

SEVERE MATERNAL MORBIDITY IN CANADA

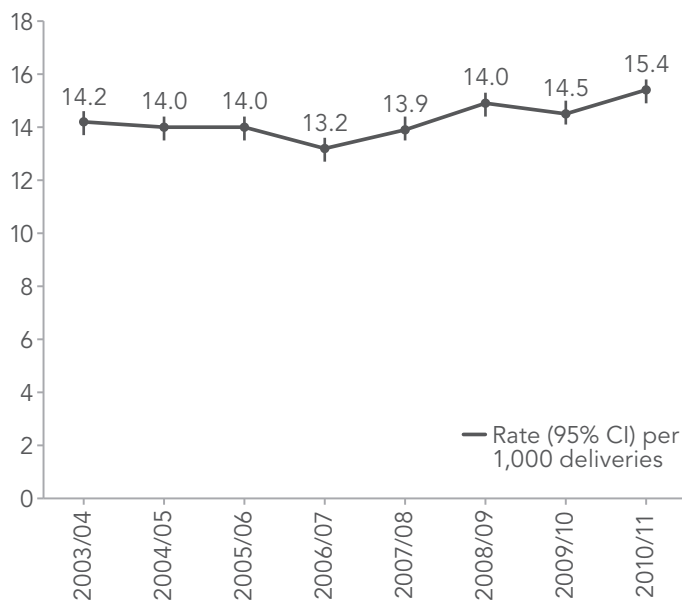
SUMMARY OF RESULTS (EXCLUDES QUEBEC)

- In 2010/11, the rate of severe maternal morbidity in Canada was 15.4 (95% CI: 14.9-15.8) per 1,000 deliveries (Figure 1 and Table 1).
- Over the 2003/04-2010/11 period, severe maternal morbidity rates fluctuated from a low of 13.2 (95% CI: 12.7-13.6) per 1,000 deliveries in 2006/07 to a high of 15.4 (95% CI: 14.9-15.8) per 1,000 deliveries in 2010/11 (Figure 1 and Table 1).
- Over the five-year time period (2006/07-2010/11), the most common severe maternal morbidities (see definition) included: blood transfusion; postpartum hemorrhage and blood transfusion; hysterectomy; cardiac arrest/failure, myocardial infarction or pulmonary edema; embolization or ligation of pelvic vessels or suturing of uterus and postpartum hemorrhage; puerperal sepsis; uterine rupture during labour; repair of bladder, urethra, or intestine; and eclampsia (Figure 2 and Table 2).
- Overall rates of severe maternal morbidity varied by province and territory ranging from 12.2 (95% CI: 11.2-13.3) to 22.3 (95% CI: 20.4-24.3) per 1,000 deliveries (Table 3).

DEFINITION

The Canadian Perinatal Surveillance System uses a pragmatic definition for severe maternal morbidity which includes disease-specific (e.g., eclampsia), intervention specific (e.g., blood transfusion) and organ dysfunction-based (e.g., acute renal failure) criteria. The severe morbidity rate is expressed per 1,000 deliveries in a given place and time. The rate of severe maternal morbidity is an important index that supplements the maternal mortality rate and represents the population burden of illness and disability that occurs as a consequence of these life-threatening events.

FIGURE 1: Temporal trends (95% CI) in severe maternal morbidity, Canada (excluding Quebec), 2003/04-2010/11



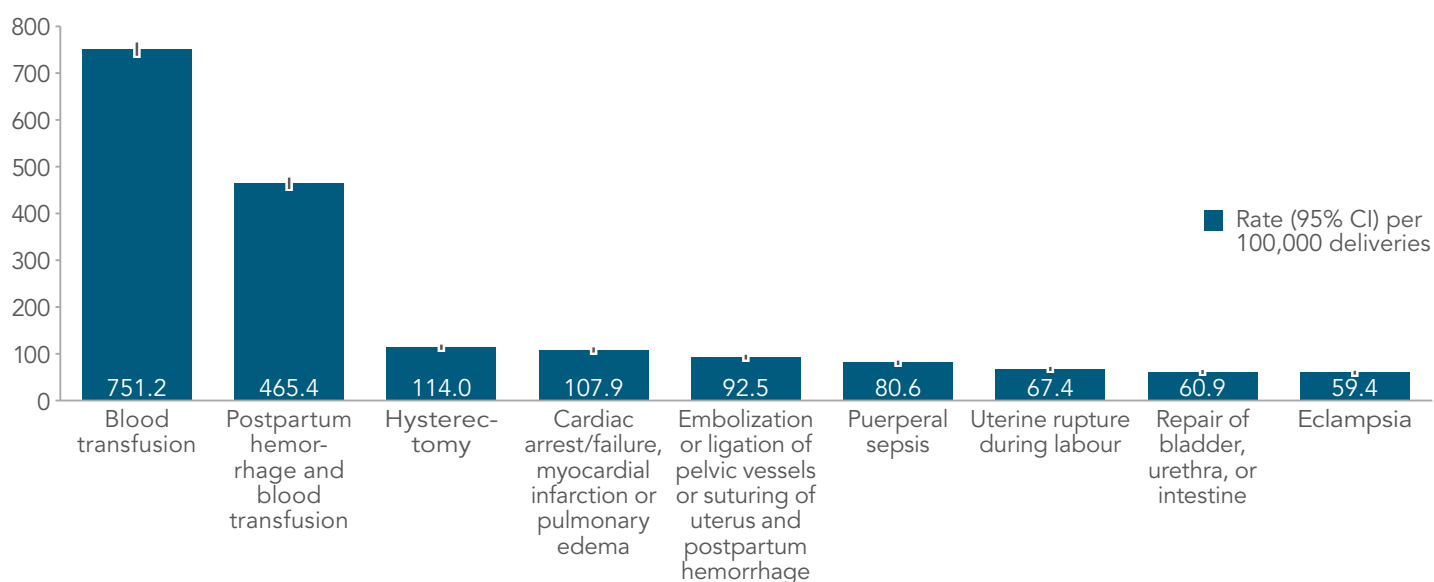
Source: Canadian Institute for Health Information, Discharge Abstract Database (DAD).
Notes: CI - Confidence Interval. The DAD does not include data from Quebec. Manitoba data, which were incomplete for earlier years, were included from 2004/05.

DATA SOURCE

Rates of severe maternal morbidity were calculated using data from the Discharge Abstract Database of the Canadian Institute for Health Information for the period 2003/04-2010/11. This database contains information on all hospital discharges in Canada (except Quebec). Diagnoses and procedures in the database are coded using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) and the Canadian Classification of Health Interventions (CCI), respectively.

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



FIGURE 2: Rates (95% CI) of the most common severe maternal morbidities, Canada (excluding Quebec), 2006/07-2010/11

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

Notes: CI - Confidence Interval. The DAD does not include data from Quebec.

DATA TABLES

TABLE 1: Temporal trends in severe maternal morbidity, Canada (excluding Quebec), 2003/04-2010/11

| | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Total deliveries | 248,496 | 262,673 | 266,172 | 274,089 | 284,924 | 286,432 | 287,942 | 282,695 |
| Maternal morbidity (N) | 3,520 | 3,672 | 3,723 | 3,608 | 3,967 | 4,256 | 4,188 | 4,347 |
| Rate (95% CI) per 1,000 deliveries | 14.2 (13.7 - 14.6) | 14.0 (13.5 - 14.4) | 14.0 (13.5 - 14.4) | 13.2 (12.7 - 13.6) | 13.9 (13.5 - 14.4) | 14.9 (14.4 - 15.3) | 14.5 (14.1 - 15.0) | 15.4 (14.9 - 15.8) |

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.

TABLE 2: Rates of the most common severe maternal morbidities, Canada (excluding Quebec), 2006/07-2010/11

| MATERNAL MORBIDITY | N | RATE PER 100,000 DELIVERIES | 95% CI |
|--|--------|-----------------------------|---------------|
| Blood transfusion | 10,637 | 751.2 | 737.0 - 765.5 |
| Postpartum hemorrhage and blood transfusion | 6,590 | 465.4 | 452.2 - 476.7 |
| Hysterectomy | 1,614 | 114.0 | 108.5 - 119.6 |
| Cardiac arrest/failure, myocardial infarction or pulmonary edema | 1,528 | 107.9 | 102.6 - 113.5 |
| Embolization or ligation of pelvic vessels or suturing of uterus and postpartum hemorrhage | 1,310 | 92.5 | 87.6 - 97.7 |
| Puerperal sepsis | 1,141 | 80.6 | 76.0 - 85.4 |
| Uterine rupture during labour | 955 | 67.4 | 63.3 - 71.9 |
| Repair of bladder, urethra, or intestine | 863 | 60.9 | 56.9 - 65.2 |
| Eclampsia | 841 | 59.4 | 55.4 - 63.5 |

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

Notes: CI - Confidence Interval. The DAD does not include data from Quebec.

TABLE 3: Rates of severe maternal morbidity, by province and territory, Canada (excluding Quebec), 2006/07-2010/11

| PROVINCE/TERRITORY | N | RATE PER 1,000 DELIVERIES | 95% CI |
|---------------------------|---------------|---------------------------|--------------------|
| Newfoundland and Labrador | 524 | 22.3 | 20.4 - 24.3 |
| Prince Edward Island | 103 | 14.9 | 12.2 - 18.0 |
| Nova Scotia | 536 | 12.2 | 11.2 - 13.3 |
| New Brunswick | 518 | 14.3 | 13.1 - 15.6 |
| Ontario | 9,296 | 13.3 | 13.0 - 13.6 |
| Manitoba | 1,155 | 14.8 | 14.0 - 15.7 |
| Saskatchewan | 1,242 | 18.2 | 17.2 - 19.2 |
| Alberta | 3,996 | 16.5 | 16.0 - 17.0 |
| British Columbia | 2,853 | 13.5 | 13.0 - 14.0 |
| Yukon | 37 | 21.0 | 14.8 - 28.8 |
| Northwest Territories | 63 | 15.7 | 12.1 - 20.0 |
| Nunavut | 43 | 22.0 | 16.0 - 29.5 |
| Canada | 20,366 | 14.4 | 14.2 - 14.6 |

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

Notes: CI - Confidence Interval. The DAD does not include data from Quebec.

LIMITATIONS

Severe maternal morbidity such as severe preeclampsia could not be identified due to limitations of the ICD-10CA codes. Severe maternal morbidity rates in Quebec could not be estimated because this province's data were not part of the Discharge Abstract Database. Data from Manitoba were excluded from some analyses because they were incomplete for the early years of the study.

ADDITIONAL INFORMATION

The Canadian Perinatal Surveillance System recently published two papers examining the temporal trends and causes of severe maternal morbidity in Canada.^{1,2} These papers provide more detailed information which complements this report.

REFERENCES

- (1) Joseph KS, Liu S, Rouleau J, Kirby RS, Kramer MS, Sauve R, Fraser WD, Young DC, Liston RM; for the Maternal Health Study Group of the Canadian Perinatal Surveillance System. Severe Maternal Morbidity in Canada, 2003 to 2007: Surveillance Using Routine Hospitalization Data and ICD-10CA Codes. *J Obstet Gynaecol Can* 2010 Sep;32(9):837-46.
- (2) Liu S, Joseph KS, Bartholomew S, Fahey J, Lee L, Allen AC, Kramer MS, Sauve R, Young DC, Liston RM; for the Maternal Health Study Group of the Canadian Perinatal Surveillance System. Temporal trends and regional variations in severe maternal morbidity in Canada, 2003 to 2007. *J Obstet Gynaecol Can* 2010 Sep;32(9):847-55.

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/>