Examining Caesarean Section Rates in Canada Using the Robson Classification System

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Abstract

Objective: To determine the groups within the obstetric population contributing most substantially to the Caesarean section rate in five Canadian provinces.

Methods: Hospital births from five participating provinces were grouped into Robson's 10 mutually exclusive and totally inclusive classification categories. The relative contribution of each group to the overall CS rate, relative size of group, and CS rate were calculated for British Columbia, Alberta, Ontario, Nova Scotia, and Newfoundland and Labrador for the four-year period from 2007–2008 to 2010–2011.

Results: In all five provinces (accounting for approximately 64% of births in Canada), and for all years examined, the group making the largest relative contribution to the CS rate was women with at least one previous CS and a term, singleton, cephalic-presenting pregnancy (Robson Group 5). The CS rate for this group ranged from 76.1% in Alberta to 89.9% in Newfoundland and Labrador in 2010 to 2011, accounting for 11.3% of all deliveries. The rate of CS for Group 5 decreased slightly over the four years, except in Ontario. The next largest contributing group was nulliparous women with a term, singleton, cephalic-presenting pregnancy. Those with induced labour or Caesarean section before labour (Robson Group 2) had CS rates ranging from 34.4% in Nova Scotia to 44.6% in British Columbia (accounting for 13.1% of all deliveries), and those with spontaneous onset of labour (Robson Group 1) had CS rates of 14.5% to 20.3% in 2010 to 2011 (accounting for 23.6% of all deliveries).

Conclusion: All hospitals and health authorities can use this standardized classification system as part of a quality improvement initiative to monitor Caesarean section rates. This classification system identifies relevant areas for interventions and resources to reduce rates of Caesarean section.

Key Words: Caesarean section, Robson classification, quality improvement

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Résumé

Objectif : Déterminer les groupes qui, au sein de la population obstétricale, contribuent le plus substantiellement au taux de césarienne dans cinq provinces canadiennes.

Méthodes : Les accouchements menés à l'hôpital au sein des cinq provinces participantes ont été répartis en fonction des 10 catégories de classification mutuellement exclusives et totalement inclusives de Robson. La contribution relative de chacun des groupes au taux global de césarienne, la taille relative de groupe et le taux de césarienne ont été calculés pour la Colombie-Britannique, l'Alberta, l'Ontario, la Nouvelle-Écosse et Terre-Neuve-et-Labrador pour ce qui est de la période de quatre ans s'étalant de 2007–2008 à 2010–2011.

Résultats : Dans chacune de ces cinq provinces (au sein desquelles l'on constate approximativement 64 % des naissances au Canada) et pendant toutes les années examinées, les femmes ayant déjà subi au moins une césarienne et connaissant une grossesse monofœtale à terme en présentation céphalique (Groupe 5 de Robson) constituaient le groupe à l'origine de la contribution relative la plus importante au taux de césarienne. Au sein de ce groupe, le taux de césarienne allait de 76,1 % en Alberta à 89,9 % à Terre-Neuve-et-Labrador en 2010-2011, ce qui représente 11,3 % de tous les accouchements. Le taux de CS au sein du Groupe 5 a connu

une légère baisse au cours des quatre années de l'étude, sauf en Ontario. Le deuxième groupe en importance en ce qui concerne la contribution au taux de césarienne était composé des nullipares connaissant une grossesse monofœtale à terme en présentation céphalique. Les femmes ayant subi un déclenchement de travail ou une césarienne avant le travail (Groupe 2 de Robson) ont présenté des taux de césarienne allant de 34,4 % en Nouvelle-Écosse à 44,6 % en Colombie-Britannique (ce qui représente 13,1 % de tous les accouchements), tandis que les femmes ayant connu un travail d'apparition spontanée (Groupe 1 de Robson) ont présenté des taux de césarienne allant de 14,5 % à 20,3 % en 2010-2011(ce qui représente 23,6 % de tous les accouchements).

Conclusion : Tous les hôpitaux et toutes les autorités sanitaires peuvent utiliser ce système standardisé de classification dans le cadre d'une initiative d'amélioration de la qualité visant la surveillance des taux de césarienne. Ce système de classification identifie les domaines pouvant faire l'objet d'interventions pertinentes et les ressources pouvant permettre la réduction des taux de césarienne.

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INTRODUCTION

Caesarean section rates have been increasing worldwide over the past few decades, with most countries and regions exceeding the World Health Organization recommended rate of 15% of all deliveries.[1] By 2010, the CS rate in Canada reached 26.9%, up from 17.6% in 1995.[2,3] The rapid increase in CS rates in Canada has received growing attention because Caesarean section is associated with both immediate and later risk of maternal and neonatal complications, and with increased health costs.[4–6]

Historically, the indications for CS have been clinical factors, such as maternal and obstetrical complications, previous CS, dystocia, fetal distress, breech presentation, and malpresentation.[7,8] Recent temporal trends in maternal characteristics that might help explain rising CS rates include increasing maternal age and higher rates of hypertension, diabetes, obesity, and multiple gestation.[9] However, many other factors have contributed to the increasing rate of CS in recent years, including improved surgical techniques, providers' and patients' perception of the safety of the procedure, patient demand, physician practice patterns, and pressures on caregivers to practise "defensive medicine."[10–12]

To address concerns over rising rates of CS and to provide a mechanism for audit and feedback, a 10-group classification system to examine CS within mutually exclusive groups of women with particular obstetric characteristics was proposed by Robson in 2001.[13] The Robson classification system groups women in the obstetric population according to plurality, fetal presentation, parity, obstetric history (i.e., previous CS), course of labour and delivery, and gestational age, providing clinically relevant categories for analyzing and reporting rates of CS.[13] In the Robson system, the overall rate of CS is presented as a composite of individual rates from 10 groups. This not only permits examination of group-specific rates to determine their appropriateness, but also demonstrates how the overall rate of CS is affected by both the magnitude of the group-specific rates and the relative size of each of group, thus identifying groups that make the greatest contribution to the overall rate of CS.[13] Such an analysis gives hospital care providers evidence-based data so they can know where to target their prevention efforts for maximum effect in reducing the rate of CS.

The purpose of this quality improvement exercise was to examine rates of CS using the Robson 10-group classification system to identify groups within the obstetric population that contribute most to CS rates in five Canadian provinces. Identifying these target groups is the first step in developing strategies to reduce rates of CS in Canada. This would then allow evaluation of the between-province similarities in groupings and areas for improvement.

METHODS

The Canadian Perinatal Program Coalition is a voluntary network for provincial maternal child programs to discuss practice issues of common interest and to share de-identified aggregated provincial data to determine similarities and differences, as well as to discuss strategies for quality improvement. We examined aggregated data from a four-year period (April 1, 2007, to March 31, 2008, through April 1, 2010, to March 31, 2011) of hospital deliveries from five Canadian provinces with comprehensive perinatal databases participating in the Canadian Perinatal Program Coalition: British Columbia, Alberta, Ontario, Nova Scotia, and Newfoundland and Labrador. These databases are provincial in scope and most capture 100% of hospital births, except for the Eastern Health Authority regional database, which captures 70% of all NL births. Each database has different mechanisms for data collection; however, all systems have data validation processes for assessing data quality,[14,15] and some groups have published their results.[15,16]

Data for all births (live births and stillbirths) at ≥ 20 weeks' gestational age were grouped into Robson's 10 categories within the province where the data were collected. Overall CS rate, relative size of each group, and relative contribution of each group to the overall CS rate were calculated separately for each province. The Robson classification system is presented in Table 1 using combined data from the five participating provinces for 2010 to 2011. The number of Caesarean sections and the number of deliveries in each group are listed in columns A and

Table 1. Rate of Caesarean section by Robson classification groups for five Canadian provinces,* 2010–2011

	A	B	C	D	E
Robson classification group	Caesarean sections n	Deliveries n	Rate of CS in each group (A/B) × 100 %	Relative size in each group (B/Total obstetrical population) × 100 %	Contribution of each group to overall CS rate (A/Total obstetrical population) × 100 %
1. Nulliparous, singleton, cephalic, ≥ 37 weeks, spontaneous labour	9053	56 691	16.0	23.6	3.8
2. Nulliparous, singleton, cephalic, ≥ 37 weeks, induced labour or CS before labour	11 956	31 460	38.0	13.1	5.0
3. Multiparous women, singleton, cephalic, ≥ 37 weeks, without a previous CS, spontaneous labour	1648	63 182	2.6	26.3	0.7
4. Multiparous, singleton, cephalic, ≥ 37 weeks, without a previous uterine scar, induced labour or by CS before labour	2747	24 015	11.4	10.0	1.1
5. Multiparous, singleton, cephalic, ≥ 37 weeks, with a previous CS	21 947	27 170	80.8	11.3	9.1
6. Nulliparous, singleton, breech	4775	5058	94.4	2.1	2.0
7. Multiparous, singleton, breech	3558	3990	89.2	1.7	1.5
8. Multiple pregnancy (twins or higher-order multiples)	2657	4218	63.0	1.8	1.1
9. Singleton, transverse or oblique lie	1297	1626	79.8	0.7	0.5
10. Singleton, cephalic, < 37 weeks	3687	13 519	27.3	5.6	1.5
All remaining records that could not be classified due to missing information on one or more of the following variables: presentation, parity, gestational age, type of labour, or previous CS.	5259	9296	56.6	3.9	2.2
Total obstetrical population	68 584	240 225	28.5	100.0	28.5

*British Columbia, Alberta, Ontario, Nova Scotia, and Newfoundland and Labrador (Eastern Health Authority Region).

B, respectively. The CS rates were calculated by dividing the number of Caesarean sections by the total number of deliveries in each group and expressing it as a percentage, as presented in column C. The relative size of each of the 10 groups was calculated by dividing the number of deliveries in each group by the total number of deliveries in the obstetric population and expressing it as a percentage (column D). Finally, the percentage contribution made by each group to the overall CS rate is shown in column E; this was calculated by dividing the number of Caesarean sections in each group by the total number of deliveries in the obstetric population. The contribution made by each group to the overall CS rate is thus not only dependent on the rate within the group, but also on the size of the obstetrical population in that group.

According to the Tri-Council Policy,[17] research ethics board approval for this project was not required because it was a quality improvement initiative.

RESULTS

The rate of CS by Robson classification groups was examined in 965 499 women who gave birth between 2007 to 2008 and 2010 to 2011 in five Canadian provinces, accounting for approximately 64% of all births in Canada (only 2010 to 2011 data shown in Table 1). In all provinces examined, the same three Robson groups showed the largest contribution to the overall rate of CS (Tables 2 and 3). The largest contributing group was Robson Group 5, women with at least one previous CS and a

Table 2. Contribution of each Robson group to overall CS rate by province, 2007–2008 to 2010–2011

Robson Group	BC				AB				ON				NS				NL			
	07–08	08–09	09–10	10–11	07–08	08–09	09–10	10–11	07–08	08–09	09–10	10–11	07–08	08–09	09–10	10–11	07–08	08–09	09–10	10–11
1	5.5	5.4	5.6	5.6	3.5	3.9	3.6	3.4	3.5	3.6	3.4	3.3	3.5	3.8	3.3	3.7	4.1	3.6	3.4	4.0
2	5.4	5.2	5.0	5.6	5.8	5.2	5.1	5.3	4.6	4.8	4.8	4.6	5.6	5.6	5.3	5.5	6.9	6.9	7.5	7.3
3	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.5	0.7	0.5	0.4	0.9	0.9	0.6	1.0
4	0.9	0.9	0.9	1.0	1.2	1.1	1.1	1.1	1.2	1.1	1.0	1.2	1.3	1.3	1.2	1.2	2.8	2.0	3.1	2.9
5	9.0	8.7	9.0	9.1	8.6	8.3	8.1	8.7	8.0	8.7	9.2	9.4	9.1	8.9	8.4	7.8	8.8	9.9	9.6	8.4
6	2.3	2.2	2.2	2.3	1.9	1.8	1.8	1.7	1.9	2.1	2.1	2.0	2.2	2.2	2.1	2.2	2.5	3.1	2.6	2.6
7	1.4	1.6	1.5	1.4	1.5	1.4	1.4	1.3	1.5	1.6	1.6	1.6	1.3	1.5	1.5	1.6	2.1	1.6	1.9	1.8
8	1.1	1.0	1.2	1.1	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.1	1.2	1.0	1.1	1.1	1.2	1.4	1.5	1.7
9	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.2
10	1.8	1.7	1.8	1.9	1.6	1.6	1.6	1.6	1.4	1.5	1.4	1.4	1.4	1.6	1.6	1.4	2.6	2.2	2.1	2.2
Missing* data	2.7	3.0	1.8	2.6	1.5	2.3	2.3	2.1	3.5	2.9	2.4	2.3	0.3	1.1	2.0	2.1	0.4	0	0	0
Overall CS rate	31.3	31.0	31.1	31.7	27.7	27.5	26.9	27.1	27.8	28.6	28.4	28.3	26.5	27.6	27.1	27.0	32.5	31.8	32.4	32.1

*Records that could not be classified due to missing information on one or more of the following variables: presentation, parity, gestational age, type of labour, or previous CS.

Table 3. Rank of contribution of each Robson group to overall CS rate by province, 2007–2008 to 2010–2011

Rank	Robson group				
	BC	AB	ON	NS	NL
1	5	5	5	5	5
2	1	2	2	2	2
3	2	1	1	1	1
4	6	6	6	6	4
5	10	10	7	10	6
6	7	7	10	7	10
7	8	4	4	4	7
8	4	8	8	8	8
9	3	3	3	3	3
10	9	9	9	9	9

term, singleton, cephalic-presenting pregnancy. Although this group accounted for only 11.3% of the total obstetric population across all five provinces, it had CS rates ranging from 76.1% in AB to 89.9%% in NL in 2010 to 2011, as well as the largest absolute number of Caesarean sections.

Robson Group 2 (nulliparous women with a term, singleton, cephalic-presenting pregnancy who had either induced labour or no labour) made the second largest contribution to the overall CS rate, except in BC where Groups 1 and 2 were reversed in order of contribution. This group accounted for 13.1% of the total obstetric population, with CS rates ranging from 34.4% to 44.6% (Table 4).

Robson Group 1 (nulliparous women with a term, singleton, cephalic-presenting pregnancy who had spontaneous labour) made the third largest contribution to the overall rate of CS (3.8%). This group accounted for approximately one quarter of the total obstetric population (23.6%) for 2010 to 2011 and had the second largest absolute number of deliveries after Group 3. The CS rate in this group was, by comparison, relatively low (14.5% in ON and 20.3% in BC for 2010 to 2011) (Table 4).

The largest group in the obstetric population is Robson Group 3 (multiparous women with no previous Caesarean section, a term, singleton, cephalic-presenting pregnancy, and spontaneous labour). This group had a low CS rate, ranging from 1.8% in NS to 4.2% in NL; it therefore did not make a large contribution to the overall CS rate (0.4% to 1.0%) in 2010 to 2011 (data not shown) and was

Table 4. Rate of Caesarean section for Robson Groups 5, 2, and 1, by province, 2007–2008 to 2010–2011

		Group 5		Group 2		Group 1	
Province	Year	A. Caesarean sections/ B.Total deliveries n	C. Rate of CS in each group (A/B) × 100 %	A. Caesarean sections/ B. Total deliveries n	C. Rate of CS in each group (A/B) × 100 %	A. Caesarean sections/ B. Total deliveries n	C. Rate of CS in each group (A/B) × 100 %
BC	07–08	3863/4773	80.9	2313/5252	44.0	2328/11498	20.2
BC	08–09	3755/4816	78.0	2225/5119	43.5	2324/11 827	19.6
BC	09–10	3887/4851	80.1	2149/5180	41.5	2428/11 878	20.4*
BC	10–11	3833/4832	79.3	2356/5287	44.6*	2349/11 556	20.3
AB	07–08	4226/5360	78.8†	2853/7111	40.1	1701/10 929	15.6
AB	08–09	4183/5427	77.1	2605/7019	37.1	1957/11 534	17.0
AB	09–10	4119/5509	74.8	2624/7256	36.2	1865/11 585	16.1
AB	10–11	4407/5788	76.1	2661/7255	36.7	1721/11 136	15.5
ON	07–08	10 786/13 153	82.0	6104/16 655	36.6	4695/31 146	15.1
ON	08–09	11 954/14 428	82.9	6619/17 612	37.6	4972/32 098	15.5
ON	09–10	12 667/15 280	82.9	6569/17 968	36.6	4709/32 193	14.6
ON	10–11	12 790/15 422	82.9	6250/16 984	36.8	4548/31 266	14.5
NS	07–08	820/1011	81.1	507/1434	35.4	318/2168	14.7
NS	08–09	820/1011	81.1	497/1291	38.5	336/2167	15.5
NS	09–10	748/928	80.6	475/1357	35.0	294/2128	13.8†
NS	10–11	667/850	78.5	472/1373	34.4†	317/2068	15.3
NL	07–08	251/276	90.9	197/467	42.2	116/620	18.7
NL	08–09	306/326	93.9*	215/546	39.4	112/760	14.7
NL	09–10	294/314	93.6	229/650	35.2	103/652	15.8
NL	10–11	250/278	89.9	217/561	38.7	118/665	17.7

*Highest values for each Robson Group

†Lowest values for each Robson Group

consistently ranked ninth in all five provinces (Table 3).

Robson Group 6 (nulliparous women with breech presentation, irrespective of gestational age) had very high rates of CS, ranging from 92.0% in AB and NS to 95.1% in BC and ON. However, this group made a relatively small contribution to the overall CS rate (1.7% to 2.6%) in 2010 to 2011 (data not shown), and ranked fourth or fifth in contribution to the overall CS rate (Table 3).

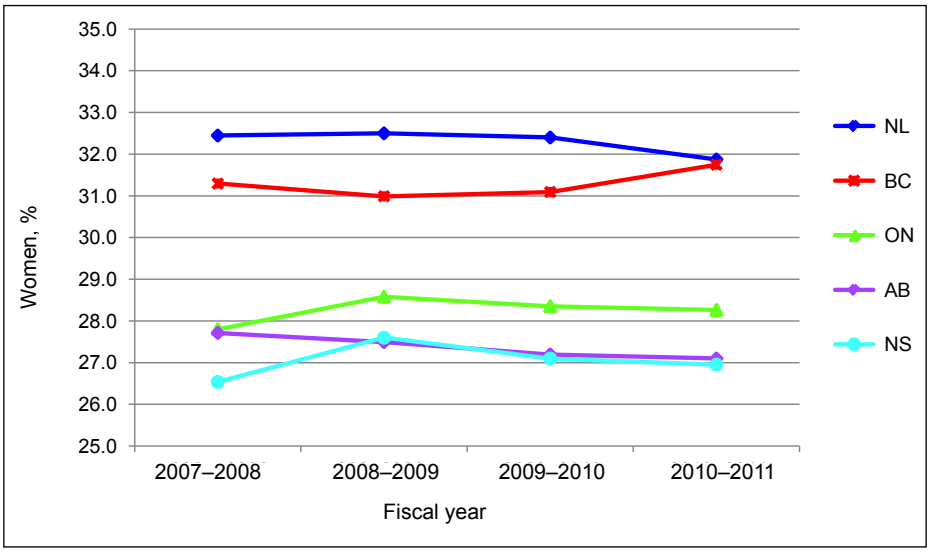
Overall CS rates remained relatively stable in all five provinces from 2007–2008 to 2010–2011, with slight decreases reported in AB and NL in the last two years (Table 2 and Figure). It must be noted that more than 5000 Caesarean sections across the five provinces could not be classified into Robson groups because of missing data elements.

DISCUSSION

The results of this analysis, based on 965 499 women who gave birth in one of five Canadian provinces during four fiscal years, 2007–2008 to 2010–2011, consistently showed that the same Robson classification groups were the largest contributors to overall CS rates.

This classification tool has recently been used to make international comparisons in CS rates. In multicentre studies in Latin America (120 hospitals in eight countries)[18] and North America, Europe, Australia, and New Zealand (nine hospitals in nine countries),[19] the classification system was easily implemented across different countries, hospital sites, and data collection systems, suggesting it is a robust and useful tool for ongoing surveillance.[18] Our finding that Group 5 makes the biggest contribution to the overall CS

Rate of Caesarean section by province, 2007–2008 to 2010–2011



Data source: Provincial Perinatal Database Systems

rate in all five provinces is consistent with the results found by Robson and colleagues[13,20,21] and is in accordance with common findings by others.[18,19]

In the first half of the 20th century, a woman who had a CS was likely also to deliver by CS in subsequent pregnancies.[22] Currently, the rate of CS is many times higher among women who have had a previous CS (Table 4, Robson Group 5), and this group makes a substantial contribution to the overall rate of CS.[13,20,21] Therefore, the best way to reduce the overall rate of CS in these groups is to prevent the first procedure.

For women who have had a previous CS, a movement to prevent repeat CS was largely driven by mothers supporting vaginal birth after Caesarean section. They helped to influence change in standard medical practice, and rates of VBAC rose in the 1980s and early 1990s.[23] A major turning point occurred in 1996 when a well-publicized Nova Scotia study reported that vaginal delivery after previous CS resulted in more maternal complications than did repeat CS.[24] Subsequent logistical and liability concerns led many hospitals to enact overt or de facto bans of VBAC.[25] As a result, the rate at which VBAC was attempted fell from 28.3% in 1996 to less than 10% in 2010.[23,26] There were controversial findings on the risks and benefits of trial of labour and elective repeat CS, and little or no evidence on short- or long-term neonatal outcomes after trial of labour compared to elective repeat CS.[25] Notwithstanding, enhanced access to VBAC has been recommended based on current findings on the safety of VBAC compared to repeat CS, indicating that 60% to 80% of women can achieve a safe vaginal delivery after a previous lower uterine segment CS.[27,28] A similar recommendation also emerged from the National Institutes of Health VBAC conference panel in March 2010.[25] It must be noted that a study published in 2012 that used a restricted patient preference cohort design demonstrated that planned elective repeat CS in women with one prior CS was associated with lower fetal risk and lower rates of infant death or critical outcome than planned VBAC[29]; however, the possibility that confounding by indication influenced the outcome of this study cannot be ruled out. Ultimately, due to the decline in attempted VBACs and concerns from hospitals and care providers about VBAC safety, a quick reduction in the rate of elective repeat CS is unlikely.

Other major contributors to the overall CS rate include Groups 1 and 2, which consist of nulliparous women with a term, singleton, cephalic-presenting pregnancy and no labour, induced labour, or spontaneous labour. There are many underlying causes for the steady rise in primary CS, including both medical and non-medical factors. Among the medical factors are increases in mean maternal age and pre-pregnancy BMI, as well as changes in obstetric practice, increased use of electronic fetal monitoring, increased labour induction and epidural anaesthesia, and reduced use of mid-pelvis forceps.[9] Some non-medical factors include CS requested by the mother, fear of litigation among caregivers, and inappropriate organization of maternity care.[30]

Research evidence suggests that significant reductions in rates of CS by 10% to 30% or more can be achieved through customized quality improvement strategies that involve rapid "plan/do/study/act" cycles to effect incremental change quickly.[31–38] A prospective study conducted in the United States from 1988 to 1994, focusing

on provider feedback, clinical guideline implementation, and health promotion, demonstrated that the overall CS rate fell from 31.1% to 15.4% without an increase in maternal, fetal, or neonatal morbidity or mortality.[32] Researchers in Latin America conducted a randomized controlled trial of mandating second opinions for cases of non-emergency CS and achieved a 25% reduction in CS rates without increased maternal and neonatal mortality.[33] The goal is to implement policies and practices to target reduction of primary CS rates, to reconsider VBAC deliveries, and to have these policies and practices accepted by consumers, maternal-newborn health care providers, and public health stakeholders.

There is growing evidence, as well as a consumer and professional movement,[39–41] to change practice in breech deliveries (Groups 6 and 7), which represent the next largest contributions to CS rates (ranked 4th to 7th for contribution). Although these two groups have the highest CS rates among all 10 Robson groups, they are relatively small contributors to the overall CS rate because of the small number of breech presentations. It has long been thought that vaginal breech birth is associated with more neonatal morbidity and mortality than elective CS. In 2000, a report from the Term Breech Trial,[39] which implied that Caesarean section was safer than vaginal birth for all fetuses with a breech presentation at term, led to a nearly universal practice of CS for breech presentation.[40] However, recent evidence shows that a substantial proportion of breech-presenting fetuses can be safely delivered vaginally in well-supported maternity units.[40,41] In 2009, the Society of Obstetricians and Gynaecologists of Canada released new clinical guidelines supporting selected vaginal breech birth.[41] New guidelines, however, rarely translate to rapid change in practice, as we have witnessed from examples such as intermittent auscultation as a preferred method of fetal surveillance in labour.[42,43] While breech presentation is a small contributor to the overall CS rate, the high rate of CS within this group could potentially be reduced if hospital administrators, care providers, and medical and midwifery educators work to include the skills required for breech delivery in training. Nurses must also relearn skills to care for women with a breech presentation in labour and to be able to assist at the time of delivery.

Better Outcomes Registry & Network (BORN) Ontario recently launched the BORN Information System, an online provincial database system for collecting and reporting on maternal and child health data across the continuum of care. As part of this reporting system, hospital and midwifery practice users can generate a standard Robson classification report at regular intervals to monitor their CS rates; additionally BORN Ontario can examine CS rates across the province. Registries in BC and NS also routinely provide Robson classification results to maternal-newborn management teams. The Newfoundland and Labrador Provincial Perinatal Program recently presented their Robson classification results to the Eastern Health Authority for the first time.

A limitation of the 2010 to 2011 data from the five participating provincial databases is the fact that over 5000 Caesarean sections could not be classified into Robson groups due to missing data elements. It is imperative for maternal–newborn care sites to document deliveries accurately by type of presentation, parity, gestational age, type of labour, and whether the mother has had a previous CS. A limitation of the Robson method is that its primary purpose is to identify differences in CS rates across patient subgroups, but it does not provide an explanation for these differences or distinguish the specific reason for performing CS. Institution-specific quality improvement initiatives are needed to address this issue.

Once the main contributors to CS rates are identified, the next steps should be to focus on prevention, where possible. Multi-faceted strategies including peer review processes, audit and feedback, and identification of barriers to change are more effective than isolated, single strategies.[21,31,33,44–46] Sustainable change requires a supportive management structure; strategies to embed practice change within the organization, feedback systems providing valid reliable accessible and timely data to users, effective collaboration, a culture of improvement with engaged staff and patients, and a formal capacity-building program.[47] Surveillance of important Caesarean section indicators, with a continuous cycle of accurate and timely data collection, synthesis, and dissemination, are crucial to the success of any reduction strategy.

CONCLUSION

The Robson 10-group Caesarean section classification system is a simple, standard tool to identify groups making the most signification contribution to the overall rate of CS. These classification findings will allow us to determine which target groups to investigate further to help us learn more about the underlying reasons for the differences in CS rates over time and between units, both nationally and internationally. This system can be used to facilitate comparisons across time and clinical settings, since it accounts for the background composition of the obstetrical population, which is likely to differ across time and place. We suggest that all hospitals and health authorities use this standardized classification system as

a key component of their quality improvement initiative for monitoring CS rates. This study adds to the growing literature on the Robson classification system and presents the Canadian context, which parallels international results.

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