

Project:

Local Area Family Care Clinic Prioritization Framework

Review of Background Information and
Proposed Indicator Framework
(Final)

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1 Executive Summary

Family Care Clinics (FCCs) are positioned to provide individual and family focused, comprehensive, quality, primary health care services across the lifespan, based on population health needs. The primary objectives are to:

- Increase and manage timely access to primary health care through same day access, extended hours of operation, on-call after hours and a triage function to provide direct access to most appropriate provider.
- Increase emphasis on health promotion, self-management, disease and injury prevention, screening and care of patients with chronic disease and complex needs.
- Utilize a collaborative interdisciplinary team approach working to full scope of practice.
- Improve coordination, continuity and integration of primary health care services.

1.1 Geographic Stratification

A framework was developed to prioritize the 132 Local Areas (LAs) in Alberta according to the need for FCC services. Local Areas reflect areas where given populations live, work and receive most day-to-day services including commercial and health care. The Local Areas can further be grouped into five “geo-categories” that have common characteristics. This will enable us to stratify the results to facilitate interpretation of indicators.

Proposed geo-areas for stratification							
Geo-area	Population	%	# LAs	%	Average	Max	Min
Metro	1,990,483	53	31	23	64,209	114,563	14,594
Metro moderate	480,955	13	16	12	30,060	73,043	5,149
Rural	835,162	22	64	48	13,049	35,375	2,629
Rural remote	95,613	3	12	9	7,968	23,763	1,754
Urban	383,475	10	9	7	42,608	69,603	16,414
Total	3,785,688	100	132	100	28,679	114,563	1,754

1.2 Proposed Indicators

Based on our research and consultations with the Oversight and Analytics Working Groups (Appendix A), we identified 13 indicators with six (6) related to utilization and six (6) related to health needs and one (life expectancy) to represent social determinants of health (see table on next page).

The selection of indicators considered measures that aligned with one or more of the target populations that would be served by the FCCs and the scope of services that would be provided. This included in no particular order of priority:

- Target population #1 – Patients without access to basic primary care.
- Target population #2 – Patients at risk of developing health conditions/diseases where health prevention and promotion would decrease the risk of development of the illness/disease.
- Target population #3 – Patients with multiple chronic conditions or co-morbidities requiring interdisciplinary care, coordination across the continuum and/or linkage with social supports.

Other indicators may be added during the prioritization step such as First Nations as a percent of the population in the Local Area, the presence of a PCN, total population, etc., to more fully characterize the selected Local Areas.

Proposed FCC need indicators

#	Statistic	Year(s)	Higher PHC need if	Comments	Geo-stratify	Target pop
Utilization						
1	% of total Family Practitioner and Pediatrician claims outside of recipient's home LA	2010/11	Higher	Use only for rural and rural remote geo-categories	Rural and remote	1
2	Age standardized Ambulatory Care Sensitive Condition hospitalization rate per 100,000	2003 to 2011	Higher	Higher ACSC rate correlated to lack of primary care alternatives (CIHI).	Yes	All
3	% of CRG 3 to 7 patients who see their Family Practitioner less than 50% of the time	2010	Higher	Patients in this category should be seeing FP regularly	No	All
4	Mood disorder - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Considers prevalence and utilization of acute services	Yes	1
5	Anxiety disorder - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Considers prevalence and utilization of acute services	Yes	1
6	Intentional and unintentional injury - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Identify prevention and service opportunities	Yes	1
Health need						
7	Age standardized diabetes prevalence per 100 population	2010	Higher	Linked to other chronic diseases like heart, renal, etc.	No	2
8	Age standardized COPD prevalence per 100 population	2010	Higher	Opportunity for secondary prevention	No	2
9	Age standardized rate of people with 3 or more chronic diseases (prevalence) per 100 population	2010	Higher	Target for multidisciplinary team intervention and coordination	No	3
10	% of population 65+ receiving annual influenza immunization	2011/12	Lower	Immunizations done by First Nations health centres not captured	No	1
11	Predicted age standardized per capita billings (\$) for community and primary care	2006/07 to 2008/09	Higher	From AH Health Human Resources Model and proxy measure for needs	Yes	1
12	Actual minus predicted age standardized per capita community and primary care service billings (\$)	2006/07 to 2008/09	Lower	From AH Health Human Resources Model they measures gap in primary care services	Yes	All
Social determinant of health						
13	Life expectancy at birth	2000 to 2011	Lower	Correlates with socio-economic status and health care costs	No	3

1.3 Risk/Need Category Definition

We developed “cut-points” for each indicator that will allow us to assign Local Areas to Low, Moderate or High risk or need categories for a particular indicator. For the indicators where a higher value was related to a higher need or risk, a Standard Score of -1.96 or less was considered Low need. A Standard Score of more than +1.96 was considered High need. Standard Scores between -1.96 and +1.96 were considered Moderate need.

For three indicators, a lower score was related to a higher need or risk. These included life expectancy, influenza vaccination and HHR gap. For these indicators, a Standard Score of +1.96 or more was considered Low need. A Standard Score of less than -1.96 was considered High need. Standard Scores between -1.96 and +1.96 were considered Moderate need.

The resulting number of Local Areas within each risk category for each indicator is shown on the following table.

Distribution of Low, Moderate, and High need/risk categories
(number of Local Areas, n=132)

Indicator	Low	Moderate	High
Non-geo stratified indicators			
Life expectancy	67	33	32
Family Practitioner continuity	64	17	51
Diabetes	47	30	55
Chronic obstructive pulmonary disease	39	27	66
3 or more chronic diseases	35	41	56
Influenza vaccination	61	30	41
Geo-stratified indicators			
ER injury visits	54	1	77
ER mood disorder visits	64	4	64
ER anxiety visits	65	4	63
Ambulatory Care Sensitive Conditions	63	4	65
Family Practitioner visits outside Local Area	101	0	31
Health Human Resource model predicted	49	38	45
Health Human Resource model gap	41	49	42

1.4 Results Matrix and Scoring Methodology

We developed a matrix to display the results, calculate scores and to prioritize Local Areas. A sample results matrix is shown below.

Local Area Name	Geo Category	Population	Utilization (1-6)						Health status (7-12)						Social Determinants	Count			Indicator Score (1L+2M+3H)	LE Modified Score	
			1	2	3	4	5	6	7	8	9	10	11	12	13	L	M	H			
LA #	Metro	##	1	3	1	3	3	3	3	3	3	3	3	1	1	-33.1181	4	0	8	28	61.1181
LA #	Rural	##	1	3	1	3	3	3	3	3	3	3	3	3	3	-12.6482	2	0	10	32	44.6482
LA #	Metro	##	1	3	3	3	3	3	3	3	3	3	3	2	3	-9.1575	1	1	10	33	42.1575
LA #	Rural remote	##	3	3	1	1	3	3	3	3	3	2	2	3	3	-10.7337	2	2	8	30	40.7337
LA #	Metro	##	1	3	3	3	3	3	1	1	1	3	1	3	-13.8056	5	0	7	26	39.8056	
LA #	Metro	##	1	3	1	3	3	3	3	3	3	3	3	3	-7.7045	2	0	10	32	39.7045	
LA #	Metro	##	1	3	3	3	3	3	3	3	3	3	3	1	1	-8.7838	3	0	9	30	38.7838
LA #	Rural remote	##	1	3	1	3	3	3	3	3	3	3	3	3	-6.1047	2	0	10	32	38.1047	
LA #	Rural	##	3	3	1	3	3	3	3	3	3	1	1	3	-7.8844	3	0	9	30	37.8844	
LA #	Rural	##	3	3	1	3	3	3	3	3	3	1	1	2	-8.51	3	1	8	29	37.51	
LA #	Rural	##	1	3	1	1	3	3	3	1	3	3	3	3	-8.8701	4	0	8	28	36.8701	
LA #	Rural	##	1	3	1	1	3	3	3	3	3	3	3	2	-7.5214	3	1	8	29	36.5214	
LA #	Rural	##	3	3	2	3	3	3	3	3	3	1	1	3	-5.0457	2	1	9	31	36.0457	
LA #	Rural	##	3	3	2	3	3	3	3	3	3	1	2	3	-3.6758	1	2	9	32	35.6758	
LA #	Rural	##	3	3	1	3	3	3	3	2	2	2	1	1	-7.662	3	3	6	27	34.662	
LA #	Metro	##	1	3	3	3	3	3	1	3	3	3	1	3	-4.2875	3	0	9	30	34.2875	
etc.	Rural remote	##	3	3	2	1	1	1	3	3	3	3	2	2	-6.9373	3	3	6	27	33.9373	

The score for each Local Area was determined as follows:

- Count the number of Low, Moderate and High need indicators for the first 12 indicators. Each indicator is weighted equally.
- Multiply the count of Low by 1, Moderate by 2, High by 3 and sum to get the Indicator Score.
- Add the life expectancy (LE) Standard Score to the Indicator Score to get the LE Modified Score for each Local Area. A lower Standard Score (i.e., a greater negative score) translates to a higher need/risk so the life expectancy Standard Score is multiplied by negative one and then added to the Indicator Score.

Since one of the unique features of the FCC is to consider the social determinants of health in programming and service delivery, the prioritization framework is heavily weighted towards the life expectancy indicator. Life expectancy at birth is correlated with the determinants of health and predictive of health care costs. This includes 12 key factors which influence population health: income and social status; social support networks; education; employment/ working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; biology and genetic endowment; health services; gender; and culture. Of these, socio-economic status is considered the most important determinant of health. (Public Health Canada. The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH) <http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php>).

The Local Areas were then sorted in descending order (from highest to lowest) based on the LE Modified Score to identify the top 40 Local Areas for FCC consideration. The model output serves as a starting point for discussions with key stakeholders to validate the top 40 FCCs based on more detailed knowledge of the Local Areas identified by the model. Other indicators or criteria may be added to facilitate decision making such as First Nations as a percent of the population in the Local Area, the presence of a PCN, minimum “panel” size, etc. Community readiness measures from AHS and/or proxy readiness measures from the Alberta’s RPAP (Rural Physician Action Plan) may also be incorporated to inform the level of effort, investment and duration required to implement an FCC in the selected FCCs.

Opportunities exist to refine the prioritization framework to inform the location the next 100 FCCs. New or refined indicators may include:

- The application of a gravity model or other appropriate methodology that determine spatial (travel) access scores at the dissemination area level.
- Results of patient satisfaction surveys with sufficient sample size to differentiate patient/family perspectives at the Local Area level.
- An update to the Alberta Health Human Resource Forecasting and Simulation Models to incorporate 2009/10 and 2010/11 data.
- Indicators of Primary Care Network service availability and utilization from the PCN Fact Sheets.
- Adjustment of the methodology to define Low, Moderate and High risk categories for geo-stratified indicators.

The extent to which these and other indicators can be incorporated into the prioritization framework will depend on the availability of data and timelines associated with decision making for the second wave FCCs.

2 FCCs within the Context of Primary Health Care

This chapter describes the proposed role of the Family Care Clinics in Alberta within the context of primary health care (PHC). Pan-Canadian PHC indicators for each of the ten (10) core services (i.e., processes and associated outputs) and inputs associated with health human resources, interdisciplinary teams, information technology and payment methods are provided to facilitate understanding of FCC roles and objectives.

2.1 Improving Alberta's Primary Health Care System

The introduction of Family Care Clinics (FCCs) is a key component of Alberta Health's vision to create the best performing publicly funded primary health care system in Canada. 140 FCCs are planned in addition to the three pilot FCCs that were introduced in East Edmonton, East Calgary and Slave Lake in April 2012. The goal is for Albertans to have access to primary health care when they need it, where they need it, from the most appropriate provider(s).

Identifying the need for FCCs requires an understanding of the role of FCCs and the services that these clinics are intended to provide. The key nuance lies in the difference between primary care vs. primary health care.

Primary care may be defined as the first contact an individual has with the health care system to seek out primary care services for the diagnosis, treatment and follow-up for a specific health problem. Primary care is typically provided by family physicians (FPs), and other allied health professionals such as pharmacists, nurses, and others. Although primary care is a core component of primary health care, it is more narrowly focused on illness treatment and rehabilitation. Primary health care (PHC) is an approach that more broadly addresses illness prevention and health promotion and encompasses determinants of health such as culture, education, and income on health and well-being.

2.2 Role of FCCs

Consistent with this definition of PHC, FCCs in Alberta are positioned to provide individual and family focused, comprehensive, quality, primary health care services across the lifespan, based on population health needs. Care is comprehensive which includes, but is not limited to: health promotion, self-management, disease and injury prevention, screening, care of chronic disease and complex needs, mental health care, family planning and pregnancy counseling, well child care, obstetrical care, palliative and end-of-life care, geriatric care, minor surgery, minor emergency care, rehabilitative care, access to diagnostic imaging and laboratory and arrangements for referrals (such as specialist referrals). The primary objectives are to:

- Increase and manage timely access to primary health care through same day access, extended hours of operation, on-call after hours and a triage function to provide direct access to most appropriate provider.
- Increase emphasis on health promotion, self-management, disease and injury prevention, screening and care of patients with chronic disease and complex needs.
- Utilize a collaborative interdisciplinary team approach with allied health professionals working to full scope of practice including nurses, social workers, psychologists, pharmacists, dietician, addiction and mental health workers, family physicians, case managers, community partners, etc.
- Improve coordination, continuity and integration of primary health care services. This may include the designation of a case manager and/or navigator for care coordination, access to appropriate and timely diagnostic tests and linkages and partnerships with communities, emergency departments, specialists, hospitals, urgent care centres, community health centres, primary care networks, public health, home care, continuing care, schools, and other health, social and community agencies.

2.3 PHC Core Service Areas

Our understanding of PHC is further facilitated by examining the pan-Canadian PHC indicators proposed by the Canadian Institute for Health Information (CIHI) in 2005. Measures were proposed for each of the ten (10) core services (i.e., processes and associated outputs) and inputs associated with health human resources, interdisciplinary teams, information technology and payment methods.

SAMPLE ABRIDGED LIST OF PHC INDICATORS		
ACCESS TO PHC THROUGH A REGULAR PROVIDER	COMPREHENSIVE CARE, PREVENTIVE HEALTH AND CHRONIC CONDITION MANAGEMENT	CONTINUITY THROUGH INTEGRATION AND COORDINATION
<ul style="list-style-type: none"> Population with a regular PHC provider Difficulties accessing routine PHC* 	<ul style="list-style-type: none"> Scope of PHC services Health risk screening in PHC* PHC client/patient registries for chronic conditions* PHC programs for chronic conditions* Client/patient participation in PHC treatment planning 	<ul style="list-style-type: none"> Collaborative care with other health care organizations
24/7 ACCESS TO PHC	PATIENT-CENTRED PHC	ENHANCING POPULATION ORIENTATION
<ul style="list-style-type: none"> Difficulties obtaining urgent, non-emergent PHC on evenings and weekends PHC after hours coverage Difficulties accessing routine PHC* 	<ul style="list-style-type: none"> Client/patient satisfaction with PHC providers Language barriers when communicating with PHC providers 	<ul style="list-style-type: none"> PHC client/patient registries for chronic conditions* PHC programs for chronic conditions* Specialized PHC programs for vulnerable/special needs populations
QUALITY IN PHC		
Primary Prevention <ul style="list-style-type: none"> Influenza immunization, 65 + Cervical cancer screening Health risk screening in PHC* Secondary Prevention for Chronic Conditions <ul style="list-style-type: none"> Screening for modifiable risk factors in adults with coronary artery disease Screening for modifiable risk factors in adults with hypertension Screening for modifiable risk factors in adults with diabetes 	Patient Safety <ul style="list-style-type: none"> Use of medication alerts in PHC Antidepressant medication monitoring Treatment Goals and Outcomes <ul style="list-style-type: none"> Glycemic control for diabetes Blood pressure control for hypertension Treatment of dyslipidemia Treatment of depression Ambulatory care sensitive conditions 	
PHC INPUTS AND SUPPORTS		
Health Human Resources <ul style="list-style-type: none"> PHC organizations accepting new clients/patients Interdisciplinary Teams <ul style="list-style-type: none"> PHC FPs/GPs/NPs working in interdisciplinary teams/networks Provider Payment Methods <ul style="list-style-type: none"> PHC provider remuneration method 	Information Technology <ul style="list-style-type: none"> Uptake of information and communication technology in PHC organizations Allocations for PHC <ul style="list-style-type: none"> Average per capita PHC operational expenditures 	

*Indicator repeated because it reflects multiple dimensions.

Source: CIHI Pan-Canadian PHC Indicators Report Part 1 (2006)

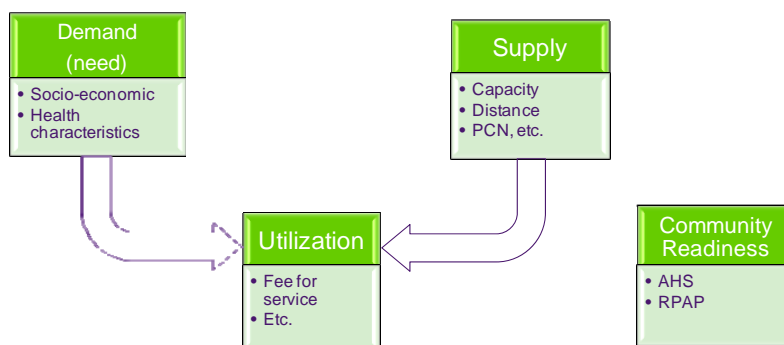
This table provides a solid framework to identify indicators that could be used for FCC reporting and evaluation purposes. We also considered some indicators that may be used in our location framework such as the primary prevention indicators but feasibility will depend on the availability of data to generate the results.

3 Potential Indicators

We reviewed literature sources and existing data sources in Alberta to identify the indicators that could be used to identify geographic areas in Alberta that would benefit most from PHC services provided by FCCs. This chapter summarizes our findings. Abstracts of relevant literature articles can be found in a companion document under separate cover.

3.1 Three Main Categories

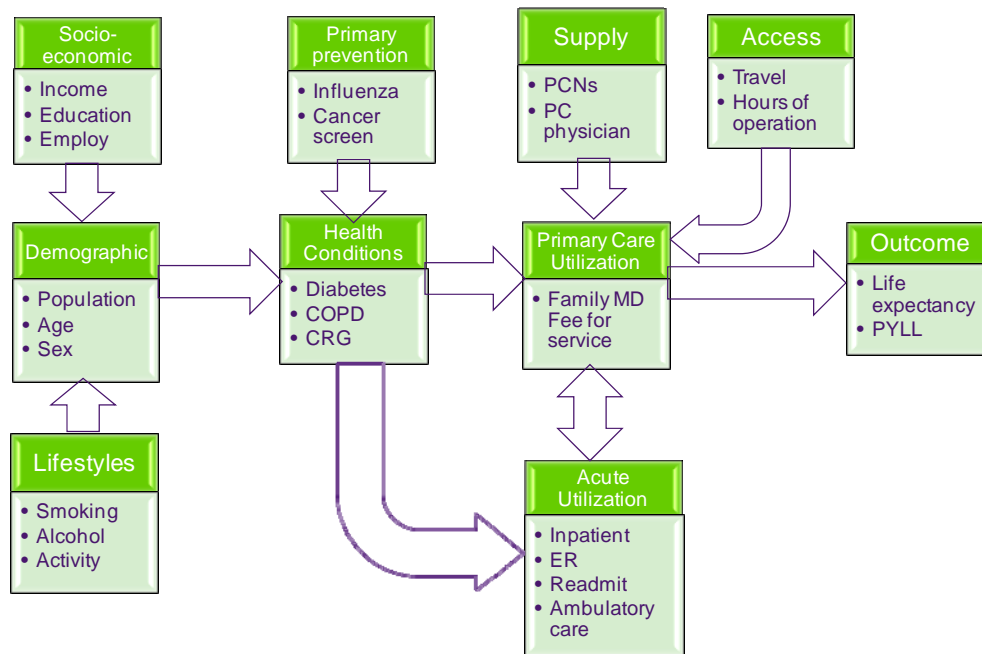
Indicators generally fall into three categories as shown in the graphic below.



Need, which is a component of demand is generally determined by socio-economic factors and health characteristics. The supply is generally described by the number and type of providers and location of PCH services. Accessibility to services factors into the supply component. The resulting utilization of health care services is a reflection of demand and supply variables. Utilization is, therefore, the dependant variable while supply and demand are the independent variables in the typical health care “needs” model. Since actual usage of the system is more informative than the availability of the service, researchers tend to focus on demand variables and the resulting utilization of various components of the health care system to inform service priority determination decisions. The gap between predicted utilization and actual utilization can be used to identify communities or areas that would benefit most from a service enhancement. The greater the gap, the greater the need for a particular type of service.

Community readiness is not considered part of the typical supply and demand model. This more appropriately informs the time and effort required to implement the service in an area considered to be in need of the service.

A more granular depiction of indicators that inform the supply-demand-utilization model is shown in the following graphic.



Indicators on the left-hand side of the exhibit reflect the determinants of health. This includes 12 key factors which influence population health: income and social status; social support networks; education; employment/ working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; biology and genetic endowment; health services; gender; and culture. Social and economic status seem to be the most important determinants of health.

Health conditions or status typically include incidence and prevalence of diseases or conditions. Chronic diseases are typically the focus in PHC models as patients benefit from secondary prevention services (e.g., screening for modifiable risk factors), interdisciplinary care, and outcome monitoring (e.g., glycemic control for diabetes, blood pressure control for hypertension, etc.).

Utilization of the primary care system provides insight into the availability of primary care services. Zero claims or low per capita billings have been used to identify lack of basic primary care services. Higher per capita billings are associated with higher primary care access. However, ideally we would want to know the mix of services provided (e.g., curative vs. secondary prevention) to identify more specific opportunities for FCCs. Inappropriate (i.e., higher than expected) use of acute care services is typically used in PHC models to reflect the lack of PHC capacity or alternatives in the community. However, interpreting these indicators needs to consider the organizational differences that drive the use of acute care facilities in rural hospitals as compared to urban settings.

Used worldwide, life expectancy at birth is a measure of a population's state of general health. Life expectancy at birth is often compared to health-adjusted life expectancy (HALE) at birth to assess whether the added years of life are spent in good health. The Canadian life expectancy at birth was 80.7 years in 2007. It has increased steadily since 1979, when it was 74.9 years. The Alberta value was 80.5 in 2007 with Canadian provinces ranging from 78.3 to 81.2.

The following sections provide a more detailed description of the indicators that have been used in Alberta and other jurisdictions.

3.2 Alberta Primary Care Redesign Project

The review of the current state of primary health care in Alberta provided potential indicators in four categories – service sites, population, health outcome and travel. These are summarized in the following table.

List of indicators

(Source: Alberta Primary Health Care Redesign, June 5, 2012)

#	Measure	Statistic
Service sites		
1	Mental health	Location of mental health clinics and facilities
2	Pharmacies	Number of pharmacies per 100,000 population
3	Physician offices	Number of physician offices per 100,000 population
4	Primary Care Networks	General location
5	Dentists	Dentist offices per 100,000 population
6	Optometrists	Communities with optometrist offices
7	Chiropractors	Number of chiropractors per 100,000 population
Population		
8	Population	Population per 400km ² hexagon
9	Children	0-17 population as a % of total population
10	Seniors	65+ population as a % of total population
11	Physician fee for service	% no claim in year
Health outcome		
12	Mortality	As a % of total population
Travel		
13	In-out movement	# GP claims imported to LA by exporting LA
14	In-out movement	# GP claims exported from home LA to destination LA

The project also applied geographic mapping techniques to display indicator results which can be applied to the FCC location project.

Our literature search identified other jurisdictions that have published PHC indicators. This has included the 2007 Canadian Survey of Experiences with Primary Health Care, the British Columbia province-wide, system-level performance measurement and PHC evaluation and research project. Specific measures are summarized under separate cover.

3.3 FCC Community Needs Assessment

Alberta Health also prepared “community needs assessment” packages for the geographic areas served by the three pilot FCCs. A summary of the indicators contained in these reports is presented in the following table.

List of indicators

(Source: Community Needs Assessment - East Edmonton FCC)

#	Measure	Statistic	Comments
Chronic diseases			
1	Chronic disease	Age standardized prevalence rate per 100,000	Six chronic diseases
2	Chronic disease	Age standardized incidence rate per 100,000	Six chronic diseases
3	Health status	Population in each health status (0 to 9) category	Clinical Risk Grouper methodology
Health outcome			
4	Mortality	Age-standardized rate per 100,000	By cause
Acute Utilization			
5	Emergency services	Visits per 1,000 population in year	Semi-urgent, non-urgent
6	Emergency services	Discrete patients per 1,000 population in year	Semi-urgent, non-urgent
7	Emergency services	Age standardized visit rate per 100,000	All and by 11 diagnosis categories
8	Inpatient services	Age standardized separation rate per 100,000	All and by 6 diagnosis categories
9	Inpatient services	Ambulatory care sensitive conditions separation rate per 1,000	
Travel			
10	Service location	% GP visits (claims) in LA vs. percent out	
11	Ambulatory care	Visits to ambulatory care	In LG vs Out of LG
12	Level of service	Predicted vs. actual \$ FP billing per person	By 6 age categories
Medication utilization			
13	Pharmacy	Number of claims per recipient	
14	Pharmacy	Number of discrete recipients by PTC Group	
15	Pharmacy	Recipients by Patient Complexity Group	and by PCT Diagnoses Group

The primary intent of these reports was to identify priorities in sufficient detail to inform FCC programming. The presentation of data at the diagnostic category level is relevant for this purpose but too detailed for the purposes of the FCC location framework. The FCC level report, however, was a good starting point to identify potential indicators for the location framework.

3.4 Alberta's Primary Care Networks

The core objectives of Alberta's Primary Care Networks (PCNs) overlap with some of the core objectives of FCCs namely:

- Increasing access to primary care;
- Providing 24/7 access to appropriate health care services;
- Increasing emphasis on health promotion, disease and injury prevention, care of medically complex patients, and patients with chronic disease;
- Improving coordination and integration with other health care services, including secondary, tertiary and long-term care; and
- Facilitating optimum use of multidisciplinary teams (MDTs).

The availability of a PCN in a given geography should be considered in the FCC location framework as well as measures of the scope of service utilized (available and actual). Currently 40 PCNs exist in the province with 2,500 FPs and about 600 FTE allied health professionals.

Some indicators of PCN effectiveness have been developed and reported for evaluation purposes such as:

- Increased attachment to a regular family physician (91% of patients in a PCN vs. 81% among patients not serviced by a PCN);
- Lower utilization of ER services (46 visits per 100 population by PCN patients vs. 52 visits per 100 population among patients not serviced by a PCN);
- Enhanced use of screening tools by physicians as part of health promotion and disease injury prevention initiatives;
- Greater patient satisfaction with respect to wait times (75% vs. 71%) and involvement in treatment plans.
- Formation of MDTs aimed at providing holistic patient contributing to increased access to chronic disease management, specialized services, and resulting in PCN physicians having more time to spend with patients.

In addition, statistical and financial information is provided by each PCN and PCN Fact Sheets are generated within AH for the 2008/09, 2009/10 and 2010/11 fiscal years. Formal indicators have not been generated from these data.

We specifically examined the data to determine if we could calculate a measure of the availability of multidisciplinary services to the population served by the PCN and this is one of the unique features of the FCC. The table below displays the two possible measures – non-physician direct care staff expenditures per patient and population per multi-disciplinary direct care FTEs.

The example on the following page shows that PCNs with a higher \$ per patient and lower population per FTE have a higher availability of multidisciplinary FTEs which could be considered in an FCC location framework.

Potential indicators of PCN scope of service
(fiscal year 201X)

Indicator	A	B	C	D	E	F	etc.
Average age of patients seen	39	32	40	41	39	42	42
Non-physician direct care (\$)	4,600,000	-	2,500,000	400,000	3,500,000	700,000	72,000
People served	180,000	14,000	23,000	32,000	340,000	34,500	26,800
Non-physician direct care payments (\$) per patient served	25.6	-	108.7	12.5	10.3	20.3	2.7
Rank	2	7	1	4	5	3	6
Multidisciplinary FTEs (excl. admin)	69.0	-	36.5	5.2	40.8	9.1	3.7
People served per	2,609		630	6,154	8,333	3,791	7,243
Rank	2	7	1	4	6	3	5

More work is required on the PCN data to develop and understand PCN indicators and assess the utility for FCC location framework purposes.

3.5 Alberta Health Surveillance and Assessment

Alberta Health Surveillance and Assessment Division has access to numerous databases that allow the calculation of various indicators related to health needs. Specifically, this includes:

- Chronic disease: Incidence and prevalence for those diseases with good case definitions (e.g., diabetes, COPD, etc.).
- Injury: Hospitalization, emergency room visits, deaths, etc.
- Mortality: Rates by cause of death, person years lives lost (PYLL) by cause, life expectancy, etc.
- Infectious diseases: Rates by disease, etc.
- Demographics: Fertility, birth rates, population, median age, First Nations, emigrants, etc.
- Children's health: Infant mortality, low birth weight, preterm birth weight, small gestational age, etc.
- CCHS surveys: Smoking, health status, etc.
- Immunization rates/coverage: Work in progress.
- Health service utilization: Fee for service, inpatient, emergency department/ambulatory care, etc.
- Statistics Canada data - Census 2006: median income, etc.

Most of the data can be segmented by regional residence of the patient which will be invaluable in the FCC location framework.

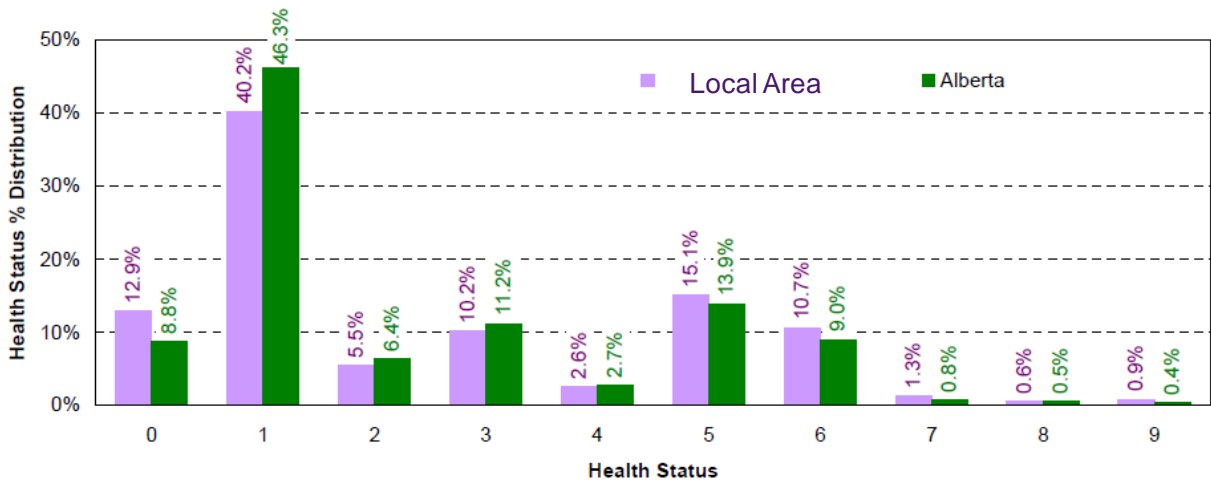
3.6 Clinical Risk Grouper

Alberta Health has acquired a methodology to assign Alberta residents to one of 9 health status categories:

1. **Healthy:** Consists of people with encounters for medical care.
2. **History of Significant Acute Disease:** A history of significant acute disease is identified by the presence within the most recent six month period of one or more. Significant acute EDCs or significant EPCs. There are no PCDs present.
3. **Single Minor Chronic Disease:** A single minor chronic disease is identified by the presence of a single Minor Chronic PCD.
4. **Minor Chronic Disease in Multiple Organ Systems:** Minor chronic disease in multiple organ systems is identified by the presence of two or more Minor Chronic PCDs.
5. **Single Dominant or Moderate Chronic Disease:** Single dominant or moderate chronic disease is identified by the presence of a single Dominant or Moderate Chronic PCD.
6. **Disease in Chronic Multiple Organ Systems:** Significant chronic diseases in multiple organ systems is identified by the presence of two or more PCDs of which at least one is a Dominant or Moderate Chronic PCD. PCDs that are a Severity Level 1 minor chronic disease are not considered a significant chronic disease and are not used to identify the presence of significant chronic disease in multiple organ systems, but Minor Chronic PCDs that are Severity Level 2 minor chronic diseases are used.
7. **Dominant Chronic Disease in Three or More Organ Systems:** Dominant chronic disease in three or more organ systems is identified by the presence of three or more dominant chronic or selected moderate chronic PCDs.
8. **Dominant and Metastatic Malignancies:** A malignancy that dominates the medical care required (e.g., brain malignancy) or a non-dominant malignancy (e.g., prostate malignancy) that is metastatic or complicated (e.g., requiring a bone marrow transplant).
9. **Catastrophic Conditions Catastrophic:** Conditions include long term dependency on medical technology (e.g., dialysis, respirator, and total parenteral nutrition, TPN) and life-defining chronic diseases or conditions that dominate the medical care required (e.g., persistent vegetative state, cystic fibrosis, AIDS, history of heart transplant).

Sample output from the model for a sample Local Area, compared to the Alberta average is shown in the following graph.

Clinical Data based on Fiscal Years 2009/2010 and 2010/2011 Combined



The methodology may have utility for the FCC location framework to identify needs for patients related to chronic diseases. For example, levels 3 and 4 can be combined and age-standardized rates calculated to identify secondary prevention opportunities while levels 5, 6 and 7 can be combined to identify needs for interdisciplinary team intervention and care coordination.

4 Assessment Frameworks or Methodologies

We also investigated the availability of frameworks or methodologies that incorporated indicators into a model to support decision making similar in scope to the AH FCC project objectives. This chapter describes the model concepts and experiences in Alberta, Ontario and the United States.

4.1 Access Concepts and Models

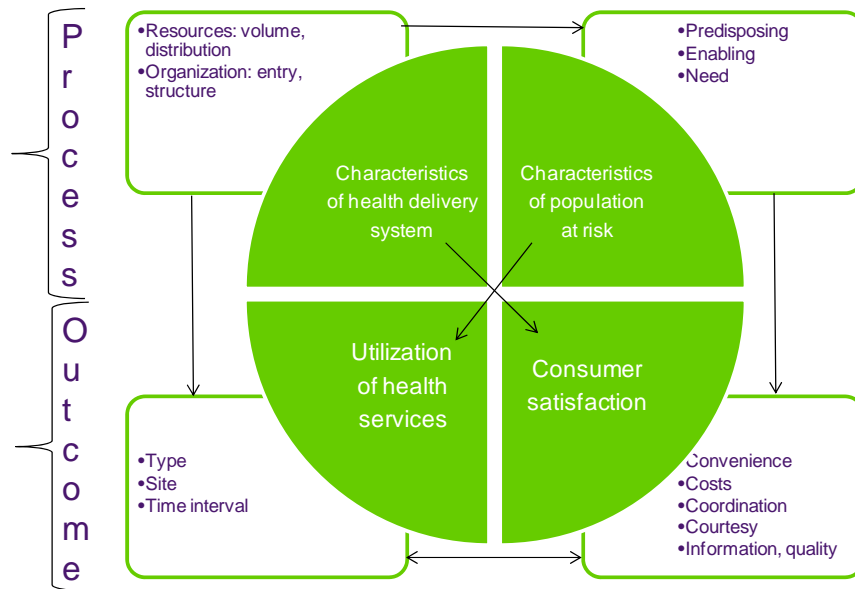
Access models need to consider both potential and realized access as well as spatial and aspatial aspects.

Spatial access is dependent on geographic distribution that impacts an individual's travel cost (time/distance) to the service as well as the amount of demand for the service by other patients. Measures of spatial access consider the count of facilities within a defined geographic area, average travel time, average travel distance, clinic operating times, waiting time to get an appointment, waiting time in the clinic, etc.

Aspatial access depends on socio-economic factors such as income, education, age, etc. The availability of culturally sensitive services is an example of a program designed to address a specific aspatial access concern.

Finally, the availability of a service by itself is not necessarily a good indicator of access. Indeed, actual usage is a better reflection of access. That is why some models use utilization indicators rather than indicators that simply measure supply like number of physicians, number of clinics, etc.

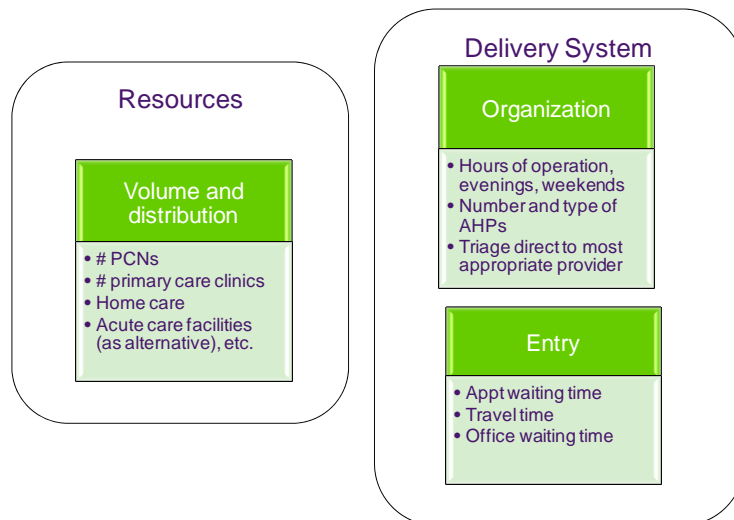
Given this broad definition of access, models that predict need or service gaps have similar components and constructs. As shown in the graphic on the following page, input variables can be grouped into four categories that describe the characteristics of the health delivery system (the supply), the characteristics of the population at risk (the demand) and the utilization of health services. The fourth category, consumer satisfaction, is not typically highlighted in models but is influenced by the other three categories and in turn influences utilization.



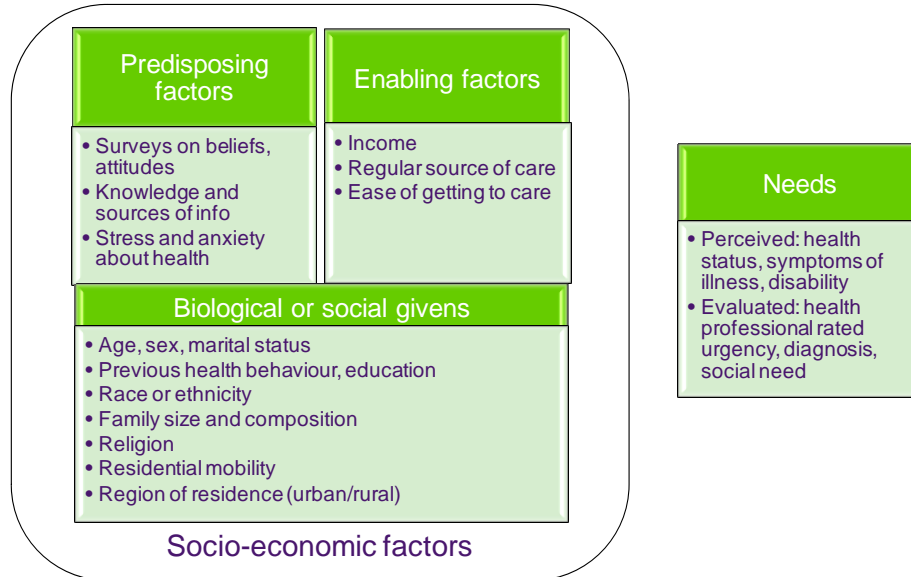
Adapted from Aday and Andersen: A Framework for the Study of Access to Medical Care

The double-headed arrow suggests a sequence in which, over time, the utilization of services is apt to influence a consumer's satisfaction with the system, and in turn, the satisfaction or dissatisfaction he experiences from this encounter influences his subsequent use of services.

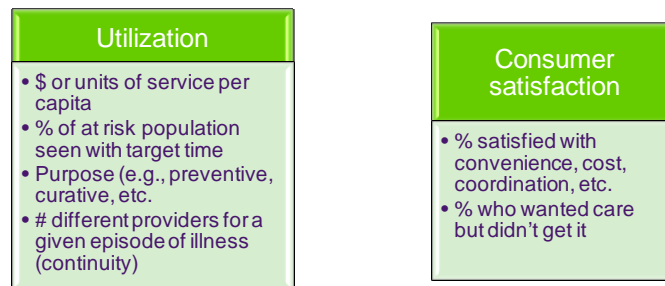
Indicators that can be used to describe the delivery system are shown below. Since these indicators influence utilization, utilization indicators may be the more important input to the model.



The characteristics of a population at risk can be described in terms of socio-economic factors that align with the determinants of health and health status or need that is based on a perceived need or a confirmed diagnosis or social need by a health care professional. These indicators are a key component of all models designed to identify service requirements.



Consumer satisfaction can be worked into predictive models but the limitation is availability of information that is specific to the population at risk and geographic area. The Population Research Laboratory at the University (on behalf of HQCA) conducted a telephone survey between February 23, 2009 and May 11, 2010 of Albertan's experiences with the health care system. Topics included satisfaction with family doctors, walk-in clinics, coordination of care, etc. The sample size is not sufficient enough to identify differences at the Local Area level.

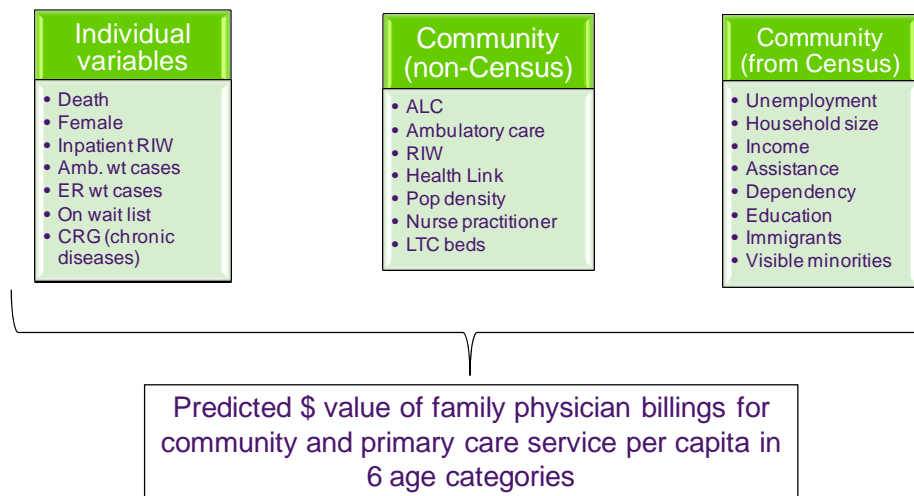


Utilization is influenced by all other components and is a key proxy that is used in predictive models. Generally, utilization by one target population/area is compared to another population in another area so the focus is on the relative difference rather than on the absolute value. Other models predict utilization using formulas that incorporate characteristics of the population at risk and compare the results to actual utilization. If predicted utilization is higher than actual utilization, then a gap in services exists which can be used to identify populations or areas that need the required service. Alberta's Health Human Resource Forecasting and Simulation Model (HHR Model) is an example of this type of model.

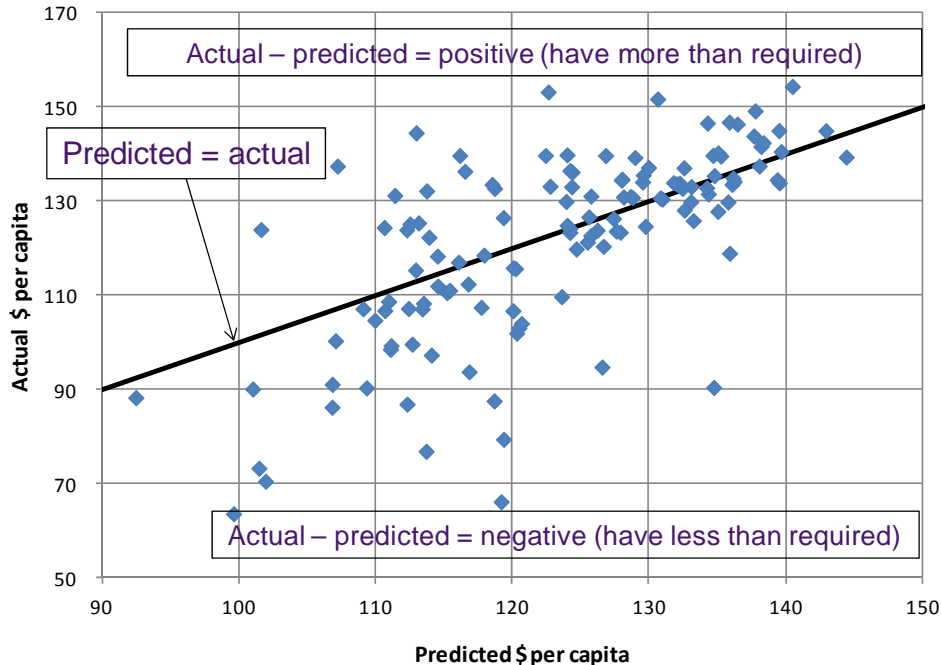
4.2 Health Human Resource Forecasting and Simulation Model

The conceptual framework utilized for the development of the HFSM model was derived from the Framework for Collaborative Pan-Canadian Health Human Resources Planning published by the Federal/Provincial/Territorial Advisory Committee on Health Delivery and Human Resources (ACHDHR) in 2005 (and updated in 2007). The model was designed to simulate demand for family physicians in four service sectors: community and primary care, inpatient hospitals, ambulatory care and continuing care facilities. The community and primary care sector is most relevant to FCC need so we will focus on this aspect of the model.

The model predicts the probability that an individual has a service event based on personal characteristics of an individual (such as age, gender, aboriginal status), health status (as measured by chronic diseases, utilization of inpatient hospitals), socio-economic characteristics of their community (including educational levels, income levels, unemployment rates, etc. and availability of various types of health services in the Local Geography Area (GP billings per capita, etc.). The following graphic shows the independent variables in the model that are used to predict community and primary care need as expressed in terms of per capita dollar value of FP billings



Predicted per capita utilization of FP services is compared to actual per capita utilization (i.e., actual minus predicted) to calculate the gap. Per capita rates have been standardized to facilitate comparison across Local Areas. A comparison of the actual to predicted per capita utilization for the 132 Local Areas in Alberta is shown in the following x:y scatter plot.



Residents of Local Areas on the left hand side of the graph (i.e., <120 predicted \$ per capita) have lower needs (i.e., are healthier) while those on the right hand side have higher needs. Local areas that are the greatest distance below the line appear to have the greatest need for community and primary care services relative to their health needs.

Two outputs from this model may be useful in the FCC location framework – the predicted \$ per capita as a measure of need and the gap between actual and predicted as a measure of access to primary care. The latter measure is perhaps better calculated as a percentage of the difference over actual.

We note that the current model is based on 3-years of data from 2006/07 to 2008/09. Therefore, one of the weaknesses is that the results may not reflect significant changes in model parameters within any given Local Area within the last three years.

4.3 Ontario Nurse Practitioner Lead Clinics

In 2007, the Ontario Ministry of Health and Long-Term Care committed to the creation of 25 Nurse Practitioner-Led Clinics (NPLCs) as part of the government's strategy to improve access to primary health care services at the community level. The identification of these 25 clinics was divided into three waves where interested clinics could submit applications. Three clinics were awarded in Wave 1 (February 2009), eight clinics were awarded in Wave 2 (November 2009), and fourteen clinics were awarded as part of Wave 3 (May 2010). Clinics were awarded based on numerous factors including:

- Proportion of unattached patients;
- Prevalence of one or more of nine chronic diseases, including diabetes;
- Number of FTE general practitioners/family physicians in a Local Health Integration Networks (LHINs) per 10,000 population; and

- Number of existing Family Health Teams/Community Health Centres.

These indicators helped to identify the areas with the greatest need for additional resources and informed selection decision making process.

4.4 Carolinas Health Care System

The Carolinas Health Care System conducted a study in 2008, similar to the FCC project, that developed a model to identify geographic areas that would benefit the most from improved access to primary care. Researchers focused on finding the best indicators for assessing primary care need for a community by using an iterative process to review available data, select attributes that were deemed important, and review maps of each data element resulting in the selection of five (5) key indicators:

- Socioeconomic – median household income.
- Population density – number per square mile.
- Emergency Department patients, uninsured or using Medicaid – percent without insurance.
- Patient Emergency Department utilization for primary care preventable or treatable illness – percent visits.
- Patient utilization of safety net clinic – percent utilization.

Each indicator was scored on a pre-determined scale and results summed across the indicators to get a total score for the geographic area. Each indicator was equally weighted as all were deemed to be equally reflective of primary care need in a community. Mapping techniques were used to display the results.

Our proposed Local Area FCC prioritization framework most closely resembles the Carolinas model as it incorporated similar indicator selection, weighting, scoring and mapping concepts.

5 Local Areas

A key component of the FCC location framework is the geographical area that will define the unit of analysis within the FCC location framework. The smallest area is the dissemination area. This is a 400 square kilometre hexagon. Dissemination areas can then be rolled up to a Local Area. There are 132 Local Areas that reflect areas where given populations live, work and receive most day-to-day services including commercial services and health care. Local Areas roll up to five zones which reflect the current organization of Alberta Health Service operations.

The FCC location framework will use the Local Areas as the basic analytic unit. The hexagons within the Local Area can be used to locate the highest population density areas that could potentially be the site for the proposed FCC in the Local Area.

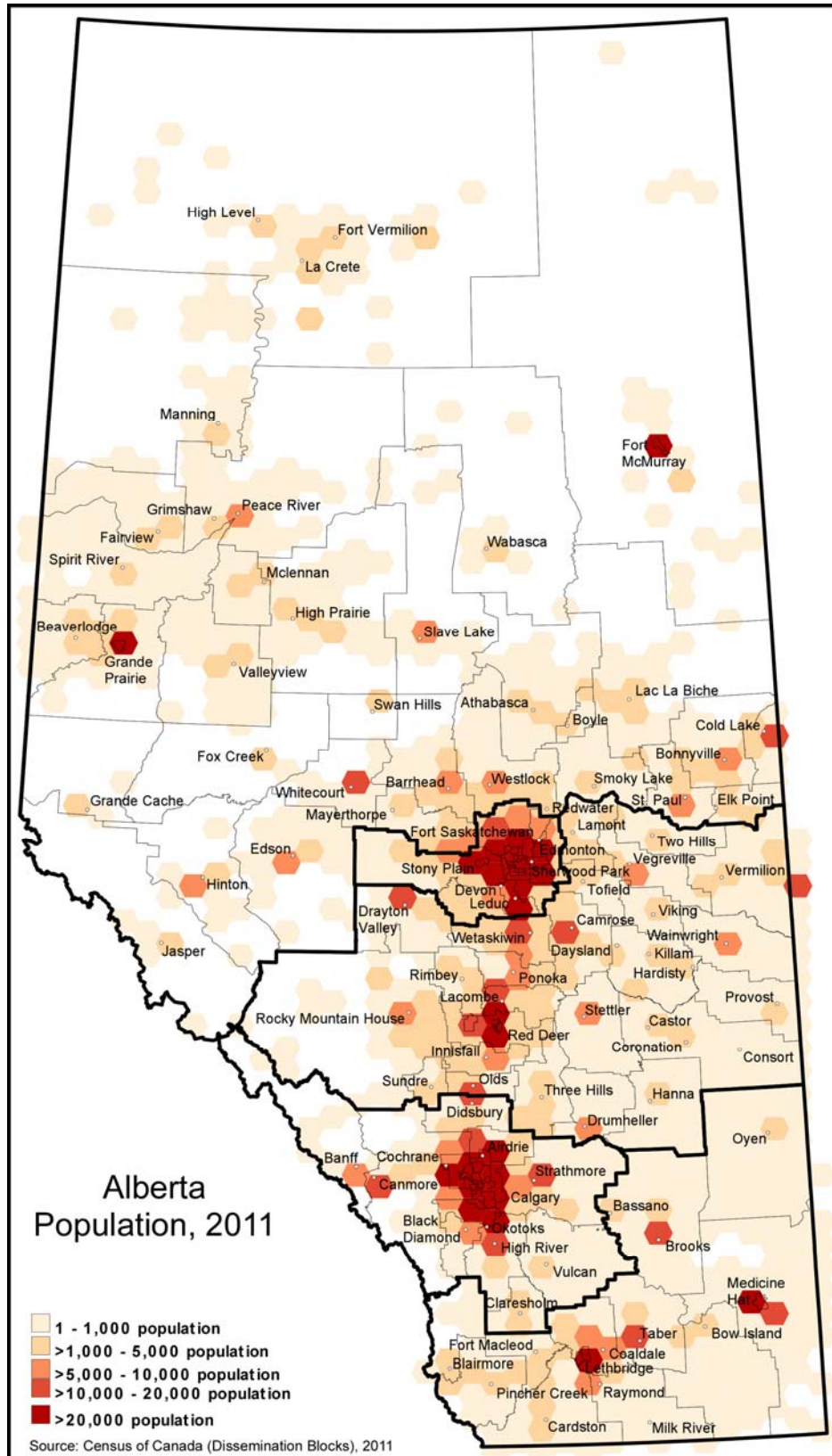
The population in a given Local Area ranges from 1,754 in Swan Hills to 114,563 in Calgary Fish Creek. We grouped Local Areas into five geo-categories based on common characteristics for purposes of stratifying indicators. The following table provides descriptive statistics for the proposed geo-categories.

Proposed geo-areas for stratification							
Geo-area	Population	%	# LAs	%	Average	Max	Min
Metro	1,990,483	53	31	23	64,209	114,563	14,594
Metro moderate	480,955	13	16	12	30,060	73,043	5,149
Rural	835,162	22	64	48	13,049	35,375	2,629
Rural remote	95,613	3	12	9	7,968	23,763	1,754
Urban	383,475	10	9	7	42,608	69,603	16,414
Total	3,785,688	100	132	100	28,679	114,563	1,754

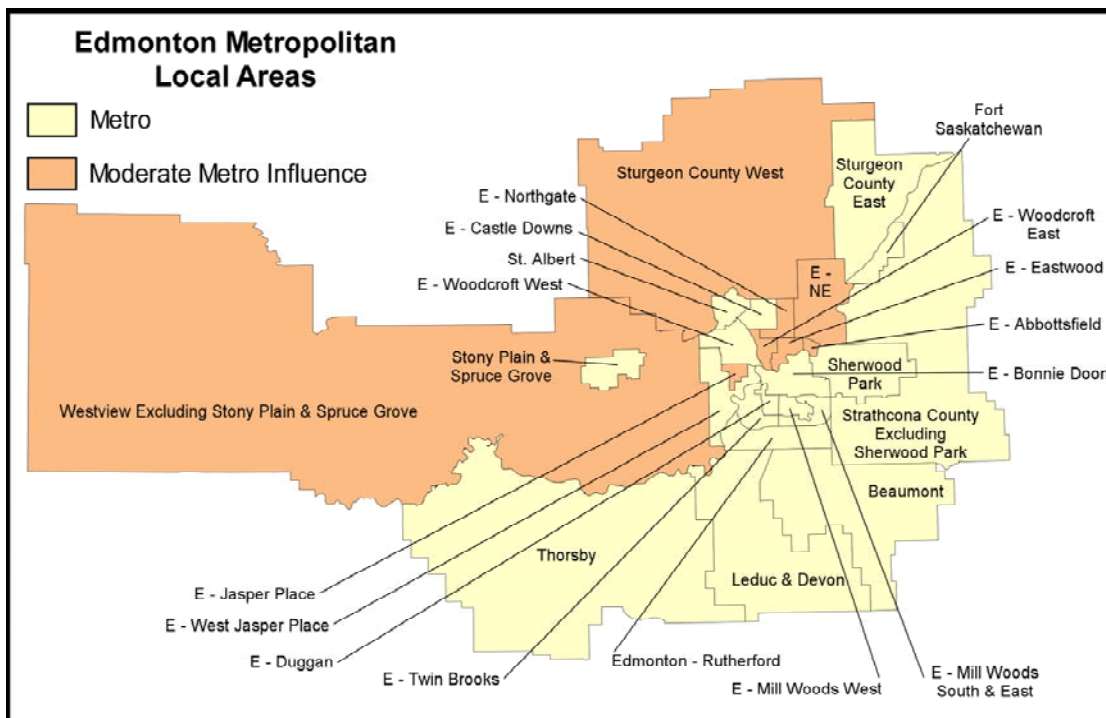
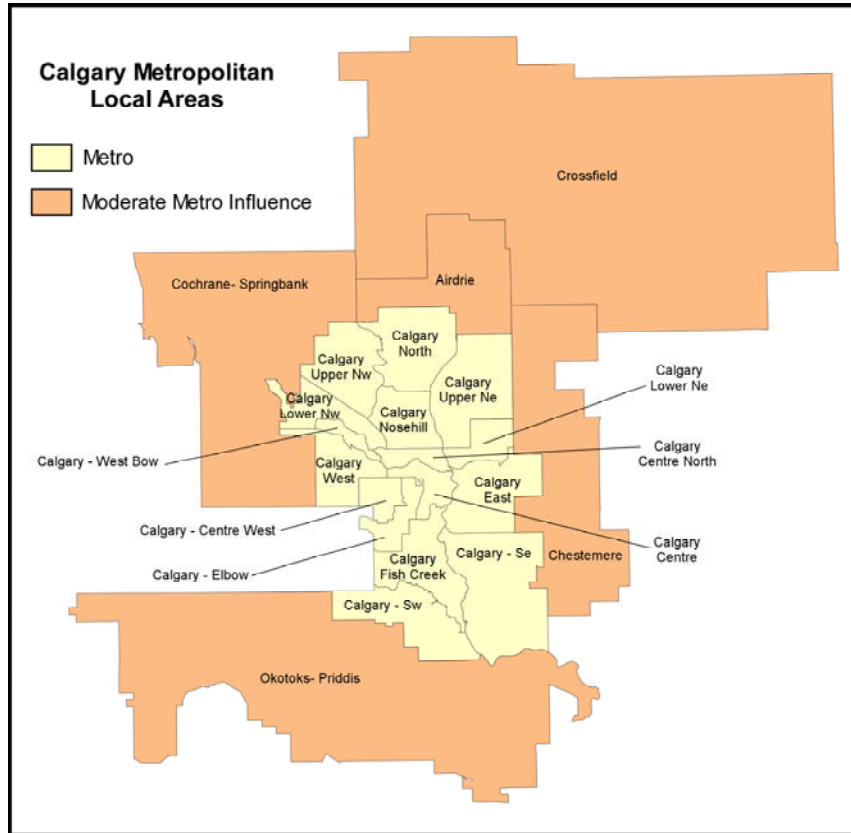
The proposed geo-areas are based on the original 13 peers groups developed by AHS that were combined into seven categories based on common characteristics. This included metro, moderate metro influence, urban, moderate urban influence and three rural categories – rural, rural central and rural remote. For purposes of the FCC location framework we combined moderate urban influence, rural and rural central into one rural category as these three areas had common characteristics. Moderate metro influence was kept as a separate category and this generally encompasses a wealthier, healthier and more mobile population.

The assignment of Local Areas to the original seven categories and the proposed five geo-categories is contained in Appendix B.

The map on the following page provides an outline of the Local Areas with light boundaries. Dark boundaries mark the five AHS Zones.

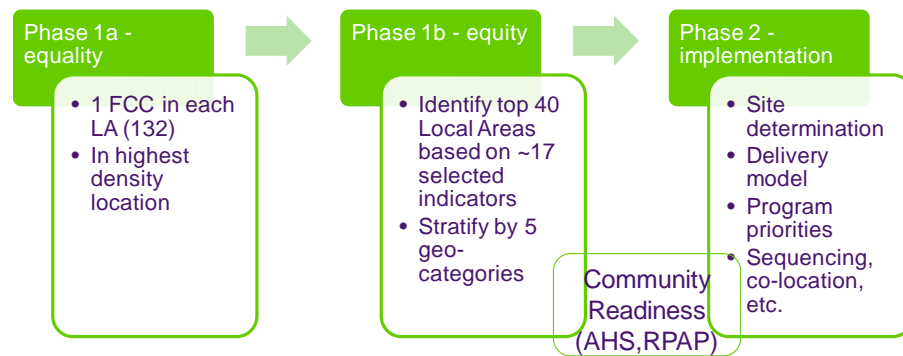


Edmonton and Calgary are high population density areas that contain a number of Local Areas in a small geographic area. The following maps show the Local Areas for the Metro and Moderate Metro geo categories in these two cities.



6 Local Area Prioritization Framework

Based on our research and consultations with the Oversight and Analytics Working Groups, we identified 13 indicators and a framework to prioritize FCC needs across the 132 Local Areas in the province. The framework is designed to address Phase 1a and 1b as shown in the following graphic. Phase 2 is designed to determine specific needs and programming priorities for the FCC and determine the specific location of the FCC within the Local Area. Phase 2 is not within the scope of our framework.



Our ability to show readiness for communities within the top 40 Local Areas depended on data availability. For this reason, the community readiness activity overlapped the two phases. For purposes of this report, the community readiness assessment has been deferred to Phase 2.

6.1 Selected Indicators

We identified 12 indicators with six (6) related to utilization and six (6) related to health needs. An additional indicator, life expectancy, was added to represent social determinants of health.

The selection of indicators considered measures that aligned with one or more of the target populations that would be served by the FCCs and the scope of services that would be provided. This included in no particular order of priority:

- Target population #1 – Patients without access to basic primary care.
- Target population #2 – Patients at risk of developing health conditions/diseases where health prevention and promotion would decrease the risk of development of the illness/disease.
- Target population #3 – Patients with multiple chronic conditions or co-morbidities requiring interdisciplinary care, coordination across the continuum and/or linkage with social supports.

Age standardized rates were used for relevant indicators to facilitate comparison across Local Areas for prioritization purposes. The table on the following page shows the selected indicators.

Other indicators may be added during the prioritization step such as First Nations as a percent of the population in the Local Area, the presence of a PCN, etc. to more fully characterize the selected Local Areas.

The list of selected indicators is summarized in the table on the following page.

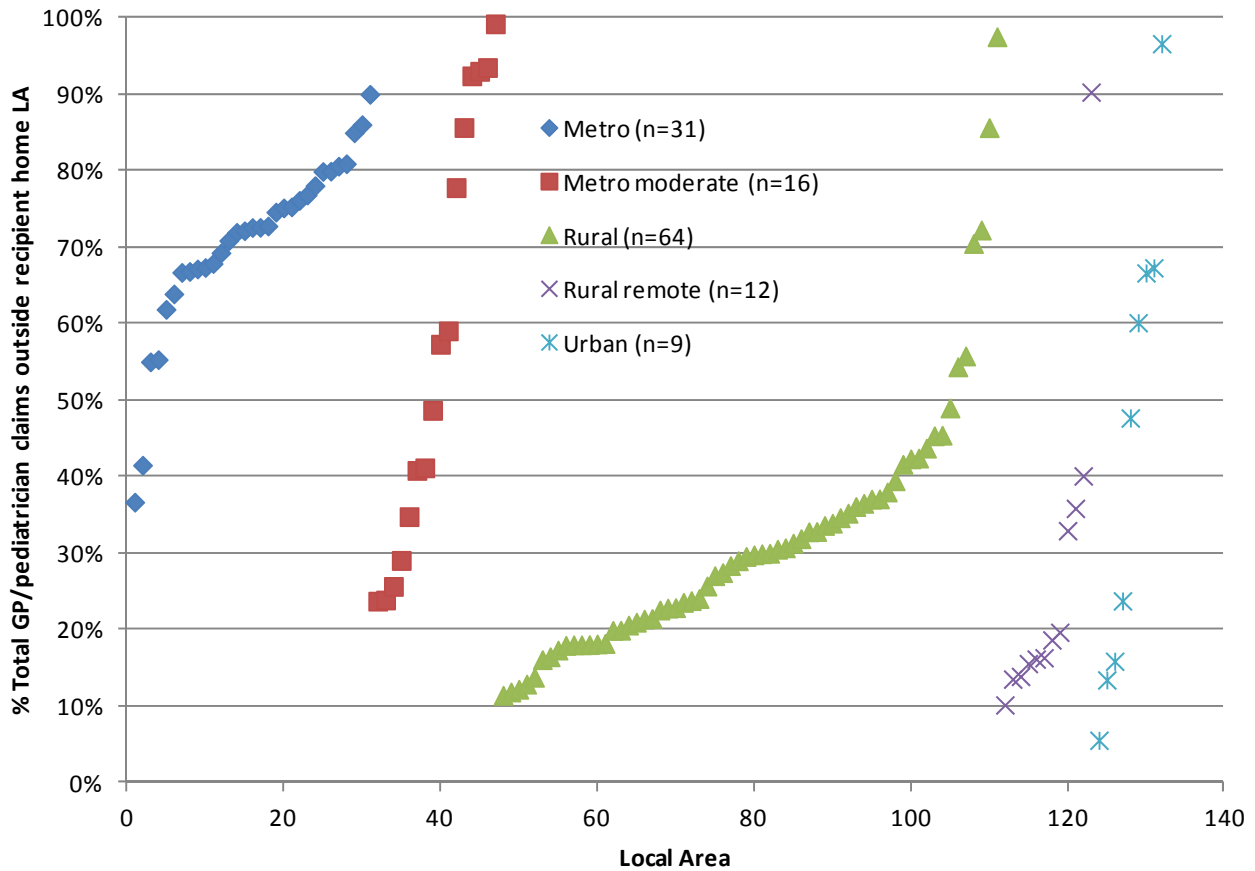
Proposed FCC need indicators

#	Statistic	Year(s)	Higher PHC need if	Comments	Geo- stratify	Target pop
Utilization						
1	% of total Family Practitioner and Pediatrician claims outside of recipient's home LA	2010/11	Higher	Use only for rural and rural remote geo-categories	Rural and remote	1
2	Age standardized Ambulatory Care Sensitive Condition hospitalization rate per 100,000	2003 to 2011	Higher	Higher ACSC rate correlated to lack of primary care alternatives (CIHI).	Yes	All
3	% of CRG 3 to 7 patients who see their Family Practitioner less than 50% of the time	2010	Higher	Patients in this category should be seeing FP regularly	No	All
4	Mood disorder - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Considers prevalence and utilization of acute services	Yes	1
5	Anxiety disorder - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Considers prevalence and utilization of acute services	Yes	1
6	Intentional and unintentional injury - Age standardized emergency visits per 100,000	2003 to 2011	Higher	Identify prevention and service opportunities	Yes	1
Health need						
7	Age standardized diabetes prevalence per 100 population	2010	Higher	Linked to other chronic diseases like heart, renal, etc.	No	2
8	Age standardized COPD prevalence per 100 population	2010	Higher	Opportunity for secondary prevention	No	2
9	Age standardized rate of people with 3 or more chronic diseases (prevalence) per 100 population	2010	Higher	Target for multidisciplinary team intervention and coordination	No	3
10	% of population 65+ receiving annual influenza immunization	2011/12	Lower	Immunizations done by First Nations health centres not captured	No	1
11	Predicted age standardized per capita billings (\$) for community and primary care	2006/07 to 2008/09	Higher	From AH Health Human Resources Model and proxy measure for needs	Yes	1
12	Actual minus predicted age standardized per capita community and primary care service billings (\$)	2006/07 to 2008/09	Lower	From AH Health Human Resources Model they measures gap in primary care services	Yes	All
Social determinant of health						
13	Life expectancy at birth	2000 to 2011	Lower	Correlates with socio-economic status and health care costs	No	3

The following sections describe the rationale for selecting these indicators and depict the indicator in graphical terms that allowed us to make decisions of whether or not to stratify the indicator across the geo-categories.

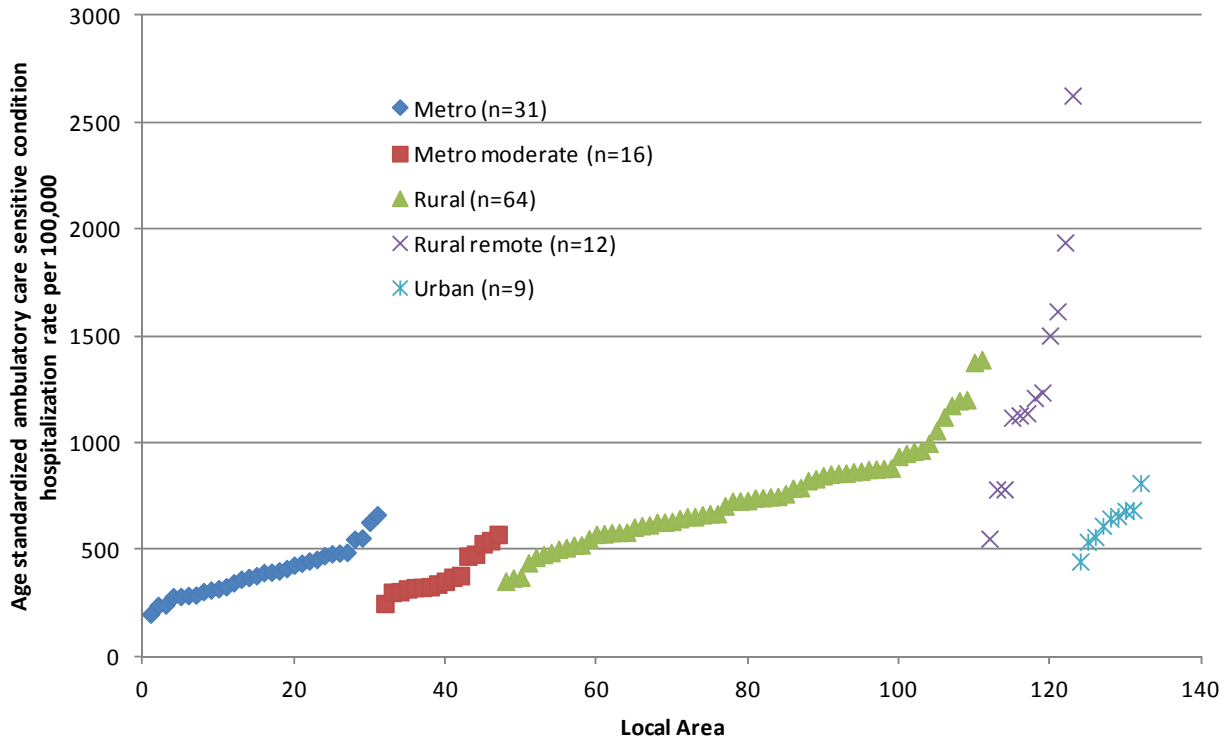
6.2 Travel for Primary Care Outside of Patient's Local Area

This indicator was chosen to identify Local Areas where patients need to travel a significant distance to access primary care. As shown in the exhibit below, this indicator does not serve the intended purpose in high density population Local Areas that are adjacent to other high density population Local Areas such as in the Metro, Metro moderate influence and Urban geo-categories.



6.3 Ambulatory Care Sensitive Conditions

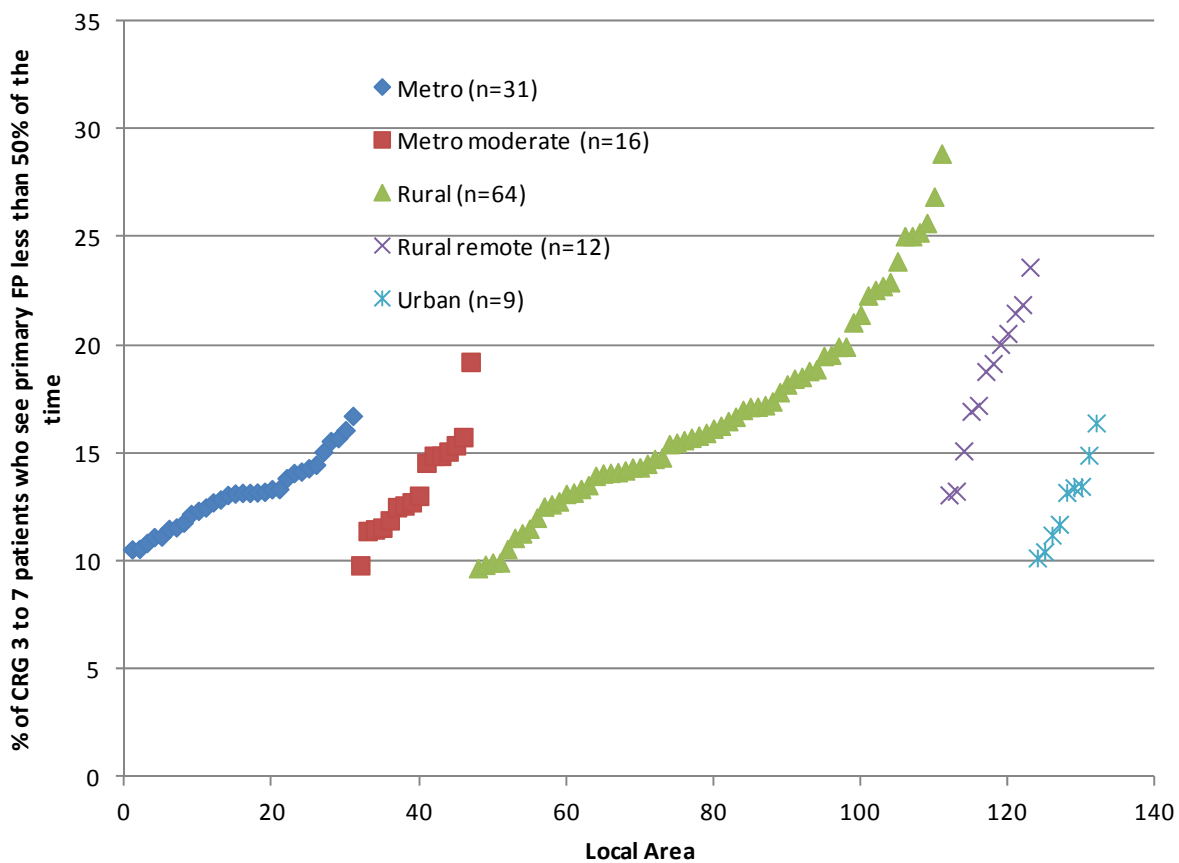
This indicator provides a measure of the inappropriate use of inpatient admissions due to the lack of community based alternatives. This metric is very sensitive to the geo-category as residents in rural and remote areas have less access to community based primary care alternatives. Geo-stratification is required for this indicator.



6.4 Degree of Continuity

This indicator defines the proportion of patients in a Local Area with minor (CRG 3&4) or severe chronic illness (CRG 5 to 7) who see their primary Family Practitioner less than 50% of the time. This will help to identify Local Areas that would benefit from greater continuity of care and care coordination.

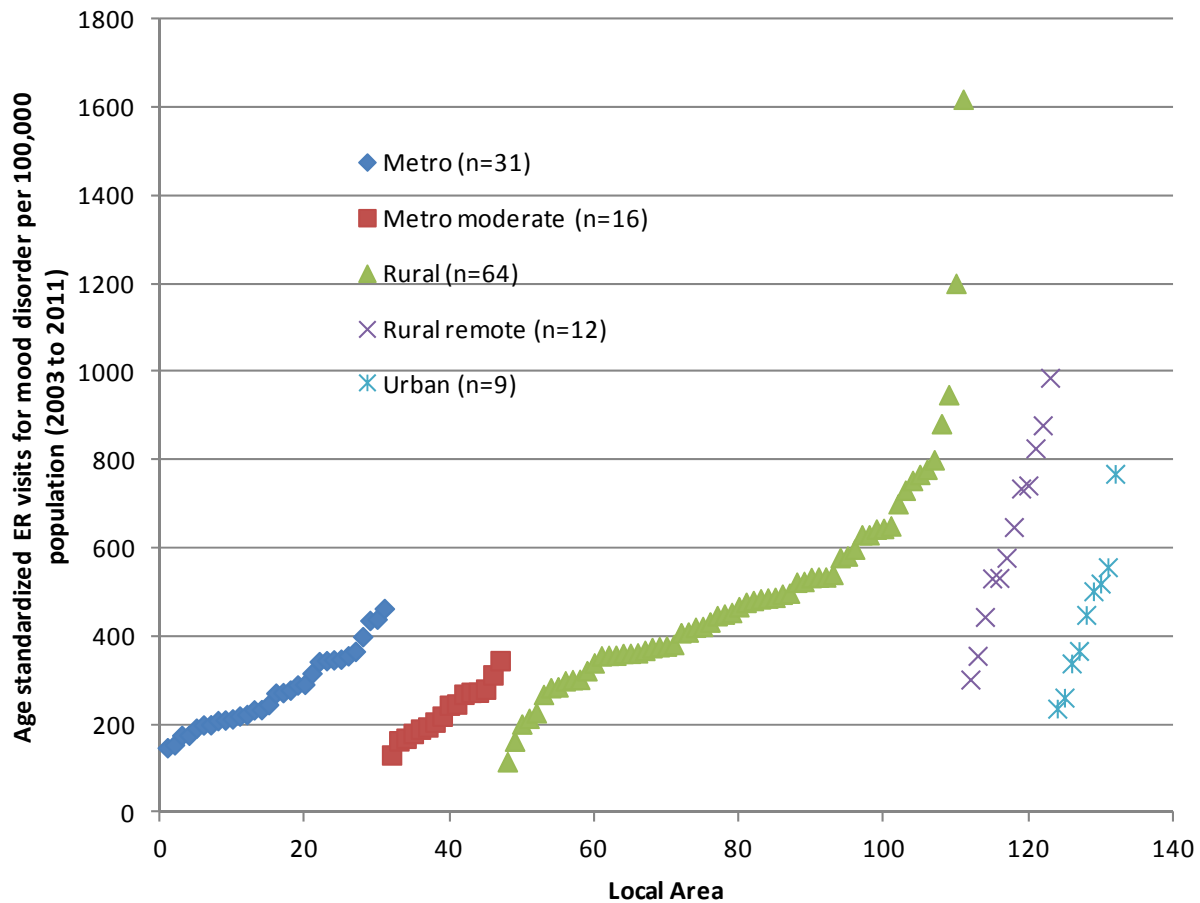
We note that higher values indicate areas with larger proportions of “unhealthy” or “sick” patients, who are weakly attached to their family physician. In contrast, the smaller values indicate areas with smaller proportions of “unhealthy” or “sick” patients (again, who are weakly attached to their family physician). Lower is better. Alternatively, Local Areas with higher percentages would benefit from the continuity that could be provided by an FCC. As shown in the graphic below, some Rural and Rural Remote Local Areas have particularly lower continuity when compared to Local Areas in other geo-categories.



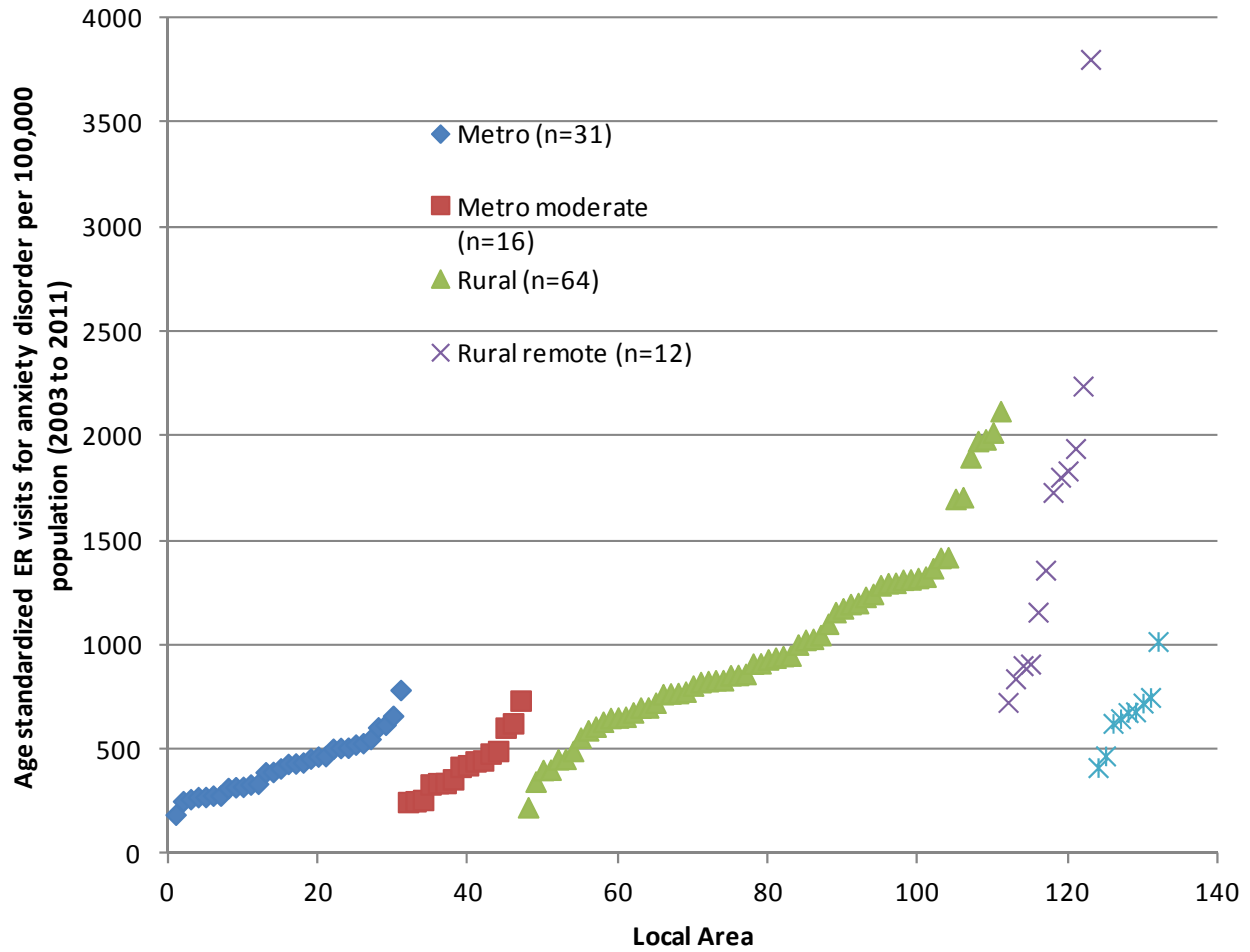
6.5 ER Visits for Mental Health

About 10% of the population has mental health conditions and a significant proportion of a FP practice involves treatment of mental health conditions. The following two indicators capture both the prevalence of mental health in a population and usage of emergency room services if adequate capacity does not exist in the community.

6.5.1 Mood Disorders

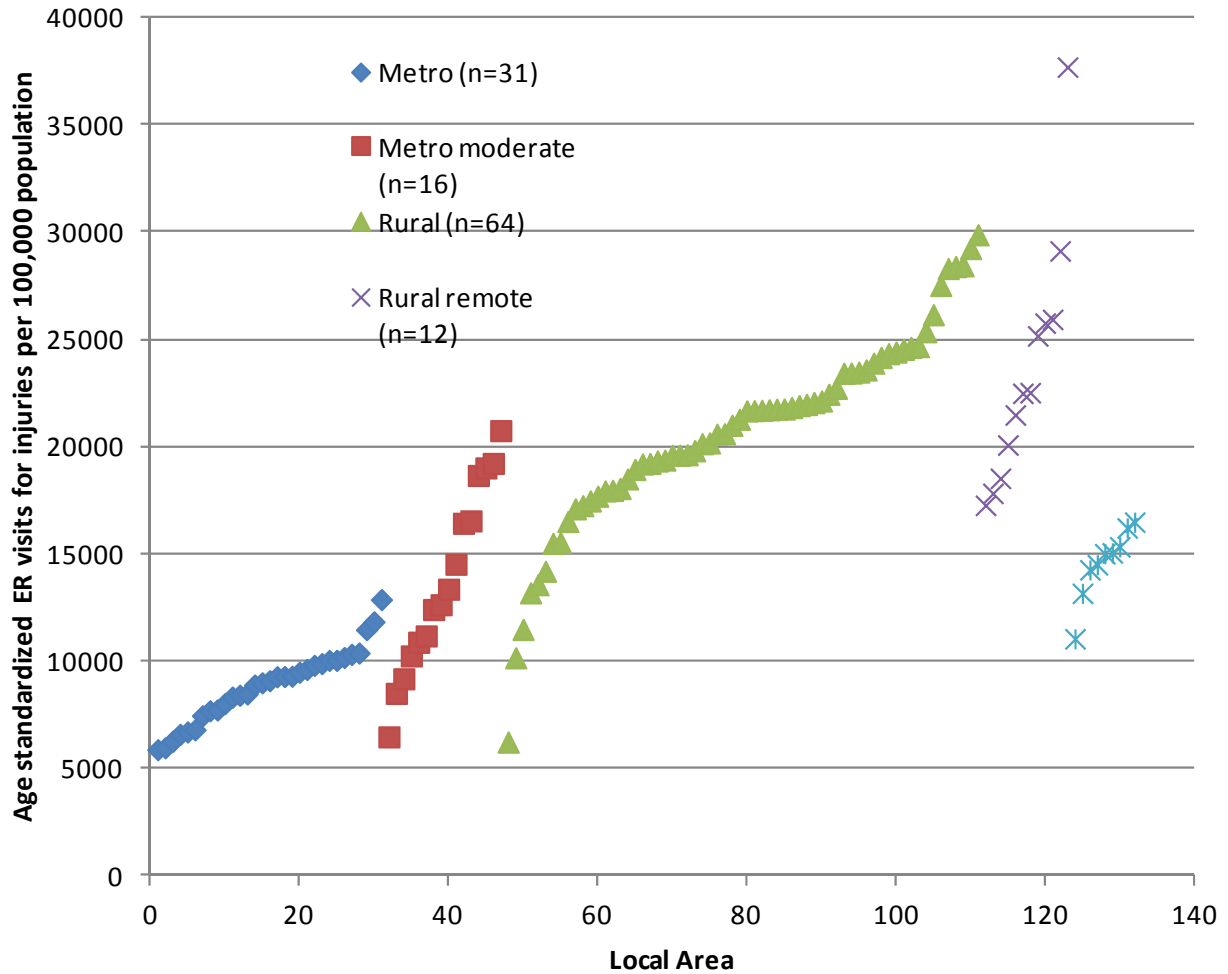


6.5.2 Anxiety Disorders



6.6 ER Visit Rate for Injuries

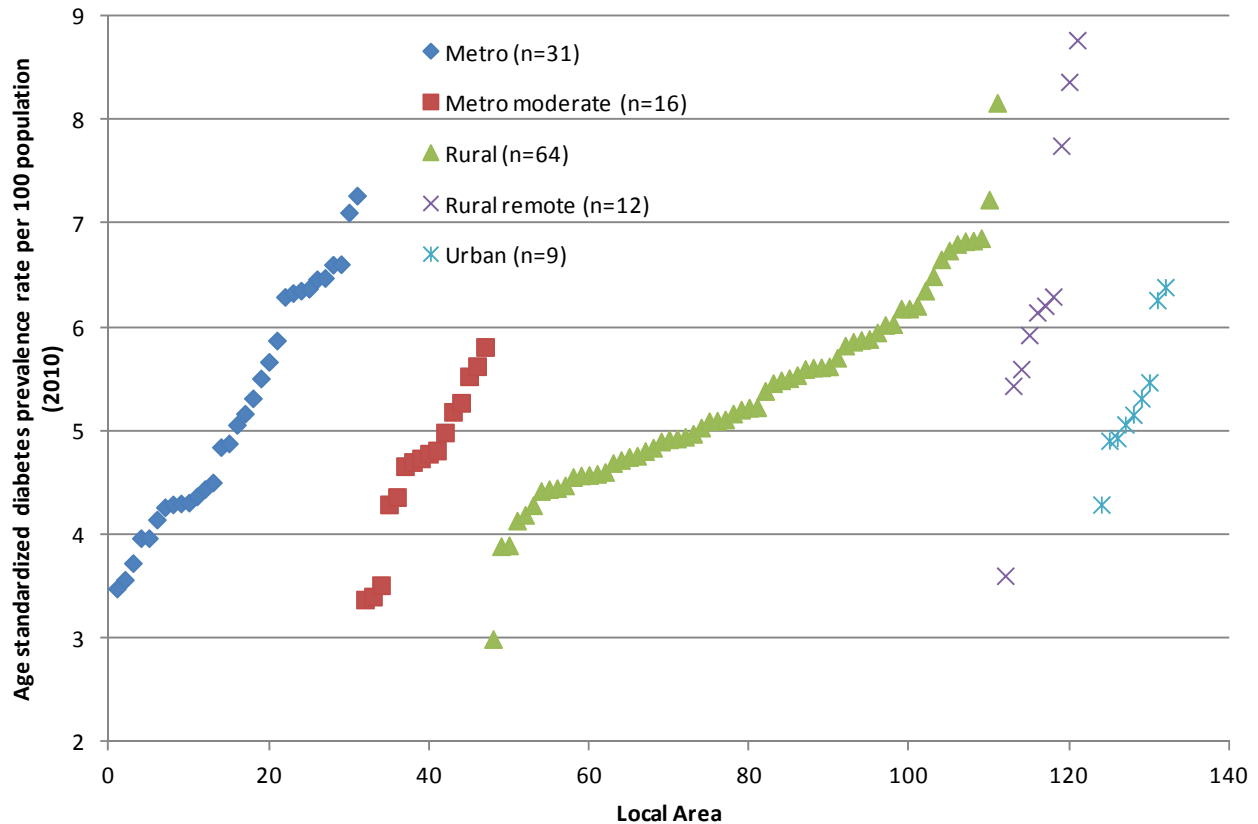
This indicator represents two opportunities for FCCs – treatment of minor injuries and implementation of programs to reduce preventable injuries.



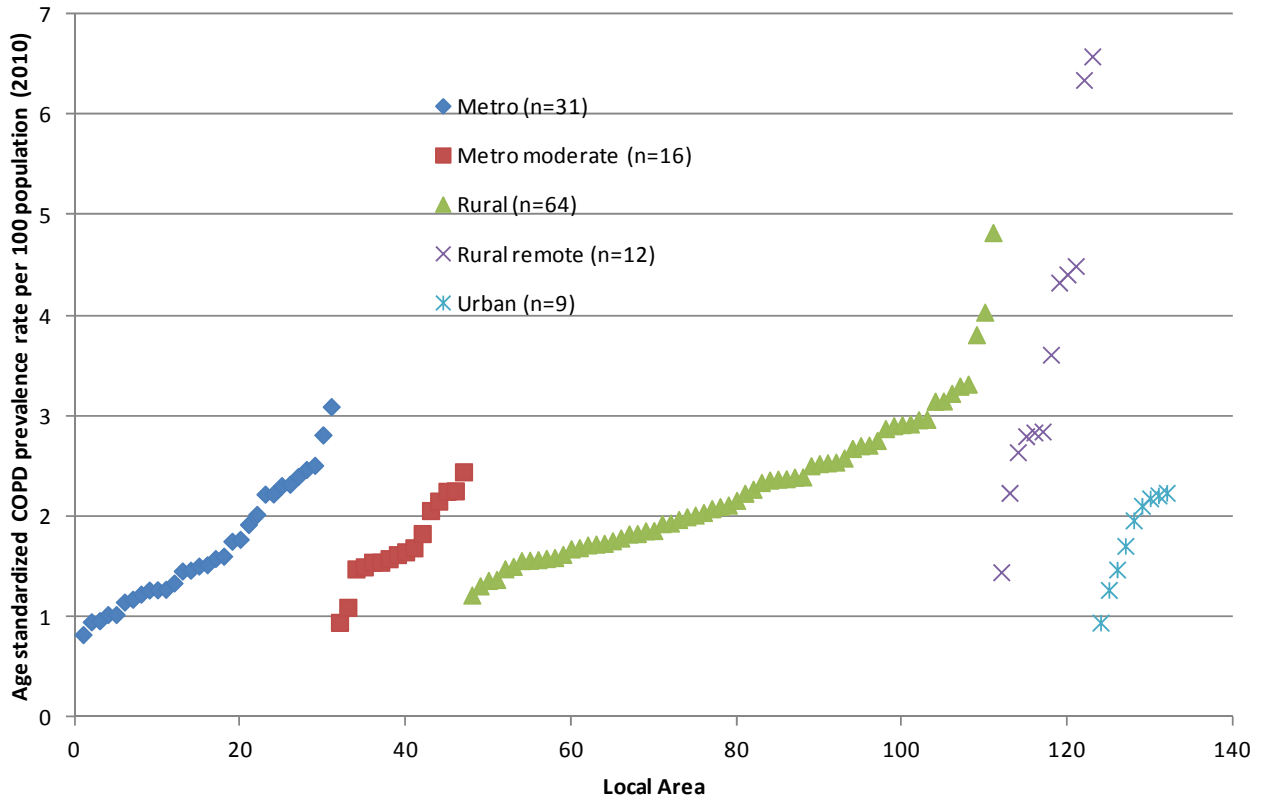
6.7 Chronic Diseases

Chronic diseases represent a significant burden on the health care system and on the quality of life for many Albertans. We selected prevalence indicators for two chronic diseases – diabetes and COPD as they represent a significant cost and benefit from management of risk factors which aligns with the secondary prevention role of FCCs. Diabetes is related to other chronic diseases such as renal disease and COPD has recognized clinical practice guidelines.

6.7.1 Diabetes Prevalence

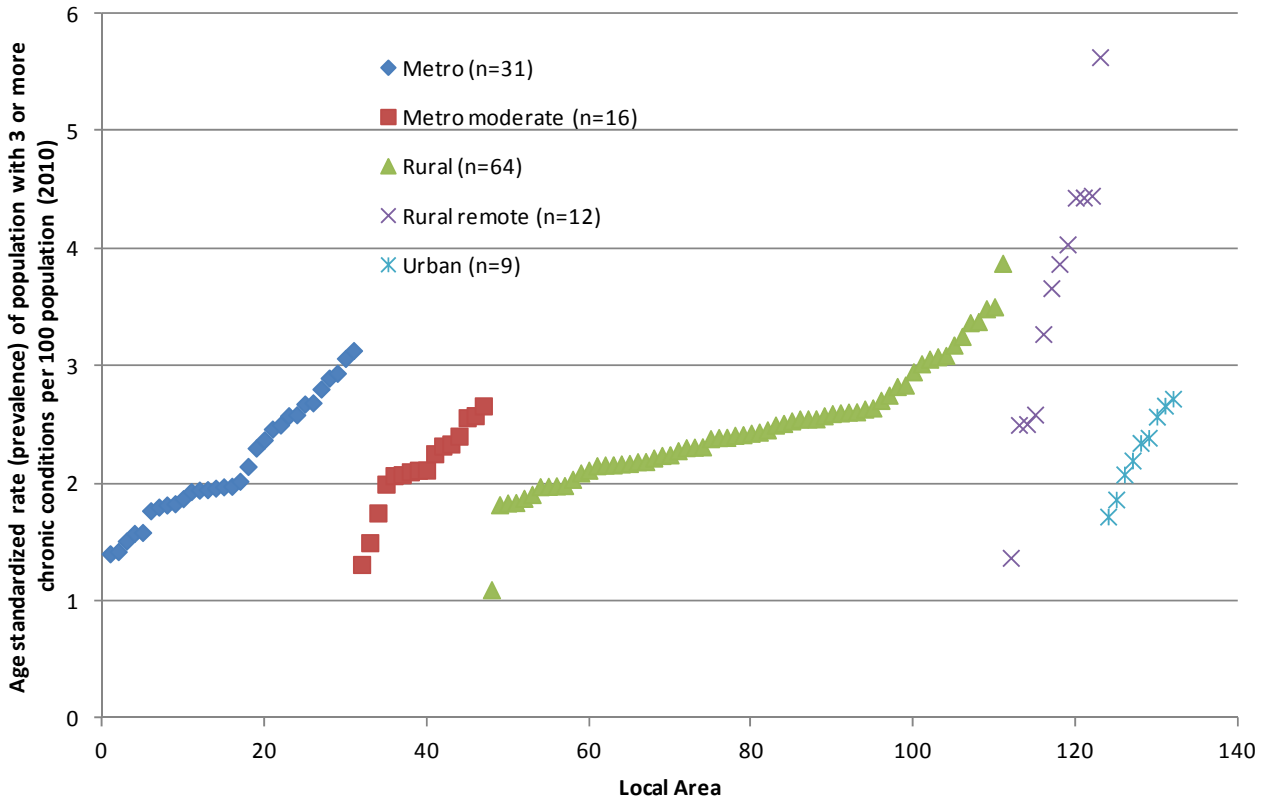


6.7.2 COPD Prevalence



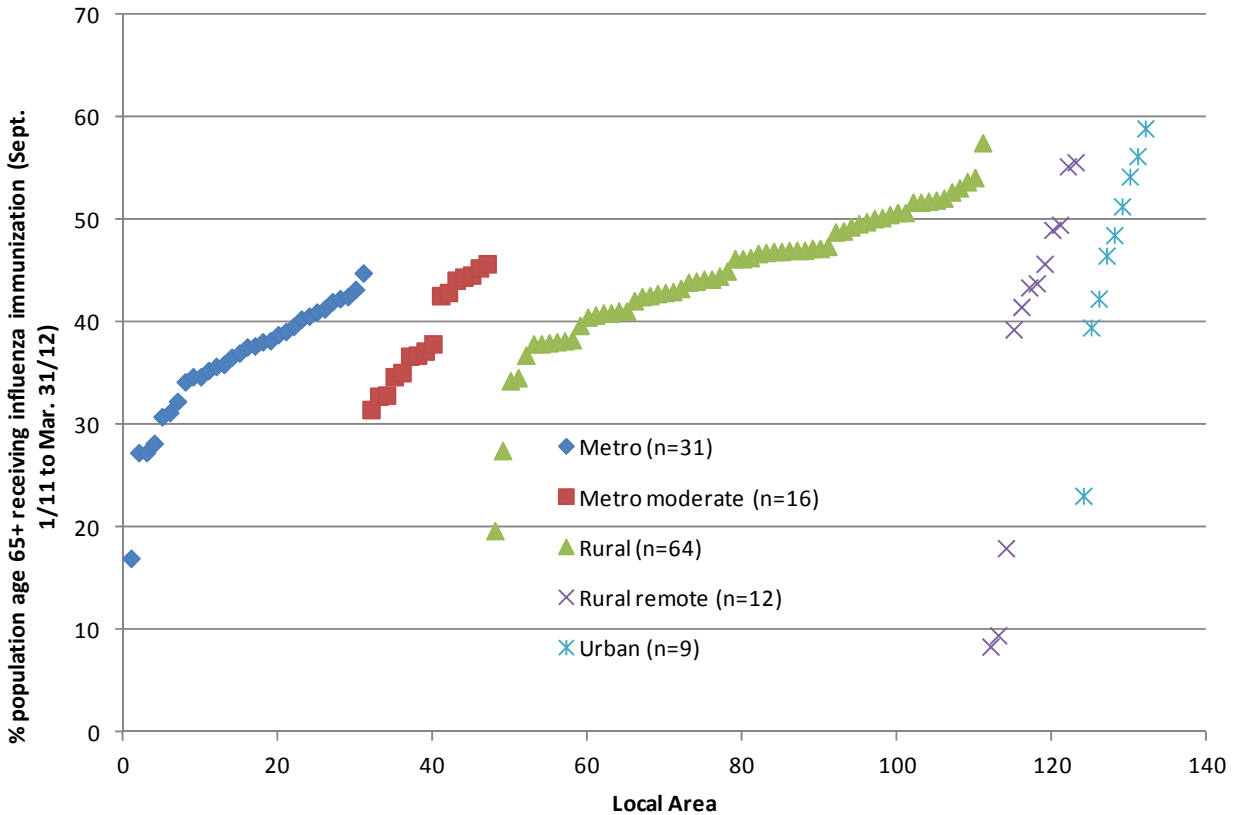
6.7.3 Population with Three or More Chronic Conditions

Patients with three or more chronic diseases benefit from interdisciplinary care and more formalized case management and care coordination. This indicator considers patients with three or more chronic conditions which may include hypertension, asthma, COPD, diabetes, ischemic heart disease and/or end stage renal disease.



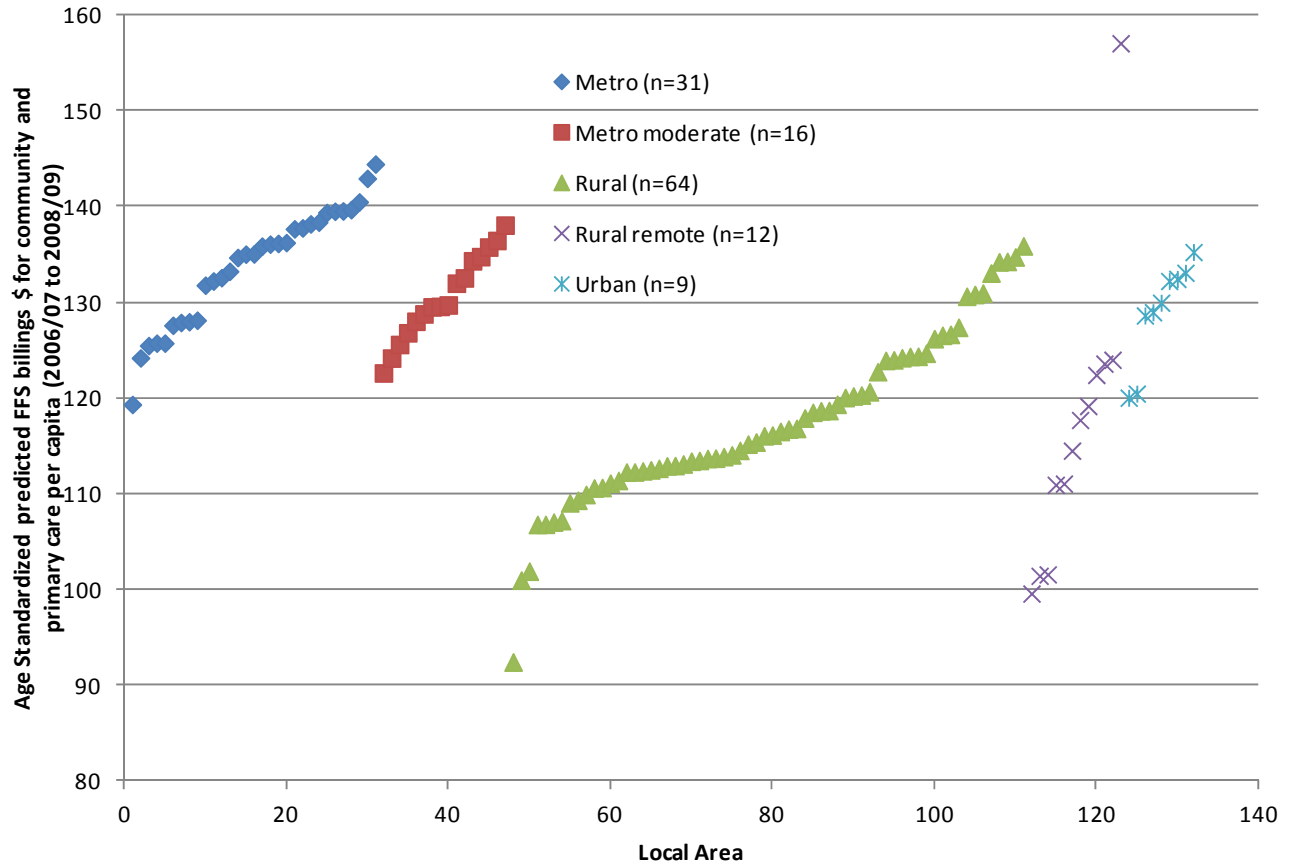
6.8 Influenza Vaccination

Influenza vaccination of patients 65+ is one of the pan-Canadian PHC indicators under primary prevention. AH data for this indicator includes immunizations delivered between September 1, 2011 and March 31, 2012 by AHS, community pharmacists and physicians. This does not include immunizations done in First Nations health centres, in long term care facilities, by Victoria Order of Nurses, etc. Local Areas that have a FN population of > 20% may be provided for context to facilitate interpretation of this indicator.



6.9 Predicted per Capita Family Practitioner Billings

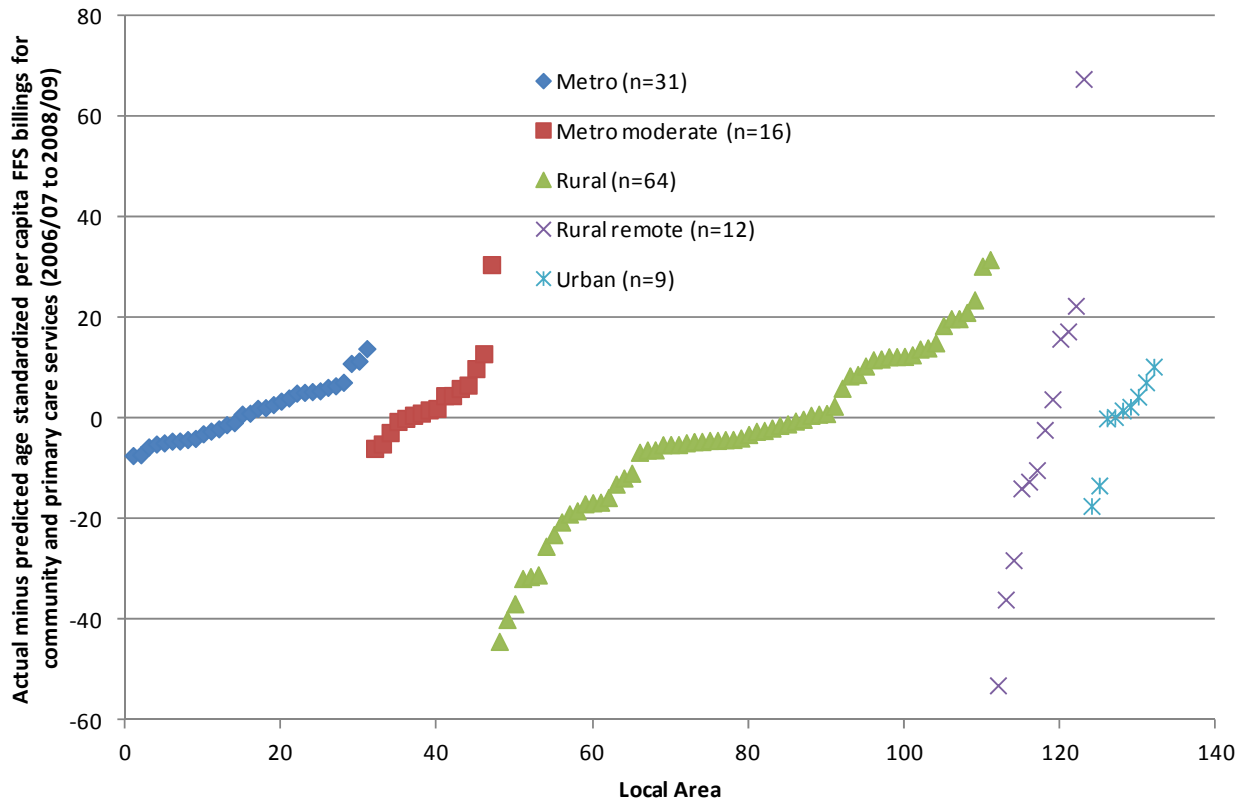
This indicator generated by the Health Human Resource (HHR) model and provides a composite measure of relative health need based on the health status and socioeconomic factors described in Section 4.2. Need is measured as the predicted age standardized per capita dollar value for community and primary care billings.



We note that the graphic shows that residents of metro areas have higher health needs which may not be intuitively consistent with current thinking of the Analytics Working Group. This indicator may require more thought and discussion to be able to explain the results.

6.10 Gap between Actual and Predicted Billings

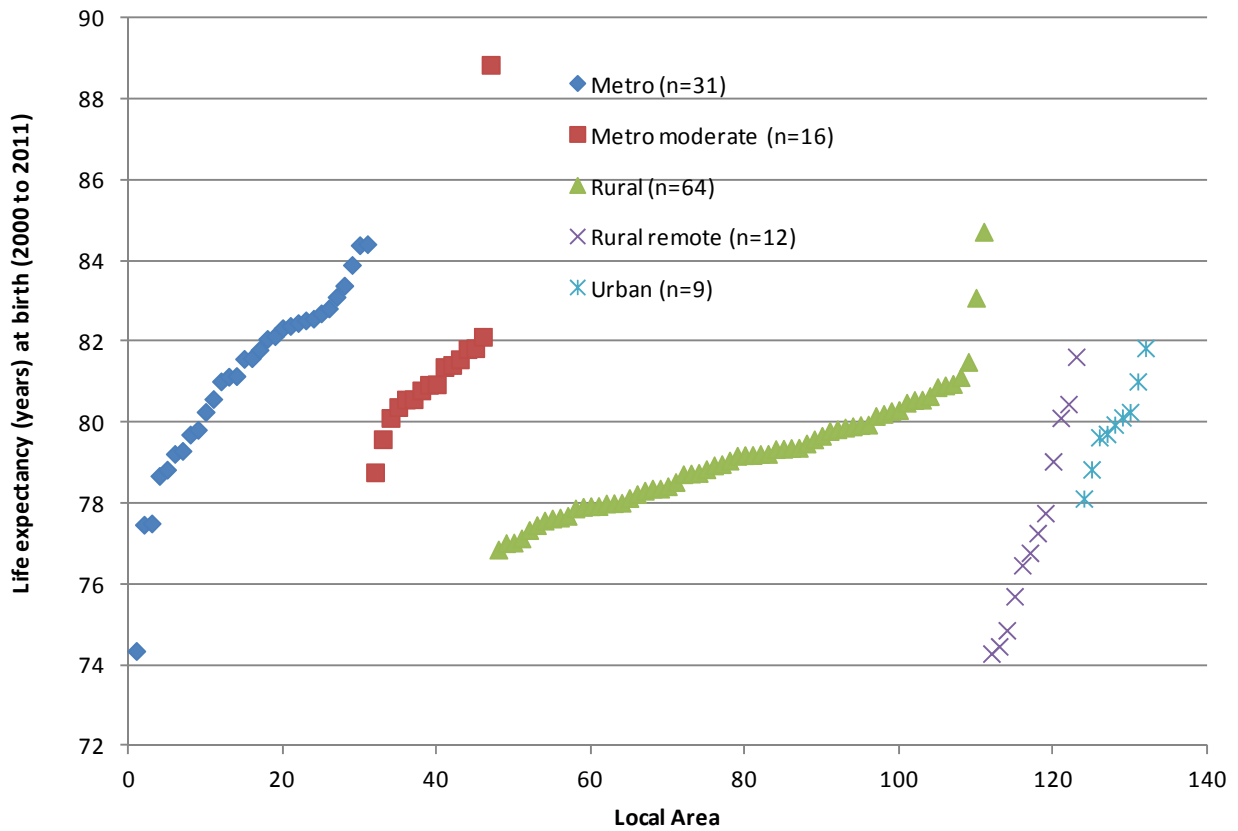
This is another indicator from the Health Human Resource model and presents the difference between actual and predicted per capita billings for community and primary care services which provides a measure of the availability of primary care services. A negative gap means that more primary care services should have been accessed/provided for a particular level of need.



6.11 Life Expectancy at Birth

Life expectancy at birth is correlated with the determinants of health and predictive of health care costs.

The life expectancy at birth indicator shows the number of years a person would be expected to live, on the basis of the mortality statistics for a given observation period. The indicator allows for reliable comparisons of the overall state of health of a population over time and among Local Areas.



7 Risk/Need Category Definitions

We developed “cut-points” for each indicator that allowed us to assign Local Areas to Low, Moderate or High risk or need categories for a particular indicator. For the indicators where a higher value was related to a higher need or risk, a Standard Score of -1.96 or less was considered Low need. A Standard Score of more than +1.96 was considered High need. Standard Scores between -1.96 and +1.96 were considered Moderate need.

For three indicators, a lower score was related to a higher need or risk. These included life expectancy, immunization and HHR gap. For these indicators, a Standard Score of +1.96 or more was considered Low need. A Standard Score of less than -1.96 was considered High need. Standard Scores between -1.96 and +1.96 were considered Moderate need.

Standard Error (SE) is an estimate of how close to the population mean your sample mean is likely to be, whereas standard deviation is the degree to which individuals within the sample differ from the sample mean. Standard error should decrease with larger sample sizes, as the estimate of the population mean improves. Standard deviation will be unaffected by sample size. The **Standard Score** determines how many SEs the Local Area result is from the Alberta value.

7.1 Results for Non-Geo Stratified Local Areas

The resulting number of Local Areas within each Low, Moderate and High category for each indicator is shown in the following table.

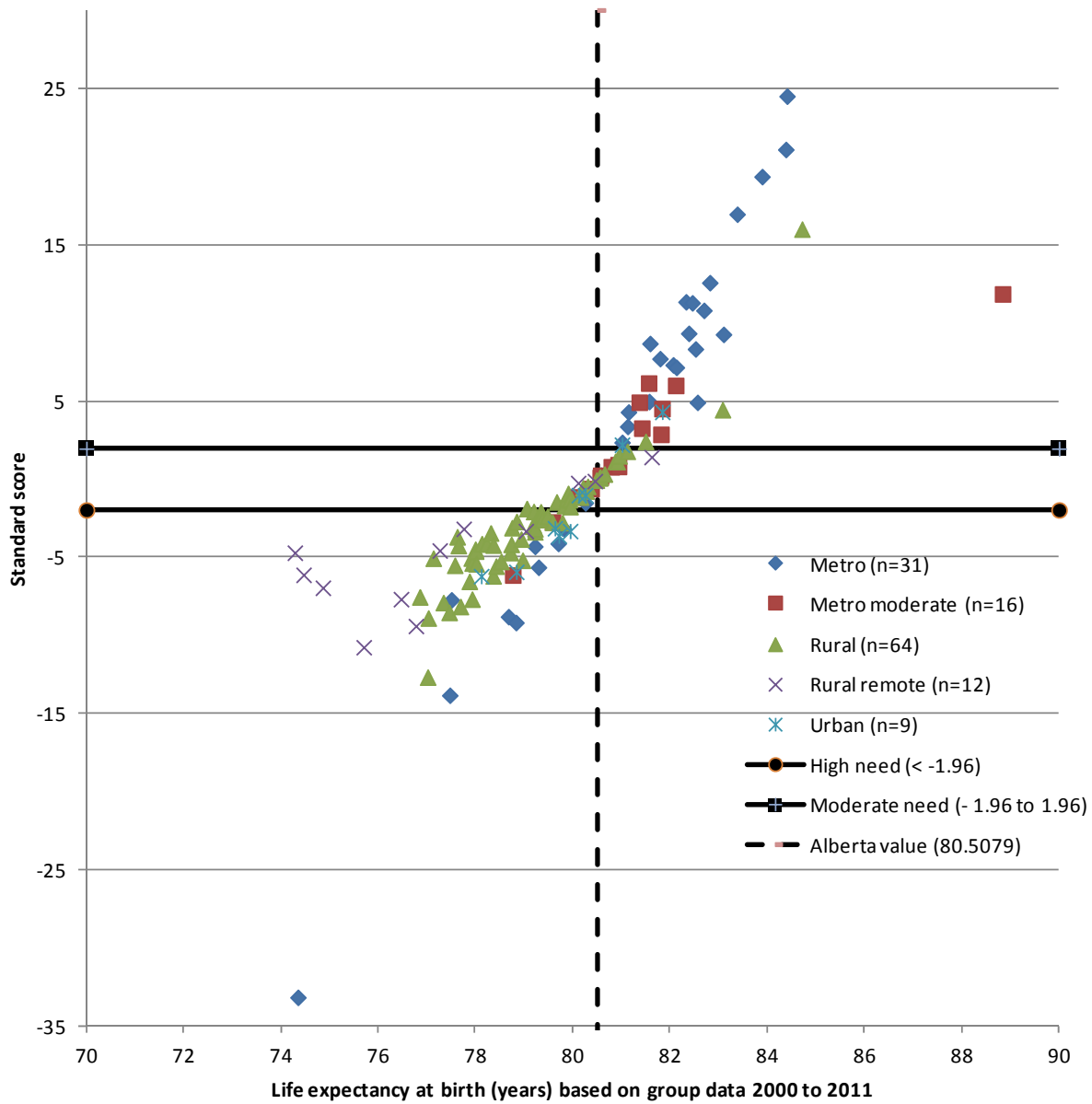
Distribution of Low, Moderate, and High need/risk categories

(number of Local Areas, n=132)

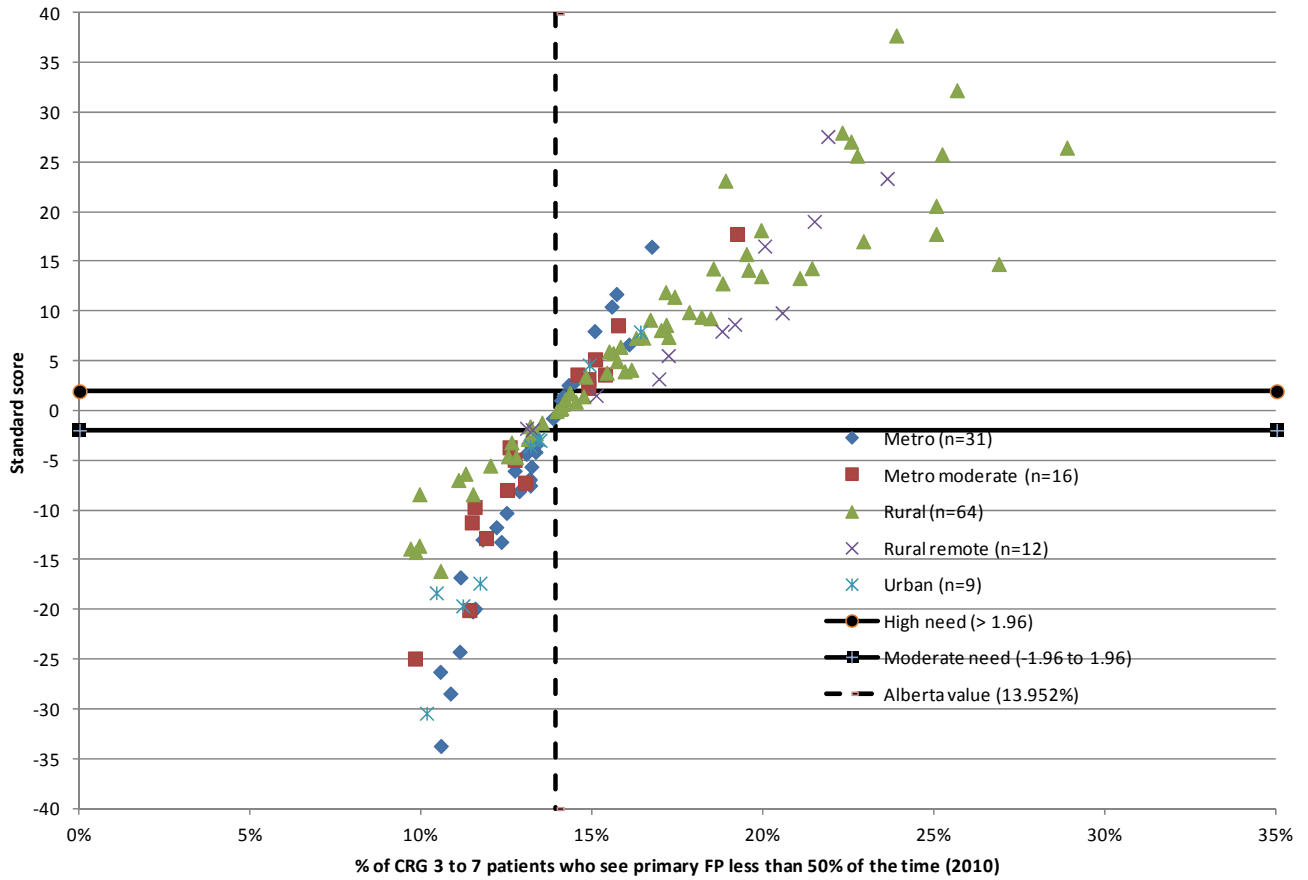
Indicator	Low	Moderate	High
Life expectancy	67	33	32
Family Practitioner continuity	64	17	51
Diabetes	47	30	55
Chronic obstructive pulmonary disease	39	27	66
3+ chronic diseases	35	41	56
Influenza vaccination	61	30	41

The following sections show the results for each non-geo stratified indicator in graphical terms.

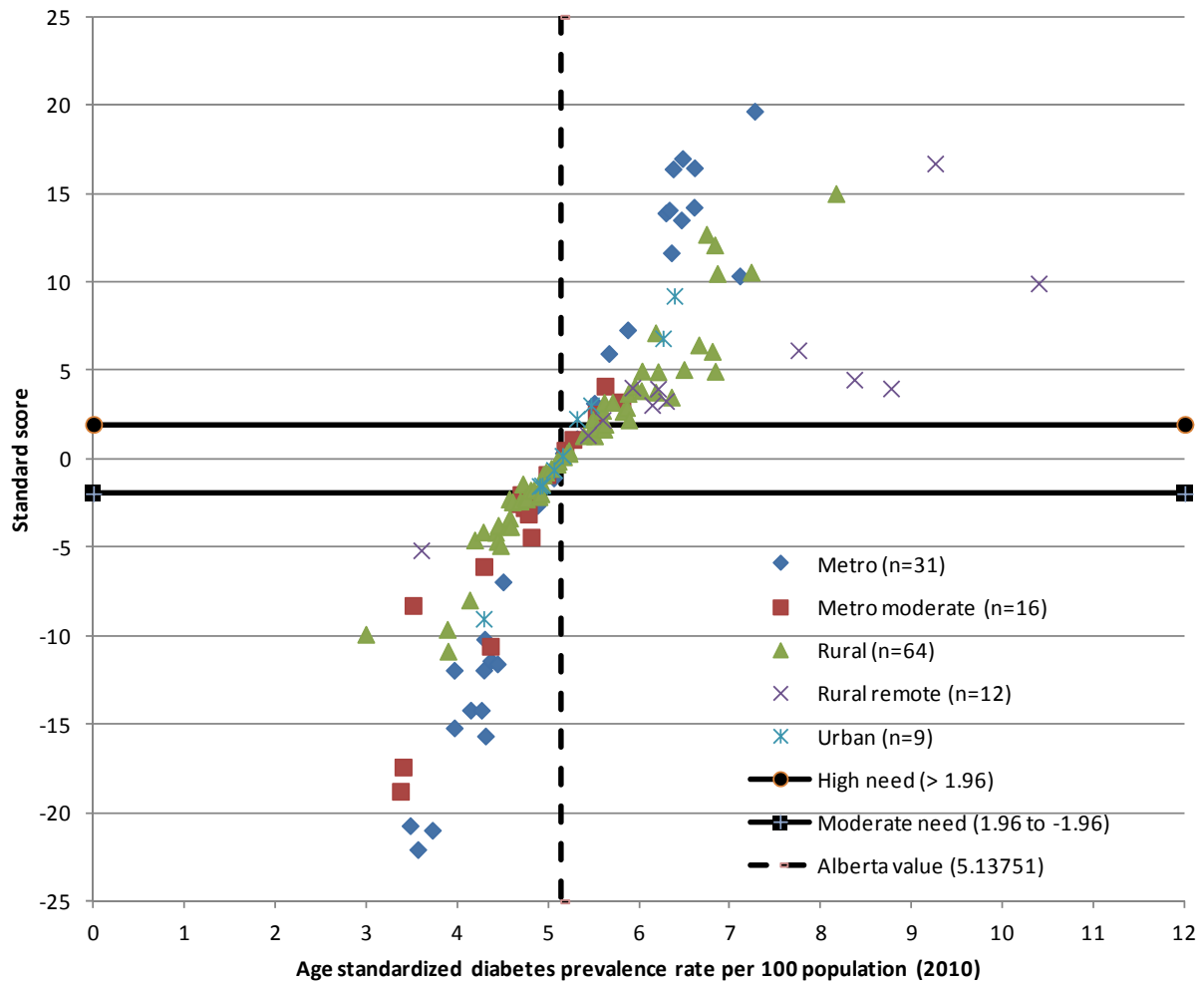
7.1.1 Life Expectancy



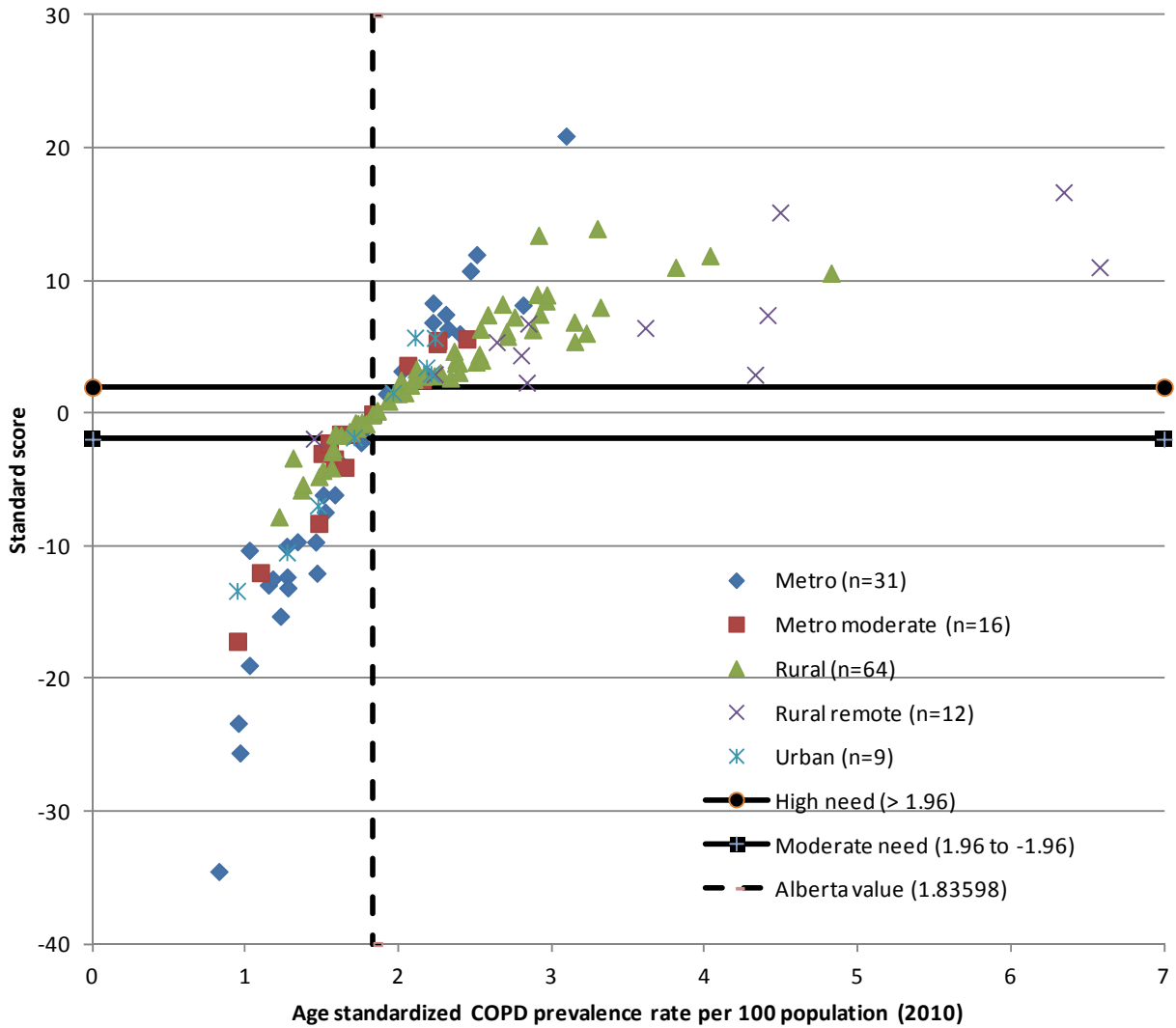
7.1.2 Family Practitioner Continuity



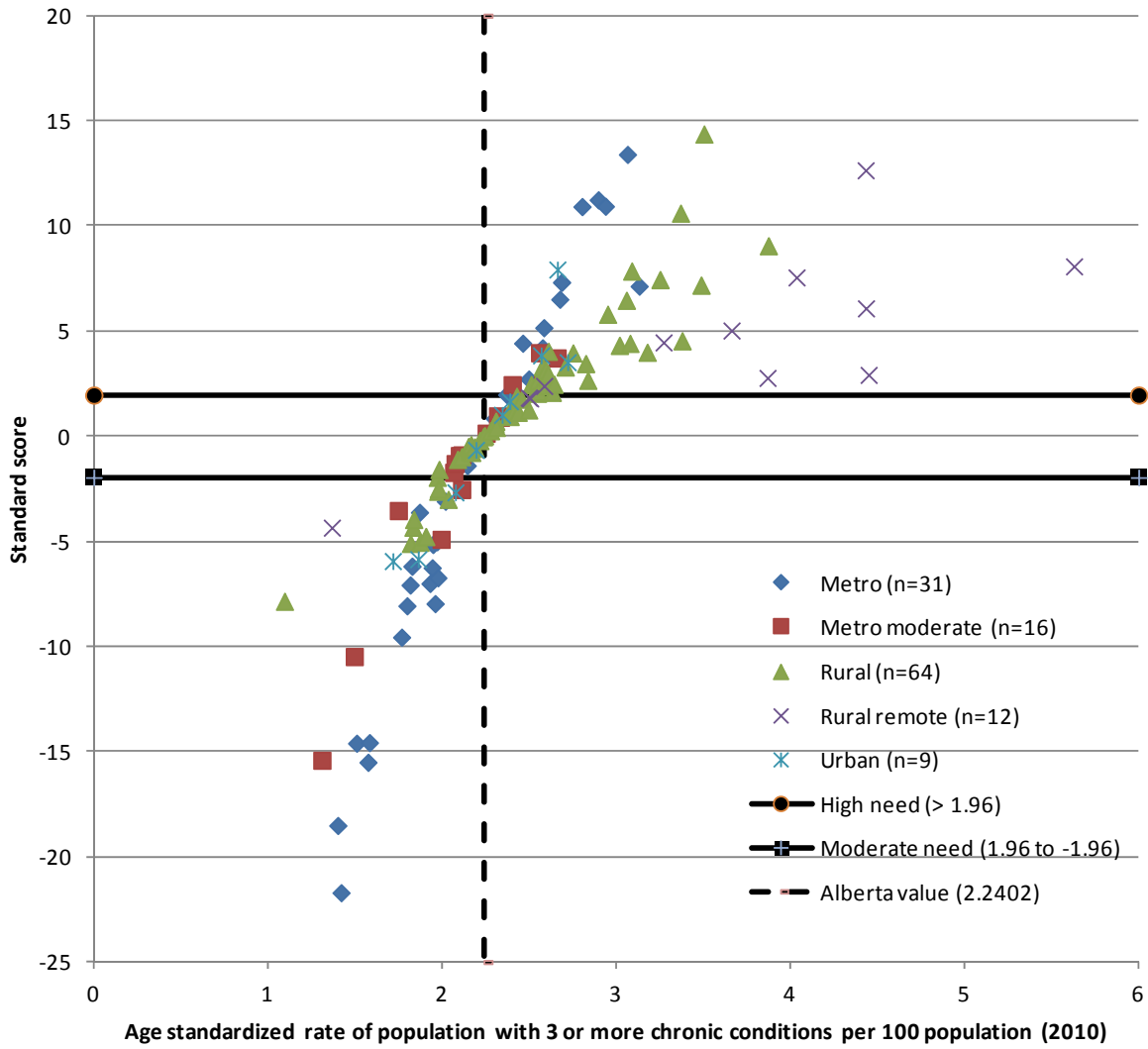
7.1.3 Diabetes Prevalence



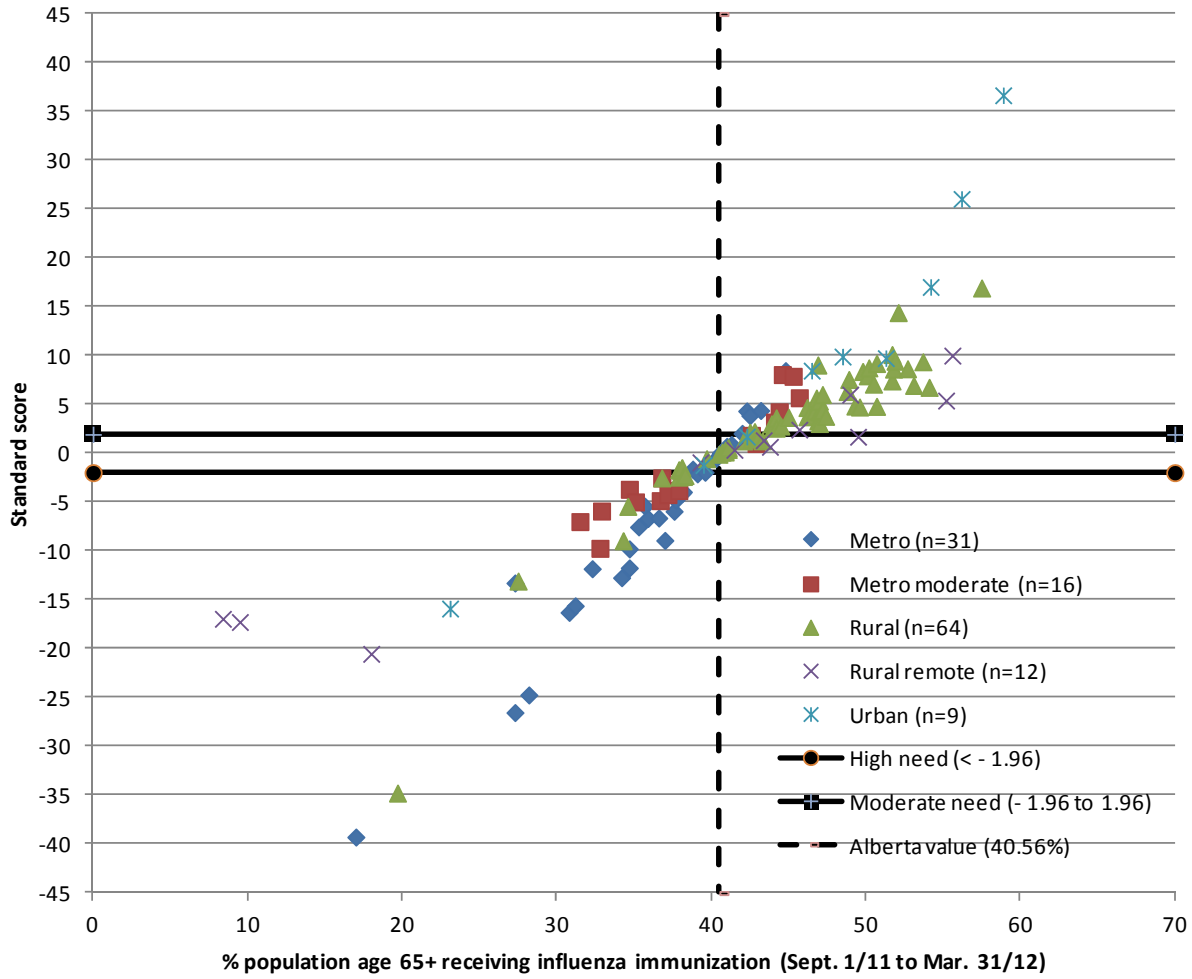
7.1.4 COPD Prevalence



7.1.5 Three or More Chronic Diseases



7.1.6 Influenza Vaccination



7.2 Cut Points for Indicators with Geo-Stratification

The following table shows the distribution of Low, Moderate and High need/risk Local Areas within each geo-category for indicators that were geo-stratified.

Distribution of Low, Moderate, and High need/risk categories
(number of Local Areas, n=132)

Indicator	Low	Moderate	High
ER injury visits	54	1	77
Metro	13		18
Metro moderate	8		8
Rural	25	1	38
Rural remote	4		8
Urban	4		5
ER mood disorder visits	64	4	64
Metro	15	2	14
Metro moderate	8		8
Rural	32	1	31
Rural remote	5	1	6
Urban	4		5
ER anxiety visits	65	4	63
Metro	15		16
Metro moderate	7	1	8
Rural	34	2	28
Rural remote	6		6
Urban	3	1	5
Ambulatory Care Sensitive Conditions	63	4	65
Metro	15		16
Metro moderate	9	1	6
Rural	29	1	34
Rural remote	7	1	4
Urban	3	1	5
Family Practitioner visits outside Local Area	101	-	31
Metro	31		
Metro moderate	16		
Rural	37		27
Rural remote	8		4
Urban	9		
Health Human Resource model predicted	49	38	45
Metro	9	8	14
Metro moderate	5	6	5
Rural	30	11	23
Rural remote	3	8	1
Urban	2	5	2
Health Human Resource model gap	41	49	42
Metro	14	5	12
Metro moderate	4	9	3
Rural	18	25	21
Rural remote	3	5	4
Urban	2	5	2

7.3 Indicator Matrix and Local Area Score Determination

We developed a matrix to display the results, calculate scores and to prioritize Local Areas. A sample results matrix is shown below.

Local Area Name	Geo Category	Population	Utilization (1-6)						Health status (7-12)					Social Determinants		Count			LE Modified Score
			1 % FP out	2 ACSC	3 FP Continuity	4 ER mood	5 ER anxiety	6 ER injury	7 Diabetes	8 COPD	9 3 or more Chronic Diseases	10 Influenza vaccine	11 HHR predicted	12 HHR gap	13 Average Life Expectancy Standard Score	Ind (1-12)			
														L	M	H	Indicator Score (1L+2M+3H)		
LA#	Metro	##	1	3	1	3	3	3	3	3	3	3	1	1	4	0	8	28	61.1181
LA#	Rural	##	1	3	1	3	3	3	3	3	3	3	3	2	0	10	32	44.6482	
LA#	Metro	##	1	3	3	3	3	3	3	3	3	3	3	1	1	10	33	42.1575	
LA#	Rural remote	##	3	3	1	1	3	3	3	3	3	3	2	2	2	8	30	40.7337	
LA#	Metro	##	1	3	3	3	3	3	3	1	1	1	3	5	0	7	26	39.8056	
LA#	Metro	##	1	3	1	3	3	3	3	3	3	3	3	2	0	10	32	39.7045	
LA#	Metro	##	1	3	3	3	3	3	3	3	3	3	1	3	0	9	30	38.7838	
LA#	Rural remote	##	1	3	1	3	3	3	3	3	3	3	3	2	0	10	32	38.1047	
LA#	Rural	##	3	3	1	3	3	3	3	3	3	3	1	3	0	9	30	37.8844	
LA#	Rural	##	3	3	1	3	3	3	3	3	3	3	1	3	1	8	29	37.51	
LA#	Rural	##	1	3	1	1	3	3	3	1	3	3	3	4	0	8	28	36.8701	
LA#	Rural	##	1	3	1	1	3	3	3	3	3	3	2	3	1	8	29	36.5214	

The score for each Local Area was determined as follows:

- Count the number of Low, Moderate and High need indicators for the first 12 indicators. Each indicator is weighted equally.
- Multiply the count of Low by 1, Moderate by 2, High by 3 and sum to get the Indicator Score.
- Add the life expectancy Standard Score to the Indicator Score to get the LE Modified Score for each Local Area. A lower Standard Score (i.e., a greater negative score) translates to a higher need/risk so the life expectancy Standard Score is multiplied by negative one and then added to the Indicator Score.

Since one of the unique features of the FCC is to consider the social determinants of health in programming and service delivery, the prioritization framework is heavily weighted towards the life expectancy indicator. Life expectancy at birth is correlated with the determinants of health and predictive of health care costs. This includes 12 key factors which influence population health: income and social status; social support networks; education; employment/ working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; biology and genetic endowment; health services; gender; and culture. Of these, socio-economic status is considered the most important determinant of health. (Public Health Canada. The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH) <http://www.phac-aspc.gc.ca/ph-sp/determinants/determinants-eng.php>).

The Local Areas were then sorted in descending order (from highest to lowest) based on the LE Modified Score to identify the top 40 Local Areas for FCC consideration. The model output serves as a starting point for discussions with key stakeholders to validate the top 40 FCCs based on more detailed knowledge of the Local Area identified by the model. Other indicators or criteria may be added to facilitate decision making such as First Nations as a percent of the population in the Local Area, the presence of a PCN, minimum "panel" size, etc.

7.4 Readiness Criteria

Subsequent analyses may consider community readiness that considers community engagement, infrastructure, etc. Proxy measures from the Alberta's RPAP (Rural Physician Action Plan) program may be used in this respect.

AHS has developed criteria to assess the readiness of a community to implement a FCC. The following questions have been identified:

- Have community stakeholders been identified, engaged and the impact /barriers assessed?
- Has existing primary care program and service delivery integration been assessed?
- What is the workforce availability: Physicians? Nurse Practitioners? Registered Nurses? Others?
- Are the existing primary care providers open to the addition of an FCC in the community?
- Is there a PCN operating / providing services in this community

From an infrastructure perspective:

- Is there space currently available to locate/co-locate the FCC team?
- Would recruitment of health care professionals be particularly difficult or costly?
- Is there an IMIT infrastructure/system currently in place to support the FCC team?
- What level of investment would be required to establish an FCC in this community?

Proxy measures are available from RPAP which includes:

- Communities that have physicians that are teaching as a measure of stability and community engagement.
- Communities recruiting to vacancies as a proxy for gap or unmet need.
- Communities with active Recruitment and Retention Committee as a proxy of community engagement and enabler for FCC staffing.

Indicators of community readiness could be considered in Phase 2 of the project.

7.5 Considerations for the Next Prioritization Wave

Opportunities exist to refine the prioritization framework to inform the location the next 100 FCCs. New or refined indicators may include:

- The application of a gravity model or other appropriate methodology that determine spatial (travel) access scores at the dissemination area level.
- Results of patient satisfaction surveys with sufficient sample size to differentiate patient/family perspectives at the Local Area level.
- An update to the Alberta Health Human Resource Forecasting and Simulation Models to incorporate 2009/10 and 2010/11 data.
- Indicators of Primary Care Network service availability and utilization from the PCN Fact Sheets.
- Adjustment to the methodology to define Low, Moderate and High risk categories for geo-stratified indicators.

The extent to which these and other indicators/modifications can be incorporated into the prioritization framework will depend on the availability of data and timelines associated with decision making for the second wave.

APPENDICES



APPENDICES

8 Appendix A: List of Project Participants

Collaborating Organizations (No. of Participants)	
Oversight Group	
	Alberta Health (5)
	Alberta Health Services (3)
	Health Quality Council of Alberta (1)
Analytics Group	
	Alberta Health (7)
	Alberta Health Services (5)
	Health Quality Council of Alberta (2)
	Mapping Consultant (1)

APPENDICES

9 Appendix B: Geo-Category Definitions

Local Code	Local Name	Population	Proposed Geo-category	Original Category
Z2.1.A.01	CALGARY - UPPER NW	102,227	Metro	METRO
Z2.1.B.02	CALGARY - NORTH	87,885	Metro	METRO
Z2.1.C.03	CALGARY - NOSEHILL	74,908	Metro	METRO
Z2.1.D.04	CALGARY - LOWER NW	60,171	Metro	METRO
Z2.1.E.05	CALGARY - WEST BOW	19,520	Metro	METRO
Z2.1.F.06	CALGARY - CENTRE NORTH	38,767	Metro	METRO
Z2.2.A.01	CALGARY - UPPER NE	77,414	Metro	METRO
Z2.2.B.02	CALGARY - LOWER NE	95,012	Metro	METRO
Z2.3.A.01	CALGARY - EAST	72,087	Metro	METRO
Z2.3.B.02	CALGARY - SE	79,995	Metro	METRO
Z2.4.A.01	CALGARY - WEST	77,719	Metro	METRO
Z2.4.B.02	CALGARY - CENTRE	56,214	Metro	METRO
Z2.4.C.03	CALGARY - CENTRE WEST	58,007	Metro	METRO
Z2.4.D.04	CALGARY - ELBOW	39,984	Metro	METRO
Z2.4.E.05	CALGARY - FISH CREEK	114,563	Metro	METRO
Z2.4.F.06	CALGARY - SW	93,267	Metro	METRO
Z4.1.A.01	EDMONTON - WOODCROFT EAST	56,913	Metro	METRO
Z4.1.B.02	EDMONTON - WOODCROFT WEST	28,670	Metro	METRO
Z4.1.C.03	EDMONTON - JASPER PLACE	44,631	Metro	METRO
Z4.1.D.04	EDMONTON - WEST JASPER PLACE	77,495	Metro	METRO
Z4.2.A.01	EDMONTON - CASTLE DOWNS	56,287	Metro	METRO
Z4.2.B.02	EDMONTON - NORTHGATE	76,605	Metro	METRO
Z4.2.C.03	EDMONTON - EASTWOOD	68,546	Metro	METRO
Z4.2.D.04	EDMONTON - ABBOTSFIELD	14,594	Metro	METRO
Z4.2.E.05	EDMONTON - NE	73,445	Metro	METRO
Z4.3.A.01	EDMONTON - BONNIE DOON	93,126	Metro	METRO
Z4.3.B.02	EDMONTON - MILL WOODS WEST	53,640	Metro	METRO
Z4.3.C.03	EDMONTON - MILL WOODS SOUTH & EAST	60,637	Metro	METRO
Z4.4.A.01	EDMONTON - DUGGAN	40,523	Metro	METRO
Z4.4.B.02	EDMONTON - TWIN BROOKS	65,804	Metro	METRO
Z4.4.C.03	EDMONTON - RUTHERFORD	31,827	Metro	METRO
Z2.5.A.01	OKOTOKS-PRIDDIS	35,737	Metro moderate	MODERATE METRO INFLUENCE
Z2.6.A.01	AIRDRIE	44,368	Metro moderate	MODERATE METRO INFLUENCE
Z2.6.B.02	CHESTEMERE	17,771	Metro moderate	MODERATE METRO INFLUENCE
Z2.6.C.04	CROSSFIELD	8,188	Metro moderate	MODERATE METRO INFLUENCE
Z2.7.A.01	COCHRANE-SPRINGBANK	34,609	Metro moderate	MODERATE METRO INFLUENCE
Z4.5.A.01	STURGEON COUNTY WEST	23,274	Metro moderate	MODERATE METRO INFLUENCE
Z4.5.B.02	STURGEON COUNTY EAST	5,149	Metro moderate	MODERATE METRO INFLUENCE
Z4.5.B.03	FORT SASKATCHEWAN	19,255	Metro moderate	MODERATE METRO INFLUENCE
Z4.6.A.01	SHERWOOD PARK	73,043	Metro moderate	MODERATE METRO INFLUENCE
Z4.6.B.02	STRATHCONA COUNTY EXCLUDING SHEPPARD	18,686	Metro moderate	MODERATE METRO INFLUENCE
Z4.7.A.01	BEAUMONT	16,294	Metro moderate	MODERATE METRO INFLUENCE
Z4.7.A.02	LEDUC & DEVON	33,208	Metro moderate	MODERATE METRO INFLUENCE
Z4.7.A.03	THORSBY	9,170	Metro moderate	MODERATE METRO INFLUENCE
Z4.8.A.01	STONY PLAIN & SPRUCE GROVE	48,739	Metro moderate	MODERATE METRO INFLUENCE
Z4.8.B.02	WESTVIEW EXCLUDING STONY PLAIN & SPRUCE GROVE	29,097	Metro moderate	MODERATE METRO INFLUENCE
Z4.9.A.01	ST. ALBERT	64,367	Metro moderate	MODERATE METRO INFLUENCE

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Local Code	Local Name	Population	Proposed Geo-category	Original Category
Z1.2.A.01	COUNTY OF LETHBRIDGE	23,003	Rural	MODERATE URBAN INFLUENCE
Z1.3.B.03	CYPRESS COUNTY	11,337	Rural	MODERATE URBAN INFLUENCE
Z3.2.C.04	RED DEER COUNTY	22,101	Rural	MODERATE URBAN INFLUENCE
Z3.2.C.05	SYLVAN LAKE	14,262	Rural	MODERATE URBAN INFLUENCE
Z5.3.B.04	GRANDE PRAIRIE COUNTY	10,874	Rural	MODERATE URBAN INFLUENCE
Z1.1.A.01	CROWSNEST PASS	6,149	Rural	RURAL
Z1.1.A.02	PINCHER CREEK	8,672	Rural	RURAL
Z1.1.A.03	FORT MACLEOD	6,778	Rural	RURAL
Z1.1.B.04	CARDSTON-KAINAI	17,278	Rural	RURAL
Z1.2.B.02	TABER MD	18,499	Rural	RURAL
Z1.2.C.03	COUNTY OF WARNER	10,729	Rural	RURAL
Z1.2.C.04	COUNTY OF FORTY MILE	6,181	Rural	RURAL
Z1.3.B.02	OYEN	3,773	Rural	RURAL
Z2.5.B.02	BLACK DIAMOND	7,873	Rural	RURAL
Z2.5.B.03	HIGH RIVER	21,421	Rural	RURAL
Z2.5.C.04	CLARESHOLM	6,228	Rural	RURAL
Z2.5.C.05	VULCAN	6,892	Rural	RURAL
Z2.6.C.03	STRATHMORE	30,004	Rural	RURAL
Z2.6.C.05	DIDSBURY	14,592	Rural	RURAL
Z2.7.B.03	BANFF	10,386	Rural	RURAL
Z3.1.A.01	ROCKY MOUNTAIN HOUSE	20,865	Rural	RURAL
Z3.1.B.02	DRAYTON VALLEY	18,230	Rural	RURAL
Z3.2.A.01	SUNDRE	6,860	Rural	RURAL
Z3.2.A.02	OLDS	11,586	Rural	RURAL
Z3.2.B.03	INNISFAIL	15,904	Rural	RURAL
Z3.3.A.01	THREE HILLS/HIGHWAY 21	11,415	Rural	RURAL
Z3.3.A.02	STARLAND COUNTY/DRUMHELLER	12,307	Rural	RURAL
Z3.3.A.04	PLANNING & SPECIAL AREA 2	4,068	Rural	RURAL
Z3.3.B.03	STETTNER & COUNTY	12,599	Rural	RURAL
Z3.3.B.05	CASTOR/CORONATION/CONSORT	6,680	Rural	RURAL
Z3.4.B.02	PONOKA	11,814	Rural	RURAL
Z3.4.B.03	RIMBEY	9,739	Rural	RURAL
Z3.4.B.04	LACOMBE	21,346	Rural	RURAL
Z3.5.B.02	TOFIELD	7,855	Rural	RURAL
Z3.5.B.03	VIKING	2,629	Rural	RURAL
Z3.5.B.04	FLAGSTAFF COUNTY	9,270	Rural	RURAL
Z3.5.C.05	MD OF PROVOST	5,653	Rural	RURAL
Z3.5.C.06	MD OF WAINWRIGHT	10,847	Rural	RURAL
Z3.6.A.01	LAMONT COUNTY	6,573	Rural	RURAL
Z3.6.A.02	TWO HILLS COUNTY	5,230	Rural	RURAL
Z3.6.A.03	VEGREVILLE/MINBURN COUNTY	10,562	Rural	RURAL
Z5.1.A.03	EDSON	15,774	Rural	RURAL
Z5.1.B.04	WHITECOURT	13,525	Rural	RURAL
Z5.1.B.05	MAYERTHORPE	16,617	Rural	RURAL
Z5.1.C.06	BARRHEAD	10,928	Rural	RURAL
Z5.1.C.07	WESTLOCK	19,948	Rural	RURAL
Z5.2.A.01	FROG LAKE	4,931	Rural	RURAL
Z5.2.A.04	ST. PAUL	15,656	Rural	RURAL
Z5.2.A.05	SMOKY LAKE	5,117	Rural	RURAL
Z5.2.B.03	BONNYVILLE	15,927	Rural	RURAL
Z5.2.C.06	BOYLE	3,574	Rural	RURAL
Z5.2.C.07	ATHABASCA	11,277	Rural	RURAL
Z5.2.C.08	LAC LA BICHE	10,251	Rural	RURAL
Z5.3.A.03	VALLEYVIEW	7,380	Rural	RURAL
Z5.3.A.05	BEAVERLODGE	11,649	Rural	RURAL
Z5.4.C.06	PEACE RIVER	17,333	Rural	RURAL
Z5.4.D.08	FALHER	4,623	Rural	RURAL
Z5.4.D.09	SPIRIT RIVER	6,893	Rural	RURAL
Z1.3.A.01	NEWELL	26,620	Rural	RURAL CENTRE AREA
Z2.7.B.02	CANMORE	22,838	Rural	RURAL CENTRE AREA
Z3.4.A.01	WETAKIWIN COUNTY	35,375	Rural	RURAL CENTRE AREA
Z3.5.A.01	CAMROSE & COUNTY	28,156	Rural	RURAL CENTRE AREA
Z3.6.B.04	VERMILION RIVER COUNTY	34,038	Rural	RURAL CENTRE AREA
Z5.2.B.02	COLD LAKE	17,668	Rural	RURAL CENTRE AREA

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Local Code	Local Name	Population	Proposed Geo-category	Original Category
Z5.1.A.01	JASPER	5,008	Rural remote	RURAL REMOTE
Z5.1.A.02	HINTON	11,768	Rural remote	RURAL REMOTE
Z5.3.A.01	GRANDE CACHE	4,701	Rural remote	RURAL REMOTE
Z5.3.A.02	FOX CREEK	2,431	Rural remote	RURAL REMOTE
Z5.4.A.01	SWAN HILLS	1,754	Rural remote	RURAL REMOTE
Z5.4.A.02	SLAVE LAKE	11,266	Rural remote	RURAL REMOTE
Z5.4.A.03	WABASCA	4,259	Rural remote	RURAL REMOTE
Z5.4.A.07	HIGH PRAIRIE	12,555	Rural remote	RURAL REMOTE
Z5.4.B.04	HIGH LEVEL	23,763	Rural remote	RURAL REMOTE
Z5.4.B.05	MANNING	4,051	Rural remote	RURAL REMOTE
Z5.4.D.10	FAIRVIEW	8,777	Rural remote	RURAL REMOTE
Z5.5.A.01	WOOD BUFFALO	5,280	Rural remote	RURAL REMOTE
Z1.4.A.01	MEDICINE HAT	65,189	Urban	URBAN
Z1.5.A.01	LETHBRIDGE - WEST	27,762	Urban	URBAN
Z1.5.B.02	LETHBRIDGE - NORTH	25,650	Urban	URBAN
Z1.5.C.03	LETHBRIDGE - SOUTH	32,046	Urban	URBAN
Z3.7.A.01	RED DEER - NORTH	34,096	Urban	URBAN
Z3.7.B.02	RED DEER - SW	16,414	Urban	URBAN
Z3.7.C.03	RED DEER - EAST	47,005	Urban	URBAN
Z5.6.A.01	FORT MCMURRAY	69,603	Urban	URBAN
Z5.7.A.01	CITY OF GRANDE PRAIRIE	65,710	Urban	URBAN

Sources: *Population registry File, AH as at March 31, 2011*
Postal Code translation File, AH

APPENDICES

10 Appendix C: Results of Priority Ranking

Results matrix				FCC in place													Counts		Scores						
(red = high; yellow = moderate; no color = low need/risk)				Indicators																					
Rank of LE Modified Score (col 15)	Local Area	Geo Category	Local Area Name	Population	Utilization (1-6)						Health status (7-12)						Average Life Expectancy Score	L	M	H	Indicator Score (1L+2M+3H)	LE Modified Score (col 14 - col 13)			
					1	2	3	4	5	6	7	8	9	10	11	12									
1	Z4.2.C.03	Metro	EDMONTON-EASTWOOD	68,692	1	3	1	3	3	3	3	3	3	3	3	3	3	1	1	-33.1181	4	0	8	28	61.1181
2	Z3.4.A.01	Rural	WETASKIWIN COUNTY	35,117	1	3	1	3	3	3	3	3	3	3	3	3	3	3	3	-12.6482	2	0	10	32	44.6482
3	Z2.3.A.01	Metro	CALGARY-EAST	71,371	1	3	3	3	3	3	3	3	3	3	3	2	3	3	3	-9.1575	1	1	10	33	42.1575
4	Z5.4.A.07	Rural remote	HIGH PRAIRIE	12,579	3	3	1	1	3	3	3	3	3	3	2	2	3	3	3	-10.7337	2	2	8	30	40.7337
5	Z2.1.F.06	Metro	CALGARY-CENTRE NORTH	38,013	1	3	3	3	3	3	3	1	1	1	3	1	3	3	3	-13.8056	5	0	7	26	39.8056
6	Z4.2.D.04	Metro	EDMONTON-ABBOTTSFIELD	14,441	1	3	1	3	3	3	3	3	3	3	3	3	3	3	3	-7.7045	2	0	10	32	39.7045
7	Z4.1.A.01	Metro	EDMONTON-WOODCROFT EA	56,011	1	3	3	3	3	3	3	3	3	3	3	3	1	1	1	-8.7838	3	0	9	30	38.7838
8	Z5.4.A.03	Rural remote	WABASCA	4,256	1	3	1	3	3	3	3	3	3	3	3	3	3	3	3	-6.1047	2	0	10	32	38.1047
9	Z5.2.A.04	Rural	ST. PAUL	15,580	3	3	1	3	3	3	3	3	3	3	3	1	1	3	3	-7.8844	3	0	9	30	37.8844
10	Z5.1.B.05	Rural	MAYERTHORPE	16,386	3	3	1	3	3	3	3	3	3	3	3	1	1	2	3	-8.51	3	1	8	29	37.5100
11	Z1.1.B.04	Rural	CARDSTON-KAINAI	17,017	1	3	1	1	3	3	3	3	1	3	3	3	3	3	3	-8.8701	4	0	8	28	36.8701
12	Z5.2.C.08	Rural	LAC LA BICHE	10,164	1	3	1	1	3	3	3	3	3	3	3	3	2	3	3	-7.5214	3	1	8	29	36.5214
13	Z5.2.A.01	Rural	FROG LAKE	4,837	3	3	2	3	3	3	3	3	3	3	3	1	1	3	3	-5.0457	2	1	9	31	36.0457
14	Z5.2.C.06	Rural	BOYLE	3,552	3	3	2	3	3	3	3	3	3	3	3	1	2	3	3	-3.6758	1	2	9	32	35.6758
15	Z3.1.A.01	Rural	ROCKY MOUNTAIN HOUSE	20,745	3	3	1	3	3	3	3	3	2	2	2	2	1	1	3	-7.662	3	3	6	27	34.6620
16	Z2.1.E.05	Metro	CALGARY-WEST BOW	19,395	1	3	3	3	3	3	3	1	3	3	3	3	1	3	3	-4.2875	3	0	9	30	34.2875
17	Z5.5.A.01	Rural remote	WOOD BUFFALO	5,042	3	3	2	1	1	1	1	3	3	3	3	2	2	2	2	-6.9373	3	3	6	27	33.9373
18	Z5.4.A.01	Rural remote	SWAN HILLS	1,754	3	1	1	3	3	3	3	3	3	3	2	2	2	2	2	-4.6933	2	3	7	29	33.6933
19	Z5.4.B.04	Rural remote	HIGH LEVEL	23,407	1	2	1	3	1	1	3	3	3	3	3	2	1	3	3	-9.3785	5	2	5	24	33.3785
20	Z3.7.B.02	Urban	RED DEER-SW	16,147	1	3	1	3	3	3	3	2	3	2	2	2	2	2	2	-6.1896	2	5	5	27	33.1896
21	Z4.1.C.03	Metro	EDMONTON-JASPER PLACE	43,724	1	3	1	3	3	3	3	3	3	3	3	3	3	3	3	-3.1729	3	0	9	30	33.1729
22	Z1.1.A.01	Rural	CROWSNEST PASS	6,093	1	3	2	3	3	3	3	3	3	2	2	1	3	3	3	-4.1445	2	3	7	29	33.1445
23	Z5.1.C.07	Rural	WESTLOCK	16,720	1	3	1	1	1	3	3	3	3	3	2	1	3	3	3	-8.137	5	1	6	25	33.1370
24	Z4.8.B.02	Metro moder	WESTVIEW EXCL SP & SG	28,736	1	3	1	3	3	3	3	2	3	2	3	1	2	3	3	-6.1201	3	3	6	27	33.1201
25	Z1.5.B.02	Urban	LETHBRIDGE-NORTH	25,465	1	2	3	1	3	3	3	3	2	3	1	3	2	3	3	-5.9154	3	3	6	27	32.9154
26	Z4.5.A.01	Metro moder	STURGEON COUNTY WEST	22,021	1	3	3	3	2	3	3	3	3	3	2	2	2	2	2	-2.7293	1	4	7	30	32.7293
27	Z5.2.B.03	Rural	BONNYVILLE	15,812	1	3	1	3	3	3	3	3	3	3	3	1	1	2	3	-5.5563	4	1	7	27	32.5563
28	Z5.4.B.05	Rural remote	MANNING	3,951	3	3	1	3	3	3	3	3	3	3	3	1	1	1	3	-4.553	4	0	8	28	32.5530
29	Z5.3.A.03	Rural	VALLEYVIEW	7,229	1	3	1	3	3	3	3	3	3	3	3	2	1	1	3	-5.5016	4	1	7	27	32.5016
30	Z4.2.E.05	Metro	EDMONTON-NE	72,101	1	3	1	1	3	3	3	3	3	3	3	3	3	1	3	-4.1001	4	0	8	28	32.1001
31	Z2.4.B.02	Metro	CALGARY-CENTRE	54,857	1	3	3	3	3	3	3	1	3	1	3	1	1	3	3	-5.6288	5	0	7	26	31.6288
32	Z3.3.B.05	Rural	CASTOR/CORONATION/CONS	6,694	1	3	3	3	3	3	3	3	3	3	1	3	2	3	3	-0.5445	2	1	9	31	31.5445
33	Z5.4.C.06	Rural	PEACE RIVER	17,163	1	3	1	3	3	3	3	3	3	3	1	1	1	1	3	-5.2563	5	0	7	26	31.2563
34	Z3.6.A.01	Rural	LAMONT COUNTY	6,536	3	3	1	1	1	3	3	3	3	3	1	1	3	3	3	-5.0337	5	0	7	26	31.0337
35	Z5.4.D.08	Rural	FALHER	4,670	1	3	2	3	3	3	3	2	3	3	1	1	2	3	3	-3.4365	3	3	6	27	30.4365
36	Z1.4.A.01	Urban	MEDICINE HAT	64,579	1	3	3	3	1	1	3	3	3	3	1	3	2	3	3	-3.3111	4	1	7	27	30.3111
37	Z5.2.A.05	Rural	SMOKY LAKE	5,150	3	3	1	1	2	1	3	3	3	3	1	2	3	3	3	-4.2345	4	2	6	26	30.2345
38	Z3.1.B.02	Rural	DRAYTON VALLEY	18,148	1	1	1	1	1	1	3	2	3	3	3	2	3	3	3	-6.1773	5	2	5	24	30.1773
39	Z3.4.B.02	Rural	PONOKA	11,715	1	3	3	1	1	3	3	1	2	3	3	3	3	3	3	-3.1655	4	1	7	27	30.1655
40	Z3.7.A.01	Urban	RED DEER-NORTH	33,174	1	3	1	3	3	3	3	2	2	2	2	2	2	3	3	-3.1304	2	5	5	27	30.1304
41	Z2.5.B.02	Rural	BLACK DIAMOND	7,798	3	1	1	3	3	3	3	1	3	2	1	2	3	3	3	-4.1128	4	2	6	26	30.1128
42	Z3.6.A.02	Rural	TWO HILLS COUNTY	5,176	3	1	1	3	3	3	3	2	3	3	2	1	2	3	3	-2.6979	3	3	6	27	29.6979
43	Z3.6.A.03	Rural	VEGREVILLE/MINBURN COUN	10,383	1	3	1	3	3	3	3	3	3	3	3	1	1	3	3	-1.6837	4	0	8	28	29.6837
44	Z5.4.A.02	Rural remote	SLAVE LAKE	11,187	1	1	1	1	1	1	3	3	3	2	2	3	3	3	3	-7.6605	6	2	4	22	29.6605

APPENDICES

Results matrix				FCC in place										Counts			Scores							
(red = high; yellow = moderate; no color = low need/risk)				Indicators																				
Rank of LE Modified Score (col 15)	Local Area	Geo Category	Local Area Name	Population	Utilization (1-6)						Health status (7-12)						Average Life Expectancy Score			L	M	H	Indicator Score (1 L+2 M+3 H)	LE Modified Score (col 14 - col 13)
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
45	Z5.7.A.01	Urban	CITY OF GRANDE PRAIRIE	63,653	1	3	3	3	3	3	2	3	2	1	1	1	-3.6133	4	2	6	26	29.6133		
46	Z1.3.B.03	Rural	CYPRESS COUNTY	11,266	3	1	3	1	1	1	2	3	3	1	3	2	-5.4065	5	2	5	24	29.4065		
47	Z5.1.B.04	Rural	WHITECOURT	13,368	1	3	1	3	3	3	2	3	2	1	1	1	-5.3579	5	2	5	24	29.3579		
48	Z1.1.A.02	Rural	PINCHER CREEK	8,582	1	3	1	2	3	3	3	2	2	1	1	3	-4.2068	4	3	5	25	29.2068		
49	Z2.6.C.03	Rural	STRATHMORE	29,612	1	1	2	1	1	3	3	3	3	1	3	2	-5.1766	5	2	5	24	29.1766		
50	Z1.3.A.01	Rural	NEWELL	26,380	1	3	2	3	1	3	3	3	3	1	3	2	-0.7502	3	2	7	28	28.7502		
51	Z4.7.A.02	Metro/modern	LEDUC & DEVON	32,405	1	3	1	3	3	3	3	3	3	3	1	2	0.2529	3	1	8	29	28.7471		
52	Z5.1.A.03	Rural	EDSON	15,631	1	3	1	3	1	3	3	2	3	1	2	1	-4.6877	5	2	5	24	28.6877		
53	Z5.3.A.02	Rural remote	FOX CREEK	2,430	1	1	2	3	3	3	3	3	3	2	1	3	-0.2345	3	2	7	28	28.2345		
54	Z5.6.A.01	Urban	FORT MCMURRAY	65,815	1	3	3	1	2	3	3	3	3	3	1	1	-1.0132	4	1	7	27	28.0132		
55	Z3.5.C.06	Rural	MD OF WAINWRIGHT	10,616	1	3	1	3	3	3	2	3	3	1	1	1	-3.0004	5	1	6	25	28.0004		
56	Z5.2.B.02	Rural	COLD LAKE	17,333	1	1	3	3	3	3	2	3	2	1	1	1	-3.8263	5	2	5	24	27.8263		
57	Z4.8.A.01	Metro/modern	STONY PLAIN & SPRUCE GRO	47,693	1	1	1	3	3	3	2	3	3	3	2	2	-0.5924	3	3	6	27	27.5924		
58	Z3.3.A.02	Rural	STARLAND COUNTY/DRUMHEL	12,307	1	2	1	3	3	3	2	2	1	1	1	1	-6.5257	6	3	3	21	27.5257		
59	Z5.3.A.05	Rural	BEAVERLODGE	11,550	1	3	3	3	3	3	1	3	2	1	2	1	-1.3044	4	2	6	26	27.3044		
60	Z5.3.A.01	Rural remote	GRANDE CACHE	4,664	1	1	1	2	1	3	3	3	3	2	2	2	-3.1685	4	4	4	24	27.1685		
61	Z4.7.A.03	Metro/modern	THORSBY	9,160	1	3	1	1	3	3	3	3	3	3	1	2	0.1275	4	1	7	27	26.8725		
62	Z4.1.B.02	Metro	EDMONTON-WOODCROFT WE	28,658	1	3	3	3	1	3	3	3	3	2	1	1	0.2651	4	1	7	27	26.7349		
63	Z4.2.B.02	Metro	EDMONTON-NORTHGATE	75,653	1	3	2	1	1	3	3	3	3	1	2	2	-1.5051	4	3	5	25	26.5051		
64	Z5.1.C.06	Rural	BARRHEAD	10,929	1	3	1	3	3	3	1	2	2	1	1	1	-4.1572	6	2	4	22	26.1572		
65	Z5.2.C.07	Rural	ATHABASCA	11,261	3	3	1	1	1	1	2	3	3	1	1	3	-2.9374	6	1	5	23	25.9374		
66	Z3.5.B.03	Rural	VIKING	2,670	1	3	1	3	3	1	2	3	3	2	1	1	-1.8726	5	2	5	24	25.8726		
67	Z1.1.A.03	Rural	FORT MACLEOD	6,672	3	1	1	1	1	1	3	2	2	2	3	1	-4.594	6	3	3	21	25.5940		
68	Z3.4.B.03	Rural	RIMBEY	9,697	3	3	3	1	1	1	2	3	2	1	1	2	-2.5784	5	3	4	23	25.5784		
69	Z5.3.B.04	Rural	GRANDE PRAIRIE COUNTY	10,541	3	1	2	1	1	1	2	3	2	2	3	2	-2.2797	4	5	3	23	25.2797		
70	Z3.2.A.01	Rural	SUNDRE	6,887	1	3	1	3	3	3	1	2	2	2	1	2	-1.2209	4	4	4	24	25.2209		
71	Z2.6.C.04	Metro/modern	CROSSFIELD	8,218	1	3	3	1	3	3	1	2	2	3	3	1	0.8234	4	2	6	26	25.1766		
72	Z4.5.B.03	Metro/modern	FORT SASKATCHEWAN	18,713	1	3	1	3	3	3	1	2	2	1	2	2	-1.1281	4	4	4	24	25.1281		
73	Z3.3.A.04	Rural	PLANNING & SPECIAL AREA 2	4,063	1	3	3	1	1	1	2	3	2	1	3	2	-2.0612	5	3	4	23	25.0612		
74	Z1.3.B.02	Rural	OYEN	3,795	1	3	2	1	1	3	3	2	2	1	3	2	-0.9036	4	4	4	24	24.9036		
75	Z3.2.B.03	Rural	INNISFAIL	15,790	3	1	1	1	1	1	2	2	2	2	3	2	-2.7498	5	4	3	22	24.7498		
76	Z3.2.C.04	Rural	RED DEER COUNTY	21,489	3	1	2	1	1	1	1	2	2	3	3	3	-1.7472	5	3	4	23	24.7472		
77	Z2.4.C.03	Metro	CALGARY-CENTRE WEST	57,163	1	3	3	3	3	3	1	2	1	3	2	3	3.3749	3	2	7	28	24.6251		
78	Z2.5.C.05	Rural	VULCAN	6,845	3	1	1	1	1	1	2	2	3	1	2	2	-4.4743	6	4	2	20	24.4743		
79	Z3.2.C.05	Rural	SYLVAN LAKE	13,890	3	1	3	1	1	1	1	3	2	2	3	3	-0.4496	5	2	5	24	24.4496		
80	Z1.2.C.03	Rural	COUNTY OF WARNER	10,518	1	1	1	3	1	1	3	2	3	2	3	1	-2.3671	6	2	4	22	24.3671		
81	Z3.5.C.05	Rural	MD OF PROVOST	5,676	3	3	1	1	2	1	2	2	2	1	1	3	-1.4481	5	4	3	22	23.4481		
82	Z5.4.D.10	Rural remote	FAIRVIEW	8,691	1	1	2	3	3	3	2	3	2	1	1	1	-0.1119	5	3	4	23	23.1119		
83	Z2.5.C.04	Rural	CLARESHOLM	6,158	1	1	1	3	3	3	1	2	2	1	1	1	-3.099	7	2	3	20	23.0990		
84	Z1.5.C.03	Urban	LETHBRIDGE-SOUTH	31,620	1	1	3	3	3	1	3	1	1	1	2	2	-1.0181	6	2	4	22	23.0181		
85	Z4.3.B.02	Metro	EDMONTON-MILL WOODS WE	52,815	1	3	1	1	1	1	3	3	1	3	3	2	2.3637	5	1	6	25	22.6363		
86	Z3.3.B.03	Rural	STETTLETT & COUNTY	12,581	1	1	3	1	1	1	1	3	2	1	2	2	-3.3621	7	3	2	19	22.3621		
87	Z5.1.A.02	Rural remote	HINTON	11,613	1	1	1	1	1	1	3	3	2	1	2	2	-3.3056	7	3	2	19	22.3056		
88	Z3.5.B.02	Rural	TOFIELD	7,798	3	1	1	1	1	1	2	3	3	1	1	2	-2.2428	7	2	3	20	22.2428		

APPENDICES

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Rank of LE Modified Score (col 15)	Local Area	Geo Category	Local Area Name	Population	Utilization (1-6)						Health status (7-12)						Average Life Expectancy Score	L	M	H	Indicator Score (1 L+2 M+3 H)	LE Modified Score (col 14 - col 13)
					1	2	3	4	5	6	7	8	9	10	11	12						
89	Z1.2.A.01	Rural	COUNTY OF LETHBRIDGE	22,512	3	1	3	1	1	1	2	1	2	1	3	2	-1.1366	6	3	3	21	22.1366
90	Z3.5.B.04	Rural	FLAGSTAFF COUNTY	9,314	1	3	1	3	1	1	2	3	2	2	1	2	-0.053	5	4	3	22	22.0530
91	Z1.2.C.04	Rural	COUNTY OF FORTY MILE	6,112	3	1	3	3	1	1	1	2	2	1	3	1	0.0834	6	2	4	22	21.9166
92	Z3.3.A.01	Rural	THREE HILLS/HIGHWAY 21	11,340	3	1	2	3	3	3	1	2	2	1	1	2	2.4177	4	4	4	24	21.5823
93	Z2.2.B.02	Metro	CALGARY-LOWER NE	94,056	1	3	3	2	3	1	3	1	3	3	3	3	7.7144	3	1	8	29	21.2856
94	Z3.5.A.01	Rural	CAMROSE & COUNTY	27,823	1	1	2	3	1	1	1	2	1	1	2	2	-2.7662	7	4	1	18	20.7662
95	Z5.4.D.09	Rural	SPIRIT RIVER	6,832	1	1	3	1	1	1	2	2	2	1	1	2	-2.0785	7	4	1	18	20.0785
96	Z2.7.B.02	Rural	CANMORE	22,489	3	1	1	1	1	1	1	1	1	3	3	3	0.1472	8	0	4	20	19.8528
97	Z2.6.A.01	Metro modera	AIRDRIE	42,581	1	1	3	3	3	1	1	1	2	1	3	3	3.271	6	1	5	23	19.7290
98	Z2.6.C.05	Rural	DIDSBURY	14,457	3	1	1	1	1	2	1	2	2	1	3	2	1.1317	6	4	2	20	18.8683
99	Z2.5.B.03	Rural	HIGH RIVER	21,183	3	1	1	1	1	3	1	1	1	1	3	3	1.4955	8	0	4	20	18.5045
100	Z4.6.B.02	Metro modera	STRATHCONA COUNTY EXCLU	18,564	1	1	3	1	1	1	1	2	2	3	2	1	0.8015	7	3	2	19	18.1985
101	Z2.6.B.02	Metro modera	CHESTEMERE	17,443	1	2	3	1	1	1	2	1	2	3	2	2	2.8745	5	5	2	21	18.1255
102	Z3.4.B.04	Rural	LACOMBE	21,115	3	1	1	1	1	3	1	1	1	2	3	1	1.1498	8	1	3	19	17.8502
103	Z2.5.A.01	Metro modera	OKOTOKS-PRIDDIS	34,594	1	1	3	3	3	3	1	1	1	1	1	3	4.5194	7	0	5	22	17.4806
104	Z2.4.E.05	Metro	CALGARY-FISH CREEK	113,350	1	1	3	3	3	3	1	1	1	3	3	3	8.6824	5	0	7	26	17.3176
105	Z2.3.B.02	Metro	CALGARY-SE	76,199	1	1	3	1	3	3	1	1	1	3	3	3	7.1532	6	0	6	24	16.8468
106	Z4.7.A.01	Metro modera	BEAUMONT	15,809	1	1	1	1	1	1	1	1	2	3	3	1	0.9365	9	1	2	17	16.0635
107	Z5.1.A.01	Rural remote	JASPER	4,915	1	1	1	1	1	3	1	2	1	1	2	2	1.4231	8	3	1	17	15.5769
108	Z4.2.A.01	Metro	EDMONTON-CASTLE DOWNS	55,486	1	1	2	1	1	1	3	2	3	1	3	1	4.9685	7	2	3	20	15.0315
109	Z3.7.C.03	Urban	RED DEER-EAST	45,728	1	1	3	1	1	1	1	1	1	1	2	3	2.2081	9	1	2	17	14.7919
110	Z2.4.D.04	Metro	CALGARY-ELBOW	39,479	1	1	3	3	3	3	1	1	1	3	1	3	9.3339	6	0	6	24	14.6661
111	Z2.7.A.01	Metro modera	COCHRANE-SPRINGBANK	33,656	1	1	3	3	1	1	1	1	1	3	1	3	5.9992	8	0	4	20	14.0008
112	Z2.2.A.01	Metro	CALGARY-UPPER NE	74,686	1	3	1	1	1	1	3	1	2	3	3	3	9.2674	6	1	5	23	13.7326
113	Z3.2.A.02	Rural	OLDS	11,379	1	1	1	1	1	1	1	1	1	1	2	2	0.3356	10	2	0	14	13.6644
114	Z1.2.B.02	Rural	TABER MD	18,249	1	1	3	1	1	1	1	1	1	1	2	1	1.7878	10	1	1	15	13.2122
115	Z1.5.A.01	Urban	LETHBRIDGE-WEST	26,809	1	1	3	1	1	1	2	1	1	1	2	2	4.3133	8	3	1	17	12.6867
116	Z2.7.B.03	Rural	BANFF	10,030	1	1	3	1	1	1	1	1	1	2	1	3	4.4502	9	1	2	17	12.5498
117	Z4.4.C.03	Metro	EDMONTON-RUTHERFORD	28,994	1	1	3	1	1	1	2	1	1	2	1	2	4.9175	8	3	1	17	12.0825
118	Z4.3.A.01	Metro	EDMONTON-BONNIE DOON	92,045	1	3	2	2	1	1	1	1	1	1	1	1	4.3015	9	2	1	16	11.6985
119	Z4.3.C.03	Metro	EDMONTON-MILL WOODS SO	59,269	1	1	1	1	1	1	3	1	2	3	3	2	8.3287	7	2	3	20	11.6713
120	Z2.4.F.06	Metro	CALGARY-SW	90,841	1	1	3	3	3	3	1	1	1	2	2	3	12.5678	5	2	5	24	11.4322
121	Z4.9.A.01	Metro modera	ST. ALBERT	64,278	1	1	3	1	1	1	1	1	1	1	2	2	4.9244	9	2	1	16	11.0756
122	Z4.6.A.01	Metro modera	SHERWOOD PARK	71,844	1	1	3	1	1	1	1	1	1	1	3	1	6.1521	10	0	2	16	9.8479
123	Z2.1.C.03	Metro	CALGARY-NOSEHILL	73,744	1	1	3	3	3	1	1	1	1	2	2	2	11.3424	6	3	3	21	9.6576
124	Z4.1.D.04	Metro	EDMONTON-WEST JASPER PL	76,021	1	1	3	1	1	3	2	1	1	3	2	1	11.2783	7	2	3	20	8.7217
125	Z4.4.A.01	Metro	EDMONTON-DUGGAN	39,770	1	1	3	1	1	1	1	1	1	2	2	1	7.3151	9	2	1	16	8.6849
126	Z2.1.B.02	Metro	CALGARY-NORTH	85,805	1	1	3	1	1	1	2	1	1	3	3	1	10.8001	8	1	3	19	8.1999
127	Z4.5.B.02	Metro modera	STURGEON COUNTY EAST	8,225	1	1	1	1	1	1	1	1	1	2	3	2	11.8477	9	2	1	16	4.1523
128	Z2.4.A.01	Metro	CALGARY-WEST	75,558	1	1	3	1	1	1	1	1	1	3	3	3	16.9452	8	0	4	20	3.0548
129	Z3.6.B.04	Rural	VERMILION RIVER COUNTY	33,406	1	1	1	1	1	1	1	3	1	3	3	1	15.9894	9	0	3	18	2.0106
130	Z4.4.B.02	Metro	EDMONTON-TWIN BROOKS	64,113	1	1	3	1	1	1	1	1	1	1	2	1	19.3543	10	1	1	15	-4.3543
131	Z2.1.D.04	Metro	CALGARY-LOWER NW	59,499	1	1	3	1	1	1	1	1	1	1	3	1	21.0825	10	0	2	16	-5.0825
132	Z2.1.A.01	Metro	CALGARY-UPPER NW	99,952	1	1	3	1	1	1	1	1	1	2	3	1	24.4958	9	1	2	17	-7.4958

11. Appendix D: Abbreviations and Acronyms

ACHDHR	Advisory Committee on Health Delivery and Human Resources
ACSC	Ambulatory Care Sensitive Condition
AH	Alberta Health (Ministry of Health)
AHP	Allied Health Professional
AHS	Alberta Health Services
ALC	Alternate Level of Care
Appt	Appointment
CCHS	Canadian Community Health Survey
CIHI	Canadian Institute for Health Information
COPD	Chronic Obstructive Pulmonary Disease
CRG	Clinical Risk Grouper
EDC	Episode disease category
EPC	Episode procedure category
ER	Emergency Room
FCC	Family Care Clinic
FN	First Nations
FP	Family Practitioner or Family Physician
FTE	Full time equivalent
GP	General Practitioner
HHR	Health Human Resource
IM/IT	Information management/ information technology
LA	Local Area
LE	Life Expectancy
LG	Local Geography
LHIN	Local Health Integration Network
LTC	Long term care
MD	Medical doctor
MDT	Multidisciplinary team
NP	Nurse Practitioner
NPLC	Nurse Practitioner-Led Clinics
PC	Primary care physician
PCD	Primary chronic disease
PCN	Primary Care Network
PHC	Primary Health Care
PTC	Pharmacologic Therapeutic Classification
PYLL	Person years of life lost
RIW	Resource Intensity Weight
RPAP	Rural Physician Action Plan
SE	Standard Error