

Northern Ontario's Obstetrical Services in 2020: A developing rural maternity care desert

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Abstract

Introduction: Rural maternity care services matter. Obstetrical care in rural Canada has seen concerning trends of service closures and decreasing numbers of family physicians who predominantly provide this service. Such reductions have been shown to have a serious impact on maternal/foetal well-being.

Methods: This study investigated the present state of obstetrical services in Northern Ontario, comparing results to those of the last similar survey in 1999. All 40 Northern Ontario communities with hospitals were surveyed, as were the 16 midwife practices in the region.

Results: Of the 35 rural and 5 urban hospitals surveyed, the number not offering obstetrical care has risen from 37.5% in 1999 to 60% in 2020, with all the closures having been rural sites. There have been no re-openings of obstetrics in hospitals that did not offer obstetrics in 1999. Women in the 9 communities that had offered maternity services in 1999, but no longer do in 2020, now travel an average of over 1.5 h to access these services. In those communities that continue obstetrics, but stopped offering caesarean sections, women now travel 2.5 h for this surgery. Although the total number of general physicians remains at the 1999 level, the number offering intrapartum care has dropped by 65% in urban centres and by 49% in rural ones still providing maternity care.

Conclusions: Like much of the rural United States, rural Northern Ontario is well on its way to becoming a maternity care desert. As proven in Southern Australia, supportive government policies and programmes should be established and education reform enacted to reverse this concerning trend.

Keywords: Midwifery, obstetrics and gynaecology, patient oriented research, primary care, rural health and medicine

Introduction: Les services de maternité en région rurale comptent. On observe une tendance préoccupante de fermeture des services d'obstétriques et de réduction du nombre de médecins de famille qui offrent surtout des soins obstétriques dans les régions rurales du Canada. Ces réductions ont montré avoir un impact grave sur le bien-être de la mère et du fœtus.

Méthodes: Cette étude s'est penchée sur l'état actuel des services d'obstétriques au

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nord de l'Ontario, et a comparé ses résultats à ceux de la dernière enquête semblable réalisée en 1999. Les 40 communautés du nord de l'Ontario dotées d'un hôpital ont été incluses dans l'enquête, tout comme les 16 pratiques de sages-femmes de la région. **Résultats:** Sur les 35 hôpitaux ruraux et les 5 hôpitaux urbains interrogés, le nombre qui n'offrait pas de soins obstétricaux est passé de 37,5 % en 1999 à 60 % en 2020, et toutes les fermetures ont eu lieu dans des centres ruraux. Aucun hôpital sans soins obstétricaux en 1999 n'avait ouvert un service en 2020. Les femmes des 9 communautés qui offraient des services de maternité en 1999, mais pas en 2020, doivent maintenant faire 1,5 heure de route en moyenne pour accéder à ces services. Dans les communautés qui offrent toujours des services d'obstétrique, mais ne réalisent plus de césariennes, les femmes doivent maintenant faire 2,5 heures de route pour recevoir cette intervention. Même si le nombre total de généralistes demeure le même qu'en 1999, le nombre qui offre des soins périnataux a chuté de 65 % dans les centres urbains et de 49 % dans les centres ruraux qui offrent toujours des soins de maternité.

Conclusion: Tout comme dans la majorité des régions rurales des États-Unis, les soins de maternité dans les régions rurales du nord de l'Ontario brilleront sous peu par leur absence. Comme l'a démontré le sud de l'Australie, des politiques et programmes de soutien gouvernemental doivent être mis sur pied et une réforme de l'éducation doit être mise de l'avant pour inverser cette tendance préoccupante.

Mots-clés: Soins primaires, première ligne, sage-femme, obstétriques et gynécologie, recherche axée sur les patients, santé et médecine rurale

INTRODUCTION

Rural maternity care matters. The loss of obstetrical services can intensify health disparities in rural Canada, given its massive geographic area and low population density.¹ In rural Canada, obstetrical care is provided predominantly by family physicians,² though the percentage attending deliveries has dropped from 68% in 1983, to 10.% in 2010.³ Over the past 15 years, small volume maternity programmes have seen closures in rural Canada and centralisation to urban areas,⁴⁻⁶ often with local rural emergency departments, anaesthesia and general surgery closing as well.⁷ This amplifies the breakdown of maternity services,⁷ eroding the social and economic fabric of rural communities.⁶

Rural obstetrical service closure is a widespread issue affecting many other affluent countries such as Australia,⁸ France,⁹ Britain¹⁰ and the United States.¹¹ This trend is occurring despite the fact that such resource-rich countries maintain high quality outcomes in small, low-volume obstetrical facilities¹² as well as in those without caesarean section capability.¹³

Rural parturient women without local obstetrics have to travel for even basic procedural maternity care services^{4,14} and, in many cases, need to relocate to another community while awaiting delivery. Those who travel for more than 1 h for obstetrical care are at a seven times higher likelihood of psychological distress and

anxiety as compared to women with local access.¹⁵ Having to leave their communities weeks before they are expecting is traumatic, isolating, socially disrupting and compromises their continuity of care.^{5,7} Rural women and families also incur costs associated with travel, accommodation and childcare, as well as lost wages.^{4,6} Lack of local obstetrical services has been linked to an increase in perinatal mortality⁴ and longer travel times to access maternity care has been associated with a higher neonatal mortality.¹⁶

Midwifery has the potential to reduce health system opportunity costs, as well as incorporate task shifting and resource reallocation in rural Ontario.¹⁷ Midwifery has been a regulated health profession in Ontario since 1994, and has seen its birth attendance surge from 8000 in 2003 to 22,000 in 2013.¹⁷ As of 2018, Ontario had 963 registered midwives and 105 midwifery practices serving 239 communities.¹⁸

Our present study surveys hospital-based obstetrics, in 40 Northern Ontario communities, as a follow-up to Hutten-Czapski's study¹⁹ in 1999 which found a 500% increase in hospitals not offering obstetrical services as compared to 1981.²⁰ In addition, information has been collected on the 16 midwifery practices in Northern Ontario (French River and north). This supports our goals of ascertaining the current labour and delivery services in Northern Ontario and to contrast and compare the involved health human resource, as well as the service availability, to that of 1999.

METHODS

We modelled the survey after that of Hutten-Czapski (1999)¹⁹ which had been pilot-tested in his study. Between May 12, 2020 and June 12, 2020, a telephone survey of all community hospitals in Northern Ontario, including one community which was missed in the 1999 survey, was conducted. Initial hospital contact was made through the switchboard operator who received a semi-structured questionnaire. The switchboard operator was asked how many GPs were on staff and whether their hospital offered obstetrical services. If obstetrical services were unavailable, the switchboard operator was asked where the nearest maternity centre was and what the land transfer time was to get there. These times were later verified by using Google Maps. If obstetrical services were available, the call was transferred to the maternity ward charge nurse. The nurse then received a semi-structured questionnaire that asked for such information as how many of the hospital's GPs attended deliveries and whether caesarean sections were performed locally. If obstetrical services were offered and no caesarean sections were done, the road distance to the nearest centre with caesarean-section capability was recorded and later verified by Google Maps. If the respondent did not know the answers, the call was forwarded until someone in their institution with this knowledge was reached.

Midwifery services were also surveyed. All Northern Ontario Midwifery practices were identified using the Association of Ontario Midwives' (AOM) search directory. Each practice in Northern Ontario was called and questions were answered by the midwives themselves. All practices were asked questions from the same semi-structured questionnaire to understand their practice characteristics as well as their service area. This questionnaire was pilot-tested with three midwives before use. The data provided was cross-referenced against data the hospitals provided.

All surveys of both hospitals and midwives were carried out by the same member of the research team.

The original data set from Hutten-Czapski's 1999 study¹⁹ was used to determine changes

between 2020 and 1999. As one community was included in the 2020 study that was not in the 1999 study, it was possible to retrospectively determine the 1999 level of obstetrical service and distances to obstetrical and caesarean sections. This was added to the data for 1999, but the number of general practitioners and number offering obstetrical services could not be determined.

Travel time to the nearest obstetrical and/or caesarean section services was determined using Google maps driving times between the communities for all communities except for Moosonee, which does not have road access. For this community, travel time was determined by average flying time. We considered travel time to be zero for patients in communities offering the services.

Validation of data obtained by hospital survey was done with cross reference to the Canadian Institute of Health Information (CIHI) and Statistics Canada data on the number of deliveries in 2019 occurring in the communities we found to be offering obstetrical services.

Statistical analysis

The distribution of communities by the level of obstetrical services available was compared between 1999 and 2020 using Chi-square analysis and *t*-tests to test for differences between the proportions within each level. Differences in travel times and number of GPs providing obstetrical services were determined using matched pair *t*-tests when all communities, or all rural communities, were included and sign rank Wilcoxon tests within smaller subgroups. Analysis of variance was used to test the difference between the means for distances travelled and number of GPs delivering by differences in obstetrical services offered between 1999 and 2020 (never having obstetrical services, obstetrical services in 1999 only and obstetrical services in both 1999 and 2020). The community for which some data was missing was excluded from matched analysis of number of GPs and number of GPs delivering. Communities with a population of <30,000 were considered rural. All data analysis was completed using SPSS (IBM SPSS Statistics for Windows, version 25, IBM Corp., Armonk, N.Y., USA) and considered significance as $P < 0.05$.

Ethics

The Lakehead University Research Ethics Board decided that this study did not require formal research ethics approval as it involved interaction with individuals who were not the focus of the research to obtain information.

RESULTS

The communities surveyed represent all 35 rural and 5 urban communities with hospitals in Northern Ontario. All 40 hospitals provided full responses to the survey. Of the 40 hospitals surveyed, the percentage not offering obstetrical care (Level 0) has risen from 37.5% in 1999 to 60% in 2020 [Table 1]. All the loss of obstetric services has been rural, with now 69% of the rural Northern Ontario communities with hospitals no longer providing these services. Table 1 describes the general characteristics of community hospitals by the level of obstetrical services offered and the changes noted. This includes a relative reduction of 57% in communities providing obstetrics with no local caesarean section capabilities (Level 1a) and a 71% relative reduction in communities with obstetrics supported by a local caesarean section service provided predominately by general surgeons (Level 1c). We did not find any community that was providing obstetrical services in 2020 that had not been doing so in 1999.

Data provided by CIHI, as well as Statistics Canada, confirmed that the Northern Ontario communities, found to be providing obstetrical delivery services in 2020, had each carried out more than 5 deliveries in the last year. This external data helps confirm an active obstetrical programme in each of these communities.

For the 40 communities studied, the average distance travelled to access obstetrical services increased from 19 min in 1999 to 41 min in 2020 ($P = 0.004$). Table 2 shows the travel time for the 35 rural communities, grouped based on their historic and present obstetrical service delivery. The average travel time to access caesarean-section services, for the 40 hospitals studied, increased from 49 min in 1999 to 61 min in 2020 ($P = 0.041$). In the community that continues offering obstetrics but stopped offering C-sections, patients must now travel 2.5 h for this surgery.

From 1999 to 2020, there has been a significant decrease in the average number of general physicians attending deliveries in the Northern Ontario communities surveyed [Table 3]. Urban communities have had an overall decrease of 65% in the average number of general practitioners providing this service per community, while rural communities have seen a decrease of 49% [Table 3]. These changes have occurred despite the overall average number of general physicians in the Northern Ontario communities surveyed having been 14 in 1999 and 13 in 2020 ($P = 0.839$).

Table 1: Community numbers by obstetrics service provision

LOC	Frequency (%)		Mean difference (%)	P
	1999 (n=40)	2020 (n=40)		
Obstetrics service				
0 (no obstetrics services)	15 (37.5)	24 (60.0)	22.5	<0.05
1a (low-risk obstetrics services, no C-sections)	7 (17.5)	3 (7.5)	10	-
1b (obstetrics+C-section by general practitioner)	5 (12.5)	6 (15.0)	2.5	-
1c (obstetrics+C-section by general surgeon)	7 (17.5)	2 (5.0)	12.5	-
2+ (obstetrics+C-section by obstetrician-gynecologist)	6 (15.0)	5 (12.5)	2.5	-

LOC: Level of care

Table 2: Current travel time from rural communities to obstetrical services

	Obstetrics never offered		Obstetrics only in 1999		Obstetrics in 1999 and 2020		P
	n	Mean	n	Mean	n	Mean	
Time travelled to obstetrics services (min)	15	49.33	9	97.78	11	0.00	0.000
Time travelled to C-section services (min)	15	56.66	9	128.33	11	39.55	0.001

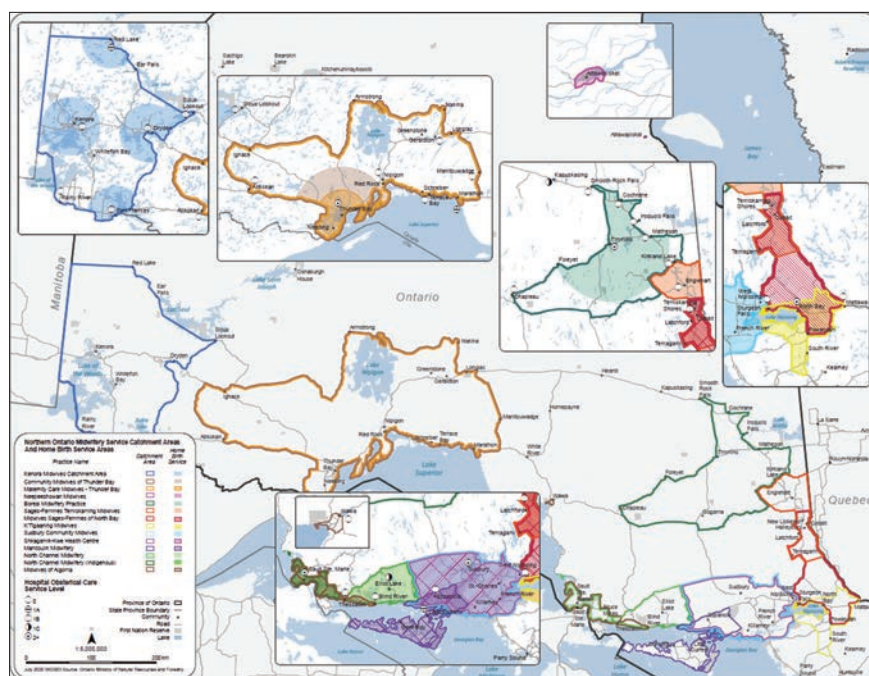


Figure 1: Northern Ontario Midwifery practices map.

Table 3: Average number of general practitioners providing obstetrics per community

	1999	2020	Mean	Wilcoxon
			difference	signed-rank
				test (P)
All communities (n=16)	7.25	3.38	3.87	0.001
Rural communities (n=11)	7.45	3.82	3.636	0.007
Urban (n=5)	6.8	2.4	4.4	0.042

Fifteen of the 16 Midwifery practices in Northern Ontario responded to all questions from our survey. We were able to obtain the missing data from the non-responding practice through a combination of local hospital sources and the AOM. Overall, 50 midwives provide services to Northern Ontario within 16 practices. The mean annual deliveries reported attended by each practice was 92 (10–380). Neepeeshowan Midwives in Attawapiskat reported the lowest annual delivery numbers (10) while Sudbury Community Midwives reported the highest (380). On average, reported home births made up 29.3% (5–90%) of midwifery deliveries, with 70.7% (10–95%) occurring in hospital settings. Manitoulin Midwifery reported the lowest hospital birth rate (10%) and Maternity Care Midwives in Thunder Bay reported the highest (95%). Some practices limited home birth services to clients within a set distance of their practice within their

catchment area; half of practices set a limit of 30 min travel time, 5/14 (35.7%) practices set a 60–75 min limit, and 2/14 (14.3%) practices had no travel limit within their catchment area [Figure 1]. Overall, the average time midwives will travel to provide home birth care is 50 min. Two midwifery practices, both in Thunder Bay, did not offer delivery services but provided prenatal and post-natal care.

DISCUSSION

Grim news. In Northern Ontario, there are now fewer rural communities offering obstetrical services, longer travel times for rural women not able to access local obstetrical delivery services, or caesarean sections, and fewer doctors per community providing obstetrics. Large parts of Northern Ontario are becoming maternity care deserts.

In the United States, 34.6% of their counties have been defined as being maternity care deserts.²¹ These are broadly defined as not having hospitals or providers providing obstetrical care. These, often rural, environments, with a lack of local obstetrical resources and greater travel time to access these services, are known to add duress to families and put women's health at risk.¹⁵ Similar maternity care deserts are developing in Northern Ontario and its population is likely to be experiencing the same health challenges.

In Ontario, throughout the period of time encompassed by this study, there have always been obstetrical services for pregnant women. The defining question has always been how far do parturients need to travel? In the 21-year period examined for the 40 communities, the average travel to obstetrical services has doubled (19–41 min) and there has been an increase to over an hour (49–61 min) to access C-sections. This continues the concerning trend of longer times to maternity care in the region. This deterioration is further accentuated in the subset of communities that lost obstetrical services in the interim, where women must now travel over 1.5 h to access maternity services and over 2 h to the nearest hospital with C-section capability [Table 2]. These distance calculations do not incorporate all the other Northern Ontario rural communities which, not having hospitals, depend on their neighbouring communities offering obstetrics for their maternity care. Doing so would clearly worsen the overall access times. With Kornelson's 2011 paper¹⁵ establishing an hour of transit time to maternity services as being a threshold for increased risk to parturients, we then have more than a concerning trend in a substantial number of rural Northern Ontario communities. We have women and their infants at increased risk of poor outcomes.

Midwifery practices have become important in sharing the demand for obstetrical services, but they are not effective in reversing the maternity care deserts of Northern Ontario. For example, a pregnant woman living in Manitouwadge, a community without local hospital obstetrical services, but in the catchment area of the Thunder Bay midwifery groups, is required to travel 400 km to receive service from a midwife. In Ontario, Midwifery practices have catchment areas specifically defined by their contractual agreements with government. The individual Midwifery practices then decide on the geographic limits of their home birthing services based on reasonable travel time to a hospital with obstetrical services [Figure 1]. The predominant Midwifery practice model in Northern Ontario is still anchored to the geographic presence of hospitals providing obstetrical services, effectively limiting their impact on rural regions.

Over 20 years ago Dr. Hutten-Czapski asked for educational action to 'strengthen programmes

to provide family practice trainees with the skills and attitudes that they need to practise obstetrics in rural Canada in hopes of changing the ongoing trend he found of rural Northern Ontario hospitals closing obstetrical services.¹⁹ As determined by this present study, the trend has not abated. In the intervening years, the Northern Ontario School of Medicine (NOSM) has been created with the social accountability mandate of meeting the needs of its Northern communities and the potential to help reverse this concerning trend. It can be done, and at least one path forward has already demonstrated success. In 2007, a potential crisis in rural obstetrics was detected in Southern Australia with a looming shortage of general practitioners providing rural maternity care. Factors contributing to this impending shortage were determined to be the rise of specialisation, centralisation of services, concerns regarding indemnity and litigation, rural work and difficulty maintaining competence.²² Understanding these underpinnings of the threat spurred the development of a comprehensive training and support programme which propelled the recovery of maternity services in that region and reversed the trend of service closures.²² Educational evolution as well as novel government initiatives to appropriately fund and support general practitioners providing obstetrical care were instrumental in its success.

Attempting to determine root causes of Northern Ontario's obstetrical challenges lead to hypothesising on the data this study has found. For example, is the decline seen of Level 1c hospitals (those with general surgeons performing the majority of C-sections) due to a change in the curriculum of general surgery residencies, as C-section competency is no longer required? Is the decline of Level 1a hospitals (those with obstetrical services, but no C-section capability) due to the perceived risk of this service by providers even when the data shows that such service provision is safe?¹³ Establishing the particular factors that have led to the maternity care service closures, as well as examining the impact of these closures on the health of the resident population would be important next steps in further understanding the issue and informing region-specific solutions.

The state of maternity care in Northern Ontario points to the urgent need to reverse the

ongoing trend of service closures. With presently only 11 northern rural hospitals continuing maternity services and an average of <4 physicians providing deliveries per site, rural obstetrics is at risk as is our ability to educate the next generation of rural maternity care providers.

Leadership in education is needed for nursing, midwifery and family physician obstetrical skills development, as well as for surgical caesarean training programmes for both family doctors and general surgeons, to ensure that not only the basic skills are taught but also that learners are given opportunities to develop the attitudes and confidence needed to practise them in rural settings. However, this will not suffice. Sustainable rural maternity care requires much more than adequately trained providers. To flourish, it needs to be supported by a complex healthcare ecosystem that recognises its importance.

Leadership in Government is needed at all levels to develop the appropriate policies and deliver the dedicated health-care dollars to maintain rural maternity care services. Rural hospitals need to be expressly funded to provide this service for their communities. Specialist-focused, tertiary care referral centres need to provide neighbouring rural obstetrical programmes with seamless, dedicated clinical support, as well as collaborate in the delivery of the continuing education they require.

Leadership in advocacy of rural maternity care in Canada, such as by the Society of Rural Physicians of Canada, needs to continue to remind policy makers that the trend of maternity care service closures continues and that service collapse will have large negative impacts that will be difficult to reverse.

Strengths and Limitations

While this study has limitations in that it relies on self-reporting, potentially resulting in some inaccuracies, it does represent all the hospitals in Northern Ontario with a complete response rate and a similarly comprehensive survey of regional Midwifery practices with only one small practice not responding. The results reported herein may not have application beyond our study area, but they do appear to reflect the trends for access to rural obstetrics seen elsewhere.

CONCLUSION

Since 1981 Northern Ontario has had 40 years of wandering in an increasingly consolidated maternity care desert. Rural women and their families need support to lead us out.

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