Best Practices in the Use of Cesarean Sections in Nova Scotia

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Suggested citation: Reproductive Care Program of Nova Scotia. *Best Practices in the Use of Cesarean Sections in Nova Scotia 2008.* Halifax, Nova Scotia

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Executive Summary

Between 1970 and 2006 the cesarean section rate in Canada more than quadrupled from 6% to 26%. Similar increases have occurred in every province, including Nova Scotia where the cesarean section rate in 2006 was 27%. The cesarean section rate has risen across all regions of Nova Scotia and among all age, parity and medical risk groups. There are many complex factors contributing to this overall increase in operative delivery. They include changes in clinical practice guidelines, changes in maternal demographics and characteristics, and changes in attitudes and beliefs about birth, risk, and choice for childbearing women. There is no agreement among clinicians about whether there is an 'ideal' cesarean section rate, but there is a sincere interest in understanding the reasons for increased interventions in childbirth. As part of this effort the Reproductive Care Program of Nova Scotia (RCP) conducted quality assessment reviews in four different centres to identify and explore practice, environmental, resource, and population factors that contribute to cesarean section rates, using both qualitative and quantitative methods. This report outlines the collective findings from these reviews and describes, in the context of the Canadian Council on Health Service Accreditation's eight quality dimensions, the factors that appear to support best practices in maternity care with respect to cesarean sections in Nova Scotia. Recommendations from the quality assessment reviews are grouped into five categories; recruitment and retention/HHR, evidence-based practice, clinical education and mentoring, communication and collaboration, and counseling and public education.

Most women and newborns are at low-risk of experiencing an adverse event. The risk, however, is not zero and women who experience a healthy, low-risk pregnancy may suddenly require urgent or emergent intervention for their babies or themselves. This dichotomy of perspectives creates challenges for caregivers and for women trying to balance acceptable risks with optimal outcomes, in an environment that emphasizes safety and risk avoidance. Considerable clinical experience and judgment are required to expertly support a woman through a normal birth, while maintaining the appropriate vigilance for signs of significant deviation from normal.

It is critical that the focus on normal and healthy be just as strong as the focus on timely intervention if the clinical situation changes. Achieving a change in recent trends towards increased intervention will require a different level of discussion among caregivers and between caregivers, women and their families. Over time this dialogue could have an impact on attitudes and beliefs about childbearing and may contribute to restoring trust in the process of birth, and a commitment to ensuring that interventions are both timely and appropriate to the clinical situation. In order to make significant and lasting change, those involved in the maternity and newborn care system must make as much of an investment in avoiding interventions when they are not warranted, as we have in ensuring their consistent availability.

Recommendations

Recruitment, retention and health human resource planning

In order to maintain consistent coverage over time, call for obstetricians should be equally distributed among the care providers in the community. Physicians who work in fee-for-service models should explore alternate options for payment (e.g. pooling on-call income). Centres with a strong commitment to an on-call system, sometimes with a shared income component, have found that it makes workload more manageable, encourages collaboration, and reduces the pressure for physicians to deliver their 'own patients', which has the potential to influence the timing of interventions.

Recruitment and retention of physicians and nurses who work in the field of maternal and newborn care should be a priority across the province. RCP will collaborate with maternal-child care providers and administrators throughout the province to explore and create innovative HHR models for maternal-child care. In addition, RCP will advocate for provincial commitment to the recruitment and retention of maternal-child care providers.

Evidence-based practice

Pregnancy dating in Nova Scotia should be standardized and follow an accepted algorithm that minimizes the likelihood of inappropriate intervention for post-dates pregnancy, provided the health status of both the mother and the fetus are reassuring. In the absence of any superimposed clinical indications to proceed, post-dates induction should be planned during the 41^{st} week of gestation ($41^{0}/_{7}$ to $41^{6}/_{7}$).

Practices that are consistent with a low intervention approach to labour should be emphasized. These include delaying admission to the labour and birth unit until active labour is established; the use of intermittent auscultation for low-risk labouring women; the use of scalp pH measurement, where laboratory resources allow, for reassurance in the presence of equivocal fetal monitoring results; and

'watchful waiting' in the 2nd stage of labour, provided fetal and maternal well-being are assured.

All Maternal-Child/Perinatal Committees should undertake annual cesarean section audits using a standardized format. If the group of caregivers is too small to allow objective review, RCP staff will work with the DHA to conduct the reviews. Individual DHAs may choose to focus the reviews on a particular aspect of care associated with cesarean sections, such as primary cesarean sections, or cesarean sections among low-risk nulliparous women (see Appendix A).

Clinical education and mentoring

The regular presence of a clinical expert to provide education and support for nurses is an essential component of care for labouring women. The RCP recommends that this education and support come from a clinical educator/clinical resource nurse or a unit-based clinical leader with expertise in normal labour care. This is particularly important when the manager has responsibility for multiple nursing units.

Facilities should support informal professional development opportunities such as nurse-to-nurse mentoring. This support can be in the form of dedicated time for nurses to mentor each other and written or verbal recognition of mentors by nurse managers and administrators.

Physicians providing maternity care should contact their local CME Coordinator to request interprofessional education sessions that address key obstetrical and newborn topics.

Communication and collaboration

Each Maternal-Child/Perinatal Committee should plan regular activities that focus on team functioning and interdisciplinary communication. These activities could be clinically based, such as a staging a mock obstetrical emergency or focused on some aspect of care that could be improved by developing a more consistent team approach. For example, the team could strategize about how best to counsel women contemplating VBAC, or consider ways to encourage women in late pregnancy to await spontaneous labour rather than seek induction of labour.

Counseling and public education

Prenatal care and education needs to include provision of unbiased, non-directive information and counseling about the risks and benefits of common obstetrical choices including admission to hospital before labour is established, use of epidural anesthesia, and induction of labour.

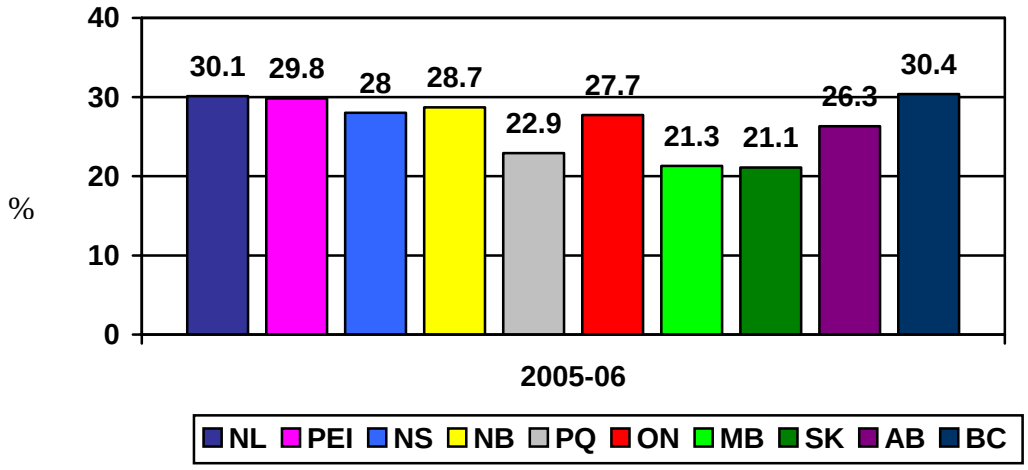
Pre-conception and pre-pregnancy care and education needs to focus on the importance of maternal health to the health of the baby and mother during pregnancy, birth, and following birth. Healthy women are more likely to give birth to healthy babies and are less likely to require interventions to do so. Women should receive very clear messages about the importance of healthy weight, avoidance of smoking and alcohol/drugs, taking multivitamins with folic acid, etc. Newer information that suggests an 'ideal' age range for childbearing should also be discussed.

Caregivers should not underestimate women's commitment to vaginal birth and avoiding intervention, provided it is safe to do so. This commitment should be fostered and supported whenever possible.

Introduction

For over thirty years the cesarean section rate has been under scrutiny from clinicians, administrators, and the public. Between 1970 and 1988 the cesarean section rate in Canada rose from 6% to 20%. Over the next two decades the increase to 26% (26.3% in 2005-06)[1] was gradual, characterized by intermittent spikes and periodic plateaus. There are many complex factors contributing to this overall increase in operative delivery. They include changes in clinical practice guidelines, changes in maternal demographics and characteristics, and changes in attitudes and beliefs about birth, risk, and choice for childbearing women. Between 1988 and 2006, the cesarean section rate in Nova Scotia rose from 19.6% to 27%. Although there is no agreement about the 'ideal' cesarean section rate, targets have been set by agencies such as the World Health Organization and, closer to home, the Nova Scotia Department of Health. While a target for Nova Scotia may not be determined easily or even wise to pursue, there is growing interest in understanding the reasons why cesarean section rates have continued to rise. It is important that we, health care providers and 'the public', do not become complacent about the increasing use of technology in the birthing process and that we continue to appreciate and value the role of the natural processes of labour and birth and their impact on short and long-term maternal and infant health and well-being.

Provincial Cesarean Section Rates 2005-2006



Source: Canadian Institute for Health Information

Between 2004 and 2006 the Reproductive Care Program of Nova Scotia (RCP) conducted quality assessment reviews in four different centres to explore the factors potentially associated with the changes in childbirth in our province. The goal was to identify practice, environmental, resource, and population factors that contribute to cesarean section rates, using both qualitative and quantitative methods. This report outlines the collective findings from these reviews and describes the factors that appear to support best practices in maternity care with respect to cesarean sections in Nova Scotia. Both provincial and regional data are included in this report. Data are presented by larger regions, rather than by District Health Authorities (DHAs) ,to emphasize the issues rather than comparisons between the current DHAs *(Note: Western Region includes DHAs 1-3, Northern Region includes DHAs 4-6, Eastern Region includes DHAs 7-8, Central Region is similar to the current DHA 9).* Unless otherwise indicated, the source for all of the graphs and tables in this report is the Nova Scotia Atlee Perinatal Database.

Literature Review

Contributing Factors

Cesarean section rates cannot be considered in isolation of other changes taking place in the health care environment and in society. [2, 3] The increase has been attributed to "multiple, convergent factors", including changes in maternal demographics and obstetrical practices, and in overall expectations regarding choice and perception of risk.[4] Pregnant women as a population are increasing in age and body mass index, and decreasing in parity. There are more multiple births due, in part, to advances in reproductive technologies. Continuous electronic fetal monitoring, while a major improvement in care for at-risk groups, has contributed significantly to the rise in cesarean sections across all populations.[5] Research about the outcomes associated with vaginal breech delivery and instrumental vaginal delivery has pointed to improved outcomes for infants and for mothers with elective cesarean section.[4, 6] The concept of choice and autonomous decision-making are also thought to play a role in the rising rates of cesarean section. It may be that the increased use of cesarean section for specific clinical situations has increased the acceptability of the procedure overall. There are reports in both the professional literature and the popular press that a growing number of women are choosing elective cesarean section.[7] In addition to introducing the idea of cesarean section as a legitimate choice, these factors may also undermine caregivers' and women's commitment to, and confidence in, vaginal birth. These factors are outlined in this section of the report. Please note that, although this is not an exhaustive review of the literature, the most influential papers are cited with particular attention to Canadian publications.

<u>Practice Factors</u>

Across Canada, the most common indications for cesarean section are previous cesarean delivery, dystocia (non-progressive labour), malpresentation including breech, and non-reassuring fetal heart rate/fetal distress. [8, 9] All four indications have been influenced by changes in clinical practice guidelines for labour and birth.

Repeat Cesarean Section versus Vaginal Birth After Cesarean Section

Prior to the 1990s the obstetrical 'mantra' was "once a cesarean, always a cesarean".[10] Family size was generally larger than in more recent years and women faced the prospect of significant morbidity from complications of repeated abdominal surgery.[11] In response to research in the early 1990's there was considerable emphasis placed on vaginal birth after cesarean section (VBAC) as a safe and viable option for women whose clinical situations met specific criteria. National professional organizations such as the Society of Obstetricians & Gynaecologists of Canada (SOGC) and the American College of Obstetrics & Gynecology published guidelines to assist their members with identifying the women most likely to have a successful vaginal birth after a previous cesarean section.

As VBAC became more common, information about serious and sometimes catastrophic sequelae started to emerge. Most concerning was the possibility of uterine rupture potentially resulting in fetal demise, a very small but real risk for women who had had a cesarean section. Other 'major maternal complications' were reported among women who laboured with a uterine scar, at nearly twice the rate reported in women who chose an elective repeat cesarean section.[12] These findings made some obstetricians reluctant to recommend a 'trial of labour' and prompted others to routinely recommend elective repeat cesarean section to all women whom they counseled. In spite of these findings, the SOGC has continued to recommend that women who have undergone one previous cesarean section should be offered a trial of labour in a subsequent pregnancy, provided the appropriate conditions are met with regard to the clinical situation and management of labour.[13] While the relative risk of uterine rupture with a trial of labour was, and is, higher than in an elective cesarean section, the absolute risk remains low. [12, 13, 14] The SOGC has made clear statements about a clinician's responsibility for full disclosure regarding potential complications as well as the likelihood of successful vaginal birth when counseling a woman about her birth options. For those who labour after a previous cesarean section close, continuous assessment of labour progress and the fetal heart rate, prudent use of oxytocin for augmentation and induction, avoidance of prostaglandin, and

timely and detailed documentation regarding the plan of care and progress of labour are all components of safe care.[13]

For women, past experiences during labour and perceived level of control in decision-making are the most important factors influencing the choice for a VBAC instead of elective repeat cesarean section. Physician/primary care provider encouragement and support is the second most influential factor and should not be underestimated.[15] In a study of thirty women who had had a previous cesarean section, the possibility of a 'failed trial of labour' prompted a number of women to opt for repeat cesarean section, particularly those women whose previous cesarean section was undertaken during labour. For those women, a cesarean section during labour represented loss of control, uncertainty, and fear and they endeavoured to avoid those feelings and maintain some control by choosing a planned cesarean birth. Others, on the other hand, opted to labour because they wanted to experience normal birth and prove to themselves that they could achieve their goal of vaginal birth. One woman expressed a feeling that, because her only previous pregnancy had resulted in a cesarean section, she had "missed out on a unique feminine experience".[16] This desire to experience natural birth was echoed in another small study. One woman in this study wanted assurance that she would not be separated from her baby as she had been following her initial cesarean section, a sentiment that was echoed during the focus groups with Nova Scotia women conducted as part of the RCP quality assessment reviews. Social science studies have suggested that women's choices about VBAC are influenced by interactions with physicians, previous experience with labour and birth, and personal beliefs about childbirth and motherhood, rather than by a 'medical analysis' of risks and benefits.[16, 17]

Management of breech presentation

The Term Breech Trial shifted the preferred management for term breech fetuses to planned cesarean section.[6, 18] The study concluded that planned cesarean delivery for these infants is associated with significantly lower risk for neonatal mortality or serious neonatal morbidity than vaginal breech birth, with no significant difference in maternal death or morbidity. Further, the authors concluded that a woman at term who plans for a

vaginal breech birth has a greater than 40% chance of requiring an emergency cesarean section, thus greatly increasing her risk for a significant maternal morbidity.[6] Even before these results were published vaginal breech birth had become far less common. The term breech study affirmed what appeared to have been commonly held beliefs about unfavourable outcomes associated with vaginal breech birth.[19] After the study was published most of the physicians still offering vaginal breech birth as an option felt compelled to change their practice. External cephalic version to avoid breech presentation is an option but the efficacy of the procedure is variable. The management of a term breech delivery remains somewhat controversial and a few care providers continue to support vaginal breech birth for carefully selected women.[18]

Management of labour/induction

Like cesarean section rates, rates of induction have risen significantly over the last twenty years. The Society of Obstetricians and Gynaecologists of Canada supports the induction of labour for post-dates after at least 41 completed weeks and cites a reduced likelihood of perinatal death associated with this practice.[20] Judicious use of induction is an important component of overall good patient care. However, the induction of labour is known to be associated with increased risk for further intervention such as operative vaginal delivery and cesarean section.[21, 22] Furthermore, there is an increased financial cost to the system for both an assisted vaginal delivery and a cesarean section following labour.[23] Recently the association between induction and cesarean section has been challenged, leading to a call for more prospective studies among various gestational age groups.[24]

Discussion of the risks and benefits of labour induction as they are understood currently, contributes to informed consent policies and ultimately to consumer choice. Once a woman is in labour much of her care and support is provided by nurses or, in provinces with midwifery regulation, by midwives. Some women have the option of focused labour support from a doula. Studies have shown that consistent supportive care by nurses or midwives may influence the reduction of interventions.[25] However, Hodnett, Hofmeyr, Gates & Sakala cautioned that the reduction of cesarean sections may not be achieved

solely by ensuring the provision of one-to-one supportive care. They concluded that the acute care environment has a tremendous impact and that the pervasive risk-oriented, technology-centred approach to intrapartum care must be changed in order to effect a reduction in cesarean section rates.[26]

Maternal choice

Maternal choice for both elective and non-elective cesarean sections is cited as a factor in the rising rates of cesarean section.[27, 28] There are five phenomena that have emerged in the last decade that have contributed to making elective cesarean section attractive to both women and physicians.[29] These include 1) an increased concern about the potential relationship between urinary and fecal incontinence and vaginal birth; 2) the judgment that cesarean section is safe; 3) liability issues associated with labour and vaginal birth; 4) the public expression of some physicians' personal preference for cesarean section; and 5) a cultural value placed on autonomy and the right to choose. These factors do not necessarily impact only the decision to have an elective cesarean section but may also impact a woman's and her physician's decision to 'abandon' a labour in progress in favour of a cesarean section. There are reports that women who have undergone a non-elective cesarean section expressed confidence in the decision, felt well informed, and reported that they played an important role in the decision to have a cesarean birth.[30]

Moffatt studied the process of decision-making for birth in thirty women who had experienced a cesarean section.[17] All of the women interviewed expressed a desire to be involved with care decisions. Some women, however, were concerned by their perception that the decision was ultimately theirs, as they did not feel "medically capable" of making the decision. One expressed uncomfortable feelings of pressure to make this decision. Another expressed a wish for "expert reassurance" suggesting that there is reliance on the primary care provider to offer a recommendation based on professional expertise. While wanting to be heard and have her feelings and wishes respected, this woman acknowledged that she was not always able to appreciate medical nuances, and therefore relied implicitly on physician advice. Although efforts to inform choice are well intentioned, some women felt that there was too much information given; one stated she

felt "laden down with information." Interestingly, some women expressed a wish that the physician would indicate what they (or their partner) would do if faced with this decision. Others stated their strong preference for information that related to their specific situation, their needs and their lives.[17]

In recent years, there has been a perception that women in growing numbers are requesting elective cesarean section. Concerns about potential maternal morbidity associated with vaginal birth including urinary incontinence, sphincter damage, and long-term effect on sexual function as well as fear of labour and vaginal birth have been acknowledged as reasons for these requests.[31] In a survey of 162 Canadian obstetrical and gynaecological health care professionals by Farrell et. al., 44% stated that cesarean section reduces bladder and bowel problems. However, respondents shared that informed choice rather than protection of the pelvic floor influenced their discussions with women about elective cesarean section.[32] In keeping with informed choice about mode of delivery Farrell suggested that obstetrical care providers need to consider the potential long-term effects of assisted vaginal delivery on the quality of women's lives.[33] He urged providers to counsel women about the risks of forceps or vacuum delivery to the integrity of the pelvic floor and anal sphincter muscles when choosing between an operative vaginal delivery and a cesarean section.

The desire to schedule birth has also prompted some women to request cesarean section. Patient choice, or cesarean section 'on request/demand', is a phenomenon that has been vigorously debated with strong and sometimes conflicting opinions about risk, patient safety and the ethics of patient choice. A recent review of cesarean sections in the eastern United States concluded that the increase in parturient women with no labour was influenced by the number of women electing a cesarean delivery without medical indication.[7] In Canada, the focus on 'choice' as an indication for cesarean section may be out of proportion to the demand but the debate is taking place in both the popular press and in professional journals. Elective cesarean section with no medical indication is not yet commonly documented in Nova Scotia. However, a chart audit of cases in the first

nine months of 2006 revealed three women who elected to have a cesarean section to avoid labour and/or vaginal birth.

Patient safety literature purports that achieving the goal of safe care can only be possible by "integrating the voices of patients and families into virtually everything".[34] Patient/ client-centredness relates to the need for women and families to have voices in decision-making.[35, 36] There is an abundance of nursing and medical literature devoted to the concept of choice and decision-making. On an individual level, the current environment which emphasizes both 'evidence-based' decisions and choice contributes to a complex balance of factors impacting method of delivery, and may even result in situations where women's and caregivers' views conflict.

Population Factors

While trends in practice have had a steady and sometimes subtle influence on increasing rates of intervention, it is also important to appreciate the influence of changes in the demographic profile and underlying health of the childbearing population. Data from Nova Scotia and other jurisdictions has contributed to the knowledge that advanced maternal age, low parity, high pre-pregnancy BMI and/or large weight gain during pregnancy, and maternal smoking all increase the risk of delivering by cesarean section.[19, 39] These characteristics and behaviours, in turn, have contributed to changes in obstetrical practices. They are associated with various medical complications in their own right but may also influence practices such as induction, which is associated with an increased risk for birth intervention.

Nulliparous women are more likely to have a birth-related intervention, including cesarean section or operative vaginal birth, than women who have had a previous vaginal birth.[40] Similarly, women who have increasing parity may have a reduced risk of an emergency cesarean section compared to nulliparous women.[41] Regardless of parity, older women are more likely to have conditions such as hypertension, diabetes or other medical complications that increase the likelihood for induction of labour and possibly cesarean section. Increasing pre-gravid BMI and weight gain between pregnancies also

contribute to an increase in cesarean sections by reducing the success rate of VBAC after a single low transverse cesarean section.[4, 39]

Increasing BMI is a major concern in the population as a whole. Obesity has implications for personal health during childbearing and in later years. Recent information suggests an increase in congenital anomalies among women with BMI $\geq$ 30. [42, 43] This association is independent of any imaging problems due to maternal habitus and may be due to a high glycemic index diet.[44] In addition, larger women tend to have larger babies. Both maternal and fetal weights have an influence on the method of delivery.

Maternal confidence in the ability to give birth

As intervention becomes more common it may seem more acceptable. As noted previously, women are greatly influenced by both their own past experiences with birth and by their primary care providers' attitudes and approaches. In a 2005 survey conducted in Kingston, Ontario over 200 women of various parities (107 nulliparous women and 103 multiparous women) who had not experienced a previous cesarean section were asked about their choices for birth. Fourteen percent of nulliparous women and 5% of multiparous women indicated that they would choose an elective cesarean section if given the option. A greater proportion was undecided; 32% of nulliparous women and 20% of multiparous women. In ranking the factors that influenced their decisions, nulliparous women most commonly cited avoiding labour pain as the reason for choosing an elective cesarean section. The most influential factor for multiparous women was the risk associated with vaginal delivery. Since these women had all experienced a vaginal birth, a previous birth complication might have influenced their desire to avoid vaginal birth in a subsequent pregnancy.[45]

For both nulliparous and multiparous women who preferred vaginal birth, risk for the baby with a cesarean section was the most common reason for not choosing an elective cesarean section. Interestingly, belief as to whether or not an elective cesarean section should be *offered* to all pregnant women differed among nulliparous and multiparous women. Of those who expressed an opinion, 51% of nulliparous women and 28% of

multiparous women expressed the opinion that cesarean section should be offered to all women, whereas 25% of nulliparous and 50% of multiparous women, responded that it should not be a choice. A quarter of all respondents were undecided.

Occasionally women who have experienced a cesarean section are inclined to rethink their personal philosophy of labour and birth. Fenwick and colleagues analyzed the responses of fourty-nine women who had experienced an unplanned cesarean section after expecting a vaginal birth.[46] Eighty percent of these women opted for an elective cesarean section in a subsequent pregnancy. For them, expectations that labour would advance normally and result in a vaginal birth were often replaced by concerns that vaginal birth was somehow "uncertain, unsafe and unachievable". The concept of vaginal birth was associated with "pain and the risk of complications." These women experienced decreased confidence, as birth was considered more "unpredictable and uncertain". Personal goals became focused on having a healthy baby as the "only reasonable expectation". The women talked about additional factors that might have influenced their decision to consider VBAC as an option. The main factors identified were discussions with primary care providers, input from family and friends, and personal reflections on their previous birth experiences. Overall, women expressed a high degree of trust in their physicians; many accepted the physician's approach to method of delivery without question. While this was only one study, it indicated the power that primary care providers have to instill confidence and trust in the birth process or to undermine women's confidence, perhaps in an effort to encourage them to make an 'informed choice'.

Studies such as the Term Breech Trial may have contributed to a common belief, among those who make the argument for cesarean section 'on request', that elective cesarean section is as safe as planned vaginal birth for the mother, safer for the baby, and should be offered to all women. Liu et. al.[47] argued that although the actual numbers are small, there is, in fact, a greater risk of severe maternal morbidity associated with planned cesarean section as compared to planned vaginal birth. The researchers used Canadian Institute for Health Information (CIHI) data for women delivering in Canada between

1991 and 2005. Significant postpartum complications associated with elective cesarean section for those women included infection, hemorrhage requiring hysterectomy, VTE and shock.

Within acute care, maternity caregivers have traditionally understood the importance of the overall experience of childbirth and mothering within the healthcare system. Clinical outcomes, although important, valued and emphasized, are only part of the picture. Relationships, communication and choice are directly related to patient satisfaction and to outcomes that impact on the overall health and well-being of the mother and baby, including confidence in the maternal role, maternal newborn attachment, and breastfeeding success.[13]

System Factors

Health care costs

Responsible use of resources, both human and financial, has been proposed as a salient issue in the cesarean section debate. Shorten and colleagues proposed that cost-effectiveness may, in some situations, influence counseling regarding the most appropriate mode of delivery for women who have had a previous cesarean section.[37] Extra health care costs associated with a cesarean delivery include increased length of hospital stay and increased nursing care, especially in the first hours following birth. A recent Nova Scotia study concluded that cesarean section during labour is the most costly method of delivery.[23] It is also well known that maternal and neonatal complications are highest among this group, although the operative delivery is not necessarily the cause of increased morbidity.[38] Health economists are focusing efforts on answering the questions about health care costs associated with various modes of delivery. Regardless of the results of these studies, however, the societal costs and family impact of cesarean birth are significant but remain unquantified.

Health human resource planning

Our current environment emphasizes both ‘evidenced-based decisions’ and choice. These concepts should be complementary on a system-wide basis, but may be at odds with each

other in individual circumstances or when considered in the context of available resources in each community. A number of health human resource models have been developed but none specific to maternal-child care. Wranik suggested that a number of innovative micro-level health human resource models have been developed based on facilitating providers to practice to their full scope, redefining the roles of health care professionals, interdisciplinary collaboration and the creation of supportive technology and information systems.[48] This author suggested that macro-level HHR strategies needed to consider changes in education and changes in policy. The lesson proposed is that, in order to provide consistent, accessible, quality care, we need to 'think outside the box' and consider new ways of providing care to women, newborns and families. The Multidisciplinary Collaborative Primary Maternity Care Project (MCP^2), a joint project of five national associations, provides concrete recommendations and evidenced-based resources to assist care providers in their efforts to develop and evaluate the effectiveness of multi-disciplinary teams.[49]

Local research with perinatal nurses has shown that mentoring is key to nurses' professional development and central in creating positive perinatal practice environments.[50] When Baumann and colleagues discussed work life issues with nurses and health care agencies across Canada, both the agencies and nurses identified the need for commitment to professional development activities such as nurse-to-nurse mentoring as vital to retaining experienced nurses and recruiting new nurses into the profession.[51] Asselin concluded that staff nurses often use informal, unit-based, person-based sources for new knowledge selection, transfer and utilization.[52] In addition, mentoring has been shown to have numerous benefits for health care organizations. These include reduced costs for recruitment and retention of nurses, improved client outcomes and enhanced client satisfaction[53, 54, 55]. A more positive organizational culture and reputation as a result of nursing professional development are other benefits noted.[56]

Implications for caregivers and women

The rising cesarean section rate in Canada and across North America has been a focus of discussion in the media and among health care professionals. There are many questions

asked and numerous issues debated. Why has this dramatic increase occurred? Is vaginal birth after cesarean section (VBAC) a risky practice? How should care providers counsel women about risk? What influences a woman's choice regarding method of birth? Should women who choose elective cesarean section in the absence of medical indications be required to pay for the intervention? How great a role do changing demographics play in practices and outcomes regarding labour and birth? Have short and long-term outcomes for mothers and babies improved sufficiently to justify the increase in interventions? Is there a need/desire to reverse the recent trends in childbirth practices? In a gradually more litigious environment, how much focus should caregivers place on risk when counseling women about their options? It is against this complex backdrop of clinical, demographic, attitudinal and societal factors that health care providers and women approach the prospect of pregnancy and birth. Women want to make the choices that are most likely to result in a good experience and a healthy outcome for themselves and their babies. Caregivers, too, strive for good outcomes and to ensure satisfaction for their clients.

There are many studies that corroborate findings that the changes in maternal characteristics and behaviours described in this report increase the risk of delivering by cesarean section.[19, 39] Although there are important population health messages in the documented demographic trends, intervention rates have increased across the entire population. Obstetrics practices such as induction of labour, delivery by an obstetrician, and avoidance of forceps undoubtedly contribute to rising cesarean section rates. What confounds the results is the extent to which obstetrical practices are influenced by maternal factors.[4] It is important that maternal health and demographic issues receive appropriate emphasis and intervention but these issues should not divert the attention of caregivers from the areas of practice over which they have control. It is counterproductive to assign 'blame' for increased levels of intervention to either care providers or women. We do, however, have an opportunity and an obligation to share with women our understanding of the factors that have led to the current situation and make a concerted effort to optimize the use of cesarean sections in Nova Scotia.

FRAMEWORK FOR THE REPORT

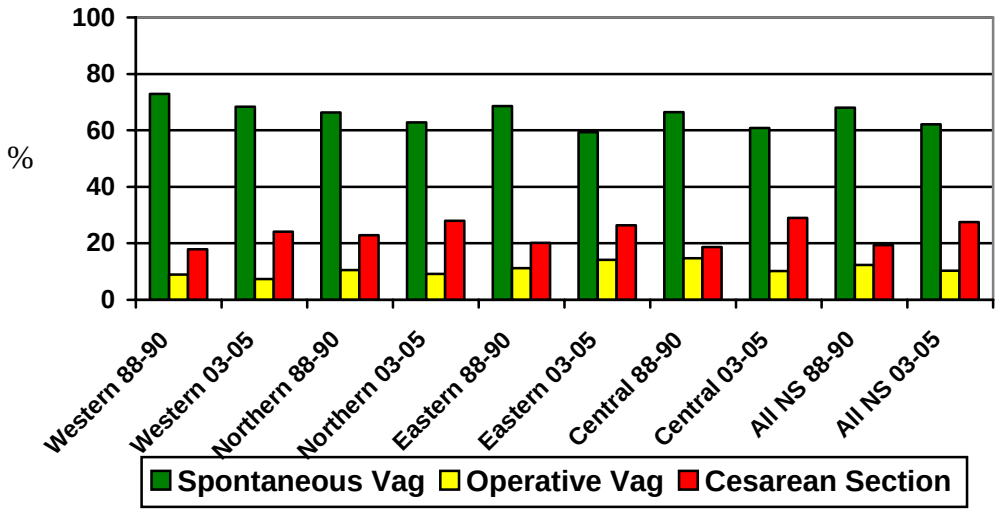
In response to an increased focus on patient safety, health care organizations and health care professionals have been increasingly focused on the provider – client/patient relationship. The Canadian Council on Health Service Accreditation's (CCHSA) standards for 2008 emphasize 'client-centredness', which the Council describes as 'putting clients and families first'. Client-centeredness is a similar concept to family-centred care, which has been a key philosophical tenant of maternal and newborn care for decades. Given this congruence in philosophy, the findings in this report are presented in the context of the applicable CCHSA quality dimensions. The eight dimensions and their tag lines are listed below.[57]

1. **Population Focus** (Working with the communities to anticipate and meet needs)
2. **Accessibility (**Providing timely and equitable services)
3. **Safety** (Keeping people safe)
4. **Worklife** (Supporting wellness in the work environment)
5. **Client-centered Services** (Putting clients and families first)
6. **Continuity of Services (**Experiencing coordinated and seamless services)
7. **Effectiveness** (Doing the right thing to achieve the best possible results)
8. **Efficiency (**Making the best use of resources)

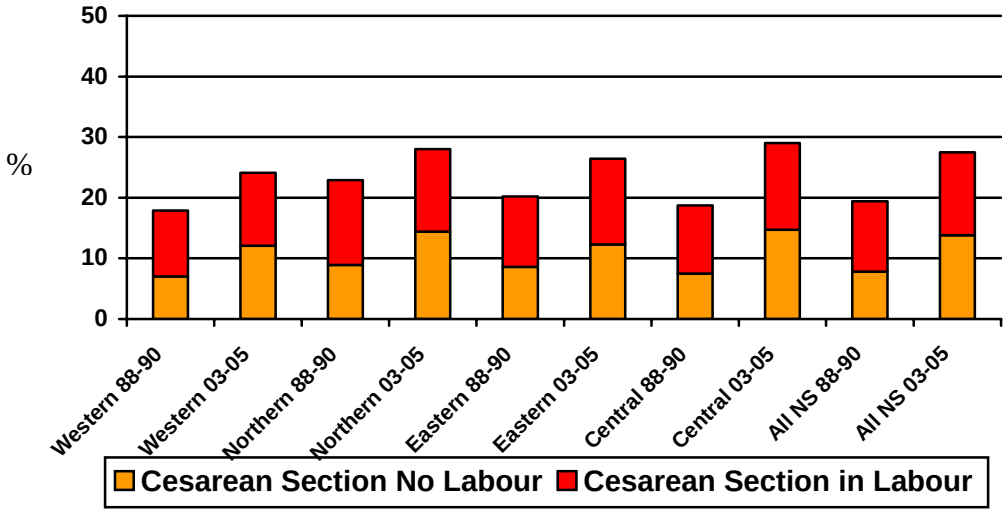
The Nova Scotia Experience: Quantitative Results

Cesarean section rates vary between District Health Authorities (DHAs) in Nova Scotia. This variation reflects the unique circumstances in each area but it is important to note that there has been an increase in cesarean deliveries in all areas of the province. Both primary and repeat cesarean sections have increased across the province.

Method of Delivery by Region in Nova Scotia 1988-1990 and 2003-2005



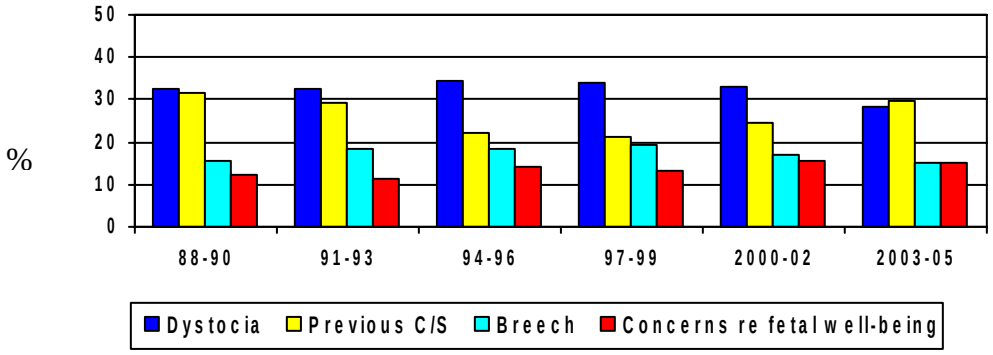
Type of Cesarean Section by Region 1988-1990 and 2003-2005



Practice factors (Quality Dimensions: Safety, Effectiveness, and Efficiency)

The most common indications for cesarean section in Nova Scotia are the same as those across Canada. They are: repeat cesarean section, dystocia, breech presentation (malpresentation), and non-reassuring fetal heart rate. The primary cesarean section rate has risen from12.3% in 1991-1995 to 17.3% in 2000-2005. With the decline in vaginal birth after cesarean section, repeat cesarean section has overtaken dystocia as the most common indication for operative delivery. All four indications are influenced by changes in clinical practice guidelines for labour and birth. The motivation for these changes is a desire on the part of caregivers to respond to evidence suggesting that interventions for specific indications improve outcomes for infants and their mothers.

Indications for Cesarean Section in Nova Scotia 1988-1990 through 2003-2005

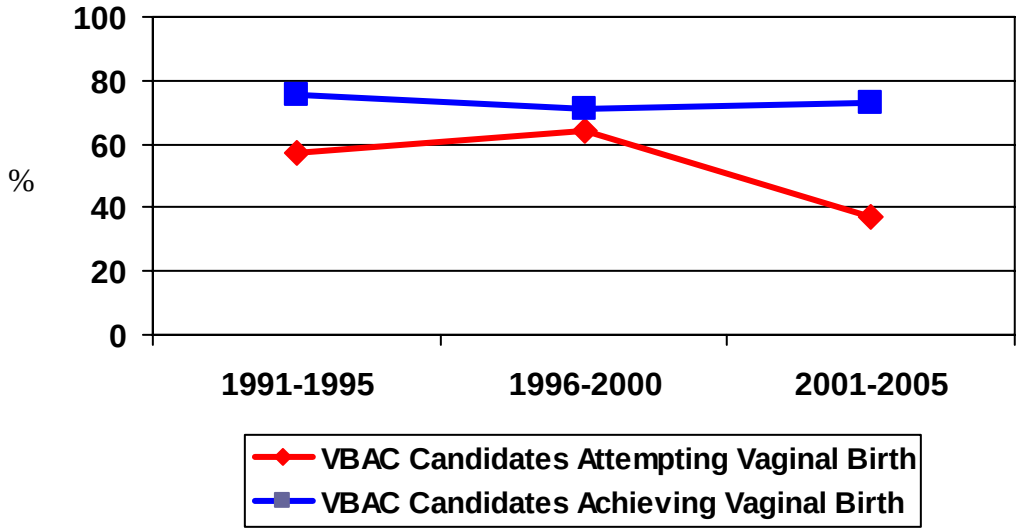


Repeat cesarean section and vaginal birth after cesarean section

In the 1990s there was widespread interest in promoting clinical practices that supported vaginal birth. The Reproductive Care Program organized and facilitated a Department of Health sponsored provincial workshop to share national and local data about the advantages of VBAC and to increase the commitment of caregivers to offering and supporting this option.[58] As a result of this province-wide emphasis on VBAC, the proportion of women considered 'VBAC candidates' who opted for labour increased from 39.7% in 1988 to 65.9% in 1998. Among women who had a 'trial of labour' in the mid to late 1990s, 66.2% – 71.9% had a successful vaginal birth. The Nova Scotia experience mirrored data from other centres that demonstrated a low absolute risk of uterine rupture with a trial of labour, although the relative risk was increased among women who laboured.[12] Care providers and women found these data reassuring and VBAC remained a popular option until the late 1990s. After that time, however, the percentage of women opting to labour after a previous cesarean section decreased from 65% in the mid-1990s to 32% in 2006. In addition to the reasons for the decline described in this report, there is anecdotal evidence that some Nova Scotia women who have to travel a significant distance for birth may choose an elective repeat cesarean section to avoid having to travel during active labour. Among those who choose to labour, the rates

of successful vaginal birth have remained high at over 70%. The graph below illustrates the percentage of women in Nova Scotia choosing and achieving VBAC.

VBAC in Nova Scotia 1991-1995 through 2001-2005



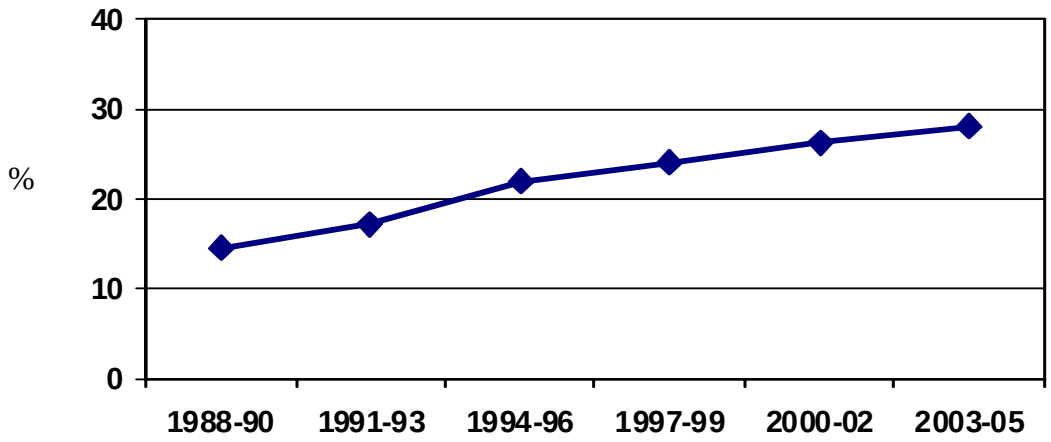
Management of breech presentation

The proportion of infants in breech presentation at term within Nova Scotia has fluctuated between 4.3% and 5.3% between 1988 and 2006. While this number is not particularly high, the delivery of these infants has made a small contribution to the rising cesarean section rate. The proportion of infants in the breech presentation delivered by cesarean section in Nova Scotia increased from 77% to 93% between 1988 and 2005 (95% for singleton births). This increase accounts for less than 1% of the overall rise in the rate of cesarean section.

Management of labour/induction

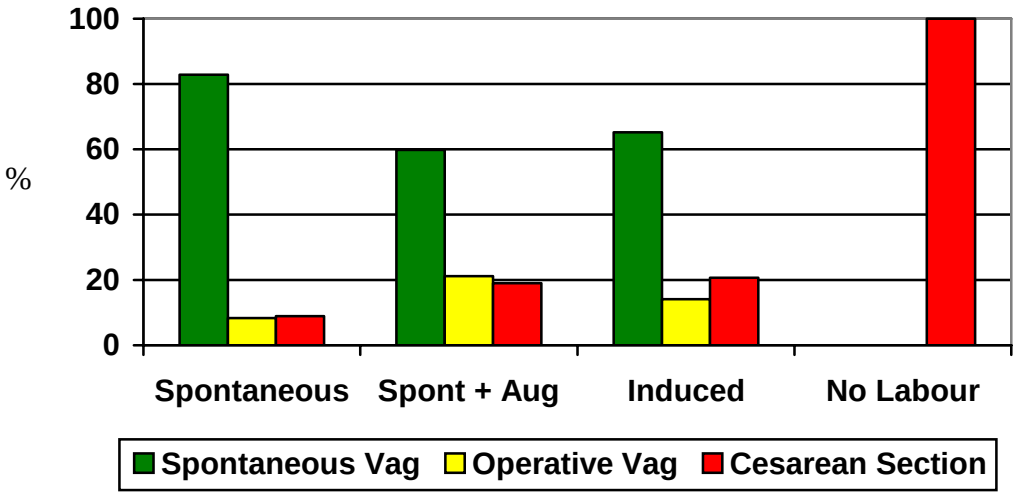
In Nova Scotia the rate of induction doubled between 1988 and 2006 and is now close to 30%. Over one-third of these inductions are for post-dates pregnancy.

Rate of Induction in Nova Scotia 1988-1990 through 2003-2005

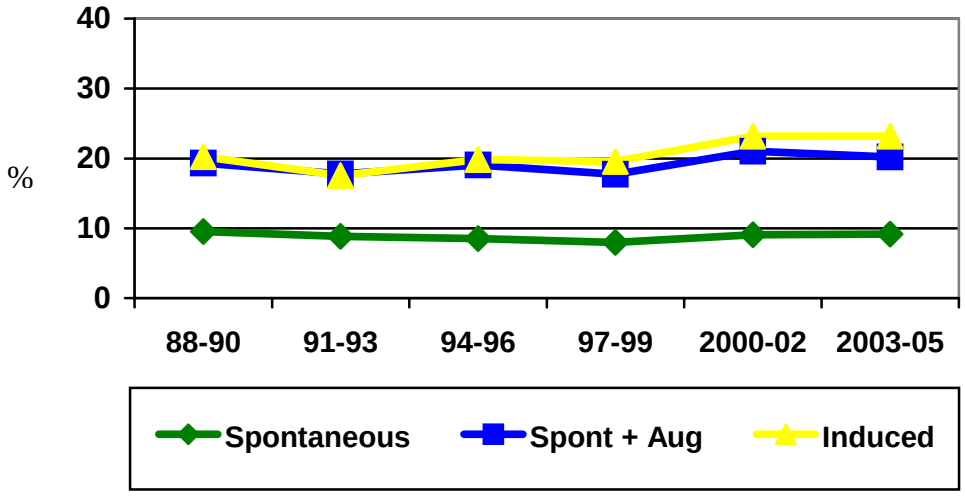


As noted in the literature, women who are induced or have their labours augmented are more likely to experience an intervention such as operative vaginal birth or cesarean section.

Method of Delivery by Type of Labour in Nova Scotia 1988-2005



Cesarean Section Rates by Type of Labour in Nova Scotia
1988-1990 through 2003-2005



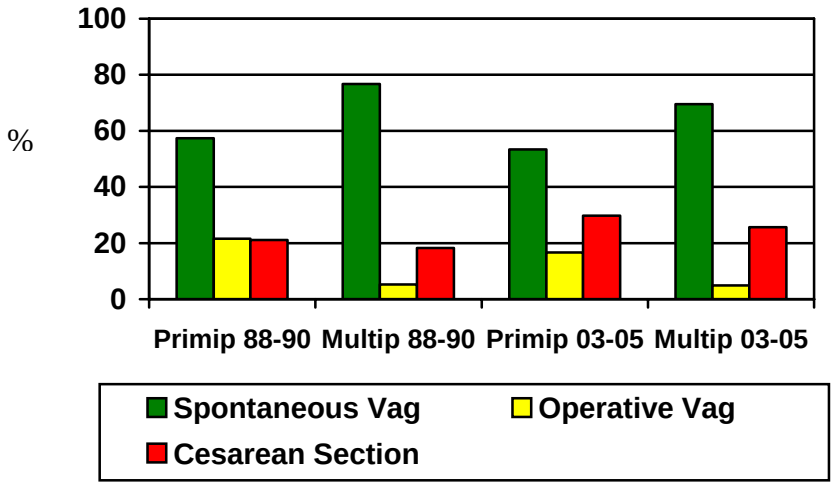
Population factors (Quality Dimension: Population Focus)

Nova Scotia has experienced many of the same demographic and practice changes as the rest of the country, including those associated with increasing cesarean section rates.

Maternal demographics/characteristics

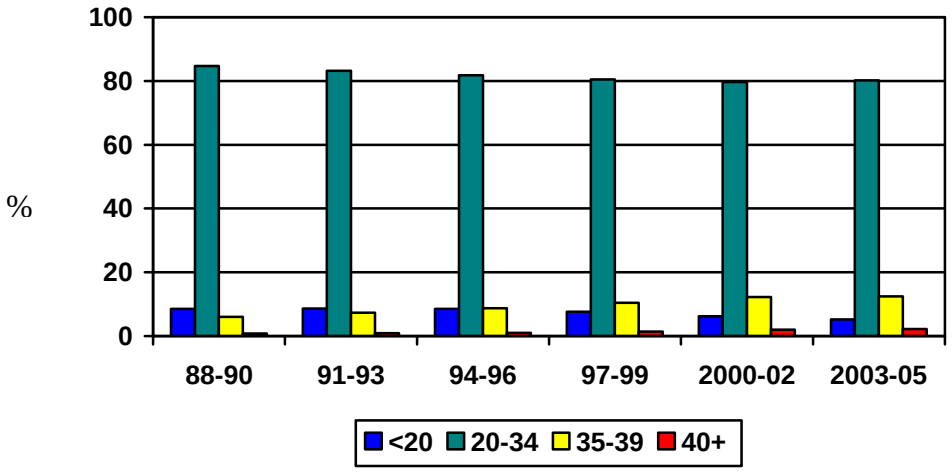
In the Capital District Health Authority, almost 50% of childbearing women are having their first baby. The proportion of nulliparous women is slightly lower for the province as a whole. Nulliparous women are more likely to have a birth-related intervention, including forceps or vacuum assistance with vaginal birth, or a cesarean section. However, cesarean section rates have increased across all parity groups.

Method of Delivery by Parity 1988-90 and 2003-2005



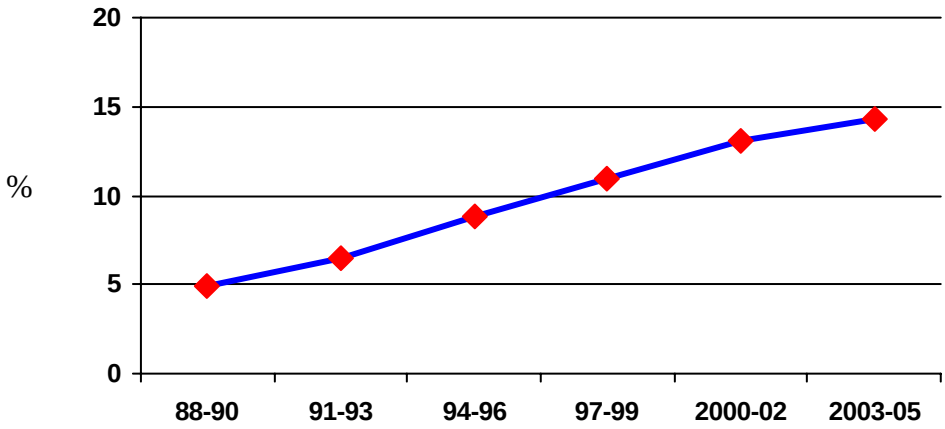
The proportion of births to women 35 years of age or older has increased from 6.4% in 1986-1988 to over 16% in 2003-2005, with the proportion of mothers in this age group closer to 20% in some areas of the province. This increase is particularly notable in the 40 or older age group where the absolute number of women giving birth has more than doubled in 18 years, from 77 in 1988 to 201 in 2006. This change in maternal age is consistent with the national trend.

Maternal Age in Nova Scotia 1988-1990 through 2003-2005

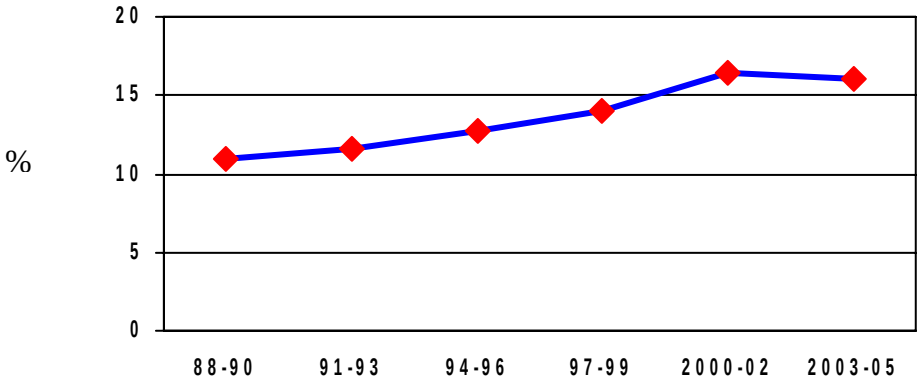


Obesity is a major concern in the Nova Scotia population. There are implications for personal health during childbearing and in later years. The proportion of women who weighed > 100 kg during pregnancy has nearly doubled in 18 years, from 7.4% to 14.2%. The proportion of women who gave birth to a large for gestational age (LGA) baby has increased by 50% from almost 11% to over 16%. Since larger women tend to have larger babies, both maternal and fetal weight influences the method of delivery.

Pregnant Women > 100 kg in Nova Scotia 1988-1990 through 2003-2005



Proportion of Nova Scotia Women with an LGA Infant in Nova Scotia 1988-1990 through 2003-2005

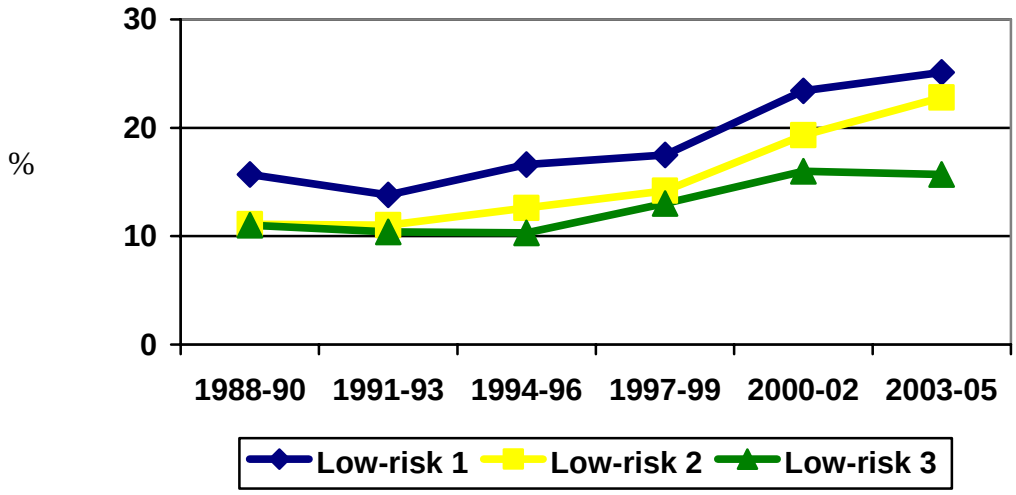


Women with low-risk pregnancies

Although this section has focused on women with underlying health concerns and pregnancy complications, it is important to remember that many pregnant women are healthy. Although the baseline cesarean section rate is much lower in women with uncomplicated pregnancies, the rate has risen steadily for these women as well as for the population as a whole. The following graphs show the cesarean section rate among low-risk women having their first baby. This population was chosen to minimize the influence of maternal health risks on interventions and to eliminate any potential influence of repeat cesarean sections. Three definitions for low-risk are displayed. 'Low-risk 1' includes women with a single fetus in cephalic presentation who gave birth at 37 $^{0}/_{7}$ weeks or greater**.** This is the definition most likely to be comparable with other low-risk definitions across the country. 'Low-risk 2' includes women in the low-risk 1 category who had no pre-existing or pregnancy-related medical complications, including a major fetal anomaly, and gave birth between 37 $^{0}/_{7}$ and 41 $^{6}/_{7}$ weeks' gestation. 'Low-risk 3' includes women in the low-risk 2 category who were between 20 and 30 years of age at

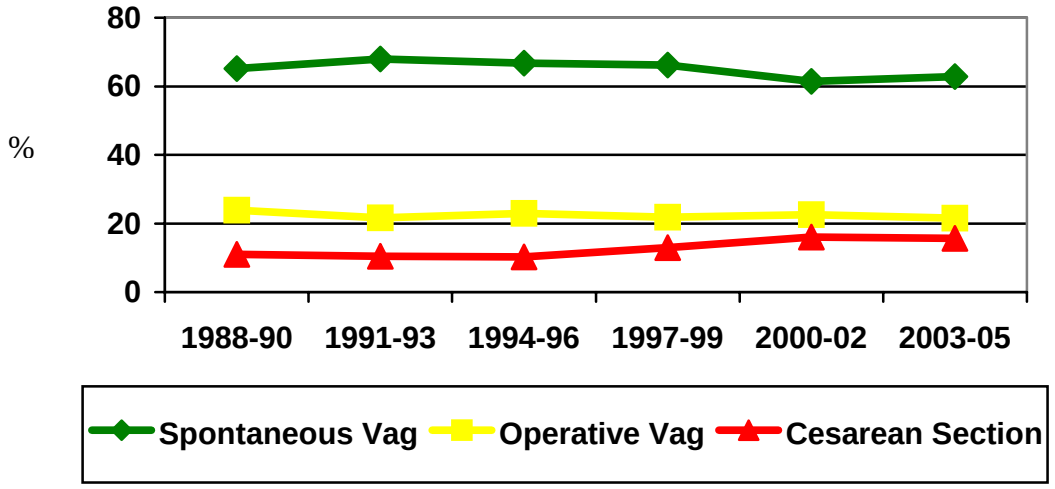
delivery, weighed < 175 pounds, and were married (Note that marital status has been a reasonable proxy for higher levels of SES in previous Nova Scotia studies.).[59]

Cesarean Section Among Low-risk Nulliparous Women in Nova Scotia 1988-1990 through 2003-2005

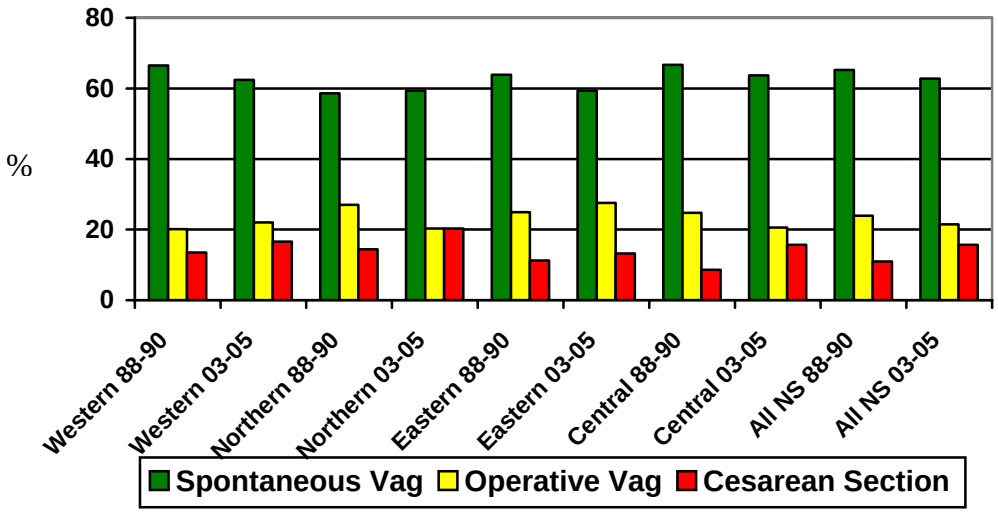


The influence of changing maternal demographics can be seen in the differences among cesarean section rates in these three groups. However, it is important to recognize that the rate of cesarean birth has increased across all categories of low-risk women and in all areas of the province. Even in women who are the healthiest and least likely to experience a pregnancy complication, the cesarean section rate has risen by 50% from 11% in 1988-90 to 15.7% in 2003-2005.

Method of Delivery Among 'Low-risk 3' Nulliparous Women in Nova Scotia 1988-1990 through 2003-2005



Method of Delivery Among 'Low-risk 3' Nulliparous Women by Region 1988-1990 and 2003-2005

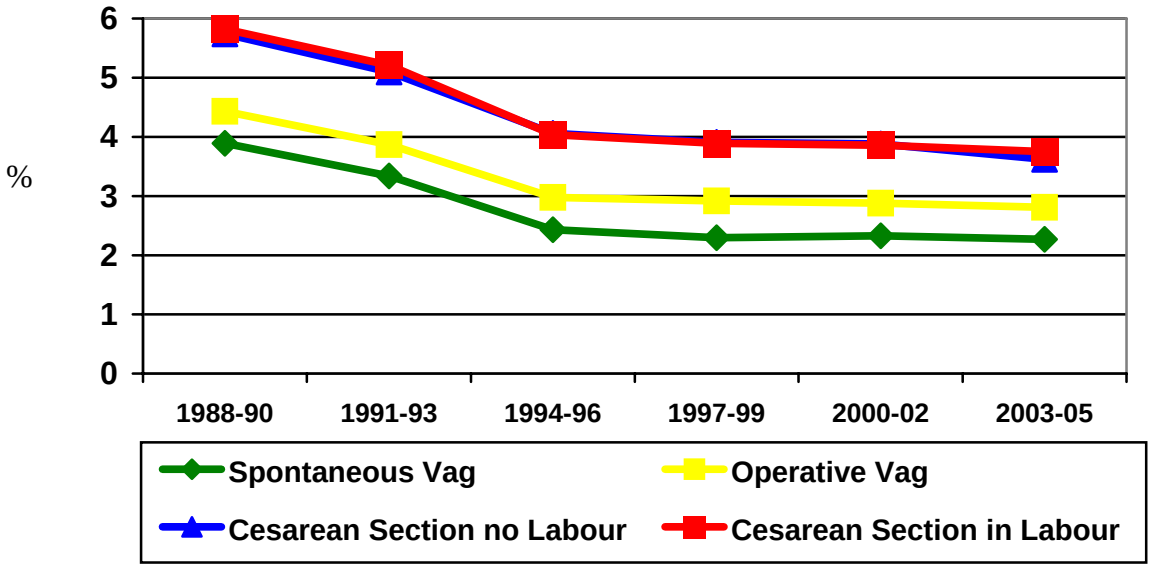


Implications of an increasing cesarean section rate

As the proportion of women experiencing a cesarean birth has risen, the acuity among labouring and postpartum women has also risen. This change has had implications for

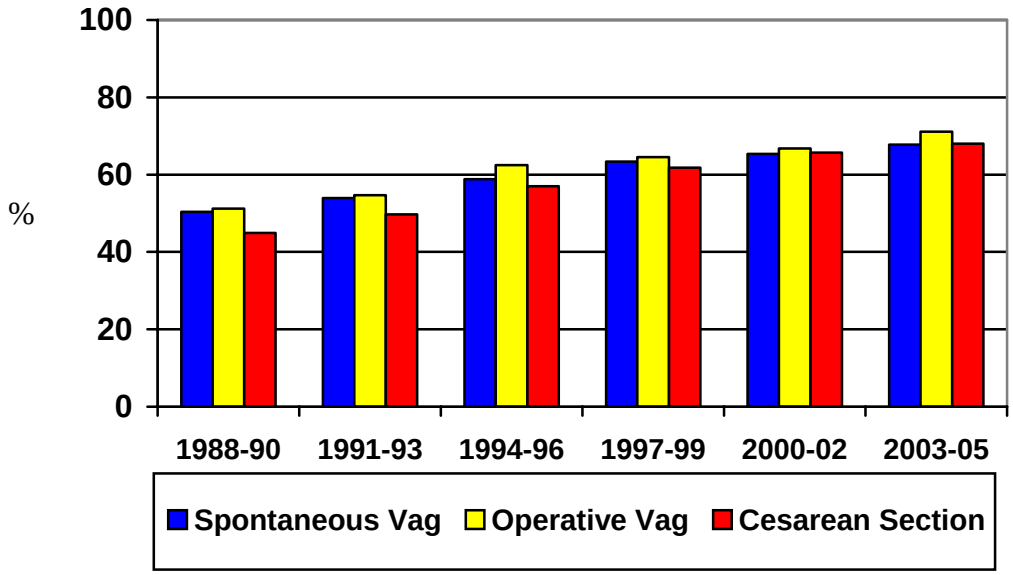
nursing resources and bed utilization and thus for health care costs.[23] Although postpartum lengths of stay have decreased over time, women who had a cesarean birth had a 50% longer length of stay on average than women who had a spontaneous vaginal birth. It is interesting to note that, although women who underwent a cesarean section in labour were more likely to experience complications than those who did not labour, the lengths of stay for these two groups of women were not appreciably different.

Mean Postpartum Length of Stay by Method of Delivery in Nova Scotia 1988-1990 through 2003-2005



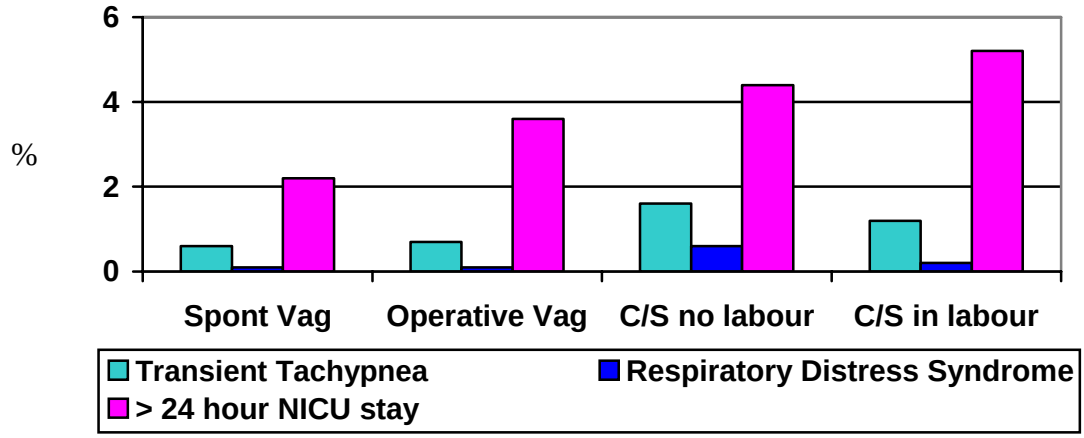
Interestingly, the rates of breastfeeding at hospital discharge are similar regardless of method of delivery. It may be that the longer lengths of stay associated with a more complex birth may facilitate early breastfeeding success, at least until women leave hospital.

Breastfeeding Rate at Discharge by Method of Delivery in Nova Scotia 1988-1990 through 2003-2005



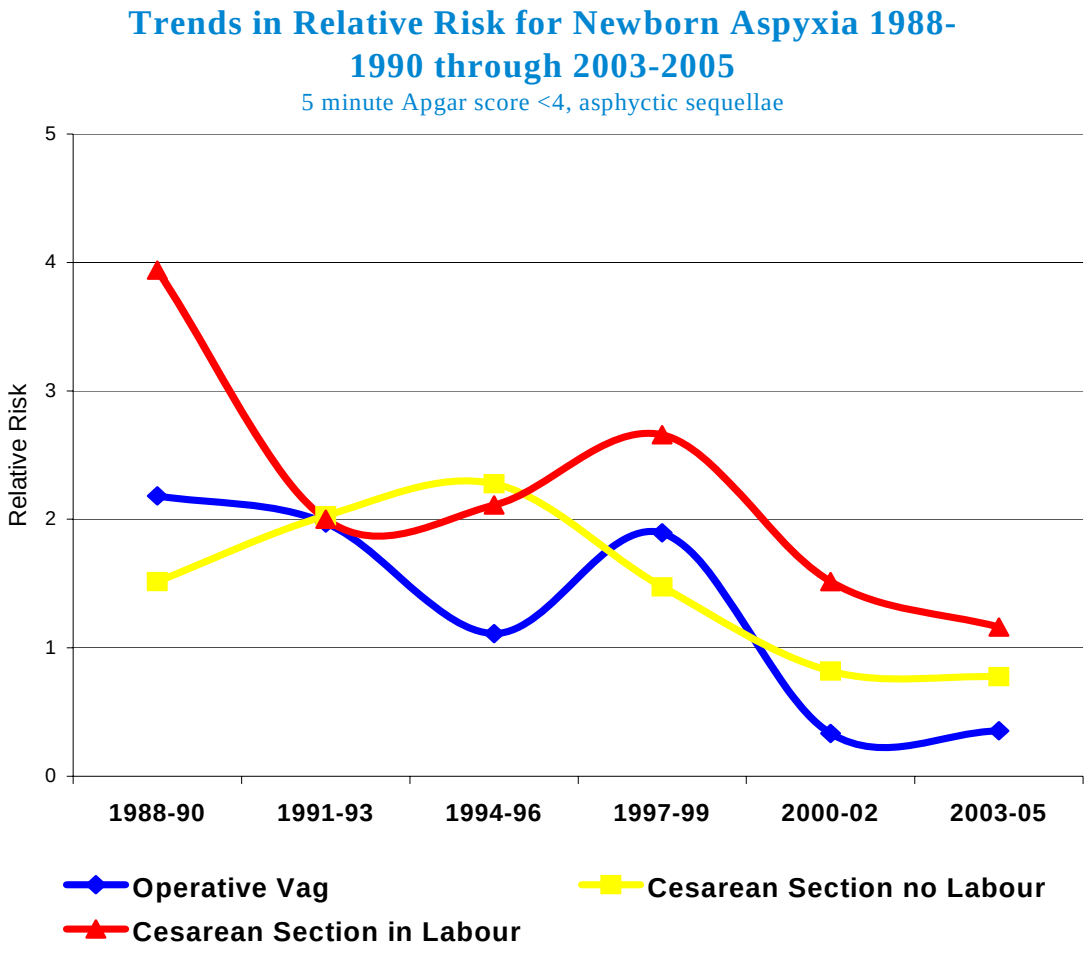
There are a number of clinical scenarios where a cesarean birth is clearly required to prevent catastrophic neonatal outcomes and others where a cesarean section is medically indicated to avoid potential morbidity. Maternal choice for cesarean birth is now considered an acceptable indication for cesarean section, although it is still uncommon in Nova Scotia. As the procedure becomes more common, there could be an impression that cesareans avoid risk when in fact there are inherent risks with any surgical procedure. Also, despite caregivers' best efforts to determine optimal timing for a cesarean birth, iatrogenic complications may occur. While the actual procedure is considered safe for the baby, an infant born by elective cesarean section is three times more likely to develop transient tachypnea of the newborn than an infant born vaginally.[60] As well, there are several cases of Respiratory Distress Syndrome among term newborns each year that are attributed to elective cesarean section undertaken before 40 weeks gestation.[61]

Neonatal Outcomes in Nova Scotia 1988-2000



A number of studies have demonstrated an increase in serious morbidities associated with cesarean birth. Levine and colleagues found increased respiratory illness among infants delivered by cesarean section. [62] A recently published review of nine studies exploring a range of neonatal respiratory conditions found that elective cesarean section in the term and late preterm infant increased the risk of respiratory morbidity across all of the studies. The outcomes reported represented a range of severity from transient tachypnea to persistent pulmonary hypertension. Among the infants delivered by cesarean section, the risk for most adverse respiratory outcomes was two to three times that for infants born vaginally.[63] In a recent case control study Hernandez-Diaz reported a seven-fold increase in the risk for persistent pulmonary hypertension among infants delivered by cesarean section compared to those born vaginally.[64]

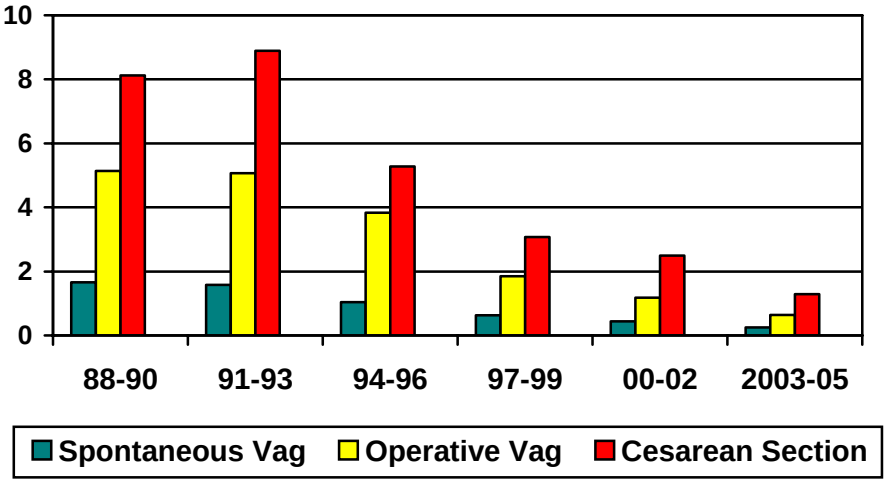
In Nova Scotia, the rates of newborn asphyxia have been low among all methods of delivery and have decreased, especially since 2000. In the epoch from 2003-2005, the rate of newborn asphyxia was 2.9 per thousand. Compared with infants who experienced a spontaneous vaginal birth, the relative risk of having asphyxia is highest among infants who were delivered by cesarean section during labour. Many of these cesarean sections would have been performed for urgent and emergent fetal indications such as cord prolapse, placental abruption or concerns about fetal well-being.



Maternal morbidity also increased significantly when cesarean section was not planned but rather undertaken during labour, particularly when the labour and period of ruptured membranes was prolonged.[65] In Nova Scotia, the postpartum infection rate has greatly improved over time although it was higher among women who had a cesarean birth than among women who had a vaginal birth.

Maternal Infection Postpartum in Nova Scotia

Any of: endometritis, UTI, septicemia, incision infection, epis/tear infection, peritonitis



Methods for Review

Between 2004 and 2006 the Reproductive Care Program of Nova Scotia (RCP) conducted quality assessment reviews at four facilities, one in each region of the province. One facility has less than 500 births per annum, two have 800 to 1000 each year, and the IWK Health Centre has close to 5000. These four facilities represent the western, northern, eastern and central areas of the province. In all of the centres, primary maternity care is provided by a combination of family physicians and obstetricians. The obstetricians have a greater role in primary maternity care in some areas than in others. At the time of the reviews, all of the centres had obstetricians and pediatricians available but the number in each caregiver group and the coverage arrangements varied by site.

Site selection for the quality assessment reviews occurred in two ways. Two of the facilities were asked by RCP staff to participate and two more approached RCP. In all

cases participation was voluntary and the concept was received enthusiastically. In recognition of the complex health care environment in which obstetrical decisions are made, the RCP team of an obstetrician, a neonatologist and two perinatal nurses was expanded to include a family physician, and a VP of Patient Care. For the IWK review the clinical team was expanded further to include additional clinicians who offered nursing expertise and either a generalist or a sub-specialist obstetrical perspective.

The goal of the quality assessment reviews was to identify practice, environmental, resource, and population factors that contribute to cesarean section rates. Members of the Review Team audited selected health records and interviewed groups of caregivers and managers and directors involved in the planning for, and provision of, maternal and newborn services. Charts were selected based on clinical criteria that reflected all possible methods of delivery and a variety of maternal and newborn outcomes. Interviews were conducted with family physicians, obstetricians, nurses who work in the Obstetrics/Mother-Baby Units, nurses who work with Public Health, Nurse Managers, Senior Team members, pediatricians, neonatologists, anesthesiologists, and radiologists. At three of the four sites the Review Team conducted one or more focus groups with women from the community. At the end of the visit the Review Team held a debriefing to offer observations and gather initial impressions about the information shared. Following the visit each site received a report that provided local, provincial and national data with an expanded discussion of the observations presented at the debriefing session. Unlike other RCP reports, these had no recommendations, although there have been anecdotal reports of action taken based on the observations in some sites. Broad recommendations that are applicable across the province are contained in this report.

Qualitative Findings

An important component of the quality assessment reviews was the candid feedback offered by the numerous clinicians who participated as well as by the women who volunteered their time to discuss their views at the evening focus groups. We in Nova Scotia are extremely fortunate to have a comprehensive perinatal database with which to monitor clinical standards and the outcomes of care delivery. Quantitative data has limitations, however, and should be considered within the context of the community and the care delivery environment. In keeping with the goal of the quality assessment reviews, which was to explore a variety of factors that influence and contribute to cesarean section rates, findings from the semi-structured interviews conducted in all four sites have been summarized in the following categories: community factors, clinical/practice factors, and system factors.

Community factors

Caregivers and women in each area of the province discussed challenges unique to their community or setting, although there were a number of areas of consistency as well. It is perhaps most difficult to assess the similarities among women's attitudes and beliefs across the province as described in the community focus groups. The groups were purposely advertised as sessions to discuss maternity care in general, as opposed to cesarean section or obstetrical interventions. There was concern that the focus groups might attract women who had had predominantly unsatisfactory experiences and needed to 'vent', however this was not the case. Women with a wide range of maternity care experiences participated and the RCP Review Team members were impressed with their thoughtful responses to the open-ended questions posed. We recognize, however, that a relatively small group of women represents only one segment of the population. Despite this limitation, the participants often expressed views that were consistent with the impressions described by members of the health care community. They also offered some opinions that contrasted sharply with their caregivers' views. All aspects of the feedback provided are worthy of careful consideration.

Comprehensive health information and choice

Among women in the focus groups there seemed to be a variable commitment to the importance of vaginal birth, a variety of opinions about whether cesarean section rates should be a concern, and sporadic assertions that the health care system is too care provider and risk focused. These discussions were interspersed with descriptions of warm and caring nurses, physicians and midwives. In all of the focus groups women expressed a desire for information and, whenever possible, choice. They have enormous trust in their caregivers and place a high value on the health information and counseling offered by primary care providers, consultants and nurses in the community and in hospitals. They also recognize that health care professionals are busy and that finding adequate time for information sharing and providing support can be a challenge.

Women expressed some confusion about the overall benefit of interventions such as labour induction and elective cesarean section, both for themselves and for mothers and babies in general. Many perceived that caregivers provided conflicting information about the safety of such choices as labour after a previous cesarean. This is disconcerting as they rely on health professionals to help them sort through the myriad of information on the Internet and in the public domain. In some areas women clearly expressed a desire for intensive labour support so that medications, including epidural anesthesia, could be delayed or avoided altogether. While this may not appear to be a commonly expressed sentiment throughout the province, as nurses who work with labouring women will attest, it is important to appreciate that women in the focus groups had had time to reflect on their birth experiences. While they were overwhelmingly grateful for a happy outcome, many expressed some disappointment related to their labours which might have been different if they had coped with labour in what they perceived to be a more effective way, whatever it would take to achieve that.

In contrast to the sometimes limited interactions with caregivers, women spoke eloquently about the pervasive influence of the media (e.g. birth reality shows), their family members and their peers on their expectations with regard to pregnancy and childbirth. While they didn't necessarily connect the two, RCP Review Team members

noted that gaps in women's understanding might be filled by sources that create distorted or unrealistic impressions of the childbearing experience and the choices that women may be offered. Thus, while dedicated efforts to ensure consistency of messages for women and time to provide supportive counseling may seem like 'frills', these are essential components of a maternity and newborn care system that values women as partners in care.

Separation of mothers and babies following birth

Women in the focus groups described a wide range of birth experiences. Some had given birth by cesarean section, many had had vaginal births but they all knew someone who had had a cesarean section. From one end of the province to the other, women expressed deep sadness at being separated from their babies after a cesarean section (N.B. This is not an issue in Halifax because of the physical environment). Knowing that other family members were with the baby was not reassuring but a source of further disappointment that others held their babies before they did. Most women did not anticipate the impact of this separation and felt that no woman would choose it if they understood how it felt. The Maternal-Newborn team at one of the sites reviewed recognized the impact of this separation and introduced a plan to reunite mothers and babies in the recovery room. Although the practice was initially met with skepticism by some hospital staff, the reactions of mothers and the impact on infant state have been overwhelmingly convincing. The women in the focus groups demonstrated, without intending to, the profound impact of the labour and birth experience on their on-going emotional well-being. For all women in the focus groups their birth experience was at least several months prior to their participation and, for some mothers, many years. Despite the passage of time their memories, both positive and disappointing, remained strong and are likely to influence their approach to subsequent pregnancies.

<u>Clinical/practice factors</u>

Nova Scotia is fortunate to have a variety of care providers involved in maternity and newborn care. Plans are underway to expand our network of primary caregivers to include midwives. The practitioners currently in the system expressed a range of opinions

about intervention rates in their centres and in the province. Some had no desire to be reminded of local rates for any intervention and felt that too much emphasis on numbers might be counterproductive. Some expressed the view that interventions are justified given the demographics of our population and the current medico-legal environment. Across all centres, however, many caregivers expressed concern about the rising rates of intervention and were supportive of efforts such as these reviews to contribute to our collective understanding of the reasons for the changes over time.

Loss of experienced and expert practitioners

Although caregivers have their own perspectives on practice, they rely heavily on established standards of care that encourage consistency across care delivery settings. All standards assume the presence of competent and confident health care professionals but maintaining a consistent cadre of experienced caregivers is a growing challenge across Nova Scotia. Members of the RCP Review Team heard consistent laments about the paucity of experienced doctors and nurses in the system. Some areas are facing significant recruitment challenges while others are coping with high rates of new and inexperienced staff who need formal education and, perhaps more importantly, consistent and supportive mentoring. There was no evidence from the chart reviews or from the interviews that care is unsafe. Nevertheless caregivers are concerned that the skills required to embrace practices that are associated with lower intervention rates are being lost, such as intermittent auscultation of the fetal heart rate during uncomplicated labour.

Without exception, caregivers across the province noted concerns about being able to consistently provide expert nursing care and support for labouring women. Caregivers in several centres were equally concerned about the decreasing involvement of family physicians in maternity care. The North American health care system is focused on technology to some extent and caregivers, nurses and family physicians included, value technical competence among their peers. The current emphasis on risk avoidance and patient safety, while extremely important, may be interpreted as a message that the reasonable and prudent practitioner is never wrong to intervene. Assessing when intervention is wise and when it is safe to continue with a low intervention approach

takes significant knowledge and skill and requires that the caregivers supporting the woman through labour communicate regularly and effectively, both with the labouring woman and with other members of the health care team. There was consistent agreement that a renewed focus on care for women experiencing uncomplicated labour and birth is warranted, though not to the exclusion of care for women with pregnancy complications. This finding is consistent with women's expressed desire for a different level of support in labour which, they suggested, might lead to increased satisfaction.

Practices that support an emphasis on 'normal'

There were a number of practices that were observed or cited in one or two of the participating centres as contributors to an environment for labouring women that focuses on 'normal'. While caregivers stopped short of suggesting a direct association with low rates of intervention, they noted that these practices have been helpful in creating a practice setting where low-risk women can generally expect a low-intervention approach to care. The practices include a consistent approach to 'diagnosing' and managing post-term pregnancy (i.e. delaying induction until at least to 41 $^{3}/_{7}$ weeks gestation unless clinically indicated), delaying admission to the hospital for women in early labour, using the appropriate method of fetal surveillance for the clinical situation (i.e. judicious use of electronic fetal monitoring), and 'watchful waiting' in the 2nd stage of labour, provided fetal and maternal well-being are assured. While all of these practices are supported by evidence, applying them consistently in a care delivery setting requires strong clinical leadership. The influence that this leadership has on unit 'culture' may have just as much influence on care delivery patterns as standards of care.

<u>System factors</u>

The four facilities that were part of the quality assessment reviews serve different geographic areas of the province and employ a range of service delivery models. There are a number of areas of overlap between the clinical and the system factors identified during the reviews. Since clinical practices cannot be considered in isolation from the care delivery environment, this overlap is understandable.

Health human resource stability and planning

The influence of turnover and a staffing complement with a large proportion of inexperienced nurses is being felt across the province. So, too, is the decrease in the number of family physicians practicing intrapartum obstetrics that is occurring across the country. Although staff in the DHAs and at the IWK are grateful that obstetricians are able to assume more primary care, they recognize that an increasing number of specialists will be required over time to maintain the maternity care system. Recognizing that fundamental changes to the medical and nursing education programs are necessary to address some of these concerns, discussion during the quality assessment reviews was focused on what can be done locally to recruit and retain maternity and newborn care practitioners in Nova Scotia. Recruitment was identified as an issue in all areas though no clear solutions emerged to the dilemma of attracting physicians and nurses, particularly to rural settings. Some facilities have had success with 'growing their own' through such strategies as providing tuition support, encouraging clinical placements in maternity care for nurses, and using locum placements as an opportunity to highlight the advantages of practice in particular communities. In terms of supporting existing maternity and newborn care providers, recommendations included ensuring the availability of regular, multi-disciplinary education sessions and encouraging attendance at case review/peer review sessions. In contrast to the difficulties with an inexperienced workforce, primary care providers and nurses consistently reported that having a stable number of obstetricians, pediatricians, and anesthesiologists in the community creates an environment where they feel safe and supported to practice low-risk maternity care. Although there are some challenges with ensuring timely access to the OR in urgent clinical situations, most facilities described exceptional support from their colleagues.

Consistent approach to clinical care

The issue of vaginal birth after cesarean section was raised consistently across the province. While it may not be possible to increase the number of women who choose to labour after a previous cesarean birth, there should be a consistent approach to counseling women about the VBAC option and to supporting those who choose VBAC as they experience labour. Interestingly, both family physicians and obstetricians described

difficulties related to counseling. Family physicians noted that some women who appeared to be interested in VBAC seemed to change their minds after they had met with an obstetrician. While they were distressed about this if the woman had seemed enthusiastic, most did not see it as their role to encourage or discourage VBAC. Obstetricians, on the other hand, noted that it would be helpful to know what discussions had taken place between a woman and her primary care provider before seeing the woman in consult. Since they rarely know what the woman is thinking about VBAC they feel that they have to start their discussion from the beginning. This is clearly an area where improved communication between caregivers might have an impact on the decisions of women who favour the option of VBAC.

In some areas of the province 'hands-on' education in conducting an operative vaginal birth was cited as a learning need. Apart from the need to practice the maneuvers, some caregivers felt that operative vaginal birth is being subtly discouraged in favour of cesarean section. This situation will lead to decreased experience and confidence with using forceps and vacuum extractors and may contribute to further increases in the cesarean section rate.

Impact of cesarean sections on the system

In addition to the impact on maternal and newborn health, breastfeeding, and women's emotional well-being, caregivers emphasized the impact of increasing cesarean section rates on the system. They cited increased pressure on the OR and increased length of stay postpartum, which reduces bed availability for mothers who have recently given birth. The bed availability situation is compounded by facility-wide bed pressures, particularly in the regional hospitals. Caregivers also noted that the increase in the number of childbearing women with underlying health concerns and complex medical problems has a further impact on care needs and lengths of hospital stay.

Recommendations

Across Nova Scotia clinicians, administrators, health policy makers, and members of the public are struggling with the trend towards increasing intervention. In the field of maternity care this trend seems particularly troubling because pregnancy and childbirth are considered 'normal', healthy events. Even those who are skeptical about labeling any event 'normal' concede that most women and newborns are at low-risk of experiencing an adverse event. It is understood, however, that women who experience a healthy, low-risk pregnancy may suddenly require urgent or emergent intervention for their babies or themselves. This dichotomy of perspectives creates challenges for caregivers and for women. If intervention is known to improve outcomes in some situations, there are likely others where benefits could be achieved. Since the benefit achieved may be harm avoidance, it is difficult to quantify the advantages gained from interventions that took place 'just in time'. Conversely it would be even more difficult to justify not intervening if the intervention was perceived to carry minimal risk and the potential gain would last a lifetime.

It requires considerable clinical experience and judgment to expertly support a woman through a normal birth, while maintaining the appropriate level of vigilance for signs of significant deviation from normal. It is critical that the focus on normal and healthy be just as strong as the focus on timely intervention if the clinical situation changes. While it is rarely fruitful to debate the need for intervention at the time it is undertaken, it is very helpful to review cases retrospectively in a non-punitive environment. These reviews should be interdisciplinary in nature and focus on ensuring that practices known or suspected of increasing the likelihood of unnecessary intervention are avoided, and that decision-making, when interventions occur, is clear and reflects current standards of care. While each District Health Authority and group of caregivers has some unique challenges, there are several areas that present a consistent challenge for all caregiver groups in Nova Scotia.

Recruitment, retention and health human resource planning

In order to maintain consistent coverage over time, call for obstetricians should be equally distributed among the care providers in the community. Physicians who work in fee-for-service models should explore alternate options for payment (e.g. pooling on-call income). Centres with a strong commitment to an on-call system, sometimes with a shared income component, have found that it makes workload more manageable, encourages collaboration, and reduces the pressure for physicians to deliver their 'own patients', which has the potential to influence the timing of interventions.

Recruitment and retention of physicians and nurses who work in the field of maternal and newborn care should be a priority across the province. RCP will collaborate with maternal-child care providers and administrators throughout the province to explore and create innovative HHR models for maternal-child care. In addition, RCP will advocate for provincial commitment to the recruitment and retention of maternal-child care providers.

Evidence-based practice

Pregnancy dating in Nova Scotia should be standardized and follow an accepted algorithm that minimizes the likelihood of inappropriate intervention for post-dates pregnancy, provided the health status of both the mother and the fetus are reassuring. In the absence of any superimposed clinical indications to proceed, post-dates induction should be planned during the 41st week of gestation ($41^{0}/_{7}$ to $41^{6}/_{7}$).

Practices that are consistent with a low intervention approach to labour should be emphasized. These include delaying admission to the labour and birth unit until active labour is established; the use of intermittent auscultation for low-risk labouring women; the use of scalp pH measurement, where laboratory resources allow, for reassurance in the presence of equivocal fetal monitoring results; and

'watchful waiting' in the second stage of labour, provided fetal and maternal well-being are assured.

All Maternal-Child/Perinatal Committees should undertake annual cesarean section audits using a standardized tool. If the group of caregivers is too small to allow objective review, RCP staff will work with the DHA to conduct the reviews. Individual DHAs may choose to focus the reviews on a particular aspect of care associated with cesarean sections, such as primary cesarean sections, or cesarean sections among low-risk nulliparous women (see Appendix A).

Clinical education and mentoring

The regular presence of a clinical expert to provide education and support for nurses is an essential component of care for labouring women. The RCP recommends that this education and support come from a clinical educator/clinical resource nurse or a unit-based clinical leader with expertise in normal labour care. This is particularly important when the manager has responsibility for multiple nursing units.

Facilities should support informal professional development opportunities such as nurse-to-nurse mentoring. This support can be in the form of dedicated time for nurses to mentor each other and written or verbal recognition of mentors by nurse managers and administrators.

Physicians providing maternity care should contact their local CME Coordinator to request interprofessional education sessions that address key obstetrical and newborn topics.

Communication and collaboration

Each Maternal-Child/Perinatal Committee should plan regular activities that focus on team functioning and interdisciplinary communication. These activities could be clinically based, such as a staging a mock obstetrical emergency, or

focused on some aspect of care that could be improved by developing a more consistent team approach. For example, the team could strategize about how best to counsel women contemplating VBAC, or consider ways to encourage women in late pregnancy to await spontaneous labour rather than seek induction of labour.

Counseling and public education

Prenatal care and education needs to include provision of unbiased, non-directive information and counseling about the risks and benefits of common obstetrical choices including admission to hospital before labour is established, use of epidural anesthesia, and induction of labour.

Pre-conception and pre-pregnancy care and education needs to focus on the importance of maternal health to the health of the baby and mother during pregnancy, birth, and following birth. Healthy women are more likely to give birth to healthy babies and are less likely to require interventions to do so. Women should receive very clear messages about the importance of healthy weight, avoidance of smoking and alcohol/drugs, taking multivitamins with folic acid, etc. Newer information that suggests and 'ideal' age range for childbearing should also be discussed.

Caregivers should not underestimate women's commitment to vaginal birth and avoiding intervention, provided it is safe to do so. This commitment should be fostered and supported whenever possible.

Conclusion

It is clear from this provincial examination of the factors that contribute to cesarean sections in Nova Scotia that interventions occur, or are sanctioned, in an effort to balance a range of real and potential risks. A multitude of long-term and short-term health risks for mother and baby must be considered. Reframing these risks from the perspective of biopsychosocial health may slow the rate of rise for interventions, and possibly even stabilize or reduce the rates. However, change will require a different level of discussion among caregivers and between care providers, women and their families. Over time this dialogue could have an impact on attitudes and beliefs about childbearing and may contribute to restoring trust in the process of birth, and a commitment to ensuring that interventions are both timely and appropriate to the clinical situation. In order to make significant and lasting change, those involved in the maternity and newborn care system must make as much of an investment in avoiding interventions when they are not warranted, as we have in ensuring their consistent availability.

Appendix A

Cesarean Sections in Nova Scotia 1988-2006
Classified using Robson's 10-Group Method[66]

"Can we reduce the caesarean section rate? Yes, but only when it can be justified, accepted by women and safely implemented." (Robson, 2001)

Group Description	Proportion of all deliveries	C/S rate for each group	Contribution to overall C/S rate of 21.56%
1. Nulliparous, singleton, cephalic, ≥ 37 weeks, in spontaneous labour	**26.0%**	**12%**	**3.3%**
2. Nulliparous, singleton, cephalic, ≥ 37 weeks, induced or C/S before labour	**9.5%**	**31%**	**3.0%**
3. Multiparous, singleton, cephalic, ≥ 37 weeks, in spontaneous labour (excluding previous C/S)	27%	2.1%	0.56%
4. Multiparous, singleton, cephalic, ≥ 37 weeks, induced or C/S before labour (excluding previous C/S)	7.2%	9.5%	0.68%
5. Previous C/S, singleton, cephalic, ≥ 37 weeks	**7.3%**	**68%**	**5.0%**
6. All nulliparous breeches	2.2%	88%	2.0%
7. All multiparous breeches (including previous C/S)	1.7%	80%	1.4%
8. All multiple pregnancies (including previous C/S)	2.6%	47%	1.2%
9. All abnormal lies (including previous C/S)	0.6%	63%	0.4%
10. All singleton cephalic < 37 weeks (including previous C/S)	4.2%	19%	0.82%
11. Insufficient information to classify	11.7%	30%	3.2%

Explanatory note: The data in this table represent nearly 20 years of births in Nova Scotia. The demographic and practice trends described in this report cannot be appreciated in aggregate data. The accompanying comments are an illustration of the way in which this method of comparing groups can be used to understand and audit cesarean section rates in a facility and across the province.

Using Robson's 10-Group Method to understand and audit cesarean sections

Robson's classification was developed to define comparable, mutually exclusive groups using clinical factors such as parity, obstetrical history, and type of labour. Comparisons using these groups can be helpful in countering perceptions that the characteristics of a catchment population dictate the level of intervention in an institution or a region. In addition to facilitating comparisons between facilities, Robson's categories can be used to compare sub-groups within facilities over time. These categories assist clinicians to better understand which groups are most likely to have a cesarean section, develop strategies to reduce the rate of intervention in these groups, and monitor the success of the specific strategies implemented.

In identifying a group for increased focus it is important to consider the overall impact of potentially reducing the rate in a specific group, as well as the likelihood of success. For example, in Nova Scotia women with a fetus in breech presentation have a greater than 80% cesarean section rate, regardless of parity. These women account for less than 4% of the pregnant population, although they represent 3.5% of the cesarean section rate. However, current clinical practice guidelines favour cesarean delivery for fetuses in the breech presentation. Thus it is unlikely that there will be significant changes to the method of delivery for this group of women.

The greatest single contribution to the cesarean section rate is the group who had a previous cesarean section and have reached term gestation in this pregnancy with a single fetus in cephalic presentation. This group accounts for 7.3% of the population but the cesarean rate is very high at 68%. Cesarean sections in this group of women represent 5% of the overall cesarean rate and the majority of these are elective repeat cesarean sections. Many of the women in this group could potentially have a vaginal birth following one cesarean section. In the context of current clinical guidelines there is potential to reduce the cesarean section rate in this group by increasing 'trials of labour' among women who are 'VBAC candidates'. However, it is not clear whether caregivers and women in Nova Scotia would favour this change. Based on feedback from the focus groups conducted as

part of this review, reducing the rate of elective repeat cesarean sections would require interest and commitment from both professionals and from the public.

Nulliparous women who have reached term gestation with a single fetus in cephalic presentation represent greater than one-third of the pregnant population (35.5%) and contribute 6.3% to the overall cesarean section rate. Approximately three-quarters of these first-time mothers had spontaneous labour, while one-quarter of them were induced. However, many demographic and clinical factors are not considered in the Robson groupings. Thus in order to develop targeted strategies, more information about the labour experience for women in this group and the indications for caesarean section would be needed. Much of the information required is available in the Nova Scotia Atlee Perinatal Database, which could be supplemented by additional chart review if required. Since this sub-group is relatively large, it may be most practical to identify specific groups for more focused attention. In terms of impact and acceptability a reasonable option might be medically low-risk women in favourable age and weight categories. While there are a number of options to further refine the population on which to focus, it is likely that both clinicians and women would be enthusiastic about reducing the cesarean section rate in this group of women. RCP plans to work with care providers around the province to develop an audit tool based on Robson's classification system and to establish targets aimed at supporting best practices in the use of cesarean section.

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