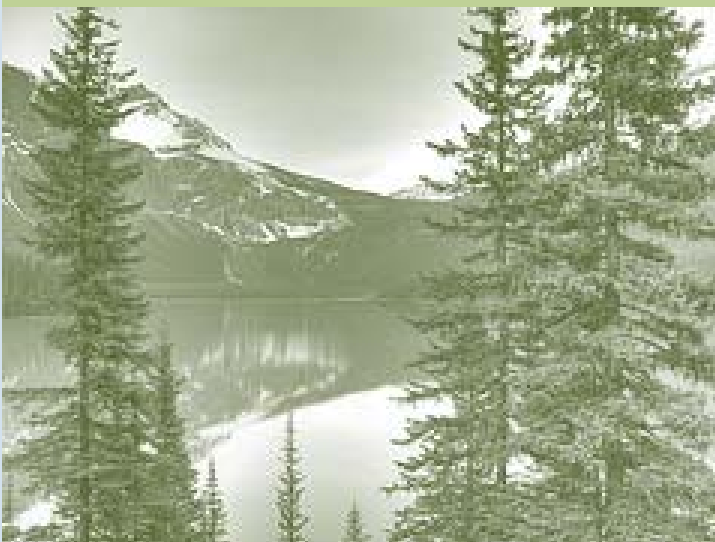




Proceedings from the Best Practices in Rural Maternity Care Service Outcomes Reporting Conference

Fairmont Vancouver Airport Hotel, Mallard Room
Richmond, BC • Friday, May 2nd, 2008

Co-hosted by the Centre for Rural Health Research
and the BC Perinatal Health Program



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Edited by the
Centre for Rural Health Research



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EXECUTIVE SUMMARY

The Best Practices in Rural Maternity Care Service Outcomes Reporting Conference (May 2, 2008, Richmond, BC) aimed to bring together key stakeholders involved in the planning and evaluation of rural maternity care services to engage in collaborative discussions and planning around data reporting systems, with the goal of optimizing data reporting processes to ensure that data is relevant and timely and that data management systems effectively address decision-maker needs. Hosted by the Centre for Rural Health Research (CRHR) and BC Perinatal Health Program (BCPHP), the participants included health authority planners, clinicians, senior executives, Ministry of Health representatives, and researchers.

The meeting focused on rural maternity services data and new tools designed to support more transparent linking of population outcomes with local service provision. The goal was to explore how we might organize data to most effectively support quality improvement initiatives at a local level and in overall systems monitoring. The day was divided into morning presentations by CRHR and BCPHP and afternoon discussions using a case study review format designed to encourage participants to consider real problems in maternity service provision to rural communities and how new data reporting strategies might facilitate new solutions.

Rural Catchments and Service Classifications

Based on its program of research with rural communities, the Centre for Rural Health Research has devised potential strategies for improvement of maternal newborn outcomes reporting which may facilitate planning and evaluation of rural maternity service provision.

Population-Based Catchments

Currently, hospital outcomes are reported based on geographic areas called Local Health Areas (LHA's). These traditional reporting areas are originally based on census area mapping and an individual LHA may contain from 0 to 3 separate maternity services. An alternative catchment schema for rural BC hospitals based on natural access patterns has been proposed that will:

- Map catchment populations living within 1 hour, 1 to 2 hours, and 2 to 4 hours or more from each rural hospital; and
- Link mothers by postal code of residence with specific hospital catchments.

These population-based catchments have been integrated into the BCPHP's reporting spreadsheets for 2006/7.

Rural Service Classification

The Rural Birth Index (RBI) is a health service delivery tool developed by CRHR and intended to calculate the appropriate level of maternity service for a given rural service population catchment based on historical population birth rate, social vulnerability of the population, and degree of isolation of the service from the next available surgical service. This projected appropriate service level is intended to suggest a sustainable level of

service that will optimally meet the local population's needs and minimize adverse perinatal outcomes. This is part one of a three part planning process that includes issues of feasibility and prioritization of service provision. While the RBI score is intended to focus on service levels in small rural communities, it can be integrated with the Provincial Specialized Perinatal Services (PSPS) levels, which apply to all hospitals across the province.

Data Reporting, Indicator Monitoring, and Process Control Charting

Each year the BC Perinatal Database Registry (BCPDR) collects data on approximately 40,000 births in British Columbia with up to 300 variables reported for each birth. This data is then analyzed and reported back to individual hospitals, health authorities, and provincially through various forms. Currently, BC Facility Comparison Reports present data in tables and graphs and compare data on individual indicators by hospital, peer group, and province. To optimize their reporting, the BCPHP asked users about the strengths and weaknesses of comparison reports. Of the 300 variables tracked by the BCPHP, which indicators are users most interested in tracking? Which populations and hospitals would the users like compared? How can we start using the data more effectively in quality improvement? Strategies proposed to enhance the usefulness of data reporting include run charts and process control charts.

Run and Process Control Charts

Run and process control charts monitor indicators over time and, in the case of process control charts, include an overlay of statistical controls representing 1-2 standard deviations from the mean. When an indicator exceeds the limits of normal statistical variance a flag is triggered which can be colour coded by degree and direction of variance. This form of charting allows summative reports to flag problem areas where a service may need to be evaluated and can be used to compare performance between similar sized hospitals. Reports that highlight flags of variance rather than normative data would allow the BCPHP to focus attention on significant variances amongst the large number of indicators monitored.

Case Studies Data Reporting Priority Setting

In the afternoon, several realistic scenarios were presented representing a range of rural maternity health service crisis situations. These scenarios were discussed in small-group working sessions which provided the opportunity for participants to outline how outcomes reports can best assist in managing problems in service provision in rural communities. The groups were asked to consider what data they would need to assist with reporting on and resolving the crisis. The ideas that emerged helped inform the BCPHP of what data to provide to assist decision making on the ground. Several suggestions were made that might help manage potential situations and included to:

- Expand the MoreOB program to more regions to facilitate interprofessional collaboration and improved practice safety;
- Integrate the Rural Birth Index into administrators' decision making;
- Improve collaboration, consultation, and transfer between hospitals through supportive physician working relationships between tertiary specialists and local physicians;
- Provide BC Bedline and tertiary centres with maps of communities that include

-
- PSPS and RBI scores, as well as CRHR Community Profiles, so that they have an understanding of resources available at rural facilities and can use a standard language with which to communicate;
 - Integrate midwives into rural communities and consider expanding their scope of practice to include well-woman and obstetric care for remote and high risk Aboriginal communities;
 - Prepare community contingency plans for women who must leave to give birth.

Perinatal Lead Discussion

Each Health Authority in British Columbia has a Perinatal Lead, or representative, who liaises with the BCPHP. These Perinatal Leads facilitated a discussion on the implications of emerging data management strategies. The participants brainstormed solutions to perinatal service challenges in 100 Mile House, Williams Lake, Invermere, Chetwynd, and McBride. Some solutions discussed included:

- To prevent the loss of local maternity care, create sustainable working environments for GPs and GP Surgeons through training, professional support, mentorship from visiting specialists;
- Develop a “nursing swap” program so that rural nurses can gain practice time in urban, high-volume environments;
- Implement the MoreOB program province-wide to instill confidence and competence in maternity care teams;
- Develop a community consultation process for consensus decision making in changes in level of service;
- Integrate midwives into rural communities and potentially expanding their scope of practice to include a blended model of care, including teen clinics, breast health, well women clinics, and sexual health, reflecting a nurse practitioner model of care;
- Implementing process control charting in a timely fashion based on Health Authorities’ priority perinatal outcome indicators.

Steps Forward

Participants outlined the next steps they would like to see taken from this working symposium:

- Integrate the PSPS levels of care with RBI scores;
- Schedule a follow-up meeting for the BCPHP and CRHR;
- Have the Health Authorities submit their priority indicators to the BCPHP;
- Consult with the Perinatal Surveillance committee of the BCPHP to ensure that the implications of the recommendations brought forward through this symposium fit with the overall surveillance committee plans.

Recommendations

A number of potential recommendations arose from the proceedings, as listed below:

1. Rural Reporting Issues

- a. Current Local Health Area (LHA) reporting should be supplemented for rural areas by population catchment reporting based on geographic proximity to hospital services.
- b. Hospital service levels should be defined across a range from no intrapartum care to cesarean section by specialist only (as listed in Slide 20 of session one).
- c. BCPHP should consider integrating run charts and process control charts into reporting materials to facilitate Health Authority decision making on priority perinatal outcome indicators.
- d. Health Authority Perinatal Leads will provide the BCPHP with their top 10-20 priority perinatal outcome indicators.
- e. The BCPHP should consider integrating run charts and process control charts into reporting materials to facilitate Health Authority decision making on priority perinatal outcome indicators.
- f. The BCPHP should consider facilitating the development of an out-of-province birth reporting system to monitor births to residents of British Columbia that occur in other provinces and the United States.

2. Rural Maternity Services

- a. Multidisciplinary care provider teams, including Midwives and General Practitioner Surgeons, are integral to the sustainability of rural maternity services and the Ministry of Health and Health Authorities should actively support their training, remuneration, continuing education, and locum coverage.
- b. Include community folk in the consultation process when local perinatal services are under threat of reduction or closure.
- c. Health Authorities and the Ministry of Health should provide appropriate financial support to rural families that must travel for intrapartum services (based on social vulnerability).
- d. The Ministry of Health, BCPHP, and Health Authorities should formalize support services, remuneration, and policy for cross-border intrapartum care when service access in British Columbia is unavailable.

PREFACE

The Best Practices in Rural Maternity Care Service Outcomes Reporting Conference was organized in order to integrate recent research findings in rural service outcomes reporting with the quality improvement practices of the BC Perinatal Health Program. The BCPHP is a provincial resource for regionalized perinatal services whose mandate is to optimize neonatal, maternal, and fetal health in BC. The BCPHP disseminates provincial perinatal data through materials such as hospital comparison spreadsheets, annual facility comparison reports, and special reports and individual requests. The Centre for Rural Health Research, housed in the Rural Maternity Care New Emerging Team, consists of academic and community-based researchers, policy makers, administrators, and other key stakeholders working together to achieve a comprehensive understanding of rural maternity care services in British Columbia.

The annual reporting structure of the BCPHP is intended to provide hospitals and health authorities with ongoing performance data and to underpin opportunities for quality management. The format of the BCPHP reporting structure includes electronic data, hospital comparison reports, maternity health service mapping, and spreadsheets linking place of residence with hospital service. Recent evidence collected by the Centre for Rural Health Research has highlighted opportunities for new approaches to data reporting and underpins this symposium and the resulting proceedings.

The Centre for Rural Health Research would like to acknowledge the support of the leadership of the BCPHP in collaboratively developing the research program that has contributed to the recommendations made in these proceedings with respect to changes in the quality reporting structure. The broad participant representation at this symposium highlights the interest of the policy and planning community with respect to rural maternity services. The research discussed and recommendations produced from this day are a tribute to the collaborative partnerships that exist amongst the perinatal planning, research, and data management communities.

Jude Kornelsen and Stefan Grzybowski
Co-Directors, Centre for Rural Health Research

AGENDA

Best Practices in Rural Maternity Care Service Outcomes Reporting Conference

Co-hosted by the
Centre for Rural Health Research and BC Perinatal Health Program

The Fairmont Vancouver Airport: Mallard Room
Friday, May 2nd, 2008

GOALS and OBJECTIVES:

The goal of this one-day meeting is to bring together clinicians, researchers, decision-makers, and policy planners focused on the provision of rural maternity care, to engage in collaborative discussions and planning around data reporting systems, with the goal of optimizing data reporting processes to ensure that data is relevant and timely and that data management systems effectively address decision-maker needs. Specific objectives include:

- Presenting possible BCPHP quality improvement rural reporting strategies;
- Brainstorm with health authority planners, clinicians, senior executives, and the Ministry of Health to identify the most effective information and data reporting systems to underpin quality improvement;
- Explore the potential for the integration of existing level of service designations in a rural-specific framework (Rural Birth Index).

AGENDA:

8:30-9:00 **Breakfast and Coffee**

9:00-9:30 **Welcome, Introductions, Review Goals and Objectives**

9:30- 11:00 **Session I: Rural Catchments and Service Classification (CRHR)**

- Overview the definition of rural maternity service catchments and rural service classification schemes in British Columbia.
- Demonstrate the potential strengths of reporting by maternity service catchment population versus by traditional Local Health Area (LHA).
- Introduction of Rural Spreadsheets.

11:00- 11:15 **BREAK**

-
- 11:15-12:30 **Session II: Data Reporting, Indicator Monitoring, and Process Control Charting (BCPHP)**
- Introduction of Process Control Charting to underpin Quality Improvement.
 - Interpret outcomes and indicators by service level.
- 12:30-1:30 **LUNCH**
- 1:30-2:30 **Session III: Data Reporting Priority-Setting**
(Facilitated small group activity)
Divide into 3 groups and brainstorm data management strategies based on case studies of rural maternity service crises.
- 2:30-3:30 **Discussion of Data Management Strategy**
Each group presents their data management strategy (10-15 min each).
- Synthesize the highlights of the small group discussion with relevance to the content area.
- 3:30-3:45 **BREAK**
- 3:45-5:00 **Session IV: General Discussion (Health Authority Perinatal Leads)**
Explore the implications of the data management strategies outlined during the day from the perspectives of the perinatal leads of the health authorities. The specific objectives will be to:
- 1) Consider case examples of rural maternity service health planning problems;
 - 2) Discuss the utility of the data management strategies outlined in resolving rural maternity service planning problems; and,
 - 3) Brainstorm expanded or alternative approaches to application of the outlined strategies.
- 5:00-6:30 **Evening Reception**

INTRODUCTION

In May 2008, the BC Perinatal Health Program (BCPHP) and the Centre for Rural Health Research (CRHR) co-hosted a working symposium on rural maternity care outcomes reporting. The goal of the meeting was to engage rural maternity care researchers, decision makers, and providers in collaborative discussions and planning around data reporting systems to ensure that data are relevant and effectively address decision maker needs. Specific objectives of the meeting included:

- Presenting possible BCPHP quality improvement rural reporting strategies;
- Brainstorming with health authority planners, clinicians, senior executives, and the Ministry of Health to identify the most effective information and data reporting systems to underpin quality improvement; and
- Exploring the potential for the integration of existing level of service designations in a rural-specific framework (Rural Birth Index).

Due to the co-hosts' commitment to creating and sharing relevant data materials with care providers and the policy and planning communities, the meeting's participants represented a diverse cross-section of rural maternity care stakeholders, including administrators from five regional health authorities, rural care providers, leaders from the Ministry of Health, and representatives from the Alberta Perinatal Health Program, as well as representatives from the BCPHP and CRHR.

The one-day working symposium was divided into morning presentations and afternoon workshops and discussion. Dr. Stefan Grzybowski from the Centre for Rural Health research and Karen Vida and Sheryll Dale from the BC Perinatal Health Program gave the participants a background on the data reporting materials currently distributed by the BCPHP and an introduction to new reporting materials developed by CRHR. The afternoon sessions facilitated by CRHR researchers and BCPHP Perinatal Leads Rose Perrin and Marty Willms provided participants with the opportunity to develop recommendations for best practices in rural maternity service outcomes reporting.

These proceedings reflect the structure of the working symposium, including detailed accounts of group discussion and slides from the Power Point presentations integrated throughout. The proceedings conclude with the participants' recommendations for next steps forward in the planning and improvement of rural maternity service data management and reporting.

WORKING SESSIONS

1 Rural Catchments and Service Classifications

Stefan Grzybowski, Centre for Rural Health Research

Karen Vida, BC Perinatal Health Program

Summary

In British Columbia, maternal newborn population outcomes data reporting has been historically provided by maternal residence based on Local Health Areas (LHA) and by utilization patterns at the hospital level. Local health areas vary in size and relationship to hospital service sites with some LHAs containing as many as 3 hospitals and some none. Population data for a given LHA is linked by the postal code of residence. LHA residents travel variable distances to access services, with travel time ranging from a few minutes to several hours. There exists significant potential to improve data management and reporting systems for rural maternity services and associated population outcomes in order to facilitate planning and rural service evaluation.

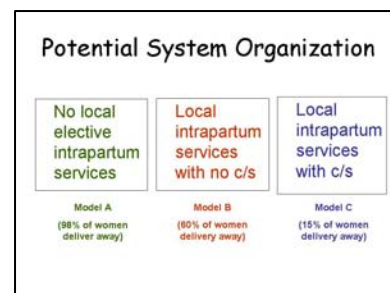
In conjunction with geographic catchment definition, a system for classifying rural hospital service levels has also been introduced and linked to local catchment areas. This linkage has provided a potential foundation for comparatively planning maternity services based on population need and isolation. A method has been defined and termed the Rural Birth Index. The RBI is intended to define level of service to meet population need for rural population catchments of under 25,000 people. The BCPHP has begun to integrate the newly defined catchments and service levels into its annual outcomes reporting spreadsheets and its Annual Facility Comparison Reports. This session provided the opportunity to gain stakeholder feedback on CRHR's evidence-based service classifications and on combining the Rural Birth Index with the existing Provincial Specialized Perinatal Services PSPS service levels.

Session outline

Based on its program of research with rural communities, the Centre for Rural Health Research has identified three general service levels for rural maternity care (see Slide 1). Each service level comes with its own challenges at both community and provider levels.

In **Model A**, in which no local intrapartum services are provided and where 98% of women leave their communities to give birth, the majority of problems occur around transferring birthing women to referral communities and the concomitant social, financial, and cultural stresses that women and their families encounter giving birth away from home.

In **Model B**, in which local intrapartum services are provided without local access to cesarean section, 60% of women deliver away and low-risk deliveries are offered locally without caesarean section back-

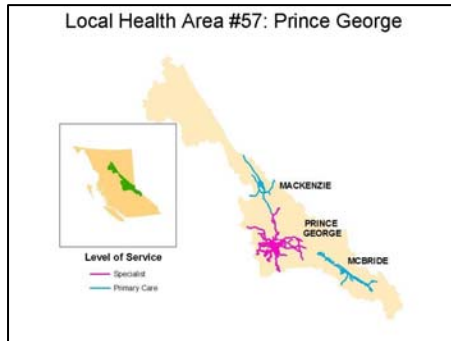


Slide 1

up. There are only a few communities in British Columbia that have managed to maintain this level of services as it is the most stressful for care providers due to the uncertainty that surrounds birth even in an uncomplicated pregnancy and labour. This uncertainty is compounded by challenges to emergent evacuation of women due to geographic isolation, weather, seasonal challenges, and administrative difficulties accessing emergency transport.



Slide 2



Slide 3

In **Model C**, where local intrapartum services are provided and include local access to cesarean section when necessary, 85% of women are able to deliver locally. In these small communities, caesarean section services are frequently provided by a General Practitioner (GP) Surgeon. There exists considerable controversy and little evidence related to the safety of GP Surgery, scope of practice, and appropriate training.

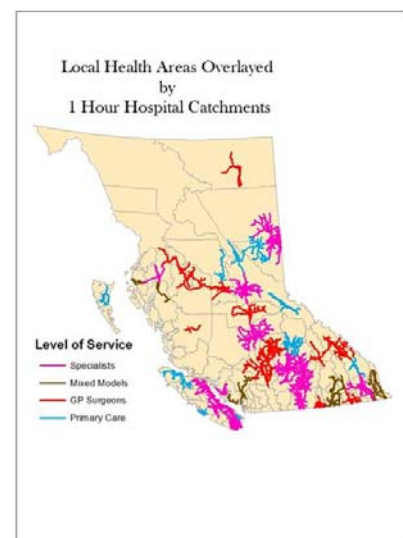
Currently there are approximately 20 GP Surgeons practicing in rural British Columbia. There is also a shortage of rural nurses with OR skills and specialized obstetric training and experience.



Slide 4

Currently in British Columbia, population outcomes are reported according to **Local Health Areas (LHAs)** of residence. LHAs are organizational designations that are based on census data mapping. They typically follow political and natural boundaries and may contain one or more hospitals, but do not reflect natural geographic catchment zones around rural hospitals. Hence it is difficult to link specific hospital services with a natural catchment population.

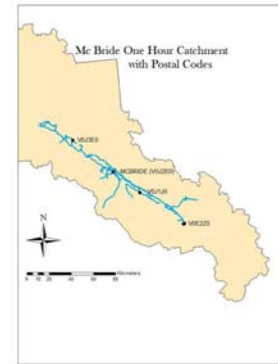
Looking at a BC map of LHAs (see Slide 2), it is evident that many LHAs do not link well with a specific rural hospital service. LHA 57, for example (see Slide 3), in the centre of the map, covers hundreds of miles north to south and contains three hospitals, Mackenzie and District, Prince George Regional, and McBride and District. In this example the much larger Prince George population obscures the outcomes of the smaller populations surrounding the two other hospitals and makes it difficult to plan services coherently for the region.



Slide 5

Work done at the Centre for Rural Health Research and in collaboration with Dr. Nadine Schuurman (SFU) has led to the development of an alternative catchment

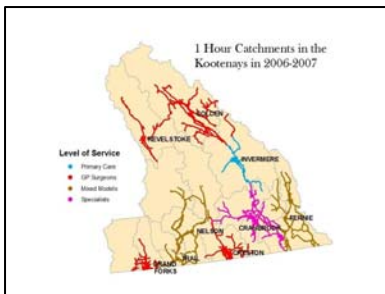
schema for rural BC hospitals that maps the population living within 1 hour, 2 hours, and 4 hours or more from a hospital. By calculating the distance travel time it takes to drive to the hospital, the spiderlike designs of these revised catchments provide a more accurate representation of the populations that would naturally use a particular rural maternity service (see Slide 3). One hour catchments are used to designate the primary care obstetric population of a rural hospital because one hour is a reasonable length of travel time for a labouring woman, particularly a woman who has previously delivered vaginally (Standards of Accessibility, Guideline 4.1, 2004).



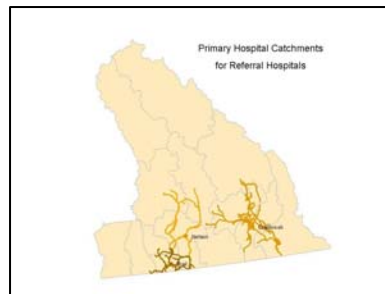
Slide 6

These geographically defined, one-hour, population-based catchments can be expanded to define natural specialist referral hospital catchments which may naturally include two hour or longer travel time. s that provide specialist surgical services to outlying communities (see Slides 4-5).

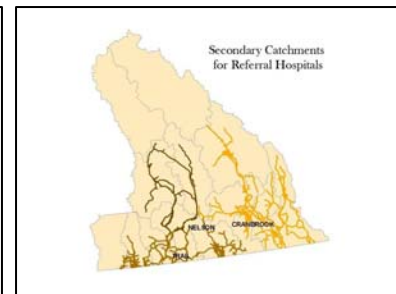
Returning to the example LHA that we have been using, we can graft postal codes onto the McBride and District area, to see the natural population the hospital serves (see Slide 6). This illustrates the natural geographic zone of draw for the hospital.



Slide 7



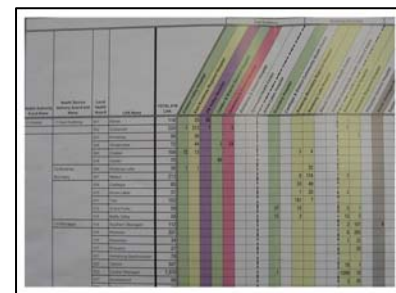
Slide 8



Slide 9

In the Kootenay region (see Slide 7), three facilities are referral hospitals with obstetricians: Trail, Nelson, and Cranbrook. Referral catchment zones for these three sites are large enough to include a range of communities needing access to specialized obstetric services, from communities without local intrapartum maternity services to sites with local GP Surgical services (see Slide 8-9).

These rural, geographically-defined catchments can be incorporated into the outcomes reports that the BCPHP produces by the addition of a supplementary report focusing on rural communities only. The current spreadsheet entitled “BC Deliveries by Maternal Residence and Delivery Hospital Highest Level of Service/Care” (see Slide 10) is distributed and reflects total deliveries occurring within BC.



Slide 10

An additional spreadsheet entitled “BC Deliveries by Maternal Resident Postal Code & Hospital’s Catchment

Area by Service Level (excludes Lower Mainland and Victoria Area) has been drafted and could be a supplementary rural community report.

The spreadsheets now report on births for the population catchments of single hospitals and different spreadsheets are provided for rural and urban hospitals.

The Centre for Rural Health Research has also developed a health service delivery tool, the **Rural Birth Index (RBI)**, to assist in the planning of rural maternity services (see Slide 11). This tool is built on the research carried out through the centre and recognizes the fundamental importance of population need and isolation as these factors relate to the sustainability of rural maternity services. Population need in the area of maternity care is measured by the *number of births* in the population annually and the *social vulnerability* of the community, as determined by BC Statistics. Isolation is characterized by *distance to nearest caesarean section service* (see Slides 12-15).

We believe that other factors, such as cost and feasibility, while important are secondary. The development of the RBI was informed by data gathering through six funded research projects involving:

What does the RBI Score mean?

The calculated score corresponds to the appropriate level of service for a given rural service catchment population:

- 0–6.5: No local intrapartum services
- 6.5–9: Local intrapartum services without operative delivery
- 9–14: Local GP Surgical Services
- 14–27: Mixed model of specialists and GPS
- >27: Specialist service

Slide 11

Birth rate

The Birth rate is transformed into a Population Birth Score (PBS).

Population Birth Score (PBS):
Average # of births in catchment area of hospital over 5 years divided by 10.

Slide 12

Adjustment for Population Vulnerability (APV)

Social vulnerability is represented by a score derived from a BC stats composite score (range -1 to +1) of several social indicators* and is weighted in the RBI between:

0.8 (advantaged) to 1.4 (disadvantaged)

* Overall regional socio-economic index including levels of human economic hardship, crime, health problems, education concerns, children and youth at risk.
www.bcstats.gov.bc.ca/data/seprl_tha/tha_main.asp

Slide 13

Proximity to nearest cesarean section service

Measured by an Isolation Factor (IF):
Surface travel time is weighted as follows:

- < 30 minutes = -3
- 31-45 minutes = -2
- 46-60 minutes = -1
- 61-90 minutes = 1
- 91-120 minutes = 2
- 2-4 hours = 3
- > than 4 hours = 4

* If Caesarean Section provided locally then distance to next service is calculated as if existing local service was closed

Slide 14

RBI Formula

RBI= (PBS x APV) + IF

RBI: Rural Birthing Index
PBS: Population Birthing Score
APV: Adjustment for Population Vulnerability
IF: Isolation Factor

Slide 15

- Repeat visits to 23 communities
- Interviews and focus groups with:
 - 121 rural women
 - 216 care providers
 - 49 administrators and key informants

Through this research, the CRHR team noticed different patterns of maternity service sustainability in each rural community. Taking the composite of the team’s research experience, they created the RBI model. The methodology for the RBI was also informed by:

- *Complex adaptive systems* modeling recognizing that small rural maternity health services are at the edge of the complexity of health systems;
- Privileging the dominant nature of *population need* and degree of *isolation* in predicting service levels for small communities;
- Comparing service levels for rural BC hospitals to RBI scores to establish phase transition points (the derivation sample).

There are some important limitations to the application of the model. The RBI is intended for populations <25,000 and was developed in the context of BC’s geography and health policy structure. At present, the RBI uses adapted LHA catchments, not the population-based 1 hour catchments discussed above, as 1 hour population-based catchments data results are still being refined. Further, the BC Stats measure of population vulnerability is based on LHA mapping, which we have adapted to fit our modified catchments. The measure likely underestimates the degree of vulnerability of the women who will make up the parturient population

Three examples of rural BC communities illustrate the calculation of the RBI score and the subsequent level of maternity service appropriate for each community (see Slides 16-18). In the provision of rural health care, optimal level of service should balance service

Summerland	Merritt	Queen Charlotte city
<p>Summerland</p> <p>Data: Average # of births (5 years): 71 →</p> <p>RBI Factors: PBS: 7.1</p> <p>Socio-economic Status: -0.79 → Adjustment for Population Vulnerability (APV): 0.84</p> <p>Travel Time to cxion: 17 minutes → Isolation Factor (IF): -3</p> <p>RBI = (7.1 X 0.84) - 3 = 3.0</p> <p>Recommended level of service: No Local Intrapartum Services</p>	<p>Merritt</p> <p>Data: Average # of births (5 years): 105 →</p> <p>RBI Factors: PBS: 10.5</p> <p>SIV: 0.87 → Adjustment for Population Vulnerability (APV): 1.35</p> <p>Travel Time to cxion: 53 minutes → Isolation Factor (IF): -1</p> <p>RBI = (10.5 x 1.35) - 1 = 13.2</p> <p>Recommended level of service: Local intrapartum services with operative delivery</p>	<p>Queen Charlotte City</p> <p>Data: Average # of births (5 years): 30 →</p> <p>RBI Factors: PBS: 3.0</p> <p>SIV: 0.29 → Adjustment for Population Vulnerability (APV): 1.12</p> <p>Travel Time to cxion: 4 hours → Isolation Factor (IF): 4</p> <p>RBI = (3.0 X 1.12) + 4 = 7.4</p> <p>Recommended level of service: Intrapartum services with no c/s</p>

Slide 16

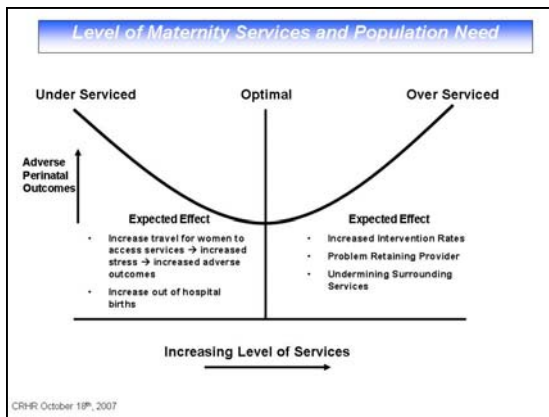
Slide 17

Slide 18

sustainability with minimization of adverse perinatal outcomes related to barriers to access to maternity services (see Slide 19). Increased numbers of women will likely birth outside of the normal system of care. Alternately, over serviced populations have increased intervention rates and in seeking adequate case volume will undermine the smaller maternity services in surrounding areas.

CRHR has also designed a three-stage implementation process for the RBI:

1. **Planning:** Using the RBI to project the appropriate service level to meet the needs of a given community.
2. **Feasibility:** Determining the feasibility of implementing a certain level of service considering the following factors:
 - Public transit access and schedules
 - Local infrastructure (existing hospital services)
 - Local care provider resources
 - Community maternity service history
 - Influence of other organizations (i.e. United Church Health Services)
3. **Administrative Priorities:** Making choices about service priorities:
 - Addressing the greatest need (i.e. cancer care vs. maternity care vs. operative facilities)
 - Political agenda



All rural maternity services in British Columbia have been assigned an RBI score. CRHR parameterized the model until it fit 32 of 42 community services and catchments. We found that ten communities do not fit their current level of service and based on site visits suspect that six of those communities currently have an inappropriate level of service. For example, three communities that appear to be under serviced are Merritt, Port Hardy, and Oliver.

Slide 19

Currently in British Columbia, the BCPHP assigns service levels to hospitals based on **Provincial Specialized Perinatal Services (PSPS) Levels of Perinatal Care.**

The purpose of these standardized levels of service is to:

- Identify standards for the provision of specified levels of care;
- Facilitate transfers between centres through a common understanding of the capabilities of each centre;
- Streamline planning and allocation of resources;
- Facilitate comparisons of regional resource utilization and outcomes; and
- Support the availability of appropriate funding and resources for care centres.

The following descriptions summarize the PSPS Levels of Perinatal Care:

LEVEL 1

1A

- Normal singleton births
- ≥ 36 weeks gestation & infants $\geq 2,500$ grams
- No on-site caesarean section capability available

1B

- Normal singleton births
- ≥ 34 weeks gestation & infants $\geq 1,800$ grams
- On-site caesarean section capability available

LEVEL 2

2A

- Singleton and some twin births
- ≥ 32 weeks gestation & infants $\geq 1,500$ grams
- May have low risk medical/obstetrical/neonatal complications
- 24/7 on-call specialty consultation & intensive care beds available

2B

- Singleton and some twin births
- ≥ 30 weeks gestation & infants $\geq 1,200$ grams
- May have moderate risk medical/obstetrical/neonatal complications
- 24/7 on-call specialty consultation available
- In-house staff skilled in intubation (MD, RN, or RT) available if infant on assisted ventilation

LEVEL 3

3A

- Investigation and care of moderate to high risk maternal and/or neonatal complications
- Investigations of potentially high risk fetal complications
- Multiple births of any gestation & infant weight
- 24/7 in-house medical coverage
- Access to 24/7 on call obstetrician and pediatrician/neonatologist
- Day time access to maternal fetal medicine specialist and access to subspecialists on a planned basis.

3B

- Investigations and care of high risk maternal, fetal and/or neonatal complications
- Multiple births of any gestation & infant weight
- Medical coverage as per 3A with the addition of access to on-call 24/7 maternal fetal medicine specialists, selected adult specialists and subspecialists, selected pediatric subspecialists, and daily access to adult infectious disease specialists and other pediatric subspecialists.

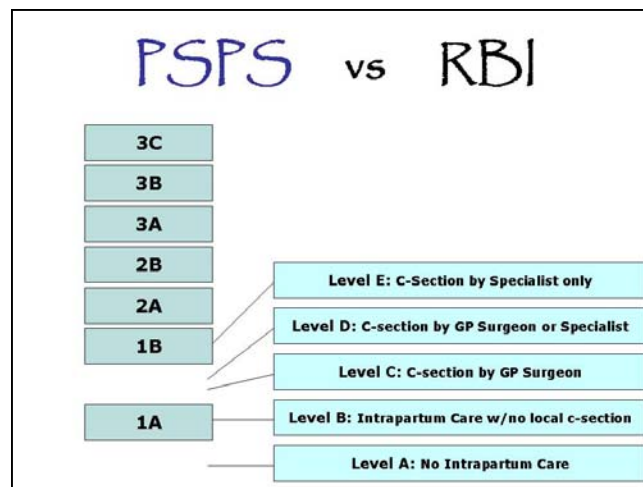
3C

- Investigation and care of very high risk maternal, fetal and/or neonatal complications
- Multiple births of any gestation & infant weight
- Medical coverage as per Level 3B with the addition of access to all on-call adult and pediatric specialists and sub-specialists that may not be available in Level 3B centres
- 24/7 access to sub-specialty intensive care beds (high complex ICU, CCU, neuro ICU, dialysis, or oncology management).

Although these service designations have been useful at some levels, they are meant as basic guidelines, and stakeholders have expressed concerns about some of the classifications. For example questions have been raised about how to make level 1B sustainable. The potential exists to harmonize the **Rural Birth Index** with the **PSPS Levels of Perinatal Care** in order to enhance the overall classification and planning of maternity services in BC (see Slide 20).

References

1. Ministries of Health Services and Health Planning. Guideline 4.1. *Standards of accessibility and guidelines for provision of sustainable acute care services by health authorities*. April 2004. http://www.health.gov.bc.ca/library/publications/year/2004/acute_accessibility_revised.pdf



Slide 20

Discussion

Discussion during this session was broad and included: appropriate reporting systems, the social implications for women and families who give birth away from their home communities, and the financial costs of the rising number of BC patients transferred to Alberta and the United States.

Outcomes reporting for out-of-province births

- Currently, BCPHP data represents only BC births
- An undetermined number of women are being transferred to or are choosing out-of-province facilities for intrapartum and postnatal care (e.g. families in northeast British Columbia are more closely linked with Alberta geographically and politically, but current BC reporting systems do not document outcomes from women who follow natural referral patterns to Edmonton and Calgary).
- A parallel system of reporting may be useful as both the Ministry of Health and Interior Health Authority have had concerns in the past about British Columbia patients having out-of-province births. Alberta has also expressed concerns about taking on the BC patient overload.
- Alberta's outcome reporting system uses clinical catchment areas based on where individual populations reside, not where they give birth. This approach, well-received by Alberta's decision makers and users, was developed by Dr. Stuart Iglesias. However, the catchment districts are designed specifically for Alberta's unique geography and population distribution.
- Outcomes reporting may be challenging for First Nations peoples residing in British Columbia near the US border, as some First Nations individuals have dual citizenship and move freely back and forth across the border, particularly when their traditional territory spans both countries. As a result, births of First Nations babies can be registered in either country.

Social implications for women and families who birth away

- Ideally maternity reporting systems should include factors such as social, financial, and cultural stressors to birthing families. For instance, when women have to travel to birth, are we documenting the financial cost to families?
- Many small rural areas have marginalized citizens who cannot afford the costs of accessing centralized service. When a socially vulnerable women travels for access to intrapartum care without appropriate funding for food and accommodation, her health and nutrition may deteriorate.
- First Nations women endure the added burden of being separated from the cultural ties and local family support that traditionally accompany birth.
- Participants stated that, if we are going to centralize services, we must factor in and support rural families' needs. This responsibility, they argued, lies with the Health Authorities.

Solutions to the negative effects of centralization

- Participants suggested enhancing local antepartum services for communities without local intrapartum care.
- Improved maternity care teams that bridge local and referral communities would assist in continuity of care and support for rural birthing women.
- The Centering Pregnancy model is another solution for team-based care that provides birthing women with a supportive peer network.
- Any social solutions to centralization of services should focus on ensuring that women do not feel isolated from their local communities.

Community consultation process

- How involved are rural communities in the provision of local maternity care?
- When we come to the community engagement process what process or model should we use?
- How do we enhance the community process when deciding to close local intrapartum services?

Costs for patients referred to the United States

- Recent newspaper headlines and published data illustrate the rising number of women who are transferred to the United States for intrapartum or neonatal care.
- There is currently no standard support mechanism for remuneration of costs incurred by the transferred families during their stay.
- Participants from the BCPHP and PSPS recently received a request from the Ministry of Health to develop a family support policy to address the transfer of specialized perinatal cases across Health Authority boundaries, provincial borders, and to the United States.
- Although it is a controversial subject, Health Authorities are making efforts to support cross-border travel for service, such as providing reimbursement for expenses incurred by families. There are no funds designated for these payments.
- The BCPHP has drafted a family brochure detailing the British Columbia support services that are available for cross-border travel for maternity care. This draft brochure was created in part in response to receiving numerous questions from transferred families about what will be covered beyond medical costs. Yet there are still difficulties with getting the information to traveling families in a timely fashion and, overall, the brochures do not address the primary concern of lack of support for women.
- In terms of creating a standard system for families that must travel cross-border, the only movement that has taken place has been discussion at high levels. Any actions taken to reimburse families has been controversial, ad lib, and very expensive.

- Health Authorities and the Ministry of Health are uncomfortable with providing reimbursement for traveling families when there is no budget for these funds. The Ministry of Health, in particular, is concerned with setting a precedent, but has placed requests to create a clear family support government policy.

Facilitating travel to access care

- Socially vulnerable women who travel to neighbouring communities for maternity care face significant financial and time-related stresses. In Lillooet, for instance, there are no local bus, train, or airplane services, meaning women without personal transportation must rely on others to travel.
- In Mt Waddington on Vancouver Island, the community is trying to establish a public transit system to assist patients with travel to maternity services in neighbouring communities.
- Travel discount programs for isolated, remote communities do not typically provide funds for accessing prenatal and postnatal visits, as local physicians generally provide that care.

Appropriate rural maternity service levels

- Participants asked how RBI scores would be calculated for retirement communities with small birthing populations (i.e. Princeton) or affluent communities with a vulnerable population subset (i.e. Saltspring Island).
 - As for all communities, the RBI score is based on number of births, not population age, the fact that there are low birth numbers in retirement communities is taken into account.
 - Retirement communities have a disproportionately low number of births for their population size. If a population has few births per year, the RBI score will take those numbers into account.
- In communities with mixed populations of affluent and vulnerable persons, the



Symposium working session

vulnerability of the birthing population may be partially obscured in the RBI score. For example, the population of Saltspring Island, overall, has a high socioeconomic status, influenced heavily by a large, older population. The birthing population in the community, however, is more economically disadvantaged, which is not reflected in the BC Stats score for the Gulf Islands LHA.

- Some rural health service planners have privileged centralized maternity services in larger communities, in part due to the perceived safety of access to interventions such as caesarean sections.
- RBI scores are intended to reflect the optimal level of sustainable service for a given rural population. The closer the score is to a service transition point the more likely it is that the service will be to some degree unstable. For example, Bella Coola has a score of 9.9 (GP surgery range is 9 to 14) and has experienced intermittent GP Surgical services over the past 3 years and has now closed maternity services temporarily.
- The capacity of a maternity service depends to a great degree on the comfort level of the care provider team. If the team is driven to a sense of purpose and commitment to providing services that they believe are necessary for the community, then common challenges, such as weather, isolation, transfer ability, and staffing shortages, become manageable.
- Participants also recognized that to some degree there is a challenge to restarting services once they have been closed. Provider skills may be lost, alternative service patterns may be established, and it is not until outcomes are effected that consideration is given to restarting services.
- Ideally, the process of local maternity service review should include discussions with the community, particularly when a service is under threat of closure.
- Participants noted that the numbers calculated in RBI scores for certain communities (i.e. distance to nearest intrapartum services) are not accurate. It is important to fine tune the distance numbers calculated in RBI scores through consultation with community folk.

Potential models of rural maternity care teams

- Participants agreed that future models of sustainable rural maternity care should integrate multidisciplinary care provider teams in which midwives work in collaboration with or alongside physicians.
- The introduction of independently practicing midwives to more rural communities is an important next step that may potentially take place, based on community interest, through pilot projects in communities such as Tofino and Mount Waddington.
- Registered midwifery in rural communities is a recent development and there is some resistance from existing care providers. However, midwives have the potential to sustain local maternity care where existing care providers lack confidence in maternity care or are unwilling to provide it.
- There is support from the Ministry of Health and Canadian Association of Midwives to move forward with rural midwifery, but more work needs to be done on the ground to achieve support at the local level from existing rural hospital staff.
- In northeast British Columbia, doctors share call between Dawson Creek and Fort St.

John, which facilitates cooperation between the communities and back-up when GP Surgeons take leave or holidays. The region also benefits from training and teaching opportunities for the family practice resident program, which receives great support from the Ministry of Health.

- Participants noted that there is a rebirth in support for training GPs to enhanced skills such as caesarean section skills and these graduates could provide locums for existing GP Surgeons.
- Locum doctors who come to the community with specialized skills could also help local GPs maintain their skills and expand their skill sets.
- In the northeast there are no midwives, but the area is open to the introduction of midwifery. Currently, 80% of the doctors in the northeast attend deliveries.
- In Alberta, where midwifery is not publicly funded, clients must pay out of pocket for services. In Stony Plain, a shared care model of midwifery service funded by the community has increased local birthing numbers from 50 to 300 per year due to inflow from outside communities.

Potential aggregation of PSPS and RBI

- The RBI and PSPS levels could potentially be integrated together and participants discussed potential correlations and challenges between the two systems.
- Participants noted that PSPS levels consider specific categories of service based on weight and gestational age, such as care for babies <1800g. Repatriation of these newborns to their home community is effected as soon as their condition and growth warrants.
- Participants noted that in addition to intrapartum services, early newborn care needs to be addressed at the local level as hospitals often do not have the appropriate transportation, staffing experience, or facilities to accommodate newborns. Lack of local pediatric capacity is due in part to rooming in policies and the subsequent closure of nurseries.
- There are funding implications associated with designated PSPS levels creating a natural focus at the community level for higher level designation. Participants argued that, putting funding aside, it would be a more informed process of service level planning if we looked first at the measure of community need related to expected burden of newborn care and built services levels to meet those needs.
- Both the RBI and PSPS designate service levels based on safety, with the former based on population outcomes. Participants noted the myth of centralizing services is that it is safer, while the evidence suggests that providing appropriate services closer to home is optimal and that centralization does not necessarily lead to increased safety.

2 Data Reporting, Indicator Monitoring, and Process Control Charting

Sheryll Dale, BC Perinatal Health Program

Summary

The BCPHP is a provincial resource for regionalized perinatal services whose mandate is to optimize neonatal, maternal, and fetal health in BC. The organization's activities include:

- Collection and analysis of perinatal data;
- Development of clinical practice guidelines;
- Promotion and facilitation of inter-professional outreach education;
- Consultation and liaison with providers and facilities;
- Promotion of perinatal care networks within the province; and
- Provincial Specialized Perinatal Services.

The BCPHP disseminates provincial perinatal data through different materials, including hospital comparison spreadsheets, annual facility comparison reports, an electronic BC perinatal reporting tool (CD), as well as through special reports and individual requests.

Data on rural hospital outcomes were integrated into the provincial database in 1997-1998, meaning that the BCPHP currently has ten years of comparative data for rural BC. Outcomes for homebirths with registered midwives province-wide were integrated in 1998. The annual BC Facility Comparison Reports began as rural-only reports to compare similar hospitals and weigh outcomes against provincial averages. In the past four years, though, these reports have been requested for larger and urban hospitals.

In order to improve the content, readability, and relevance of the BC Facility Comparison Reports and other reporting materials, the BCPHP is interested in receiving feedback from users on the strengths and weaknesses of how perinatal outcomes are reported. When users read a comparison report, what decisions can they make from it? Of the 300 outcome indicators tracked by the BCPHP, which ones are users most interested in tracking? Which populations and hospitals would the users like to be compared? How can we start using the data more effectively in quality improvement?

Paying specific attention to two forms of indicator monitoring – run charts and process control charts – this session culminated in the following suggestions from participants:

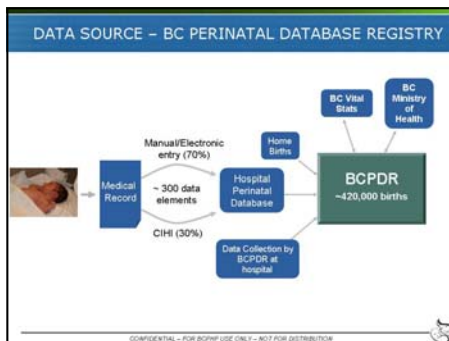
- Revise the BCPHP Facility Comparison Reports to include process control charts;
- Establish a system of “flags” for statistically significant indicator variance;
- Provide easy to read “report cards” summarizing facility performance;
- Provide electronic data so that an individual facility can analyze their own data in order to explore the meaning of signal “flags.”

Session outline

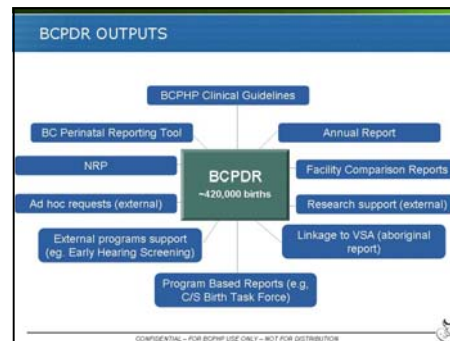
The BC Perinatal Database Registry (BCPDR), operated by the BCPHP is the data source for BC perinatal reporting. Data are collected from a variety of sources:

- Mother and Baby Hospital medical records
- Births at home attended by a BC Registered Midwife
- Data collection by BCPDR at hospitals
- BC Vital Statistics
- BC Ministry of Health

Each year the BCPDR collects data on approximately 41,000 BC births with 300 indicator outcomes reported for each (see Slide 1). This data is then analyzed and reported through various forms, including annual BC Hospital Facility Comparison Reports and spreadsheets, “British Columbia Deliveries by Maternal Residence and Delivery Hospital Highest Level of Service/Care” (see Slide 2). These reporting materials provide data to assist in healthcare quality improvement, but the way this data is presented and compared could be made more user-friendly.



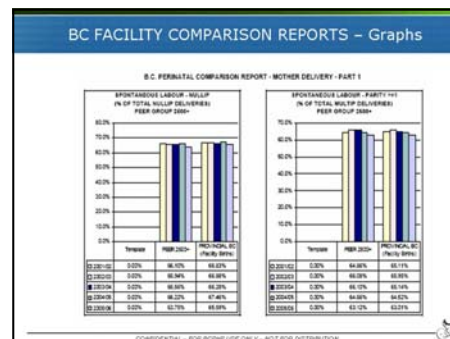
Slide 1



Slide 2

The table displays facility comparison data for spontaneous labour and cesarean sections. It is organized into three main sections: 'FACILITY TABLE', 'PREV GROUP TABLE', and 'POST GROUP TABLE'. Each section contains columns for 'Facility', 'Spontaneous Labour (%)', 'C/S (%)', and 'Total (%)'. The data is presented in a grid format with multiple rows for different facilities and groups.

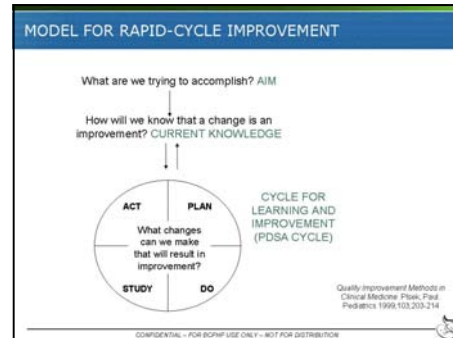
Slide 3



Slide 4

Currently, BC Facility Comparison Reports present data in tables and figures and compare data on individual indicators by hospital, peer group, and province. As well, the figures compare data for the past five year period (see Slides 3-4).

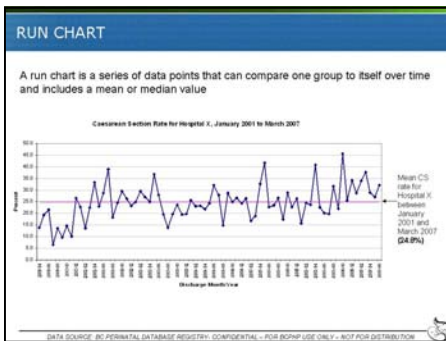
From a quality improvement standpoint, these reporting mechanisms attempt to provide feedback on hospital outcomes and signal the need for change or identify positive strides in hospital services. The problem that exists with current reporting mechanisms is that it is difficult to identify which variances from normal are significant. By *studying* outcomes data, decision makers and care providers can use current knowledge to inform changes and improvements in health services delivery (see Slide 5).



Slide 5

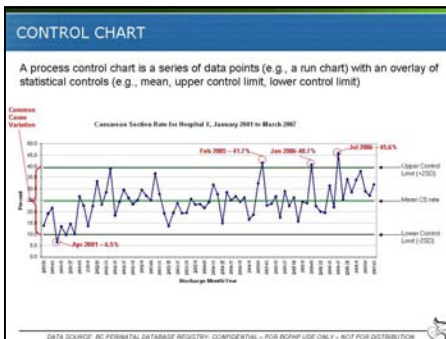
In addition to comparison tables and figures, the BCPHP is considering introducing two useful indicator monitoring forms to its methods of reporting strategies:

- Run charts
- Control charts



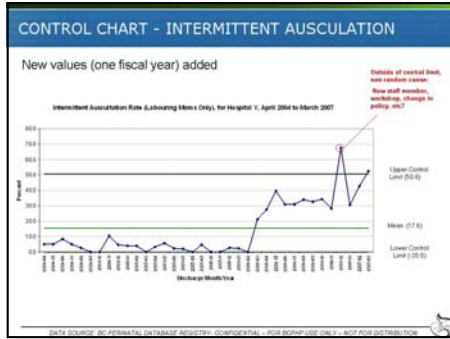
Slide 6

A **run chart** examines specific indicators by plotting a series of data points over time and includes a mean or median value. For instance, in Slide 6, a run chart tracks the caesarean section rate for Hospital X between January 2001 and March 2007 and indicates that the mean rate for that period of time was 24.8%. Visually, the run chart provides a clear illustration of the hospital's fluctuating caesarean rate. New data can be added to run charts each reporting period (i.e. weekly, monthly, quarterly, annually) depending on the frequency of the event and the availability of data.

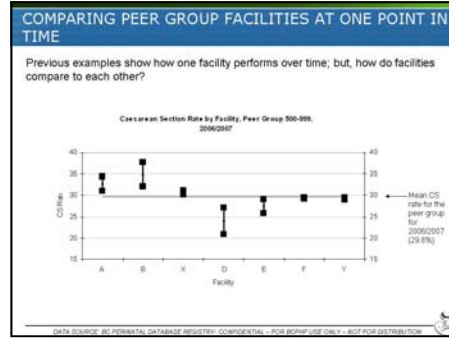


Slide 7

A **control chart**, or process control chart, examines specific indicators by plotting a series of data points over time, like a run chart, but it also contains an overlay of statistical controls (i.e. mean, upper control limit, lower control limit) that represent one or two standard deviations from the mean. Slide 7 illustrates again the caesarean section rate for Hospital X, but includes an upper



Slide 8



Slide 9

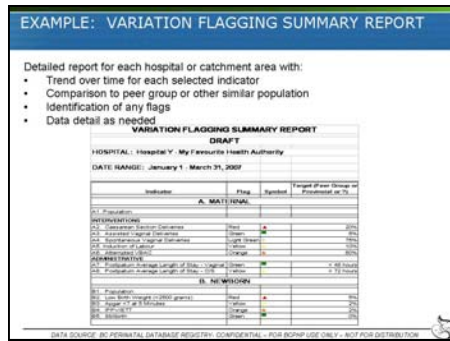
and lower control limit of two standard deviations from the mean caesarean rate. The control limits clearly distinguish points during the time period of January 2001 to March 2007 where variation in the caesarean section rate went above or below expected levels. This form of charting allows BCPHP to flag problem areas where a service should be evaluated.

To illustrate, we can consider the example of Hospital Y's intermittent auscultation rate of labouring mothers (heart rate monitoring by stethoscope at regular intervals) (see Slide 8). At this hospital, rates were significantly low, with a mean of 4.6 and upper control limit of 13.2, until February 2006 when they increase significantly and peak in December of that year. This chart illustrates the importance of data interpretation at the local level. This is a real-life example and the BCPHP did ask the facility about changes that may have affected these rates. The change in intermittent auscultation resulted from the introduction of a new data coder at the facility and a new program that was put into place. By maintaining sensitivity to indicator variance, data managers can flag apparent change and encourage local interpretation. This may lead to the identification of clinically significant opportunities for improvement.

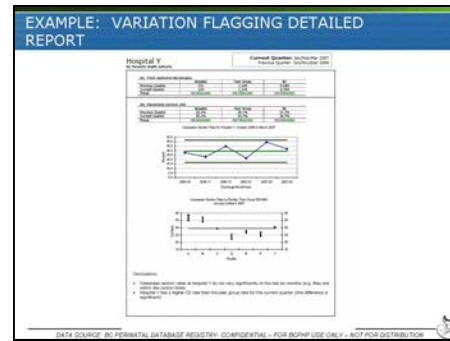
Process control charts can also illustrate how data compare between facilities. Slide 9 illustrates the caesarean section rates for 2006-2007 for a peer group of hospitals and indicates the mean cesarean rate for the group (29.8%). This chart illustrates that Hospitals F, X, and Y have caesarean rates that fall close to the mean, Hospital B has a rate statistically higher than its peer group, and Hospital D has a lower rate.

Current BC Facility Comparison Reports contain upwards of thirty pages of data and graphs. Typically, 90% of the data reported is normal while only 5% is out of variance. Through process control charting, the reports could become more user-friendly and easy to analyze. In the Facility Comparison Reports, the BCPHP proposes the following data be included:

- 1-2 page process control facility reports with clearly indicated “flags” for significant variance in outcomes;
- “Flags” would range from red to green, representing a range of outcomes of concern to outcomes demonstrating better performance than the peer group norms;



Slide 10



Slide 11

- Report cards would summarize indicators of significant variance by colour code and would include indicators that individual regions are most interested in tracking (see Slide 10);
- Data in electronic format providing comparison summary of individual hospital outcomes with those of peer groups to provide context for “flags” (see Slide 11).

Process control charting and variance reporting has the potential to build on the successes of the perinatal database registry in collecting and standardizing provincial hospital data, enhancing the usefulness of the data to health managers and providers.

Discussion

Personalized reporting mechanisms

- Participants expressed some support for the idea that process control charting addresses the needs of health authorities and may provide clearer information to support decision making.
- Version 6.0 of the BC Perinatal Database includes supplementary fields that each health authority can label for specific data indicators of interest. This allows health authorities to tailor the database to regional needs.
- Primary care providers appreciate feedback from other agencies (i.e. MSP) on their individual practice indicators, such as pap smears and mammograms. In maternity care, however, there is no mechanism to show care providers how their outcomes compare to their peers.
- Participants were particularly interested in comparisons of epidural and caesarean section rates and suggested integrating such comparisons into reports for individual care providers.
- Although the perinatal database does not capture individual physician’s names, it does track care provider type and it is possible to link the database at the individual

hospital, to other sources that do track names, such as the BC linked database. This is a possible direction for future reporting.

Development of “flags”

- The definition of red, orange, and green flags needs to be informed by clinician input to strengthen the clinical significance and the relevance and sensitivity of the indicator.
- There is a science of variance recognition that is more sensitive than just reporting one or two standard deviations. Integrating sensitivity to trends using sigma levels may be an option for the reporting process.
- The BCPHP has not yet decided on the sensitivity of classification. Classification should be flexible, rather than mechanistic, and take into account population demographics.
- There will be differences in classification of significant variations between the three categories of reporting: intervention rates, newborn outcomes, and maternal outcomes.

Selecting priority indicators

- The province, individual health authorities, and facilities have different indicator priorities, which could be recognized through catered reports. Importantly as the BCPHP brings all the indicators being monitored into a process control format, significant variance for a facility or region will become more transparent and identifiable and the capacity of the system to monitor a large number of indicators could be increased.
- To begin, the BCPHP could create process control charts for 10-20 indicators to establish the appropriate algorithm, after which all 300 indicators could be run.
- It can be a difficult and lengthy process to decide which indicators are of highest priority. Interior Health expressed that they have the foundation for the first 10-20 indicators because of the government reporting entity (GRE), Ministry of Health, and PSPS priorities.
- Many participants identified themselves as “numbers people” who appreciate looking through data themselves to identify and analyze trends. They recommended that reports include both the summaries proposed for a discrete number of indicators, as well as the entire data set usually included in BC Facility Comparison Reports.

Parallels in the Alberta Perinatal Health Program

- The Alberta Perinatal Health Program (APHP) has been creating run charts for hospital peer group comparisons, not for tracking and reporting data for individual facilities.
- Their run charts plot hospital indicators as well as population volume, geographic location, and level of service.
- The APHP’s goal is to present data for all hospitals so that users can decide for themselves what is comparable. This data is not publicly available or to other provinces in order to maintain professional rapport between facilities and stakeholder confidentiality.

- The APHP does not want to present a “big brother” approach by using flags because it is an organization at arm’s length from the Ministry. It instead conducts focused data request and responses.
- Providing flags, though, as an addition to detailed reports, would be useful for focusing and summarizing data. In addition, the range of flags, from red to green, is valuable in illustrating which areas are successful and which may need improvement.
- The APHP is embarking on a similar project to select priority indicators for Alberta. After four months, they have created a framework and hired two consultants. It is a challenging task, but the benefit of a provincial approach is that all users will work from the same set of indicators and keeps reporting consistent.

3 Data Reporting Priority-Setting *Facilitated small group activity*

Participants were divided into small groups, each with a facilitator from the Centre for Rural Health Research. The groups were presented with case studies describing problematic rural maternity health service planning scenarios. After discussing the scenario, each group was responsible for brainstorming how they would prepare a report for the senior executive of the Health Authority outlining an approach to planning optimal services for the community. The groups were asked to consider what data they would need and how they would approach the problem. The goal of this session was to brainstorm what data management questions and concerns emerge from administrative crises to help inform the BCPHP of what data to provide to assist decision making on the ground.

Case Study 1

A rural community of 5,000 people has a local diagnostic and treatment centre. In the space of three months there are two term stillbirths in the population. The nearest rural birthing hospital with caesarean section is 90 minutes away to the south. There is a story in the local paper that raises the question of a birthing service and hospital for the community. On exploring further you learn the clinic averages one precipitate birth a month and that there is a First Nations population of 1,600 scattered in several small communities north of town.

Discussion

Participants were interested in acquiring more data in order to have a full understanding of the context of these stillbirths and precipitous births:

- What is the community's RBI score?
- What is the context of the community? What does its "Community Profile" look like?
- How many women in the community give birth locally and how many away?
- How many births take place in the Caucasian population? In the Aboriginal population?
- Is the community socially and economically vulnerable? Is it too expensive for moms to travel to the nearest intrapartum service? What is the community's addiction rate?
- What age is the birthing population? What is the average gestational age of delivered babies?
- What is the annual number of precipitous deliveries occurring out of hospital?
- How many of the precipitous births are Aboriginal? Why did they not leave the community? Were their reasons cultural? Financial?
- What are the community's desires? Where and how would they like birth to take place?
- Who is providing prenatal/postnatal care and education?
- What is the transfer protocol in the community? What is the local role of BC Ambulance Service? Do ambulance attendants have labour and delivery skills?
- Are there any midwives or lay birth attendants in the community?
- What does the 90 minute distance to the nearest birthing hospital constitute? Is this distance by road or ferry?
- What are the maternity care and emergent delivery skills of the local care providers? Is the local Aboriginal health nurse competent in maternity care? How many physicians are in the community?
- What are the annual provincial numbers for stillbirth compared to the numbers for this community?
- Are these intrapartum or prenatal stillbirths?
- Are there diagnoses for the stillbirths? What are the miscarriage rates? Are we losing babies at a high rate early on compared to near term?
- What are the newborn health demographics of the area?
- Are there maternity care pathways in place? Do women get transferred at a certain number of weeks?
- How do we provide relief and financial support for any care providers who are integrated into this small community?
- How many births would new care providers need to keep up their skills?
- What are the existing resources available and what new resources need to be added into the community?

One group prepared the RBI score for the case study community:

- Population Birth Score
 - Catchment of 5,000 including 1,600 vulnerable individuals.
 - On average there are 10 births per thousand.
 - Thus we have 55 births in a year (additional births due to high Aboriginal population).
- Calculating Social Vulnerability
 - We know they are socially vulnerable and we arbitrarily gave them a score of 1.2
- Travel time
 - 90 minutes to the nearest cesarean section service = Isolation factor of 3.

$$5.5 \times 1.2 + (1 \text{ or } 2) = \mathbf{7.6 - 8.6}$$

Local intrapartum services without operative delivery

Suggestions for addressing this maternity care health services problem included:

- Accessing StatsCan, BCPHP, and RBI data for this community.
- Disaggregating Aboriginal data from general population outcome data.
- Finding ways to identify Aboriginal women in the database. Currently, identifying Aboriginal women/babies in the database is a struggle. Vital Statistics has the information, which BCPHP is trying to attain, but currently, ethnicity is a hole in the data.
- Comparing the birthing outcomes of this community with those of comparable communities across the province.
- Establishing a community consultation process that includes presenting the community with a proposed collaborative care model of maternity care with Aboriginal midwifery who also provides well-woman care, the option of a birthing centre, and Aboriginal doulas.
- Providing cultural sensitivity training for larger referral centres to encourage safe and comfortable birthing experiences for Aboriginal women who must travel to give birth.
- Providing education and support to the community to let them know about the lack of local birthing services and the protocol for birth away.
- Planning services based on population projections of what a community will need in the coming five years. Proactively adding a service could prevent morbidity.
- Implementing an exchange program where nurses in rural areas could come work an urban area to improve skills, while nurses in high volume facilities are rotated into rural areas. Also, have practitioners from the local referral hospital rotate into the small community to help maintain competency. Many rural practitioners have stated that they want to go into rural communities for short periods of time.
- Getting students from the new UNBC rural specialty program, which covers everything from labour to emergency, into rural areas.
- Inviting traveling midwifery outreach clinics to visit the small community, as this may lead to reduced numbers of interventions.

Case Study 2

A rural hospital with a long standing GP Surgery service and visiting consultant obstetricians averages 200 births per year. The local community has a population of 15,000 and there are two other communities within an hour to the north which cumulatively add another 12,000 people. The next nearest caesarean section service is over 70 minutes to the south over a mountain pass that is often closed in bad weather in the winter. Two midwives apply to the hospital for privileges and are refused because of barriers to interprofessional practice. You learn that over 100 women a year from the three communities are bypassing local services to access midwifery care to the south.

Discussion

The groups were interested in more data to help inform their decision making:

- Are women birthing at home outside the system?
- What are the reasons of the 100 women who choose to leave to give birth each year?
- Do women in the community want midwifery services?
- At what level are privileges granted? Community or Health Authority?
- Are medical bylaws consistent across the health authority?
- What are the local barriers to interprofessional practice?
- Who are the key opponents of integration – Physicians? Administrators?
- Would it be possible for midwives to collaborate with doctors in the south community, not the local community? Would community women be comfortable with that?

One group calculated the RBI score for the community:

- Population Birth Score
 - 200 births/year = score of 20
- Calculating Social Vulnerability
 - Assume average social vulnerability = 1
- Travel time
 - 70 minutes to the nearest caesarean section service = Isolation factor of +1 or +2.

RBI Score of 21-22 = Mixed Model

The groups emphasized the need for broad changes in attitudes towards midwifery and the importance of ongoing efforts of health authorities in integrating midwives into rural maternity services. The small groups consisted of both decision makers and care providers, who equally emphasized that many practitioners do not understand midwifery care. Some of their comments included:

- Physicians do not have the right to refuse to work with midwives. As licensed practitioners, midwives are legally protected to practice in this province.
- Although physicians may be opposed to midwives, medical advisory committees do not have the right to refuse a licensed practitioner from practice.
- Communities without local caesarean section back-up should employ collaborative teams that include midwives.
- One method for improving interprofessional relationships is the MoreOB program, which promotes supportive integrated learning and practice environments.
- Physicians who prevent the integration of midwifery are thinking more about themselves than about community need. They are out of date and behind the times.
- To appeal the physicians' prevention of midwifery integration, it would be useful to approach the board, which is usually responsive to the community.
- The Northern Health Authority has the highest number of GP Surgeons and the smallest number of midwives of the four regional health authorities.
- If you force the midwives in, you still need to find someone at the hospital to provide support.

Case Study 3

There is a front page article in the Sun about a woman from a small northern community who died in a car accident en route to the hospital in which she planned to give birth. It was mid-February and the roads were slippery and her husband who survived admitted that they were driving very fast as he was afraid that the baby would be born en route. It was her second baby and she started having contractions at 37 weeks gestation age. Her first baby had been delivered at the hospital in her home community, but the hospital had closed its maternity services the previous year.

Discussion

To inform their decision making, the group members were interested to know:

- What was the distance from the woman's community to maternity services?
- Was there cell phone coverage? Did the referral centre know they were coming?
- What was the local hospital's protocol for transferring patients after closing the local maternity services?
- Was there an ambulance? What is the community's relationship with BC Ambulance Services? Would it have been possible to have an ambulance meet them halfway?
- What information was covered in making the decision for her to travel? Did she go to the local hospital? Did the emergency room provide an assessment? The hospital would have been responsible to send a hospital staff member with her in the ambulance or call someone in.
- Did the local hospital have any other services? The local emergency ward would have been a better alternative to driving.
- Was there a formal community consultation process when local services were closed?
- Is there a maternity care plan clearly in place for the community?
- Did any similar events occur historically while the hospital still had services?
- What was this woman's informed consent process? Did she have adequate information to make the right decision to leave so quickly? What did she know about her risks?
- What was the socioeconomic status and education level of the woman?
- What was the woman's prenatal care and education?
- What information in the BCPHP database could help in this situation? Perhaps with damage control?
- Does the perinatal database track high risk pregnancies?
- Have there been other maternal deaths due to car accidents elsewhere in province?
- As transportation challenges change based on the time of year, are women planning their pregnancies according to the seasons?

Specific actions that the group would take included:

- Using population data from the postal code catchment to see how many births take place in the catchment. This would illustrate how many women have to travel to the referral hospital to give birth.
- Providing a standard emergency delivery kit to physicians in communities with no intrapartum services.
- Establishing an "expectant moms day" for women in outlying communities so they become familiar with the referral hospital, get to see the back of an ambulance, and have this education marked as completed in their charts (as currently occurs in Trail).
- Providing prenatal and transfer education for partners and parents as well, so that they act on knowledge, not instinct.
- Establishing a clear maternity care pathway from the local community to the referral

hospital. In some communities, the labouring mom will be assessed in the local community before moving on to the delivery hospital. In other communities, there is no maternity care pathway and the protocol for transfer/travel is not clear.

- Using the RBI score of the community, check the measure of local need and compare to other isolated populations in the province.

Case Study 4

A rural referral community has a hospital caesarean section rate of over 45% for two years in a row. They carry out 260 births per year and have three obstetricians on staff. The one hour catchment population is 20,000 and there are four other surrounding communities with local maternity services that range in population from 5,000 to 8,000 and in distance from 60 minutes to 2 ½ hours travel time depending on weather. The community is anxious to add a second pediatrician as the first pediatrician is burning out.

Discussion

The small groups were interested to know more about the factors that may have influenced this high caesarean section rate:

- What is the RBI score for the community?
- Does each OB have the same caesarean section rates?
- What is the primary caesarean section rate compared to the repeat caesarean section rate? What is the elective caesarean section rate?
- What are the indicators for these caesarean sections? Is there a trend towards higher caesarean section rates for women from outlying communities or at certain times of the day or year?
- What is the BMI of the population, as high population BMI can lead to high caesarean section rates?
- What is the age of the population undergoing cesarean births?
- Is there a cultural preference among birthing women for caesarean section?
- How many people refer to the community?

- What are the hospital's induction and epidural rates?
- How many local physicians attend deliveries? What are their philosophical perspectives on caesarean sections?
- What are the practice patterns and shared call patterns for doctors? Do different patterns reflect physicians' lifestyles or their patient load?
- Are there homebirths in the community that are not being accounted for in the overall catchment caesarean section rate?
- Do any local family physicians have an interest in developing a pediatric specialty?
- What is the critical mass to sustain a full-time physician?
- Does the referral hospital have a nursery? How soon can babies be sent back to this community?
- Regarding pediatrician need, what is the child population in the community? What is their level of social vulnerability? Is there a pediatrics department or in-patient unit?
- Is there a local child health plan? Are families using the emergency room for pediatric health?
- What is the RIW (resource intensity weight) attached to each case?

Possible solutions to mitigate the rising caesarean section rate and pediatrician burn-out included:

- Having a GP with pediatric experience in the community.
- Integrating midwifery and doula services, which are proven to reduce caesarean section rates.
- Investigating the factors influencing the 45% caesarean section rate to see if it is inflated by an influx of women from outlying communities who are high risk or emergent transfers.
- Lowering the rate of caesarean sections for primiparous women, as they will likely lead to an increase in caesareans for second births. There may also be a greater need for a pediatrician then.
- Showing projections of rising caesarean section rates to Health Authority head administrators.
- Investigating if there is sufficient volume for a second pediatrician. When one practitioner is overstressed and second one is introduced, often the new practitioner does not get adequate patient volume or challenging cases and leaves within the year.
- Looking at a range of communities to determine what level of service fits best – the smallest communities get a visiting pediatrician; at a certain size you get a local GP specialist; and at even larger sizes you get a pediatrician, and so on. There are no numbers available for determining the critical mass of pediatrician patient load, but patient vulnerability and population size are important factors. The Rural Birth Index follows this planning model.

Discussion of Data Management Strategy

Following the small group working session each group presented their data management ideas. Highlights included reflections on the importance of educating physicians and rural communities on the benefits of interprofessional collaboration with midwives. All groups emphasized that behind the data there is a story that provides context for decision making. Background stories also prevent us from placing blame on individuals for rural maternity care crises. It is important to position data within the context of practice and birth experiences as well as the larger scope of demographic data, such as provided in Centre for Rural Health Research Community Profiles. This session was a valuable opportunity for participants to learn more about the problems faced by colleagues in other regions and for Health Authority representatives to learn how to deal with each other's issues.

Key discussion points included:

- Expand the MoreOB program to more regions to facilitate interprofessional collaboration and improved practice safety;
- Integrate the Rural Birth Index into raw data used for decision making (this would be particularly useful for Case Study 1);
- Improve collaboration, consultation, and transfer between hospitals through supportive physician working relationships between tertiary specialists and local physicians;
- Provide BC Bedline and tertiary centres with maps of communities that include PSPS and RBI scores, as well as Community Profiles, so that they have an understanding of resources available at rural facilities and can use a standard language with which to communicate;
- Send midwives and primary health care nurses into remote and high risk Aboriginal communities to look after well-woman and obstetric care, as many women do not want to travel to the hospital for check-ups;
- Prepare community contingency plans for women who have to leave to give birth.

4 General Discussion

Facilitated by Health Authority Perinatal Leads

Summary

This final session provided the opportunity for participants to explore the implications of the data management strategies outlined during the day. The Health Authority Perinatal Leads facilitated a discussion that dealt broadly with data management issues, but gave specific focus to on-the-ground rural maternity care administrative issues. Discussion of current scenarios gave rise to ideas on how to mitigate the stress of fragile services for care providers and women.

Session outline

Case examples of maternity health service planning problems can provide insight into common issues and regional solutions. The discussion began with a description of current services in 100 Mile House, where hospital staff are becoming increasingly uncomfortable with intermittent GP Surgery services and low birth volumes affecting nursing competency. Some solutions posed for this strained maternity service included:

Data management

- Looking at the RBl score and Community Profile for 100 Mile House to determine community needs and current level of care;

Prioritizing community need

- Assessing current challenges:
 - Intermittent GP Surgeon service,
 - Staffing problems,
 - Competency based on volume (both surgical and maternity),
 - Nurses have high anxiety,
 - Sterilization challenges,
 - Pain management,
 - Many nurses not trained for OR;
- Maintaining local OR services, which provide more than just caesarean section capabilities;
- Creating sustainable working environments for GP's and GP Surgeons to prevent the loss of local maternity care;
- Weighing the costs of providing care against the costs of not providing care, such as attrition of care providers and loss of pediatric skills;
- Considering the implications of increasing intrapartum capacity in a referral community, which leads to erosion of maternity services in surrounding small communities;

Innovative programs

- Implementing MoreOB to instill confidence and competence;
- Implementing low risk obstetrics and sending high risk mothers to Williams Lake, the referral community;

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- Developing a community consultation process for consensus decision making in changes in level of service;

Health human resources

- Developing strong relationships with Williams Lake and getting obstetricians to visit 100 Mile House for clinic and caesarean section services, as visiting specialists can help sustain a rural OR;
- Having Health Authorities express a need for more GP Surgeons trained and supported in a rural BC context;
- Providing nurses with BCIT rural nurse training and the time to practice in high volume facilities;
- Bringing nurses from larger centres to rural communities for locum services while rural nurses go to larger centres for training, skill updates, and doula education;
- Creating rural and urban “nursing swaps” where nurses get experience in different environments;
- Classifying these “swaps” as internship education in order to bypass the collective agreement issue that normally prevents nurses from crossing regional boundaries;
- Developing a traveling outreach midwifery program to enhance local prenatal and postnatal care, while doctors continue to provide labour and delivery services;
- Having Health Authorities express a need to increase the number of midwives graduating from the UBC program each year;
- Expanding accreditation of rural midwives to include a blended model of care including teen clinics, breast health, well women clinics, and sexual health, reflecting a nurse practitioner model of care.

This conversation of fragile rural intrapartum services led to a discussion of three other rural communities, Invermere, Chetwynd, and McBride. The conversation focused on:

- Developing sustainable options for communities whose populations substantially increase during the summer;
- Improving referral hospital support for outreach nurses in First Nations communities;
- Planning for closure of services in communities (i.e. McBride) where experienced maternity staff are soon retiring;
- Comparing decision making between the example community and communities with similar challenges.

Perinatal leads were particularly interested in moving forward with the development of 10-20 indicators for the BCPHP’s proposed process control charts. In particular, they discussed:

- Developing a schedule for creating these indicators in a timely fashion (i.e. within the year);
- Gaining feedback from the BCPHP Surveillance Committee;
- Having the Health Authorities present their top indicators to the BCPHP;

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- Prioritizing process control charts for communities that have particularly fragile intrapartum services;
 - Providing users with process control charts on a regular basis;
 - Defining “normal birth,” as Great Britain has done, and including it as an indicator on process control charts;
 - Avoiding the creation of “benchmarks” for outcomes and leaving the interpretation of data to the clinician.

Conclusions

This concluding session provided stimulating discussion on the context of maternity services in rural British Columbia, which is central to any informed discussion of data management services. Participants stressed that in order to develop sound data management and reporting mechanisms, they must situate data within the context of lived, day-to-day rural maternity care experiences. Although the Health Authorities are eager to receive process control charting in the immediate future, the charts are still in the developmental phase and the information discussed at this symposium will be used by the BCPHP Surveillance Committee to assess the charts proposed and to determine next steps forward.

Within the context of other research being conducted in rural maternity care, it was observed that the RBI scoring developed by the Centre for Rural Health Research represents Phase 1 in a three-stage planning process: 1) predicting need; 2) assessing feasibility; and 3) determining administrative priorities. Research being conducted by the Maternity Care Research Group headed by Michael Klein could be said to involve Phase 2, feasibility.

Participants outlined the next steps they would like to see taken from this working symposium:

- Integrating the PSPS levels of care with RBI scores;
- Scheduling a follow-up meeting for the BCPHP and CRHR;
- Having the Health Authorities submit their priority indicators to the BCPHP;
- Having follow up from the BCPHP to assess whether, once in use, process control charts for priority indicators are being used.

MOVING FORWARD

NEXT STEPS IN OUTCOMES REPORTING

Recommendations

A number of potential recommendations arose from the proceedings, as listed below:

1. Rural Reporting Issues
 - a. Current Local Health Area (LHA) reporting should be supplemented for rural areas by population catchment reporting based on geographic proximity to hospital services.
 - b. Hospital service level should be defined across a range from no intrapartum care to cesarean section by specialist only (as listed in Slide 20 of session one).
 - c. The BCPHP should consider integrating the Rural Birth Index system of classification with PSPS Levels of Service in order to enhance the discrimination between service levels in smaller rural communities.
 - d. Health Authority Perinatal Leads will provide the BCPHP with their top 10-20 priority perinatal outcome indicators.
 - e. Run charts and process control charts should be integrated into BCPHP reporting materials to facilitate Health Authority decision making on priority perinatal outcome indicators.
 - f. The BCPHP should facilitate the development of an out-of-province birth reporting system to monitor births to residents of British Columbia that occur in other provinces and the United States.
2. Rural Maternity Services
 - a. Multidisciplinary care provider teams, including Midwives and General Practitioner Surgeons, are integral to the sustainability of rural maternity services and the Ministry of Health and Health Authorities should actively support their training, remuneration, continuing education, and locum coverage.
 - b. Include community folk in the consultation process when local perinatal services are under threat of reduction or closure.
 - c. Health Authorities and the Ministry of Health should provide appropriate financial support to rural families that must travel for intrapartum services (based on social vulnerability).
 - d. The Ministry of Health, BCPHP, and Health Authorities should formalize support services, remuneration, and policy for cross-border intrapartum care when service access in British Columbia is unavailable.

APPENDIX

List of Participants

NORTHERN HEALTH AUTHORITY

Rose Perrin	Regional Program Coordinator MORE OB, Perinatal Lead
Dr. Michael Pilgrim	MD, Family Physician, Dawson Creek
Alison Giddings	Head Nurse, Bulkley Valley District Hospital
Dr. Octaaf Bulterys	OBGYN, Dawson Creek & Dept Chief, NEHSDA

INTERIOR HEALTH AUTHORITY

Marty Willms	Leader Maternal and Child Services, Planning and Improvement, Perinatal Lead
Donna Flood	Director of Acute Care, Kootenay Boundary Regional Hospital
Chris Ondrik	Clinical Coordinator OBS, Cranbrook
Deb Runge	Site Manager, Acute Care, Cariboo
Ann Crawford	Manager, Women's Health and Neonatal Services, Royal Inland Hospital

VANCOUVER ISLAND HEALTH AUTHORITY

Lenora Marcellus	Leader of Perinatal Program Development, Perinatal Lead
Jo'Anne Yearley	Manager Perinatal NICU and Pediatrics, NRGH
Jean Wheeler	Manager of Rural Health Services
Pam Rardon	Nurse Lead/ Educator, Port McNeill

VANCOUVER COASTAL HEALTH AUTHORITY

Patty Keith	Regional Planning Leader, Maternity and Pediatrics, Perinatal Lead
Donna Wong	Decision Support Data Analyst
Dr. Brenda Wagner	Regional Perinatal Physician Planning Leader, PHSA/VCH

FRASER HEALTH AUTHORITY

Kim Williams	Director, Planning & Development, Child, Youth & Perinatal Services
Amin Jivanni	Manager, Decision Support Services
Karen Hatchwell	CHIM, Decision Support Analyst

MINISTRY OF HEALTH

Sanja Ristic	PHSA Health Authority Manager
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ALBERTA PERINATAL HEALTH PROGRAM

Nancy Bott	Coordinator, Information Management and Research
Sharon Zhang	Epidemiologist

BRITISH COLUMBIA PERINATAL HEALTH PROGRAM

Karen Vida	Provincial Director
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Cathe Johnson	Provincial Perinatal Analyst
Terri Pacheco	Provincial Perinatal Analyst
Lucy Barney	BCPHP, Nurse Consultant for Perinatal Aboriginal Health

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