 deliveries in Canada (Figure 1 and Table 1).
- Over the 1997/98-2010/11 period, maternal mortality rates fluctuated from a low of 6.1 (95% CI: 4.3-8.6) maternal deaths per 100,000 deliveries in 2009/10-2010/11 to a high of 11.9 (95% CI: 9.1-15.4) maternal deaths per 100,000 deliveries in 2001/02-2002/03 (Figure 1 and Table 1).
- The most common diagnoses associated with these deaths in 2002/03-2010/11 were diseases of the circulatory system; other indirect causes (e.g., diseases of the digestive system and mental disorders and diseases of the nervous system complicating pregnancy, childbirth and the puerperium); postpartum hemorrhage; hypertension complicating pregnancy, childbirth and the puerperium; and obstetric embolism (Figure 2 and Table 2).
- Maternal mortality varied by province and territory ranging from 0 (95% CI: 0.0-37.5) to 19.0 (95% CI: 5.2-48.6) deaths per 100,000 deliveries for the years 1996/97-2010/11 (Table 3).
- Maternal mortality rates increased with age. For 1996/97-2010/11, women 40 years and older had 3.6 (95% CI: 2.1-6.0) times the rate experienced by women aged 20-24 years (Table 4).
- For 1997/98-2010/11, the late maternal mortality rate was 5.7 (95% CI: 5.0-6.5) maternal deaths per 100,000 deliveries. Neoplasms and injury, poisoning or external causes (e.g., unintentional poisoning) were the most commonly associated diagnoses in these deaths.

DEFINITION

The maternal mortality rate is defined as the number of maternal deaths (occurring during pregnancy, childbirth, or within 42 days after delivery or termination of pregnancy) divided by the number of deliveries, and

FIGURE 1: Maternal mortality rates (95% CI), Canada (excluding Quebec), 1997/98-2010/11



Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).
Notes: CI - Confidence Interval. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

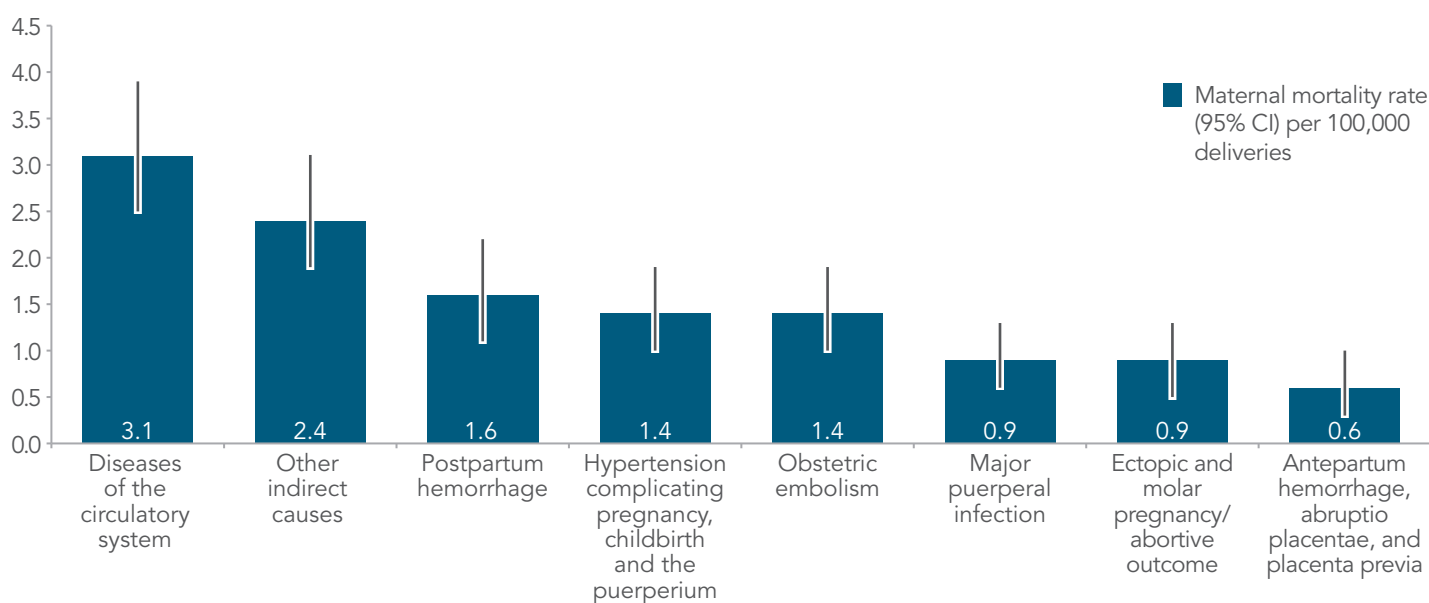
expressed per 100,000 deliveries. The definition of maternal death under the International Classification of Diseases, Ninth and Tenth Revision (ICD-9, ICD-10) is: "The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes." Maternal deaths are considered to be direct or indirect. Direct obstetric deaths are deaths resulting from obstetric complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions or incorrect treatment, or from a chain of events resulting from any of the above. Indirect obstetric deaths are deaths resulting from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by the physiologic effects of pregnancy. Late



maternal death is defined as the death of a woman from direct or indirect obstetric causes more than 42 days but less than one year after termination of pregnancy. Late

maternal deaths are not included in the data in this report with the exception of the specific bullet on the late maternal mortality rate.

FIGURE 2: Diagnoses associated with maternal deaths in Canada (excluding Quebec), 2002/03-2010/11



Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).

Notes: CI - Confidence Interval. Diagnoses do not represent an underlying cause of death. Therefore, cases could have more than one associated diagnosis. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

DATA TABLES

TABLE 1: Maternal mortality rates, Canada (excluding Quebec), 1997/98-2010/11

YEAR	N	RATE PER 100,000 DELIVERIES	95% CI
1997/98-1998/1999	42	8.3	6.0 - 11.2
1999/2000-2000/01	42	8.5	6.2 - 11.6
2001/02-2002/03	58	11.9	9.1 - 15.4
2003/04-2004/05	42	8.2	5.9 - 11.1
2005/06-2006/07	48	8.9	6.6 - 11.8
2007/08-2008/09	50	8.8	6.5 - 11.6
2009/10-2010/11	35	6.1	4.3 - 8.6
Total	317	8.6	7.7 - 9.6

Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).

Notes: CI - Confidence Interval. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

TABLE 2: Diagnoses associated with maternal deaths in Canada (excluding Quebec), 2002/03-2010/11

DIAGNOSIS	N	MATERNAL MORTALITY RATE PER 100,000 DELIVERIES	95% CI
Diseases of the circulatory system	76	3.1	2.5 - 3.9
Other indirect causes	59	2.4	1.9 - 3.1
Postpartum hemorrhage	39	1.6	1.1 - 2.2
Hypertension complicating pregnancy, childbirth and the puerperium	34	1.4	1.0 - 1.9
Obstetric embolism	34	1.4	1.0 - 1.9
Major puerperal infection	22	0.9	0.6 - 1.3
Ectopic and molar pregnancy/abortive outcome	21	0.9	0.5 - 1.3
Antepartum hemorrhage, abruptio placentae, and placenta previa	15	0.6	0.3 - 1.0

Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).

Notes: CI - Confidence Interval. Diagnoses do not represent an underlying cause of death. Therefore, cases could have more than one associated diagnosis. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

TABLE 3: Maternal mortality rates by province and territory of occurrence (excluding Quebec), 1996/97-2010/11

PROVINCE/TERRITORY	N	RATE PER 100,000 DELIVERIES	95% CI
Newfoundland and Labrador	12	16.7	8.7 - 29.3
Prince Edward Island	*	19.0	5.2 - 48.6
Nova Scotia	8	5.9	2.6 - 11.7
New Brunswick	6	5.4	2.0 - 11.7
Ontario	195	9.6	8.2 - 11.0
Manitoba	6	5.6	2.1 - 12.3
Saskatchewan	13	6.8	3.7 - 11.7
Alberta	49	7.9	5.8 - 10.4
British Columbia	52	8.4	6.3 - 11.0
Yukon	*	18.8	0.5 - 104.4
Northwest Territories	0	0.0	0.0 - 37.5
Nunavut	0	0.0	0.0 - 54.7
Canada	346	8.8	7.9 - 9.8

* suppressed due to cell size less than 5.

Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).

Notes: CI - Confidence Interval. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

TABLE 4: Maternal mortality rates by age (excluding Quebec), 1996/97-2010/11

AGE	N	RATE PER 100,000 DELIVERIES	95% CI
15-19	18	8.8	5.2 - 14.0
20-24	43	6.5	4.7 - 8.7
25-29	96	8.2	6.6 - 9.9
30-34	89	7.3	5.9 - 9.0
35-39	75	13.1	10.3 - 16.4
≥40	25	23.1	14.9 - 34.1
Total	346	8.8	7.9 - 9.8

Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).
Notes: CI - Confidence Interval. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

DATA SOURCE

Data from the Discharge Abstract Database (DAD) of the Canadian Institute of Health Information (CIHI) were used to identify in-hospital deaths among women of reproductive age (15-54 years) in Canada (excluding Quebec). Manitoba data, which were incomplete for earlier years, were included from 2004/05.

The rates are calculated based on fiscal years (i.e., April 1 to March 31).

Causes of death were coded according to ICD-9, Chapter XI: Complications of Pregnancy, Childbirth and the Puerperium (630-676) and ICD-10, Chapter XV: Pregnancy, Childbirth and the Puerperium (O00-O99). The year range presented for some tables and figures varies because of the necessity to group the data into two-year groupings for the time trends (Figure 1 and Table 1) and to encompass only the years where data were coded using ICD-10 for the diagnoses associated with maternal death (Figure 2 and Table 2).

This report uses CIHI data rather than the more traditional Vital Statistics data because recent papers by the Canadian Perinatal Surveillance System have shown that hospitalization data are more comprehensive and timely.^{1,2}

LIMITATIONS

The DAD does not include data from Quebec. Data from Manitoba were excluded from some analyses because they were incomplete for the early years of the study. The small number of deaths that occurred outside the hospital were not identified. The DAD data include multiple diagnostic codes for each maternal death, but do not assign an underlying cause of death. Therefore, maternal mortality rates by cause of death cannot be presented from these data.

REFERENCES

- (1) Lisonkova S, Bartholomew S, Rouleau J, Liu S, Liston RM, Joseph KS; for the Maternal Health Study Group of the Canadian Perinatal Surveillance System. Temporal trends in maternal mortality in Canada I: Estimates based on Vital Statistics data. *J Obstet Gynaecol Can* 2011;33(10):1011-1019.
- (2) Lisonkova S, Liu S, Bartholomew S, Liston RM, Joseph KS; for the Maternal Health Study Group of the Canadian Perinatal Surveillance System. Temporal trends in maternal mortality in Canada II: Estimates based on hospitalization data. *J Obstet Gynaecol Can* 2011;33(10):1020-1030.

The Public Health Agency of Canada's Canadian Perinatal Surveillance System monitors and reports on key indicators of maternal, fetal and infant health in Canada. For more information visit: <http://www.phac-aspc.gc.ca/rhs-ssg/>