Sustainable Rural Maternity Care: A Comprehensive Approach to Program Planning

CAHSPR

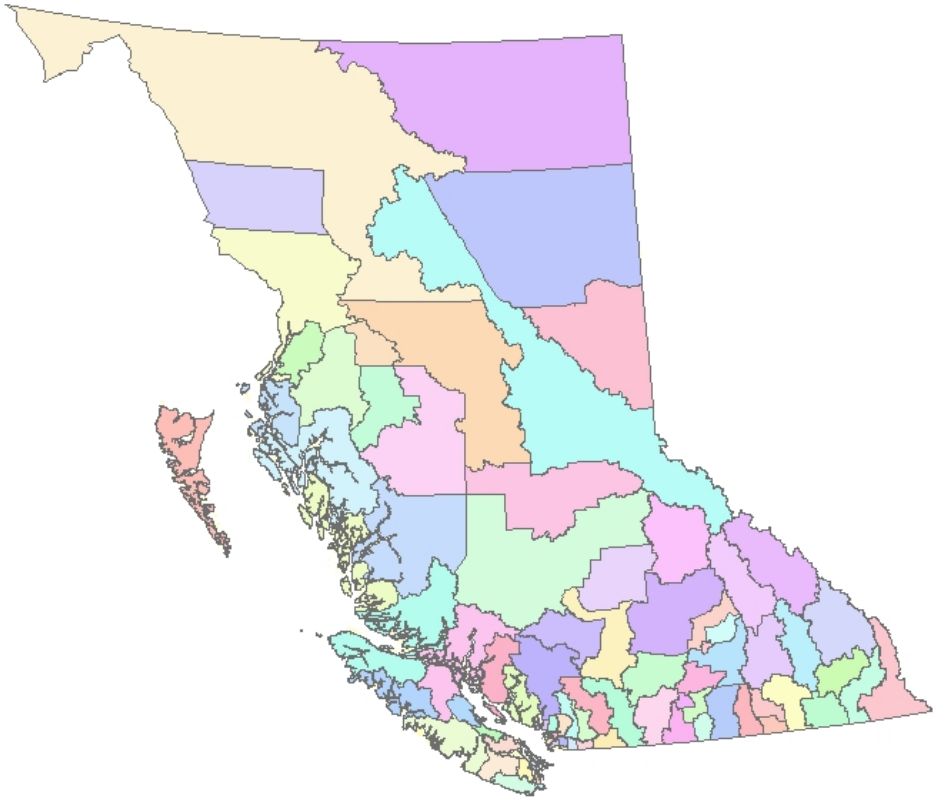
May 26th, 2008

The Centre for Rural Health Research

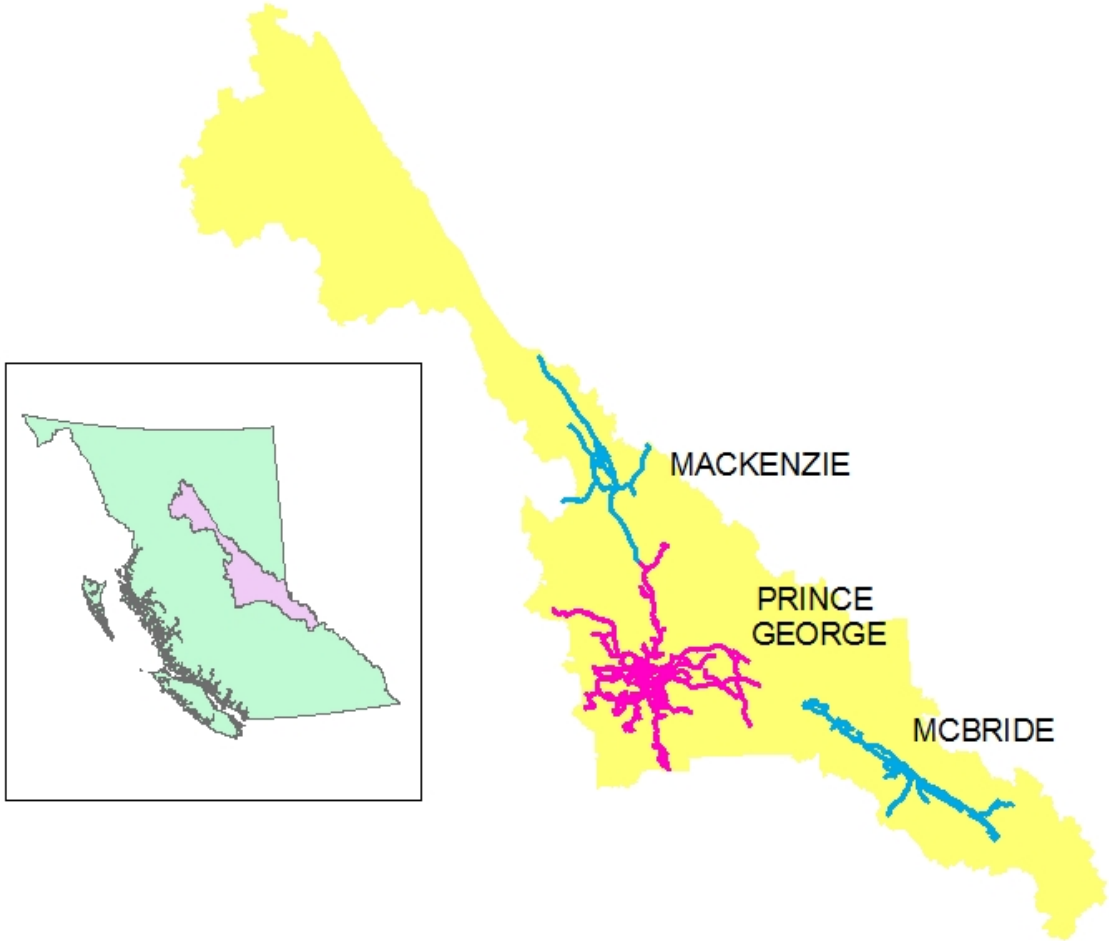
Objectives:

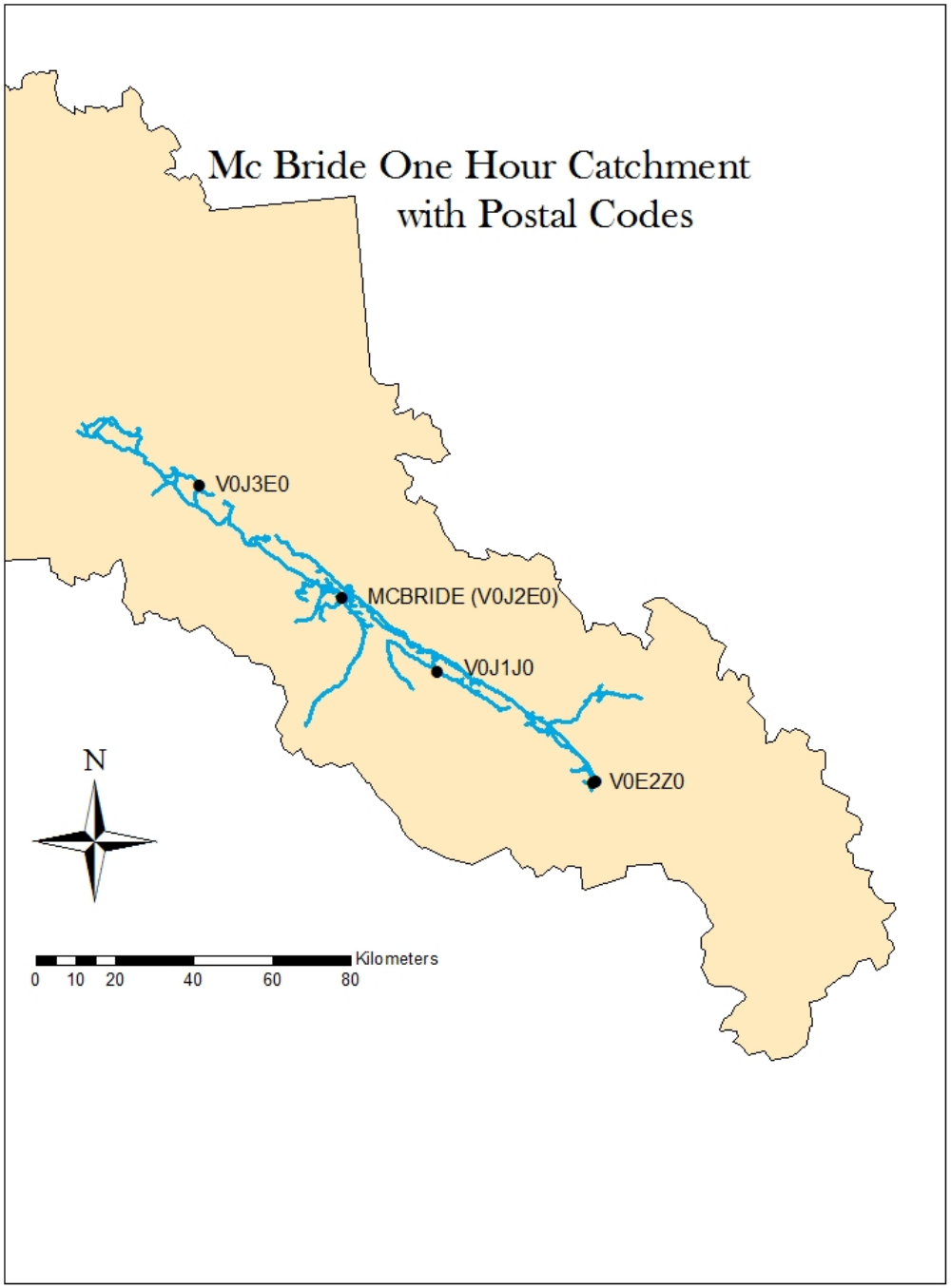
- To explore the implications of rural population catchment definition on hospital service planning.
- To apply the reasoning to rural maternity service planning in British Columbia.
- To outline the Rural Birth Index planning tool.

Local Health Areas

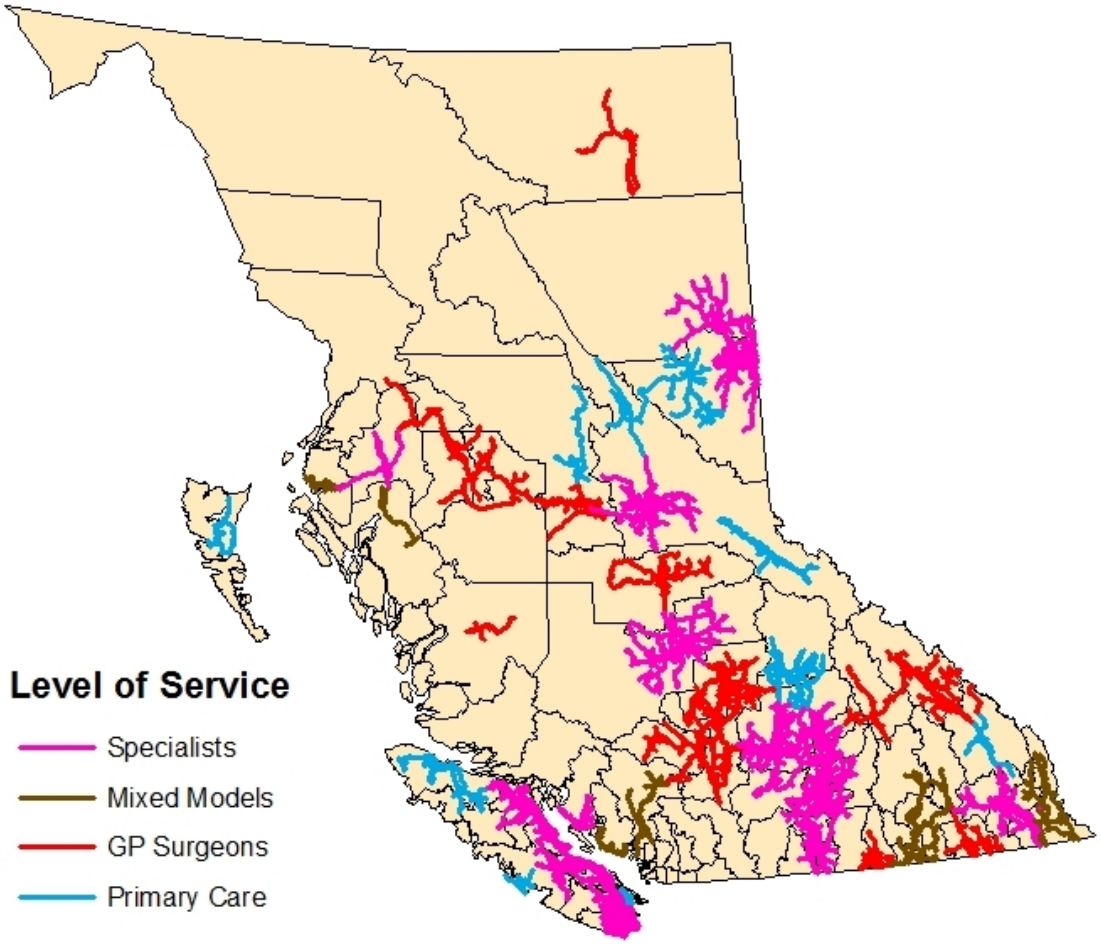


Prince George Local Health Area

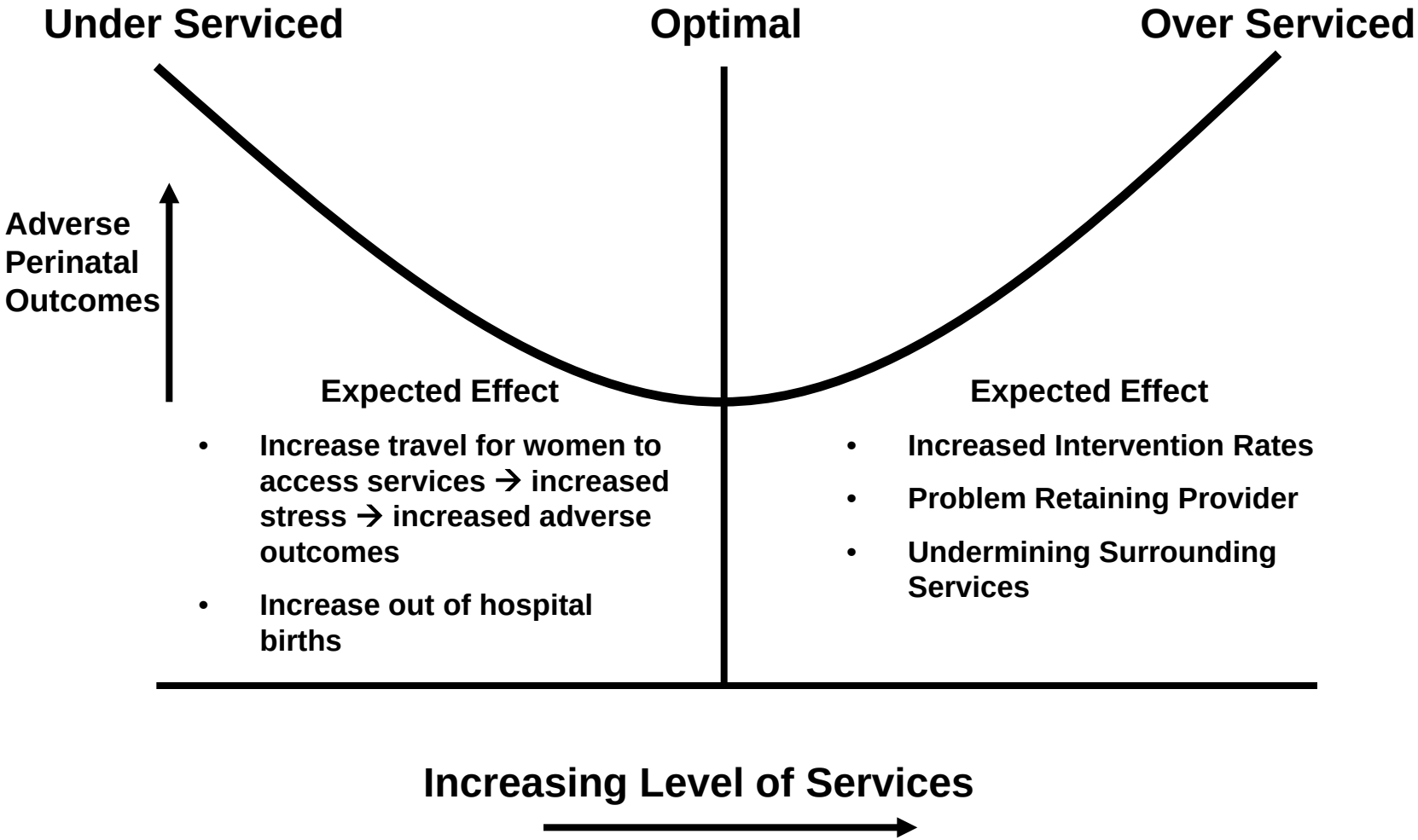



Mc Bride One Hour Catchment
with Postal Codes
V0J3E0
MCBRIDE (V0J2E0)
V0J1J0
V0E2Z0
N
Kilometers
0 10 20 40 60 80

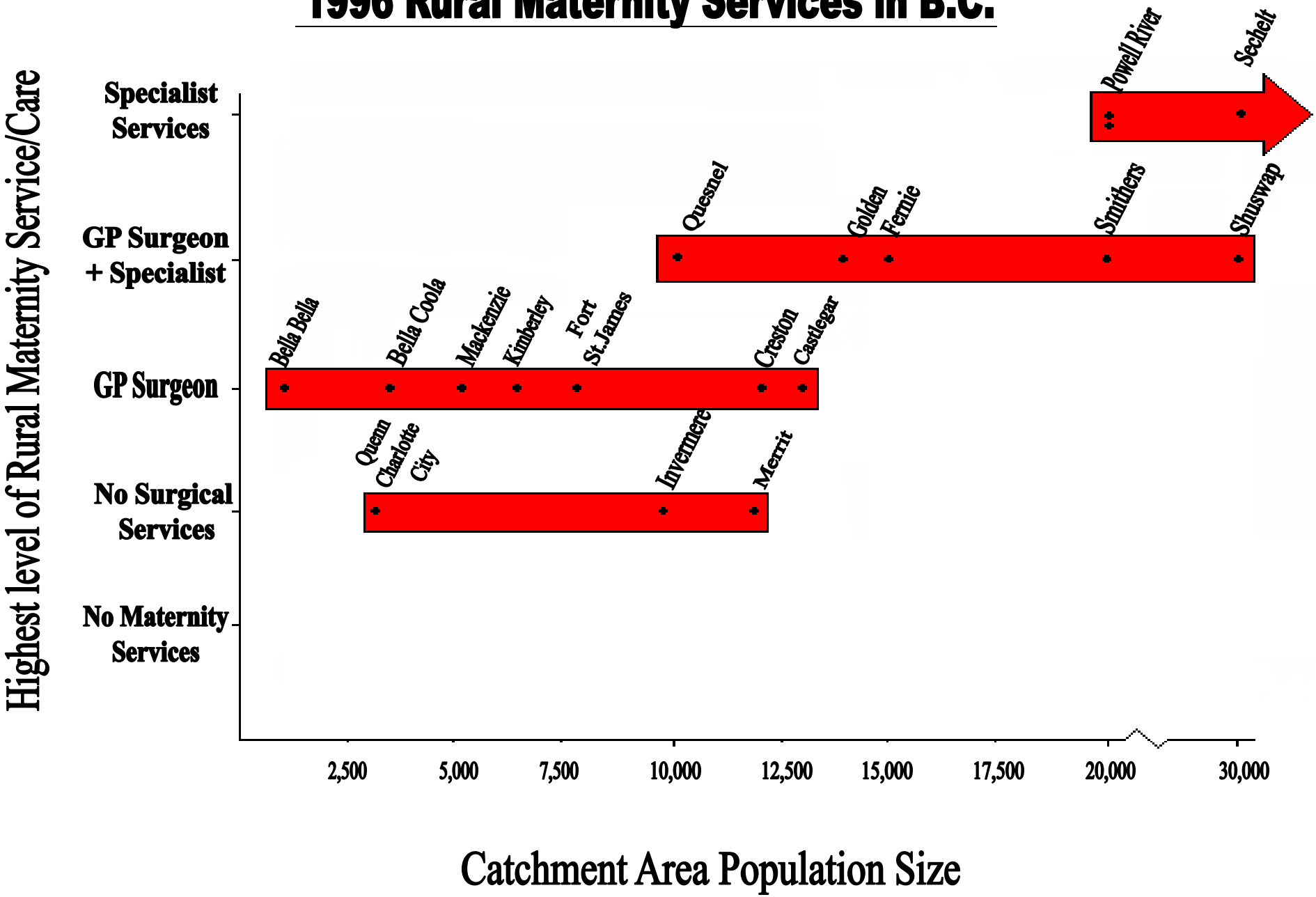
Local Health Areas Overlayed by One Hour Catchments



Level of Maternity Services and Population Need



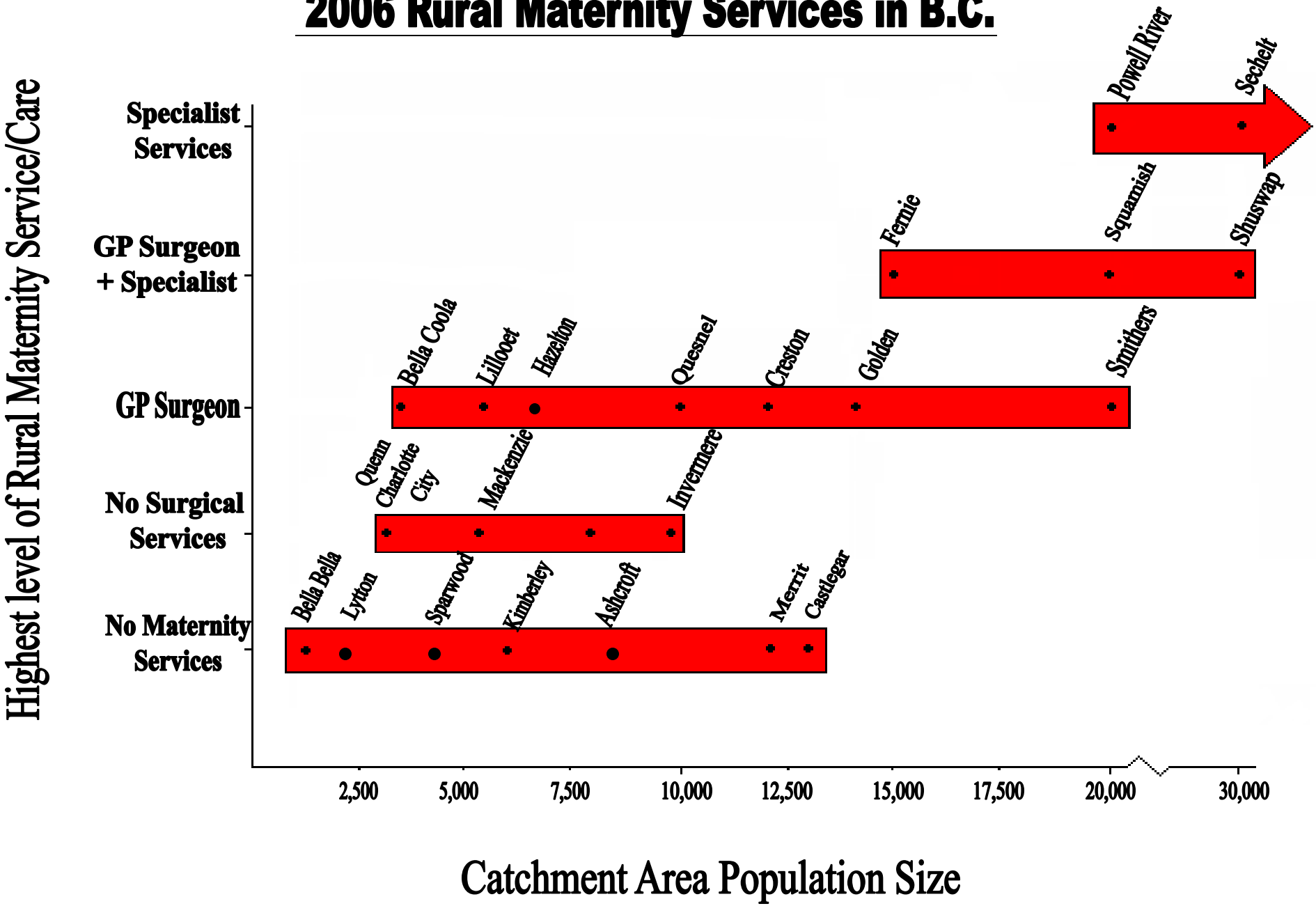
1996 Rural Maternity Services in B.C.



Maternity Service Closures in B.C. since 2000

- Kimberly and District Hospital (May 1/02)
- Sparwood General Hospital (May 1/02)
- Arrow Lakes Hospital (Nakusp)
- Castlegar and District Hospital (March 1/02)
- Summerland General Hospital (June 00)
- South Okanagan General Hospital (Oliver) (April 1/00)
- Nicola Valley General Hospital (Merritt) (April 1/01)
- St. Bartholomew's Hospital (Lytton) (April 1/01)
- Ashcroft and District Hospital (April 1/02)
- Fraser Canyon Hospital (Hope) (April 1/02)
- R.W. Large Memorial Hospital (Bella Bella) (2001)
- Saanich Peninsula Hospital (Saanichton) (May 1/02)
- Masset Hospital (QCI/Haida Gwaii) (May 2002)
- Mission Hospital (2002)
- Alert Bay (2002)
- Port Hardy (2002)

2006 Rural Maternity Services in B.C.



Background

- Development of the Rural Birth Index (RBI) was informed by data gathering through 6 funded projects involving:
  - Repeat visits to 23 communities;
  - Interviews/focus groups with
    - 121 rural women;
    - 216 providers;
    - 49 administrators/key informants

The RBI Model

A health service delivery tool to determine the appropriate level of rural maternity service for a given rural community population.

Methodology

- Developing a formula based on comprehensive and prolonged immersion in the phenomena of the sustainability of small rural maternity health services in one Canadian Province.
- Recognizing the dominant nature of population need and degree of isolation in predicting level of service for small rural populations.
- Sensitivity analysis to establish optimal weighting of components of the formula and service level transition points.

Component parts of the RBI

To project the appropriate service level for a given community, the RBI Model takes into account 3 factors.

- Birth rate;
- Social vulnerability,
- Proximity to nearest cesarean section service

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.

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/sep/i_lha/lha_main.asp

RBI Model: 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 Cesarean Section provided locally then distance to next service is calculated as if existing local service was closed.*

RBI Formula

RBI= (PBS x APV) + IF

RBI: Rural Birthing Index

PBS: Population Birthing Score

APV: Adjustment for Population Vulnerability

IF: Isolation Factor

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

RBI Model: Limitations

- Intended for application to rural populations of under 25,000 and has been developed within the context of British Columbia's geography and health policy structure.
- Population and Birth data is reported using adapted Local Health Area mapping rather than 1 hour surface travel time.
- The adjustment for population vulnerability is an average across the LHA and is likely to underestimate the degree of vulnerability of the women who make up the parturient population.

Three Examples of application of the RBI Model

- Summerland
- Queen Charlotte city
- Merritt

Summerland

Summerland

Data:

Average # of births (5 years): 71 → **RBI Factors: PBS: 7.1**

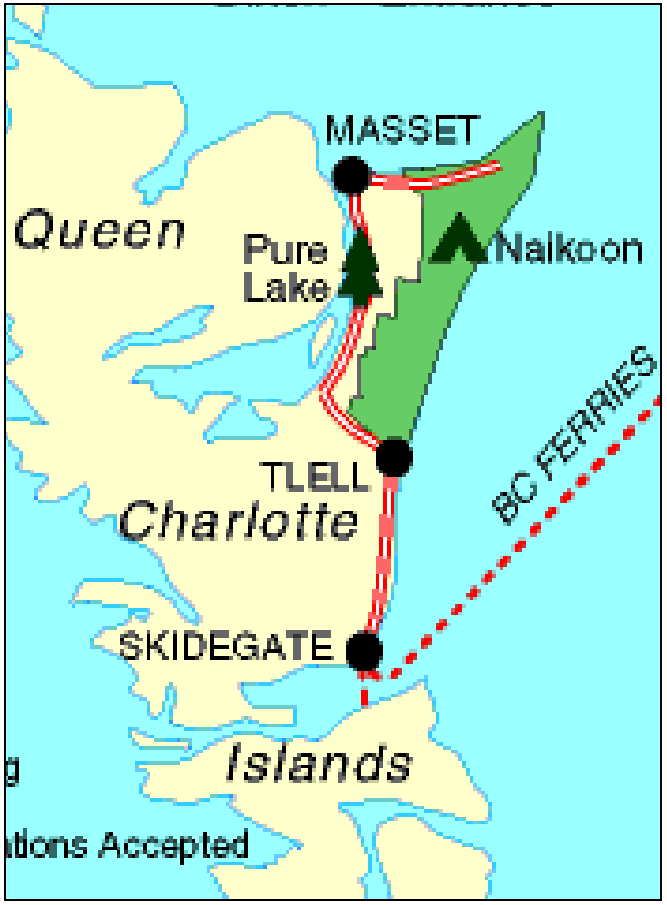
Social Index of Vulner. : -0.79 → **Adjustment for Population Vulnerability (APV): 0.84**

Travel Time to cxion: 17 minutes → **Isolation Factor (IF): -3**

RBI = (7.1 X 0.84) - 3 = 3.0

***Recommended level of service*: No Local Intrapartum Services**

Queen Charlotte city



Queen Charlotte City

Data:

Average # of births (5 years): 30 → **RBI Factors:**

PBS: 3.0

SIV: 0.29 → **Adjustment for Population Vulnerability (APV): 1.12**

Travel Time to cxion: 4 hours → **Isolation Factor (IF): 4**

RBI = (3.0 X 1.12) + 4 = 7.4

***Recommended level of service*: Intrapartum services with no c/s**

Merritt

Merritt

Data:

Average # of births (5 years): 105 → **RBI Factors:** **PBS: 10.5**

SIV: 0.87 → **Adjustment for Population Vulnerability (APV): 1.35**

Travel Time to cxion: 53 minutes → **Isolation Factor (IF): -1**

RBI = (10.5 x 1.35) - 1 = 13.2

***Recommended level of service*: Local intrapartum services with operative delivery**

Three-stage planning process for Rural Maternity Care Services

1. Projecting the appropriate service level to meet the needs of a given community based on size of birthing population and degree of isolation using the Rural Birth Index (RBI);
2. Assessing the feasibility of implementing the proposed model of care based on community characteristics;
3. Considering potential implementation within the planning priorities of the Health Authority.

Stage 2: Measuring Feasibility

In Stage 2, the feasibility of implementing a certain level of service is evaluated.

Factors that might be considered:

- Public transit access and schedules
- Local infrastructure (existing hospital services)
- Local caregiver Resources
- Community maternity service history
- Influence of other organizations (e.g. United Church Health Services)

Stage 3: Administrative Priorities

Making choices about service priorities:

- Addressing the greatest need (e.g. cancer care vs maternity care vs operative facilities)
- Political agenda