

Healthy Northern Communities 2013

Mackenzie

Revised
September 24, 2013



northern health
the northern way of caring

What Determines Health?

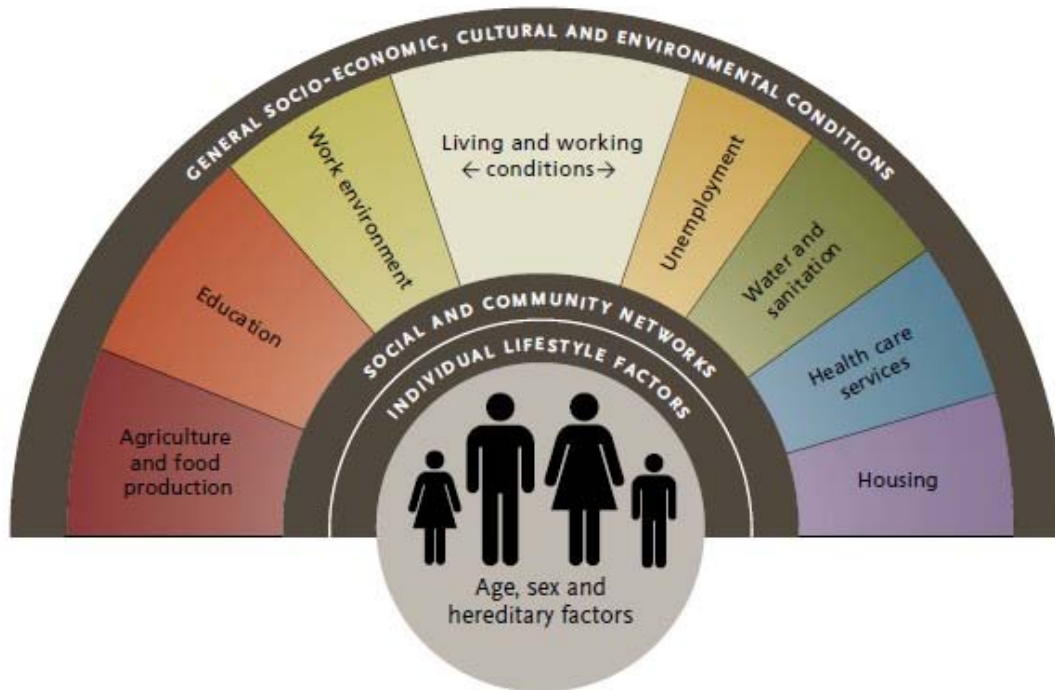


Figure: Health Council of Canada, 2010.

Broadly speaking: a good strong start in life; early and enriching experiences; educational opportunities; a sufficient and equitable distribution of employment, income, housing and food; water and sanitation; our interactions with the environment; our choices towards certain lifestyles and risks; our age and sex; genetics; as well as access to appropriate high quality health care are some of the many factors that are known to influence our health.

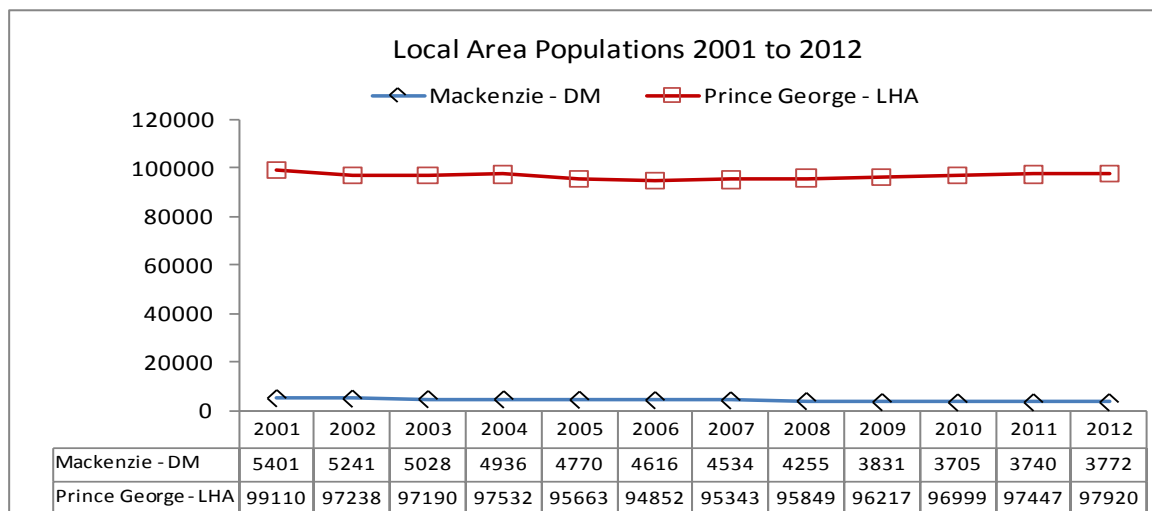
Additional Information (text below is hyperlinked)

- [World Health Organization: Social Determinants of Health](#)
- [Public Health Agency of Canada: Best Practices Portal](#)
- [Canadian Institute for Health Information: Factors Affecting Health](#)
- [Canadian Institute for Health Information: Health System Performance](#)
- [Health Council of Canada: Stepping it Up to a Healthier Canada.](#)
- [National Collaborating Centre for Aboriginal Health: Social Determinants of Health](#)
- [Northern Health: Community Health Information Portal](#)

The District Municipality of Mackenzie was incorporated in 1966 and is located 190 km north of Prince George and 180 km west of Chetwynd. ¹

Mackenzie is situated within the Fraser-Fort George Regional District, within the Prince George Local Health Area (LHA 057) and within the Northern Interior Health Service Delivery Area of Northern Health. The Mackenzie area is served by Prince George School District No. 57.

This area is the traditional territories of the Tse' Khene (Sekani) peoples. Nearby to Mackenzie is the community of the McLeod Lake First Nation. Northwards along Williston Lake are the communities of the Tsey Keh Dene and Kwadacha Nations. ^{2, 3, 4}



The estimated 3,772 people within the District of Mackenzie account for approximately 3.8 % of the Prince George LHA population (3,772 / 97,920 persons) and for 3.9 % of the Fraser Fort George Regional District population (3,772 / 97,449 persons). ^{5, 6, 7}

During the 2011 calendar year, there were 1,045 live births, 575 deaths and 406 marriages to the residents of the Prince George Local Health Area. Of these, 40 live births, 17 deaths and 13 marriages could be attributed to Mackenzie residents. Average life expectancy for both populations was 79.3 years: less than the British Columbia (BC) average of 82 years. ⁸

Additional Community Information

District of Mackenzie: <http://www.district.mackenzie.bc.ca/>

Mackenzie Chamber of Commerce: <http://www.mackenziechamber.bc.ca/Home>

McLeod Lake First Nation: <http://www.mlib.ca>

Kwadacha First Nation: <http://www.kwadacha.com/nation>

Tsay Keh Dene Community Profile: Aboriginal Affairs & Northern Development Canada
<http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/SearchFN.aspx?lang=eng>

Fraser Fort George Regional District: <http://www.rdffg.bc.ca/>

Northern Health: Community Health Information Portal <http://chip.northernhealth.ca>

Selected Community Indicators

Demographics	Mackenzie	LHA	BC
Percent of population who are 0 – 19 yrs old	24	25	21
Percent of population who are ages 65+	8.8	11	15
Percent of population who are Visible Minorities	5.0	3.5	24.5
Percent of population who are Aboriginal Identity	7.0	22.1	4.8
Income			
Percent of families earning < \$20,000 per year	3.6	11.4	8.0
Percent of families earning from \$20,000 - \$80,000 per year	35.5	50.8	53.8
Percent of families earning > \$80,000 per year	60.8	37.7	38.1
* Percent of population receiving Income Assistance > 1 yr.	nca	1.8	1.0
Early Development and Educational Achievement			
Percent of kindergarten children vulnerable:1 or more EDI scales	22.2	32.3	28.6
† Percent of Grade 4 & 7 students below standard on FSA - Reading	nca	25.4	20.7
† Percent of Grade 4 & 7 students below standard on FSA - Writing	nca	23.8	17.9
† Percent of Grade 4 & 7 students below standard on FSA - Math	nca	33.8	23.4
† Percent of 18 yr olds who did not graduate	nca	33.4	29.0
Percent of persons ages 25 to 54: without high school completion	nca	16.3	11.1
Percent of persons ages 25 to 64: with university degree or above	9.4	14.3	24.1
Housing			
Percent of households that are renting	18.5	20.3	30.4
Percent of tenants paying 30 % or more of income towards housing	15.0	29.7	43.4
Percent of owners paying 30 % or more of income towards housing	7.0	12.1	22.7
Children and Youth at Risk			
* Children (ages <15) receiving Income Assistance > 1 year	nca	3.6	1.7
* Youth (ages 15 - 24) receiving Income Assistance > 1 yr	nca	1.9	0.9
Children in care rate per 1,000 population, ages 0 – 18	nca	15.9	9.2
Teen pregnancies per 1,000 women ages 15 – 19 (2007-2009)	nca	45.9	26.3
Other Indicators			
Alcohol sales per capita in 2010 (Dollars Spent)	nca	800	790
Alcohol sales per capita in 2010 (Litres Consumed)	nca	123	107
nca = means this level of data detail or data aggregation is "not currently available."			
* Income Assistance figures may be understated as they do not include Aboriginal people who are living on reserve.			

Sources of the above information:

BC Stats Socio-economic Profiles

<http://www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/SocioEconomicProfilesIndices.aspx>

Census 2011: Statistics Canada

<http://www12.statcan.ca/census-recensement/2011/dp-pd/prof/index.cfm?Lang=E>

BC Ministry of Education K -12 Reporting

<http://www.bced.gov.bc.ca/reporting/province.php>

Human Early Learning Partnership: Early Development Instrument

<http://earlylearning.ubc.ca/edi/>

Population Forecasts (with a focus on seniors)

Although the percentage of seniors in northern BC is the smallest of all the health regions, this group is expected to grow quickly over the next 15 years. From 2015 to 2030, the 65+, 75+ and 85+ populations in northern BC are expected to grow by 78 %, 111 % and 106 % respectively: the highest overall seniors' growth rates in BC's health authorities.⁹

Below is a forecast of what we might expect at the local health service delivery levels.

Prince George Local Health Area: Population Projection						Population Change 2015 - 2030	
Broad Age Groups	2010	2015	2020	2025	2030	number	%
<20	24,091	22,270	21,612	21,318	20,755	-1,515	-6.8
20-44	34,116	34,745	33,899	33,483	33,312	-1,433	-4.1
45-64	28,317	28,803	28,229	26,600	25,588	-3,215	-11.2
65+	10,460	13,548	17,243	20,810	23,828	10,280	75.9
Total Population	96,984	99,366	100,983	102,211	103,483	4,117	4.1
Focus on Seniors						number	%
65+	10460	13548	17243	20810	23828	10,280	75.9
75+	3979	5021	6363	8323	10662	5,641	112.3
85+	926	1343	1738	2136	2745	1,402	104.4
90+	298	506	706	902	1095	589	116.4

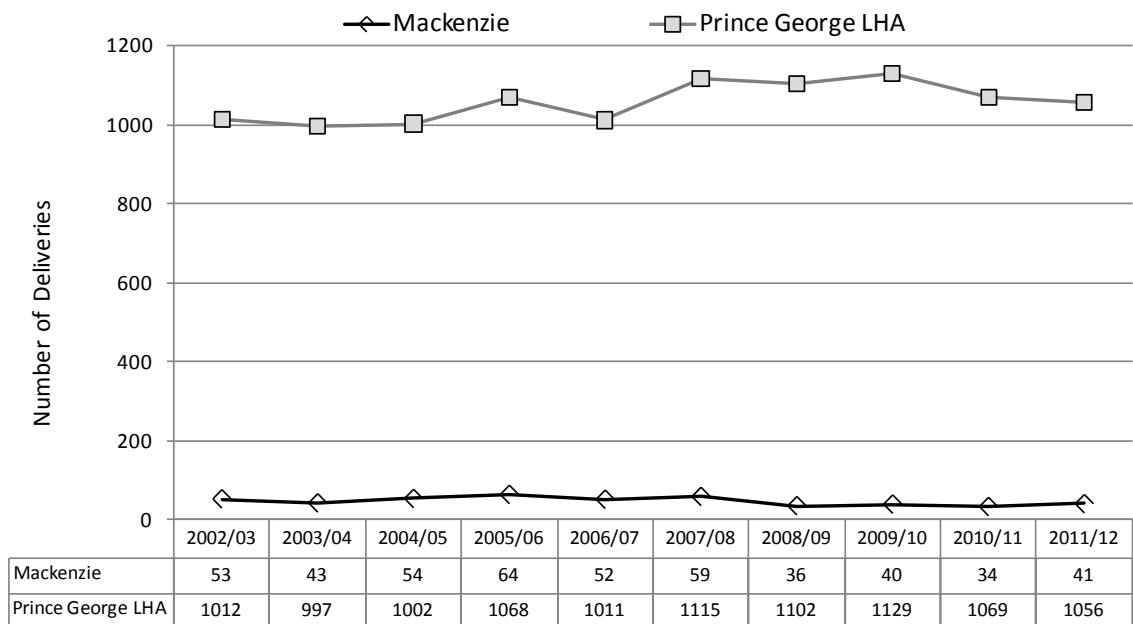
Northern Interior HSDA: Population Projection						Population Change 2015 - 2030	
Broad Age Groups	2010	2015	2020	2025	2030	number	%
<20	36,011	33,430	32,085	31,639	30,913	-2,517	-7.5
20-44	47,526	48,196	47,511	47,029	46,853	-1,343	-2.8
45-64	43,103	43,603	41,925	38,914	36,621	-6,982	-16.0
65+	17,065	21,723	27,375	32,656	37,062	15,339	70.6
Total Population	143,705	146,952	148,896	150,238	151,449	4,497	3.1
Focus on Seniors						number	%
65+	17,065	21,723	27,375	32,656	37,062	15,339	70.6
75+	6,720	8,303	10,451	13,468	17,007	8,704	104.8
85+	1,619	2,280	3,022	3,685	4,639	2,359	103.5
90+	534	850	1,220	1,572	1,883	1,033	121.5

About these Population Forecasts: These projections incorporate the known trends in terms of births, deaths, migration, fertility, age-group (cohort) survival etc. The extra populations that "might" result from the many anticipated projects in the north are not yet explicitly considered. At best, these projections reflect a base-case of what our future population might look like if currently known trends continue into the future. For methodological reasons, these forecasts are not produced at the community level.

A Good Strong Start in Life is more likely if infants, children and all family members are as healthy as possible. In thinking about this we consider many factors including trends in the number of mothers delivering babies and the locations where the infants are delivered.

This type of information informs services such as prenatal education, parenting skills programs, post delivery follow-ups for moms, immunizations, and the many childhood screening services that are intended to detect and address vision, hearing and dental health concerns.

Deliveries per year by Mackenzie and Prince George LHA mothers: ¹⁰



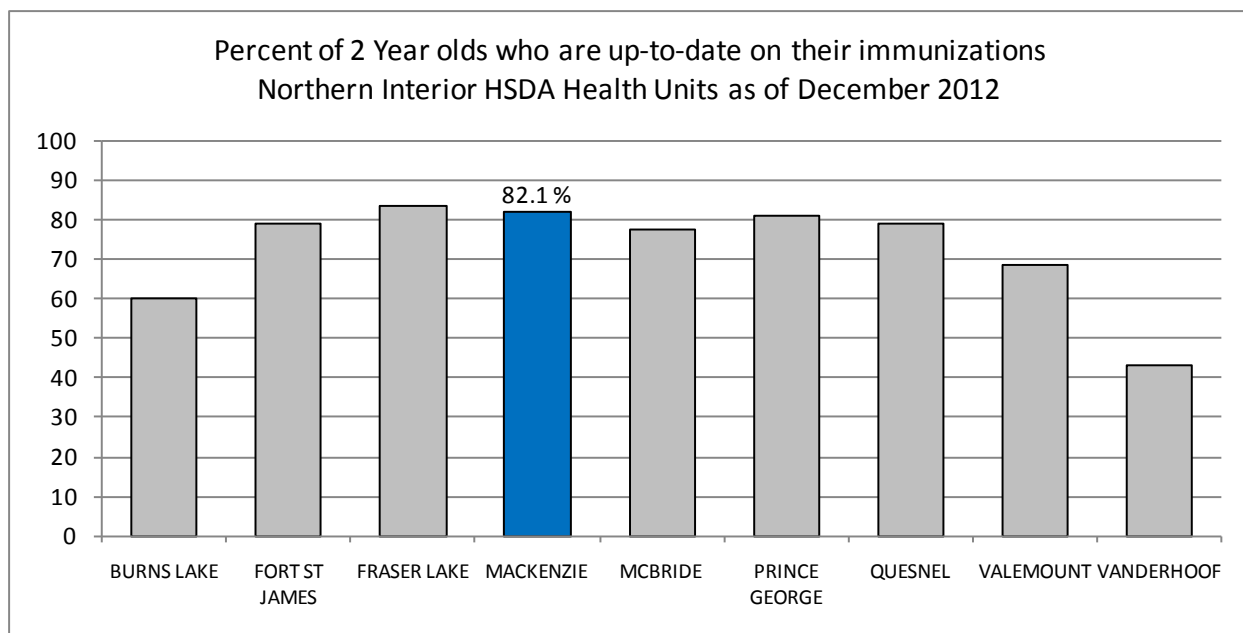
Delivery locations for Mackenzie mothers (five year summary).

Mom's Home Community	Delivery Location: 2007/08 – 2011/12						Total Deliveries
	UHNBC	Mackenzie	McBride	Other BC Location	Home Births	Alberta ¹¹	
Fraser Fort George (A)	143	0	0	5	1	0	149
Fraser Fort George (C)	143	0	0	3	0	0	146
Fraser Fort George (D)	157	0	0	2	2	0	161
Fraser Fort George (E)	22	0	0	8	0	0	30
Fraser Fort George (F)	52	0	0	4	0	0	56
Fraser Fort George (G)	20	1	0	1	0	0	22
Fraser Fort George (H)	9	0	0	6	0	0	15
Mackenzie (DM)	195	11	0	4	0	0	210
McBride (VL)	51	0	3	9	0	8	71
Valemount (VL)	12	0	1	23	1	22	59
Prince George (City)	4,379	0	0	111	54	0	4,544
Total Deliveries	5,183	12	4	176	58	30	5,463

Deliveries in Alberta are reported annually to Northern Health by the Alberta Perinatal Health Program

Immunizations are some of the best health investments that we can make. Along with better sanitation and clean drinking water, immunizations have been responsible for the huge increases in life expectancy that we have seen around the world. ^{12, 13}

Because immunizations are such a good investment and the protection they provide to individuals and communities as a whole is so important, we actively monitor whether certain target populations are fully immunized. For example, we know that the percent of 2 year old children in the Mackenzie area, who are up-to-date with their immunizations, is 82.1 %. ¹⁴



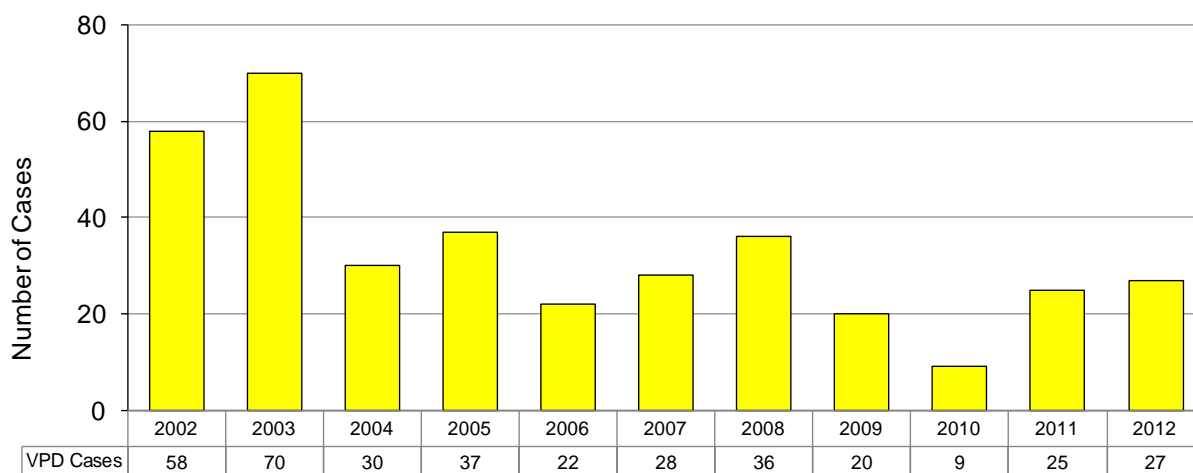
The above graph represents children who were born during the year 2010 and who were two years of age as of Dec 31st, 2012. To be considered as up-to-date for their age, two year old children must have completed the following immunizations by their second birthday:

- 4 doses of DTP vaccine
 - 3 doses of Polio vaccine
 - 3 doses of Hepatitis B vaccine
 - 1 dose each of Measles, Mumps and Rubella vaccines
 - at least 2 doses of Pneumococcal conjugate vaccine
 - at least 1 dose of Meningococcal conjugate vaccine
 - at least 1 dose of Haemophilus Influenza B vaccine after month 15
 - 1 dose of Varicella (chicken-pox) vaccine or past disease by the 2nd birthday.
- Note: DTP = Diphtheria, Tetanus and Pertussis (whooping cough).

Vaccine Preventable Diseases (VPD) are illnesses that may have been avoided if individuals and communities were sufficiently immunized.

This page presents a summary of the most frequently reported Vaccine Preventable Diseases for the Northern Interior Health Service Delivery Area.

Vaccine Preventable Disease Cases in Northern Interior BC: 2002 - 2012



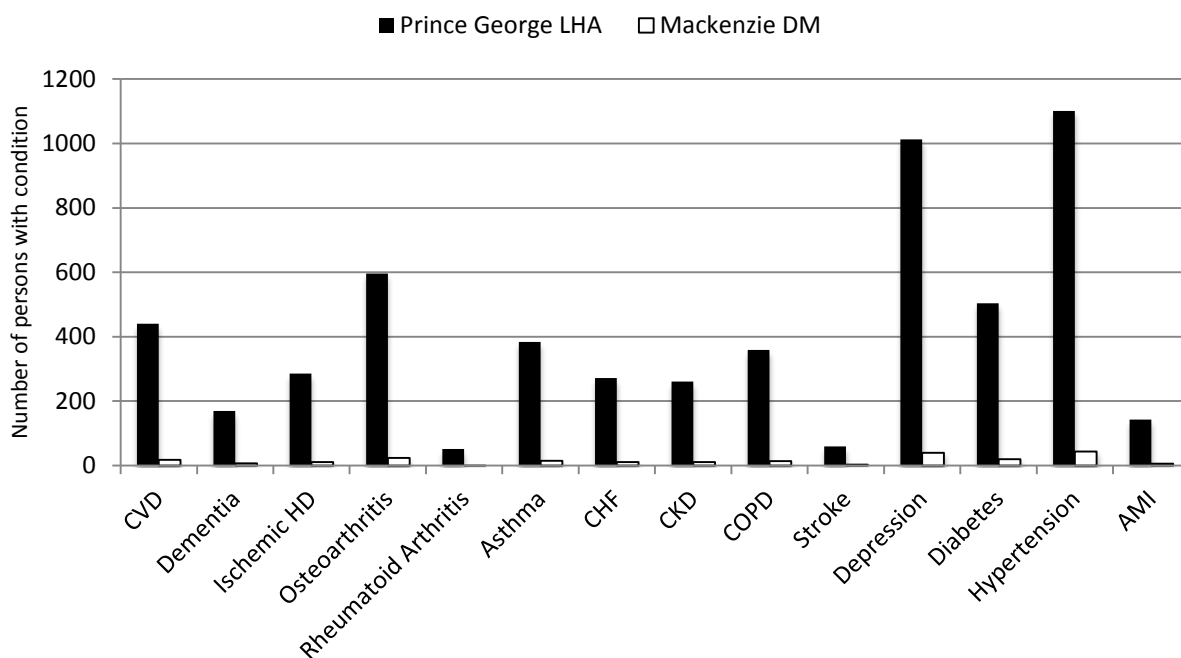
VPD in Northern Interior BC: Cases by Community 2002 - 2012 ¹⁵												
Community	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Burns Lake	26	1	0	4	0	0	1	2	0	0	3	37
Ft. St. James	2	0	0	1	3	2	2	0	0	2	3	15
Fraser Lake	0	5	0	1	0	0	1	0	0	0	0	7
Mackenzie	0	1	0	0	1	0	0	1	1	0	0	4
McBride	0	0	0	0	0	0	0	0	0	0	0	0
Prince George	26	52	26	22	17	19	31	13	7	20	15	248
Quesnel	1	5	4	9	1	4	1	4	1	1	3	34
Valemount	0	4	0	0	0	0	0	0	0	0	1	5
Vanderhoof	3	2	0	0	0	3	0	0	0	2	2	12
Total	58	70	30	37	22	28	36	20	9	25	27	362

From 2002 to 2012, the most frequently reported VPDs in the Northern Interior HSDA were:

- Invasive Pneumococcal Disease - 167 cases
- Pertussis (whooping cough) - 109 cases
- Hepatitis B - 60 cases
- Invasive Meningococcal Disease - 16 cases
- Haemophilus Influenza B – 5 cases.

Chronic Diseases tend to accumulate with age and limit our independence. Our personal choices towards a handful of well known risk factors: tobacco use; physical inactivity; poor dietary choices; obesity; inappropriate alcohol and drug use; certain sexual activities; and, excessive sun exposure can greatly determine how we age and whether we remain free from certain types of cancers and chronic illnesses. ^{16, 17, 18, 19}

Estimated numbers of new cases of selected chronic conditions
Prince George LHA and Mackenzie DM residents: 2010-2011



Chronic Conditions	Existing or treated cases		New cases / yr		Cost per patient / year
	Mackenzie DM	LHA	Mackenzie DM	LHA	
Cardiovascular Disease (CVD)	170	4,350	17	440	\$8,523
Dementia	35	898	7	169	\$9,901
Ischemic Heart Diseases (IHD)	130	3,321	11	285	\$7,567
Osteoarthritis	301	7,729	23	596	\$4,552
Rheumatoid Arthritis	52	1,325	2	51	\$5,575
Asthma	329	8,431	15	384	\$1,419
Congestive Heart Failure (CHF)	75	1,929	11	272	\$12,405
Chronic Kidney Disease (CKD)	78	1,995	10	261	\$11,271
COPD	85	2,192	14	359	\$8,557
Stroke	23	580	2	59	\$10,293
Depression	931	23,870	40	1,013	\$2,742
Diabetes	285	7,312	20	504	\$5,272
Hypertension	689	17,654	43	1,101	\$4,039
AMI	61	1,567	6	143	\$8,366

Community level estimates are based upon each community's relative share of the total Local Health Area (LHA) population and reflect what "might be expected" at the community level.

Healthy and independent seniors are what we want to see when we look around the communities in northern BC. The population however, is aging and with that often comes an accumulation of chronic health conditions that inhibit our independence.

Home support and other services provided by Northern Health intend to keep people healthy and independent. As of March 2013, there were 917 northern interior residents receiving long-term home-support services. Here is an abbreviated profile of these residents.²⁰

Male	37 %	Married	28 %	Aged 75+	71 %
Female	63 %	Widowed	44 %	Aboriginal	9 %
Frequently Noted Health Conditions					
Hypertension	58 %	Diabetes	23 %	Any Psychiatric Diagnosis	21 %
Arthritis	44%	Osteoporosis	22%		
Clients with Multiple Health Conditions					
≤ 3 Conditions	28.5 %	3 - 5 Conditions	39.8 %	≥5 Conditions	31.7 %
Clients with Cognitive Impairment (Cognitive Performance Score)					
No impairment	38 %	Borderline /mild	45 %	Moderate	10 %
Clients with independence difficulty in 1- 3 daily activities (IADL Difficulty Scale)					
No difficulty	29.7 %	Some difficulty	23.7 %	Great difficulty	46.7 %

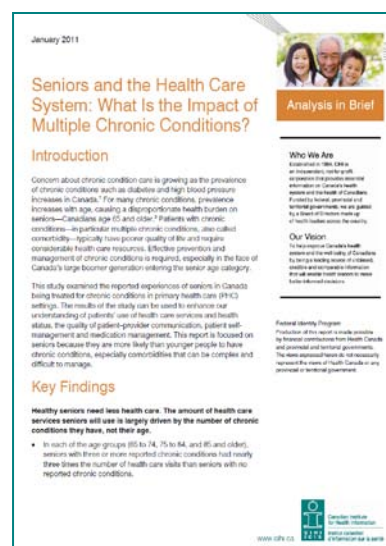
How do we compare to the rest of Canada?

The most frequently reported chronic conditions affecting Canadian seniors overall are:

- Hypertension (47%)
- Arthritis (27%)
- Hypertension and arthritis (14%)
- Hypertension and heart disease (12%)
- Hypertension and diabetes (11%)

The amount of health care that Canadian seniors need as they age is largely driven by the number of chronic conditions that they have, not their age.²¹

These are just a few of the many findings contained in the report: *Seniors and the Health Care System: What is the Impact of Multiple Chronic Conditions?*



This publication is available from the Canadian Institute for Health Information: https://secure.cihi.ca/free_products/air-chronic_disease_aib_en.pdf

Acute care (hospital) services are an important part of the health care services continuum. This page provides a 5 year snap-shot of where residents received acute care services and a glimpse into the activities occurring at local facilities.

Location where inpatient hospital services were received:²²

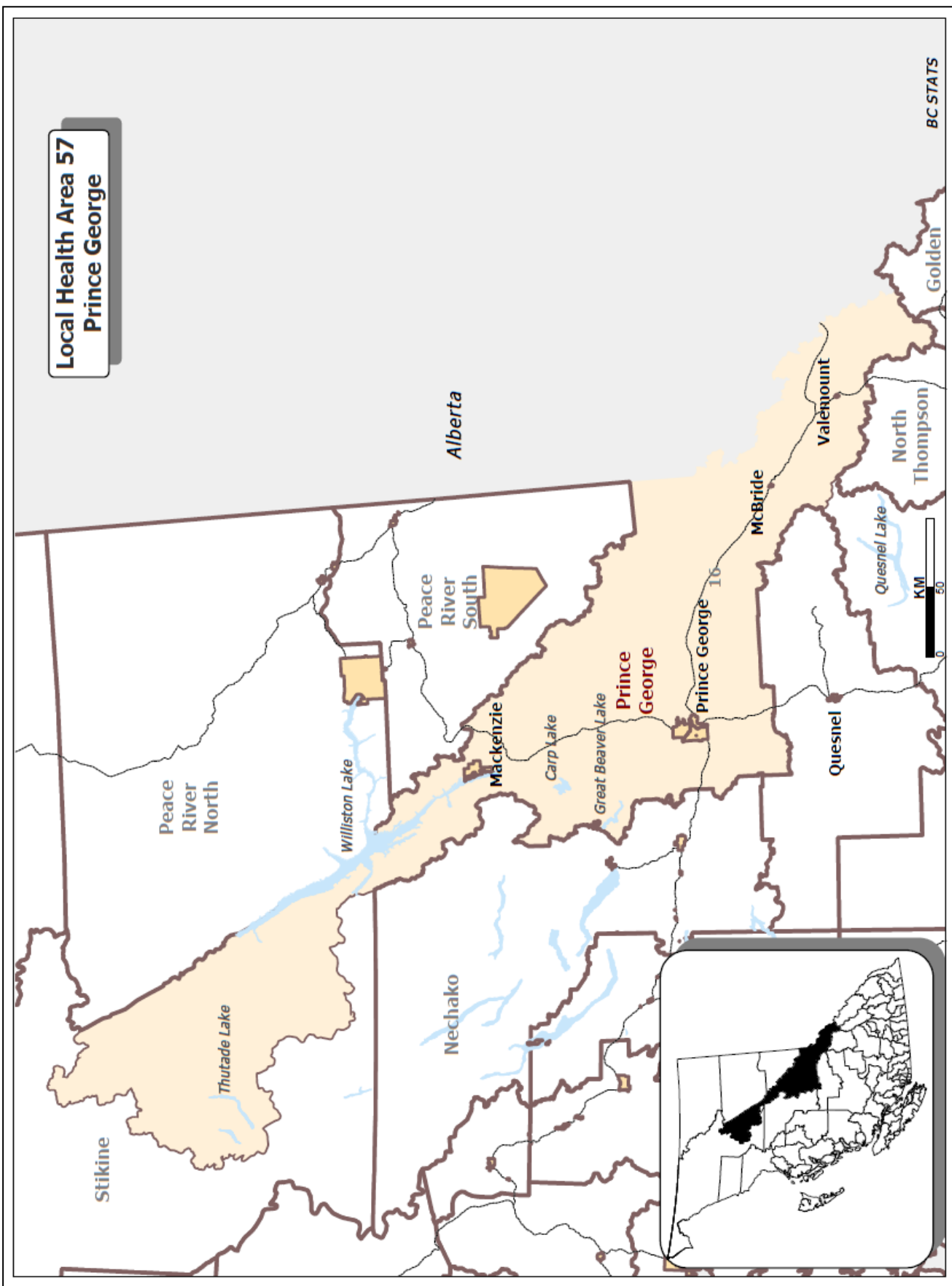
For Mackenzie residents during the five year period: 2008/09 – 2012/13.						
Number of Cases and Days	Location of Hospital Care					
	Mackenzie	Prince George	Other NH	Other BC	OOP	Total
Cases	647	1,019	110	197	18	1,991
Days	4,236	4,968	310	1,488	290	11,292

- ALC Alternate Level of Care. Clients who no longer need acute services and who are waiting to be discharged to a setting more appropriate to their needs.²³
- Cases These are inpatient cases - client was admitted to the facility.
- Days These are inpatient days - does not include days attributable to ALC.
- Other NH Care was received at a Northern Health facility other than those shown.
- Other BC Care was received at a non Northern Health facility in BC.
- OOP Care was received Out of Province – in most cases this means Alberta.

Facility Activities (selected measures).²⁴

No. 715 - Mackenzie & District Hospital & Health Centre					
Selected Measures	2008/09	2009/10	2010/11	2011/12	2012/13
Acute discharges/deaths total	116	144	170	179	155
Acute in-patient admissions total	115	148	168	183	157
Acute in-patient days (excl. ALC)	608	858	1,114	781	1,040
ALC days total	837	319	114	n/a	68
Psychiatry/addiction admissions	n/a	n/a	n/a	n/a	n/a
Ambulatory visits (excl. E/R).	n/a	n/a	n/a	1,608	1,492
Emergency visits (excl. Ambul)	5,044	4,735	5,385	5,772	7,411
In-patient surgical cases total	n/a	n/a	n/a	n/a	n/a
Surgical day care cases total	n/a	n/a	n/a	n/a	n/a
Lab Tests (excludes respiratory)	85,159	87,150	76,933	89,031	82,710
Medical Imaging Tests	2,226	1,298	1,915	2,351	1,961

**Local Health Area 57
Prince George**



References

- ¹ BC Stats, Community Fact Sheets: <http://www.bcstats.gov.bc.ca/StatisticsBySubject/SocialStatistics/CommunityFacts.aspx>
- ² BC Treaty Commission Statement of Intent Maps: GEO BC. <http://archive.ilmb.gov.bc.ca/cis/initiatives/treaty/index.html>
- ³ BC Ministry of Aboriginal Relations & Reconciliation: First Nations by Region. <http://www.gov.bc.ca/arr/treaty/regional.html>
- ⁴ Metis Nation: BC Metis Places. http://document.bcmetsiscitizen.ca/manage_metisplace_display.php
- ⁵ BC Stats: Population Estimates for Local Health Areas: PEOPLE 2013. <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx>
- ⁶ Population Estimates for Municipalities: BC Stats; 1996-2006, 2006-2012. <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx>
- ⁷ BC Stats: Population Estimates for Regional Districts: PEOPLE 2013. <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx>
- ⁸ BC Vital Statistics Annual Report: 2011. <http://www.vs.gov.bc.ca/stats/annual/index.html>
This is calendar year data (Jan - Dec). There will be a small mismatch with fiscal year data of Perinatal-Services-BC.
- ⁹ BC Stats: Population Projections: PEOPLE 2013: Published August 2013.
- ¹⁰ Northern Health Resident Mothers that Delivered a Baby in British Columbia, by Resident Municipality: Prepared for Northern Health by Perinatal Services BC. Request 211051: April 24, 2013.
- ¹¹ Alberta Perinatal Health Program, update for Northern Health: March 2013.
- ¹² Immunization: A Report on the Health and Wellbeing of British Columbian. BC Provincial Health Officer, 1998. <http://www.health.gov.bc.ca/pho/pdf/phoannual1998.pdf>
- ¹³ Small Area Populations Projections (P.E.O.P.L.E.): Technical Paper. BC Stats, July 2009. (mortality: page 10) <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/TechnicalPapers.aspx>
- ¹⁴ 2010 Cohort (2 year olds) Date of Birth Jan 01, 2010 to Dec 30, 2010. Up-to-date for age: (2010 definition). Data extracted Jan 15, 2013: Prepared by CM for JMH / MMP: Northern Health Public Health: August 2013.
- ¹⁵ Vaccine Preventable Disease: Northern Health-Public Health Internal Files: August 2013.
- ¹⁶ Population Patterns of Chronic Health Conditions in Canada: Health Council of Canada. <http://healthcouncilcanada.ca>
- ¹⁷ The Cost of Chronic Disease in Canada: GPI Atlantic. 2004. <http://gpiatlantic.org/pdf/health/chroniccanada.pdf>
- ¹⁸ Prevention: British Columbia Cancer Agency. 2009. <http://www.bccancer.bc.ca/PPI/Prevention/default.htm>
- ¹⁹ Hospitalizations: Counts and Rates Attributable to Alcohol, Tobacco, and Illicit Drugs for BC Health Authorities. BC Centre for Addictions Research: AOD project. March 2010. <http://carbc.ca/AODMonitoring/tabid/541/Default.aspx>
- ²⁰ Inter-RAI Client Assessment Summary: Northern Health. Summary as of March 31, 2013. Data extracted July, 2013. Northern Health: Home and Community Care Services.
- ²¹ Seniors and the Health Care System: What is the Impact of Multiple Chronic Conditions? CIHI, January 2011. <https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC1575>
- ²² Hospitalizations by patient's home community 2003/ 04 to 2012/13: Special Analysis by the BC Ministry of Health for Northern Health. Project No. 2013_00828. Revised and Updated: September 2013.
- ²³ Alternate Level of Care in Canada: CIHI. <https://secure.cihi.ca/estore/productSeries.htm?pc=PCC456>
- ²⁴ Northern Facility Activity Summaries from Northern Health Finance: Extracted August 20, 2013.