POLICY BRIEF

Monitoring and Maintaining Quality of Care

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Access to Maternity Care: Distance Matters

Centre for Rural Health Research

SUMMARY

Across British Columbia, many rural women have to travel to access labour and delivery services. The social, financial, and health impacts on birthing women and their infants are significant. This policy brief outlines findings from two studies: 1) An investigation of stress and anxiety in pregnancy for rural women and 2) Analysis of rural maternal and newborn outcomes. Findings indicate that women with no local access to maternity services are 7.4 times more likely to experience moderate to severe stress when compared with women who have local maternity care. Analysis of maternal and newborn outcomes found increased perinatal mortality for newborns from communities greater than 4 hours from services and increased NICU days for newborns with no local maternity services. The cost implications for poor neonatal outcomes are significant. Decision makers should consider such findings when planning rural services.

The Problem

Since 2000, there has been a wave of closures of small rural maternity services across Canada. These closures are due to a trend towards regionalization of health services, challenges with recruitment and retention of skilled rural practitioners,[1] and concerns about the cost-effectiveness and safety of small rural services.[2,3] As a result of diminished local access to maternity care, many rural women must travel to access labour and delivery services in centralized referral hospitals.

Relocation for care creates significant social, financial, and health challenges for rural birthing women, who are separated from their families, receive little to no social support in referral communities, have diminished continuity of perinatal care, and experience significant travel, accommodation, and food expenses.[4-6] These social and financial costs have the greatest impact on Aboriginal, multiparous, and vulnerable rural women.[7-11] Studies indicate that when women experience stress in pregnancy it can lead to adverse outcomes, including increased rates of premature delivery, increased intervention rates, and increased costs related to neonatal hospitalization.[11] At the same time, there is emerging evidence supporting the safety of low volume rural maternity services.[11-13]

In light of these changing service patterns, planners and policy makers have an opportunity to consider how distance from care impacts maternal and newborn health. Two recent studies shed light on the impact of geographic isolation on birthing families in British Columbia: 1) Investigation of stress and anxiety in pregnancy for rural women and 2) Analysis of rural maternal and newborn outcomes. Findings from the studies provide decision makers with evidence to plan appropriate and sustainable maternity services for rural communities.

Stress in Pregnancy

The Centre for Rural Health Research recently conducted a study to determine whether lack of local obstetric services in a rural woman's home community is linked to stress and anxiety during pregnancy.[15,16] Using the Rural Pregnancy Experience Scale (RPES), a survey tool developed by the Centre, the study surveyed women living in 52 rural and remote BC communities with differing levels of access to maternity services. The diverse communities represented a range of population size, level of maternity service, and ethnic composition. The survey asked women questions about their demographic background, financial worries, and stress and anxiety associated with

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continuity of care, psychosocial support, and realizing one's vision of birth.

The surveys were grouped by service level to determine whether geographic isolation from maternity services was related to stress in pregnancy. The three service levels were:

Service Level	Description
No local services	No maternity services within one hour
Local generalist services	Local maternity services provided by family physician or GP surgeon
Local specialist services	Local maternity services provided by at least one specialist

Based on analysis of the surveys, we now know that rural women with ***no local services*** were significantly more stressed and anxious than women with local access to generalist or specialist care. Specifically,

→ *Rural women **without local access to maternity services** are 7.4 times more likely to experience moderate or severe stress when compared to those with access to local services.*

Certain women were more likely to experience stress and anxiety during pregnancy:

→ Women with a household income <$25,000
→ Women without a high school diploma
→ Women with at least one self-identified complication of pregnancy
→ Aboriginal women

Results from the study indicate that women experience significant psychological distress when they lack local maternity services. This is important for two reasons:

1) This might be the pathway linking stress to adverse perinatal outcomes such as prematurity; and
2) This data should provide rural health service planners with better information with which to plan appropriate services for rural communities.

The RPES is the first validated scale to address issues that are particularly relevant to rural parturient women who have to relocate to give birth, issues such as separation from family and community and financial concerns.[15,16]

Distance and Adverse Outcomes

The Centre for Rural Health Research also analyzed perinatal outcomes for women and newborns residing in rural BC communities, from remote coastal enclaves of <100 people to rural referral centres of 100,000. This "Distance Matters" study explored the relationship between clinical outcomes and access to maternity services.[17]

About the Study

We created "catchments" for every rural population in BC that lived within 1 hour (surface travel time) of a given maternity service.[18] We also created catchments for women residing 1-2, 2-4, and >4 hours from the next nearest caesarean section service (see Table). We linked maternal and newborn data to the catchments using the postal code of maternal residence, regardless of the actual location of delivery. This population-based approach improves on current outcomes monitoring strategies, which look at data based on where a woman gives birth, not where she actually resides or the distance she must travel to access care.

What We Found

There were 49,402 cases of mothers and infants who met the study criteria.* Over 5% resided in catchments with no local access to birthing services within 1 hour travel time.

* All women carried a singleton pregnancy beyond 20 weeks and delivered between April 1, 2000 and March 31, 2004. The study excluded women with twins or multiples, congenital anomalies, and late terminations.

Summary of Rural Obstetrical Service Levels for "Distance Matters" Study (2000-2004)

Obstetric Service Level	Definition of Service Level	# of Catchments	# of Births
1 No local services	> 4 hours from maternity services	15	506
2 No local services	2-4 hours from maternity services	19	747
3 No local services	1-2 hours from maternity services	23	1,359
4 Primary care	Intrapartum primary care, no specialists	31	8,031
5 Mixed Model	C-section provided by GP Surgeon or OB/GYN	8	5,945
6 Specialist Services	C-section provided by Obstetricians or General Surgeons	19	32,814
Total		**115**	**49,402**

Newborn Outcomes

→ Perinatal mortality was 3 times more likely for infants whose mothers lived in communities more than 4 hours (Level 1) from birthing services (OR 3.1 95% CI 1.2-8.5)

→ Mothers living 1-2 hours from services (Level 3) were over 3 times more likely to have their baby admitted to the NICU 2 after adjustment for confounding factors (OR 3.11 95% CI 2.05 - 4.73)

Maternal Outcomes

→ Induction rates were highest for women travelling 2-4 hours to access services (Level 2)

→ Women living 1-2 hours away from services (Level 3) were 6 times more likely to have an unplanned out of hospital birth (OR 6.41 95% CI 3.69, 11.28)

Implications for Policy Makers

These two studies demonstrate the impact of distance on maternal and newborn health. Within the policy and planning process, this emerging evidence can be used to inform where services should be located to ensure that birthing woman have access to safe care. It is noteworthy that in both studies *women who lived the farthest from maternity services experienced the most stress and their infants were at greatest risk for perinatal mortality*.

Stressing pregnant women in communities with limited access to care can lead to adverse perinatal outcomes, but it can also add stress to the health care system. The cost implications for poor neonatal outcomes are significant. For instance, women who live 1 to 2 hours away from services are more likely to remain at home until the onset of labour, particularly if they have other children at home. These women are more likely to deliver en route to the hospital.[4] It is also likely that infants born en route to the hospital will be admitted for observation in a transitional nursery. Neonatal intensive care days cost an estimated average of $1300 (NICU 2) to $2500 (NICU 3) per day. Maternal interventions can also be costly. Women who have to travel more than 2 hours to access maternity services generally stay in their referral community until the onset of labour, typically from 36 weeks gestation. These women are more likely to request an induction for logistical reasons to try and shorten their stay.[19] These costs need to be considered in the planning process as the value of sustaining small rural maternity services may be greater than previously appreciated.

Most importantly the quality of both newborn and maternal outcomes is associated with access to local services. Actions to mitigate stress in pregnancy could include, where services exist, offering local birth to rural women who have had previous uncom-

The *Issues in Rural Maternity Care* policy brief series addresses current issues in the provision of maternity care in British Columbia and provides timely recommendations for improving the quality and safety of rural intrapartum care. Targeted at policy makers and maternity care providers, it is produced by the Centre for Rural Health Research.

About the *Stress in Pregnancy Survey*

- → 187 women completed the survey
- → The mean age of respondents was 29 years old
- → 54% of respondents were nulliparous (no previous pregnancies)
- → Only 2 of the 29 First Nations respondents resided within communities without local obstetric services
- → Survey analysis controlled for maternal characteristics and risk factors

About the *Distance Matters Study*

- → 49,402 births were included in the analysis
- → Newborn outcomes analyzed include perinatal mortality (including stillbirths and early neonatal mortality), prematurity (gestational age <37 weeks), and admissions to the NICU
- → Maternal outcomes analyzed include induction of labour, primary caesarean section, and planned out of hospital deliveries
- → Analysis controlled for two sets of variables: 1) maternal characteristics and risk factors and 2) ecological determinants of outcomes, such as social vulnerability and Aboriginal status

plicated pregnancies and previous vaginal births as it would remove the stress they incur from relocating to a referral centre. The Canada Health Act specifies that insured persons must be provided "reasonable access" to insured services.

Distance matters. Health planners and policy makers need to consider such findings when planning the fate of rural services.

References

1) Grzybowski S, Kornelsen J, Cooper E. Rural maternity services under stress: the experience of the providers. *Canadian Journal of Rural Medicine* 2007; 12: 89–94.
2) Tucker J, Hundley V, Kiger A et al. Sustainable maternity services in remote and rural Scotland? A qualitative survey of staff views on required skills, competencies and training. *Quality and Safety in Health Care* 2005; 14: 34–40.
3) Hutten-Czapski P. Life on Mars – practicing obstetrics without an obstetrician. *Canadian Journal of Rural Medicine* 1998; 3 (2): 69.
4) Kornelsen J, Grzybowski S. Safety and community: the maternity care needs of rural parturient women. *Journal of Obstetrics and Gynaecology* 2005; 27: 247–254.
5) Kornelsen J, Grzybowski S. The costs of separation: the birth experience of women in isolated and remote communities in British Colombia. *Canadian Woman Studies Journal* 2005; 24 (1): 75-80.
6) Becker G, Paulette L. Informed choice with a focus on rural and northern midwifery in the Northwest Territories. *Canadian Journal of Midwifery Research and Practice* 2003–2004; 2 (3): 22–25.
7) Kornelsen J, Kotaska A, Waterfall P, Willie L, Wilson D. The geography of belonging: the experience of birthing at home for First Nations women. *Health & Place* 2010; 16: 638–645.
8) Douglas VK. Childbirth among the Canadian Inuit: a review of the clinical and cultural literature. *International Journal of Circumpolar Health* 2006; 64: 117–132.
9) Voisey E, Okalik A, Brown M, Napayok A. Cultural perspectives on pregnancy and childbirth. In: O'Neil J, Gilbert P, eds. Childbirth *in the Canadian North: Epidemiological, Clinical and Cultural Perspectives.* Winnipeg: University of Manitoba Northern Health Research Unit, 1990; 37–42.
10) Paulette L. The changing experience of childbirth in the Western N.W.T. In: O'Neil J, Gilbert P, eds. *Childbirth in the Canadian North: Epidemiological, Clinical and Cultural Perspectives*. Winnipeg: University of Manitoba Northern Health Research Unit, 1990; 45–50.
11) Nesbitt TS, Connell FA, Hart GL, Rosenblatt RA. Access to obstetric care in rural areas: effect on birth outcomes. *American Journal of Public Health* 1990; 80: 814–818.
12) Chaska BW, Mellstrom MS, Grambsch PM, Nesse RE. Influence of site of obstetric care and delivery on pregnancy management and outcome. *J Am Board Fam Pract* 1998;1:152-63.
13) Rourke, JT. Trends in small hospital obstetrical services in Ontario. *Can Fam Physician* 1998;44:2117-24.
14) Rosenblatt RA, Reinken J, Shoemack P. Is obstetrics safe in small hospitals? Evidence from New Zealand's regionalized perinatal system. *Lancet* 1985;2(8452):429-32.
15) Kornelsen J, Stoll K, Grzybowski S. Stress and anxiety associated with lack of access to maternity services for rural parturient women. *Australian Journal of Rural Health 2011*; 19 (1): 9-14.
16) Kornelsen J, Stoll K, Grzybowski S. Development and psychometric testing of the Rural Pregnancy Experience Scale (RPES). *Journal of Nursing Measurement* 2011; 19 (2): 115-128.
17) Grzybowski S, Stoll K, Kornelsen J. Distance matters: a population based study examining access to maternity services for rural women. *BMC Health Sciences Research* 2011; 11 (147): 1-8.
18) Level of Service – Neonatal Daily Classification Tool. [http://www.perinatalservicesbc.ca/sites/bcrcp/files/psps/Neonatal_LOS_Classification.pdf]
19) Kornelsen J, Moola S, Grzybowski S: Does distance matter? Increased induction rates for rural women who have to travel for intrapartum care. *J Obstet Gynaecol Can* 2009, 31:21–7.

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