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VOLUME 10, N° 1, HIVER 2005

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The Occasional Breech

Sixty-one Years of Obstetrics in Bella Coola

Rural and Urban Medical Students: a Comparison



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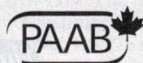
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A Child's Winter Dream

Hooked rug: hand-dyed wool on jute burlap

Marie Adèle Poirier, CP 875,
Cheticamp NS B0E 1H0

*Poirier's works available from Co-op
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The third time's a charm!

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Scientific editor, *CJRM*

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QC J0X 2Y0

It is with a great deal of pride that I am able to announce to *CJRM*'s readership and to its authors, current and future, that as of Vol. 9, No. 1, (2004) this journal has been selected by the National Library of Medicine / National Institutes of Health for indexation and inclusion in *Index Medicus* and MEDLINE. It was the third try, but who's counting?

What does this mean? It means that instead of being easily available to only the 5000 physicians on our mailing list, material published in *CJRM* is now available to the world! This status is both a major opportunity and a great responsibility. It is an opportunity because *CJRM* will be increasingly able

ciples of rural medicine recognized as credible in Canada and around the world. This development confirms their importance and their relevance to rural practice anywhere, and the SRPC should justly feel proud of this recognition and draw strength from it.

What will this mean for *CJRM*? It is difficult to say for sure, but as there are very few other rural medical journals in the world, this change in status has the potential to have dramatic consequences. To my knowledge there is only one other rural journal in the United States, one in Australia, and one exclusively published electronically. Set against this is the fact that perhaps close to 50% of the world's population is rural! Although Canada is blessed by large rural spaces, it has a relatively small population, and the number of rural researchers is proportional to this population. As we become better known internationally it is inevitable that we will be sought as a vehicle to publish research from beyond our borders, and conversely, to become increasingly sensitive to the fact that our published papers will be read internationally.

So, interesting times are ahead — for *CJRM* for sure, hopefully also for the rural research community and, lastly, (or more properly "firstly") for the rural communities on whose behalf this journal is published.

Raise a glass wherever you are, of "Blue," of "bitter," of "schnapps" or of "grappa" . . . a toast to rural!

**. . . MATERIAL PUBLISHED IN
CJRM IS NOW AVAILABLE
TO THE WORLD!**

to position itself as the premier source for rural health publication. With that will come an increased responsibility because we will have to manage not only the expected increase in future submissions, but of course their quality, with all that that implies with respect to the need for more reviewers, and the need to find more editorial hours.

The credit, however, goes to those rural physicians who have fought since the creation of the Society of Rural Physicians of Canada to have the prin-



Persévérance récompensée

John Wootton, MD
Shawville (Qué.)

Rédacteur scientifique,
JCMR

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C'est avec beaucoup de fierté que je peux annoncer aux lecteurs du *JCMR* et à ses auteurs, actuels et futurs, qu'à compter du volume 9, numéro 1 (2004), la National Library of Medicine et les National Institutes of Health ont retenu notre journal pour indexation dans *Index Medicus* et MEDLINE — suite à une troisième tentative d'inscription de notre part.

Que signifie ce succès? Il signifie qu'au lieu d'être facilement disponible uniquement pour les 5000 médecins inscrits sur notre liste d'abonnés, le matériel publié dans le *JCMR* est désormais accessible dans le monde entier! Voilà à la fois une grande possibilité et une grande responsabilité. Une possibilité parce que le *JCMR* pourra de plus en plus se positionner comme principale source de publication en santé rurale, et une responsabilité accrue parce que nous devons gérer non seulement une augmentation du nombre de communications qui nous seront présentées, mais aussi, bien entendu, leur qualité, sans compter tous les aspects d'ordre administratif, par exemple trouver davantage d'examineurs et consacrer plus de temps à la rédaction.

Le crédit revient toutefois aux médecins ruraux qui luttent depuis la création de la Société de la médecine rurale du Canada pour faire reconnaître la crédibilité des principes de la médecine rurale au Canada et dans le monde entier. Ce succès confirme leur importance et leur pertinence pour la pratique rurale n'importe où et la SMRC a raison d'être fière de cette reconnaissance et d'y puiser de la force.

Quelles seront les répercussions pour

le *JCMR*? Difficile à dire, mais comme il se publie très peu d'autres journaux sur la médecine rurale dans le monde, ce nouveau statut pourrait avoir un impact spectaculaire. Sauf erreur, il y a un seul autre journal rural aux États-Unis, un en Australie et un autre publié

... LE MATÉRIEL PUBLIÉ

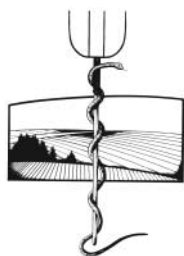
DANS LE *JCMR* EST

DÉSORMAIS ACCESSIBLE

DANS LE MONDE ENTIER!

en version électronique seulement. Or, on peut estimer que près de 50 % de la population du monde vit en milieu rural! Même si le Canada est béni par ses vastes espaces ruraux, sa population est relativement faible et le nombre de chercheurs ruraux est proportionnel à la population. À mesure que nous nous ferons mieux connaître sur la scène internationale, on cherchera inévitablement à recourir à nos services pour publier des recherches provenant de l'étranger. Par ailleurs, nous serons de plus en plus sensibilisés au fait que nos communications publiées seront lues sur la scène internationale.

Une période intéressante nous attend donc — pour le *JCMR*, c'est certain. Aussi pour les milieux de la recherche rurale, nous l'espérons et, en dernier lieu (ou, ce qui est plus juste, «en premier lieu»), pour les milieux ruraux pour lesquels nous publions ce journal. Où que vous soyez, levez votre verre de bière, de vin, de schnaps ou de grappa... pour porter un toast aux milieux ruraux!



President's message. Once a rural doc...

Trina M. Larsen Soles, MD

Golden, BC

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I've travelled a great deal, visiting such diverse places as Prince George, Sudbury, Vancouver, Ottawa and Toronto. Whether attending an SRPC meeting or a provincial or national medical organization meeting, I've noted that many physicians have some experience of rural practice. There's a tendency for such people to be apologetic about leaving rural practice. I find this interesting. People's lives change. One of the great things about rural medicine is the large generalist skill set one acquires. Sometimes this opens doors to new opportunities in other places. Sometimes it is the beginning of a career path leading to a specialty. Sometimes personal reasons dictate a move. This does not invalidate rural experience or rural interest. In fact, it strengthens the medical profession as a whole to encourage such flexibility. I'm grateful for whatever time people give to rural practice, because it gives something to rural medicine and rural communities, as well as benefiting the individual practitioner. There's a reason why the best "first person" stories in medical humour journals are often from the time the author spent in rural practice. Once a rural doc, to some extent, always a rural doc! I hope when considering membership you realize that a concern for rural health issues, no matter where you live, is all you need to become or remain a member of the SRPC.

The SRPC is involved in a number of exciting activities. It's encouraging that those at both provincial and national levels are looking to us for input. I'd like to highlight a few of these projects.

Our Obstetrical Committee has changed its name to the **Maternal and Newborn Care Committee**. They're

involved in a project with the Society of Obstetricians and Gynaecologists of Canada, looking at collaborative models of care in primary care obstetrics. Drs. Brian Geller and Jill Konkin are representing us.

The Canadian Nurses Association requested our participation in the **Nurse Practitioner Initiative**. This project will look at the role of NPs in primary care nationally. Dr. Caroline Knight is representing us on the steering committee.

In British Columbia the Provincial Health Services Authority requested SRPC representation in their **Rural Emergency Department Reference Group**. This project is developing classification schemes, and staffing and equipment standards for rural EDs in BC.

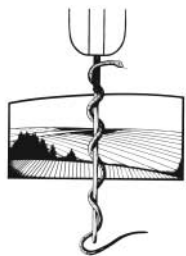
Our Anaesthesia Committee, chaired by Dr. Hal Irvine, continues to work with the Canadian Anaesthesia Society and the College of Family Physicians of Canada (CFPC) on issues related to GP-anesthetists. The SRPC will take a more active role in the administration of the "**Crisis Management in the Simulator Course**," initiated by this group.

Dr. Karl Stobbe is chairing a joint **Rural Education Committee** with the CFPC.

The planning for our upcoming Rural and Remote Conference, **Apr. 28-30, 2005**, in Montréal is well underway, chaired by Dr Gordon Brock.

Lastly, **congratulations to CJRM** for being accepted for indexing in *Index Medicus* and MEDLINE!

Our organization is only as strong as our members. Together we can make a difference in how medical care is delivered in rural communities. Thank you to the many individuals who are giving their time and energy to the work of the SRPC.



Message de la présidente. Médecin rural un jour...

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Golden (C.-B.)

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J'ai beaucoup voyagé et visité des endroits aussi variés que Prince George, Sudbury, Vancouver, Ottawa et Toronto. Que ce soit pendant une réunion de la SMRC ou celle d'une organisation médicale provinciale ou nationale, j'ai constaté que beaucoup de médecins ont de l'expérience de la pratique en milieu rural. Curieusement, ces médecins ont tendance à s'excuser d'avoir quitté la pratique rurale. La vie des gens change. Un des grands aspects intéressants de la médecine rurale, c'est le vaste éventail de connaissances techniques générales que l'on y acquiert. Cette expérience ouvre parfois des portes sur de nouvelles possibilités ailleurs. C'est parfois le début d'un cheminement de carrière qui débouche sur une spécialité. Parfois, ce sont des raisons personnelles qui imposent un déménagement. Ce déménagement n'annule pas l'expérience acquise en milieu rural ni l'intérêt à cet égard. En fait, on renforce la profession médicale dans son ensemble en encourageant une telle flexibilité. Je suis reconnaissant aux intéressés du temps qu'ils consacrent à la pratique en milieu rural parce que le praticien donne quelque chose à la médecine et aux communautés rurales et qu'il en retire aussi quelque chose. Voilà pourquoi les meilleures anecdotes «personnelles» publiées dans les journaux humoristiques médicaux découlent souvent de la période que l'auteur a passée en milieu rural. Médecin rural un jour, médecin rural toujours, jusqu'à un certain point! J'espère que lorsque vous envisagez de devenir membre, vous réalisez qu'il suffit de s'intéresser aux questions de santé en milieu rural, peu importe où vous vivez, pour adhérer à la SMRC ou demeurer membre.

La SMRC participe à de nombreuses activités intéressantes. Les intervenants des niveaux tant provincial que national recherchent notre contribution, ce qui est encourageant. Je veux vous présenter quelques-uns de ces projets.

Notre Comité d'obstétrique est devenu le **Comité des soins à la mère et**

au nouveau-né. Le Comité participe, avec la Société des obstétriciens et gynécologues du Canada, à un projet dans le cadre duquel on étudie des modèles de soins primaires en obstétrique fondés sur la collaboration. Les D^{rs} Brian Geller et Jill Konkin nous y représentent.

L'Association des infirmières et infirmiers du Canada nous a demandé de participer aux travaux de **l'Initiative sur les infirmières et infirmiers praticiens** dans le cadre de laquelle on se penchera sur le rôle des IP dans les soins primaires à l'échelon national. Le D^r Caroline Knight nous représente au comité directeur.

En Colombie-Britannique, la Régie provinciale des services de santé a demandé à la SMRC de déléguer un représentant à son **Groupe témoin des services d'urgence en milieu rural.** Le projet est en train d'établir des régimes de classification et des normes sur la dotation et l'équipement des services d'urgence ruraux en Colombie-Britannique.

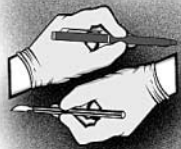
Notre Comité de l'anesthésie, présidé par le D^r Hal Irvine, poursuit ses travaux sur des questions qui ont trait aux OP-anesthésistes en collaboration avec la Société canadienne des anesthésistes et le Collège des médecins de famille du Canada (CFMC). La SMRC participera plus activement à l'administration du «**Cours de gestion de crise en simulateur**» lancé par le groupe.

Le D^r Karl Stobbe préside un **Comité mixte de l'éducation rurale** mis sur pied avec le CMFC.

La planification de notre prochaine Conférence sur la médecine en milieu rural et éloigné, qui aura lieu **du 28 au 30 avril 2005** à Montréal, est bien amorcée sous la direction du D^r Gordon Brock.

Enfin, **félicitations au JCMR** qui a été accepté pour indexation dans *Index Medicus* et MEDLINE!

Notre organisation est aussi forte que ses membres. Ensemble, nous pouvons faire une différence dans la prestation des soins médicaux en milieu rural. Merci aux nombreuses personnes qui font don de leur temps et de leur énergie pour collaborer avec la SMRC.



ORIGINAL ARTICLE ARTICLE ORIGINAL

Obstetric maternal outcomes at Bella Coola General Hospital: 1940 to 2001

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This article has been peer
reviewed.

Objective: To describe obstetric procedures (episiotomy, forceps, vacuum extraction, caesarean section) and maternal outcomes for patients who gave birth in an isolated, rural hospital.

Design: A retrospective cohort study.

Study population: Women beyond 20 weeks' gestation who gave birth between Mar. 7, 1940, and June 9, 2001, inclusive, at the Bella Coola General Hospital (BCGH).

Main outcome measures: Data collected included maternal age, date of delivery, mode of delivery (vaginal delivery v. cesarean section), whether an episiotomy was performed or not, if forceps or vacuum extraction were used, whether analgesia, sedation or anesthesia was used, and maternal mortality.

Results: There were 2373 deliveries, including 12 sets of twins. There were no maternal mortalities. Cesarean sections were not routinely performed until the 1970s. Since then, there has been an increase in cesarean section rates to 11% of all deliveries in the 1990s. In the 1940s 28% of deliveries involved an episiotomy. This increased to 47% in the 1970s and was followed by a sharp decline to 4% in the 1990s. There was an increase, followed by a more gradual decrease in the use of forceps, and there was a recent increase in the use of vacuum extraction. The changes in procedure rates appear to reflect best practice guidelines of the times. In the case of episiotomies, the data suggest rural physicians are capable of rapid incorporation of recent recommendations. Rates for all procedures tended to be lower than those reported elsewhere in Canada and the United States. Narcotics, sedatives, inhalation agents and regional anesthetics were used to relieve the pain of labour and delivery throughout the study period.

Conclusions: Women giving birth in the low technology environment of the BCGH experienced relatively low obstetric procedural rates with excellent maternal outcomes.

Objectif : Décrire les interventions en obstétrique (épisiotomie, forceps, succion, césarienne) et les résultats pour les patientes qui accouchent dans un hôpital isolé en milieu rural.

Conception : Étude de cohorte rétrospective.

Population étudiée : Des femmes enceintes de plus de 20 semaines qui ont accouché entre le 7 mars 1940 et le 9 juin 2001 inclusivement au Bella Coola General Hospital (BCGH).

Principales mesures de résultats : Les données recueillies comprennent l'âge de la mère, la date et le genre d'accouchement (vaginal ou par césarienne) et précisent s'il y a eu ou non recours à l'épisiotomie, aux forceps, à la succion, ainsi qu'à l'analgésie, la sédation ou l'anesthésie, et si la mère est décédée.

Résultats : Il y a eu 2373 accouchements dont 12 paires de jumeaux. Il n'y a eu aucune mortalité maternelle. La césarienne n'était pas pratiquée de routine avant les années 1970. Le taux de césariennes atteint ensuite 11 % de tous les accouchements pendant les années 1990. Au cours des années 1940, 28 % des accouchements comprennent une épisiotomie. Le taux grimpe à 47 % dans les années 1970 et chute à 4 % dans les

années 1990. Le recours aux forceps augmente pour diminuer ensuite plus graduellement, et la succion est à la hausse récemment. L'évolution des taux d'intervention semble refléter les lignes directrices sur les pratiques exemplaires de l'époque. Dans le cas de l'épisiotomie, les données laissent entendre que les médecins en milieu rural peuvent rapidement intégrer les recommandations récentes. Les taux de toutes les interventions avaient tendance à être inférieurs à ceux déclarés ailleurs au Canada et aux États-Unis. Au cours de la période à l'étude, des stupéfiants, des sédatifs, des agents inhalés et l'anesthésie locale ont servi à soulager la douleur pendant le travail et la naissance.

Conclusion : L'étude révèle des taux d'intervention en obstétrique relativement faibles et d'excellents résultats pour les femmes qui accouchent à l'hôpital BCGH à faible technologie.

INTRODUCTION

The practice of obstetrics in rural Canadian communities is undergoing profound change.^{1,2} Fewer family doctors starting their practices are taking on obstetrics, and the average age of physicians who do practise obstetrics is close to the age of retirement.² Some remote and rural communities now have no local access to maternity care services.³ Rural women are affected particularly hard by losses in local obstetric services because they must travel and be separated from family and friends when they give birth.⁴⁻⁶

Loss of maternity services affects not only women giving birth but the health and sustainability of rural communities. Communities without maternity services have difficulty attracting families, which in turn limits economic development and economic opportunities.^{7,8}

Specific reasons given by physicians for discontinuing obstetrical services are many and varied. Some physicians cite family/social reasons; that is, delivering babies interferes with family time and social occasions. Others state that delivering babies is just too stressful. Some state that they quit obstetrics because having to leave the office during office hours to deliver a baby disrupts their practice too much. Inadequate training, medicolegal concerns, inadequate remuneration, lack of confidence, lack of professional support, and the cost of malpractice insurance are other reasons for giving up obstetrics. Centralization of health care, which in turn decreases certain services to rural areas such as locally available obstetricians, cesarean section (C-section) capability, general surgery capability, ultrasonography capacity and epidural anesthetics, are also believed to be contributing factors.^{2,6,9-14}

There is a widespread belief among rural physicians that competency in obstetrics is related to the number of babies delivered per year, and is also

related to the mastery and necessary continuous updating of advanced maternity skills (e.g., forceps delivery, manual extraction of placenta, repair of severe vaginal lacerations, and the administration of anesthetic agents).^{11,15,16} Since these advanced maternity skills are used so infrequently, it is easy to see how rural physicians make the decision to refer obstetric deliveries to secondary and tertiary care facilities.

Intuitively it makes sense that being managed by a highly skilled obstetrics team will result in lower maternal mortality and morbidity. However, studies suggest "low risk" women living in rural communities have just as good outcomes if they choose to deliver their babies in local primary care facilities, as opposed to delivering them in a rural primary care facility. In fact, when maternity care is not available locally and women must travel for that care, negative outcomes are more common.^{10,17-21} These women tend to have higher rates of complicated deliveries, higher rates of prematurity, and a greater need for neonatal care as compared to women who deliver in their local community.

Admittedly, the limitations of studies published so far are their small sample sizes and the short time periods they cover. Hidden away in a safe located in the Bella Coola General Hospital (BCGH), Bella Coola, British Columbia (BC), were case room record books that document the details surrounding births that took place between Mar. 7, 1940, and June 9, 2001, inclusive, except for the period from Mar. 22, 1967, through to Jan. 7, 1969, inclusive. (There was no evident explanation for the missing data.) As far as we can tell, the data from these case room record books represent one of the longest rural hospital data sets available on the topic of obstetrical outcomes and procedural usage rates. This paper reviews and summarizes the information in this birth registry in an attempt to answer the following questions.

1. What procedures were being done by the rural physicians over this time period?
2. How do BCGH's obstetrical outcomes and procedural usage rates over time compare to provincial, national and international trends?

METHODOLOGY

This research project was carried out in a participatory fashion and followed the recommendations outlined in the Society of Obstetricians and Gynaecologists of Canada (SOGC) 2001 policy statement "A Guide for Health Professionals Working with Aboriginal Peoples."²²⁻²⁴ Prior to collecting data we obtained letters of support from the Nuxalk Band Council, the Bella Coola Transitional Health Authority and the Central Coast Regional District for a comprehensive study on a broad range of determinants of health for people living in the Bella Coola Valley. Ethics approval to collect these data was then obtained from research ethics committees located at both the University of British Columbia and the University of Northern British Columbia. The results and the manuscript were reviewed and approved for publication by both Nuxalk Health professionals and health professionals from the United Church Health Services, which owns and operates BCGH.

Bella Coola Valley is located in the central coast region of BC (Fig. 1). A detailed geographic description of the Valley appears in the accompanying Original Article²⁵ on page 22 of this issue. The isolation of this region is such that almost everyone who lives in the Bella Coola Valley has either a clinic chart or emergency room record. This makes the Valley an ideal region in which to study population-based issues. Details of the medical services available in this region have previously been reported.^{26,27} According to the 2001 Census 2289 people live in the Bella Coola Valley and at least 40% of these people are of Aboriginal descent.^{28,29} Bella Coola Valley is part of the traditional territory of the Nuxalk Nation, a tribe of Salish-speaking Coastal Indians.³⁰⁻³³

The study population consisted of Aboriginal and non-Aboriginal women beyond 20 weeks' gestation who delivered at the BCGH between Mar. 7, 1940, and June 9, 2001, inclusive (except for the aforementioned missing period), according to hospital labour and delivery case room books. Information collected included maternal age, ethnicity, maternal mortality, analgesia, anesthesia, sedation, episiotomy, forceps and vacuum delivery, and C-sections.

In Canada, 3 groups of Aboriginal people are recognized: First Nations (formerly referred to as Indians), Métis and Inuit.³⁴ First Nations people can, in turn, be separated into Status Indian and non-Status Indian populations. Status Indians are First Nations people who have registered and are entitled to receive provisions outlined by the *Indian Act*. An estimated 3.6% of the entire BC population is Aboriginal.

Information used to determine Aboriginal status of Bella Coola Valley women came from multiple sources: 1) 1920, 1979, 1989 and 2001 Nuxalk Band lists; 2) access to birth and death vital statistics information for the Nuxalk Band members back to the 1920s; and 3) consultation with Nuxalk elders (a comprehensive genealogy of the Nuxalk people was constructed in the 1990s). There were Aboriginal people living in the Bella Coola Valley who were not associated with Nuxalk people. These people were identified from a review of their clinic charts, from their response to a survey question asking about Aboriginal status, or by asking directly whether they had Aboriginal ancestry. The lead author used this information to assign Aboriginal status to each woman. A long-time resident and medical clinic staff person then reviewed and verified or queried whether Aboriginal status assigned to each woman was correct. There were only a few alterations made after consultation with the medical clinic staff person.

The data were entered into an electronic Excel



Fig. 1. Detailed map of the Bella Coola Valley.

spreadsheet and later transferred to a statistical program (SPSS) for statistical analyses, summary and graphing.³⁵ Differences in the outcomes were evaluated using Pearson's chi-square with a significance level of $p \leq 0.05$ for each outcome measure.³⁶

RESULTS

There were 2373 deliveries between Mar. 7, 1940, and June 9, 2001, that were recorded in the BCGH labour and delivery case room books. This included 12 twin deliveries. Aboriginal women accounted for 47% of the deliveries. There was a steady increase in births until the early 1960s and then a decline throughout the '60s and '70s, with another increase in the early '80s, followed by a gradual decline thereafter. The years with the highest birth rates ($> 60/\text{yr}$) were 1960, 1963, 1983 and 1992. The years with the lowest rates ($< 30/\text{yr}$) were 1945, 1971 and 1995.

Table 1. Analgesia given to 2361 women in labour at Bella Coola General Hospital during the study period, 1940–2001

Analgesia	No. of women who received this agent	Time period
Inhalation agents		
Chloroform	246	1940–1953
Ether	413	1940–1953
Trilene	215	1956–1977
Cyclopropane	34	1959–1964
Nitrous oxide	69	1958–1981
Entonox	145	1984–2001
Narcotic		
Heroin	24	1940–1945
Morphine	36	1941–1961
Codeine	13	1942–1967
Demerol	869	1946–2001
Sedatives		
Benzodizepines	5	1960–1992
Sodium amytal	206	1940–1957
Nembutol	95	1941–1955
Seconal	216	1946–1964
Pentothal	22	1959–1964

There were no reported maternal deaths in the BCGH during the recorded study period. Narcotics, sedatives, inhalation agents and regional anesthetics were all used during labour and delivery. A descriptive summary of the inhalation agents, narcotics, and sedatives used is presented in Table 1. The use of regional anesthetics during the study period is summarized in Table 2.

The number of recorded obstetric procedures (episiotomy, forceps, vacuum delivery, C-section) performed is shown in Table 3.

Episiotomies

The data show a gradually increasing episiotomy rate into the 1970s (47%), after which it dropped to $< 5\%$ in the 1990s (Table 3).

Operative deliveries (forceps / vacuum extraction)

BCGH's recorded forceps and vacuum extraction rates indicate a reduction in the rate of forceps use from the 1960s to the 1980s, with a marked decrease from the '80s to the '90s. Vacuum extraction deliveries were not used in BCGH prior to the 1980s. Operative deliveries prior to that time denote the exclusive use of forceps (Table 3).

Cesarean sections

Up until the 1970s there was only one C-section done in the BCGH according to the data available to us. It was an emergency C-section done in 1959 because the patient was hemorrhaging from a ruptured uterus. From the 1970s onward there has been a gradual rise in the rate of C-sections (Table 3). Reasons for the increase are summarized in Table 4; they include failure to progress, repeat C-sections, breech delivery and fetal distress.

Statistic analyses

Pearson's chi-squared statistical analyses reveals

Table 2. Regional anesthetics given during the study period, 1940 to 2001

Procedures	Decade						Total
	1940s	1950s	1960s	1970s	1980s	1990s	
Spinal anesthesia	0	2	0	6	0	24	32
Pudendal nerve block	0	4	9	17	21	2	53
Epidural anesthesia	0	0	12	19	88	55	174
Cesarean section	0	1	0	13	42	44	100
Regional + C-section	0	0	0	8	39	39	86

that the likelihood of any of the interventions — episiotomy, operative delivery (forceps and vacuum extraction), C-section — being used varied significantly with the decade of birth ($p < 0.05$).

DISCUSSION

With Canada's vast geographic area and large rural base there is an obvious need for rural obstetrical care. Studies report better labour and delivery outcomes if "low risk" rural woman give birth in their own community surrounded by family and friends. The Joint Position Paper of the SOGC, the Society of Rural Physicians of Canada (SRPC) and the College of Family Physicians of Canada (CFPC) states that maternity care should be provided as close as possible to the rural patient's home location, within the limits of safe practice, regardless of on-site C-section support.^{10,11}

The BCGH is located in the isolated, rural, remote community of Bella Coola, and women have been delivering their babies there since the first hospital was built in 1908.^{27,32} The data described in this paper cover a 60-year time period, from 1940 to 2001, and the results support the aforementioned Joint Position Paper of the SOGC, SRPC and CFPC.

There were no reported maternal deaths in the BCGH during the recorded study period. Mater-

nal mortality rate (MMR) can be defined as the number of maternal deaths due to delivery and complications of pregnancy, childbirth and the puerperium, per 10 000 live births.⁹ MMRs have decreased throughout the decades. The MMR was 31/10 000 live births in BC compared with 40/10 000 in Canada as a whole for 1940.³⁷ Current MMRs in Canada are in the order of 0.3/ to 0.5/10 000.

Data from the BCGH obstetric case room books reveal that women have been receiving narcotics, sedatives, inhalation anesthetics and regional anesthetics since the 1940s. The specific agents used have changed over the years, but the broad category of analgesic agents has not — for example, demerol is given today instead of heroin, entonox gas instead of ether gas, and benzodiazepines are given instead of barbiturates.³⁸

A review of the literature suggests wide variations in use of pain management in Canada in the 1980s. In a study of anesthesia availability in cities across Canada, epidural anesthesia was unavailable in Edmonton, whereas in Toronto the rate of use was 58.7%.³⁹ Epidural anesthesia was offered routinely in BCGH during the 1980s, but this practice may not be representative of other rural community hospitals. The literature suggests that the use of epidural anesthesia in rural and remote area hospitals is rather low and may be related to fewer deliv-

Table 3. Obstetric procedure usage rates during the study period, 1940 to 2001

BCGH	Decade						Overall
	1940s	1950s	1960s	1970s	1980s	1990s	
No. of women	251	443	425	368	475	399	2361
No. of births	253	447	426	370	478	399	2373
Episiotomy, %	28	33	36	47	35	4	31
Operative delivery, %							
Forceps	7	6	8	10	9	2.5	7
Vacuum	0	0	0	0	7	9	3
Forceps + Vacuum	7	6	8	10	16	12	10
Cesarean section, %	0	0.2	0	4	9	11	4

BCGH = Bella Coola General Hospital

Table 4. Reasons for cesarean section, per decade

Reason	Decade, no. of women						Total
	1940s	1950s	1960s	1970s	1980s	1990s	
Failure to progress	0	0	0	8	14	24	46
Breech delivery	0	0	0	3	7	7	17
Repeat C-section	0	0	0	0	9	10	19
Fetal distress	0	0	0	0	3	5	8
Miscellaneous	0	1	0	0	6	1	8
No information in records	0	0	0	2	3	1	6

eries, and fewer personnel resources to perform the procedure.⁴⁰

Episiotomies

Episiotomies were introduced in the 18th century with the intent of improving maternal outcomes.⁴¹ In the 1920s the episiotomy was introduced as a routine procedure in the belief that it would shorten the second stage of labour, lower perinatal mortality and morbidity, reduce severity of perineal tears, improve sexual function, and reduce the possibility of urine and fecal incontinence.^{41–44} The routine use of episiotomies was introduced without strong scientific evidence of its benefits.

Recent studies indicate the use of episiotomies may result in the following: 1) a decrease in muscle strength of vaginal muscles; 2) slower wound healing; 3) more pain during sexual intercourse; and 4) higher rates of urinary and fecal incontinence. The only North American randomized controlled trial of episiotomy was conducted and published in Canada. It showed that midline episiotomy caused the very trauma that it was supposed to prevent.⁴⁵ Third- or 4th-degree tears took place in the presence of episiotomy. Moreover, the physicians who employed it routinely were responsible for most of the severe trauma, with 3rd- and 4th-degree tear rates reaching 20% in the first births.^{45–47} As a result of these studies, and as the result of an initial review of the literature in 1983 illustrating the disadvantages and lack of advantages of episiotomies, there has been a noticeable decline in prevalence of episiotomies in Canada.^{33,48,49} The figures from the 2003 Canadian Perinatal Surveillance System (CPSS) show how the Canadian episiotomy rate has declined — from 49% in 1991/1992 fiscal year to 24% in 1999/2000.⁴⁹ An earlier Canadian study revealed that the episiotomy rate declined from 66.8% in 1981/1982 to 37.7 % of all women giving birth vaginally in 1993/1994.⁴⁸ The World Health Organization (WHO) recognizes the reasons for performing an episiotomy but also recognizes that episiotomies are frequently used inappropriately.⁵⁰ WHO recommends an overall episiotomy rate of around 10% because of the evidence suggesting that liberal use of episiotomies causes more harm than good. Restrictive use of episiotomies is seen as a positive initiative in relation to evidence-based recommendations.⁴⁸ Episiotomy rates at BCGH seem to follow best practice recommendations; its rate of less than 5% in the 1990s is significantly lower than other provincial, national and international rates.

Forceps

Trends in forceps delivery rates in BCGH reflect Canadian and international studies that report decreases in forceps usage since the 1970s, along with increases in vacuum extraction rates.^{10,51–53} BCGH's rate of the use of forceps, when compared to BC and Canadian data, indicates that BCGH has a rate that falls far below the national and provincial averages for both the 1980s and the 1990s. Reported forceps usage rates in Canada range from 6.5% to 21%.^{9,49} In BC, forceps delivery declined from 13% in 1987 to 7.4% in 1995, and use of vacuum devices increased from 0.8% in 1987 to 4.9% in 1995.⁵⁴

Cesarean section

In some ways, the C-section has become an icon of all the medical advances made in obstetrics. Today, C-sections are used as both a medical intervention and a mode of choice for women who prefer it as an alternative to vaginal birth. Worldwide trends illustrate marked differences in C-section rates. Among the developed countries, the US and Canada have relatively high C-section rates (19%–23%).^{49,55} In contrast, some Eastern European (e.g., former Czechoslovakia and Hungary), some Western European (e.g., the Netherlands), some Scandinavian countries (e.g., Iceland and Sweden) and Japan report relatively low rates of C-sections (5%–10%).^{56,57} According to US statistics, the C-section is now the most common major operation performed in the US, with rates of 22.9% and 26.1% reported for the years 2000 and 2002, respectively.⁵⁸ In comparison, BCGH has C-section rates that are lower than provincial, national and international rates.^{59,60} The WHO recommends a C-section rate of 10%–15%, which is exactly the rate reported for BCGH.

Early Canadian data from the '60s, '70s and '80s show an increasing C-section trend. In Canada the rate increased from 4.8/100 in 1968 to 12.1/100 in 1977.^{54,60} Figures from the 2003 CPSS reveal that Canada's C-section delivery rate increased from 18% in the 1991/1992 fiscal year to 21% in 1999/2000.⁴⁹ As with other hospitals around the world, the BCGH data show there has been gradual rise in the rate of C-sections since the 1970s — from 0% to < 15%. Klein concludes that all studies indicate a rising C-section rate in Canada and notes this rising rate is not associated with improved fetal health.⁵⁶

The indications for C-sections are vast. One

account⁶¹ states that a C-section is indicated whenever a practitioner makes the judgement that "the risk of vaginal delivery exceeds the risk of the operation or that the mother's perception is that it does." The main indications for C-sections in Canada and the US are 1) previous C-section, 2) dystocia, and 3) fetal distress.^{62,63} At BCGH the main indications for C-section are dystocia, previous C-section, breech and fetal distress.

Limitations

The data presented in this paper provide detailed insights into the practice of rural obstetrics in one rural hospital over a 60-year period. As with most data sets, it is not perfect. First of all, the study population size of 2373 deliveries may not be large enough to capture significant differences involving rarely occurring events such as maternal mortality; that is, certain variables studied are at risk of suffering a Type II statistical error — false-negative finding. MMRs for Canadian women are presently in the order of 1/10 000 births. We do believe the population studied was large enough, however, for variables such as episiotomy and C-section rates.

It is difficult to comment on the accuracy of the data entered into the delivery case room books. One would suspect that events like C-section, twin delivery, maternal death or stillbirth would almost always be accurately reported. Perhaps things like the occasional vacuum extraction or forceps delivery would be missed, but we assume most were entered accurately. The case room book also contained notes referring to morbidities such as postpartum hemorrhage, dystocia, prolonged labour, but we chose not to report on this information because of the greater likelihood this kind of data was prone to greater inter-observer variability.

Data were missing for the time period Mar. 22, 1967, through to Jan. 7, 1969, inclusive, so it is possible that we missed maternal mortalities during this time period. It is also possible that there were deaths not reported in the case room books. However, we polled the collective residents of 14 long-term Bella Coola Valley residents who were young adults in the 1940s, as well as 4 nurses and 1 doctor who worked in the Valley in the '50s and '60s. None of these people were aware of any women who died while giving birth at BCGH during our study period. People recalled a woman who died giving birth in 1906; and several people mentioned the deaths prior to 1940 of 2 women, who each died several days after giving birth, from what sounded like tox-

emia. Although the scientific validity of polling collective memories of a community is obviously suspect, it was still reassuring to us that none of the long-term residents recalled a maternal death during the study period.

Another limitation of the data relates to the fact that since about the late 1970s an increasing number of women have been choosing to deliver their babies out of the Valley. Local residents and health professionals who worked in Bella Coola Valley during the '50s, '60s and '70s state that very few women went out to deliver their babies prior to the start of the 1980s. The Bella Coola airstrip was paved and extended in 1977, and this allowed for medical evacuations by provincial ambulance jet. We believe that the development of a rapid medical evacuation system is an important factor in more and more women being transferred elsewhere to deliver, and more and more women being told that they should deliver elsewhere because of the possibility there would be no C-section coverage during the time of their delivery. Lynch and colleagues⁶⁴ reviewed obstetric outcome data obtained from BC Vital Statistics for women who listed the Bella Coola Valley as their home residence. Obstetric outcomes for women who gave birth at the BCGH were compared to outcomes reported for women who delivered elsewhere over the time period Jan. 1, 1986, to Dec. 31, 2000.⁶⁴ In the early 1980s over 80% of women were delivering locally, but over time this number has fallen to less than 60%. More of the women who delivered elsewhere had a C-section (31% v. 12%).⁶⁴

Statistical analyses revealed no significant differences in obstetrical outcomes between Aboriginal and non-Aboriginal women. Lastly, the data reported here were for only one rural, remote, hospital and it is not clear how applicable these results are to other rural, remote hospitals. Perhaps people working in other rural hospitals could take a look in their old safes to see if they too, have similar obstetric data sets, which could also be summarized and compared to our results.

CONCLUSION

The data presented here support the position that rural hospitals such as the BCGH have been offering, and continue to offer, relatively safe obstetric services to local residents.⁶⁵ The absence of immediate specialist backup and advanced technology support has not resulted in an obvious lowering of maternity or obstetrical care. Trends in maternal

mortality, as well as episiotomy, forceps, vacuum extraction, and C-section rates mirror those recorded for BC, Canada and the US. Episiotomy, forceps, and C-section rates were, however, lower than the rates reported for BC, Canada and the US — suggesting that Bella Coola Valley physicians had a low interventionist philosophy.

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ORIGINAL ARTICLE ARTICLE ORIGINAL

Perinatal outcomes at Bella Coola General Hospital: 1940 to 2001

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Objective: To describe perinatal outcomes (mortality, weight, condition at birth) at an isolated, rural hospital.

Design: A retrospective cohort study.

Study population: Neonates born to women beyond 20 weeks' gestation who delivered in the Bella Coola General Hospital (BCGH) between Mar. 7, 1940, and June 9, 2001, inclusive.

Main outcome measures: Information collected from the labour and delivery case room record book includes Aboriginal status, date of delivery, birth weight, newborn mortality, and newborn condition at birth.

Results: There were 2373 deliveries, including 12 sets of twins. Total newborn mortality rates declined from approximately 4.7% in the 1940–1954 time period to 0.7% in the 1970–1984 time period and have remained near that level ever since. From 1940–1960 BCGH's perinatal mortality rate was higher than Canada's; it was lower than Canada's in the 1970s, higher in the 1980s and about the same for the 1990s. The condition of the vast majority (approximately 90%) of newborns was described as being "good" at birth. Approximately 5% of newborns had birth weights < 2500 g, and this has not changed much over the years. In the 1951–1962 time period Aboriginal women had a higher percentage (8%) of infants with birth weight < 2500 g compared with non-Aboriginal women (5%), but this percentage has declined over time to the point where the rate for both groups is now around 5%.

Conclusions: Women giving birth in the low technology environment of the BCGH experienced acceptable neonatal outcomes. Trends in perinatal mortality, morbidity and low-birth-weight rates mirror those recorded for Canada.

Objectif : Décrire les résultats périnataux (mortalité, poids, état à la naissance) dans un hôpital rural isolé.

Conception : Étude de cohorte rétrospective.

Population de l'étude : Nouveau-nés, nés après 20 semaines de gestation de femmes ayant accouché à l'Hôpital général Bella Coola (BCGH) entre le 7 mars 1940 et le 9 juin 2001 inclusivement.

Principales mesures de résultats : L'information tirée du registre des cas de la salle de travail et d'accouchement comprend le statut d'Autochtone, la date de l'accouchement, le poids à la naissance, la mortalité néonatale et l'état du nouveau-né à la naissance.

Résultats : Il y a eu 2373 accouchements, dont 12 paires de jumeaux. Les taux totaux de mortalité chez les nouveau-nés ont chuté d'environ 4,7 % entre 1940 et 1954 à 0,7 % entre 1970 et 1984, et sont demeurés à peu près à ce niveau depuis. Entre 1940 et 1960, le taux de mortalité périnatale à l'hôpital BCGH était plus élevé que dans l'ensemble du Canada. Il a été moins élevé dans les années 1970, plus élevé dans les années 1980 et à peu près le même dans les années 1990. L'état de la grande majorité (environ 90 %) des nouveau-nés a été jugé « bon » à la naissance. Environ 5 % des nouveau-nés avaient un poids à la naissance inférieur à 2500 g, pourcentage qui n'a pas beaucoup changé au fil des ans. Entre 1951 et 1962, les femmes autochtones ont donné naissance à un pourcentage plus élevé (8 %) de bébés pesant moins de 2500 g à la naissance que les femmes non-autochtones (5 %), mais ce pourcentage a diminué au fil du temps et se situe maintenant pour les deux groupes à environ 5 %.

Conclusions : Les femmes qui ont accouché dans l'environnement à faible technologie de l'Hôpital BCGH ont eu des résultats néonataux acceptables. Les tendances de mortalité et morbidité périnatales, ainsi que du faible poids à la naissance, sont à l'image de celles du Canada dans l'ensemble.

INTRODUCTION

With each passing year there are fewer rural hospitals providing obstetric services, and the result is that more and more rural women are being referred to secondary and tertiary care centres to deliver their babies.¹⁻⁹ It is generally assumed that management of these women by highly skilled obstetrics teams located in these secondary and tertiary care centres will result in lower maternal and neonatal adverse outcomes.

Interestingly, some studies have shown that low-risk women living in rural communities who deliver in secondary and tertiary hospitals have higher rates of complicated deliveries and higher rates of prematurity compared with low risk women who deliver in their local community hospital, and the newborns require more neonatal care.^{6,7,10,11} This subject requires more attention. In particular, there continues to be a surprising lack of baseline data available on the subject of maternal and neonatal outcomes in the rural setting.

A retrospective cohort study of 2373 consecutive deliveries between 1940 and 2001 at the Bella Coola General Hospital (BCGH) revealed that women giving birth in this rural and remote hospital experienced low obstetric procedural rates with excellent maternal outcomes.¹²

This paper uses the same database to answer perinatal-related questions:

1. What was the perinatal mortality rate (PMR) at BCGH over this time period?
2. What was the low-birth-weight rate for BCGH over this time period?
3. Did the description of newborn condition change significantly over this time period?
4. How do BCGH's newborn outcome rates compare to provincial, national and international trends?

METHODOLOGY

Description of the community

The Bella Coola Valley is located within the rugged coastal mountains of northwestern British Columbia

(BC).^{13,14} Highway 20 provides the main access to the Valley. The BCGH is located in the town of Bella Coola and serves a geographic region that includes the communities of Bella Coola, Hagensborg, Firvale, Stuie, Anaheim Lake and Nimpo Lake. BCGH is one of the most isolated health care facilities in BC. The closest referral hospital is over 450 km by road to Williams Lake or a 2-hour flight to Vancouver.

According to the 2001 Census, 2289 people live in the Bella Coola Valley.^{15,16} At least 40% of the population are Aboriginal, most being of Nuxalk descent. The Nuxalk Nation is a tribe of Salish-speaking Coastal Indians who settled in the Valley but formerly lived throughout the surrounding BC Central Coast area.^{14,17-19}

Study population

The study population consisted of women beyond 20 weeks' gestation who delivered at BCGH between Mar. 7, 1940, and June 9, 2001, inclusive. Specific information collected from the labour and delivery case room record book included Aboriginal status, date of delivery, birth weight, newborn mortality and newborn morbidity or complications. Information used to determine Aboriginal status of these women is described in detail in the accompanying Original Article¹² on page 13.

Newborn condition

Apgar scores were not used until Sept. 11, 1971. Prior to 1971 the physician would describe the condition and colour of the infant. A scoring system was set up to describe the condition of the infant in a simple manner over the entire study period (Table 1).

Ethics

This research project was carried out in a participatory fashion, following the recommendations outlined in the Society of Obstetricians and Gynaecologists of Canada (SOGC) 2001 policy statement "A Guide for Health Professionals Working with Aboriginal Peoples."²⁰⁻²² Prior to collecting data we

obtained letters of support from the Nuxalk Band Council, from the Bella Coola Transitional Health Authority and the Central Coast Regional District for a comprehensive study on a broad range of determinants of health for people living in the Bella Coola Valley. Ethics approval to collect these data was then obtained from research ethics committees located at both the University of British Columbia, and the University of Northern British Columbia. The results and the manuscript were reviewed and approved for publication by both Nuxalk Health professionals and health professionals from the United Church Health Services, which owns and operates BCGH.

RESULTS

Birth trends

There were 2373 deliveries involving 2361 women (12 twin births) between Mar. 7, 1940, and June 9, 2001, at the BCGH. There was a steady increase in births until the early 1960s, and then a decline throughout the '60s and '70s, with another increase in the early '80s, followed by a gradual decline thereafter. Data were missing for the time period Mar. 21, 1967, through to Jan. 7, 1969, inclusive.

Table 1. Newborn morbidity scoring system

Physician description	Apgar score	Morbidity score
Good or Excellent	8,9,10	1
Fair, Slow to breathe, or Cyanosed	6,7	2
Poor, Difficult breathing, or Resuscitated	≤ 5	3
Stillbirth	0	4

That is, there was an entry on Mar. 20, 1967, and the next entry was on Jan. 8, 1969. Aboriginal and non-Aboriginal deliveries are summarized in Table 2.

Gravida status was available for the majority of women (2318/2361). From the 1940s to 1960s average gravid score was between 3.6 and 3.8 for the entire population. This dropped to 2.4–2.6 between the 1970s and 2001. Aboriginal women had higher gravida scores compared to other women, though this difference has declined over time (Table 3).

Twin data

According to the available data, there were 12 sets of twins; 9 sets born to non-Aboriginal women (Table 4). Four (1 Aboriginal female, 1 non-Aboriginal female, and 2 non-Aboriginal males) of the 24 twin newborns died. These deaths all occurred between 1955 and 1969. Two of the deaths (non-Aboriginal male and female) were from one twin delivery. These two were described as being premature and both died a few hours after birth. Another twin death was a non-Aboriginal female stillbirth; and the last twin death was a premature Aboriginal female, who died 7 days after delivery.

Perinatal mortality

PMRs are summarized in Table 5. Newborn mortality rates declined from approximately 4.7% in the 1940–1954 time period to 0.7% in the 1970–1984 time period and have remained around that level ever since.

Since BCGH lacks the numbers to calculate a true PMR, a calculation was performed to get the

Table 2. Summary of Aboriginal and non-Aboriginal deliveries during the study period, 1940 to 2001

Race	Time period			
	1940–1954	1955–1969	1970–1984	1985–2001
Aboriginal	221	317	271	316
Non-Aboriginal	229	359	346	314
Total	450	676	617	630

Table 3. Mean gravida number over time

	Time period			
	1940–1954	1955–1969	1970–1984	1985–2001
Total population	3.62	3.77	2.40	2.54
Aboriginal women	4.49	4.81	2.66	2.73
Non-Aboriginal women	2.78	2.85	2.19	2.36

PMR for BCGH during the study period: the number of perinatal deaths was divided by the number of live births (including twin births), and then multiplied by 1000. Perinatal mortality included stillbirths, antenatal deaths, intrauterine deaths and deaths up to a week after birth (see Table 6).

Newborn condition at birth

Information on condition of newborns at birth is summarized in Table 7. The data below show that the condition of the vast majority of newborns (approximately 90%) was described as being “good” at birth over most of the study period.

Newborn weight data

Mean weights for newborns are summarized in Figure 1. The data show that mean weight for both Aboriginal and non-Aboriginal newborns has not really changed much over time.

Low birth weight

Low-birth-weight rate is defined as the proportion of live births with a birth weight less than 2500 g. For this study the birth weight data were available for 1793 newborns, beginning around 1951, except for the period from 1978–1984. Aboriginal women appeared to have a higher percentage of infants with birth weight of < 2500 g, but this percentage declined over time to the point where the rate is similar to non-Aboriginals, at around 5% (Table 8).

DISCUSSION

The data presented in this paper provide detailed insights into the practice of rural obstetrics in one rural community over a 60-year period. Perinatal death rates for both Canada and the Bella Coola Valley have declined steadily since the 1950s (Table 9).^{23–25} From 1940–1960, Bella Coola Valley’s PMR is higher than Canada’s, it is lower than

Table 4. Summary of data on twin births during study period

No. of twin births	Time period				Total
	1940–1954	1955–1969	1970–1984	1985–2001	
Aboriginal	1	1	0	1	3
Non-Aboriginal	2	3	4	0	9
Total	3	4	4	1	12

Table 5. Newborn mortality (total study population)

No. of newborns (and %)	Time period			
	1940–1954	1955–1969	1970–1984	1985–2001
Total no. of births	450	676	617	630
Stillborn	13 (2.9)	13 (1.9)	4 (0.7)	5 (0.8)
Died within 24 h	4 (0.9)	12 (1.8)	0 (0.0)	2 (0.3)
Died within 1–30 d	4 (0.9)	2 (0.3)	0 (0.0)	0 (0.0)
Total no. of deaths	21 (4.7)	27 (4.0)	4 (0.7)	7 (1.1)

Table 6. Perinatal mortality rates (PMR) for Bella Coola General Hospital, during the study period

	Decade					
	1940s	1950s	1960s	1970s	1980s	1990s
No. of women	251	443	425	368	475	399
No. of births*	253	447	426	370	478	399
No. of maternal deaths	0	0	0	0	0	0
No. of newborn deaths	11	22	14	4	6	2
PMR (no./1000 births)	43.8	49.2	32.9	10.8	12.6	5.0
*There were 12 sets of twins born during the study period.						

Canada's in the '70s, higher in the '80s, and about the same for the '90s. Because of the relatively small number of births per year and within a decade, fluctuations in the PMRs are to be expected. Some authors believe such fluctuations make PMR a poor indicator of rural obstetrical care or safety.²⁶ These reductions are attributed to improved health, nutrition and living conditions for mothers; improvements in the level of prenatal care delivered; better parity distribution; and better cooperation between physicians and obstetricians within effective regionalization.²⁷

Perinatal mortality is associated with low birth weight which, in turn, is associated with a great number of variables.²⁸ Identified maternal risk factors for low-birth-weight babies include: age < 18 or > 35; primiparity or parity of more than 3; being in manual or non-manual work; being less than 158 cm tall; attending antenatal care after 18 weeks' gestation; having diabetes or urinary tract infection; pre-eclamptic toxemia, antepartum hemorrhage; being a smoker; being of Asian origin; and having a history of infertility.²⁹ Other risk factors include bacterial vaginosis, high perceived stress, cocaine use, women living without partners, women with uterine or cervical anomalies, and asymptomatic bacteriuria.³⁰ A number of these risk factors can be modified if at-risk women are identified early or the woman makes changes in her lifestyle. Birth weight is thought to be a reflection of socio-economic status and the quality of medical care received before birth.²⁸ It is believed that communities with high rates of low-birth-weight babies can benefit from interventions and referrals to appropriate community resources.

Approximately 5% of BCGH newborns have birth weights < 2500 g, and this has not changed much over the years. Aboriginal women seemed to have a higher percentage of infants with birth

weights of < 2500 g. The percentage has decreased over time, and the rate is now similar to that of non-Aboriginals. Studies of birth weight reveal higher average birth weight for North American native populations compared to other North American populations.³¹ According to BC Vital Statistics Agency, the low-birth-weight rate for Aboriginal people in 2000 was 5.2% and for other British Columbians in 2000 it was 5.1%. BC Vital Statistics has information on low-birth-weight births among Status Indians dating back to only 1991. Prior to 1991, Vital Statistics did not routinely collect information on a newborn's Aboriginal status. Consequently, the comparison of Aboriginal birth-weight data to that of non-Aboriginals is problematic

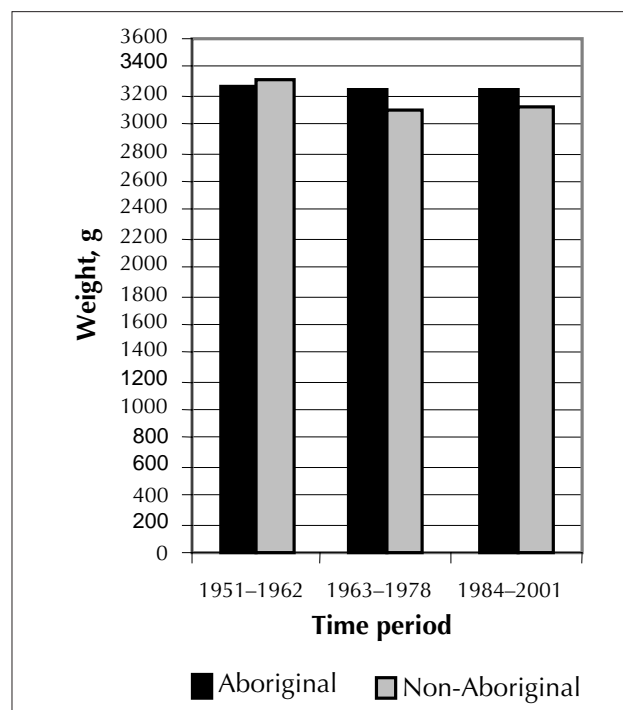


Fig. 1. Weight at birth for Aboriginal and non-Aboriginal newborns

Table 7. Condition of newborn at birth, born at Bella Coola General Hospital during the study period

	Decade					
	1940s	1950s	1960s	1970s	1980s	1990s
Total no. of births	253	447	426	370	478	399
Condition of newborn, % of total						
Good	91	90	90	84	92.5	96
Fair	2	3	3	8	5	3
Poor	2	3	3.5	2	0.4	1
Stillborn	3.5	2.5	1.4	0.5	1	0
Information missing	1.5	1.5	1.9	6	1	0.25

because no one is really sure what should be considered normal for Aboriginal people.^{31,32}

Data presented in this paper suggest rural hospitals such as the BCGH have been offering, and continue to offer, relatively safe obstetric and neonatal services to local residents. The absence of immediate specialist back-up and advanced technological support has not resulted in an obvious lowering of perinatal care. Such data support the position that neonatal care should be provided as close as possible to the rural patient's home.^{7,18,33} The current trend toward centralization of obstetric services is difficult to justify based on the data presented in this paper. Forcing rural women to give birth away from friends and support systems, in high technology "baby delivering" factories, under the care of health care strangers may not actually be in their best interests.³⁴⁻³⁶

Our results are relevant to both health care planners and to women struggling to decide whether they should stay or leave their isolated rural communities to give birth. Local residents can be reassured that choosing to stay home does not expose them to greater perinatal risk. Being able to stay home and deliver has many benefits, including 1) avoidance of travel and accommodation risk and costs; 2) the avoidance of unnecessary specialist consultation; and 3) lower rates of some adverse perinatal outcomes.^{6,7,10,11}

Limitations

Our historic data set has some limitations. First of all, definitions and perceptions of conditions may have changed over time. For example, the definition

of perinatal mortality has changed over time based on weight, whereas some institutions may calculate or classify according to older literature.^{24,25} Since there was no way of knowing in what term week the stillbirth occurred (and therefore it is just listed as "stillbirth" on the labour and delivery sheets), all stillbirths listed in the data were included in the calculations. It was assumed that medical staff were basing the diagnosis on the proper medical definitions of the time but there is no way of knowing if some "stillbirths" were omitted and if some "spontaneous abortions" were included as a stillbirth.

A second limitation pertains to mortalities that may have occurred beyond the early postpartum period. There were probably perinatal deaths occurring after the first few days of delivery that were not recorded on the labour and delivery forms. There were some neonatal deaths recorded in the labour and delivery book that occurred a few weeks post-delivery but we do not know how comprehensive or uniform the recording of these later deaths was. Finally, since Apgar scoring did not come into effect until 1971 — over 30 years after our data collection begins — it is impossible to know how accurately the 4-point scoring system describes infant condition over the entire study period. We do believe that the scoring system intuitively makes sense, and encourage others to use it so that comparisons can be made with other historic data sets.

CONCLUSION

Women giving birth in the low technology environment of the BCGH experienced acceptable neonatal

Table 8. No. of infants born during the study period who weighed < 2500 g (i.e., low birth weight)

Ethnicity and no. of infants	Time period		
	1951–1962	1963–1978	1984–2001
Total no. of Aboriginal infants	254	285	334
No. (and %) < 2500 g	21 (8)	16 (6)	15 (5)
Total no. of non-Aboriginal infants	300	275	345
No. (and %) < 2500 g	14 (5)	13 (5)	15 (4)
Note: Weight information for the years 1978 and 1984 was incomplete or unavailable.			

Table 9. Comparison of Bella Coola General Hospital (BCGH) and Canadian perinatal mortality rates (PMRs) during the study period

PMR (no./1000)	Decade					
	1940s	1950s	1960s	1970s	1980s	1990s
Canada	24–30	37.9	28.4	12.8–21.8	8.7–10.9	8
BCGH	43.8	51.6	32.9	10.8	12.6	5

outcomes. Trends in perinatal mortality, morbidity and low-birth-weight rate mirror those recorded for Canada.

Competing interests: None declared.

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ORIGINAL ARTICLE ARTICLE ORIGINAL

Sustaining rural maternity care — Don't forget the RNs

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Introduction: Registered nurses provide intrapartum care to women who choose to have their babies in hospital. Considering the current national shortage of nurses, the ability of registered nurses to continue to care for women, especially in small rural hospitals, is a critical concern.

Purposes: The purposes of the study were 1) to conduct a systematic review of the maternal-child-nursing literature in rural locations; and 2) to identify one rural Ontario hospital where nurses and physicians deliver care to women with low-risk pregnancies, and then conduct an institutional ethnography to understand the enablers and barriers to low-risk rural maternity care.

Methods: A literature search was conducted to determine the state of rural registered nurses; and a telephone survey of 25 rural Ontario hospitals was undertaken to locate a hospital in which an institutional ethnography study could be conducted.

Results: Registered nurses in rural areas are more likely to be multi-specialists than generalists because of the need to adapt to emergencies across the life continuum. To care for pregnant women and their families, registered nurses require many of the same considerations that physicians have outlined: access to continuing education, appropriate call-back schedules, support from other health care professionals and administrators, and a value system that respects their expertise. Results from the ethnography of one Ontario health care institution revealed that when these aforementioned considerations are addressed, registered nurses are able to provide safe, comprehensive low-risk care in a rural maternity programme.

Conclusions: Registered nurses play an important collaborative role in maternity care. We need Canadian data on registered nurses so that we can educate, recruit and retain them to care for women with low-risk pregnancies in rural and remote areas of Canada. Nursing services should be reviewed. Collaborative care models integrating newer professionals such as midwives, as well as understanding the role of doulas, may help in developing sustainable care to rural women.

Introduction : Les infirmières autorisées dispensent des soins périnataux aux femmes qui décident d'avoir leur bébé à l'hôpital. Compte tenu de la pénurie nationale d'infirmières qui sévit actuellement, il est crucial que les infirmières puissent continuer de s'occuper des femmes, en particulier dans les petits hôpitaux ruraux.

Objetctifs : L'étude visait à 1) réaliser une recension systématique des écrits sur les soins infirmiers dispensés à la mère et à l'enfant en milieu rural et 2) trouver un hôpital rural de l'Ontario où les infirmières et les médecins dispensent des soins aux femmes dont la grossesse est à faible risque et procéder ensuite à une ethnographie institutionnelle pour comprendre les facteurs habilitants et les obstacles aux soins dans les cas de maternité à faible risque en milieu rural.

Méthodes : On a procédé à une recension d'écrits pour déterminer la situation des infirmières rurales et effectué un sondage téléphonique auprès de 25 hôpitaux ruraux de l'Ontario pour trouver un hôpital où l'on pourrait effectuer une étude ethnographique institutionnelle.

Résultats : Les infirmières autorisées des régions rurales sont plus susceptibles d'être multispécialistes que généralistes parce qu'elles doivent s'adapter aux urgences dans tout le continuum de la vie. Pour s'occuper des femmes enceintes et de leur famille, les infirmières ont besoin d'un grand nombre des mêmes facteurs que les médecins : accès

à l'éducation continue, horaires de rappel appropriés, appui des autres professionnels de la santé et des administrateurs, ainsi que système de valeurs qui respecte leur expertise. Les résultats de l'ethnographie réalisée dans un établissement de soins de santé de l'Ontario ont révélé que lorsque l'on tient compte des facteurs ci-dessus, les infirmières peuvent dispenser des soins sécuritaires, intégrés et à faible risque dans un programme de maternité en milieu rural.

Conclusions : Les infirmières autorisées sont des collaboratrices importantes dans les soins dispensés en maternité. Nous avons besoin de données canadiennes sur les infirmières afin de pouvoir les former, les recruter et les garder pour qu'elles s'occupent de femmes qui ont une grossesse à faible risque dans les régions rurales et éloignées du Canada. Il faut revoir les services de soins infirmiers. Les modèles de soins en collaboration qui regroupent de nouveaux professionnels comme les sages-femmes et comprennent aussi le rôle des doulas peuvent aider à instaurer des soins viables pour les femmes en milieu rural.

Maternity services in Canada are in crisis. In Canada, the most common reason to be admitted to hospital is to give birth,¹ and yet maternity services are the very services that seem to be in real jeopardy. The 2002 Future of Maternity Care in Canada Conference highlighted many issues, including ensuring that a collaborative practice be implemented in undergraduate education programmes, that medicolegal issues be addressed, and that women should be cared for in an appropriate setting (i.e., at home, or at a level I, II or III facility). Urban areas are having problems recruiting and retaining staff, but rural and remote areas are experiencing acute shortages — now. Physician shortages have been well articulated, and some steps are being taken to remedy the situation. However, there are little systematic data to describe the current rural maternity registered nurse (RN) shortage. Human resource management is not using nurses effectively, and there is not enough money available to hire nurses.²

We conducted a systematic review of the maternal-child-nursing literature in rural locations, and then we identified one rural Ontario hospital where nurses and physicians deliver care to women with low-risk pregnancies and conducted an institutional ethnography to understand the enablers and barriers to low-risk rural maternity care.

METHODS

Literature review

A comprehensive literature search, using such key words as rural maternity, rural nursing and rural obstetrics, was completed by accessing standard databases (MEDLINE, PubMed and CINAHL), government documents, and rural Web sites in

Canada and internationally. However, because health care is funded provincially, we began our work on rural maternity care by focussing on one Canadian province. In this paper, the findings and supporting literature are derived mainly from the experience in Ontario.

Institutional ethnography

An informal telephone survey by the authors identified 25 rural Ontario hospitals that provide maternity services. One hospital from these 25 was chosen for the research project; it was picked for the project because the maternity unit had been threatened with closure. Institutional ethnography was the methodology used, because it aims to answer questions about how everyday life is organized.³ It allows the researcher to use a number of methods, including interviews and focus groups, to collect data. A Canadian, Dorothy Smith, developed the methodology, based on sociology, to understand the complex and often inexplicable organization of peoples' lives. Working in hospitals is often politically charged, with institutional power affecting the ability of the health care team to provide care. These political influences are acknowledged in the methodology and therefore are incorporated into the data collection and analysis.³

The research questions were as follows.

1. What are the qualifications and demographics of rural nurses who are currently providing maternity care in Ontario?
2. How do maternity nurses, or how can maternity nurses work in multidisciplinary teams to enhance care to birthing women in rural hospitals? and

3. What are the key policies and procedures required in order to sustain a maternity nursing practice in rural hospitals in Ontario?

Three focus groups were conducted, in which 5 RNs, 2 physicians, and 2 administrators participated at the rural institution. The discourses were tape-recorded, transcribed verbatim and analyzed, by constant comparison, for general themes. Ethical approval was granted by the Research Health Ethics Board, Queen's University, Kingston, Ont. Administrative approval was granted by the local health organization. At the start of each session participants signed a consent form agreeing to have the discussion audio-taped.

Two conceptual frameworks guided the development of the project and analysis of results: the Critical Success Factors⁴ and the Model for the Evaluation of Rural Sustainability.⁵ The Critical Success Factors include attitude toward childbirth, program organization, knowledge and information, connections and networking, and ability to manage change. These factors are embedded in adequate funding for a maternity program. The Model for the Evaluation of Rural Sustainability stresses being "rural-centred, but not exclusive; the linkages with larger centres and more specialized facilities and institutions would remain." The primary goal of rural sustainability is to provide internal support and to minimize the requirement for external services and support.

RESULTS

Literature review

Maternity services in Canada are provided by physicians (obstetricians and family physicians [FPs]), nurses and, increasingly, midwives. In rural areas maternity services are provided by FPs because there are remarkably few rural obstetricians ($n = 31$) in Canada.⁶ The Janus Project⁷ results estimated that only 18% of FP/GPs are providing intrapartum care, but 64% are involved in prenatal, postpartum or newborn care. Midwifery services are increasing in Canada. However, there are real constraints on practice; hospitals are reluctant to grant privileges to midwives because of the lack of critical mass of midwives across Canada, because of funding mechanisms and because of a lack of models of collaborative care practice.⁸

Decisions to regionalize health care services in some provinces have resulted in closure of facilities,

requiring specialists to move to different centres. This has resulted in a loss of capacity to maintain a maternity service, which is critical to sustaining rural communities.⁹ In 2002 there were 328 802 babies born in Canada,¹⁰ yet, only 11 869 RNs reported that their direct patient care responsibilities were maternal/newborn, and only 1631 of those RNs lived in rural Canada.¹¹

It is likely that there are many RNs who provide maternity care as well as holding other nursing responsibilities within hospitals. Also, almost half of the abovementioned 11 869 RNs and half of the 1631 rural RNs are employed only part time.¹¹ In 2002 the Advisory Committee on Health Human Resources² recommended that "Governments, employers and unions should collaborate to increase the proportion of nurses working full-time to at least 70% of the workforce in all healthcare settings by April 2004."

Financially, it may seem appropriate to regionalize maternity services so that birthing women and their families can be cared for with all the necessary backups available. However, it is well recognized that women with low-risk pregnancies who are cared for in tertiary settings often have high-risk management in labour, which can lead to unnecessary interventions.¹² Low-risk women do not need to be confined to bed, do not need continuous fetal monitoring, and may require only minimal interventions. Low-risk women in labour do need one-on-one care from well qualified health care professionals who will monitor their labour and assess for change from low to high risk.¹³ When women are required to travel for care in pregnancy and birth, perinatal mortality and morbidity is increased.¹⁴

Midwives

International literature on rural maternity nursing practice is often not relevant to the Canadian health care system because the solutions are often geared toward using midwives, who are not available in most of rural Canada due to small numbers. In Vermont, a network of rural midwives was set up to fill the gap when physicians, particularly obstetricians, were giving up practice in rural areas.¹⁵ Models of rural care based on nurse-midwives and FPs have been proposed in New Zealand¹⁶ and the US.¹⁷ Similarly, in rural Australia nurse-midwives (more recently midwives who are not nurses are being employed) provide all maternity care.¹⁸ Problems identified by US midwives who are contemplating giving up practice include the cost of malpractice

insurance, lack of physician backup, physician hostility, and lack of hospital privileges.¹⁹ These issues are often cited by Canadian midwives as barriers to setting up their practice in a rural setting.⁸

Rural RNs

Very little research could be found that described rural maternity nurses' practice or rural maternity services.

Macleod²⁰ described rural RNs as multi-specialists, not generalists, because they have to be able to respond to emergencies in a number of different areas requiring specialist knowledge. Bushy,²¹ however, defined rural nurses as expert generalists. Their work often includes preparation for air evacuation, triage of multiple victims of a road accident, as well as risk assessment of women in labour. The RNs in the Bushy study described 3 areas of rural practice as unique to the setting: mobilizing limited resources and backup, coping with the realities of practice, and working with physicians.²¹

In rural settings, the maternity RN may be the only nurse on a particular shift who has any experience in intrapartum care. In urban settings there are more likely to be a number of nurses with whom the primary maternity nurse can consult.

During a woman's labour, a single RN may have to organize backup care for other patients, provide support to other nursing staff, and consult with a physician for routine orders, as well as provide one-on-one care for the labouring woman. If one of these activities is problematic, then the ability of the RN to provide one-on-one care and adequate monitoring of labour will be jeopardized. As an Alberta nurse explained in Shellian's paper:²² *"It is not uncommon for the rural nurse to begin the shift in the ER, assist in the delivery room at noon and perhaps end the shift providing one-to-one nursing care for a child with a severe asthmatic episode."*

There are many anecdotes of RNs who simply don't feel safe to practise because they can't keep up their skills. Perhaps the nurses who stay in practice are more resilient, resourceful, adaptable and creative.²¹ RNs in rural practice settings consistently identify the importance of collaboration. An Australian study ranked "being part of a team" as the most important factor that influenced an RN's decision to stay in rural nursing.²³

Rural maternity nursing can be very satisfying because it is likely that women with low-risk pregnancies will have minimal intervention and experience a joyful, normal birth. Registered nurses spend

time with women, provide intermittent auscultation rather than continuous monitoring, encourage women to be mobile and support them in labour, therefore increasing the likelihood that they will have a normal birth.¹⁴

Institutional ethnography

The hospital chosen for study employs 44 RNs: 14 full-time positions, 16 part-time and 7 job-shares. Eight maternity nurses, who range in experience from 6 months to over 20 years of working in the hospital, provide intrapartum care. Two other nurses who have worked in maternity now have positions in the emergency department and occasionally provide maternity care. The maternity service provides intrapartum care to approximately 70 women each year. The staff estimate they care for 45% of those living in their community. In the view of the staff, the reasons why women do not choose to have their babies in the local institution include the following: the women live at the edges of the county and are closer to an urban hospital; their FP does not admit to the institution or does not provide maternity services; and women prefer to have their babies in a tertiary setting. When there are no maternity cases in the institution, the nurses provide nursing care to other in-patients, which is approximately half of their shift time. One-on-one care in active labour (defined as 4 cm or more cervical dilation) is a cornerstone of the service. With approximately 70 births a year it is rare to have more than one woman in active labour at the same time. Efforts are made to find a second nurse to be present at the birth in case resuscitation of the infant or extra care of the mother is required.

On a day-to-day basis, nursing staff are assigned a patient load, but if they know a woman in labour may be coming in they will be ready to transfer care to another nurse. The physicians regularly provide an updated list with names and a *hint list* with useful tips about anticipated events (e.g., the woman had a fast labour with her first child, or, she is a nervous first-time mother). The *hint list* is used to determine if the physicians should be called immediately or whether they will come in later. The physicians stated that they always come in as soon as they are called to assess labour if the mother is not their own patient in order to develop a professional relationship. Four FPs provide maternity services for their own patient roster. They provide coverage for each other only when one of them is out of town.

One of the 4 FPs is also an anesthetist and

administers approximately 5 epidurals a year. There is no surgery on site; women requiring a cesarean section are transferred to an urban hospital. Transfer time is approximately 30 minutes to 1 hour, depending on weather and ambulance availability. Although births are usually spontaneous, the physicians may use vacuum extraction on occasion and, rarely, outlet forceps.

One physician perceived the growing trend toward cesarean section as the single-most important barrier to maintaining a rural practice. It was her belief that there may come a time when 50% of women choose to have a cesarean, and physicians will be powerless. *"Fifty percent of women would have had an elective section. . . . It is big in the obstetric literature. . . . Several years ago I remember [name of physician] bringing it up more as a devil's advocate thing . . . but now they are not laughing. . . . I think they are discussing it in a serious way — as being a reasonable option."* She believes that facilities without cesarean section capability will close, and the effect on rural Canada would be devastating.

Midwives and doulas

Both the nurses and physicians at this institution did not believe there was a need or space for midwives or doulas. Midwives, in the opinion of the physicians, would not be able to have a full-time practice without taking away almost all of their patients, and this would lead to feeling that they, the physicians, would not remain competent. The scope of practice of midwifery is not well understood, and the nursing staff in particular had not had good experiences working with midwives. Doulas have caused considerable anxiety to the nursing staff in the past, and nurses claimed it was "a nightmare." As one nurse explained, *"It was very hard to keep a civil professional thought in your mouth. . . . everything you would say, this doula would contradict, and right in our face."*

Rural RNs

The maternity nursing staff at the study institution have current Advanced Cardiac Life Support and Neonatal Resuscitation Program qualifications. They have participated in recent fetal surveillance and labour support workshops. As part of the health care team they are actively involved in reviewing current best practice guidelines and adapting their nursing and medical protocols. The staff all recognized that some courses offered (e.g., Advanced Life Support in Obstetrics) are not

always relevant in the rural context.

There were 3 key factors outlined by the RNs that the research team felt were critical to the successful long-term sustainability of this maternity unit: 1) the mutual respect for each other's experience and caring, 2) the understanding of the importance of continuing education to maintain and enhance skills, and 3) the collaborative practice among members of the health care team.

Working relationships

The advantage of using focus groups to obtain data in this study is that the researchers could obtain a sense of the working relationships among the participants. The mutual respect demonstrated by the nurses for each other was readily apparent. The respect for clinical experience and the willingness to seek advice from each other enabled a meaningful discussion about all the issues related to rural maternity nursing practice. The nurses appeared willing to support newer members of the team who had less experience. They obviously valued the care they provided and saw maternity as a key component to health care in their hospital.

Continuing education for both nurses and physicians, including working together on best practice guidelines and attending rounds, ensures both disciplines are up to date. Both disciplines outlined the importance of meeting to discuss issues, keeping each other informed of new guidelines or recommendations, and continually evaluating their practice against commonly used practice.

The nurses were concerned about their future ability to access continuing education programmes. Nurses in many Ontario hospitals are members of a union (Ontario Nurses' Association), which is separate from the voluntary professional association (Registered Nurses Association of Ontario). With the recent provincial union contract, it was likely that individual nurses at this hospital would have no access to funding to attend professional education programmes, such as labour support workshops.

The political action of a local community is described by Troughton⁵ as a key component to community sustainability. The collaborative relationship between the physicians and nurses appeared strong and mutually supportive. Physicians reported that they trusted the judgement of the nursing staff and vice versa. Both disciplines felt well supported by the administrative staff. The importance of relieving nurses of patient loads immediately, when a labouring woman was admit-

ted, was stressed by all staff and was seen as a positive sign that one-on-one care was a key component of labour care.

DISCUSSION

Low-risk maternity care in rural settings without cesarean section capability requires a team approach, with physicians and nurses working collaboratively with due respect given to each discipline. The participants in this study clearly articulated why the team approach worked in this setting: there was genuine respect for each other. All participants believed they gave good quality care and acknowledged that their practice was vulnerable if the rates of cesarean section continue to rise. Maintaining the concept of physiological labour and birth is a cornerstone to the critical success factors in maintaining a low cesarean section rate.⁴ Low-risk maternity care is congruent with rural settings. "Low-risk," by definition, is physiological, with minimal intervention required.

The nurses and physicians in our study had worked with doulas and midwives. In particular, the nurses were not impressed by the perceived interference by doulas in their own ability to care for women. Recent discussion in the literature has highlighted the difficulties experienced by health care professionals who are concerned that doulas may be advising women of choices in opposition to those recommended by the professional team.²⁴ Experiences with working alongside midwives raised many of the issues outlined by Rogers,²⁵ including a resistance to change, professional allegiances, scope of practice of midwives and funding models. In small hospitals it may be difficult for a number of physicians to keep their own skills and, hence, their confidence. Collaborative models with midwives require trust on both sides, but there are financial, regulatory and insurance barriers that need to be overcome.

Study limitations

The results of the literature survey and the ethnography study stem from the experience in Ontario, although it is likely that the experiences may be similar across Canada. Future work will need to address a Canadian perspective.

CONCLUSION

For the sustainability of rural maternity care, we

recommend that nursing services be reviewed. Collaborative care models integrating professionals such as midwives, as well as understanding the role of doulas, may help in developing sustainable care to rural women. Policy-makers need data about the availability of skilled nurses in order to determine the economic viability of rural maternity care. Pregnant women and their families need the support of well qualified and knowledgeable RNs. Communities need the information in order to plan services they should be offering to the populations. Much of the current data is either dated,²⁶ about other health care providers,²⁷ or from other countries.¹⁵ We need Canadian data on RNs so that we can educate, recruit and retain RNs, and physicians and midwives, to care for women with low-risk pregnancies in rural settings, close to their homes.

Competing interests: None declared.

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LETTERS / CORRESPONDANCE

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ACCESS TO FPs IN NEWFOUNDLAND

To the Editor:

It was interesting to read the article by Mathews and Edwards¹ on the access to a regular family physician (FP) in Newfoundland.

The data used in this study were from 1995. My colleagues and I, working at a rural community health centre (CHC), felt that the situation had changed for the worse since then. We decided to do an audit of patients presenting to our walk-in clinic/emergency department, in the last week of July 2004.

We asked 100 consecutive patients whether they had a regular family doctor; 49 said Yes, 51 said No. We asked the 49 people who claimed to have a family doctor who that doctor was; 24 identified one of the doctors at our CHC, 25 named another doctor, often 50–100 km distant. We examined the charts

of the 24 who identified a doctor at our CHC; 18 indeed had a regular family doctor, the other 6 had attended to see a variety of doctors.

There has been a one-third decline in the number of permanent rural FPs in Newfoundland in the past decade (Newfoundland and Labrador Medical Association: personal communication, 2004). Rural sites are becoming increasingly dependent on locums; our site is supposed to have 5 or 6 full-time family doctors. In the past year 29 different physicians have worked here.

Although the methodology of our small audit was weaker than that used by Mathews and Edwards, we feel that the access to continuity of FP care is much less than it was in 1995.

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CORRECTION

In Dr. Stewart Harris's Letter to the Editor¹ regarding the Type 2 Diabetic Flow Chart, 2004 Update,² reference 3 was erroneously cited as reference 2 at the end of the first sentence in the "Lipid values (p. S58–65)" section of his Letter. The sentence in that paragraph should have read: "This method of assessing risk based on 10-year risk of CVD event is outdated and was recently revised.<3>" The correct reference is cited in Dr. Harris's reference list. We apologize for this error.

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ACCESS TO FPs IN NEWFOUNDLAND

To the Editor:

It was interesting to read the article by Mathews and Edwards¹ on the access to a regular family physician (FP) in Newfoundland.

The data used in this study were from 1995. My colleagues and I, working at a rural community health centre (CHC), felt that the situation had changed for the worse since then. We decided to do an audit of patients presenting to our walk-in clinic/emergency department, in the last week of July 2004.

We asked 100 consecutive patients whether they had a regular family doctor; 49 said Yes, 51 said No. We asked the 49 people who claimed to have a family doctor who that doctor was; 24 identified one of the doctors at our CHC, 25 named another doctor, often 50–100 km distant. We examined the charts

of the 24 who identified a doctor at our CHC; 18 indeed had a regular family doctor, the other 6 had attended to see a variety of doctors.

There has been a one-third decline in the number of permanent rural FPs in Newfoundland in the past decade (Newfoundland and Labrador Medical Association: personal communication, 2004). Rural sites are becoming increasingly dependent on locums; our site is supposed to have 5 or 6 full-time family doctors. In the past year 29 different physicians have worked here.

Although the methodology of our small audit was weaker than that used by Mathews and Edwards, we feel that the access to continuity of FP care is much less than it was in 1995.

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REFERENCE

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ORIGINAL ARTICLE ARTICLE ORIGINAL

A comparison of Canadian medical students from rural and non-rural backgrounds

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reviewed.

Context: Very little is known about medical students from rural areas currently enrolled in Canadian medical schools.

Purpose: We aimed to compare rural and non-rural students in terms of demographics, socioeconomic status, financial status and career choices.

Methods: As part of a larger Internet survey of all students at Canadian medical schools outside Quebec, conducted in January and February 2001, we conducted post-hoc analyses to compare students from rural and non-rural areas. Canada Post's classification system was used to determine rural status. To compare differences between rural and non-rural students, we used logistical regression models for categorical variables and factorial analysis of variance for continuous variables.

Results: We received responses from 2994 (68.5%) of 4368 medical students. Eleven percent of Canadian medical students come from rural backgrounds. Rural students tend to be older and originate from families of lower socioeconomic status. Students from rural areas report higher levels of debt, increased rates of paid part-time and summer employment, and greater stress from their finances. Nevertheless, rural students are not more likely to state that financial considerations will affect their choice of specialty or practice location.

Conclusions: Canadian medical students who come from rural backgrounds are different from their non-rural counterparts. Students from rural areas face numerous financial barriers in obtaining a medical education and report greater levels of financial stress. Medical schools should examine and address barriers to admission of rural students and they should consider directing more financial resources toward this financially vulnerable group.

Contexte : On en sait très peu au sujet des étudiants en médecine des régions rurales qui fréquentent actuellement les facultés de médecine du Canada.

Objectif : Nous voulions comparer les étudiants ruraux et non ruraux sur les plans des caractéristiques démographiques, de la situation socio-économique et financière et du choix de carrière.

Méthodes : Dans le contexte d'un sondage Internet de plus grande envergure réalisé en janvier et février 2001 auprès de tous les étudiants des facultés de médecine du Canada sauf au Québec, nous avons procédé à des analyses ultérieures pour comparer les étudiants des régions rurales et non rurales. Nous avons utilisé le système de classification de Postes Canada pour déterminer la ruralité. Afin de comparer les différences entre les étudiants ruraux et non ruraux, nous avons utilisé des modèles de régression logistique pour les variables de catégorie et l'analyse factorielle des écarts pour les variables continues.

Résultats : Nous avons reçu 2994 (68,5 %) réponses de 4368 étudiants en médecine. Onze pour cent des étudiants en médecine du Canada proviennent d'un milieu rural. Les étudiants ruraux ont tendance à être plus âgés et à provenir de familles défavorisées sur le plan socio-économique. Les étudiants des régions rurales ont des taux d'endettement plus élevés, occupent plus souvent des emplois à temps partiel et d'été rémunérés et sont plus stressés par leur situation financière. Les étudiants ruraux ne sont néanmoins pas plus susceptibles de déclarer que des facteurs financiers auront

une incidence sur la spécialité qu'ils choisiront et sur le lieu où ils décideront d'exercer.

Conclusions : Les étudiants en médecine du Canada qui proviennent de milieux ruraux sont différents de leurs homologues non ruraux. Les étudiants des régions rurales ont de nombreux obstacles financiers à surmonter pour faire des études en médecine et signalent un taux plus élevé de stress financier. Les facultés de médecine devraient se pencher sur les obstacles à l'admission des étudiants ruraux, s'y attaquer et envisager de consacrer davantage de ressources financières à ce groupe financièrement vulnérable.

BACKGROUND

Because Canada is a large country with a geographically dispersed population, rural health is an important issue. The provision of health care services, and especially the recruitment and retention of physicians, is an ongoing challenge in many areas of the country.¹⁻³ The physician shortage is particularly acute in rural areas.^{4,5} For example, although according to the 2001 Census of Canada⁶ 20.3% of the population live in rural communities, only 10.2% of physicians in the Canadian Medical Association Masterfile Database⁷ practise in a rural location.

While many factors contribute to a physician's decision to practise in a rural area,^{2,8} studies from Canada, Australia and the United States have shown that originating from a rural community is most important.⁹⁻²¹ In some studies, exposure to rural medicine during training has also been shown to be positively associated with the decision to practise in a rural community.^{9,13,15,21-25}

In response to the shortage of rural doctors, some medical schools have expanded their medical training facilities to include new rural sites.²⁶ Ontario is planning to admit a first cohort of students to a new, rural medical school in the fall of 2005.²⁷⁻³⁰ The chief aim of these programs is to train more physicians who will choose to practise in rural communities. Such programs have had some success in other countries that face similar problems in rural health, such as the US.^{10,13,22,23,31,32} and Australia.³³ These programs preferentially select those from rural backgrounds and feature increased emphasis on rural medicine by providing training opportunities in rural communities.

Very little is known about medical students from rural areas currently enrolled in Canadian medical schools. A recent survey of Canadian medical students found fewer students from rural areas than expected at Canadian medical schools.³⁴ Building on this previous work and using previously collected data from the National Medical Student Survey, we

performed more detailed post-hoc analyses to compare rural and non-rural students in terms of demographics, socioeconomic status, financial status and career choices. We hope our findings will help to inform policy-makers concerned with the provision of rural health care and to serve as a benchmark for measuring the effectiveness of these policy initiatives.

METHODS

Survey design

A questionnaire was developed to examine, among other topics, medical student demographics, socioeconomic status, financial status and related attitudes. Questions relevant to the data presented in this paper are described below. Other aspects of this questionnaire have been described elsewhere.^{34,35}

Assignment of rural status

We asked students for the first 3 characters of the postal code of their main residence during their final year of high school. Canada Post's classification system was used to identify students from rural areas: a zero as the second character (i.e., first number) in the postal code indicates a rural area. All other respondents were classified as "non-rural."

Socioeconomic status

Parental income and education were used as indicators of socioeconomic status. We also asked students if they had a physician parent.

Financial status, career choices and related attitudes

Using open-ended questions, we asked students to report their financial debt at entry to medical school and anticipated debt at graduation. To elicit accurate predictions of anticipated debt, we asked stu-

dents to report their current level of debt as well as a breakdown of their debts by source (e.g., government loans, bank loans, credit cards). We asked students to consider their future career options by choosing from 1 of the following: 1) university-affiliated (basic science); 2) university-affiliated (clinical); 3) non-academic clinical; 4) governmental agency; and 5) other. We also asked students if they engaged in part-time employment during the academic year, if they'd had paid summer employment in the past summer, and about their participation in "return-of-service" programs (where a student receives funding to attend medical school in exchange for a commitment to several years of rural or military practice).

Using 5-point Likert-like scales we inquired about the importance of financial considerations on the students' choice of specialty and practice location, as well as the level of stress students were experiencing as a result of their financial situation.

Survey procedure

Approval of the study was obtained from the Ethics Review Office at the University of Toronto. The email addresses of all students enrolled in Canadian medical schools were then collected. Each student was sent an email message containing a personal identification code and an invitation to complete the questionnaire at a specific Internet Web site. The survey was conducted over a 7-week period in January and February of 2001, and draw prizes were offered to encourage participation.

Foreign students as well as respondents who did not provide postal code information were excluded from this analysis. In addition, students from the 4 Quebec medical schools were excluded after data collection but prior to analysis because we could not be confident that their data were representative. Our email address databases for the Quebec schools were incomplete and were found to include pre-medical students. Also, the response rates at the Quebec schools were poor, ranging from 38% to 53%.

Data analysis

Questionnaire responses were automatically compiled into a computer database. Duplicate responses and those with an invalid identification number were removed. The data were imported into a statistical analysis program (SAS version 8) and frequency distributions were examined to find evidence of irregularities in the data. Irregular data points were

manually recoded where possible (e.g., \$50K would be recoded as \$50 000) and nonsensical values were discarded. Descriptive statistics were used to summarize responses to all questions.

We were interested in comparing the characteristics of rural and non-rural medical students, and present unadjusted data in the text and accompanying tables. However, because the proportion of students with rural backgrounds varies significantly among medical schools, we adjusted for the individual medical school when assessing statistical significance. Specifically, we used logistical regression models for categorical variables and factorial analysis of variance for continuous variables, with both school and rural status as predictor variables.

Sensitivity analysis

To investigate the robustness of these results, a sensitivity analysis was performed. This type of analysis involves assessing the extent to which results are affected by changes in inputs, methods or assumptions. To further assess whether confounding by school had an important effect, we re-analysed the data for the set of schools where more than 10% of the students were classified as rural (Table 1). We compared rural and non-rural students both with and without adjustment for school.

RESULTS

In September 2000, there were 4421 medical stu-

Table 1. No. and percentages of rural students at the 12 medical schools included in the study, during January and February 2001

Medical school	Total no. of students	No. of rural students (and % of total)
Memorial University of Newfoundland	125	37 (29.6)
University of Saskatchewan	127	33 (26.0)
Dalhousie University	238	52 (21.8)
University of Calgary	158	21 (13.3)
University of Manitoba	145	16 (11.0)
McMaster University	198	21 (10.6)
University of Alberta	277	24 (8.7)
University of Ottawa	269	23 (8.6)
University of Western Ontario	260	22 (8.5)
Queen's University	212	14 (6.6)
University of British Columbia	289	18 (6.2)
University of Toronto	466	23 (4.9)
Total	2764	304 (11.0)

dents enrolled at the 12 medical schools included in our study.³⁶ We collected 4383 unique email addresses, of which 4368 were valid. We received 2994 responses, giving a response rate of 68.5%. After excluding foreign students and respondents who did not provide postal code information, 2764 responses remained for further analyses (62.5%).

Three hundred and four (11.0%) of the 2764 respondents lived in a rural area during high school. The proportion of rural students ranged from 4.9% at the University of Toronto to 29.6% at Memorial University of Newfoundland (Table 1). In a previous paper,³⁴ we reported that 10.8% of 1st-year students came from rural areas; this study included students from all years.

Demographics

The mean (\pm SD) age of entry of students from rural areas was 24.3 (\pm 3.0) years, compared with 23.5 (\pm 2.5) years for non-rural students — a difference of 0.8 years. More rural students were 25 or older at the start

of medical school (38% v. 26%; $p < 0.0001$). There was no significant difference between the proportion of females among rural and non-rural respondents.

Socioeconomic status

Rural respondents reported both lower household incomes ($p < 0.0001$) and lower levels of parental education ($p < 0.0001$ for both maternal and paternal education) than non-rural respondents (Table 2). Rural students were also less likely to have a physician parent than their non-rural counterparts (5.6% v. 15.2%; $p < 0.0001$)

Financial status, career choices, and related attitudes

Compared with non-rural students, more rural students entered medical school with financial debt ($p < 0.0001$) and anticipated graduating with debt ($p = 0.0044$) (Table 3). As well, among those with debt, rural students reported more debt both at entry to medical school and upon graduation (Table 4). Rural students were more likely to report having had paid summer employment in the past year (34.9% v. 27.0%; $p = 0.01$), part-time employment during the academic year (20.9% v. 14.0%; $p = 0.005$), and to have enrolled in “return of service” agreements (4.9% v. 1.0%; $p = 0.0002$). Rural students were less likely than non-rural students to report an intention of working in a university setting (40.6% v. 56.8%; $p < 0.0001$).

Rural students were more likely to report fair to extreme levels of financial stress (61.7% v. 55.4%; $p = 0.03$). Despite the increased levels of financial stress experienced by those from rural areas, the proportion of students who felt that financial considerations would be a major influence (i.e., 4 or 5 on our 5-point scale, with 5 representing “the most

Variable	No. (and %) of rural students*	No. (and %) of non-rural students*
Parental income <\$40 000	79/298 (26.5)	353/2394 (14.7)
Father without university degree	165/304 (54.3)	677/2434 (27.8)
Mother without university degree	163/304 (53.6)	968/2445 (39.6)
*The denominators varied because some respondents did not provide answers to certain questions.		

Variable	No. (and %) of rural students*	No. (and %) of non-rural students*
Debt		
Entered medical school with debt	166/304 (54.6)	881/2443 (36.1)
Expecting debt at graduation	282/302 (93.4)	2096/2428 (86.3)
Employment		
Part-time	63/302 (20.9)	344/2453 (14.0)
Summer	106/304 (34.9)	664/2460 (27.0)
Financial stress		
Reported “fair” to “extreme” level	187/303 (61.7)	1358/2451 (55.4)
*The denominators varied because some respondents did not provide answers to certain questions.		

Variable	Quartile; debt (\$)		
	25th percentile	50th percentile	75th percentile
Debt at entry to medical school			
Rural students	10 000	16 750	30 000
Non-rural students	6 000	13 000	23 000
Debt expected upon graduation			
Rural students	48 000	70 000	100 000
Non-rural students	40 000	60 000	85 000

important factor”) on their choice of specialty or practice location was actually slightly higher (but not significantly so) for students from urban areas: 18.8% v. 14.5% for specialty choice ($p = 0.12$) and 24.6% v. 22.7% for practice location ($p = 0.35$).

Sensitivity analysis

Most of the differences between rural and non-rural students that were statistically significant in the main analysis remained so in the sensitivity analysis. The exceptions were the comparisons for paid summer employment, part-time employment during the school year, and financial stress. In all 3 cases the magnitude of the difference between rural and non-rural students was slightly smaller (but in the same direction) as in the main analysis.

DISCUSSION

We found that the 11% of Canadian medical students who come from rural backgrounds are different than their non-rural counterparts. However, our data did not confirm the popular belief that rural students are more likely to be male. Rural students tend to be older and originate from families of lower socioeconomic status. Students from rural areas report higher levels of debt, increased rates of paid part-time and summer employment, and greater stress from their finances. Nevertheless, they are not more likely to state that their finances will affect their choice of specialty or practice location. Finally, rural students are less likely to plan an academic career.

The finding that rural medical students are underrepresented compared to the Canadian population has been reported previously,³⁴ and suggests that increased efforts to recruit students from rural areas may be needed. We are unaware of any previous reports on the financial status of rural students. Our findings indicate that students from rural areas face numerous financial barriers in obtaining a medical education. Their families have lower incomes. Many enter medical school with higher levels of debt than their non-rural counterparts, probably a result of having to live away from home to attain their pre-medical undergraduate education. These living costs persist during medical school. Despite being more likely to work during medical school, both during the summer and part-time during the academic year, they graduate from medical school with higher debt than non-rural students. Unsurprisingly, students from rural areas report higher

levels of financial stress than their non-rural classmates. These findings suggest that rural students may not be getting sufficient levels of financial support. Policy-makers might consider directing more financial resources toward this group.

Although rural students face greater financial hardship during medical training, they are less likely to report that financial considerations would influence their choice of practice location. We speculate that many rural students may be planning to practise in a rural community and those intentions may have more of an influence on their plan than their financial situation. If this speculation is correct, post-graduation financial incentives may have less impact on alleviating the rural physician shortage than would increasing the enrolment of students originating from rural areas. One US study that supports this notion found that while debt was associated with participation in programs involving post-graduation service commitments, there was no association between higher levels of debt and choosing to practise in a rural area.³⁷

When asked to choose their future practice type, fewer students from rural areas indicated plans to pursue an academic career. This may be related to the fact that academic health centres are generally centred in urban areas. Possibly, creation of the new rural medical school in Ontario and expansion of existing medical schools to rural sites may make rural practice more attractive for those interested in academic medicine.

Limitations

Our study has several limitations. We used the second character (i.e., first number) of the student's postal code during high school to identify those from rural areas, which essentially included those who lived in areas where people picked up their mail at the post office or corner boxes. Alternative definitions of “rural” have been reviewed by du Plessis and colleagues;³⁸ they suggested the “rural and small town” definition, comprising those who live outside the commuting zone of urban centres of 10 000 or more, as being the most appropriate for research purposes. However, this definition would have been impossible to use in our study because we collected only the first 3 characters of the postal code to facilitate the preservation of confidentiality. All 6 characters of the postal code would have been required to identify “rural” students using the “rural and small town” definition. Based on the 1996 census, however, both definitions yielded similar num-

bers for the rural population and there was 78% overlap between the 2 definitions.

It was unfortunate that we were unable to include the data for students from Quebec; our results should be considered valid only for non-Quebec medical students. As well, we relied on self-report for data on socioeconomic and financial status, and could not verify responses independently. Finally, we asked participants general questions about the effect of financial considerations on practice location and preferred career types; there were no specific questions about plans to work in a rural area.

Our analysis should be interpreted with caution. The proportion of rural students varied dramatically by medical school. Such variation likely reflects the population from which these medical schools draw students as well as differences in admissions criteria. Yet we were interested in general comparisons between rural and non-rural students, not between students enrolled at Memorial University of Newfoundland and the University of Toronto. To minimize the effect of the individual school in comparing rural and non-rural students, we included a term for each school in our analyses. Hence the independent effects of each school were minimized in the statistical testing.

CONCLUSION

In summary, we found that rural medical students differ from their non-rural colleagues in terms of socioeconomic background, financial status, and plans for future practice. We hope that results from this study will provide valuable information to aid decision-makers in implementing policies to increase the number of physicians practising in rural communities in the future.

Competing interests: None declared.

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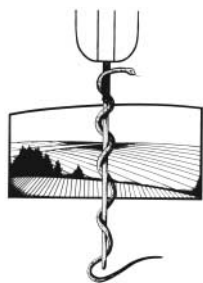
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ÉNONCÉ DE POLITIQUE POLICY PAPER

Document stratégique de la SMRC sur la régionalisation, printemps 2004

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Tous les gouvernements provinciaux du Canada, sauf celui de l'Ontario, ont adopté la régionalisation des services de santé. Dans certaines provinces, la régionalisation a englobé un vaste éventail de services comme les services de soins actifs, de soins à domicile, de santé publique et de santé mentale. Dans d'autres, les services régionalisés sont plus limités. Certaines provinces ont créé beaucoup d'entités plus petites et d'autres en ont créé de plus grosses qui sont moins nombreuses. Tous les exercices de régionalisation ont été la force motrice d'une centralisation des services qui a eu des répercussions importantes sur les communautés rurales.

Beaucoup de communautés ont perdu des services, y compris leur hôpital dans certains cas. Même dans les provinces qui ont indiqué que la régionalisation visait notamment à augmenter l'apport local dans le système de soins de santé, la population et les professionnels de la santé de la plupart des communautés rurales interviennent maintenant moins qu'auparavant dans le système.

On a préconisé la régionalisation comme moyen pour les gouvernements provinciaux de guérir un grand nombre des problèmes qui touchent le système de santé, mais il existe très peu de recherches prouvant que la régionalisation soit la solution. Aussi récemment qu'en septembre 2003, le Centre canadien de l'analyse de la régionalisation et la santé (CCARS) affirmait¹ :

«Plusieurs des modifications des frontières des régions ont été faites malgré un manque de données probantes sur le sujet. Les effets de ces modifications sur l'efficacité des politiques de régionalisation sont donc considérables — l'un

de ces effets étant la déstabilisation de la prestation des services de santé.»

Nous manquons de recherches canadiennes au sujet des effets de la régionalisation sur l'accès aux soins, la qualité des soins, le recrutement des professionnels de la santé et le maintien des effectifs, notamment. Les recherches sur la taille et la conception optimales des régions de santé sont peu nombreuses. Les régions vont de celles qui sont concentrées principalement dans une grande agglomération urbaine, jusqu'aux vastes régions rurales, en passant par de multiples régions (ou districts) peu étendues dont la capacité de prestation de services varie.

Les régions rurales n'ont souvent aucune tendance commerciale commune, aucun centre régional distinct et aucun principe organisationnel susceptibles de les aider à fonctionner comme région, autres que les édits du gouvernement provincial qui les a créées. Dans la même province, certaines régions seront en mesure d'intégrer entièrement les services de santé, y compris les soins à domicile, la santé publique, les soins primaires, tous les niveaux de soins actifs et les services de soins tertiaires. D'autres régions sont très disparates et l'intégration au niveau des soins primaires y est déjà si difficile, qu'elles ne peuvent offrir tous services secondaires aucun des services de soins tertiaires.

Il y a aussi une anomalie : les centres «régionaux» peuvent refuser des patients de communautés rurales n'ayant pas accès aux services dispensés par les centres en question et il est facile de comprendre le fossé qui se creuse entre les régions comportant d'importantes agglomérations urbaines et les régions rurales.

Compte tenu des inégalités croissantes entre les populations des régions rurales et éloignées du Canada et celles des centres urbains, la Société de la médecine rurale du Canada (SMRC) recommande les principes suivants pour la régionalisation des soins de santé au Canada.

1 – OBJECTIFS ÉNONCÉS ET MESURABLES

Les gouvernements ont lancé des essais de régionalisation sans buts clairement définis ni outils d'évaluation nécessaires pour les surveiller et les mesurer. Beaucoup de gouvernements se sont tournés vers la régionalisation comme moyen de contenir l'escalade des coûts des soins de santé, mais la restructuration massive des systèmes de prestation des soins dans de nombreuses provinces n'a pas produit d'économies. On ne sait pas combien la régionalisation a coûté au système, dans certains cas 10 ans après les premières expériences, ce qui démontre qu'il faut examiner rigoureusement les réussites et la régionalisation et ses échecs. Il est essentiel de définir clairement les problèmes que doit régler la régionalisation et la façon dont on évaluera celle-ci.

2 – PRISE DE DÉCISION FACTUELLE

Les changements apportés aux programmes actuels de régionalisation ou la mise en place de structures nouvelles doivent reposer sur les meilleures données probantes disponibles.

Dans beaucoup de cas, la régionalisation était conjuguée à la fermeture de petits hôpitaux ruraux sans que l'on reconnaisse les risques connexes possibles pour les communautés rurales. Des données probantes indiquent, par exemple, que les femmes qui ont une grossesse à faible risque et leur bébé présentent des taux de morbidité et de mortalité plus élevés au cours des premières semaines suivant l'accouchement si elles ont dû se rendre à l'extérieur de leur communauté^{2,3}. On a en outre démontré que plus l'intervalle qui s'écoule entre un infarctus du myocarde et les soins à l'hôpital est long, plus le taux de mortalité est élevé⁴⁻⁶. On a fermé trop de programmes d'obstétrique communautaires au nom de la régionalisation, lorsque les preuves démontrent qu'il en découlera une augmentation et non une diminution des résultats négatifs.

3 – ANALYSE RIGOREUSE DES COÛTS AVANT LES CHANGEMENTS

On a apporté des changements à la régionalisation

sans en analyser rigoureusement la rentabilité. Les analyses doivent inclure les coûts cachés pour les patients qui doivent s'absenter du travail pour se déplacer afin d'obtenir des services au loin, le coût des déplacements en direction et en provenance des services régionalisés et les coûts pour les membres de la famille qui doivent accompagner leurs proches. La régionalisation des services impose souvent aux populations des régions rurales et éloignées du Canada un fardeau financier beaucoup plus lourd qu'à leurs homologues des centres urbains.

4 – DÉFINITION D'UNE RÉGION VIABLE

Il est difficile de croire qu'il n'existe au Canada aucune norme ou définition de ce qui constitue une région viable et efficace. Les exemples de régions rurales constituées de communautés qui n'ont aucun lien historique, aucune tendance commerciale commune (sauf avec des communautés à l'extérieur de la région) ni aucun centre régional ne manquent pas. Les régions doivent reposer sur de solides principes opérationnels. Tous les aspects des soins, depuis les soins primaires jusqu'aux soins tertiaires, doivent être disponibles pour toute la population d'une région. L'incapacité du système de s'intégrer verticalement remet en question la viabilité et l'aplicabilité de la régionalisation.

Lorsque l'on établit les frontières des régions, il faut tenir compte des réalités de la géographie, depuis les aléas de la température locale jusqu'aux défilés montagneux impassables, en passant par le nombre moyen de jours par année pendant lesquels l'évacuation par avion est impossible, pour ne nommer que quelques facteurs.

Toutes les régions d'une province doivent bénéficier de services équitables qui doivent être disponibles de façon équitable pour la population de chaque région.

Lorsque l'on détermine les services qui seront dispensés, l'endroit où ils le seront et qui les dispensera, il faut tenir compte des éléments suivants.

- Conjoncture économique locale, y compris le rôle des établissements et des services de soins de santé dans l'économie locale.
- Géographie.
- Effet sur le recrutement des professionnels de la santé et le maintien des effectifs.
- Transport, ce qui inclut tout, depuis les services ambulanciers jusqu'aux transports en commun, en passant par l'état des routes ou les services

aériens vers les centres régionaux. Il faut tenir compte de l'effet de la température sur la capacité de voyager.

- Il faut assurer que les services comme les soins à domicile, les services ambulanciers et les services de télésanté sont disponibles dans les communautés où l'on ferme des hôpitaux ou des services.
- Équité d'accès.

5 – ÉQUITÉ D'ACCÈS

La Loi canadienne sur la santé garantit l'équité d'accès pour tous les Canadiens. La régionalisation de la prestation des soins de santé a exacerbé des inégalités qui existaient déjà.

La géographie est devenue un déterminant de la santé au Canada et il faut en tenir compte. Concept urbain imposé aux réalités rurales, la régionalisation a exacerbé certains des problèmes créés par la géographie sur le plan de l'équité d'accès aux services de santé.

6 – SERVICES DE BASE

Les gouvernements doivent définir les services de base dans le cas des niveaux locaux, régionaux et provinciaux de soins. La régionalisation a continué de miner les services dans les petites communautés rurales sans que le gouvernement s'engage à assurer un noyau fondamental de services devant être disponibles le plus près possible de toute la population.

La délimitation de ces services de base reposera sur les besoins en soins de santé de la population. Il faut chercher à déterminer les besoins en soins de santé en évaluant rigoureusement les besoins à tous les niveaux, de celui de la personne à celui de la province, en passant par la communauté et les régions.

Les centres régionaux reçoivent souvent plus d'argent pour jouer ce rôle, mais on leur permet ensuite de refuser les patients des petites localités d'une région lorsqu'ils sont pleins. Il faut mettre fin aux injustices que créent les centres régionaux qui continuent de s'occuper de la population de la communauté où ils sont situés tout en refusant des citoyens des communautés qui n'ont pas de services comparables et que le centre régional devait desservir. L'Australie a adopté une loi qui interdit aux centres régionaux de refuser des patients de leur région. Il est temps que les provinces du Canada fassent de même.

7 – CONTRIBUTION SIGNIFICATIVE DE LA POPULATION LOCALE

Les communautés s'attendent à pouvoir exercer de l'influence sur les décisions prises au sujet de la régionalisation et méritent de pouvoir le faire. Les gouvernements doivent fournir l'information pertinente de façon non partisane et neutre.

Si les gouvernements provinciaux persistent à nommer les membres des régies régionales de la santé, il doit exister de solides conseils communautaires à représentation générale pour conseiller les régies régionales de la santé et remettre en question leurs décisions et leurs hypothèses.

8 – CONTRIBUTION SIGNIFICATIVE DES PROFESSIONNELS DE LA SANTÉ LOCAUX

Les professionnels de la santé sont dans une position unique pour fournir des observations et apporter des contributions utiles à l'organisation des régions et aux politiques de prestation des services. La théorie de la gestion moderne appuie l'élaboration de politiques et de procédures le plus près possible du point de service.

9 – ÉDUCATION DES PROFESSIONNELS DE LA SANTÉ ET RECHERCHE

Les responsables chargés de mettre en œuvre ou de modifier les systèmes régionaux doivent reconnaître que les professionnels de la santé ont besoin d'appui pour se prévaloir des possibilités d'éducation continue et effectuer des recherches sur la santé à l'intérieur du système.

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THE PRACTITIONER LE PRATICIEN

The occasional breech

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INTRODUCTION

About 3% of pregnancies at term are breech presentations.¹ Some of the perinatal morbidity associated with a breech may be mitigated by planned cesarean section (C-section), at the cost of potential maternal surgical complications.² Pre-emptive C-section for breech presentations has become commonplace. However, even in city hospitals not all women make it to the operating room in time. Thus it is certain that rural doctors, some without local C-section capacity,³ will continue to have to deliver babies who present by the buttocks or feet. It is hoped that this primer will be of assistance in such an occurrence.

[If you are in a hurry, skip to the parts highlighted in bold.]

Breech is associated with increased morbidity. Part of this relates to factors beyond direct control, such as prematurity and congenital abnormalities. Part relates to the challenge of delivering the largest part of the baby, its head.

Over the last 20 years, vaginal breech delivery in North America has all but vanished and has been replaced with the comfortable C-section. The practitioners who retained competency, with historic volume supplemented with a few highly selected perfect breeches (term, frank, multip, generous pelvis and a touch-small fetus), have been mostly convinced by either the lawyers or the Term Breech Trial⁴ to deliver by a booked C-section. Although the results of the Term Breech Trial have not held in the 2-year follow-up⁵ and there are still arguments for planned vaginal delivery,^{6,7} more than 90% of hospitals in one survey delivered breech babies by elective C-section.⁸

So it is not without some trepidation that a rural doctor contemplates the discovery of breech presentation in labour. As labour progresses, the neonatal advantage of C-section is lost.⁹ A rural doctor in such a situation has to contemplate vaginal delivery. Ultimately, what historically made a good breech to deliver, is rendered moot if the baby's sacrum is crowning.

DELIVERING A BREECH

The good news is that the vast majority of breech babies, and hopefully especially those in a hurry, will deliver themselves. Thus, after **calling for help**, the first step in vaginal breech delivery is to encourage the mother's efforts. Both the extra hands and a good rapport will reduce both the mother's and your anxiety and will help you when you do need to intervene.

As the breech crowns, consider a generous episiotomy. It won't help increase room in the pelvis but will make it easier for you to place your hands or forceps. **Do not apply traction on the baby because this may deflex and trap the head and cause injury** (Fig. 1).

When the umbilicus delivers you may pull out a length of cord to ensure slack and to monitor fetal pulse. **If the baby is facing up (sacrum posterior), rotate the baby gently by two hands on its pelvis so it assumes the more favourable face down position.** Allow the baby's legs to deliver by "popping out."

At this point the baby can be either left to hang or supported at 45 degrees to the floor or on a horizontal angle. Do not elevate the body beyond the horizontal (Fig. 2). The baby's back can be

rotated from one anterior oblique to the other, which is helpful in flexing the arms across the chest. The shoulders can be delivered with the trunk in the oblique. When the scapulae deliver, the arms can be optionally swept across the chest and out of the birth canal (Fig. 3, Fig. 4).

Delivery of the head should be by flexion, which presents the same favourable diameters to delivery as with a vertex presentation. A modified Mauriceau–Smellie–Veit (MSV) manoeuvre is used to flex the head. To deliver the head, set yourself below the baby. One hand goes on the baby's back with a finger pushing down on the occiput. Place the other hand under the baby with the forearm supporting it and with two fingers pushing up on

the maxillae. Your assistant will follow with transabdominal pressure flexing the occiput. Some traction on the shoulders by your upper hand may be required. As the head delivers keep the baby's body in neutral position in respect to the head by raising it gently in a large arc (Fig. 5).

The vast majority of babies presenting in the breech position will be delivered by this method.

COMPLICATIONS: PIPER FORCEPS

Forceps delivery is to be respected, as the instrument will amplify leverage and traction, greatly increasing the chance of both delivery and injury. Routine forceps have been advocated for pre-term

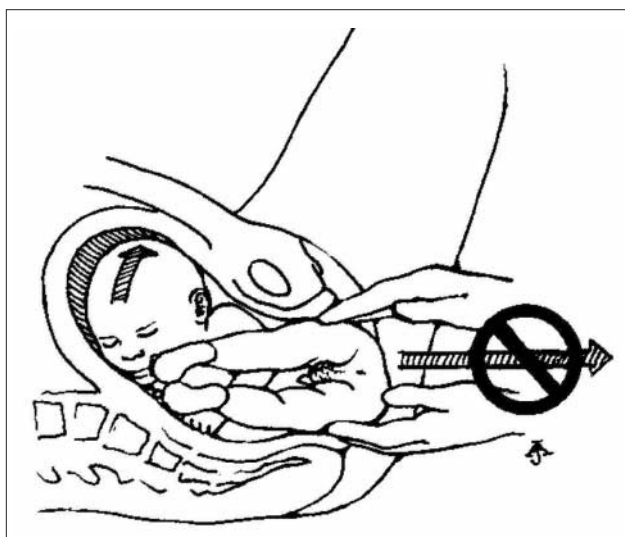


Fig. 1. Axial traction is to be avoided as it may cause the head to deflex and result in spinal injury. Keep the sacrum anterior.

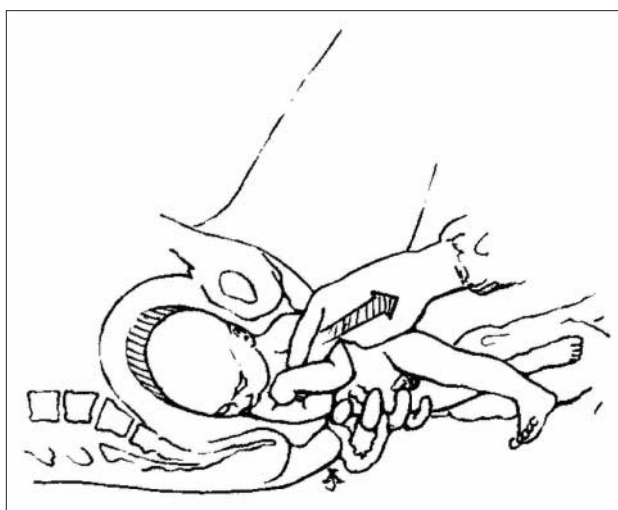


Fig. 3. When the scapulae deliver you can assist delivery of the arms by sweeping them across the chest and then extending the elbows.

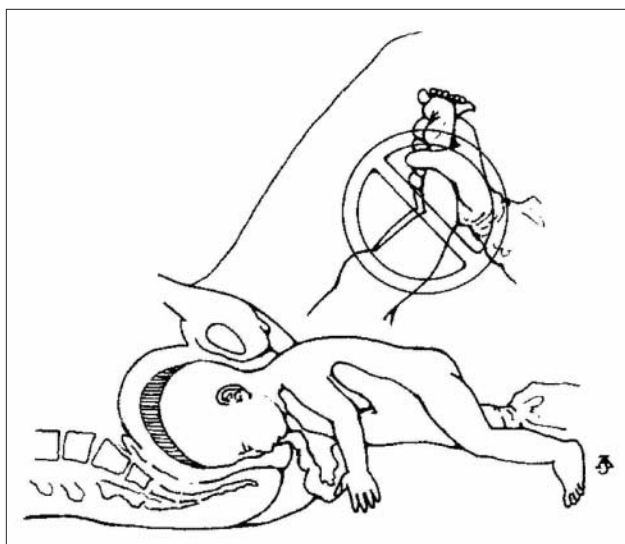


Fig. 2. The trunk is supported in the horizontal, with a small loop of cord pulled out. A towel can be used to support the trunk in the horizontal plane.

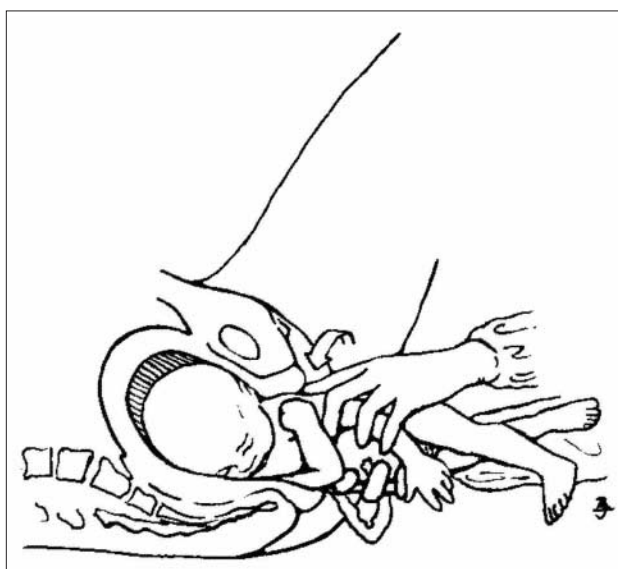


Fig. 4. Gentle rotation of the shoulder girdle facilitates delivery of the left arm.

breech but should be avoided by the inexperienced physician because vaginal breech delivery normally has a good outcome. Early recognition of abnormal breech presentation and attempted delivery is important. **Failure to manually deliver the head in 2 or 3 minutes is an emergency and warrants an attempt at forceps,** by an informed, even if inexperienced, operator.

An assistant holds the baby up to ease application. The operator starts by test assembling the forceps (Pipers are preferred, but any will do) and visualizing the application as if the presentation was occiput anterior. **The handle of the left blade is held by the operator's left hand and inserted almost horizontally into the mother's left side.** The operator's right hand may be used against the patient's left vaginal wall to direct the blade and reduce chances of injury from the insertion (Fig. 6). The blade may be left there or supported by the assistant while the right blade is applied.

The handle of the right blade is held by the operator's right hand and inserted in a manner similar to the first blade, between the mother's right side and the baby's head. The operator's left hand may be used against the patient's right vaginal wall to direct the blade and reduce chances of injury from the insertion.

The handles of the forceps should come together and lock easily without undue force. If not, they should be removed and reapplied. There is no other check on the application that is possible. When the operator is satisfied, **the baby is laid down on the handle of the forceps and traction is applied. At first, traction is applied downward and then, as the head descends, the forceps can be progres-**

sively lifted in an arc reflecting the pelvic curve (Fig. 7).

COMPLICATIONS: NUCHAL ARM

One or more of the baby's arms may extend past the neck along with the head. With a generous pelvis or a small baby this may not even be noticed and the delivery effected regardless. However, an attempt to flex the arm across the baby's chest and out of the vagina should be made.

COMPLICATIONS: CERVICAL ENTRAPMENT

Particularly in premature or footling breeches, the body can deliver without dilating the cervix enough

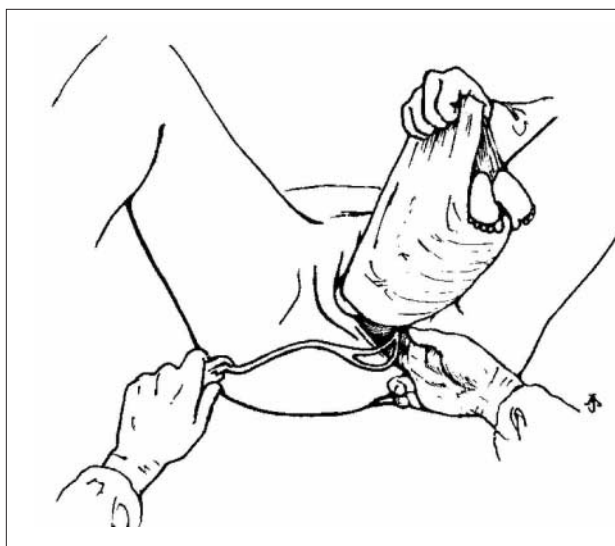


Fig. 6. The baby is held up by the assistant as Piper forceps are applied.

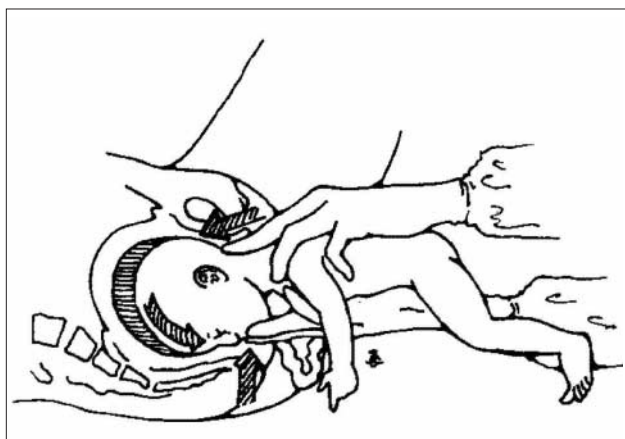


Fig. 5. Maintain cephalic flexion by pressure on the baby's maxilla (not mandible!). Delivery of the head is easily accomplished with continued expulsive forces from above and gentle downward traction. As the delivery proceeds, the baby's position moves from the horizontal to a more vertical one.

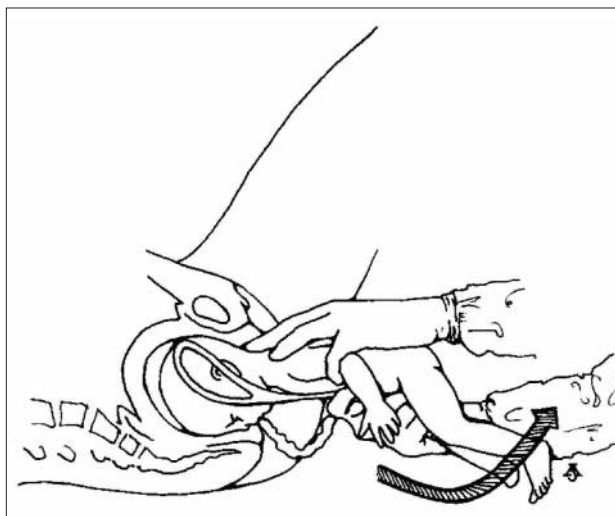


Fig. 7. Traction on the forceps is applied initially below the horizontal plane but rotates through the horizontal toward the vertical as the head delivers.

to allow passage of the after-coming head. At some risk to the mother, pairs of ring forceps can be placed at 2:00, 10:00 and 6:00 o'clock away from the cervical arteries. Radial (Dührssen's) incisions can be made, extending about 3 cm between each pair of forceps to release the head. Adequate exposure, anesthesia and hemostasis are significant problems, so this should be considered a method of last resort.

CONCLUSIONS

Most, if not all, breech deliveries should be done by elective C-section. A rural doctor, forced by circumstances to deliver a breech baby vaginally, can, in the vast majority of cases, deliver the baby without incident. Very rarely, emergency application of forceps will be required.

Competing interests: None declared.

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