Practice Points

Special Edition

November 2020

Evidence and Strategies to Inform a 10-Year Health Accord in Newfoundland & Labrador

Quality of Care NL

A 10-year health transformation

Health Accord
for Newfoundland & Labrador

Agenda for Health Accord NL

1. Awareness of and intervention in the social factors that influence health (Social Determinants of Health)

2. Balance of community-based (Primary Health Care, Elder Care, Social Care) and hospital-based services

- Public engagement is a priority in shaping the agenda
- Six strategies are intended to implement that agenda

FACTS

1 Worst life expectancy, highest death rates for cancer, cardiac disease and stroke, and highest rate of chronic disease in Canada

2 Since 1981, only 6% increase in social spending but 232% increase in health spending

3 Worst health system performance across all Canadian provinces

4 Highest per capita spending on health care in Canada. NL provides the worst value for spending in health care

5 Population shift to a low percentage of children, a high percentage of seniors, with a drop in rural populations

6 50-year-old institution-based system with an imbalance between community-based services and hospital services

STRATEGIES

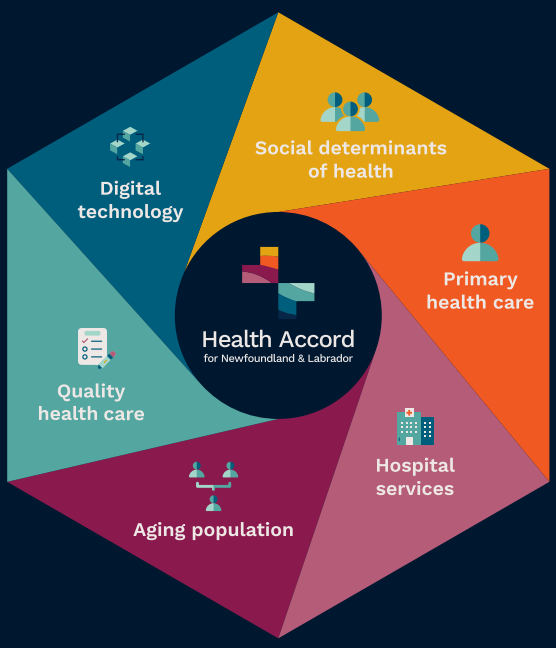


Table of Contents

7. QUALITY OF CARE IN ACUTE CARE HOSPITALS

8. QUALITY OF CARE IN LONG-TERM CARE FACILITIES IN NL

9. QUALITY OF CARE IN THE COMMUNITY

10. INTERVENTIONS TO REDUCE LOW-VALUE CARE

(Practice Points Vol. 7, Jan–Jun 2020)

Six Evidence-Based Strategies to Improve Health in NL, Based on Comparisons of Health System Performance to Canadian Provinces, Australia, and Tasmania

Objective

To summarize the evidence and strategies derived from comparisons of health system performance in Newfoundland & Labrador (NL), Canada (CAN), and Australia (AUS).

Increase Social Spending and Preventative Care

Evidence

- Life expectancy is the worst in Canada: 2.6 years lower
- 232% increase in medical spending compared to flat social spending over the past four decades
- Highest rates of unhealthy non-medical determinants of health in Canada
- St. John's is the city with the highest rate of food insecurity in Canada.
- Lowest discussion of non-medical determinants of health with provider in Canada
- 29% skipped dental care because of cost
- Worst prevalence of chronic disease, cancer and vascular mortality in Canada

Strategy

- Create a 10-year budget plan to increase proportion of the provincial budget on social spending
- Develop a plan to improve rate of homeless-ness, precarious housing and food insecurity
- Enhance the impact of the education system on non-medical determinants of health with a focus on supporting healthy eating, more exercise, and prevention of obesity, alcohol abuse, and smoking
  - Make improvement in non-medical determinants of health, especially in parents of children attending school, a focus of primary care renewal
  - Put into practice a "Health in All Policies" of Government to Promote health

Transform Primary Care

Evidence

- Low percentage of adults who talked to their provider about preventative care
- Low influenza vaccination rate for seniors
- High avoidable hospital admissions
- High use of low-value/unsafe care: antibiotics, long-term PPIs, psychotrophic drugs for seniors, CT scanning
- Low performance on patient engagement metrics
- Low percent of seniors with end-of-life directives
- Poor after-hours or weekend acess to family physicians
- 43% of family physicians spend 1–14 minutes with patients compared to 28% for Canada
- Low use of nurse practitioners in primary care

Strategy

- Transform primary care with an emphasis on group practices, multi-disciplinary care, nurse practitioners, e-technology and communication, provision of after-hours and weekend cover, and an accountability structure for the use of health care resources

Centralize Some Acute Hospital Specialties

Evidence

- High number of acute care hospitals but low number of specialists
- High level of many hospital services, relative to the population, but without the resources for optimal service
- Poor coordination of care between specialists and family physicians
- Poor access to specialists
- High cancer mortality
- High in-hospital myocardial infarction and stroke mortality
- Poor thrombolysis rates for ischemic stroke

Strategy

- Centralize some hospital specialties with an emphasis on the appropriate level of complexity for each hospital site and specialty area, use of multi-disciplinary teams, and an accountability structure to improve access and outcomes

Reduce Low-Value Care & Improve Quality of Care

Evidence

- High use of drugs associated with harm and of CT scanning in primary care
- High use of blood tests
- Longer than optimal wait times for interventions
- High in-hospital mortality for myocardial infarction and stroke
- Poor thrombolysis rates for ischemic stroke

Strategy

- Create an executive plan with stakeholders to improve the uptake of audit, feedback, and academic detailing on the use of health care resources in hospitals, long-term care facilities and in the community, that includes an accountability infrastructure
- Provide recommendations on e-ordering, implementation teams to improve care process, system care, public engagement and other interactions to improve quality
- Create a Quality of Care Health Council with legislative approval to evaluate and make recommendations on health quality and health system performance

Social Model for Care of the Aging Population

Evidence

- Low rate of end-of-life directives in seniors
- High use of benzodiazapine and antipsychotics in seniors
- Over half of seniors are at moderate/high risk of falling
- Low number of long-term care workers per 100 people ≥65 years
- Sparce geriatric services
- Support for ageing at home by Department of Health and Community Services
- High occupancy and high alternate level of care in acute care hospitals because of waiting for long-term care services

Strategy

- Create a new model of care for frail seniors that increases geriatric services, increases end-of-life directives, supports ageing at home, and encourages provision of medical care in long-term care facilities (not in acute care hospitals), and provides more long-term care workers in a better workplace environment, as recommended by the Royal Society of Canada report

Enhance Electronic Infrastructure

Evidence

- Low percentage of family physicians who report e-clinical decision support
- Poor bidirectional coordination of care
- Use of e-infrastructure to remove inequities is not optimal
- High rate of low-value care: CT scanning, blood tests, antibiotics, other drugs
- Need for virtual communication in multi-disciplinary primary care for areas with low population density

Strategy

- Create a plan involving stakeholders at the NL Centre for Health Information, RHAs, NL Medical Association, Department of Health and Quality of Care NL to enhance virtual communication, bidirectional coordination of care, access, e-ordering, e-support, and decision tools

(Practice Points Vol. 7, Jan–Jun 2020)

Health and Social Spending in NL

Objective

To examine changes in health and social spending since 1981 and compare metrics on the non-medical determinants of health in NL to those in the other Canadian provinces.

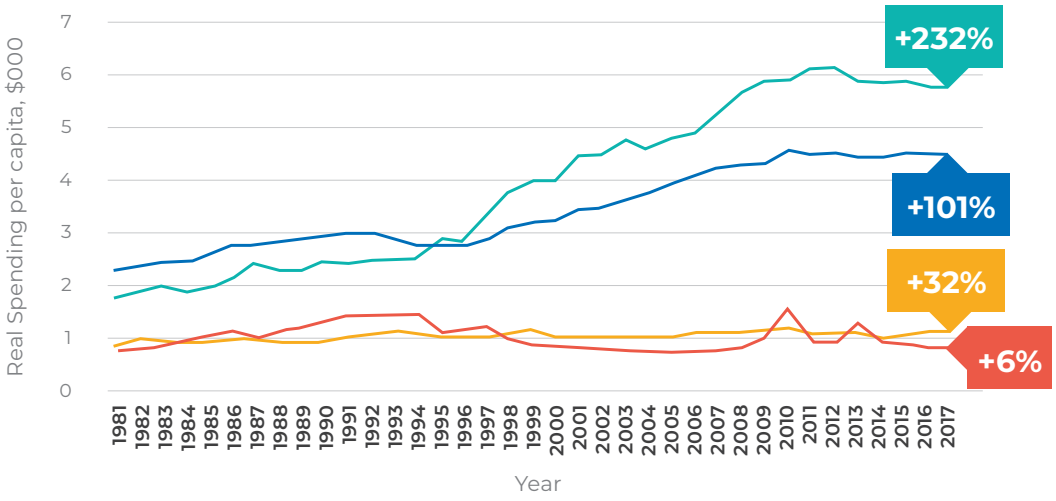
Practice Points

1. Life expectancy, prevalence of chronic disease, and incidence of cancer and vascular disease in NL are the worst in Canada, all of which are strongly influenced by non-medical determinants such as unemployment, education, income, diet, physical activity, smoking, and alcohol use.

Methods

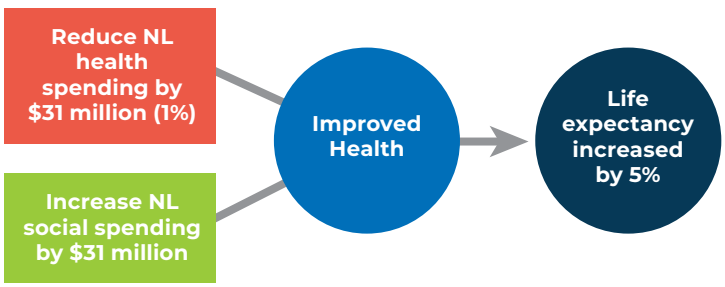
1. Data on non-medical and social determinants of health for 2017–18 was obtained from the Canadian Institute for Health Information (CIHI) and Statistics Canada. For each metric, NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst.
2. Real per capita health and social spending by the NL provincial government and the Canadian average for all provincial governments for 1981–2017 was requested from D. Dutton, Dalhousie University.
3. Analysis of the impact of social spending on health outcomes is cited from Dutton et al. (2018). CMAJ.

Results



- Since 1981, health spending in NL has increased by 232% in real spending per capita and social spending has been flat.

Figure 1. Real per Capita Canadian and NL Health and Social Spending



- Canadian research (Dutton et al., 2018) demonstrates that by spending one more cent on social services for every dollar spent on health, life expectancy in Canada could increase by 5% and avoidable mortality could drop by 3%.

Table 1. Non-medical and Social Determinants of Health, 2017–18

		CAN	NL	NL Rank
Healthy Eating	Fruit consumption at least once per day	66.5%	56.3%	10
	Vegetable consumption at least once per day	55.9%	34.1%	10
	Fruit or vegetable consumption 5+ times per day	28.6%	18.3%	10
Physical Activity	Adults (age 18+): 150 minutes per week	56.0%	49.4%	10
	Youth (age 12-17): 60 minutes per day	57.8%	51.0%	9
Alcohol Use	Heavy drinker	19.3%	26.7%	10
	Consumption (litres per capita)	8.2	9.1	10
Current Smoker	Daily or occasional	16.0%	20.8%	10
	Daily	11.3%	16.7%	10
Breast-feeding	Initiation	91.0%	70.6%	10
	Exclusive, at least 6 months	34.5%	20.6%	10
Employment	Unemployment rate	6.0%	14.8%	10
Income	Living on low income	8.7%	9.7%	9
Education	Tertiary education	58%	49%	9
	Bachelor's level or above	32%	20%	10
Family	Children living in lone-parent family	19.2%	23.2%	8
	Children living in a family without their parents	1.4%	2.0%	8
Stress	Most days quite a bit or extremely stressful	21.4%	14.9%	1
Belonging	Somewhat or very strong sense of belonging	68.9%	77.8%	1
Life Satisfaction	Satisfied or very satisfied	93.2%	92.6%	7

- NL has the lowest provincial ranking for the non-medical determinants of health in Canada.

Conclusions

1. NL ranks poorly in many non-medical and social determinants of health, relative to the rest of Canada. It would be better to address these factors than increase spending in the health care system.

2. Over 37 years, the level of social spending by the NL government has remained almost unchanged, while the level of health spending has more than tripled.

3. Reallocating some NL government expenditure from health to social spending would result in improved health outcomes, even if total government spending remained the same.

4. A preventative approach to improving population health requires coordinated action outside of the health sector, a review of policies in all government sectors to determine opportunities to promote health across the life cycle, and a "Health in all Policies" plan to address the non-medical factors which lead to the diminished life expectancy and excess comorbidity observed in NL.

5. Health promotion is not currently a responsibility of the Department of Health and Community Services, and should be. An integrated and imaginative approach is necessary targeted at children in school and parents through primary care, plus a communications plan to influence the population.

(Practice Points Vol. 7, Jan–Jun 2020)

Mortality Rates and Co-Morbidity in NL Compared to Canada

Objective

To compare disease specific mortality rates and co-morbidity associated with COVID-19 risk in NL and Canada (CAN).

Practice Points

1. Health system structure should target the most frequent clinically important diseases defined by death and major clinical events.

2. We defined co-morbidity as disorders that increased risk for major adverse events in patients with COVID-19.

Methods

1. Provincial health outcomes for the most recent year available were obtained from CIHI (2015-17; 2018-19) and Statistics Canada (2017-18; 2018). NL was ranked against other provinces with 1=best/healthiest and 10=worst/unhealthiest.

2. Risk factors for severe illness from COVID-19 was obtained from the Centers for Disease Control and Prevention (CDC).

Results

Table 1. Life Expectancy (in Years) and Mortality (Rate per 100,000 Population) in Canada and NL, and Provincial Rank of NL

		CAN	NL	NL Rank
Life Expectancy	At birth	82.1	79.5	10
	At age 65	21.0	18.9	10
All causes mortality	Crude rate	766.4	993.0	9
	Age-standardized rate	671.8	839.8	10
Avoidable deaths	Overall	195	238	9
	From preventable causes	128	149	7
	From treatable causes	67	90	10

- Life expectancy at birth or at 65 years is the worst in Canada, as is the mortality from treatable causes.

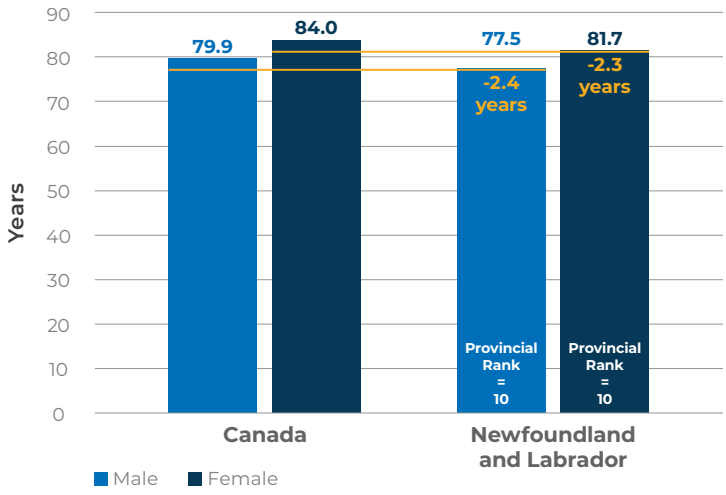


Figure 1. Life Expectancy

Table 2. Age-standardized Mortality Rates per 100,000 Population for Canada and NL and Provincial Rank of NL for the Most Common Natural Causes of Death in Canada

	CAN	NL	NL Rank
Malignant neoplasms	190.0	222.3	10
Diseases of the heart	123.6	167.8	10
Cerebrovascular diseases	31.4	44.2	10
Chronic lower respiratory diseases	30.4	40.9	8
Influenza and pneumonia	19.5	25.9	9
Diabetes mellitus	16.1	34.1	10
Alzheimer's disease	14.6	10.8	5
Nephritis, nephrotic syndrome, and nephrosis	8.4	16.6	10

- Mortality rates in NL are the highest in Canada for cancer, cardiac disease, cerebrovascular disease, diabetes and kidney disease.

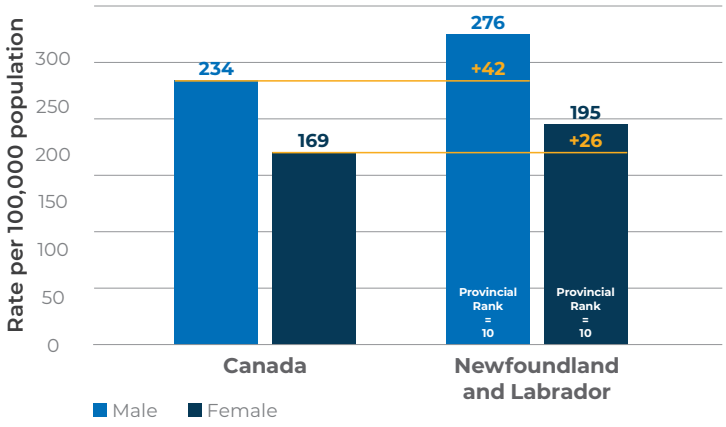


Figure 2. Age Standardized Cancer Mortality

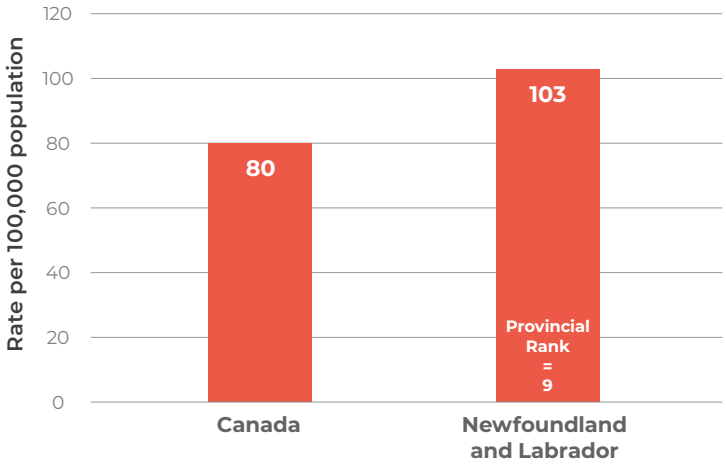


Figure 3. Age-Sex Standardized Cardiac Disease Mortality

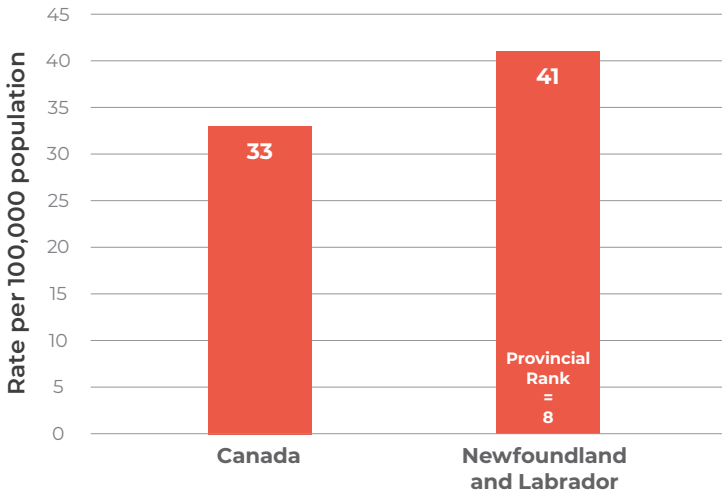


Figure 4. Age-Sex Standardized Stroke Mortality

Table 3. Standardized Rates for the Six Most Common Cancers in Canada (Excluding Quebec)

		CAN	NL	NL Rank
Lung and bronchus	Age-sex standardized incidence rate/100,000	61.4	68.4	6
	5-year survival, %	19	18	4
	Age-sex standardized mortality rate/100,000	47.2	57.5	8
Colorectal	Age-sex standardized incidence rate/100,000	60.5	94	9
	5-year survival, %	65	62	7
	Age-sex standardized mortality rate/100,000	21.8	38.6	9
Breast	Age-sex standardized incidence rate/100,000	128.2	128.9	8
	5-year survival, %	88	85	8
	Age-sex standardized mortality rate/100,000	22	26.2	9
Prostate	Age-sex standardized incidence rate/100,000	116.7	110.1	6
	5-year survival, %	93	93	2
	Age-sex standardized mortality rate/100,000	21.8	27.2	7
Non-Hodgkin's lymphoma	Age-sex standardized incidence rate/100,000	24.4	25.1	8
	5-year survival, %	68	71	1
	Age-sex standardized mortality rate/100,000	6.5	8.2	8
Bladder	Age-sex standardized incidence rate/100,000	25	25.2	6
	5-year survival, %	75	72	7
	Age-sex standardized mortality rate/100,000	5.7	5	2

- NL has high incidence and mortality rates for common cancers in comparison to other provinces and has the highest rate for age standardized mortality for colorectal and breast cancer in the country.

Table 4. Selected Groups at Higher risk for Severe Illness from COVID-19 in Canada and NL

Risk Factor	Measure	CAN	NL	NL Rank
Asthma	Prevelance (age 12+)	8.3%	7.4%	1
	Hospitalization rate per 100,000 population	14.7	21.5	10
	Mortality rate per 100,000 population	0.7	1.3	10
Chronic kidney disease	Incidence per 100,000 population	21.1	25.9	8 (of 9)
	Prevalence per 100,000 population	140.5	167.1	8 (of 9)
	Dialysis prevalence per 100,000 population	81.2	114.2	8 (of 9)
	Mortality rate per 100,000 population	9.8	19.4	10
Chronic lung disease	COPD prevalence	4.1%	5.4%	7
	COPD hospitalization rate per 100,000 population	238.0	288.2	6
	Mortality rate per 100,000 population	35.1	49.7	7
Diabetes	Prevalence	7.1%	9.2%	9
	Hospitalization rate per 100,000 population	95.9	164.8	9
	Mortality rate per 100,000 population	18.4	40.7	10
Chronic liver disease/ cirrhosis	Mortality rate per 100,000 population	4.7	8.4	9
Aged ≥65 years	% of total population	17.5%	21.5%	10
Long-Term Care resident	Per 1,000 population	7.2	7.2	3 (of 6)
Serious heart condition	Mortality rate per 100,000 population	192.6	274.3	10
	Heart failure hospitalization rate per 100,000 population	198.6	211.3	9
	Heart failure mortality rate per 100,000 population	16.6	17.1	6
	Pulmonary hypertension	17.1%	21.5%	9
	Hospitalized heart attacks per 100,000 population	243	340	10
	30-day in-hospital fatality per 100 admissions: AMI	4.8	5.6	10
Obesity	Adults (18+)	26.8%	40.2%	10
	Youth (12-17) overweight or obese	23.7%	31.4%	9

- The prevalence and severity of chronic disease in NL places the province at greater risk of poor outcomes for those who contract COVID-19 than the rest of Canada.

Conclusions

1. The highest mortality rate was for cancer. Reduction in incidence rates requires a focus on Health Promotion through improving the non-medical determinants of cancer. A holistic provincial plan is indicated to improve screening for colorectal and breast cancer and survival rates following diagnosis.

2. The second highest mortality rate was from cardiac disease. Here, a focus on the non-medical determinants of cardiac disease is also necessary. The provincial cardiac program should develop a holistic plan for the province to improve cardiac outcomes.

3. Reduction in the high prevalence of obesity and of diabetes will require improvement in the non-medical determinants of health.

4. The high hospitalization rate for asthma and diabetes indicates a need for improved primary care in the community.

(Practice Points Vol. 7, Jan–Jun 2020)

Demographic Change, Health Care Structure, and Value of Health Spending in NL

Objective

To determine demographic change in NL for the last 20 years and predict it for the next 20 years, to provide information on health care structure in regions of NL, and to assess the value of health spending.

Results

A. Demographic Change

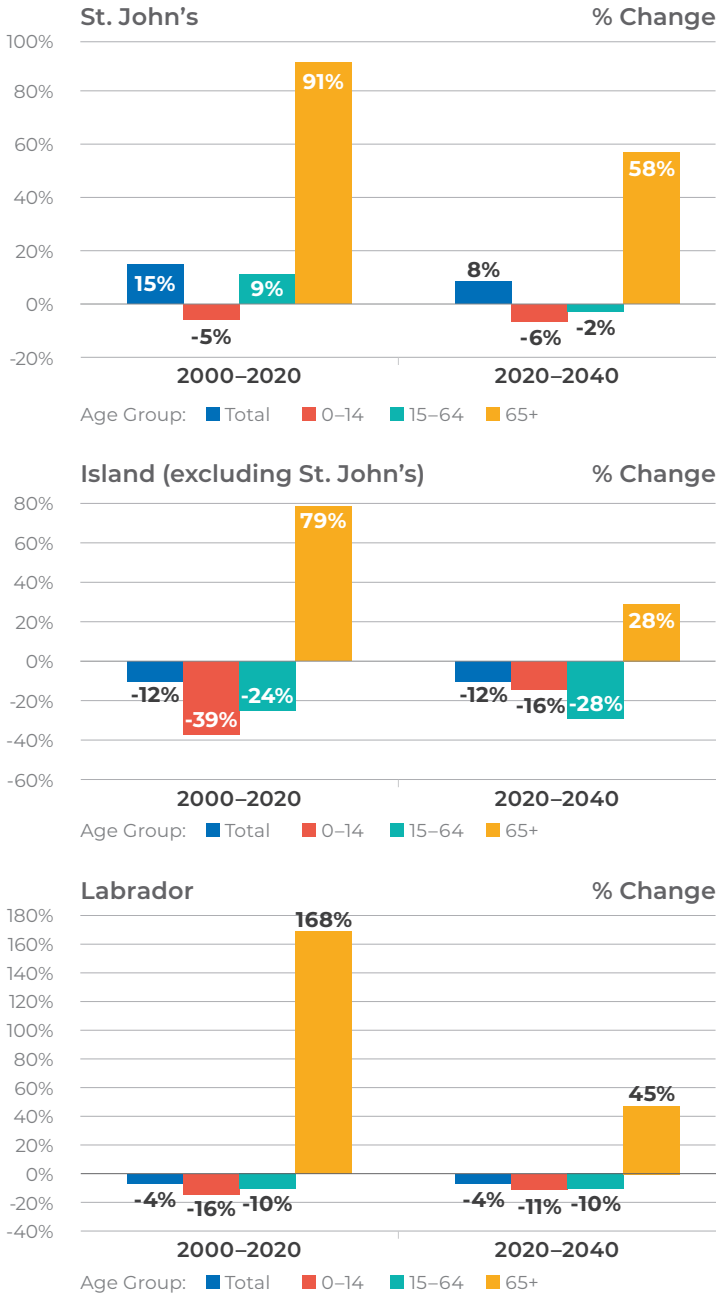


Figure 1. Demographic Change in the three Regions of NL From 2000-2020 and Predicted Change From 2020-2040

- Demographic change in NL has been and will be substantial, with a lower proportion of children, substantially higher proportion of seniors, and a decrease in population outside the Avalon.
- Demographic change in NL is increasing the need for health care services for seniors.

B. Health Structure

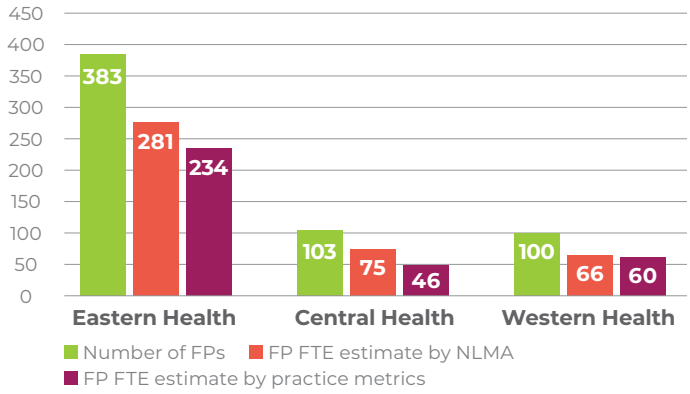
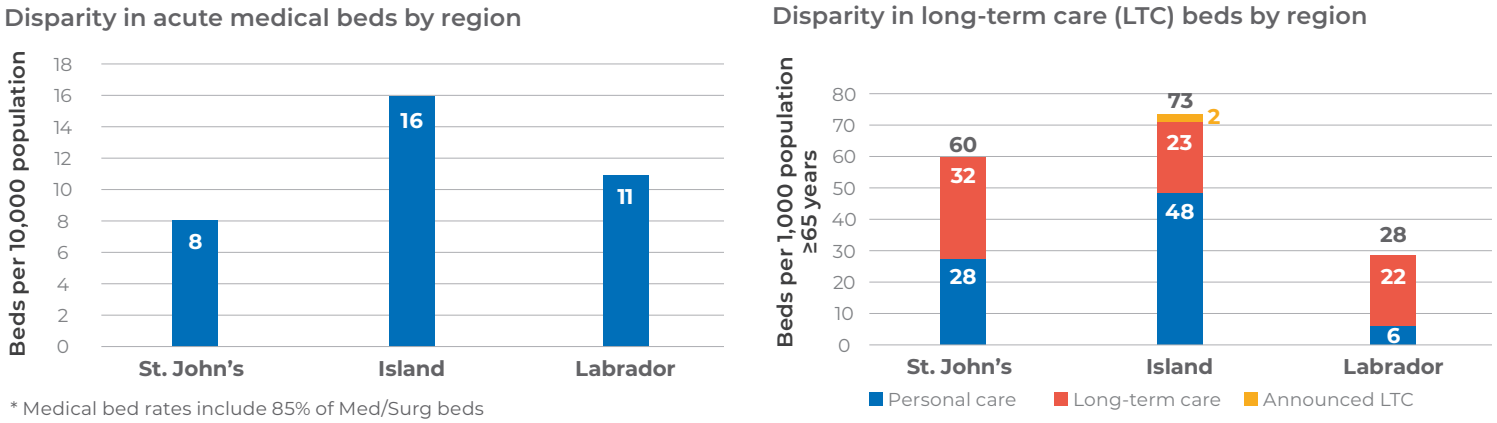


Figure 2. An Estimate of the Number of Fulltime Equivalent (FTE) Family Physicians (FPs) Working in NL

- The number of FTE FPs is substantially less than the number registered: 72% estimated by the NLMA and 59% based on estimates from clinical practice metrics (rate of ordering hemoglobin tests and of antibiotic prescription).
- The rate of FPs/1,000 in NL is 1.2 but the rate of FTE FPs is 0.7

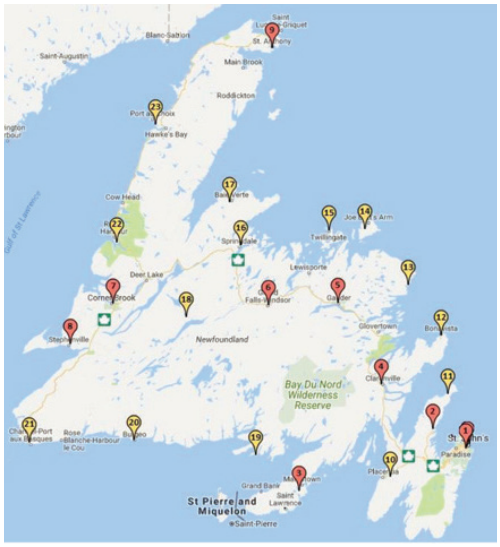
- In the 2019 survey of primary care doctors in NL, 17% were in private solo practices (5th highest in Canada), 40.8 % saw ≥200 patients/week (highest in Canada), 43% spent 1–14 minutes with a patient during a routine visit (second worst in Canada), compared to 27.9% for Canada and 24.7% for Australia.



* Medical bed rates include 85% of Med/Surg beds

Figure 3. Regional Rates of Acute Medicine and Residential Care Beds

- The structure of the institutional health system outside St. John's is not optimal, as there is an excess of acute medical beds and a deficit of long-term care beds.



Provincial Beds:
20 medicine beds + 130 medicine/surgery beds
* With available data, occupancy of medicine/surgery beds exclusively by medical patients could not be calculated

ALC = Alternate Level of Care

Hospitals Newfoundland

1. St. John's (Health Sciences Centre)
Beds: 92; Occupancy: 96%; ALC: 11%

St. John's (St. Clare's)
Beds: 76; Occupancy: 89%; ALC: 21%

2. Carbonear
Beds: 48; Occupancy: 83%; ALC: 15%

3. Burin
Beds: 22; Med/Surg; Occupancy: 69%*; ALC: 16%

4. Clarenville
Beds: 28; Med/Surg; Occupancy: 87%*; ALC: 16%

5. Gander
Beds: 27; Occupancy: 110%; ALC: 27%

6. Grand Falls- Windsor
Beds: 52; Occupancy: 108%; ALC: 38%

7. Corner Brook
Beds: 91; Occupancy: 94%; ALC: 37%

8. Stephenville
Beds: 25 + 16; Med/Surg; Occupancy: 94%*; ALC: 22%

9. St. Anthony
Beds: 24; Med/Surg; Occupancy: 86%*; ALC: 29%

Labrador

Happy Valley-Goose Bay
Beds: 25; Med/Surg; Occupancy: 97%*; ALC: 21%

Labradory City
Beds: 15; Med/Surg; Occupancy: 84*%; ALC: 16%

Health Centres

Overall
Occupancy: 75%; ALC: 42%

10. Placentia
Beds: 10; Occupancy: 42%; ALC: 13%

11. Old Perlican
Beds: 4; Occupancy: 37%; ALC: 4%

12. Bonavista
Beds: 10; Occupancy: 64%; ALC: 26%

13. New-Wes-Valley
Beds: 12; Occupancy: 76%; ALC: 36%

14. Fogo
Beds: 5; Occupancy: 70%; ALC: 49%

15. Twillingate
Beds: 12; Occupancy: 115%; ALC: 50%

16. Springdale
Beds: 9; Occupancy: 95%; ALC: 52%

17. Baie Verte
Beds: 7; Occupancy: 78%; ALC: 42%

18. Buchans
Beds: 3; Occupancy: 51%; ALC: 0%

19. Harbour Breton
Beds: 5; Occupancy: 64%; ALC: 63%

20. Burgeo
Beds: 3; Occupancy: 63%; ALC: 45%

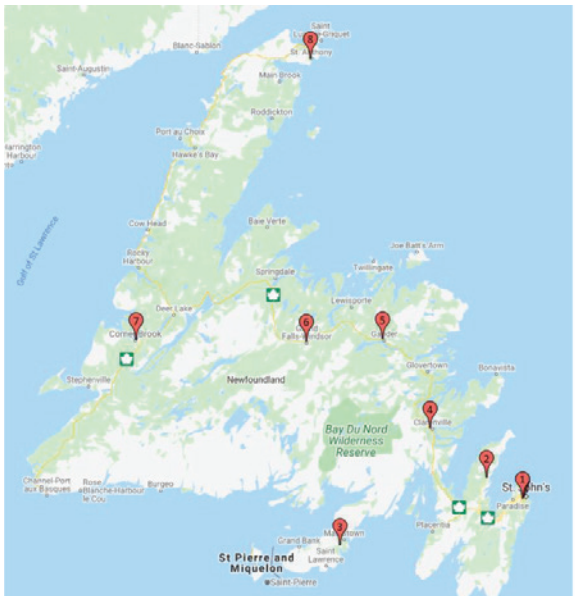
21. Port Aux Basques
Beds: 14; Occupancy: 85%; ALC: 45%

22. Norris Point
Beds: 8; Occupancy: 77%; ALC: 66%

23. Port Saunders
Beds: 7; Occupancy: 46%; ALC: 16%

Figure 4. Distribution and Utilization of Acute Medicine Beds

- There are 520 medicine beds and 130 medicine/surgery beds in 12 hospitals and 14 health centres.



Provincial Totals:
Beds: 112 Births: 3,909 Births/Bed: 35

Newfoundland

1. St. John's (Health Sciences Centre)
Beds: 35; Births: 2,246; Births/Bed: 64

2. Carbonear
Beds: 10; Births: 136; Births/Bed: 14

3. Burin
Beds: 9; Births: 102; Births/Bed: 11

4. Clarenville
Beds: 9; Births: 142; Births/Bed: 16

5. Gander
Beds: 10; Births: 51; Births/Bed: 5

6. Grand Falls- Windsor
Beds: 14; Births: 434; Births/Bed: 31

7. Corner Brook
Beds: 11; Births: 442; Births/Bed: 40

8. St. Anthony
Beds: 14; Births: 59; Births/Bed: 4

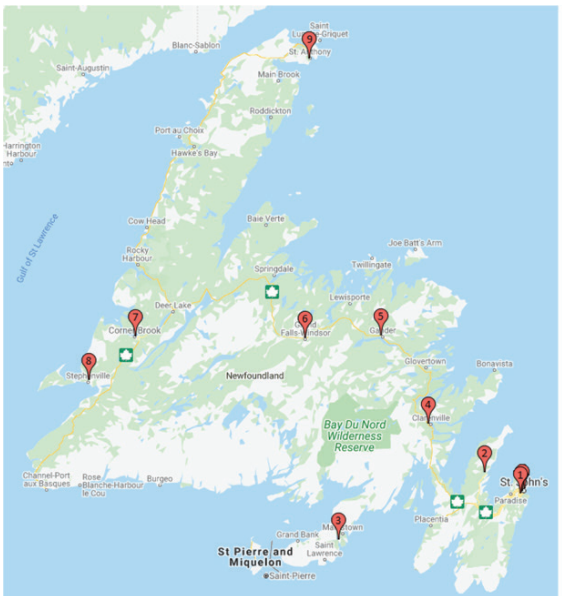
Labrador

Happy Valley-Goose Bay
Beds: 0; Births: 225; Births/Bed: N/A

Labrador City
Beds: 0; Births: 72; Births/Bed: N/A

Figure 5. Distribution and Utilization of Obstetrics Beds

- Capacity for obstetrics care exceeds requirements based on current births.



Provincial Beds:
387 surgery beds + 130 medicine/surgery beds

* With available data, occupancy of medicine/surgery beds exclusively by surgery patients could not be calculated

Hospitals Newfoundland

1. St. John's (Health Sciences Centre)
Beds: 162; Occupancy: 87%; ALC: 4%

St. John's (St. Clare's)
Beds: 104; Occupancy: 77%; ALC: 11%

2. Carbonear
Beds: 8; Occupancy: 60%; ALC: 10%

3. Burin
Beds: 22 Med/Surg; Occupancy: 69%*; ALC: 2%

4. Clarenville
Beds: 28 Med/Surg; Occupancy: 87%*; ALC: 6%

5. Gander
Beds: 40; Occupancy: 93%; ALC: 18%

6. Grand Falls- Windsor
Beds: 20; Occupancy: 90%; ALC: 30%

7. Corner Brook
Beds: 53; Occupancy: 89%; ALC: 39%

8. Stephenville
Beds: 16 Med/Surg; Occupancy: 99%*; ALC: 14%

9. St. Anthony
Beds: 24 Med/Surg; Occupancy: 86%*; ALC: 23%

Labrador

Happy Valley-Goose Bay
Beds: 25 Med/Surg; Occupancy: 97%*; ALC: 3%

Labrador City
Beds: 15 Med/Surg; Occupancy: 84%*; ALC: 0%

Figure 6. Distribution and Utilization of Surgery Beds

- Most surgeries in the province are performed as day surgeries. Capacity for surgery in-patient care exceeds requirements based on current volume.

Table 1. Hospital and Health Centre Metrics

Large Hospitals	Stays	Beds	Occupancy	Cost/Stay
St. Clare's Mercy	6,923	192	82%	$5,837
Health Sciences Centre	15,299	345	93%	$6,160
James Paton Memorial	2,668	85	98%	$6,580
Central NL Region	3,409	115	99%	$5,628
Western Memorial	5,883	217	88%	$5,298
Small Hospitals	**Stays**	**Beds**	**Occupancy**	**Cost/Stay**
Burin Peninsula	1,069	35	54%	$11,644
Dr. G.B. Cross Memorial	1,590	41	76%	$8,103
Carbonear General	2,393	72	73%	$7,671
Sir Thomas Roddick	1,119	44	91%	$5,575
Charles S. Curtis Memorial	1,173	42	83%	$9,887
Labrador Health Centre	1,372	25	97%	$7,899
Labrador West	758	15	84%	$9,180
Acute Care Health Centres*	**Stays**	**Beds**	**Occupancy**	**Cost/Stay**
Eastern Health	552	24	51%	$9,036
Central Health	676	45	90%	$8,989
Western Health	794	29	74%	$6,905

* Excludes 4 health centres for which cost per stay data is unavailable

- Assuming an optimal occupancy of 85%, most large hospitals are operating over capacity, while many small hospitals are operating under capacity.
- Small hospitals account for just over 20% of hospital stays in 2017–2018 but almost 30% of the total cost of stays.

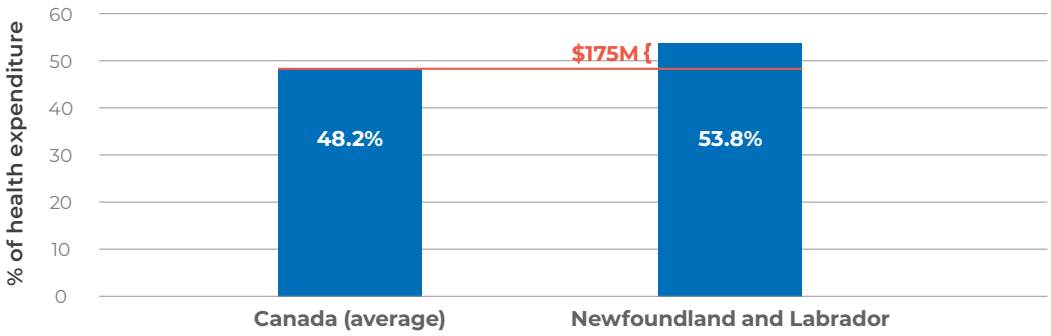


Figure 7. Provincial Government Expenditure on Institutional Health Care, 2019–2020

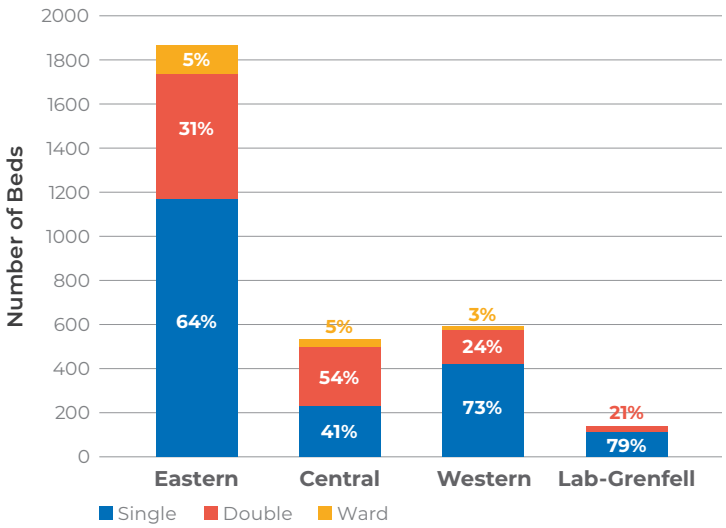


Figure 8. Number of Beds and Percent of Total Beds per RHA in LTC Homes in NL in Single Occupancy, Double Occupancy, or Ward Rooms, 2020

- Ward rooms (triple or quadruple occupancy) form a small percentage of LTC beds in three RHAs, accounting for 138 LTC beds in the province. There are no ward rooms in Labrador-Grenfell Health.
- LTC beds announced to open in Central Health are all in single occupancy rooms.

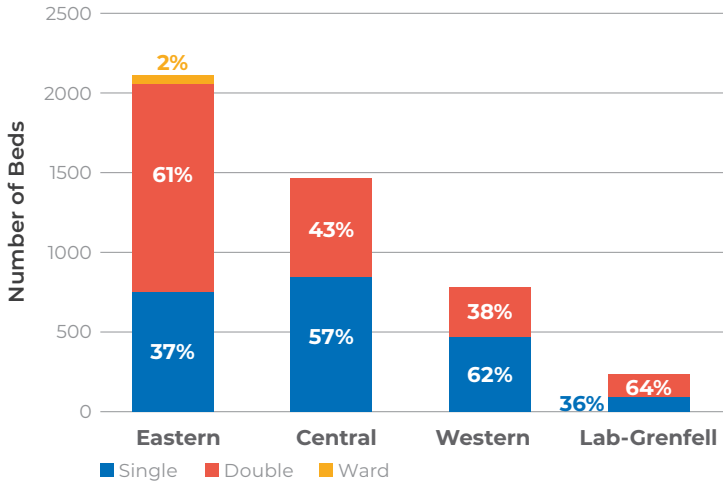


Figure 9. Number of Beds and Percent of Total Beds per RHA in Personal Care Homes in NL in Single Occupancy, Double Occupancy, or Ward Rooms, 2020

- Out of 87 PCHs in NL, only 4 have ward rooms. These 4 PCHs are all located in the Eastern Health region.
- Only 32 beds in PCHs are in ward rooms, which is less than 1% of all PCH beds in the province.
- Ward rooms have been demonstrated to be a risk to controlling the spread of infectious diseases in residential facilities in other jurisdictions, with fatal consequences during the COVID-19 pandemic.

C. Value of Health Spending

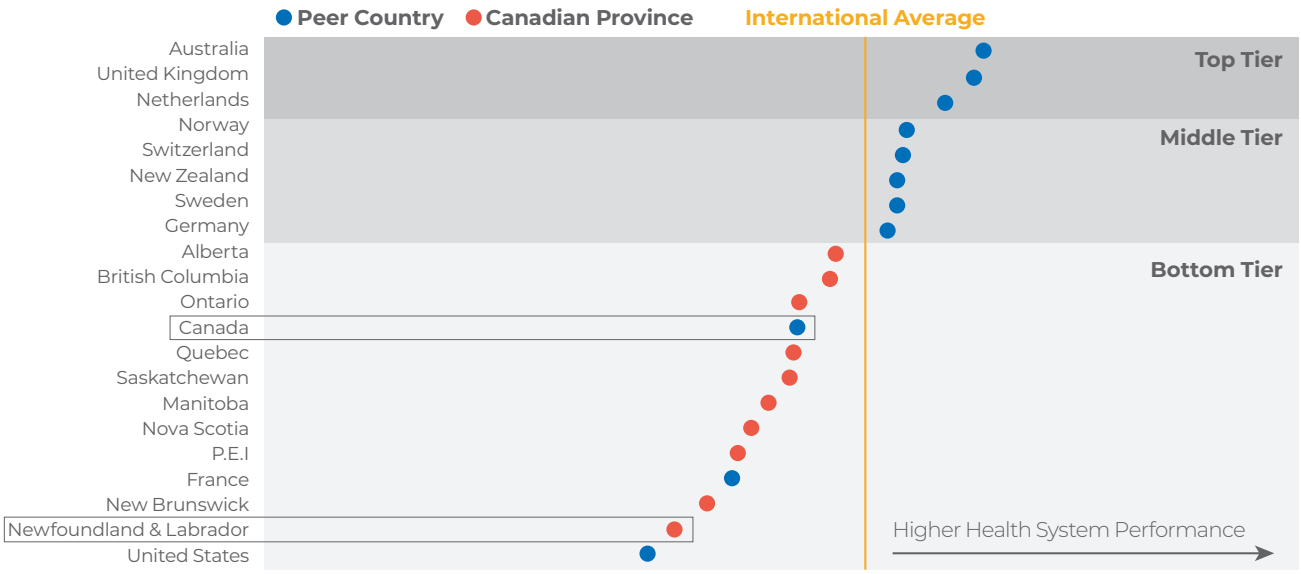


Figure 10. Ranking of Health System Performance in 11 OECD Countries and 10 Canadian Provinces

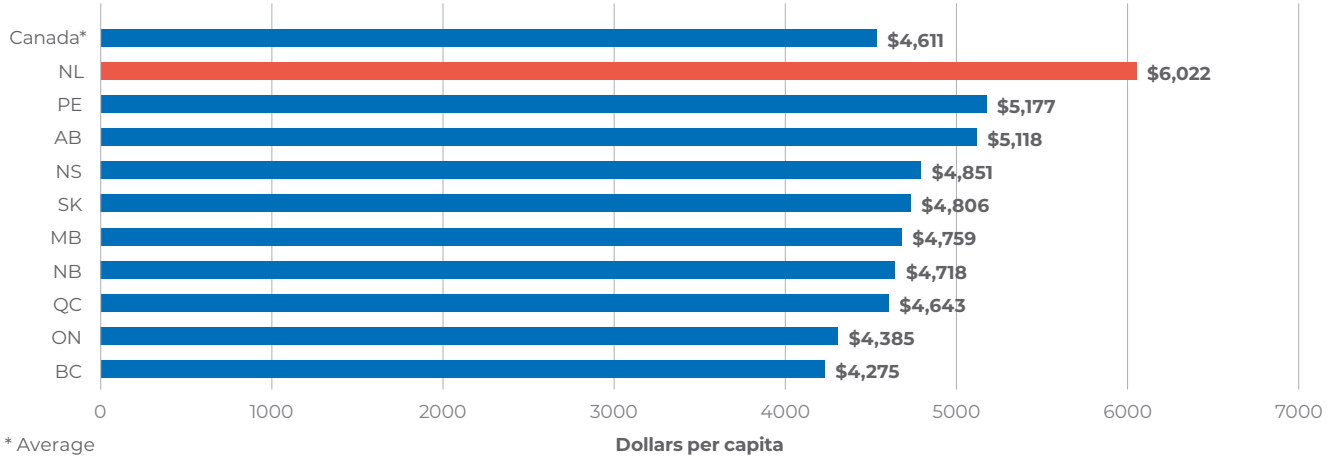


Figure 11. Provincial Government per Capita Health Expenditure, 2019-2020

- NL spends more per capita on health care than any other province, but achieves the worst health outcomes.
- The difference in health care expenditure is driven by above average spending on institutional care.
- Among the Canadian provinces, NL provides the worst value for health spending in that it spends the most per capita and has the worst health system performance.

A Proposal to Improve Quality of Care

Balance access to primary care collaborative centres, emergency rooms to stabilize and transfer, long-term care, public health, and social care in local communities with acute care located in specialized centres.

(Practice Points Vol. 7, Jan–Jun 2020)

Analysis of NL's Health System Performance Compared to Provincial Peers and Canada's Performance Compared to Australia

Background

The Commonwealth Fund surveys the public and doctors about health system performance in 11 OECD countries, and the OECD provides metrics on care processes and health outcomes. The following four sections examine NL's performance on care processes (preventative care, safe care, coordinated care, engagement, and patient preferences), access (timeliness and affordability), administrative efficiency, and health care outcomes, and we provide additional data from our own research. The next two sections compare health system structure, expenditures, and workforce in CAN and AUS. The final two sections compare NL's health system structure and workforce to that of Tasmania (TAS), an island off AUS comparable to NL in population size.

Health System Performance

- **Care Processes**
  - Preventative Care
  - Safe Care
  - Coordinated Care
  - Patient Engagement/Preferences
- **Access**
  - Timeliness
  - Affordability
- **Administration**
  - Efficiency
  - Equity
  - Low-Value Care
- **Health Outcomes**
  - Population Health
  - Mortality Rates
  - Cancer Epidemiology
  - Cardiovascular Disease Outcomes
- **Health Economics**
  - Structure
  - Expenditures
  - Workforce

Implications

From the data, strategies needed to improve the health of the province and the value of health care spending include:

- **Increase social spending and preventative care**
- **Transform primary care**
- **Centralize some acute hospital specialties**
- **Reduce low-value care & improve quality of care**
- **Social Model for care of the aging population**
- **Enhance electronic infrastructure**
- **Social and Health budget that reflects above priorities**

Respondents

The Commonwealth Fund has undertaken surveys of adults (2016), adults ≥ 65 years (2017), and primary care physicians (2019), plus indicators of health quality are published by the OECD.

Respondents	AUS	CAN	NL
Commonwealth Fund Survey 2016 – Adults	5,248	4,547	253
Commonwealth Fund Survey 2017 – Adults ≥ 65 Years	2,500	4,549	254
Commonwealth Fund Survey 2019 – Primary Care Physicians	500	2,569	192
Chronic Disease Prevalence	5,216	30,850	––

Source:
Commonwealth Fund International Comparisons 2017
Benchmarking Canada's Health Care Systems: International Comparisons 2019

Ranking

OECD countries are ranked according to the distance the metric is from its mean measured in standard deviations. Thus, the score could vary from -2 (very bad) to +2 (very good).

For each metric, NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst. In the tables rank 1–3 is coloured green, 4–7 is yellow, 8–10 is red, and no data is grey.

(Practice Points Vol. 7, Jan–Jun 2020)

Care Processes in NL Compared to Canada and Australia

Objective

To compare care processes pertaining to preventative care, safe care, coordinated care, and patient engagement and preferences in NL to that in Canada (CAN), and to compare Canada's to that in Australia (AUS).

- *OECD countries are ranked according to the distance the metric is from its mean measured in standard deviations. Thus, the score could vary from -2 (very bad) to +2 (very good).*
- *For each metric NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst. In the tables rank 1–3 is coloured green, 4–7 is yellow, 8–10 is red, and no data is grey.*

Results

A. Care Processes: Canada vs. Australia

Figure 1. Scores for Care Processes in Canada and Australia, Defined as + and - Standard Deviations (SDs) From the International Mean.

- CAN's overall care process score was just above average whereas AUS's was better. CAN had a high score for preventative care, and AUS had high scores for safe care and engagement/patient preferences. CAN's score for coordinated care was below average.

B. Preventative Care in NL compared to Canada and Australia

Table 1. Non-Medical Determinants of Health

AUS	CAN	NL	NL Rank
Fruit consumption in adults (% at least once/day)			
94.8	66.5	56.3	10
Vegetable consumption in adults (% at least once/day)			
99.2	55.9	34.1	10
Reported obesity in adults (% BMI > 30)			
19.5	19.8	29.8	10
Alcohol consumption in adults (litres/capita)			
9.4	8.2	9.1	10
Smoking daily (%) Females			
10.8	10.0	15.7	10
Smoking daily (%) Males			
14.0	14.2	24.5	10

- NL has the worst rates of non-medical determinants of health in CAN related to diet, obesity, alcohol use and smoking.

Table 2A. Preventative Care in NL Reported by the Public

AUS	CAN	NL	NL Rank
Among all adults, during the past 2 years, % who talked with provider about:			
Healthy diet and healthy eating			
44.8	50.4	48.5	7
Exercise or physical activity			
47.4	55.2	37.1	10
Things in your life that cause worry or stress			
33.6	34.5	28.2	9
Alcohol use			
25.1	23.2	10.2	10
Health risks of smoking and ways to quit			
56.1	70.6	56.9	10

Table 2B. Preventative Care and Primary Care Metrics

AUS	CAN	NL	NL Rank
Influenza vaccination in past years in adults ≥65 years			
––	61.1	51.6	10
Avoidable hospital admissions, age-sex standardized/100,000 population			
Congestive heart failure			
239.3	187.9	210.0*	9
Diabetes			
143.8	95.9	164.8	9
Asthma			
71.3	14.7	21.5	10
COPD			
332.0	238	288.2	6

*unstandardized

- In comparison to CAN, NL has the lowest provincial ranking for preventative care, despite having the highest rates of non-medical determinants of health.
- Compared to the other provinces, NL has high incidence of avoidable hospital admissions for congestive health failure, diabetes, and asthma.

C. Safe Care in NL compared to Canada and Australia

Table 3. Patient Safety After Surgery

AUS	CAN	NL	NL Rank
Foreign body left in after surgery per 100,000 adult discharges			
––	9.8	9.1	3
Obstetrics trauma per 100 vaginal deliveries (with instrument)			
6.8	16.4	6.0	1
Obstetrics trauma per 100 vaginal deliveries (without instrument)			
2.5	3.1	1.3	1
Postoperative pulmonary embolism per 100,000 discharges for hip/knee replacements			
––	554.0	428.4	5
Postoperative sepsis per 100,000 discharges for abdominal surgery			
––	1,268.2	959.0	2
Defined daily dose (DDD) of antibiotics prescribed in hospital per 1,000 inpatient days			
––	1.5	2.5	10

- Patient safety using metrics for surgery is very good when compared to other Canadian provinces, but antibiotic use in hospital is the highest in CAN.

Table 4. Patient Safety in Primary Care

AUS	CAN	NL	NL Rank
% of adults ≥65 years taking ≥5 medications			
19.7	31.1	39.2	10
Antibiotics dispensed in the community (DDD/1,000 inhabitant days)			
22.7	17.9	29.1	10
Antibiotics dispensed in the community (Prescriptions/1,000 inhabitant days)			
––	––	970	10
Chronic use of benzodiazepines in adults ≥65 years per 1,000 population ≥65 years			
––	14.6	53.6	9
Use of long acting benzodiazepines in adults ≥65 years per 1,000 population ≥65 years			
––	10.6	32.1	10
Age-sex standardized rate of antipsychotic use per 1,000 population ≥65 years			
––	54.0	59.1	9
% of adults ≥65 years whose health provider reviewed medications during the past 12 months			
85.9	80.9	55.9	10
% of primary care providers who review prescribing practices at least yearly			
38.0	26.5	23.5	4

- Extensive prescribing of medications contrary to Choosing Wisely Canada recommendations occurs in NL and is the highest in the country.

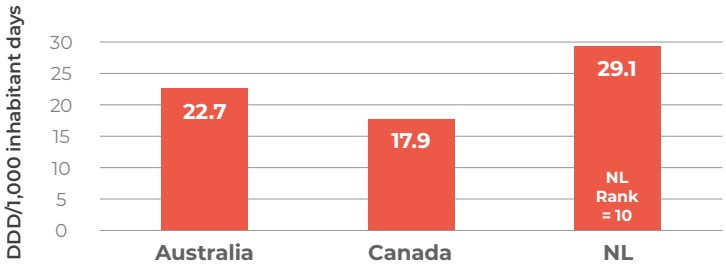


Figure 2. Antibiotics dispensed in the community

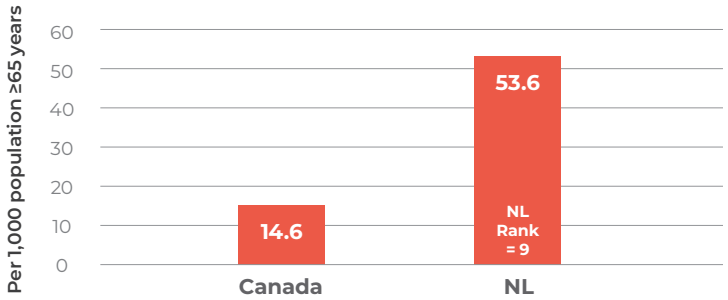


Figure 3. Chronic Use of Benzodiazepines in Adults ≥65 Years

Table 5. e-Support in Primary Care

AUS	CAN	NL	NL Rank
% of primary care physicians who report electronic clinical decision support in their practice			
72.0	28.0	––	––
% of primary care physicians who receive reminders for guideline-based interventions			
65.8	38.4	17.6	8
% of primary care practices where patients are sent a reminder when it is time for regular preventative or follow-up care			
82.8	25.6	8.1	8
% who experienced a medical, medication, or laboratory test mistake in the past 2 years			
22.0	22.0	––	––
% of family physicians (FPs) who can electronically exhange:			
Patient clinical summaries			
59.4	25.0	34.6	2
Laboratory and diagnostic tests			
57.0	36.0	42.1	4
List of all medications taken by individual patients			
54.6	32.6	45.6	2

- Despite 93% of primary care physicians in NL having electronic access to patient information systems outside their practice, use of electronic clinical support tools in their practice is low.

D. Coordinated Care in NL compared to Canada and Australia

Table 6. Coordinated Health System: FP Perspective

AUS	CAN	NL	NL Rank
% of FPs who usually (≥75% of the time):			
Send the patient history and the reason for the consult to the specialist			
94.7	90.3	96.1	4
Receive information from the specialist about changes made to patients' drugs/care plan			
57.2	59.2	58.5	9
Receive a report of the specialist's visit within 1 week of the service >50% of the time			
43.6	50.9	36.1	10
Receive notifications that patients have been seen in the emergency department (ED)			
40.1	48.8	54.2	6
Receive notifications that patients have been admitted to hospital			
41.1	54.1	49.4	8
Receive information on the care plan within 1–4 days for patients discharged from the hospital			
50.1	47.7	25.1	9
Communicate with home-based nursing care providers			
14.2	24.1	16.9	10
Receive communications from home-based nursing care providers			
20.8	36.1	22.2	10

- In NL, timely communication between the specialist/hospital/home care providers and FP is not optimal, nor is the bidirectional communication between home-based nursing care providers and FPs. These metrics can be improved because higher proportions of FPs in NL than in CAN can electronically exchange clinical summaries, laboratory and diagnostic tests, and medications. The proportions in AUS with this capacity are substantially higher than in CAN.

Table 7. Coordination of Care From the Perspective of Adults ≥65 Years

AUS	CAN	NL	NL Rank
Excluding hospitalizations, % who have seen >1 doctor in the past 12 months			
69.5	57.3	62.9	10
% whose regular practice always coordinates care from other doctors and places			
63.2	61.1	55.9	8
% who needed help to coordinate care from other health care professionals			
38.0	30.3	26.6	5
In the past 2 years, % whose tests results/medical records were unavailable at time of appointment			
8.2	11.4	9.0	2
In the past 2 years, % who received conflicting information from different health providers			
9.7	11.4	9.6	2
In the past 2 years, % who felt a test was unnecessary because it had already been done			
11.0	6.7	7.9	8
In the past 2 years, % who felt a medical mistake had been made in treatment or care			
11.8	8.4	6.9	1
After hospitalization, % whose regular practice seemed informed about the care received in hospital			
85.6	84.1	88.2	4

- From the patient's perspective, most of the metrics measuring coordination of care were better in NL than in CAN.

E. Engagement and Patient Preferences in NL compared to Canada and Australia

Table 8. Patient Engagement and Preferences

AUS	CAN	NL	NL Rank
In adults ≥65 years:			
% completely/very satisfied with quality of care received in the past 12 months			
71.3	65.6	70.8	4
% with a regular doctor			
96.8	95.5	93.5	7
% whose doctor always know important information			
67.4	69.9	66.5	7
% whose doctor always spends enough time with the patient			
63.0	64.1	63.7	6
% whose doctor always encourages patients to ask questions			
62.4	52.9	42.6	10
% whose doctor always explains things in a way that is easy to understand			
71.3	73.3	64.7	10
% whose doctor always involves the patient as much as they want in decisions about their care			
68.0	65.6	63.6	6
Among adults ≥65 years with a chronic condition, % who had any health provider seen for their condition:			
Discuss main goals of care			
67.2	61.9	58.4	10
Give clear instructions on symptoms to watch for and when to seek further care			
75.1	58.7	51.8	9

- There is room for improvement in NL, in comparison to CAN, concerning patient engagement, particularly as it relates to encouraging patients to ask questions, explaining things in a way that's easy to understand, and discussing main goals of care and symptoms to watch in patients with chronic conditions.

Table 9. Patient Engagement in Hospitalized Adults

AUS	CAN	NL	NL Rank
% always treated with courtesy and respect by doctors			
79.9	73.3	76.6	4
% always treated with courtesy and respect by nurses			
80.5	64.6	59.5	6
% definitely involved as much as they wanted in decisions about care			
65.1	57.7	67.8	1

- Compared to AUS, the proportion of patients who felt that they were not always treated with courtesy and respect is poor.

Table 10. End-of-Life Care for Adults ≥65 Years

AUS	CAN	NL	NL Rank
% who had a discussion with family, a close friend or health professional about what health care is wanted if incapacitated			
62.0	65.6	49.7	10
% who have written a plan or document on health care wanted at end of life			
33.3	43.0	22.3	10
% who have a written document that names someone else to make treatment decisions if incapacitated			
49.0	62.6	42.8	10

- Discussion of end-of-life care and having a written plan on health care wanted and person named to make treatment decisions if incapacitated has occurred in <50% of seniors in NL.

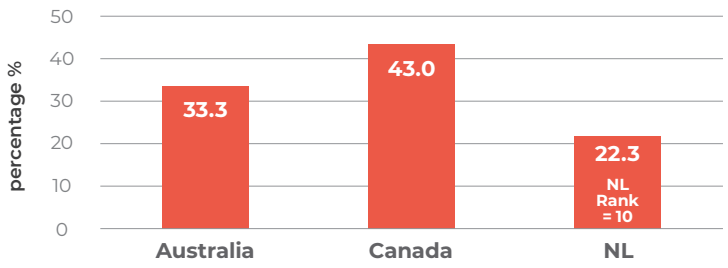


Figure 4. Percent Who Have Written a Plan or Document on Health Care Wanted at End of Life

Conclusions

1. Care processes in CAN are average and in NL some domains need substantial improvement.

2. A focus on the nature and adverse consequences of non-medical determinants of health, including obesity, smoking, excess alcohol use, diet, and physical activity, require investment in both education at a young age and preventative care.

3. Extensive prescribing of medications, contrary to guidelines and associated with harm, occurs in primary care, particularly for antibiotics, benzodiazepines, antipsychotics, and other medications. Audit and feedback with detailing could be effective in reducing these rates, particularly as there is now 100% coverage of pharmacies in the Pharmacy Network. Family practice renewal requires an element where evidence-based prescribing is facilitated, and electronic clinical decision support tools are used.

4. Communication between specialists/hospitals/ home care providers and family physicians is not optimal, requiring investment in the electronic infrastructure to enhance coordination of care.

5. Family practice renewal requires an element focused on enhancing patient engagement and their preferences and needs, particularly associated with chronic conditions.

6. The addition of nurses to primary care units, with a focus on preventative care, coordination of care, patient needs, and management of chronic disease would likely lead to an improvement of care processes.

7. Nursing management needs to improve the professional approach of hospital nurses to their patients.

8. Improvement in communication concerning end-of-life care is critically important and should become a focus for primary care and long-term care.

(Practice Points Vol. 7, Jan–Jun 2020)

Access to Health Care in NL Compared to Canada and Australia

Objective

To determine the timeliness and affordability of health care in NL compared to Canada (CAN) and Australia (AUS), and to identify solutions to improve access.

- *OECD countries are ranked according to the distance the metric is from its mean measured in standard deviations. Thus, the score could vary from -2 (very bad) to +2 (very good).*
- *For each metric NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst. In the tables rank 1–3 is coloured green, 4–7 is yellow, 8–10 is red, and no data is grey.*

Results

A. Overall Scores for Access to Care comparing Canada and Australia

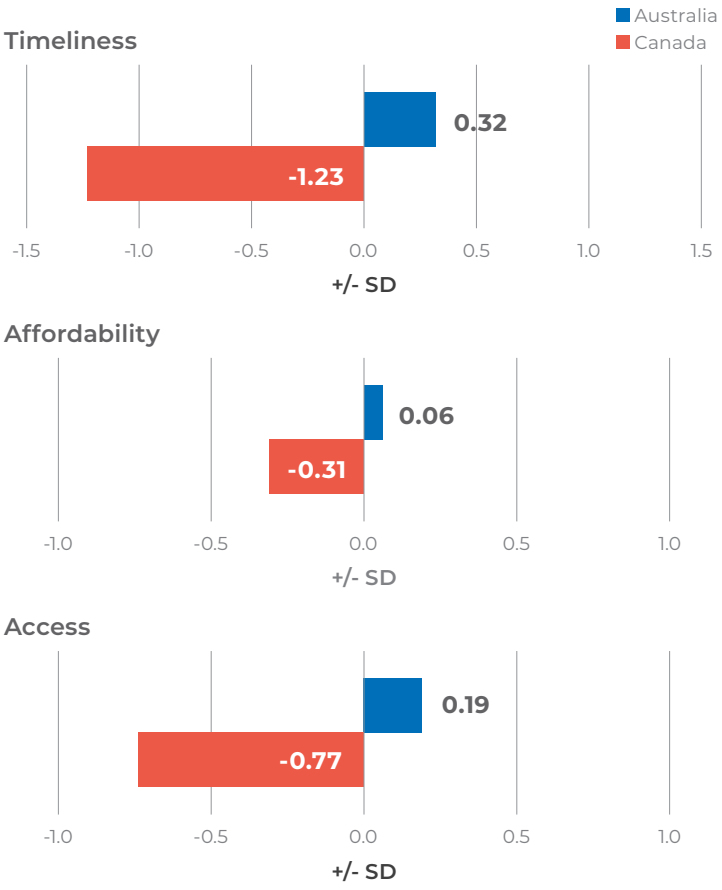


Figure 1. Scores for Timeliness, Affordability, and Access to Health Care in Canada and Australia, Defined as + and - Standard Deviations (SDs) From the International Mean

- Timeliness of health care in CAN is the worst of the 11 OECD countries compared, and despite its universal access, taxpayer funded health system, CAN is ranked below average for affordability.

B. Timeliness of Health Care in NL compared to Canada and Australia

Table 1. Timeliness of Health Care Reported by Adults

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Able to get an appointment on the same day if sick or needed medical attention			
41	27	19	9
Always get a response on the same day when contacting a regular doctor's office			
52	37	39	2
Getting medical care after hours without going to ED is very difficult			
13	32	49	10
Never attended an ED in the past two years			
77	58	55	5
Went to ED but thought it could be treated by regular doctor			
28	41	49	8
Went to ED and waited >4 hours for treatment			
10	30	39	9
Waited ≥ 4 months for elective surgery			
8	18	15	4
Waited at least 4 weeks to see a specialist			
39	59	68	10

- As a country, CAN timeliness of health care is bad, and as a province, NL is ranked poorly among the provinces for getting appointments on the same or next day when sick, getting care after hours, going unnecessarily to the ED, getting treatment in the ED within 4 hours, and waiting to see a specialist.

Table 2. Timeliness of Care Reported by Family Physicians (FPs)

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Care never offered after 6pm on Monday–Friday			
50	43	55	4
Care never offered on weekend			
17	50	60	5
No arrangement where patients can be seen by a doctor or nurse when practice is closed			
31	51	66	7
Receive notification patient has been seen after hours ≥50% of the time			
75	41	45	8
Practices where patients can communicate by email or secure website about medical condition			
34	23	9	10
Practices where patients can request appointments online			
73	22	4	9
Practice never makes home visits			
18	29	17	2
Patients often experience difficulty getting specialized tests (e.g., CT, MRI)			
11	40	--	--

- The majority of FPs do not see patients after hours or make arrangements for a patient to be seen by a doctor or nurse when the practice is closed and fail to receive notifications when patients are seen after hours. Very little opportunity is provided for patients to communicate electronically or to request appointments online.

Table 3. Wait Times for Procedures in NL

AUS Days	CAN Days	NL Days	NL Rank (1=best)
Wait time for:			
Cataract surgery			
86	66	85	7
Hip replacement			
119	105	92	2
Knee replacement			
198	129	132	4
% who had colonoscopy within target time Priority 1 (≤14 days)			
		59	
% who had colonoscopy within target time Priority 2 (≤60 days)			
		57	
% who had colonoscopy within target time Priority 3 (≤182 days)			
		64	
Time to cardiac catheterization after STEMI % within 24 hours			
		42	
% who achieved target time from abnormal screening mammogram to final diagnostic test breast biopsy performed			
		55	
% who achieved target time from abnormal screening mammogram to final diagnostic test no biopsy performed			
		86	

- Wait times for specialized surgery in CAN are better than in AUS and reasonable in NL, but wait times for colonoscopy, cardiac catheterization, and resolution of an abnormal mammogram are not optimal.

C. Affordability of Health Care in NL compared to Canada and Australia

Table 4. Health Care Coverage/Hardship Reported by Physicians

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Have private health insurance			
--	--	49	7
Doctors report patients often have difficulty paying for medications or out-of-pocket costs			
25	30	--	--
Doctors consider reducing cost-sharing, deductibles, and co-payments for patients is a top priority			
22	13	18	9
Reduction of prescription drug prices is a top priority			
12	37	50	8

Table 5. Cost Barriers Reported by Adults

AUS	CAN	NL	NL Rank
In the past 12 months, % who had a medical problem but because of cost:			
Did not visit a doctor			
8.6	6.3	5.4	4
Skipped test/treatment/follow-up			
7.4	5.7	2.8	3
Skipped doses of medicine			
6.3	10.2	9.8	5
Skipped dental care			
20.9	28.1	28.6	8
Serious problems paying medical bills			
4.7	6.5	5.5	5
Spent a lot of time on paperwork			
4.8	5.3	2.3	1
Insurance denied payment or did not pay as much as expected			
8.8	14.0	9.8	1

- Because of cost barriers, 29% of adults skipped a dental appointment, the third highest province for this metric. In general, cost barriers to health care in NL were not a major issue.

Conclusions

1. Timeliness of health care is a major problem in CAN, and in NL several of the metrics were ranked as the worst in CAN.

2. Primary care renewal should assure better access to a FP for both urgent and after-hours care. Finding a solution to this problem may alleviate long wait times in emergency department.

3. The reasons for long waits to see a specialist need investigation and resolution and should be a focus of the strategy on centralization of hospital specialties.

4. Timeliness of colonoscopy, cardiac catheterization and of resolution of an abnormal mammogram were not optimal. These are complicated care processes that require examination and implementation of change.

5. Both affordability and equity were influenced by cost barriers to dental care.

(Practice Points Vol. 7, Jan–Jun 2020)

Administrative Efficiency and Equity in NL Compared to Canada and Australia

Objective

To determine the administrative efficiency and equity of health care in NL compared to Canada (CAN) and Australia (AUS).

- *OECD countries are ranked according to the distance the metric is from its mean measured in standard deviations. Thus, the score could vary from -2 (very bad) to +2 (very good).*
- *For each metric NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst. In the tables rank 1–3 is coloured green, 4–7 is yellow, 8–10 is red, and no data is grey.*

Results

A. Administrative efficiency and equity scores for Canada and Australia

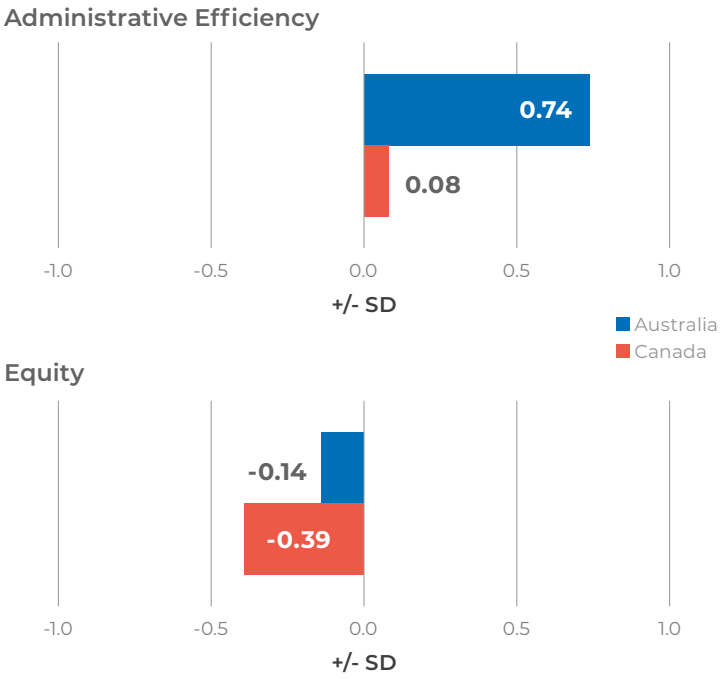


Figure 1. Scores for Administrative Efficiency and Equity in Canada and Australia, Defined as + and - Standard Deviations (SDs) From the International Mean

- CAN was average for administrative efficiency among the 11 OECD countries compared, whereas AUS was ranked number 1. CAN was ranked in the lower tier for equity and AUS was ranked 6th.

B. Administrative Efficiency in NL compared to Canada and Australia

Table 1. Administrative Efficiency, Reported by Adults (2016)

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
In the past 2 years, medical reports/records not available at medical appointment			
5	8	6	2
Doctor ordered an unnecessary test that had already been done			
6	6	3	2
In the past 2 years, when seeing a specialist:			
The specialist did not have basic medical information or test results from the regular family physician			
11	13	10	3
After seeing the specialist the regular family physician (FP) was not up to date on the care the specialist provided			
16	21	22	8
After leaving the hospital:			
The hospital made arrangements for follow-up			
81	73	86	2
The patient received written information on what to do on returning home			
80	75	74	8
The regular FP seemed informed about care received in hospital			
75	76	68	9
After visit in emergency department (ED), regular FP seemed informed about care received in ED			
--	--	62	8
Adults ≥65 years visited ED for a condition that could have been treated by a FP had he/she been available			
28	41	49	8
FP reported time spent getting patients needed medications or treatment because of coverage restrictions was a major problem			
11	21	--	--

- For most of the metrics on administrative efficiency NL was comparable to CAN, except for regular FPs did not seem informed about care received in hospital or ED, and visiting an ED for a condition that could have been treated by the regular FP.

C. Low-Value Care in NL

Table 2. Barriers to Reducing Low-Value Care Reported by FPs

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Major barriers to reducing low-value care:			
Lack of tools or decision aids			
25	23	24	7
Patient requests for unnecessary tests and treatment			
54	59	63	8
Lack of time for shared decision making with patients			
35	37	37	4
The medical malpractice environment			
40	27	25	5

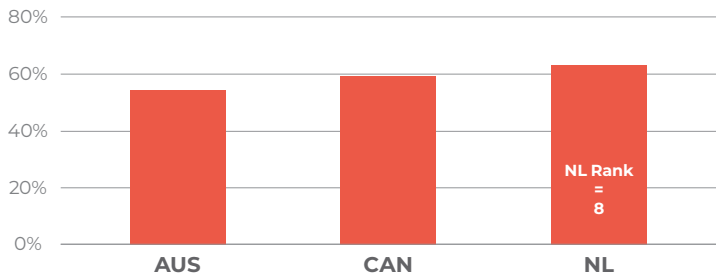


Figure 2. Patient Requests for Unnecessary Tests and Treatment

- 63% of NL FPs believe that patient requests are a major barrier of unnecessary tests and treatments.

Table 3. Rate of Biochemical Tests and CT Scans Ordered by FPs in NL

	NL (total)	NL (N/100)
Hemoglobin	446,689	85
Ferritin	121,837	23
Creatinine	415,903	80
Urea	229,966	44
Uric acid	70,309	14
AST	58,871	11
Creatine kinase	93,784	18
ANA	12,000	2.3
Thyroid tests	168,766	33
CT scans	88,400	17
Lumbar CT Scans	6,760	1.3

- Rate of biochemical testing and of CT scans is very high, particularly for tests that are potentially unnecessary (ferritin in low risk patients with normal hemoglobin, urea, uric acid, AST, creatine kinase, CT scans in people without alarm symptoms) or ordered too frequently (Hb, creatinine, ANA, thyroid tests)

- Compared to CAN (15.9 CTs/100 population) and AUS (13.4 CTs/100 population), rate of CT scans in NL was high (17 CTs/100 population)

D. Health Care Equity in Canada and Australia

Scores for equity were not available by province. CAN's poor score on equity was driven by meaningful differences in rates comparing high income to low income for (1) coordinated care: specialist lacked medical history or regular FP not informed about specialist care in the past 2 years, (2) affordability: cost related access to medical care in the past year, and (3) skipped dental care or checkup because of cost in the past year.

Conclusions

1. Administrative efficiency should be enhanced by using electronic infrastructure to improve coordination between hospitals and primary care. This should also remove equity imbalances that relate to coordinated care.

2. Reduction in unnecessary visits to the ED should be an objective of primary care reform.

3. Reduction in low-value care and accountability for utilization of health care resources should be an objective of primary care reform.

4. The biggest barrier to reducing low-value care reported by FPs was patient requests. Public engagement about low-value care reinforced by FP education will be necessary, as will audit and feedback to FPs plus system change in the biochemistry laboratory.

5. Electronic ordering matched to criteria of appropriateness for each test will be necessary.

(Practice Points Vol. 7, Jan–Jun 2020)

Health Care Outcomes in NL Compared to Canada and Australia

Objective

To compare health care outcomes provided by the Commonwealth Fund and OECD, and additional metrics available in Canada (CAN) to determine why NL's health system performance is poor.

- *OECD countries are ranked according to the distance the metric is from its mean measured in standard deviations. Thus, the score could vary from -2 (very bad) to +2 (very good).*
- *For each metric NL was ranked in comparison to the 9 other provinces: 1st is the best and 10th is the worst. In the tables rank 1–3 is coloured green, 4–7 is yellow, 8–10 is red, and no data is grey.*

Results

A. Health Care Outcomes in Canada and Australia

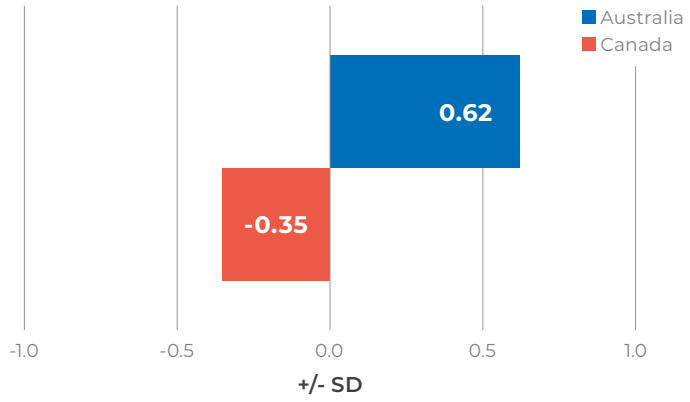


Figure 1. Scores for Health Care Outcomes in Canada and Australia, Defined as + and - Standard Deviations (SDs) From the International Mean.

- CAN's health care outcomes are in the bottom tier of 11 OECD countries, whereas AUS is ranked number 1.

Table 1. Health Care Outcomes in Canada and Australia With Scores Derived From Standard Deviations

AUS	CAN	AUS score	CAN Score	CAN Rank (1=best)
Population health				
Infant mortality, deaths/1,000 live births				
3.8	4.8	0.35	-0.94	10
Adults aged 18–64 with at least 2 of 5 common chronic conditions, %				
10	16	0.41	-1.17	10
Life expectancy at age 60 years				
25.5	25.0	1.20	0.52	4
Mortality amenable to health care				
Deaths/100,000				
62	78	0.81	-0.15	7
10-year decline in mortality amenable to health care				
29	26	0.03	-0.52	9
Disease specific health outcomes				
30 day in-hospital mortality rate following AMI, deaths per 100 patients				
4.1	6.7	1.79	-0.05	6
30 day in-hospital mortality rate following ischemic stroke, deaths per 100 patients				
9.3	10.0	-1.08	-1.45	11
Major lower extremity amputation in adults with diabetes, age-sex standardized rate/100,000				
3.9	7.1	--	--	--
Breast cancer five-year relative survival rate				
88	88	0.46	0.46	4
Colon cancer five-year relative survival rate				
69	64	1.59	0.10	3

- For health outcomes, CAN was ranked 9 of 11 countries, although higher than the UK and US, but substantially worse than AUS (score -0.35 vs. 0.62). CAN scored badly for infant mortality, adults aged 18–64 years with at least 2 of 5 common chronic conditions, mortality amenable to health care (particularly when measured by the 10-year decline in mortality), and 30-day in-hospital mortality rate following ischemic stroke. AUS has a better 30-day in-hospital mortality rate following AMI, rates of lower limb amputation in diabetics, and colon cancer survival rate.

B. Mortality Rates in NL, Canada and Australia

Table 2. Mortality Rates by Disease in NL, Canada and Australia

AUS	CAN	NL	NL Rank (1=best)
Infant mortality (Deaths/1,000 live births)			
3.3	4.5	4.4	6
Life expectancy at birth (Females)			
84.6	84.0	81.7	10
Life expectancy at birth (Males)			
80.5	79.9	77.5	10
Cancer mortality (Females) Age standardized rate/100,000			
148	169	195	10
Cancer mortality (Males) Age standardized rate/100,000			
231	234	276	8
Heart disease mortality Age-sex standardized rate/100,000			
80	80	103	9
Stroke mortality Age-sex standardized rate/100,000			
42	33	41	8
Suicide (Females) Age standardized rate/100,000			
5.8	5.3	8.4	9
Suicide (Males) Age standardized rate/100,000			
18.2	16.6	25.5	10
Transport accident mortality (Females) Age standardized rate/100,000			
3.0	2.7	4.0	5
Transport accident mortality (Males) Age standardized rate/100,000			
9.4	7.4	9.9	5

- NL has a high rate of infant mortality, and higher rates than CAN for life expectancy, cancer mortality, heart disease and stroke mortality, and suicide.

C. Cancer Epidemiology in NL, Canada and Australia

Table 3. Cancer Incidence, Survival, and Mortality Rates in NL, Canada and Australia

AUS	CAN	NL	NL Rank* (1=best)
Lung and bronchus			
Age-sex standardized incidence rate/100,000 population			
42.8	61.4	68.4	6
5-year survival, %			
17.4	19	18	4
Age-sex standardized mortality rate/100,000 population			
30.4	47.2	57.5	8
Breast – female			
Age standardized incidence rate/100,000 females			
124.4	128.2	128.9	8
5-year survival, %			
90.8	88	85	8
Age standardized mortality/100,000 females			
19.8	22	26.2	9
Colorectal			
Age-sex standardized incidence rate/100,000 population			
57.4	60.5	94	9
5-year survival, %			
69.8	65	62	7
Age-sex standardized mortality/100,000 population			
19.2	21.8	38.6	9
Prostate – male			
Age standardized incidence rate/100,000 males			
140.9	116.7	110.1	6
5-year survival, %			
95.2	93	93	2
Age standardized mortality/100,000 males			
25.3	21.8	27.2	7

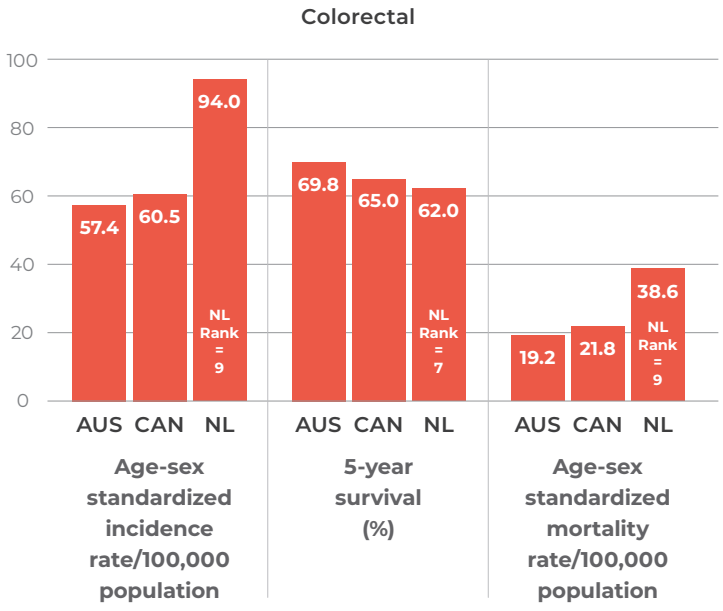
* Rank excludes Quebec. Rank 1–3 is green, 4–6 is yellow, and 7–9 is red.

Table 3. Continued

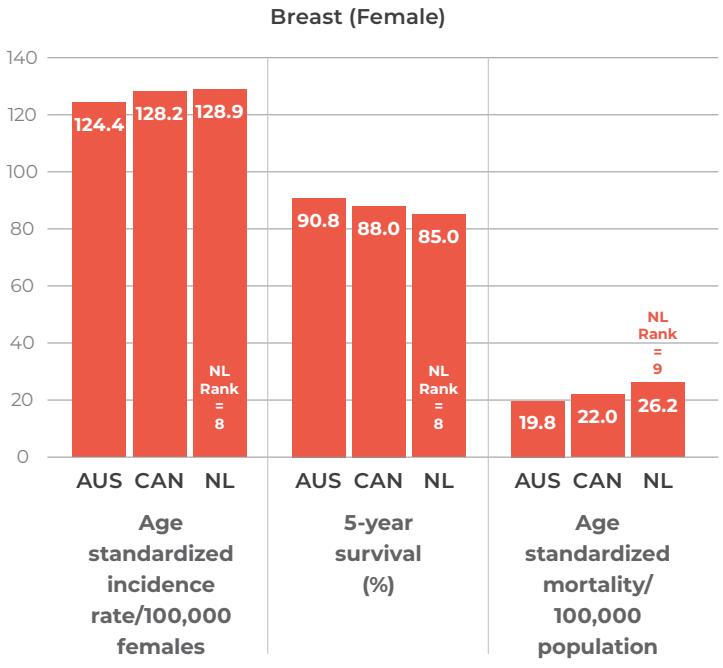
AUS	CAN	NL	NL Rank* (1=best)
Bladder			
Age-sex standardized incidence rate/100,000 population			
10	25	25.2	6
5-year survival, %			
53.5	75	72	7
Age-sex standardized mortality/100,000 population			
3.9	5.7	5	2
Non-Hodgkin's lymphoma			
Age-sex standardized incidence rate/100,000 population			
18.7	24.4	25.1	8
5-year survival, %			
74.6	68	71	1
Age-sex standardized mortality/100,000 population			
5.3	6.5	8.2	8
Uterus (body, NOS) – female			
Age standardized incidence rate/100,000 females			
19.3	35	32.5	6
5-year survival, %			
83.3	83	83	6
Age standardized mortality rate/100,000 females			
3.2	5.4	4.6	2
Cervical – female			
Age standardized incidence rate/100,000 females			
6.9	7.1	10.8	9
5-year survival, %			
73.5	72		
Age standardized mortality/100,000 females			
1.7	2	3.2	7

* Rank excludes Quebec. Rank 1–3 is green, 4–6 is yellow, and 7–9 is red.

- Compared to CAN, NL has a higher incidence rate of lung and bronchus cancer and of colorectal cancer. Five-year survival rates for the most frequent cancers are within 3% of the Canadian survival rates for all 8 cancers reviewed.



*Provincial rank excludes Quebec (9 = worst)



*Provincial rank excludes Quebec (9 = worst)

Figure 2. The Epidemiology of Colorectal and Breast Cancer in NL, Canada and Australia

D. Cardiovascular Outcomes in NL, Canada and Australia

Table 4. Short Term Cardiovascular Mortality Rates and Thrombolysis Rates for Ischemic Stroke

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Cardiovascular			
30-day in-hospital mortality, age-sex standardized/100 admissions			
Myocardial infarction			
3.8	4.8	5.6	10
Ischemic stroke			
6.0	7.9	10.3	10
Thrombolysis rates for ischemic stroke			
	19	11	8 (of 8)

E. Health Status in NL, Canada and Australia

Table 5. Health Status Reported by Adults ≥65 Years

AUS (%)	CAN (%)	NL (%)	NL Rank (1=best)
Health very good/excellent			
44	48	54	1
Have chronic conditions			
79	86	90	9
Have ≥3 chronic conditions			
27	33	48	10
High/moderate risk of failing			
51	50	54	8
Admitted to hospital overnight in past 2 years			
29	22	21	3
Have experienced emotional distress which was difficult to cope with by oneself			
27	19	20	5

- NL has a high rate of people with chronic conditions, but residents rank health as very good to excellent and have relatively low rates of hospitalization and emotional distress.

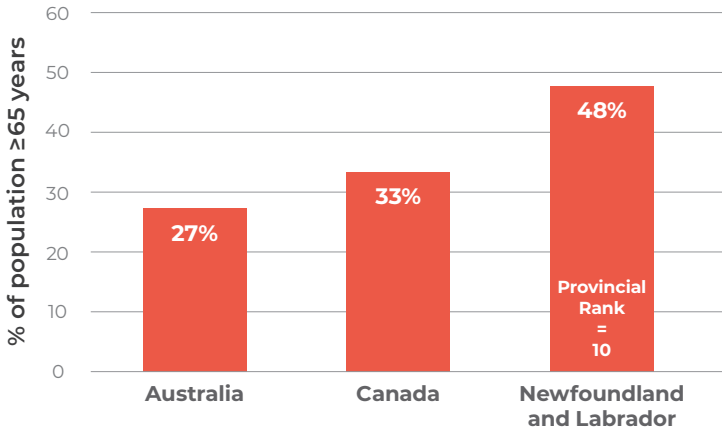


Figure 3. Seniors with ≥3 Chronic Conditions*

* Hypertension or high blood pressure; heart disease, including heart attack; diabetes; asthma or chronic lung disease such as chronic bronchitis, emphysema or chronic obstructive pulmonary disease; depression, anxiety or other mental health problems; cancer; joint pain or arthritis; stroke.

Conclusions

1. Infant mortality is higher in CAN and in NL than in AUS. The reasons for infant mortality in NL should be investigated and whether centralization of obstetrics units could improve infant mortality.

2. Life expectancy is substantially reduced in NL compared to CAN and AUS, and likely associated with low social spending, high prevalence of negative non-medical determinants of health, high prevalence of chronic conditions, high cancer mortality, particularly the high incidence rate of lung and colorectal cancer, high cardiovascular mortality, and suicide. Much of this mortality is likely to improve with increased spending on the social and non-medical determinants of health, and on preventative care.

3. Cardiovascular in-hospital survival and thrombolysis rates for ischemic stroke are the worst in CAN, and may be improved by reduction of the number of services providing acute care, and implementation of better care processes in cardiac care and in stroke care in the acute care hospitals.

(Practice Points Vol. 7, Jan–Jun 2020)

Canada vs. Australia: Background and Health System Structure

Objective

To examine the health system organization in Canada (CAN) and Australia (AUS) to determine whether there are structural differences that contribute to better health system performance in AUS.

Practice Points

1. CAN's health system performance ranks in the bottom tier of 11 OECD countries whereas AUS's ranks in the top tier.
2. CAN and AUS have similarities in history, population size, and distribution of population on the peripheries.
3. AUS has a universal public health insurance program, and access to private health insurance, which represents 8.7% of all health spending. CAN provides universal access to health care through Medicare.
4. In AUS, public hospitals are funded by state and federal governments and private hospitals exist.
5. In AUS, family physicians (FPs) are self-employed and fee-per-service is paid by the federal government. A practice incentives program accounts for 5.5% of federal spending on FPs. Public hospital physicians are salaried, and private physicians providing public services are paid per session or per service.

Methods

1. Comparative data was obtained from the OECD for 2018–2019.

Results

Table 1. Demographic and Economic Metrics for Canada and Australia

		AUS	CAN
Geographic size (km²)		7,774,220	9,984,670
Population (millions)		25.0	37.1
Foreign-born (%)		30	21
White (%)		92	73
GDP per capita (US$)		54,752	50,967
Average weekly earnings (US$)		1,025	939
Life expectancy at birth (years)	Male	80.5	79.9
	Female	84.6	84.0
Life expectancy at age 65 years (years)	Male	19.7	19.3
	Female	22.3	22.1

- CAN has similar percentage of the population born overseas as AUS, but AUS is less racially/ethnically diverse. GDP per capita is almost identical and average weekly earnings is higher in AUS. Life expectancy is the same.

Table 2. Chronic Disease Prevalence in Men and Women ≥45 Years in Canada and Australia

		AUS (%)	CAN (%)
Arthritis and osteoporosis	Male	31	23
	Female	43	40
	Total	38	32
Asthma	Male	10	6
	Female	16	9
	Total	13	8
Hypertension	Male	33	31
	Female	41	33
	Total	37	32
Bronchitis/emphysema	Total	5	5
Cancer	Total	9	3
Diabetes	Total	10	12
Heart disease	Total	10	12

- The prevalence of chronic disease is higher in AUS than in CAN for arthritis and osteoporosis, asthma, hypertension, and cancer.

Table 3. Health Care Economic Metrics in Canada and Australia (OECD 2018)

		AUS	CAN
Health expenditure	% GDP	9.3	10.7
	Per capita (US$, adjusted for PPP)	5,005	4,943
% population coverage for core services		100	100
% total expenditure covered by public sources		69	70
Voluntary private health insurance		54	67
Hospital best/1,000 population		3.7	2.5
Long-term care beds/1,000 people ≥65 years		51.2	54.2
Employment in health and social care workforce (% of total employment)		13.3	10.3
Doctors/1,000 population		3.6	2.7
Nurses/1,000 population		11.5	9.9
Long-term care workers/100 people ≥65 years		6.2	3.6

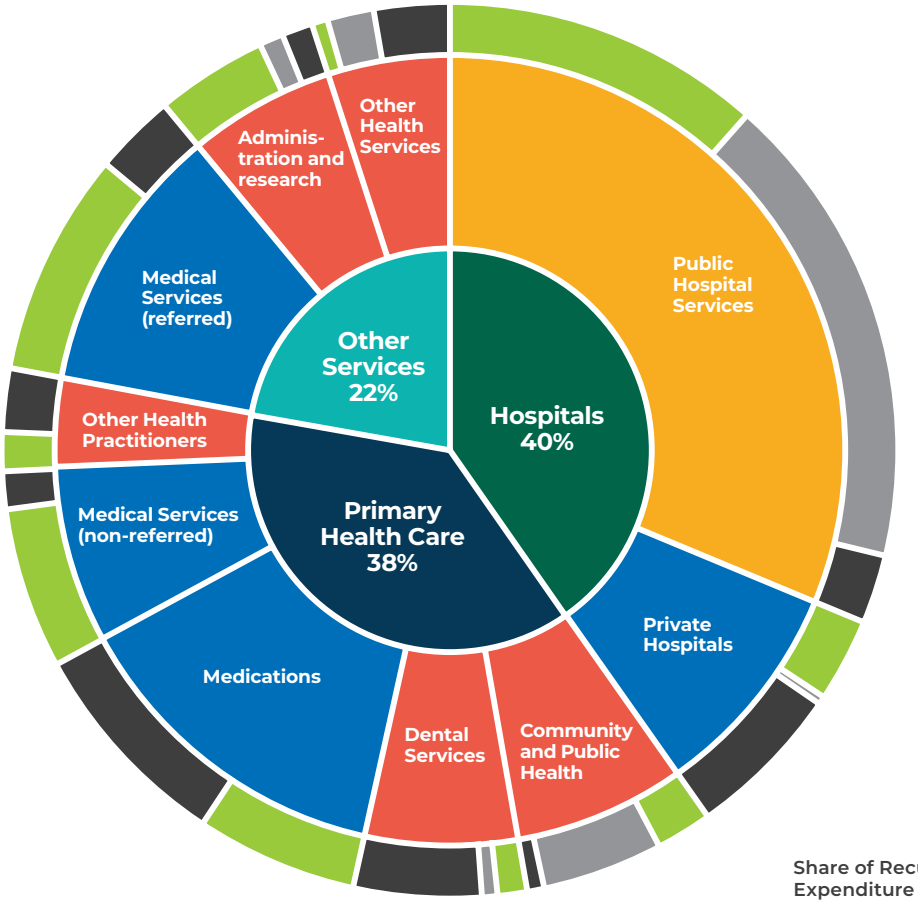


Figure 1. Health Expenditures in AUS for 2014/15 by Share of Recurrent Expenditure, Responsibility for Services, and Source of Funding.

- CAN spends more on health than AUS as % of GDP and per capita health spending is similar.
- AUS has more hospital beds/1,000 population than CAN. This comprises 2.51 public hospital beds and 1.28 private hospital beds.
- AUS has more doctors, nurses, and long-term care workers per capita than CAN.
- AUS spent about $158 billion on health care in 2014/15: $60 billion on hospitals, $56 billion on primary care, $32 billion on other health goods and services and $10 billion on capital projects.

Primary care in AUS

In 2015 there were 91,813 doctors in AUS of whom 34,367 were family physicians (FPs) (1.5/1,000 population). FPs usually work in group practices with an average of 4/practice.

In 2015 there were 11,040 nurses working in a FP setting (0.5/1,000 population) funded by the practice incentives program or out of practice earnings. They provided chronic disease management, care coordination, preventive health education, and oversight of patient follow-up and reminder systems. FPs are required to ensure that after-hours care is available to patients but are not required to provide care directly.

Conclusions

1. Like AUS, CAN has universal access to health care, with fee-per-service for most FPs and for many specialists. The provincial governments play a bigger role than the federal government in spending compared to the states in AUS.
2. Number of hospital beds is substantially higher in AUS, driven by the provision of private hospital beds. It has been stated that AUS has a similar case mix to CAN but more even distribution of health funds across areas.
3. There are fewer physicians, nurses, and long-term care workers per capita in CAN compared to AUS.

(Practice Points Vol. 7, Jan–Jun 2020)

Canada vs. Australia: Differences in Health Expenditures and Health Workforce

Objective

To compare health spending and workforce in Canada (CAN) and Australia (AUS) to identify potential reasons for differences in health system performance.

Methods

1. Comparative metrics were obtained from OECD 2019 for both countries.

Results

Table 1. Health Expenditures in Canada and Australia, 2017

		AUS	CAN
Government/compulsory spending, US$ per capita		3,467	3,466
Voluntary/out of pocket spending, US$ per capita		1,538	1,508
Spending as % of health expenditure on:	Outpatient care	33	28
	Inpatient care	31	24
	Long-term care	2	18
	Medical goods	16	19
	Other	18	19
Hospital expenditure by type of service (%)	Hospital inpatient	61	53
	Day care	13	13
	Outpatient care	19	22
	Long-term care	5	10
	Other	2	2
Capital expenditure as % of current expenditure		8	6

- Health per capita expenditures are virtually the same in CAN and AUS, whether that is measured by government, voluntary, or total expenditures.
- Less money is spent on primary care and hospital care in CAN. Of hospital expenditures, CAN spends a lower proportion on inpatient care and a higher proportion on long-term care.

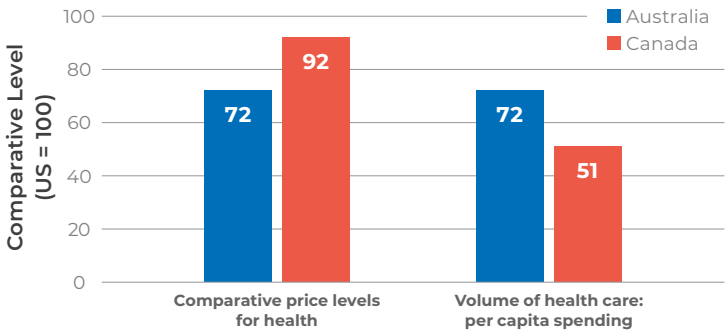


Figure 1. Comparative Price Levels and Health Care Volume for Canada and Australia

Table 2. Health Workforce in Canada and Australia, 2017

		AUS	CAN
Health Professionals (N/1,000 population)	Family physicians	1.6	1.3
	Specialists/generalists	2.1	1.5
	Nurses	11.7	10.0
Average annual income (2016, US$)	Family physicians	104,276	156,208
	Specialists	210,785	249,008
	Nurses	67,700	57,000
Remuneration of doctors (ratio to average self-employed wage)	Family physicians	1.9	3.8
	Specialists	3.1	4.9
Remuneration of nurses (ratio to average wage)		1.2	1.1
Graduates/100,000 population	Medical	15.5	7.7
	Nursing	84.5	52.5

- The price of health is higher in CAN and the volume of care provided for the money spent is lower than in AUS.
- Compared to AUS there are fewer family physicians (FPs) in CAN and they are paid more (twice as much as in AUS relative to the average self-employed wage).
- There are substantially fewer specialists in CAN and they are paid more (58% more than in AUS relative to the average self-employed wage).
- This relative deficiency of doctors in CAN is maintained by graduating half the number of doctors per capita compared to AUS.
- There are fewer nurses per capita in CAN, they are paid less than in AUS, and there are fewer nursing graduates per capita.

Conclusions

1. Although total health expenditures are similar in CAN and AUS the volume of care provided for the money spent is lower in CAN than in AUS and the price of care is higher.
2. There are fewer FPs and specialists in CAN and they are paid more than in AUS.
3. There are fewer nurses in CAN and they are paid less than in AUS.
4. There are fewer medical and nursing graduates in CAN compared to AUS.

(Practice Points Vol. 7, Jan–Jun 2020)

Canada vs. Australia: Long-Term Care and the Impact of COVID-19

Objective

To compare long-term care (LTC) organization and regulation in Australia (AUS) and Canada (CAN), and identify the potential relation to the impact of COVID-19 in LTC facilities.

Practice Points

1. Nursing homes in AUS may be private non-profit or for-profit, or run by state or local government. Federally subsidized residential aged-care positions are available to those who are approved by an Aged Care Assessment Team. Eligibility is determined through needs assessment, and permanent care is means tested. Federal government supports permanent and respite residential aged care.
2. The COVID-19 pandemic has provided insight into the quality of care in LTC facilities that would not normally be available in CAN.
3. In AUS, compliance with eight Quality Standards (Figure 1) has been mandatory since 1 July 2019. LTC facilities are required to demonstrate performance on an ongoing basis to meet Australian Government requirements.

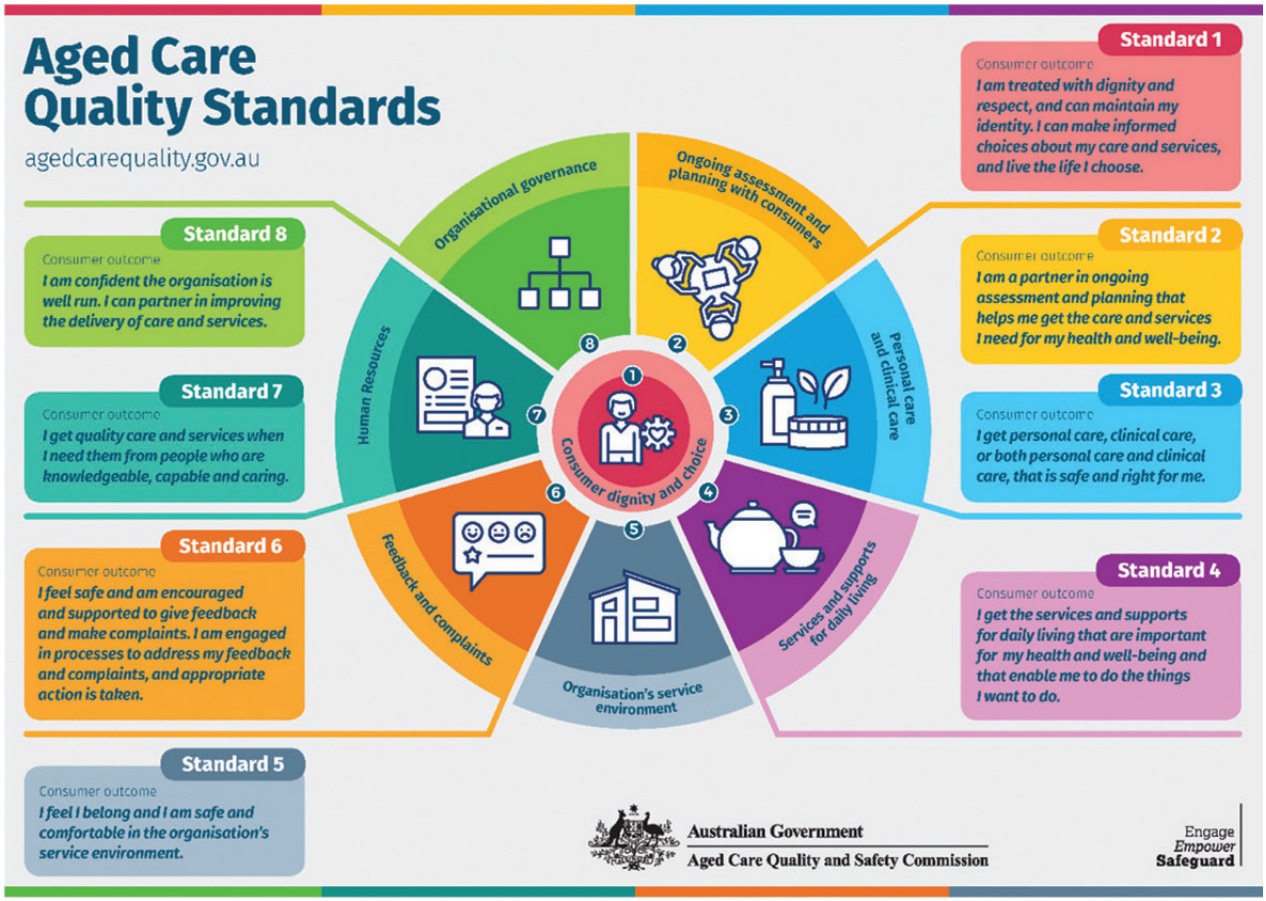


Figure 1. Australia Aged Care Quality Standards

- If a LTC provider in AUS fails to meet the standards, the Aged Care Safety and Quality Commission will take action ranging from identifying areas for improvement to imposing a sanction, which revokes the provider's approval to deliver aged care. In 2019, there were 267 non-compliance notifications including 55 sanctions.

Methods

1. Data on the characteristics of LTC facilities and COVID-19 interventions in AUS and CAN was obtained from CIHI.

2. Data on the impact of COVID-19 in LTC facilities in CAN was obtained from the Government of Canada COVID-19 webpage and for AUS from the Australian Government COVID-19 webpage.

3. Information on the Australia Aged Care Quality Standards was accessed from the Australian Government Aged Care Quality and Safety Commission.

Results

Table 1. LTC Characteristics in Canada and Australia, 2017–19

	AUS	CAN
Number of LTC residents age 65+	233,171	415,530
Percentage of LTC residents age ≥65	94.0	91.0
Percentage of LTC residents age ≥80	75.2	73.5
Percentage of total population age ≥65 residing in LTC	6.2	7.0
Nurses per 100 LTC residents age ≥65	1.3	1.3
Nursing aides/personal support workers per 100 LTC residents age ≥65	4.9	2.3
Type of funding in model care classification	Income-tested user fees	Mixed: Universal coverage/Income-tested user fees
Type of regulation in model of care classification	National: Legislation	Local: Regional

- AUS has double the rate of nursing aides/personal support workers for LTC residents compared to CAN.

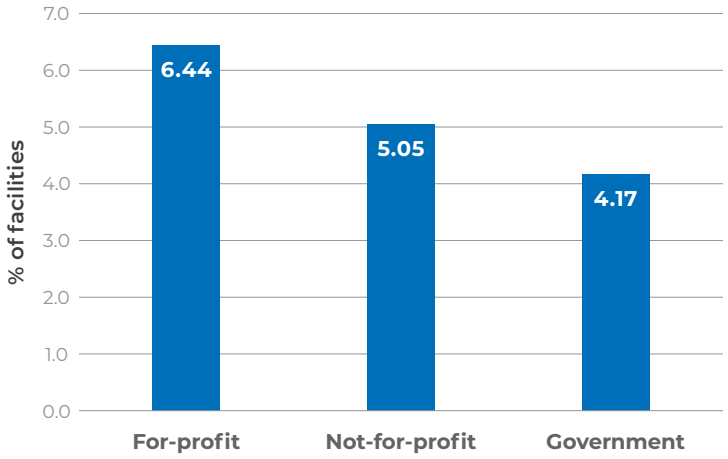


Figure 2. Percentage of Australian LTC Facilities That Failed Aged-Care Standards, by Type of Facility, 2019

- For-profit LTC facilities in AUS failed to meet quality standards more commonly than not-for-profit facilities or government facilities. This has been attributed to slim profit margins in this sector leading to cost cutting that impacts residents' care.

- Data on inspections, complaints, performance, and actions for long-term care facilities in AUS are available in quarterly aggregate reports from the Aged Care Quality and Safety Commission of the Australian Government and by facility on the My Aged Care website of the Australian Government Department of Health. Comparable data for CAN is not available.

Table 2. Interventions Announced/Implemented at the Time of the Country's 1,000th Case of COVID-19

	AUS	CAN
Date of 1,000th COVID-19 case	March 20	March 20
LTC infection control training and audit	March 11	n/a
LTC rapid response prevention and control teams	March 11	n/a
Isolation wards for infected LTC residents	n/a	n/a
COVID-19 testing of all LTC residents and staff	n/a	n/a
Hazard pay	March 11	n/a
LTC health care worker recruitment and surge staffing	March 11	n/a
Updated LTC guidelines for COVID-19: Recommended	March 13	n/a
Funding for personal protective equipment	March 10	n/a
Enforced restriction of visitors to LTC	March 18	March 17
Increased acute care, economic and research funding	March 10	March 17
Stay-at-home order enforced	March 10	April 1
Closure of public places and educational institutions	March 10	March 15

n/a: Dates for policy interventions/announcements are included only if they occurred around the time of the country reporting its 1,000th case of COVID-19

- AUS initiated numerous interventions, particularly in terms of guidelines/training and staffing to reduce COVID-19 in LTC facilities much more promptly than CAN.

Table 3. Impact of COVID-19 on LTC Facilities in Canada and Australia (as of 22 July 2020)

	AUS	CAN
LTC confirmed cases	280	21,569
LTC deaths	43	6,677
LTC cases as a percentage of all COVID-19 cases	2.1	19.2
LTC deaths as a percentage of all COVID-19 deaths	33.6	75.3
LTC deaths as a percentage of LTC cases	15.4	31.0
Total confirmed COVID-19 cases	12,896	112,240
Total confirmed COVID-19 deaths	128	8,870
Number of deaths per 1 million population	5.1	239.3

- The impact of COVID-19 has been much more devastating in LTC facilities in CAN than in AUS.

Conclusions

1. Extensive data is available on the quality of LTC facilities in AUS and on the regulations and oversight of these facilities. Comparable data is not available for CAN.

2. For-profit LTC facilities in AUS are associated with a lower standard of care. Due to the lack of data available, conclusions cannot be made about CAN, but this corresponds to media reports in CAN that private, for-profit LTC facilities had a poorer response to COVID-19, resulting in larger outbreaks and more deaths.

3. LTC facilities in AUS had more staffing for normal operations and increased staffing in response to COVID-19 than CAN. While a lack of Canadian data on LTC facilities prevents conclusions on the usual quality of care, the impact of COVID-19 on LTC facilities in the two countries suggests that the quality of care in LTC facilities during the pandemic was better in AUS than in CAN.

(Practice Points Vol. 7, Jan–Jun 2020)

NL vs. Tasmania: Health System Structure

Objective

To compare the health system profile in NL, a province in Canada (CAN), to that in Tasmania (TAS), a state in Australia (AUS), both islands with similar sized populations but NL having a geographic area 59% greater than that of TAS.

Practice Points

1. The island of NL has a population of 492,000 people in a land mass of 109,000 km^2, and Labrador has 30,000 in a land mass of 300,000 km^2. The urban to rural distribution of NL is 58:42. TAS has a population of 535,500 in a land mass of 68,400 km^2, with urban to rural distribution of 74:26.

2. AUS ranks in the top tier of 11 OECD countries for health system performance, whereas CAN ranks in the bottom tier. NL provides the worst value for health spending in CAN.

3. NL has the highest number of doctors per capita in CAN, according to data from Canadian Medical Association (CMA).

Methods

1. Data on TAS health profile was obtained from their White Paper "Delivering Safe and Sustainable Services" available at dhhs.tas.gov.au. Data on doctors in TAS was obtained from doctors registered at Medical Board of Australia and in NL from the College of Physicians and Surgeons of NL (CPSNL).

Results

Table 1. Demographics of NL and Tasmania

	NL (%)	TAS (%)
Male	48.9	48.9
Children ≤14	14.3	17.7
Seniors ≥65	19.4	19.4

Table 2. Health Care Facilities in NL and Tasmania

	NL	TAS
Number of major acute hospitals	13	4
Number of rural health centres	15	13
Number of hospital beds/1,000 population	2.5	2.6 +1.2 private
Number of residential aged care facilities	40 LTC + 87 PCH	78

- NL has substantially more acute care hospitals than TAS but has fewer beds, with the difference provided by private hospitals in TAS.

- NL has a high number of personal care homes providing 4,608 beds with 76% occupancy (30 Mar 2020).

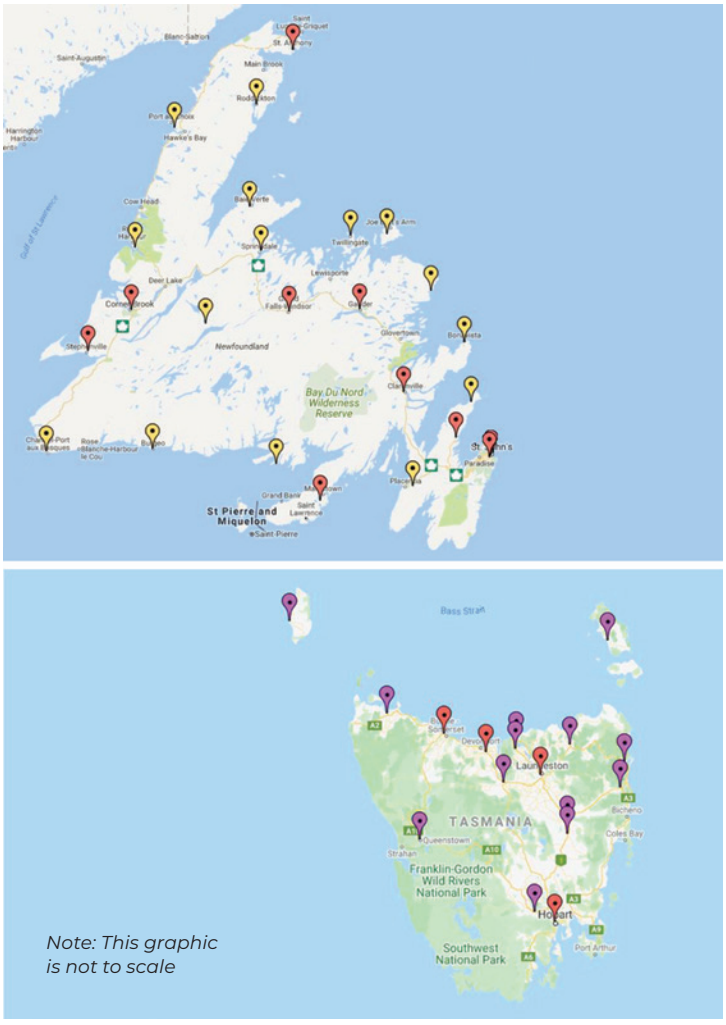


Figure 1. Geographic Distribution of Hospitals and Health Centres in NL and TAS

- NL has 13 acute care hospitals and 15 health centres which provide acute care (1,022 beds)
- TAS has 4 acute care hospitals and 13 health centres

Table 2. Doctors and Nurse Practitioners (NPs) in NL and Tasmania

	TAS Med Board	NL CPSNL	% Difference
Total	1,583	1,384[1]	-13
Family Physician	666	704[2]	+6
Other Specialists	917	693	-24
Nurse Practitioners	320	181	-43

[1]There are 123 physicians with multiple specialties
[2]There are 13 Family Physicians (FP) with a specialty counted as both a FP and another Specialist

- The CMA count of 910 FPs in NL is an overestimate as CPSNL has 670 registered FPs. Our research using primary practice indicators reveals 625 FPs active in clinical practice. On the island of Newfoundland, there are 583 FPs in active practice but this amounts to 344 full-time equivalents.
- The CMA estimates 591 specialists in NL but there are 781 registered by CPSNL.
- NL has a similar number of FPs as TAS, but TAS has substantially more nurses in primary care practices (N=320). The 181 Nurse Practitioners (NPs) in NL include both nurses attached to primary care and to other organizations/hospitals.
- In NL, 136 of 181 NPs are in urban communities and likely some are attached to local hospitals. 45 are in communities without hospitals. 122 are involved in the provision of primary care.
- There are 298 physiotherapists working in NL and 214 occupational therapists.

Table 3. Number of Specialists in NL and Tasmania by Subspecialty

	TAS Med Board	NL CPSNL	% Difference
ER Doctors	65	3	-95
Radiologists/ Nuclear Medicine	58	72	+24
Medical Specialists	256	190	-26
Surgical Specialists	138	101	-27
Anesthetists	125	72	-42
Obstetrician/ Gynecologists	50	54	+8
Pediatricians	51	81	+60
Psychiatrists	78	88	+13
Laboratory Medicine Specialists	47	37	+21
Other	49	14	-71
Total	917	712[1]	

[1]There are 19 doctors counted twice among specialty groupings

- NL has 24% fewer specialists than TAS, in particular fewer specialized ER doctors, medical specialists, surgery specialists, anesthetists, laboratory medicine specialists, and 'other' specialities. NL has more radiologists and pediatricians.

Conclusions

1. In TAS, the service requirements for high-level care are met by having fewer hospitals but with more beds and more specialists, whereas in NL there are more hospitals but fewer beds and fewer specialists.
2. The number of privately owned Personal Care Homes (PCHs) in NL is responsible for the difference in facilities for the frail elderly comparing NL and TAS.
3. The count of doctors in NL is higher than in TAS, but the number of full-time equivalent FPs in the island of NL is 59% that of the FPs registered in family practice.
4. There are substantially more NPs linked to primary care in TAS compared to NL, but similar numbers of FPs.

Quality of Care NL

(Practice Points Vol. 7, Jan–Jun 2020)

NL vs. Tasmania: Level of Hospital Services

Objective

To compare acute hospital services currently provided in NL, an island province of Canada (CAN), to Tasmania (TAS), an island state of Australia (AUS).

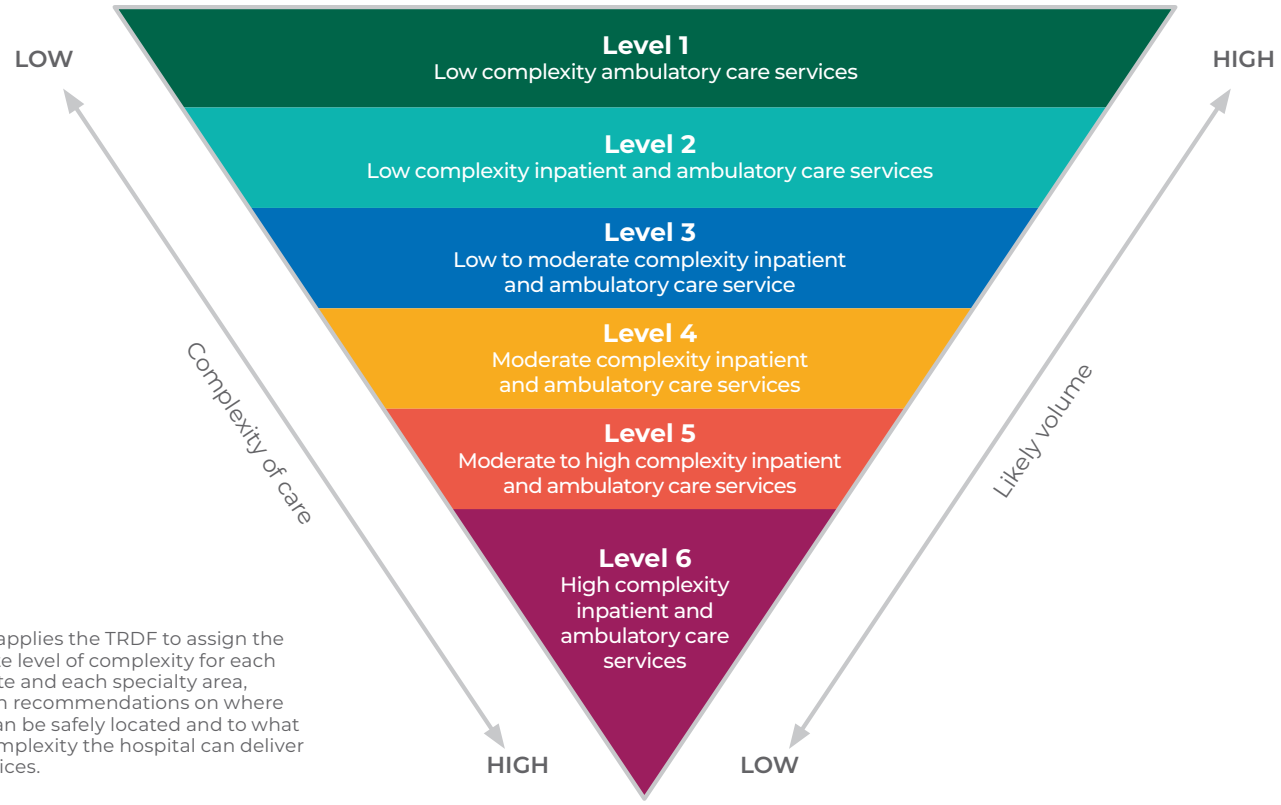
Methods

1. We compared the clinical services matrix for Tasmanian hospitals to those provided currently in NL, with the limitation that the role delineation criteria have not been applied to hospitals in NL.

2. TAS hospitals were defined by level of service for 47 services. The level of service ranges from the lowest level 1 to the highest level 6 (Figure 1).

3. The definitions can be obtained from the Tasmanian Role Delineation Framework and Clinical Services Profile at dhhs.tas.gov.au.

4. Here we provide comparisons for only 10 services.



The TCSP applies the TRDF to assign the appropriate level of complexity for each hospital site and each specialty area, resulting in recommendations on where services can be safely located and to what level of complexity the hospital can deliver those services.

Figure 1. Tasmanian Role Delineation Framework Service (TRDF) Complexity Levels

Results

- NL has 13 acute care hospitals, 1,022 beds and 15 health centres which provide acute care (110 beds).
- TAS has 4 acute care hospitals and 13 health centres.

A. OBSTETRICS

Table 1. Number of Hospitals by Level of Service (1–6) for Obstetrics in NL and TAS

	1	2	3	4	5	6
NL	0	0	0	7	2	1
TAS	7	0	0	1	1	1

- N births/year: NL: 4,052; TAS: 5,835.
- Despite having a lower birth rate, NL provides a substantially higher level of obstetrics services. Level 1 in TAS provides community antenatal and postnatal care by a midwife for mothers and infants who have normal care needs, with access to an obstetrician. There are no planned birthing services.
- Level 4 (7 services in NL) provides intrapartum care for low and moderately complex mothers and babies with pregnancies ≥34 weeks by an obstetrician.

B. PEDIATRIC MEDICINE

Table 2. Number of Hospitals by Level of Service (1–6) for Paediatrics in NL and TAS

	1	2	3	4	5	6
NL	2	6	1	0	1	0
TAS	9	0	1	1	1	0

- The increased level for paediatrics in NL is driven by the presence of paediatricians in 6 centres.

C. GENERAL SURGERY

Table 3. Number of Hospitals by Level of Service (1–6) for General Surgery in NL and TAS

	1	2	3	4	5	6
NL	--	0	0	1	10	2
TAS	--	0	1	1	1	1

- If level 5 is defined as doing general surgery with a moderate to high level of complexity and risk and has an on-site ICU, there are 10 level 5 general surgery units, which is substantially higher than in TAS. Seven of the surgery units do less than 200 inpatient surgeries per year.

D. INTENSIVE CARE

Table 4. Number of Hospitals by Level of Service (1–6) for Intensive Care in NL and TAS

	1	2	3	4	5	6
NL	--	0	1	9	1	2
TAS	--	1	0	1	1	1

- If an ICU is defined as providing mechanical ventilation, there are 9 level 4 ICUs in NL, a level of service substantially higher than in TAS.

E. ORTHOPEDICS

Table 5. Number of Hospitals by Level of Service (1–6) for Orthopedics in NL and TAS

	1	2	3	4	5	6
NL	--	7	0	1	3	2
TAS	--	0	1	1	1	1

- St. Anthony does <200 orthopedic inpatient procedures/year. St John's Orthopedic Service works collaboratively on 2 sites.
- Level 2 is the provision of minor reduction of fractures on low-risk patients by a doctor with anaesthesia support.

F. UROLOGY

Table 6. Number of Hospitals by Level of Service (1–6) for Urology in NL and TAS

	1	2	3	4	5	6
NL	--	--	--	1	1	2
TAS	--	--	--	2	0	2

G. GENERAL MEDICINE

Table 7. Number of Hospitals by Level of Service (1–6) for General Medicine in NL and TAS

	1	2	3	4	5	6
NL	––	0	16	1	6	5
TAS	––	13	0	1	1	2

- TAS has 13 low-acuity medical services with access to a FP whereas NL has 16 FP lead health centres. In addition, NL has substantially more units with internal medicine attending staff than TAS.

H. GERIATRICS

Table 8. Number of Hospitals by Level of Service (1–6) for Geriatrics in NL and TAS

	1	2	3	4	5	6
NL	––	0	0	1	1	0
TAS	––	9	5	1	1	1

- TAS has a far more robust geriatrics care structure than NL, which is rudimentary. A level 2 service in TAS provides outpatient and outreach care from a higher-level geriatrics service and has access to a health practitioner specializing in geriatric assessment. A level 3 service has inpatient beds in the facility with onsite FP, and access to a visiting geriatrician. Level 4 adds interdisciplinary assessment and management of the care and needs of older people, with service by a geriatrician. Level 5 adds inpatient care by a geriatrician, and level 6 provides inpatient care for specialized geriatric assessment.

I. MEDICAL IMAGING

Table 9. Number of Hospitals by Level of Service (1–6) for Medical Imaging in NL and TAS Based on Equipment

	1 General Radiology	2 +Ultrasound	3 +CT	4 +MRI	5 +Nuclear	6 +Interven-tional
NL	24	4	7	0	4	1
TAS	10	3	1	1	1	1

- NL has substantially more general radiology units than TAS (40 vs. 17), ultrasound (16 vs. 7), CT (12 vs. 4), MRI (5 vs. 2), nuclear imaging (5 vs. 2), and interventional radiology (5 vs. 2).

J. EMERGENCY MEDICINE

Table 10. Number of Hospitals by Level of Service (1–6) for Emergency Medicine in NL and TAS

	1	2	3	4	5	6
NL	0	0	13	11	0	2
TAS	7	6	1	1	1	1

- Level 1 is basic life support by a RN with access to a doctor within 30 minutes. Level 2 is 24 hour advanced life support by an RN with access to a doctor and/or paramedic within 15 minutes, Level 3 is a unit staffed by FPs who can provide emergency treatment to low risk patients and have access to a higher level emergency unit. Level 4 is staffed by emergency physicians 24 hours and has an ICU onsite. Level 5 has access to interventional cardiology and critical medicine 24 hours. Level 6 can manage complex trauma and can provide full range of time critical services 24 hours.

- NL has substantially more emergency services than TAS.

Conclusions

1. NL has substantially higher level of hospital services than TAS for Obstetrics, General Surgery, Intensive Care, Emergency Medicine, General Medicine, and Medical Imaging.

2. NL has an extremely large dearth of Geriatrics services compared to TAS.

3. Each level of service by speciality has different service requirements and workforce requirements, which have not been assessed. The current provision of these requirements in NL should be obtained, and a plan created to rationalize services and to provide optimal outcomes for the population.

(Practice Points Vol. 6, Jul–Dec 2019)

NL Acute Care Hospital Expenditures Are the Highest in Canada

Objective

To assess costs and use of NL hospitals.

Practice Points

1. In 2019, the NL budget was $8.7 billion. The deficit was $1.2 billion and the debt was $15.4 billion. $1.4 billion was spent on debt repayment.

2. Health spending was $3 billion of which 40% was for acute care hospitals.

Data Source

1. CIHI National Health Expenditures Database, 2019 forecast. NL data was compared to Canada and to Nova Scotia.

Results

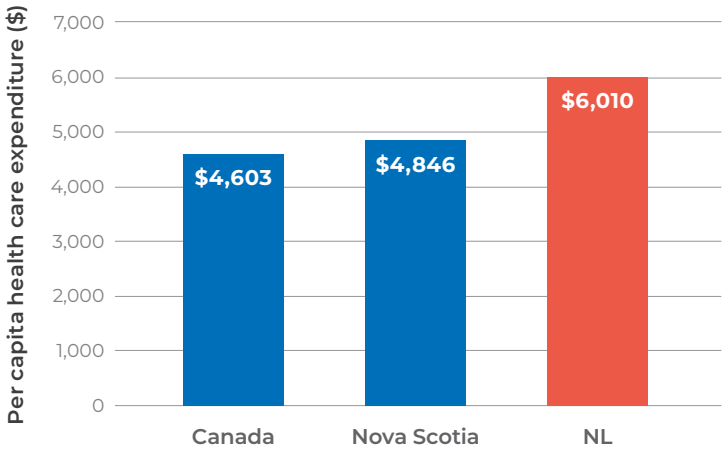


Figure 1. Per Capita Health Spending in NL Compared to Canada and Nova Scotia

- Health care spending per capita in NL is the highest in Canada, and is 24% higher than in Nova Scotia.

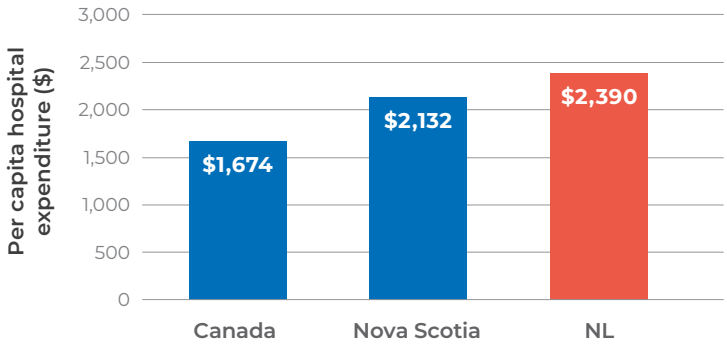


Figure 2. Per Capita Hospital Expenditures in NL Compared to Canada and Nova Scotia

- Hospital spending per capita in NL is the highest in Canada, and is 12% higher than in NS.

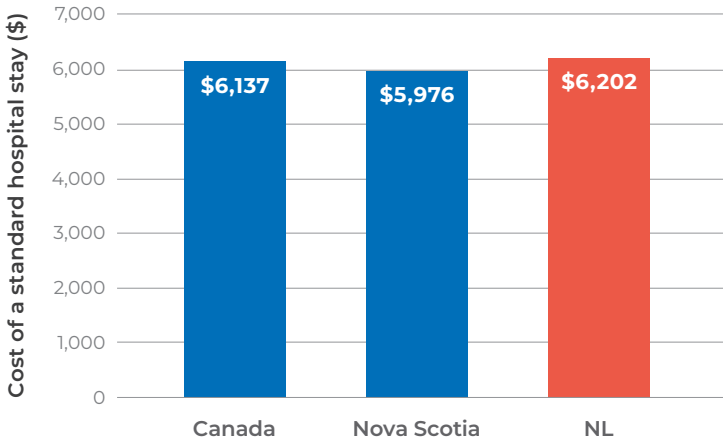


Figure 3. Cost of a Standard Hospital Stay in NL Compared to Canada and Nova Scotia

- Cost of a hospital stay in NL is similar to Canada and 4% higher than in NS.

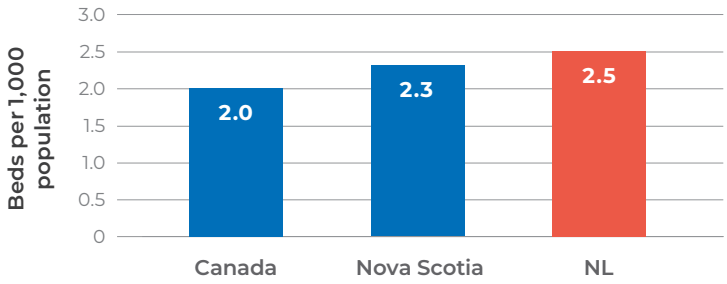


Figure 4. Acute Hospital Beds/1,000 Population in NL Compared to Canada and Nova Scotia

- Beds per 1,000 population in NL are 25% higher than in Canada and 9% higher than in NS.

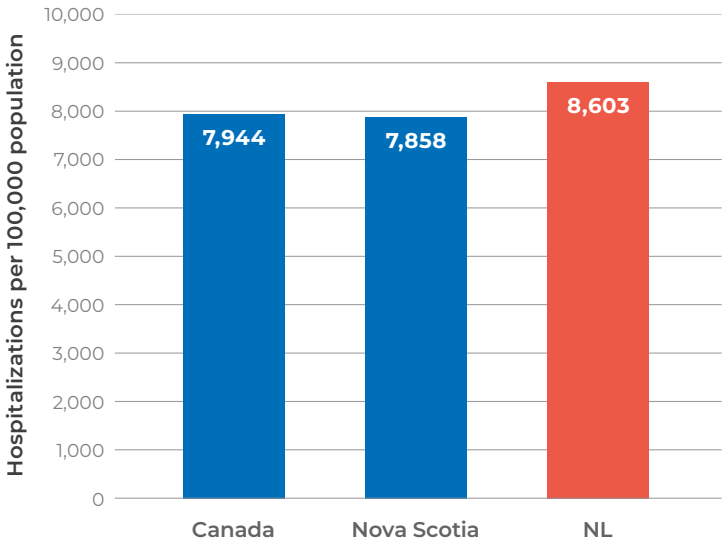


Figure 5. Age-Sex Standardized Hospitalization Rate/100,000 Population in NL Compared to Canada and Nova Scotia

- Hospitalization rate per 100,000 population in NL is 8% higher than in Canada and 9% higher than in NS.

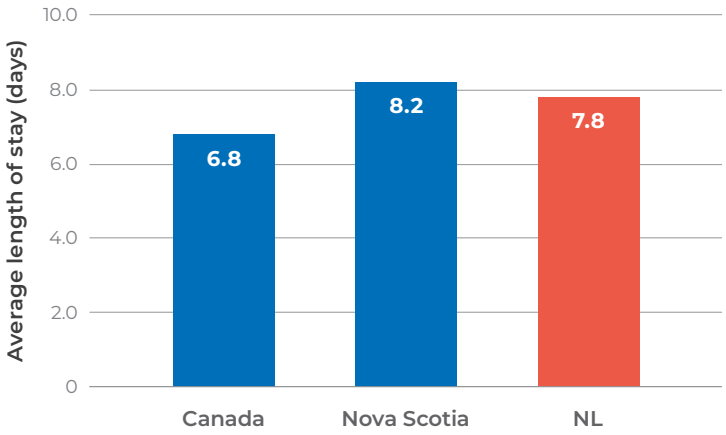


Figure 6. Age Standardized Average Length of Hospital Stay in NL Compared to Canada and Nova Scotia

- Length of stay in NL is 15% higher than in Canada and 5% lower than in NS.
- Limitation: This data includes ALC.

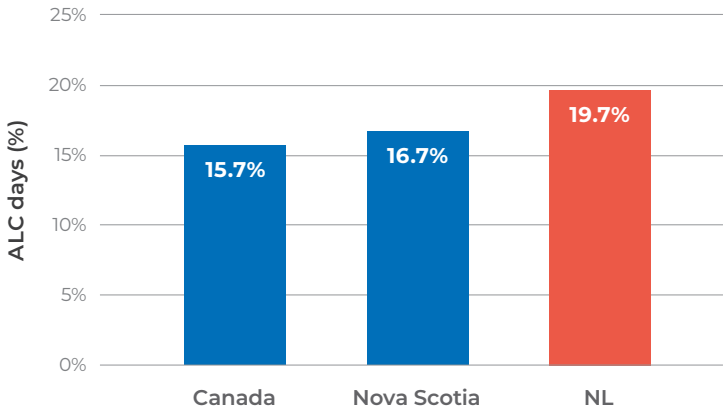


Figure 7. Percentage Alternate Level of Care in NL Acute Care Hospitals Compared to Canada and Nova Scotia

- Percentage alternate level of care in NL is 25% higher than in Canada.

Conclusions

1. In NL, hospital spending per capita is 43% higher than for Canada, as a result of a 25% higher number of beds per 1,000 population, 8% higher age and sex standardized hospitalization rates, 15% higher length of stay, and 25% higher alternate level of care.

2. Reduction in the number of hospital beds, hospitalization rates, and length of stay will require accompanying improvement in primary care and long-term care, as there are already signs of capacity pressure in some hospitals.

3. Age standardized per capita spending would be a valuable comparison as it would adjust for the older age of the NL population compared to other provinces.

(Practice Points Vol. 6, Jul–Dec 2019)

Signs of Capacity Pressure in Acute Care Hospitals in NL

Objective

To assess whether acute care hospitals in NL exhibit signs of capacity pressure revealed by high occupancy rates, and the role of high alternate level of care (ALC) use in causing capacity pressure.

Practice Points

1. Severe hospital capacity pressures, revealed by high occupancy rates, lead to an increase in emergency room wait times and high numbers of patients waiting for a hospital bed.

2. The lack of alternatives to hospital care for patients ready for discharge but who cannot go home has been labeled the alternate level of care (ALC) issue.

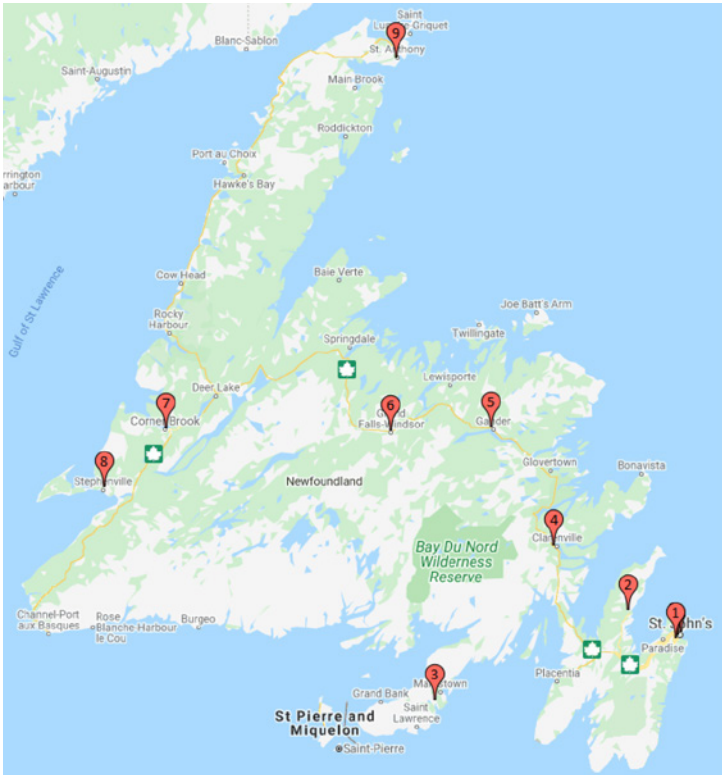
3. ALC is an inefficient use of hospitals but it occurs because of deficits in access to long-term care, personal care, home care, rehabilitation, or tertiary care.

Methods

1. Data for 2018/19 occupancy rates were obtained from the Department of Health and Community Services. ALC data for 2018/19 were obtained from the NL Centre for Health Information.

2. The Waterford and Janeway Hospitals were excluded from the analysis.

Results



Newfoundland Hospitals

1. **St. John's (Health Sciences Centre)**
   Occupancy: 92%; ALC: 7%
   St. John's (St. Clare's)
   Occupancy: 83%; ALC: 17%
2. **Carbonear**
   Occupancy: 77%; ALC: 12%
3. **Burin**
   Occupancy: 55%; ALC: 13%
4. **Clarenville**
   Occupancy: 82%; ALC: 18%
5. **Gander**
   Occupancy: 97%; ALC: 19%
6. **Grand Falls-Windsor**
   Occupancy: 98%; ALC: 33%
7. **Corner Brook**
   Occupancy: 91%; ALC: 35%
8. **Stephenville**
   Occupancy: 95%; ALC: 29%
9. **St. Anthony**
   Occupancy: 84%; ALC: 29%

Labrador Hospitals

Happy Valley-Goose Bay
Occupancy: 96%; ALC: 11%
Labrador City
Occupancy: 86%; ALC: 4%

Health Centres

Occupancy: 76%; ALC: 19%

- The Health Sciences Centre and the hospitals in Gander, Grand Falls-Windsor, Corner Brook, Stephenville, and Happy Valley-Goose Bay have >85% occupancy levels.

- The hospitals in Central Health and Western Health have high ALC rates.

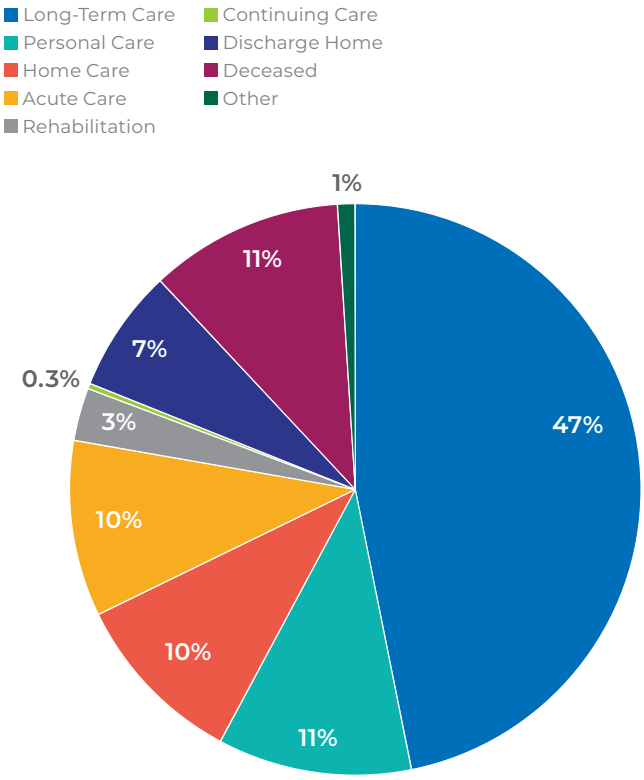


Figure 1. Proportion of Total ALC Length of Stay Due to Wait For Type of Other Care

- Majority of ALC Length of Stay is caused by a wait for long-term care.

Conclusions

1. Capacity stress exists in six hospitals which have high occupancy rates and in four hospitals it is associated with high ALC rates (Gander, Grand Falls-Windsor, Corner Brook and Stephenville).

2. Low occupancy and high ALC occur in three rural Eastern Health hospitals (Carbonear, Burin, Clarenville) and in St. Anthony.

3. The majority of ALC days are for patients awaiting a long-term care bed.

4. Reduction in the number of acute care beds in NL will require accompanying improvement in the long-term care sector.

(Practice Points Vol. 6, Jul–Dec 2019)

Prolonged Length of Stay in NL Hospitals Is the Result of Prolonged Stay in Medicine Beds

Objective

To determine the reasons why length of stay in NL acute care hospitals is prolonged.

Practice Points

1. In NL hospitals, average length of stay (LOS) for any type of acute care case is 6.9 days, whereas in Canada it is 5.7 days. For typical cases only, the average lengths of stay are 5.1 and 4.4 days, respectively.

Methods

1. Acute LOS for each hospital and health centre in the province by acute care type for 2018/19 was obtained from the NL Centre for Health Information and compared to the corresponding Canadian average for 2018/19 by acute care type and hospital size (defined by CIHI: teaching/large/medium/small) obtained from CIHI. This data excludes ALC. The bars in the figures are LOS in NL hospitals and the line parallel to the x-axis is the comparable LOS in Canadian hospitals.

Results

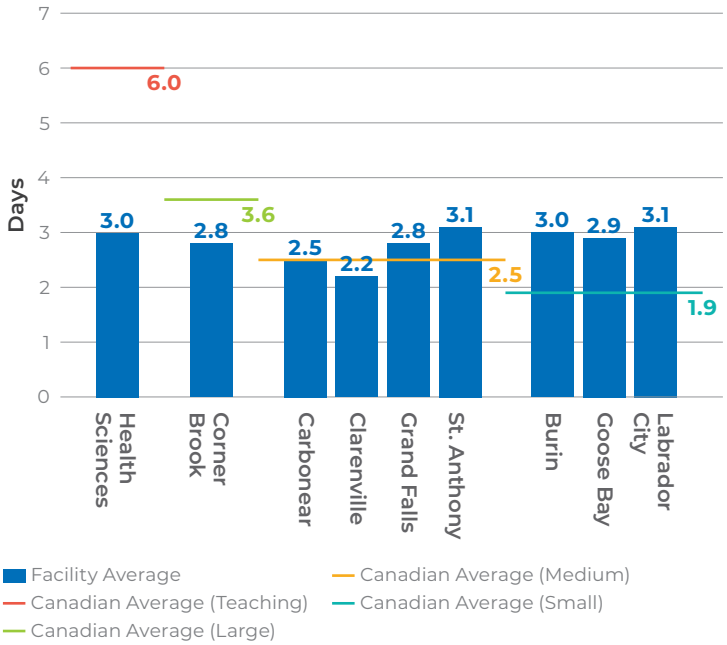


Figure 1. Obstetrics Acute Length of Stay

- Obstetrics LOS was lower than Canada, except for St. Anthony, Burin, Goose Bay and Labrador City.

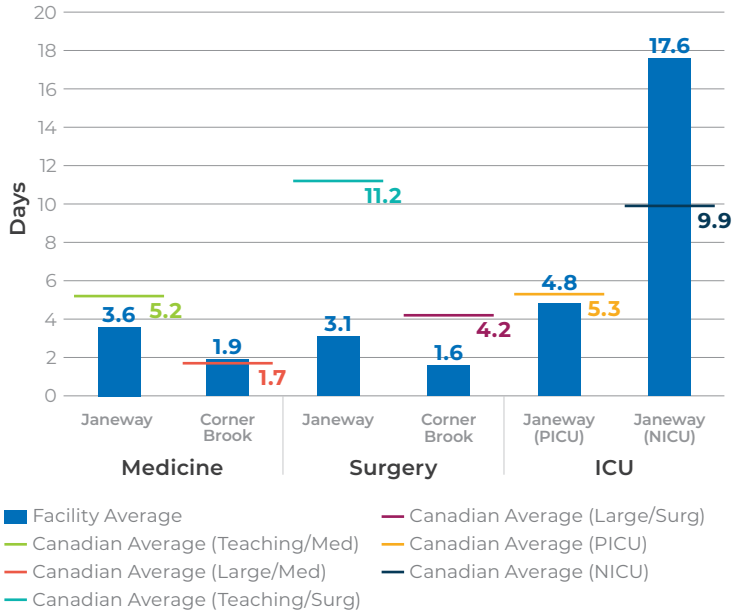


Figure 2. Pediatrics Acute Length of Stay

- Pediatrics LOS is lower than Canada, except for the Janeway NICU.

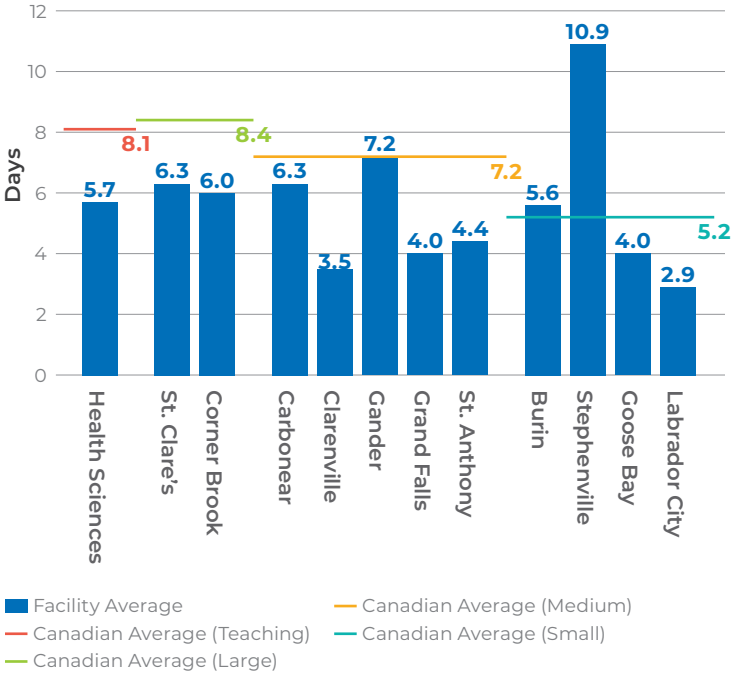


Figure 3. Surgery Length of Stay

- Surgery LOS is lower than Canada, except in Stephenville.

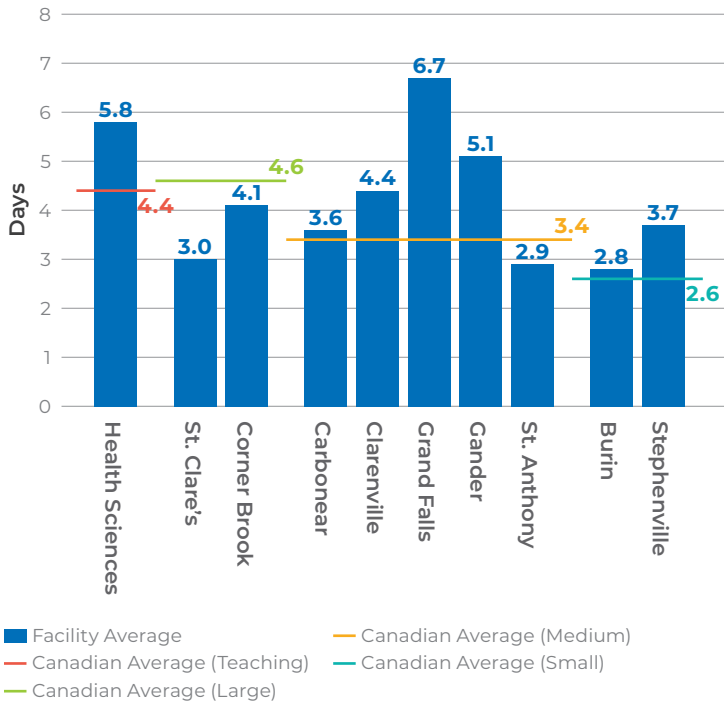


Figure 4. ICU Length of Stay

- ICU LOS is higher than Canada at the Health Sciences Centre, Clarenville, Grand Falls, Gander, and Stephenville.

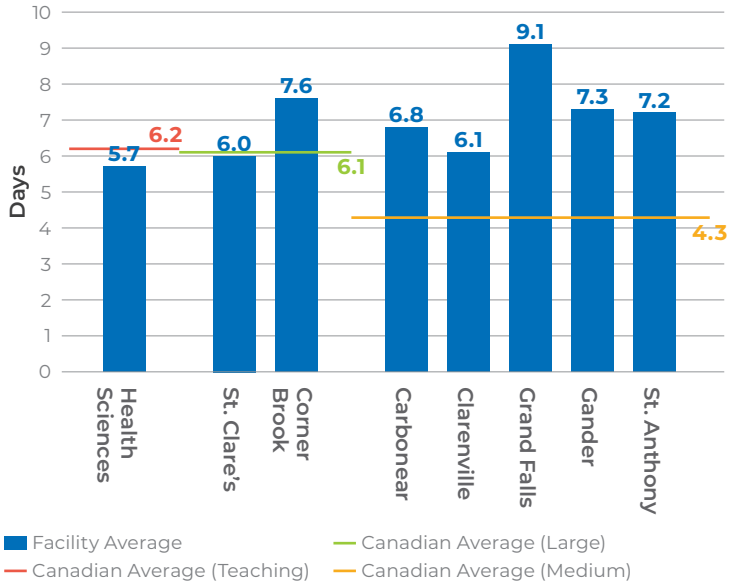


Figure 5. Medicine Acute Length of Stay (Teaching/Large/ Medium Hospitals)

- Medicine LOS outside St. John's is higher than Canada, and in four of these hospitals occupancy is >85% which contributes to capacity pressure.

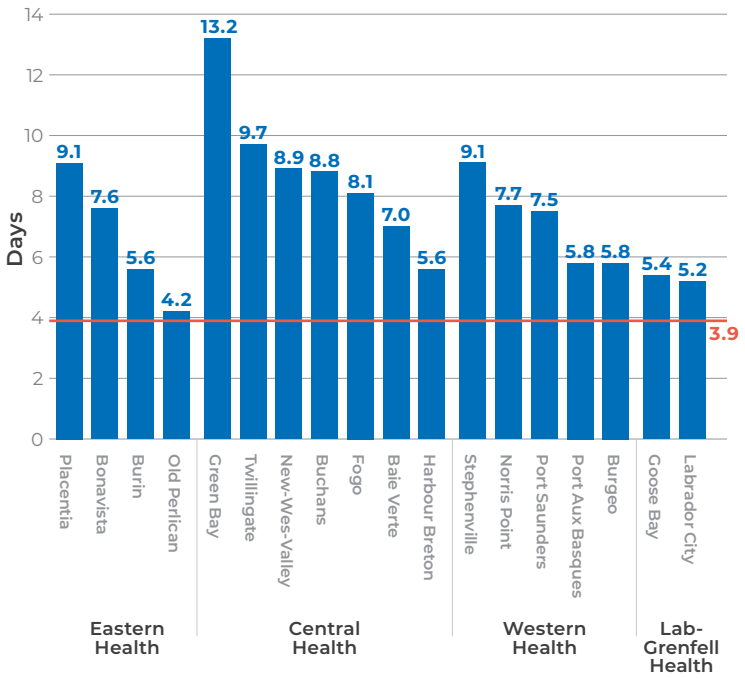


Figure 6. Medicine Acute Length of Stay in Small Hospitals

- LOS in all the small hospitals is higher than the Canadian average.

Conclusions

1. The high acute length of stay in NL is primarily due to increased length of stay for medicine patients.

2. With the current acute LOS, 621 medicine beds are required in the province, but if the average LOS was similar to Canada, 461 medicine beds would be required (assuming 85% occupancy and 10% ALC).

3. It is possible that the causes of increased ALC are also contributing to higher acute LOS.

(Practice Points Vol. 6, Jul–Dec 2019)

Prediction of Optimal Number of Acute Care Hospital Beds Required Based on an Optimal Occupancy, Alternate Level of Care, and Length of Stay

Objective

To determine the optimal number of beds required in the acute care hospitals of NL based on occupancy, alternate level of care (ALC), and length of stay (LOS) compared to the number assigned currently and to current usage.

Practice Points

1. The number of beds per 100,000 population in NL is 25% higher than in Canada. The rate outside St. John's is double that in St. John's.
2. Occupancy is below 85% in five of 12 hospitals and above 90% in seven hospitals. Optimal occupancy is 85%.
3. NL has the highest ALC rate in Canada at about 20% of hospitalization days, with the highest rates in Central Health and Western Health.
4. LOS is 21% higher in NL compared to Canada, attributed predominantly to increased LOS in medicine beds.

Methods

1. Currently assigned beds for 2018/19 were obtained from the Department of Health and Community Services.
2. Optimal usage assumed occupancy to be 85%, ALC to be 10%, and LOS at the current LOS or corresponding Canadian average, whichever was the lesser.
3. Current use is actual usage by patients including ALC as a separate category. Current usage data were obtained from NL Centre for Health Information.

Results

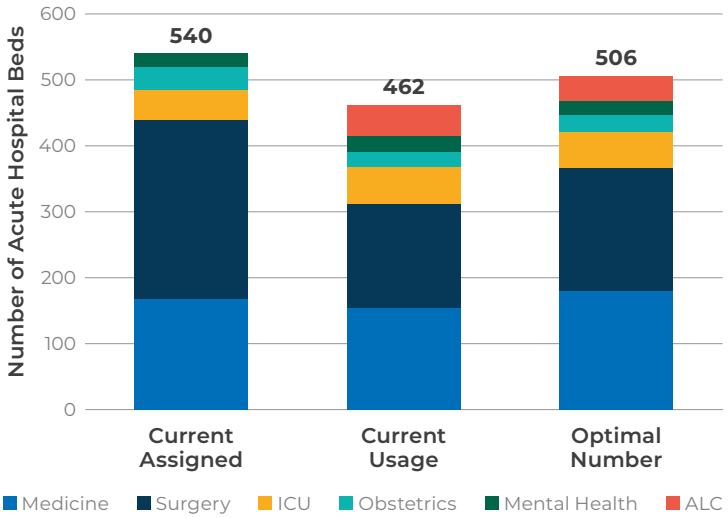


Figure 1. Acute Hospital Beds in St. John's (Health Sciences Centre and St. Clare's) Currently Assigned, Currently Used, and Predicted Optimal Number by Acute Care Type

- For St. John's, the optimal number of beds is 6% (N=34) lower than the number assigned.

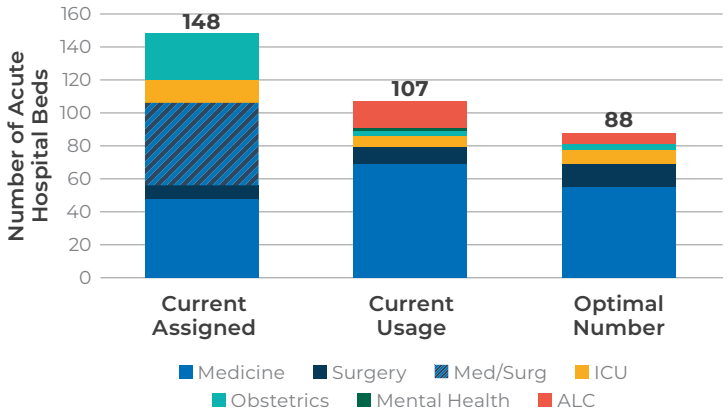


Figure 2. Acute Hospital Beds in the Three Rural Hospitals of Eastern Health Currently Assigned, Currently Used, and the Predicted Optimal Number by Acute Care Type

- The optimal number of acute hospital beds required in Carbonear, Clarenville and Burin is 41% (N=60) less than currently assigned.

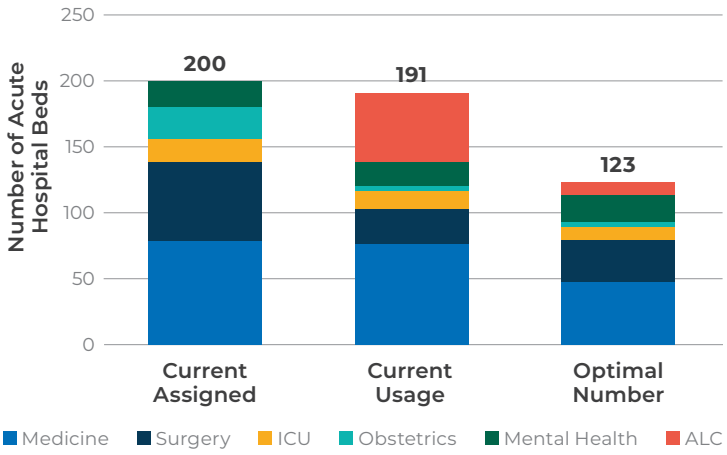


Figure 3. Acute Hospital Beds in Gander and Grand Falls Currently Assigned, Currently Used, and the Predicted Optimal Number by Acute Care Type

- The optimal number of acute hospital beds required in Gander and Grand Falls is 38% (N=77) less than currently assigned.

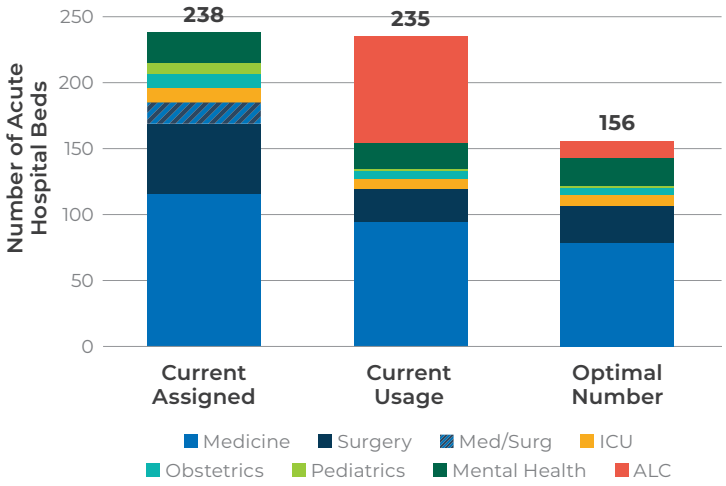


Figure 4. Acute Hospital Beds in Corner Brook and Stephenville Currently Assigned, Currently Used, and Predicted Optimal Number by Acute Care Type

- The optimal number of beds required in Corner Brook and Stephenville is 34% (N=82) less than currently assigned.

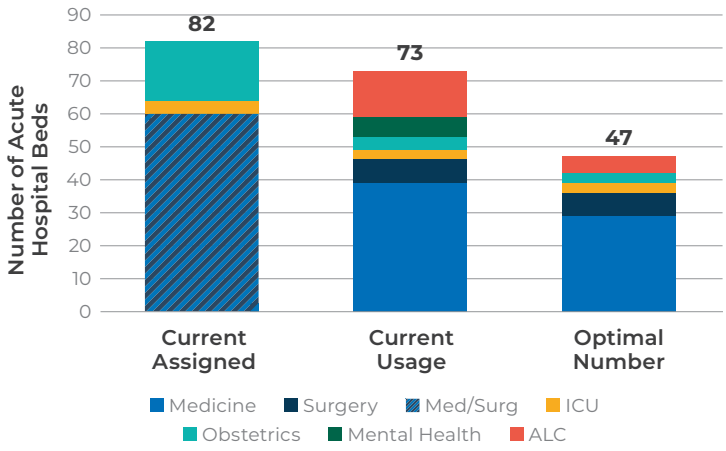


Figure 5. Acute Hospital Beds in Labrador-Grenfell Currently Assigned, Currently Used, and Predicted Optimal Number by Acute Care Type

- Acute hospital beds required in Labrador-Grenfell is 43% (N=35) less than currently assigned.

Conclusions

1. Bed usage in Eastern Health is unique in the province, with hospitals in St. John's operating near optimal levels and relatively close to matching assigned beds, while outside of St. John's there is already a surplus of hospital beds, which would be further increased if the high medicine LOS and high ALC in these hospitals was addressed.

2. Outside Eastern Health capacity problems are driven by the high rate of ALC and high LOS for medicine patients. Addressing these issues would result in lower demand for hospital beds, below the number of beds currently available in these regions.

Quality of Care NL

(Practice Points Vol. 4, May–Dec 2018)

Utilization of Obstetric and Pediatric Acute Care Beds in NL

Practice Point

1. In 1976 there were 11,130 births in NL and in 2016 there were 4,424.

Methods

1. Data on beds, occupancy, and pediatricians were obtained from the Department of Health and Community Services and birth and length of stay data were obtained from NL Centre for Health Information for 2016–17.

2. Estimated number of beds required was calculated using the current obstetrics length of stay and an occupancy rate of 85% for obstetrics beds.

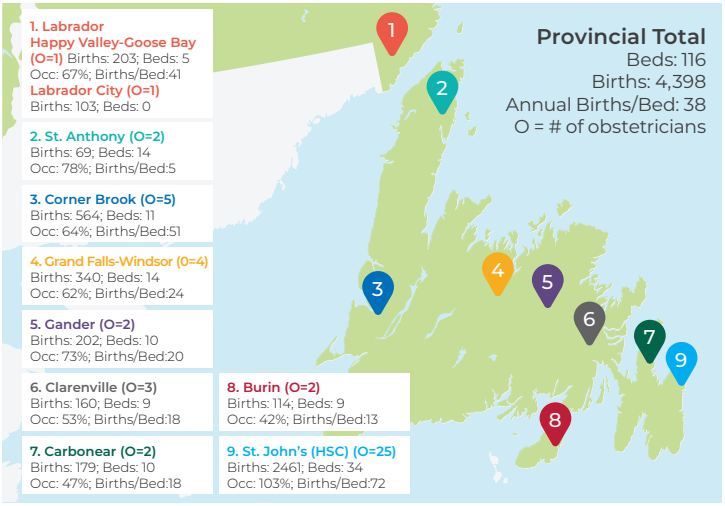


Figure 1. Current Obstetrics Acute Beds

Figure 2. Required Obstetrics Acute Beds

Table 1. Pediatricians by Population and Location

Location	Pediatricians July 2018	Population <15 years	Pediatricians per 1,000 children
St. John's*	57	35,498	1.6
Carbonear	2	5,400	0.4
Burin	1	2,454	0.4
Clarenville	2	3,325	0.6
Gander	4	5,979	0.7
Grand Falls	2	5,802	0.3
Corner Brook	7	10,140	0.7
St. Anthony	1	1,041	1.0
Goose Bay	0	3,356	0.0
Labrador City	0	1,921	0.0

**Includes provincial services*

Western Memorial Regional Hospital

Current

8 pediatric beds; occupancy unknown

Required

2 pediatric beds; 68% occupancy

Janeway Hospital

Current

29 pediatric ICU beds; 82% occupancy
22 pediatric medicine beds; 58% occupancy
20 pediatric surgery beds; 37% occupancy
8 mental health beds; 53% occupancy

Required (for 85% occupancy):

27 pediatric ICU beds
23 pediatric med/surg beds
5 mental health beds

Figure 3. Current and Required Pediatric Beds

Conclusion

1. Capacity for obstetric and pediatric acute care exceeds requirements based on current births and child population.

(Practice Points Vol. 6, Jul–Dec 2019)

Impact of Potential Closure of Obstetrics Units on Time for Mother to Travel to the Nearest Obstetrics Unit

Objective

To determine the impact on travel time to obstetrics services if three obstetrics units in NL were closed.

Practice Points

1. In 2018/19, the number of births in Burin was 101 and in St. Anthony it was 46. Both Gander and Grand Falls-Windsor have an obstetrics unit and are within an hour of each other.

2. Centralization of obstetrics services and closure of some current facilities would increase travel time for mothers who would otherwise deliver at those facilities. Some mothers would have to relocate for some weeks pre-partum to a community with an obstetrics unit if their travel time was >90 minutes.

Methods (PI: A. Simms)

1. Numbers of births in the province and estimated travel time to the nearest obstetrics services were projected for the year 2030 for each obstetrics facility in the province.

2. The impact of closing some obstetrics services (Burin, St. Anthony, and Gander) on travel time was calculated.

Results

Table 1. Estimated Births (Year 2030): Current Obstetrics Configuration

Facility Location	Births	Travel >90 minutes (count)	Travel >90 minutes (%)
Carbonear	410	3	0.6%
St. John's	2,051	24	1.2%
Burin	75	0	0.0%
Clarenville	125	0	0.0%
Gander	226	2	0.7%
Grand Falls-Windsor	233	36	15.5%
Corner Brook	389	44	11.4%
St. Anthony	48	25	52.2%
Happy Valley-Goose Bay	182	38	20.9%
Labrador City	84	9	10.2%
Total	3,823	181	4.7%

Table 2. Estimated Births (Year 2030): Services Removed from 3 Facilities

Facility Location	Births	Travel >90 minutes (count)	Travel >90 minutes (%)
Carbonear	410	3	0.6%
St. John's	2,051	24	1.2%
Burin	0	0	0.0%
Clarenville	258	92	35.8%
Gander	0	0	0.0%
Grand Falls-Windsor	401	51	12.7%
Corner Brook	429	85	19.8%
St. Anthony	0	0	0.0%
Happy Valley-Goose Bay	190	46	24.1%
Labrador City	84	9	10.2%
Total	3,823	309	8.1%

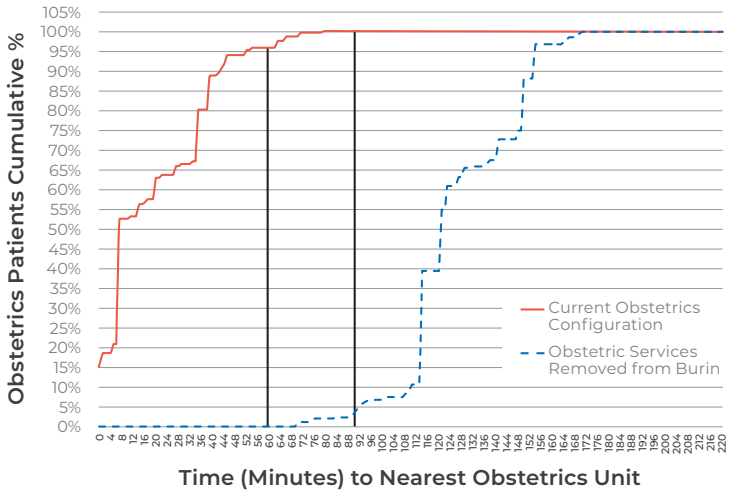


Figure 1. Estimated Travel Time in 2030 if Burin was Open or Closed

- In 2030, all of the anticipated 75 mothers in Burin would have a travel time <90 minutes, but if Burin Obstetrics Unit was closed, 73 would have a travel time >90 minutes to the next closest obstetrics facility.

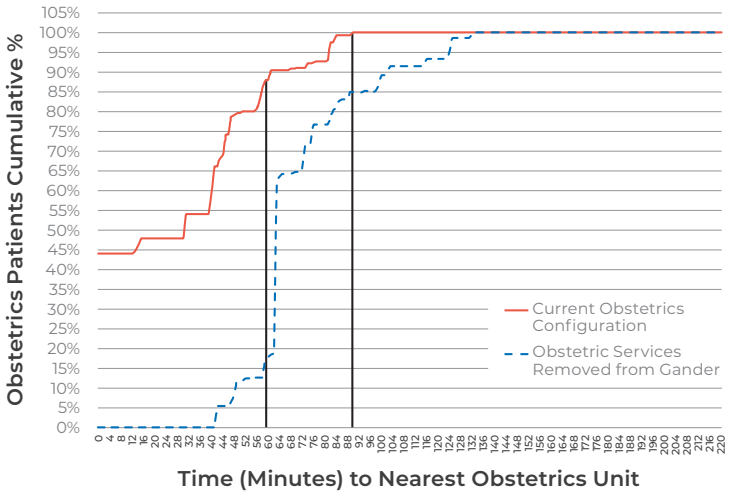


Figure 2. Estimated Travel Time in 2030 if Gander was Open or Closed

- In 2030, 224 of the anticipated 226 mothers in Gander would have a travel time <90 minutes, but if Gander Obstetrics Unit was closed, 34 would have a travel time >90 minutes to the next closest obstetrics facility.

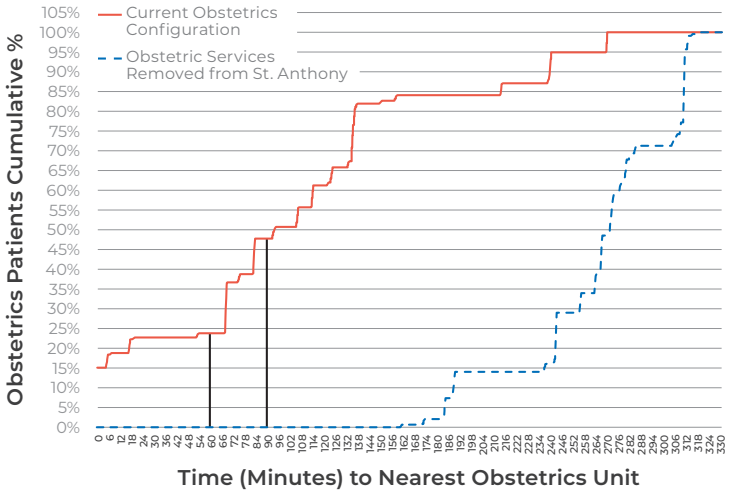


Figure. 3. Estimated Travel Time in 2030 if St. Anthony was Open or Closed

- In 2030, 23 of the 48 anticipated mothers in St. Anthony would have a travel time <90 minutes, but if St. Anthony Obstetrics Unit was closed, all 48 would have a travel time >90 minutes to the next closest obstetrics facility.

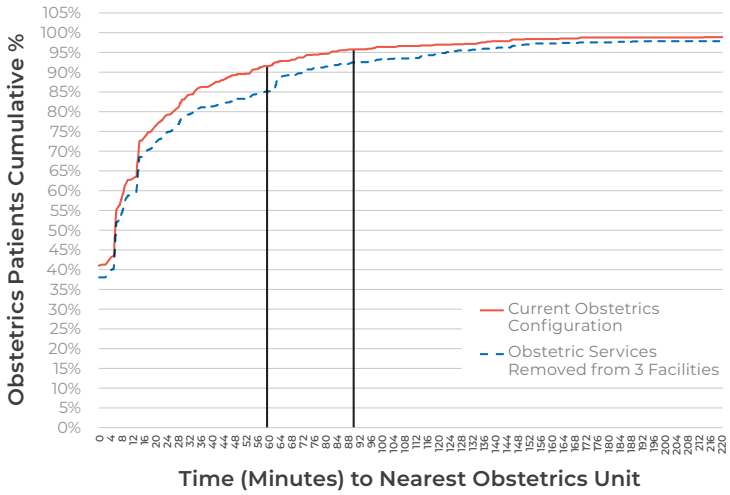


Figure 4. Estimated Travel Time in 2030 if Three Obstetrics Facilities were Open or Closed

- In 2030, 181 (4.7%) of the 3,823 anticipated mothers in NL would have a travel time >90 minutes, but if three obstetrics facilities were closed, 309 (8.1%) would have a travel time >90 minutes to the next closest obstetrics facility.

Conclusions

1. Removing obstetrics services from Burin, St. Anthony, and Gander would increase travel time to >90 minutes for 128 mothers who would otherwise deliver at those facilities. This would increase the percentage of mothers in NL who would have to travel for >90 minutes from 5% to 8%.

2. As a result, these anticipated additional 128 mothers may have to relocate to a community with an obstetrics unit pre-partum.

3. Centralization of services would require unquantified costs for infrastructure, e.g. midwives, transport, travel, and accommodation added to both the health system and the patient.

Quality of Care NL

(Practice Points Vol. 4, May–Dec 2018)

Utilization of Surgery Acute Care Beds in NL

Practice Points

1. Day surgery has increased over time.
2. For particular surgical procedures lower quality outcomes are associated with low volumes.

Methods

1. Data on beds and occupancy were obtained from the Department of Health and Community Services and surgery/length of stay (LOS) data were obtained from NL Centre for Health Information.
2. Required number of beds was calculated using the current acute surgery length of stay, 10% alternate level of care (ALC), and an occupancy rate of 85% for acute surgery beds.

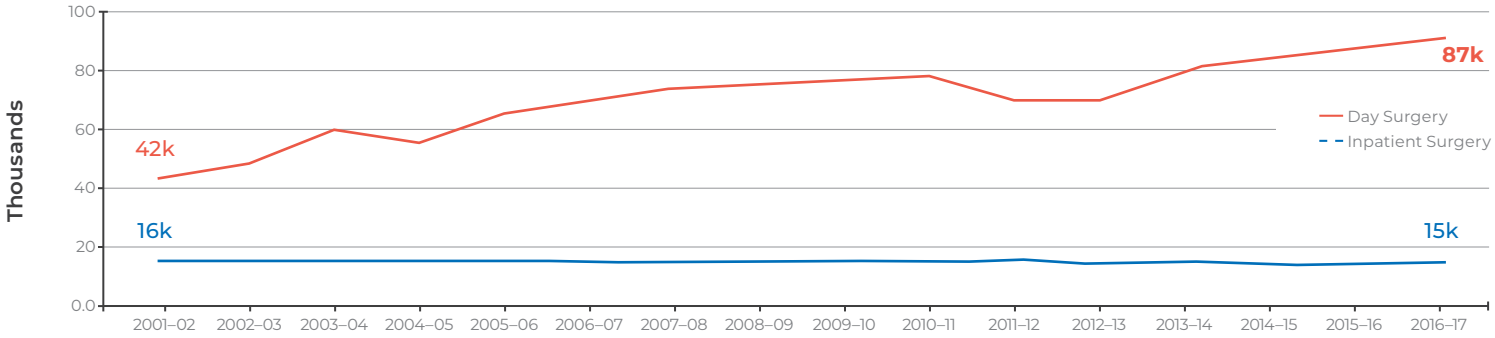
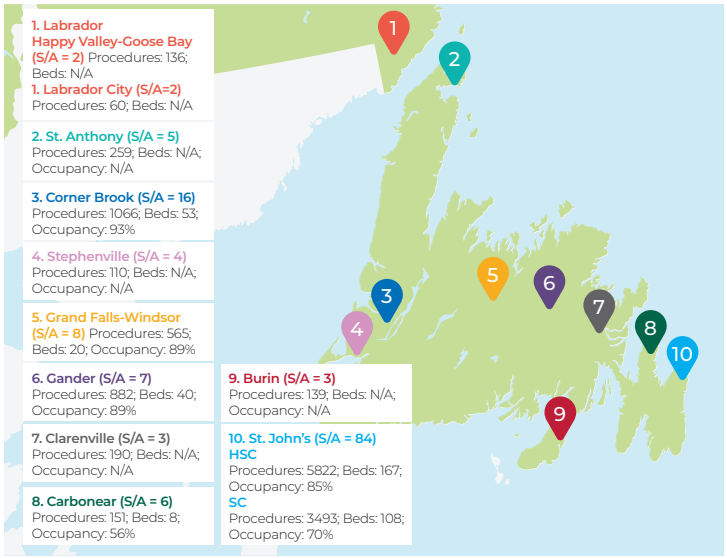


Figure 1. Hospitalizations for Surgery and Day Surgery Visits



Provincial Beds: 396 surgery beds + approx. 20 of medical/surgical beds
Procedures = surgeries performed as inpatient by a surgeon
*S/A = number of surgeons and anesthesiologists

Figure 2. Current Surgery Acute Beds

Provincial Beds: 300 surgery beds
*Stephenville beds based on LOS of 7 days

Figure 3. Required Surgery Acute Beds

Conclusions

1. Most surgeries in the province are performed as day surgeries.
2. Capacity for surgery acute care exceeds requirements based on current volume of inpatient surgery.

(Practice Points Vol. 5, Jan–Jun 2019)

Utilization of Medicine Beds in NL: Alternate Level of Care and Long-Term Care Availability

Objective

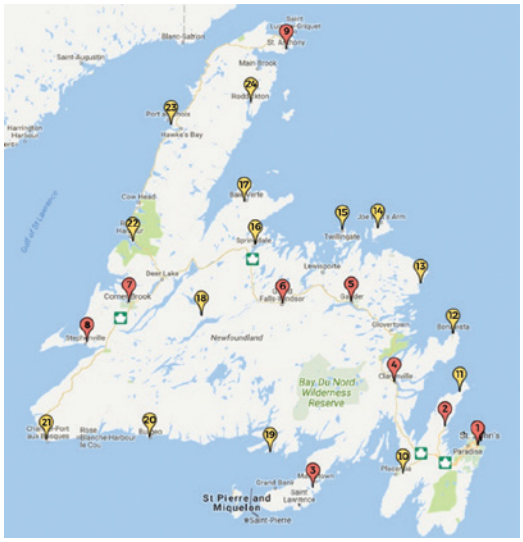
To determine the utilization of medicine beds, including the rates of use for alternate level of care (ALC) patients, and its relation to regional availability of long-term care beds.

Methods

1. Data on medicine beds and occupancy were obtained from the Government of NL. ALC data were obtained from the NL Centre for Health Information.

2. The Eastern Health (EH) region was divided into two regions based on probable catchment areas for urban versus rural hospitals. The St. John's region was defined as the portion of EH including economic zones 18–20, while the Tri-Pen region was defined as the portion of EH including economic zones 15–17.

3. The Waterford and Janeway Hospitals were excluded from the analysis.



Provincial Beds:
527 medicine beds + 132 medicine/surgery beds

* With available data, occupancy of medicine/surgery beds exclusively by medical patients could not be calculated.

Newfoundland Hospitals

1. **St. John's (Health Sciences Centre)**
   Beds: 92; Occupancy: 98%; ALC: 7%
   St. John's (St. Clare's)
   Beds: 76; Occupancy: 93%; ALC: 17%
2. **Carbonear**
   Beds: 48; Occupancy: 90%; ALC: 11%
3. **Burin**
   Beds: 22 Med/Surg; Occupancy: 84%*; ALC: 13%
4. **Clarenville**
   Beds: 28 Med/Surg; Occupancy: 83%*; ALC: 18%
5. **Gander**
   Beds: 27; Occupancy: 110%; ALC: 24%
6. **Grand Falls-Windsor**
   Beds: 54; Occupancy: 99%; ALC: 29%
7. **Corner Brook**
   Beds: 91; Occupancy: 95%; ALC: 35%
8. **Stephenville**
   Beds: 25+16 Med/Surg; Occupancy: 104%*; ALC: 30%
9. **St. Anthony**
   Beds: 32 Med/Surg; Occupancy: 62%*; ALC: 26%

Labrador Hospitals

Happy Valley-Goose Bay
Beds: 20 Med/Surg; Occupancy: 110%*; ALC: 14%
Labrador City
Beds: 14 Med/Surg; Occupancy: 86%*; ALC: 4%

Health Centres

Overall
Occupancy: 71%; ALC: 26%

10. **Placentia**
    Beds: 10; Occupancy: 39%; ALC: 22%
11. **Old Perlican**
    Beds: 4; Occupancy: 41%; ALC: 25%
12. **Bonavista**
    Beds: 10; Occupancy: 84%; ALC: 22%
13. **New-Wes-Valley**
    Beds: 12; Occupancy: 74%; ALC: 16%
14. **Fogo**
    Beds: 5; Occupancy: 75%; ALC: 24%
15. **Twillingate**
    Beds: 12; Occupancy: 88%; ALC: 24%
16. **Springdale**
    Beds: 9; Occupancy: 70%; ALC: 20%
17. **Baie Verte**
    Beds: 7; Occupancy: 65%; ALC: 43%
18. **Buchans**
    Beds: 3; Occupancy: 47%; ALC: 0%
19. **Harbour Breton**
    Beds: 5; Occupancy: 82%; ALC: 22%
20. **Burgeo**
    Beds: 3; Occupancy: 65%; ALC: 28%
21. **Port Aux Basques**
    Beds: 14; Occupancy: 84%; ALC: 28%
22. **Norris Point**
    Beds: 8; Occupancy: 82%; ALC: 49%
23. **Port Saunders**
    Beds: 7; Occupancy: 54%; ALC: 29%
24. **Roddickton**
    Beds: 1; Occupancy: 38%; ALC: 0%

Figure 1. Current Medicine Beds

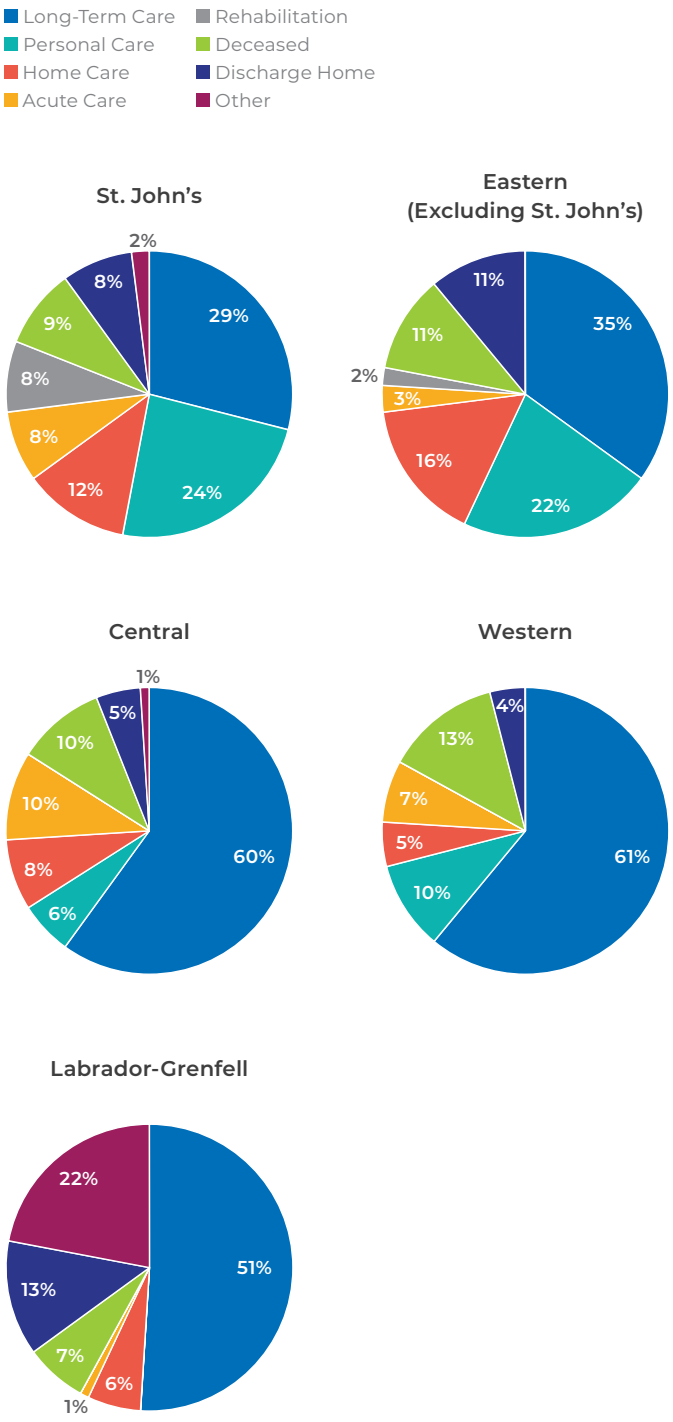


Figure 2. Proportion of Total ALC Length of Stay by Discharge Need

- The biggest cause of ALC length of stay in acute care hospitals is waiting for a long-term care bed.

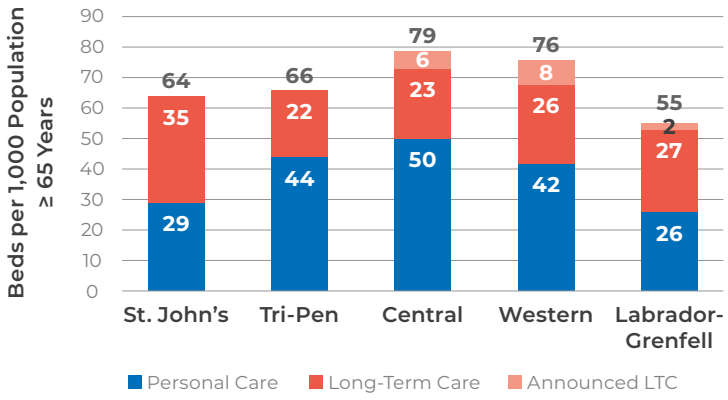


Figure 3. Regional Rates of Long-Term and Personal Care Beds

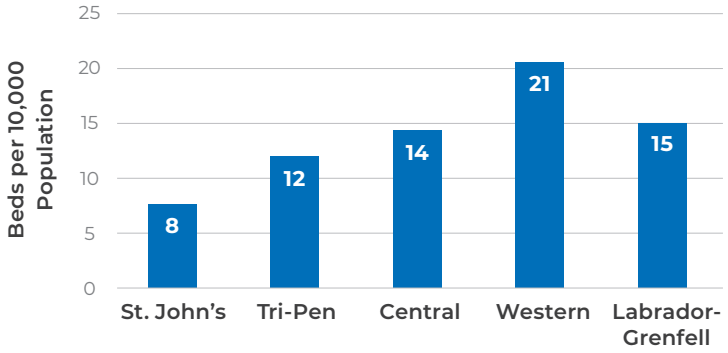


Figure 4. Regional Rates of Medicine Beds

Conclusions

1. Occupancy rates of medicine beds in hospitals exceeds optimal levels, while medicine beds in health centres are underutilized.

2. Despite having significantly more medicine beds per capita than the St. John's region, over-occupancy of medicine beds in Central and Western Health is driven by high ALC levels.

3. The majority of ALC days in hospital in Central and Western Health are for patients waiting for a long-term care bed.

4. The structure of the institutional health sector outside St. John's is opposite to that in St. John's, with an excess of personal care and a deficit of long-term care beds, and an excess of acute hospital beds.

5. Restructuring of the institutional health sector outside St. John's is necessary.

Quality of Care NL

(Practice Points Vol. 4, May–Dec 2018)

Evaluation of Need for Nursing Home Beds in NL

Objective

To develop an analytics infrastructure to predict the need for long-term care beds in NL.

Practice Points

1. From 1996–2016 the number of people in NL aged 65 years and older has increased by 69% and is predicted to increase by a further 50% by 2036.
2. The population of St. John's aged 65 years and older is 31,288; tri-peninsula region is 26,952; Central region is 22,832; Western region is 18,439; Labrador-Grenfell region is 5,303.
3. Beds needed = Incidence x Survival.
4. The vast majority of client admissions to Nursing Homes (NHs) were appropriate in 2016–2017.

Data

- Data was obtained from the initial Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©) completed on admission to NHs in NL, 1 Apr 2016–31 Mar 2017.

- Data was not available from Chancellor Park.
- Alternate Level of Care (ALC) in the acute care hospitals was obtained from CIHI.

Results

		St. John's	Tri-Peninsulas	Central	Western	Labrador-Grenfell
N incident clients	≥ 65 years	271	223	259	168	53
	< 65 years	26	17	9	15	4
N prevalent clients in NH ≥ 5 years		331	112	107	128	28
Beds needed *		947	621	692	509	149
Beds available		1,078	582	519	474	145
% ALC in acute care hospitals		12	14	27	34	19

**Assumptions:* *(a) Median survival for incident clients ≥ 65 years = 2 years*
(b) Wait time reduced by 90 days
(c) Beds for prevalent clients ≥ 5 years unchanged presuming this rate stays stable

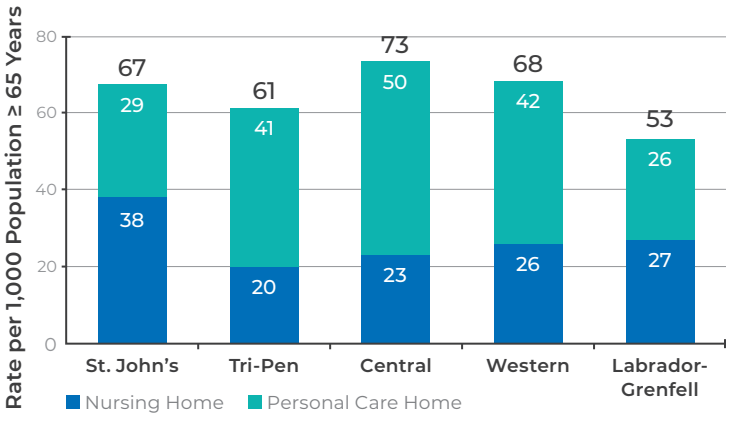


Figure 1. Rate of Long-Term Care Beds by Region

Conclusions

1. The high rate of ALC in acute care hospitals of Central and Western Health is linked to the deficit of NH beds available.
2. Compared to St. John's, Central and Western Health have a high rate of personal care homes and a low rate of NH beds. Restructuring of the long-term care sector will be necessary to improve the use of acute hospital care in NL.
3. An analytics platform to predict long-term care needs should be feasible using RAI data from the single entry system and on admission to institutional long-term care, together with survival, plus predictions of demographic change in the province and prevalence of long-stay patients.

(Practice Points Vol. 6, Jul–Dec 2019)

An Estimate of the Number of Full-Time Equivalent (FTE) Family Physicians Working in Newfoundland

Objective

To estimate the number of FTE Family Physicians (FPs) working in Newfoundland (island only), both fee-based and salaried, using measures of clinical practice.

Practice Points

1. According to the Canadian Medical Association, NL has the highest number of doctors per capita in Canada, but it is unknown how many are actually working in family practice, and whether they are working full-time.

2. For fee-based FPs, analysis of billings would give some indication of days worked.

3. For salaried FPs, measures of clinical practice, using expected rates derived from fee-based FPs, could be used to indicate FTE numbers.

Methods

1. The NLMA published their estimates, gleaned from knowledge of their enrolled members.

2. In 2017, number of antibiotic prescriptions and of hemoglobin (Hb) and of serum creatinine tests were obtained for all FPs, as well as number of billings for fee-based FPs. Hb and serum creatinine were nearly always bundled, so rate of creatinine tests was not used for the estimate.

3. It was assumed that the top 2 quintile of billings represented FTE, 3rd quintile 0.6 FTE, 4th quintile 0.4 FTE and 5th quintile 0.2. From this, the number of fee-based FTE FPs was determined.

4. For each quintile of billings, median and interquartile range was calculated for number of antibiotics and for number of Hb tests, and these measures of clinical practice were extrapolated to non-fee-based doctors to estimate FTEs.

5. The number of non-fee-based FTEs was the average of the predictions from the two metrics.

Results

Eastern Health (EH)

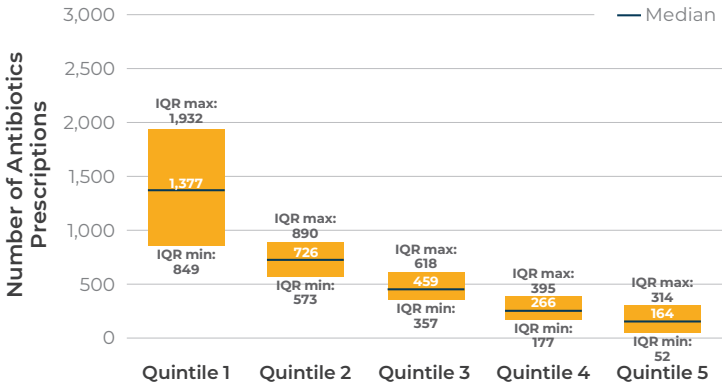


Figure 1. Median and Interquartile Range of Antibiotic Prescriptions by Quintile of Billings for Fee-Based FPs in EH.

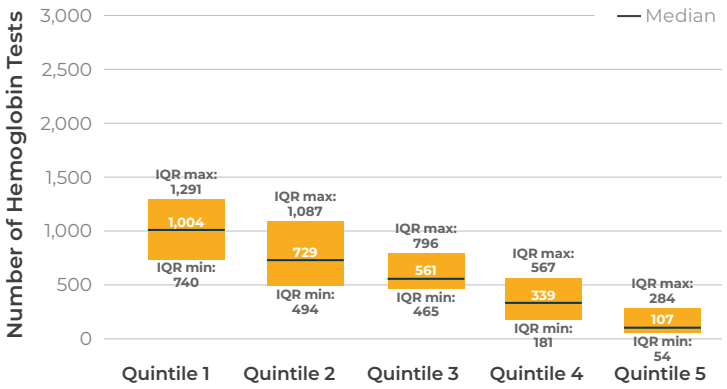


Figure 2. Median and Interquartile Range of Hb Tests by Quintile of Billings for Fee-Based FPs in EH.

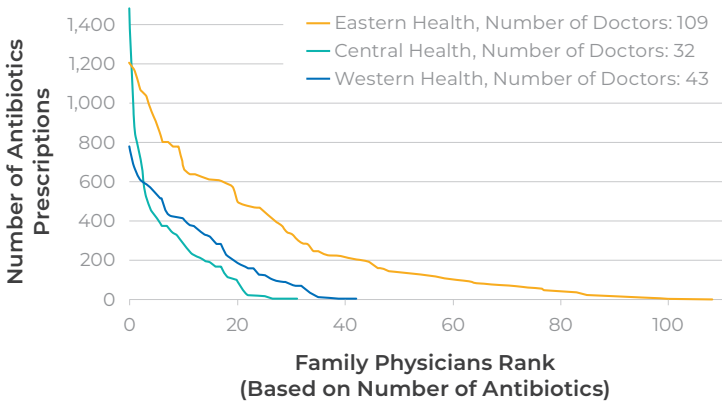


Figure 3. Number of Antibiotics Prescribed by Non-Fee-Based FPs Ranked by FP in Each Region.

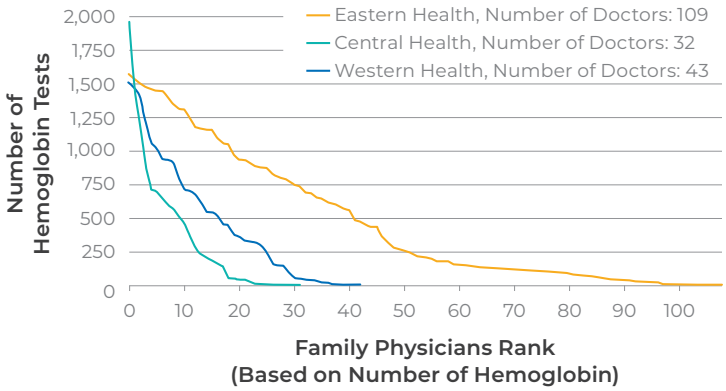


Figure 4. Number of Hb tests ordered by non-fee-based FPs, ranked by FP in each region.

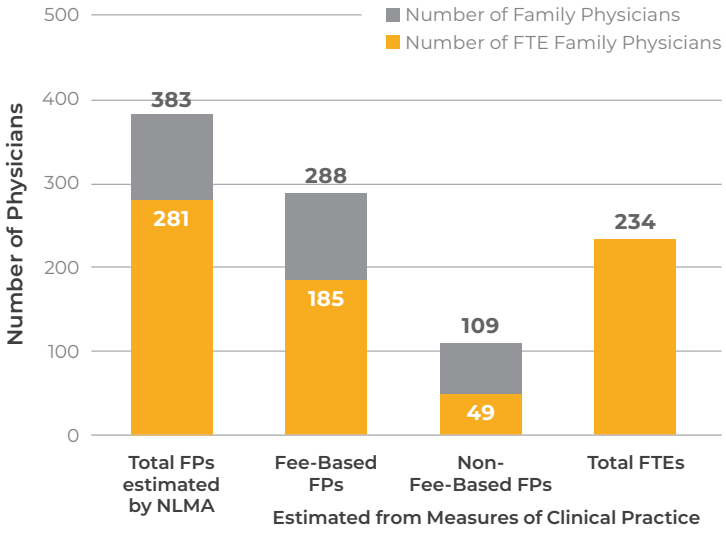


Figure 5. Number of FTE FPs estimated in EH by the NLMA and by measures of clinical practice.

- NLMA had a record of 383 FPs in EH and estimated 281 FTE FPs in clinical practice.
- Clinical practice data identified 397 FPs.
- Billings suggested 116 full time fee-based FPs and a further 172 FPs in the bottom 3 quintiles who represented 69 FTEs.
- Estimate of clinical practice of 109 non-fee-based FPs suggested a further 49 FTEs for a total of 234 FTEs in EH.

Central Health (CH)

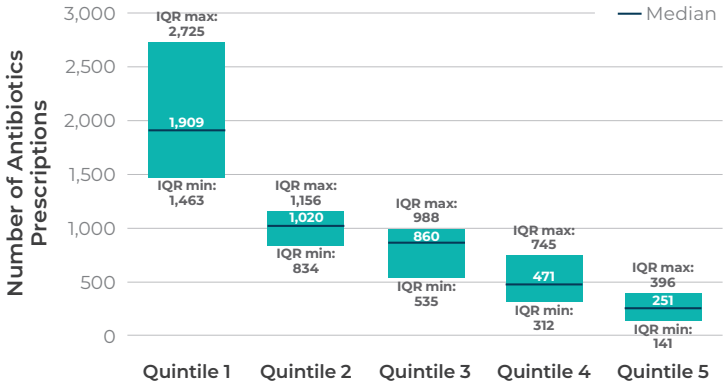


Figure 6. Median and interquartile range of antibiotic prescriptions by quintile of billings for fee-based FPs in CH.

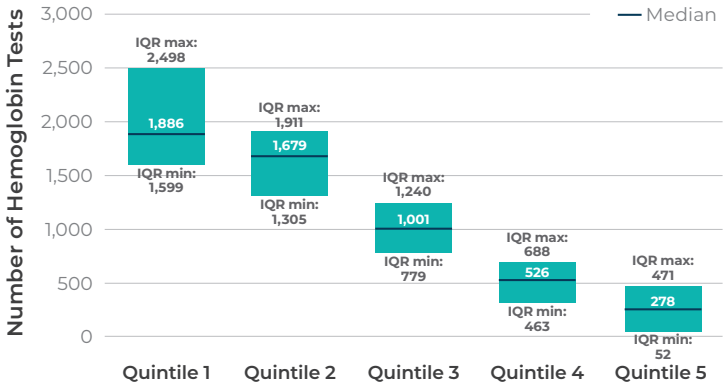


Figure 7. Median and interquartile range of Hb tests by quintile of billings for fee-based FPs in CH.

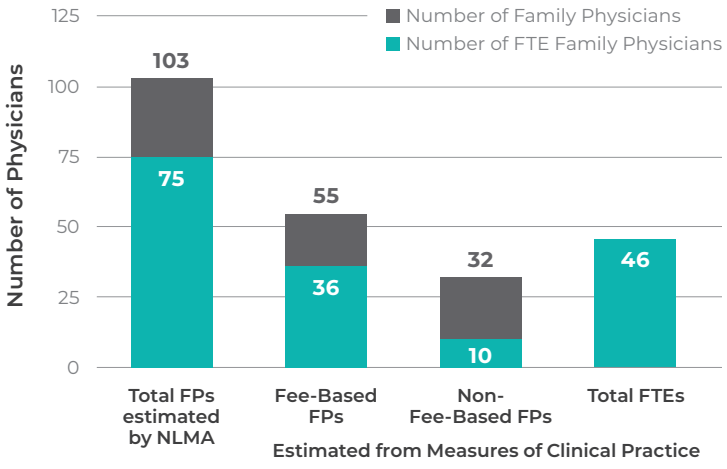


Figure 8. Number of FTE FPs estimated in CH by the NLMA and by measures of clinical practice.

- NLMA estimated 75 FTEs in family practice.
- Clinical practice data identified 87 FPs.
- Billings suggested 22 full-time fee-based FPs and a further 33 FPs in the bottom 3 quintiles who represented 14 FTEs.
- Estimates of clinical practice of 32 Salaried FPs suggested 10 FTEs.
- The total FTEs in CH was 46.

Western Health (WH)

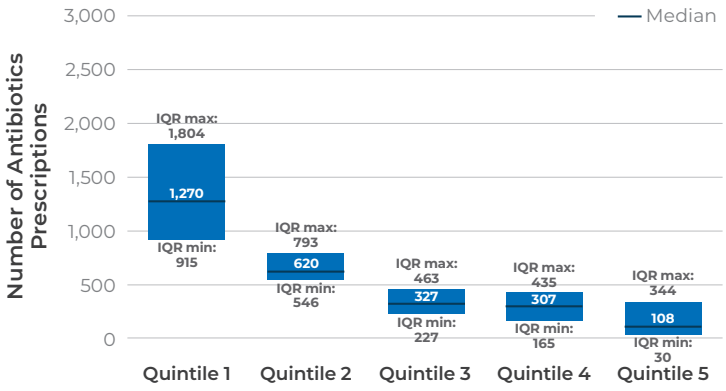


Figure 9. Median and interquartile range of antibiotics prescriptions by quintile of billings for fee-based FPs in WH.

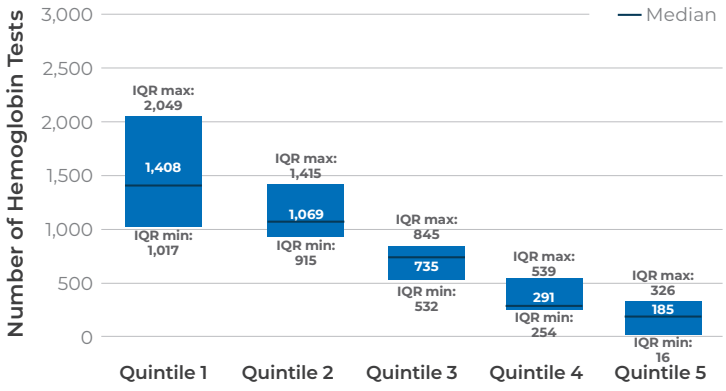


Figure 10. Median and interquartile range of Hb testing by quintile of billings for fee-based FPs in WH.

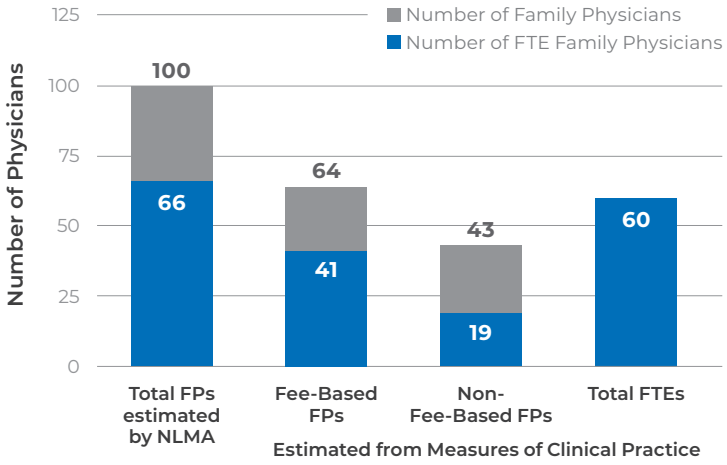


Figure 11. Number of FTE FPs in WH estimated by the NLMA and by measures of clinical practice.

- NLMA had a record of 100 FPs in WH, and estimated 66 FTEs in family practice.
- Clincal practice data identified 107 family physicians.
- Billings suggested 26 full-time fee-based FPs and a further 38 FPs in the bottom 3 quintiles who represented 15 FTEs.
- Estimates of clinical practice of 43 non-fee-based FPs suggested a further 19 FTEs.
- The total FTEs in WH was 60.

Conclusions

1. NLMA have estimated that 383 FPs in EH represent 281 FTEs. From billings and assuming that measures of clinical practice in fee-based FPs apply to non-fee-based FPs, we estimate 234 FTEs.
2. In CH, of 103 FPs, NLMA estimated 75 FTEs and our data suggests 46. Clinical practice data identified 15 fewer FPs than NLMA.
3. In WH, of 100 FPs, NLMA estimated 66 FTEs and our data suggests 60.
4. Although NL has the highest rate of doctors per capita, the number of FTE FPs is substantially less than the number registered: 72% of those registered estimated by the NLMA and 59% based on estimates of clinical practice.
5. It is likely that non-fee-based doctors see fewer patients than fee-based, and metrics of clinical practice are based on those of fee-based family physicians.

(Practice Points Vol. 6, Jul–Dec 2019)

After-Hours Care Provisions by Family Physicians and Non-Urgent Emergency Department Visits in St. John's

Objective

To describe the relationship between after-hours care provisions by Family Physicians (FPs) who were practicing full time in St. John's and non-urgent emergency department (ED) visits made by adult patients from St. John's who were patients of those FPs.

Practice Points

1. In Canada, wait times for patients in EDs are rising year-on-year and are already among the highest of OECD countries.

2. Self-reported wait times in EDs in NL are the second highest compared to the other provinces in Canada, with 39% waiting 4 or more hours in an ED before receiving any care.

3. 60% of all patients who present to EDs in Canada are non-urgent with Canadian Triage and Acuity Scale (CTAS) scores of 4 or 5. This is an important contributor to long wait times.

4. There are some primary care options for patients outside of normal FP working hours, but often EDs are the only option during this time.

Methods (J Siromani)

1. FP and ED Visit data on patients from the St. John's Metro region across the 4-year study period (1 Apr 2011 - 31 Mar 2015) were obtained from NL Centre for Health Information and from the Academic Family Medicine clinics.

2. Non-urgent ED visits were defined by a CTAS score of 4 or 5.

3. Fee-For-Service FPs were categorized into those with (1) less than 5% of billings for after-hours, (2) 5-14%, (3) 15-24%, or (4) greater than 24% for after-hours billings. Academic FPs comprised a fifth group, which had an FP available on-call to provide telephonic advice/triage and accept patient visits where necessary.

4. Non-urgent ED visit rates were compared across these groups using a statistical method that adjusts for group differences (e.g. sex, age, and comorbidity).

Results

Table 1. Non-urgent Emergency Department Visits Made by Patients from St. John's

	Number of Patients	Percent
0 visits	68,630	57.5
1–4 visits	45,704	38.3
5–9 visits	3,968	3.3
10–19 visits	959	0.8
20 or more visits	182	0.2
Total	119,443	100.0

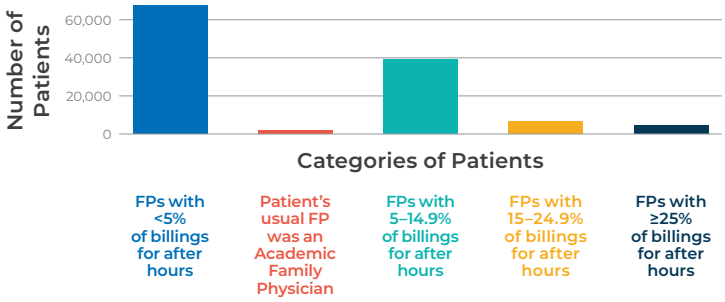


Figure 1. Patients with Non-urgent ED Visits Categorized by Their Usual (Respective) Family Physicians

- Patients of Memorial University affiliated Academic FPs were 17% less likely to make non-urgent ED visits compared to FPs with little or no after-hours practice.

- There was no difference in non-urgent ED visits for patients of FPs who submitted 5-14%, 15-24%, or greater than 24% of billings for after-hours care compared to FPs with little or no after-hours care.

Conclusions

1. The model of care provided by Academic FPs is associated with a lower number of non-urgent ED visits.

2. The after-hours care provided by Fee-For-Service FPs does not appear to prevent non-urgent ED visits.

3. Results were adjusted for some differences in case-mix between physician groups, but this adjustment may not have been complete, which is a limitation.

(Practice Points Vol. 7, Jan–Jun 2020)

The Impact of eOrdering for Cardiac Catheterization on Population Rates by RHA and on Diagnosis of Critical Coronary Artery Disease

Objective

To determine whether the objectives of eOrdering Cardiac Catheterization (CC) were achieved: similar rates of CC across Regional Health Authorities (RHAs) and improvement in percentage diagnosed with critical coronary artery disease (CAD).

Practice Points

1. Electronic ordering of CC with embedded decision supports was undertaken using MyCCath (a Mobia developed tool) in the CC Unit of the Health Sciences Centre, the provincial centre for CC.

2. The decision tool included the Thrombolysis in Myocardial Infarction (TIMI) score which predicts risk for adverse outcomes in patients with acute coronary syndrome (ACS).

3. Prior to introduction of MyCCath, Western Health had the lowest rate of CC/1,000 population but the highest rate of diagnosis of critical CAD.

4. Initial evaluation revealed that users of MyCCath felt it improved the referral process and that they supported its introduction.

5. Audit, feedback, and academic detailing was undertaken in 2019 for 46 referring physicians to improve selection of patients with stable angina for CC who had high risk features.

Methods

1. MyCCath was introduced in Dec 2017 and in Feb 2019 referrals could only be made electronically.

2. Data was obtained on patients who had CC for CAD from 2014-2017 (pre-MyCCath) and for 2019 (post-MyCCAth) from the APPROACH database to determine rates of CC by indication and the percent diagnosed with critical CAD. Rates were standardized for age and sex/1,000 adults/year to facilitate accurate comparison of RHAs.

Results

Table 1. Age Standardized Rates/1,000 Adults/Year of CC for Stable Angina and Percent Diagnosed With Critical CAD Analyzed by RHA Before and After Introduction of Electronic Ordering

	Eastern (EH)	Central (CH)	Western (WH)	Labrador-Grenfell (LGH)
Age Standardized Rate/1,000 Adults 2014–17 (per year)	2.35	2.89	1.52	1.76
Age Standardized Rate/1,000 Adults 2019	1.74	2.69	1.13	0.93
% Critical CAD 2014–17	50.2	50.0	58.8	57.3
% Critical CAD 2019	58.7	57.2	59.5	72.4

- In all four regions, rate of referral for CC for stable angina in 2019 fell. The provincial age standardized rate was 1.77 (95% CI: 1.64% – 1.89) in 2019.
- Rate of referral was significantly higher than the provincial rate in CH and significantly lower in WH and LGH.
- Rate of diagnosis of critical CAD improved from 51% to 59%.
- In 2019, 11% of those who had CC for stable angina had more atypical symptoms or angina on strenuous activity (CCSI), 58% had angina with slight exercise limitation and 31% had angina with severe exercise limitation.

Table 2. Age Standardized Rates/1,000 Adults/Year of CC for STEMI and Percent Diagnosed With Critical CAD Analyzed by RHA Before and After Introduction of Electronic Ordering

	Eastern	Central	Western	Labrador-Grenfell
Age Standardized Rate/1,000 Adults 2014–17 (per year)	0.86	0.84	0.69	0.77
Age Standardized Rate/1,000 Adults 2019	0.91	0.98	1.08	1.03
% Critical CAD 2014–17	78.0	71.0	77.0	70.3
% Critical CAD 2019	75.6	85.0	78.0	71.0

- Rate of CC for ST Elevated Myocardial Infarction (STEMI) increased in all four regions, particularly in WH.
- The provincial age standardized rate in 2019 was 0.96 (95% CI: 0.86 – 1.05).

- Despite increase in utilization the provincial rate of diagnosis was good at 77%, similar to that in 2014–2017 (76%).

TABLE 3. Age Standardized Rates/1,000 Adults/Year of CC for NSTEMI and Percent Diagnosed With Critical CAD Analyzed by RHA Before and After Introduction of Electronic Ordering

	Eastern	Central	Western	Labrador-Grenfell
Age Standardized Rate/1,000 Adults 2014–17 (per year)	2.11	2.33	1.34	2.05
Age Standardized Rate/1,000 Adults 2019	2.37	2.37	2.05	2.44
% Critical CAD 2014–17	68.9	67.8	73.5	62.9
% Critical CAD 2019	71.0	70.0	65.0	76.0

- The standardized rates of CC for Non ST Elevated Myocardial Infarction (NSTEMI) increased, particularly in WH. This was accompanied by a fall in percent diagnosed with critical CAD from 73.5 to 65.
- The age standardized rate for the province in 2019 was 2.32 (95% CI: 2.18 – 2.47).
- Percent diagnosed with critical CAD was 69%, similar to 2014–2017 (69%).

TABLE 4. Age Standardized Rates/1,000 Adults/Year of CC for Unstable Angina and Percent Diagnosed With Critical CAD Analyzed by RHA Before and After Introduction of Electronic Ordering

	Eastern	Central	Western	Labrador-Grenfell
Age Standardized Rate/1,000 Adults 2014–17 (per year)	0.87	1.01	0.69	0.94
Age Standardized Rate/1,000 Adults 2019	0.85	0.92	0.92	1.10
% Critical CAD 2014–17	55.7	58.7	64.7	36.6
% Critical CAD 2019	60.0	63.6	54.0	48.5

- The age standardized rate for the province was 0.89 (95% CI: 0.80 – 0.98).
- The rate increased in WH with percent diagnosed with critical CAD falling from 65 to 54.
- The percent diagnosed in the province with critical CAD who had unstable angina was 56% in 2014–2017 and in 2019 it was 59%.

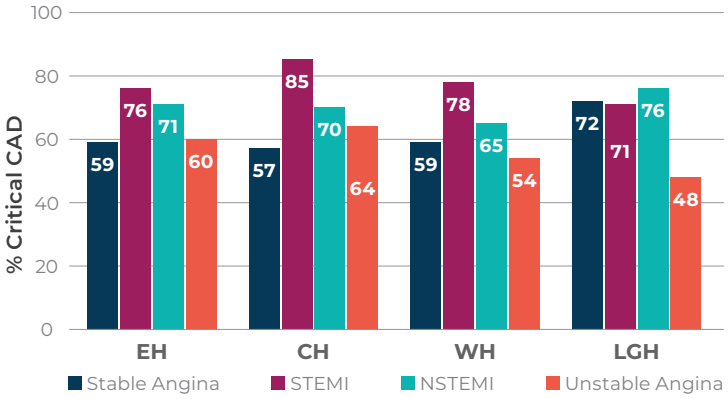


Figure 1. Percent Diagnosed With Critical CAD by Indication and by RHA in 2019

- In 2019, the provincial rate of diagnosis of critical CAD was 59% for stable angina, 77% for STEMI, 70% for NSTEMI, and 59% for unstable angina.

Conclusions

1. Rates of CC use for stable angina decreased in 2019 and percent diagnosed with critical CAD increased associated with introduction of eOrdering and of audit, feedback, and academic detailing.
2. Potential exists to reduce CC in stable angina in patients with CCS scores 1 and 2.
3. Rates of CC use for STEMI increased and percent diagnosed with critical CAD was 77%, close to optimal target.
4. Rates of CC for NSTEMI increased and percent diagnosed with critical CAD was 70%, a good result in the era of high sensitivity Troponin use.
5. Rates of CC use for unstable angina increased in WH but percent diagnosed with critical CAD decreased.
6. The provincial rate of diagnosis of critical CAD in stable angina was 59% in 2019, whereas during COVID-19, the rate of diagnosis fell to 48% instead of increasing at a time of forced rationing. These facts support an educational intervention for referring physicians.
7. eOrdering facilitated appropriate decrease in the use of CC for stable angina and appropriate increase in the use for STEMI and Acute Coronary Syndrome (ACS). However, the educational intervention likely had additional benefit in stable angina where percent with critical CAD improved.
8. Audit, feedback, and academic detailing on the work up and referral strategy for CC in ACS should be undertaken with referring physicians.

(Practice Points Vol. 7, Jan–Jun 2020)

The Impact of an Educational Intervention on the Diagnosis of Critical Coronary Artery Disease in Men and Women With Stable Angina by Age

Objective

To compare rates of diagnosis of critical coronary artery (CAD) disease by indication following the introduction of universal use of eOrdering at a time when an educational intervention for management of stable angina was undertaken.

Practice Points

1. In February 2019, ordering of a cardiac catheterization (CC) in NL could only be undertaken electronically using MyCCath.

2. In 2019, audit, feedback, and academic detailing of 46 referring physicians was undertaken to improve appropriate referral of patients with stable angina, particularly in women in whom the rate of diagnosis of critical CAD from 2014–2017 was 32%.

3. No educational program was undertaken in patients with ST Elevated Myocardial Infarction (STEMI) and Acute Coronary Syndrome (ACS). ACS comprises Non ST Elevated Myocardial Infarction (NSTEMI), in whom the use of CC may have been influenced by the advent of high sensitivity troponin tests, and unstable angina, in whom CC may be undertaken in patients with chest pain falsely attributed to CAD.

4. The hypothesis was that the use of the thrombolysis Myocardial Infarction (TIMI) score in the eOrdering tool, MyCCath, may be associated with some improvement in the rate of diagnosis of critical CAD in ACS but that the educational intervention would increase the rate more in patients with stable angina, particularly women and people <60 years.

Methods

1. Patients in the APPROACH database who had cardiac catheterization for CAD were analyzed for the period 1 Jan 2019 – 15 Mar 2020 (63 weeks) by indication, age and sex, and compared to comparable groups in 2014–2017. Critical CAD was defined as ≥1 coronary artery with ≥70% stenosis or ≥50% stenosis of left main coronary artery.

Results

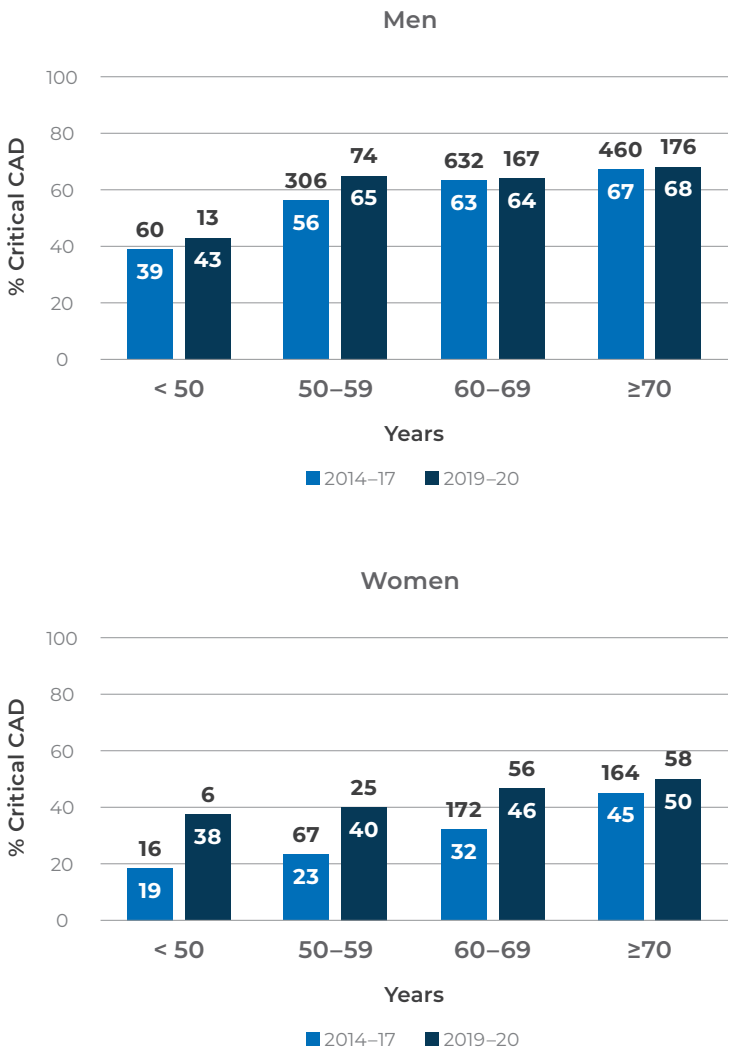
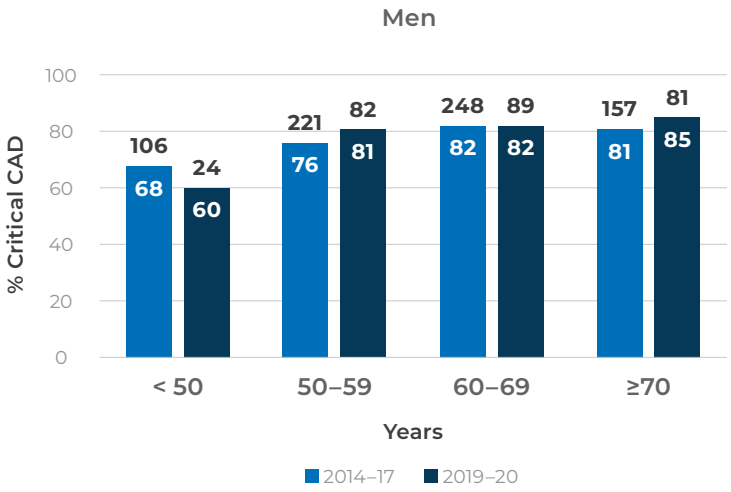


Figure 1. Percent Diagnosed With CAD in Men and Women With Stable Angina by Age in 2014–2017 and 2019–2020

- For men <60 years, improvement in percent with critical CAD was observed: overall rate improved from 60% in 2014-2017 to 65% in 2019-2020.

- For women, substantial improvement in the rate of diagnosis was observed in 2019-2020: overall the rate improved from 32% to 46%.



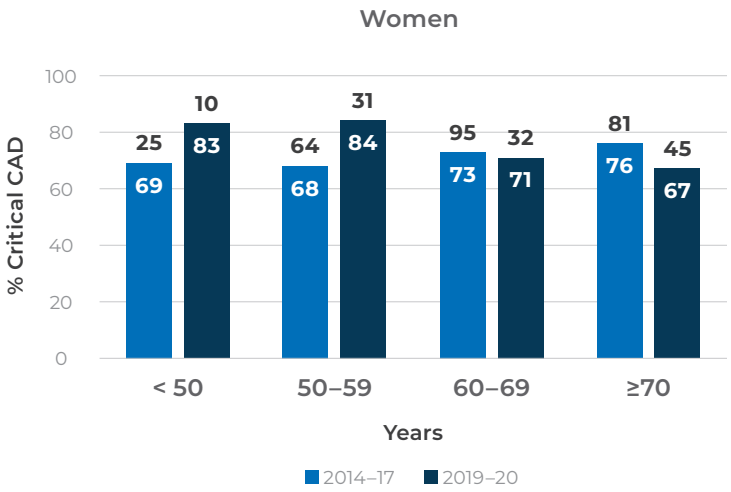
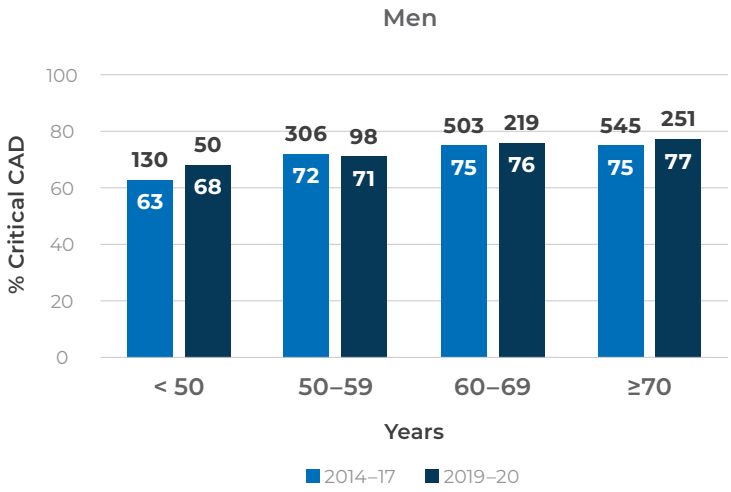


Figure 2. Percent Diagnosed With Critical CAD in Men and Women with STEMI by Age in 2014–2017 and 2019–2020

- Overall rate of diagnosis in men with STEMI was 80% in 2019–2020, compared to 78% in 2014–2017.
- Overall rate of diagnosis with critical CAD in women with STEMI was 77% in 2019–2020 and 72% in 2014–2017.



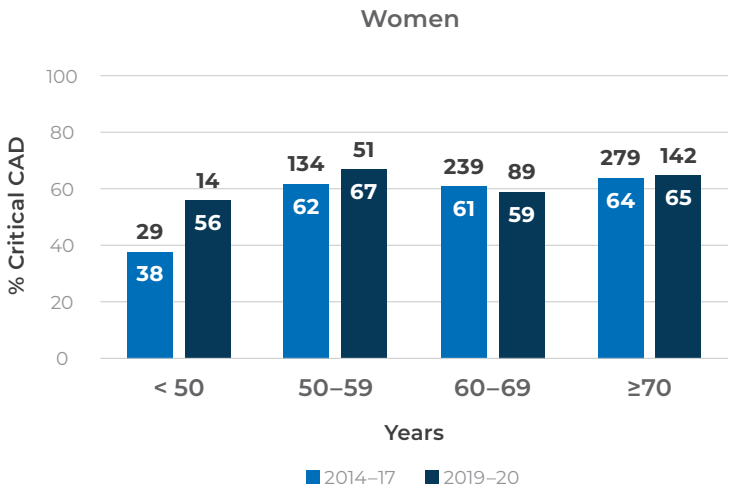


Figure 3. Percent Diagnosed With Critical CAD in Men and Women With NSTEMI by Age in 2014–2017 and 2019–2020

- Overall the rate of diagnosis in men with NSTEMI in 2019-2020 was 75% compared to 73% in 2014–2017.
- Overall the rate of diagnosis in females with NSTEMI was 63% in 2019–2020 compared to 61% 2014–2017.

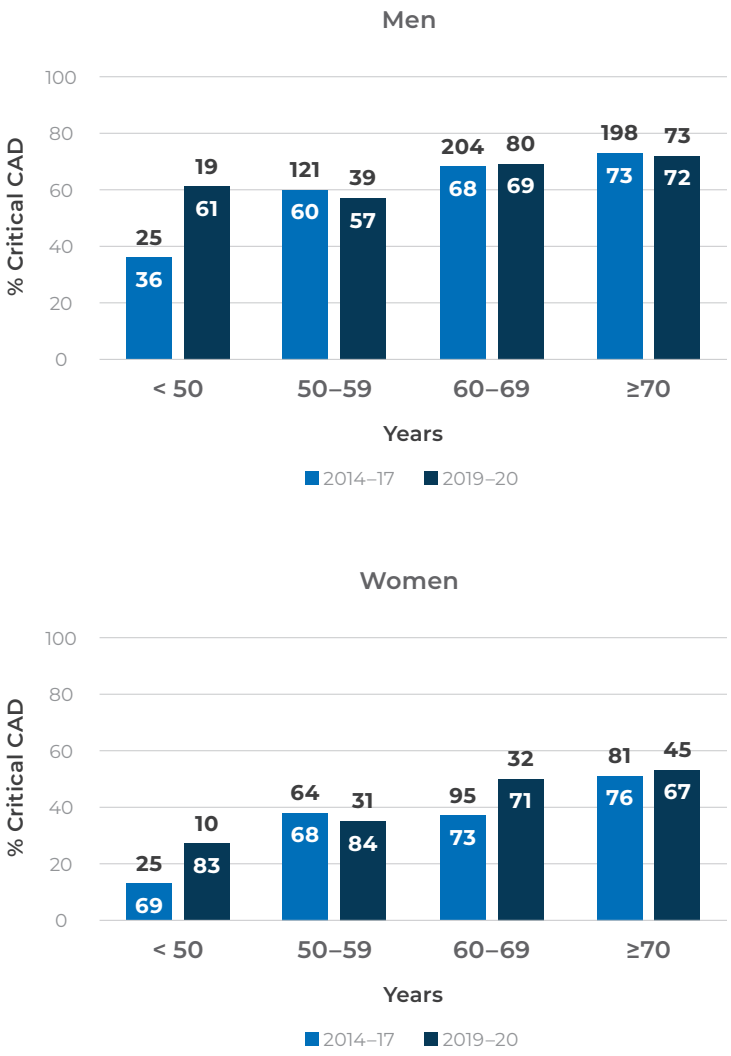


Figure 4. Percent Diagnosed With Critical CAD in Men and Women With Unstable Angina by Age in 2014–2017 and 2019–2020

- Overall, percent diagnosed with CAD in males with unstable angina was 67% in 2019–2020 compared to 65% in 2014–2017.
- Overall, the percent diagnosed with critical CAD in females with unstable angina was 46% in 2019–2020 compared to 40% in 2014–2017.

Conclusions

1. eOrdering and the educational intervention in stable angina were associated with an improvement in the diagnosis of critical CAD in men <60 years from 52% to 60% and in women from 32% to 46%.
2. In the groups with no educational intervention, the rate of diagnosis in men with STEMI was virtually unchanged, but a bigger improvement was observed in women. A small change was observed in NSTEMI (an absolute difference of 2%) and in unstable angina (3%).
3. In view of relatively low rates of diagnosis of critical CAD in unstable angina, particularly in women, and the benefit of an educational program on stable angina management, an educational program involving audit, feedback and academic detailing is indicated for referring physicians.

(Practice Points Vol. 7, Jan–Jun 2020)

Peripheral Artery Testing by Indication and Diagnosis of Critical Disease at St Clare's Hospital

Choosing Wisely Canada Recommendations

1. Don't perform percutaneous interventions or bypass surgery as first line therapy in patients with asymptomatic peripheral artery disease (PAD) and in most patients with claudication.
2. Do not suggest a test that will not change the patient's clinical course.

Practice Points

1. Patients with rest pain, tissue loss, or severe claudication need testing urgently because they may benefit from revascularization if critical Peripheral Artery (PA) stenosis is identified. Follow-up testing after revascularization is often undertaken.
2. Patients with atypical symptoms like numbness, paranesthesia, leg cramps, Raynaud's phenomenon do not need PA testing, nor do asymptomatic patients with absent pedal pulses or digital cyanosis.
3. There is no evidence that screening for PAD is beneficial.

Methods

1. Indications for PA testing (Ankle-brachial index and Doppler ultrasound) and results of testing were obtained from the Vascular Laboratory at St Clare's Hospital for 2018 (n=937) and 2019 (n=1,027).

Results

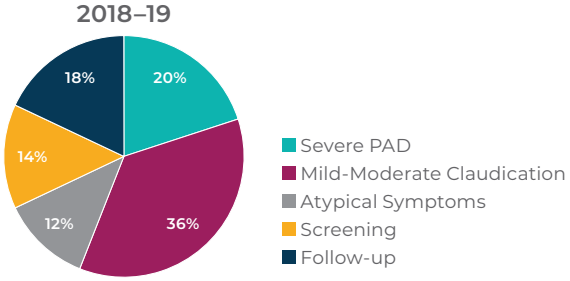


Figure 1. Indications for PA Testing in 2018–19

- There was no difference in indications for 2018 compared to 2019.
- Proportion who needed PA testing because they had manifestations of severe PAD was 20% and who had testing in follow-up was 18%.
- The majority had indications for whom PA testing was not needed.

Table 1. Number of Patients Who had PA Testing by Indication and by Diagnosis of Critical PAD in 2018–19

Indication	Critical Stenosis	Mild-Moderate	Normal	Total
Severe PAD	109	143	138	390
Mild-Moderate Claudication	69	461	190	720
Atypical Symptoms	20	73	141	234
Screening	17	74	181	272
Follow-up	47	187	114	348
Total	262	938	764	1,964

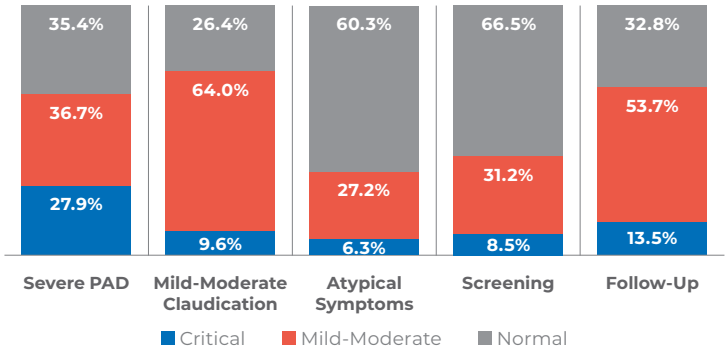


Figure 2. Diagnosis of Critical PAD by Indication

- In patients tested because they had manifestations of severe PAD, 28% had critical stenosis, whereas in patients with mild to moderate claudication, 9.6% had critical disease.
- Critical PAD was identified in 8.5% with atypical symptoms and in 6.3% of those being screened.

Conclusions

1. The majority of patients referred for PA testing did not need testing because they had mild-moderate claudication, atypical symptoms or were being screened. Although cases with critical stenotic disease were identified, intervention with revascularization would be unlikely in the absence of severe clinical manifestations of PAD.
2. No impact on the appropriateness of ordering PA tests was observed following knowledge translation interventions with Eastern Health family physicians in 2018.
3. eOrdering for the vascular laboratory has started with the intent to improve the time to testing in patients with severe PAD and decrease the rate of inappropriate testing.

(Practice Points Vol. 5, Jan–Jun 2019)

Carotid Artery Testing for Stroke Prevention in NL

Guideline

Canadian Stroke Best Practice Recommendations states that carotid artery territory transient ischemic attack (TIA) is a medical emergency and patients need either carotid artery ultrasound or CT angiogram within 24 hours.

Objectives

To determine whether the reduction in carotid artery testing at St. Clare's Hospital was associated with an increase in other diagnostic modalities, and whether the rate of appropriate ordering of carotid artery testing had improved following academic detailing.

Practice Points

1. 19% of strokes in NL are secondary to warning symptoms of Transient Ischemic Attack (TIA), the highest rate in Canada.

2. Secondary strokes are preventable in patients with carotid artery territory TIA because early carotid revascularization is efficacious in symptomatic patients with critical carotid stenosis.

   Consequently, carotid artery territory TIA is a medical emergency and these patients need either carotid artery ultrasound or CT angiogram within 24 hours.

3. Carotid artery testing is appropriate when there are rapid onset symptoms arising from the carotid artery territory including:

   - Unilateral weakness of face/arm/leg
   - Speech disturbance (aphasia and/or dysarthria)
   - Monocular visual loss (Amaurosis Fugax), or loss of one visual field (Homonymous Hemianopia)

Data

- St. Clare's Vascular Laboratory provided data on carotid ultrasound, and NLCHI provided data on volume of carotid ultrasounds undertaken in other hospitals and of CT/MRI carotid tests.

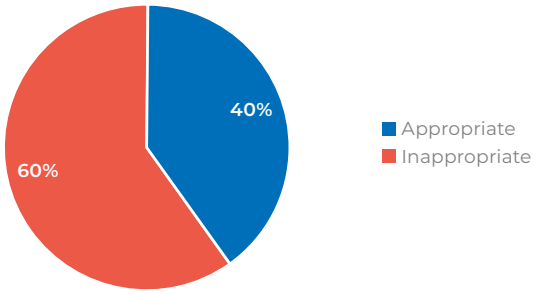
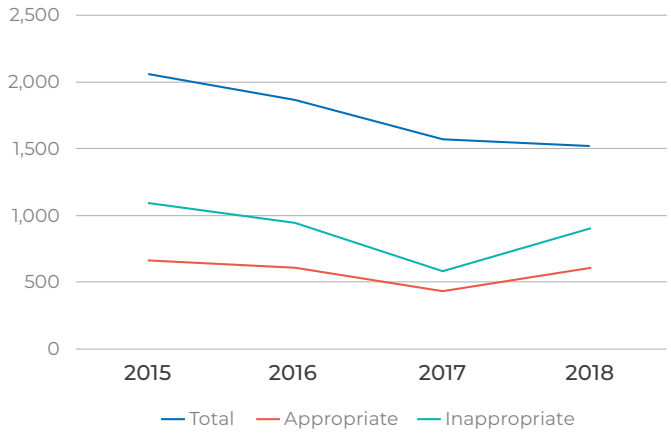


Figure 1. Carotid Artery Testing at St. Clare's (2007–2015) N=17,600

- 40% of carotid artery tests ordered were indicated.
- More recent data (2015–2018) shows the proportion of appropriate carotid artery tests to overall number of tests performed at the Vascular Lab has not changed.

Carotid Artery Test Appropriateness



40% of carotid tests were indicated.

Figure 2. Volume of Carotid Artery Testing at St. Clare's 2015–2018

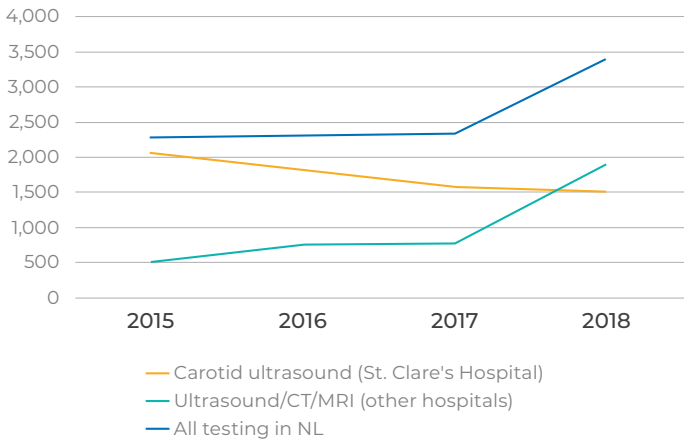


Figure 3. Volume of Carotid Artery Testing in NL 2015–2018

- The volume of carotid artery testing at the Vascular Lab has decreased.
- At the same time, the volume of carotid artery tests (e.g., carotid ultrasound, CT angiograms, MRI) at other health care facilities across the province has increased.

Wait Times

At the Vascular Lab, wait time for a Priority 1 (recent TIA) test decreased from 9 to 2.2 days in 2017. However, the optimal wait time is within 1 day.

Solution: An eOrdering form launched within HEALTHeNL, the provincial Electronic Health Record, which will includes a decision tool to determine priority and automatic scheduling.

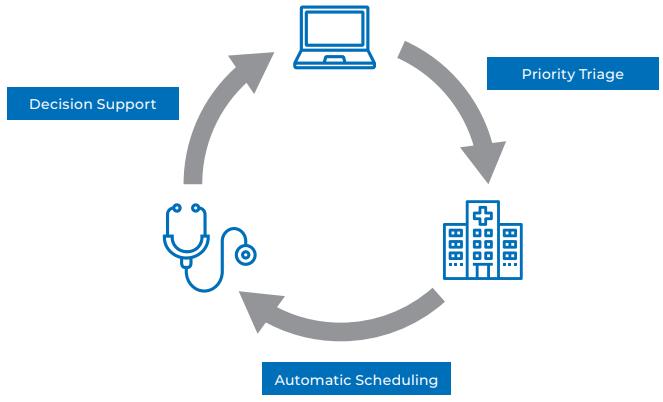


Fig. 4. Basic Components of the eOrdering Solutions

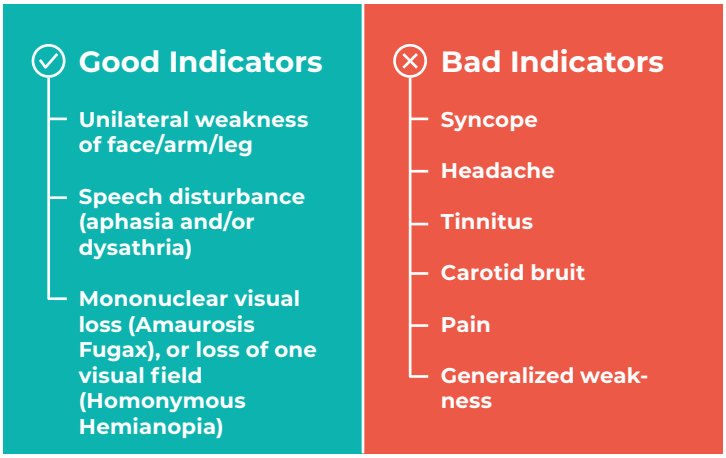


Figure 5. When to Test?

Conclusions

1. 40% of carotid artery tests in the Vascular Lab were indicated.
2. Carotid artery testing across the province has increased.
3. The wait time for high priority patients at the Vascular Lab has decreased but is still not optimal.
4. The objective of eOrdering is to increase the volume of necessary tests and improve wait time in high priority patients with carotid artery territory symptoms.

(Practice Points Vol. 5, Jan–Jun 2019)

Low Thrombolysis Rates for Ischemic Stroke Persisted in Eastern Health in 2018

Canadian Stroke Best Practice Recommendation

Administer intravenous thrombolytics (tPA) for ischemic stroke within 4.5 hours of stroke onset.

Practice Points

1. In NL, thrombolysis rates are poor. In 2017–2018, administration rates were <10% in all regions except Labrador-Grenfell where they were 19%. Target rates should be >25%.
2. In Eastern Health (EH), rates were ≤10% in St. Clare's, Burin, and Carbonear hospitals.
3. Knowledge translation on best practice was undertaken from 2016 onwards.

Methods

1. Data were obtained from the Provincial Stroke Measuring and Monitoring Working Group (Project 340) collected by EH.
2. Rate of thrombolysis was the number of tPA administrations divided by the number of ischemic strokes in a given time.
3. In 2018–2019, verified data were available from 1 Apr – 30 Oct (6 months).

Data

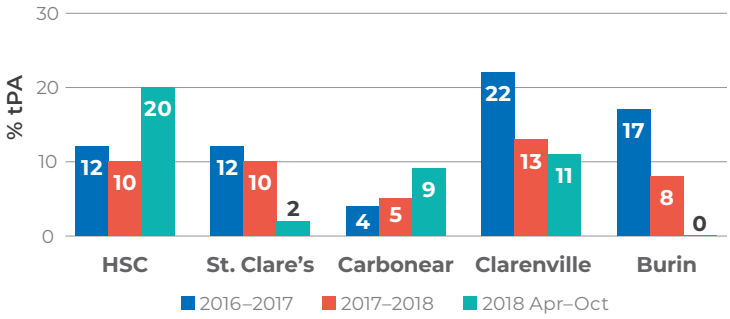


Figure 1. Rate of tPA per 100 Strokes by Year and by Hospital in EH

- Compared to 2016–2017, there was a significant increase in tPA rates in 2018 (April to October) at the Health Sciences Centre (HSC) (from 12% to 20%), but a significant decrease in rates in St Clare's, Clarenville, and Burin.

Conclusions

1. Knowledge translation did not lead to an overall improvement in thrombolysis rates at EH hospitals.
2. Implementation of process changes using CODE STROKE, a standardised evidence-based, hyperacute stroke management protocol, with electronic moni-toring of times to events in the process, is necessary.

Table 1. Number of tPA Administrations and of Ischemic Strokes (IS) in EH Hospitals by Year

Year	HSC		St. Clare's		Carbonear		Clarenville		Burin		Total	
	N tPA	N IS	N tPA	N IS	N tPA	N IS	N tPA	N IS	N tPA	N IS	N tPA	N IS
2016–2017	22	184	12	98	3	71	8	36	5	29	50	418
2017–2018	20	193	10	90	3	62	3	23	2	24	38	392
2018 (Apr–Oct)	24	112	2	44	4	45	2	19	0	7	32	227

(Practice Points Vol. 6, Jul–Dec 2019)

Improvement in Access to Colonoscopy in Eastern Health But Not in Western Health

Guideline

Access to colonoscopy should be guided by priority as defined by the Canadian Association of Gastroenterology (CAG).

Practice Points

1. Optimal times for **Priority 1 (Urgent):** 0–14 days; **Priority 2 (Non-Urgent):** 0–60 days; **Priority 3 (Baseline Screening):** 0–182 days

2. Previous review of colonoscopy referrals in 2016 and 2017 showed that access was not optimal, but that it had improved in Eastern Health (EH) but not in Western Health (WH).

Methods

1. Data was obtained from Community Wide Scheduler for five hospitals in EH: Burin, Carbonear, GB Cross, Health Sciences Centre (HSC) and St. Clare's Mercy (SCM), and from two hospitals in WH: Western Memorial (WM) and Sir Thomas Roddick (STR).

2. During 2017, waitlist management was ongoing in the Tri-Peninsulas' hospitals of EH and continued in the remaining two city hospitals in 2018. A formal utilization review was not performed in WH.

3. Referral rates and wait time evaluation was compared regionally and by year.

Results

Table 1. Summary of Colonoscopy Referral Rates

	Referral Rate per 1,000 persons (≥20 yrs)					
	Eastern Health			Western Health		
	2016	2017	2018	2016	2017	2018
Priority 1	6.4	5.6	5.7	6.2	4.8	4.6
Priority 2	18.9	18.7	19.3	26.4	30.5	40.2
Priority 3	4.9	4.3	3.2	2.1	1.2	1.3
Total	30.2	30.6	28.2	34.7	36.5	46.1

- WH referrals for priority 2 indications were substantially higher than for EH, particularly in 2018.

Table 2. Comparison of Median Time to Colonoscopy by Priority and Region for 2016–2018 Data

	Median Time to Colonoscopy (Days)								
	Priority 1			Priority 2			Priority 3		
Region	2016	2017	2018	2016	2017	2018	2016	2017	2018
Tri-Peninsulas[1]	14	9	9	135	78	51	NA	119	165
St. John's[2]	22	20	17	41	40	42	211	132	95
Eastern Health	17	13	11	57	51	47	286	126	118
Western Health	12	13	14	49	63	84	153	207	185

[1] Burin, Carbonear & GB Cross
[2] HSC & SCM

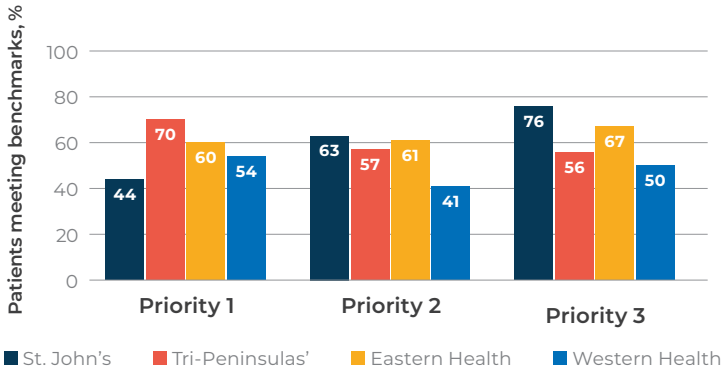


Figure 1. Percentage of Patients Meeting Benchmarks by Priority and by Region in 2018

Conclusions

1. From 2016–2018, population rates for priority 1-3 colonoscopy decreased slightly for EH but increased substantially for WH. This was due to an increase in priority 2 referrals in WH.

2. Access to colonoscopy, defined by priority, has significantly improved from 2016–2018 in EH but has deteriorated in WH. Improvement in EH was associated with utilization review in these hospitals.

3. Percentage of patients meeting benchmarks for optimal time to access colonoscopy, defined by priority, was not optimal in either EH or WH.

(Practice Points Vol. 4, May–Dec 2018)

Demand for and Access to Orthopedic Interventions in St. John's

Guidelines From Bone and Joint Canada

1. Hip fractures should be fixated within 48 hours.
2. Knee and hip replacements should be undertaken within six months from decision to proceed to having the procedure.

Practice Points

1. By 2036 the number of people aged 65 years or older in NL will increase by 50% compared to 2016. In the St. John's region the number will increase by 67%.
2. Demand for knee and hip replacements will increase, as will the incidence of hip fractures.

Data (PI Dr. A. Furey)

- Referral data was collected from Central Intake database, joint replacement surgical data from Total Joint AC database and Cognos surgical cube for St. Clare's Hospital and Health Sciences Centre.

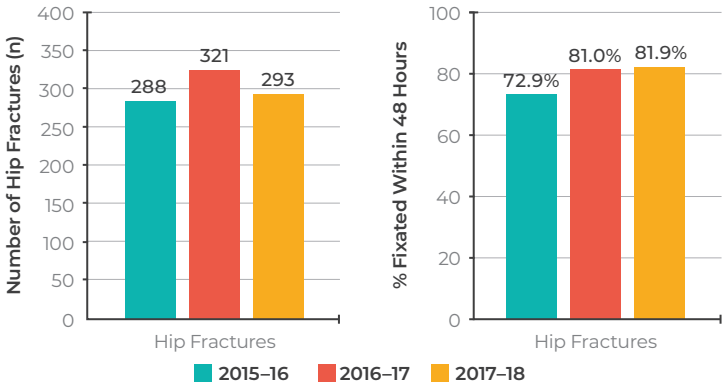


Figure 1. Annual Incidence of Hip Fractures and Proportion Fixated within 48 hours (2015–2018)

- Annual incidence of hip fractures is approximately 300 and approximately 80% are fixated within 48 hours.

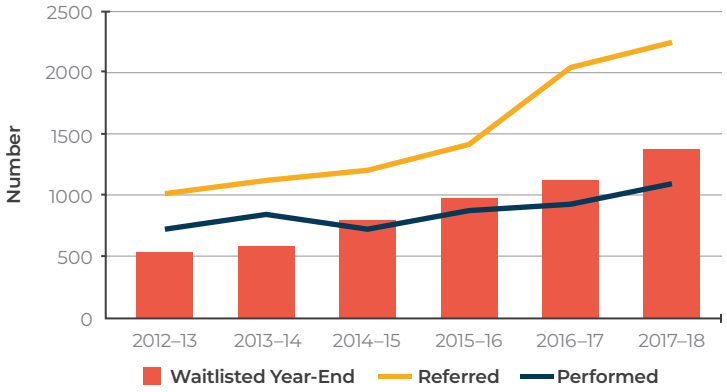


Figure 2. Hip and Knee Replacements by Fiscal Year, Number Referred, Performed, on Waitlist (2012–13 to 2017–18)

- Number of referrals increased by 185% from 2012 to 2018.
- Number added to the wait list increased by 161%.
- Number of replacements undertaken increased by 50%.
- In 2017–18, 63% of knee replacements and 75% of hip replacements were undertaken within 6 months of being placed on the wait list.

Conclusions

1. There is an inexorable increase in demand for joint replacement and limited capacity to meet the demand. Consequently, only 63% of knee and 75% of hip replacements are undertaken within the recommended time, and the waitlist increases annually.
2. There is constant incidence of hip fractures and 80% are fixated within the recommended time.
3. Demographic change will exacerbate delayed access for orthopedic interventions.

(Practice Points Vol. 7, Jan–Jun 2020)

Improvement in Time From Abnormal Screening Mammogram to Final Diagnostic Test in NL over 6 Years (2014–2019)

Guidelines

Canadian Partnership against Cancer (CPAC):

The target times for abnormal mammogram to final diagnostic tests should be:

a. <7 weeks in those who had a breast biopsy,

b. <5 weeks in those who did not have a biopsy

Practice Points

1. The age standardized incidence rate of breast cancer/100,000 women is one of the highest in Canada (128) and the age standardized mortality in NL is the highest in Canada (26.6/100,000 females).

2. In Canada, <10% of screening mammograms are abnormal.

3. In 2018, CPAC reported that NL's median time to final diagnostic test in those who required a biopsy was ranked ninth compared to the other Canadian provinces but 90th centile was ranked eleventh. In those who did not require a biopsy, median time was seventh and 90th centile was ranked eleventh.

Methods

1. Data were obtained from the breast screening database, diagnostic imaging, pathology reports, laboratory, and ARIA tumor registry 2014–2019, and were analysed by region.

2. In Eastern Health (EH), process changes were made to improve efficiency over time. Changes were also implemented in Central Health (CH) in 2019.

3. Total number of mammograms completed in NL was 18,541 in 2014, 19,952 in 2015, 20,884 in 2016, 19,930 in 2017, 20,779 in 2018 and 21,555 in 2019.

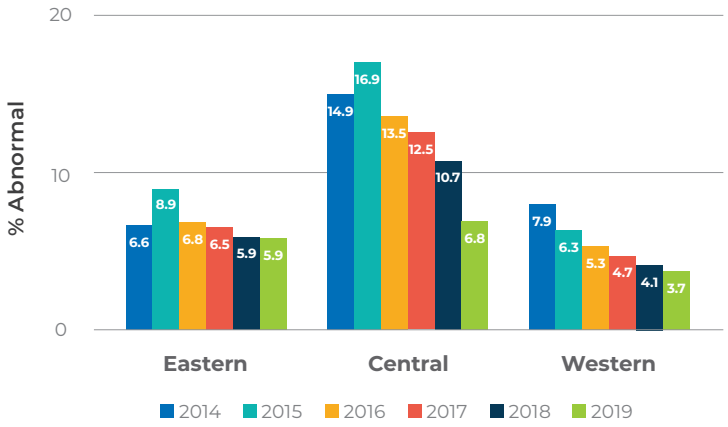


Figure 1. Percentage Abnormal Mammograms in Each Region (2014–2019)

- The provincial rate of abnormal mammograms in 2019 was 5.5%. Central Health consistently has the highest rate but it improved to 6.8% in 2019.

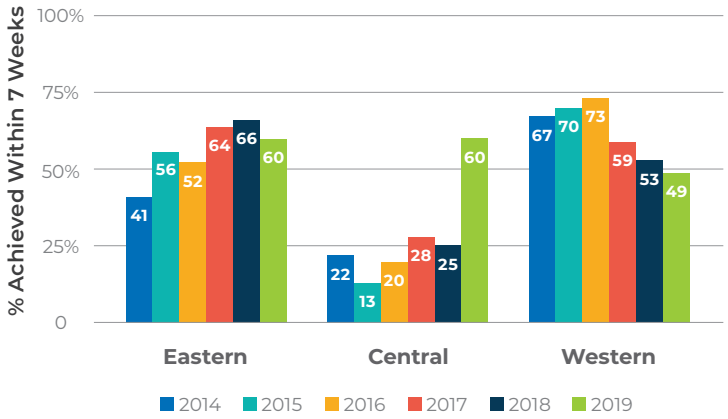


Figure 2. Time From Abnormal Screening Mammogram to Final Diagnostic Test in Those Who had a Breast Biopsy: Percentage Achieved Within 7 Weeks by Region

- In patients who had a breast biopsy, Western Health (WH) had the lowest percentage of patients who had a final diagnostic test within 7 weeks at 49%. CH improved substantially.

- In 2018 in the province the number of weeks taken for 90% to have received a final diagnostic test was 31 and in 2019 it was also 31.

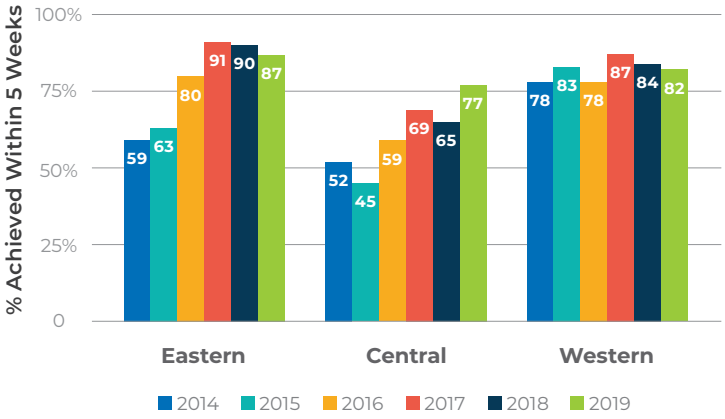


Figure 3. Time from Abnormal Screening Mammogram to Final Diagnostic Test in Patients Who Did Not Have a Breast Biopsy: Percentage Achieved Within 5 Weeks by RHA

- In patients who had abnormal mammogram and no breast biopsy, CH had the lowest percentage of patients who had final diagnostic test within 5 weeks at 77% but this percentage has improved over time. Both EH and WH had good performance.

- In 2018 in the province, the number of weeks taken for 90% to have received a final diagnostic test was 7 and in 2019 it was 8.

Conclusions

1. Time from abnormal screening mammography to final diagnostic test in women who had a breast biopsy has improved in EH and CH and deteriorated in WH. Times are not yet optimal.

2. Time to final diagnostic test in women who did not have a breast biopsy improved in EH and CH. In WH, around 80% consistently had a resolution within the target time of 5 weeks.

(Practice Points Vol. 7, Jan–Jun 2020)

The Impact of a Mobile Decision Support Tool (Spectrum) on Antimicrobial Use in St. John's Hospitals

Objective

To determine the impact of the Spectrum app on inpatient antimicrobial use (AMU) and on appropriateness in the Health Sciences Centre and St. Clare's hospital.

Practice Points

1. Excess AMU in hospitals selects for the expression of AM resistance genes among bacteria causing human infections. AM resistance is associated with attributable deaths and economic loss in Canada.

2. Hospital AM purchasing in the Atlantic provinces is twice as high as in Ontario.

3. Spectrum is a mobile app containing AM prescribing guidelines based on the local antibiogram, AM and pathogen information, and it advises on management of AM allergy, prophylaxis, dosing, duration and de-escalation strategies.

Methods (Dr. P. Daley)

1. Spectrum was introduced at start of Jan 2019. AMU was collected using Pyxis automated dispensing system from Jan 2019 to Mar 2020 (15 months).

2. Defined Daily Dose (DDD)/1,000 patient days was calculated.

3. Appropriateness was assessed using the Australian National AM prescribing survey on 25 Jun 2018 in 176 inpatients (6 months prior to Spectrum introduction) and on 25 Jun 2019 in 192 patients (6 months post introduction).

Results

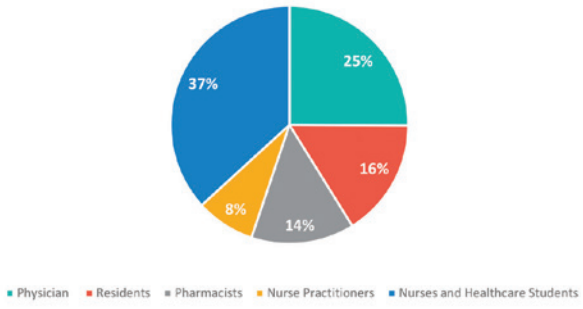


Figure 1. Spectrum Users by Health Profession

- Spectrum was accessed 20,016 times during 20 weeks of 2019, by a mean of 598 monthly active users, comprising multiple health provider groups.

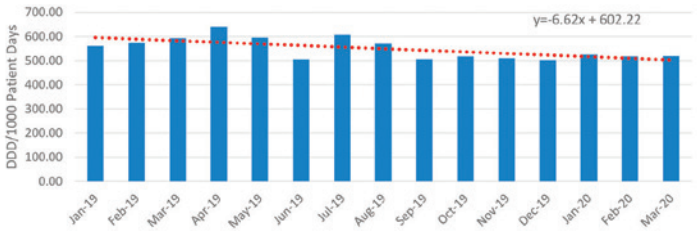


Figure 2. Total Monthly Antimicrobial Use (AMU)

- AMU declined by 6.62 DDD/1,000 patient days/month (p=0.05). Comparing rates of AMU use in Jan 2019 to Mar 2020 there was a 12% reduction.

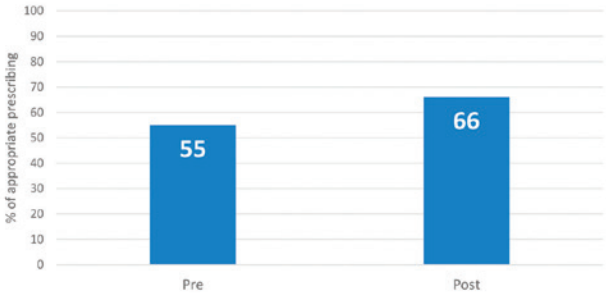


Figure 3. Appropriateness of AMU pre Spectrum Introduction and Post Introduction (% of Prescriptions Appropriate)

- Appropriateness of AMU improved by 11% (p=0.05) comparing pre to post Spectrum introduction. Carbapenem appropriateness improved from 17% of prescriptions pre to 86% post Spectrum introduction (p=0.05).

Conclusions

1. Reduction in inpatient AMU and increase in inpatient appropriateness was observed following introduction of a mobile decision support tool in the two St. John's hospitals.

2. National AMU in 2016 was 555/1,000 patient days, and in St. John's in 2020, it was lower at 514. Continued use of the Spectrum decision support tool and of other antibiotic stewardship measures are necessary to improve AMU.

(Practice Points Vol. 4, May–Dec 2018)

Evaluation of Remote Monitoring in Patients With Chronic Disease

Practice Points

1. Remote monitoring of patients with chronic disease may improve patient outcomes.
2. Electronic monitoring of patients with COPD and/or heart failure started in Eastern Health in 2016.
3. The enrollment of patients, equipment functioning, and threshold setting for intervention by Registered Nurse (RN) was difficult during the feasibility period.
4. In addition to monitoring blood pressure, oxygen saturation and weight, glucose monitoring was added in 2017.

Data

- Program data for a six month period 1 Sept 2017–28 Feb 2018.

Results

- 107 (27%) of 390 eligible patients refused to enroll.
- 171 (70%) of 245 patients who enrolled were referred.

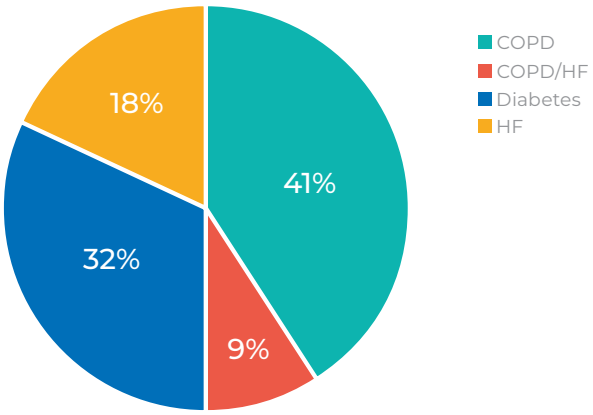


Figure 1. Chronic Conditions Monitored

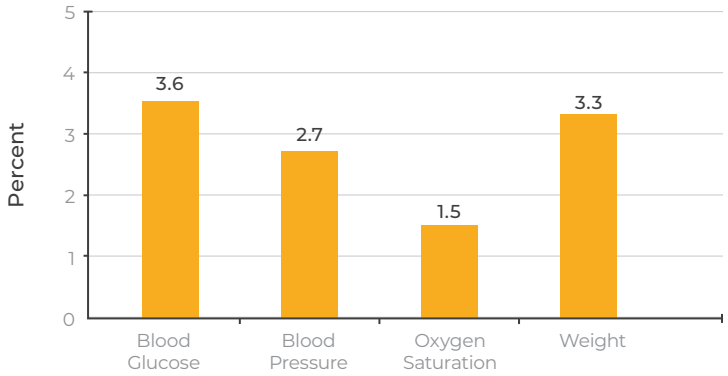


Figure 2. Percentage of Failed Readings

- Failed readings were infrequent.
- 0 (16%) of 244 electronic units were replaced.

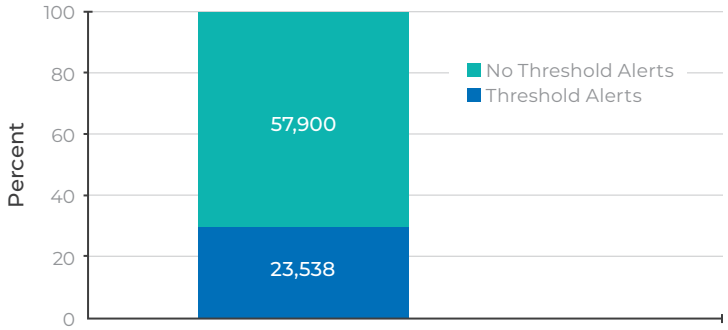


Fig. 3. Measurements: 81,438

- Threshold alerts were very frequent: 29% of measurements.

Perceptions of quality of life, health, self-management, symptom monitoring, knowledge, confidence, and activity limitations improved during the program, but deteriorated following discharge from the program.

Conclusions

1. Compared to the feasibility period in 2016, electronic units were more reliable and failed readings were less frequent, but threshold alerts continued at a high rate.
2. Perceptions of quality of life significantly improved during the program, which lasted 4–6 months, and deteriorated following discharge from the program.
3. Impact on hospitalization and emergency room visits is presented on the next page.

(Practice Points Vol. 4, May–Dec 2018)

Remote Monitoring Reduced Days in the Hospital in Patients With COPD and/or Heart Failure

Objective

To assess the impact of Remote Monitoring (RM) on admissions, in-hospital days, and Emergency Room (ER) visits in patients with prior hospitalization or ER visit.

Practice Points

1. COPD and/or heart failure patients are at high risk of being re-admitted or attending the ER.

2. RM of weight, blood pressure, and oxygen levels together with reporting of symptoms to a centralized unit staffed by nurses may prevent hospital use.

Data

- 303 patients with COPD and/or heart failure were enrolled in RM Program.
- Data on hospitalizations and ER visits was obtained from Eastern Health Decision Support for the 12 months prior to enrollment in the program and for up to 12 months after enrollment.
- Time to event (admission or ER visit) for the two periods were calculated using Kaplan Meier.

Results

- 184 patients were admitted to hospital pre-RM and 127 after enrollment. The cumulative percentage admitted within the 12 months prior was 61% and post was 40%. The relative risk was not significantly different when comparing the two periods.
- The total number of admissions pre-RM was 289 and the rate of in-hospital bed use was 7.9 days per patient per year, compared to 215 admissions and a rate of in-hospital bed use of 6.9 days per patient per year post enrollment.

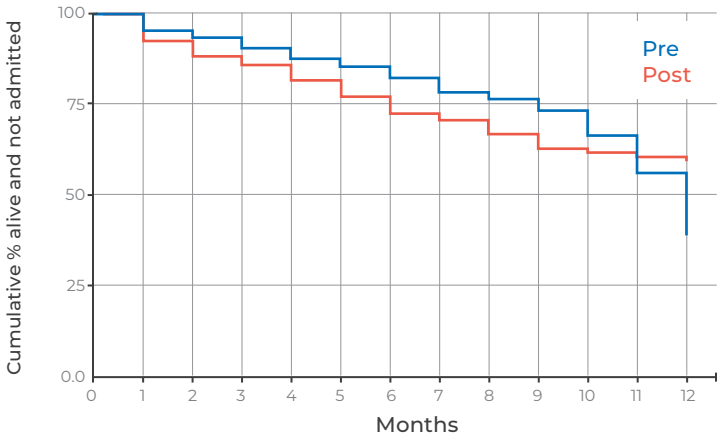


Figure 1. Incidence of Hospital Admissions Before and After RM

- Days of hospitalization were reduced by 12.7% post enrollment in RM.
- 279 patients visited the ER pre-RM and 224 after. The cumulative percentage that visited the ER in the 12 months prior was 92% compared to 71% post. The relative risk was non-significant.
- The total number of visits to the ER pre-RM was 1,154, a rate of 3.8 visits per patient per year, compared to 874 visits post enrollment, a rate of 3.3 visits per patient per year.
- ER visits were reduced by 13.2% post enrollment in RM.

Conclusions

1. RM in patients with COPD and/or heart failure did not decrease the risk of admission to hospital, but was associated with a 13% decrease in both in-hospital days and ER visits.

2. The success and sustainability of RM depends upon enrolling more patients at high risk of admission, and higher numbers of patients supervised per nurse.

In-Hospital Use for the 12 Months Before and After Remote Monitoring

	Admissions N	N Patients Admitted	Mean Days Stay per Admission	Total Days in Hospital	Patient Months Follow Up	Days in Hospital/pt/Year
Pre-RM 303 pts	289	184	8.43	2,400	3,636	7.9
Post RM 303 pts	215	127	8.49	1,825	3,178	6.9

Choosing Wisely NL

(Practice Points Vol. 5, Jan–Jun 2019)

Pre-Operative Testing Prior to Low Risk Surgery in NL

Choosing Wisely Canada Recommendation

Don't perform standard baseline laboratory studies, electrocardiogram or chest X-ray for asymptomatic pre-operative patients undergoing low risk, non-cardiac surgery.

Methods

1. In 2016, Choosing Wisely NL identified pre-op testing for low risk surgeries as an area of low-value care and adopted the "Drop the Pre-op" campaign.

   In January 2017, a medical directive was rolled out in two Eastern Health (EH) hospitals, St. Clare's and the Health Sciences Centre.

2. The rate of chest X-rays and ECGs for healthy patients (ASA 1–2) undergoing low risk surgery reduced by more than half (23% to 10% and 69% to 31%, respectively) in 2017 compared to 2016. The rates of blood tests—Serum Creatinine, INR and Hemoglobin—saw smaller reductions (15%, 40% and 7%, respectively).

3. Data was collected for all four Regional Health Authorities from 1 Jan 2016 – 31 Mar 2018. ECG data was not available for the entire province. All patients undergoing low risk surgery were included in the province-wide data (not limited to ASA 1s and 2s).

Regional Health Authority	2016	2017	2018 1st Quarter	Total
Eastern Health	4,613 (68%)	4,538 (65%)	1,306 (70%)	10,455 (67%)
Central Health	1,116 (16%)	1,152 (17%)	258 (14%)	2,524 (16%)
Western Health	883 (13%)	1,062 (15%)	244 (13%)	2,187 (14%)
Labrador-Grenfell Health	205 (3%)	231 (3%)	72 (4%)	506 (3%)
Total	6,814	6,980	1,877	15,669

Results

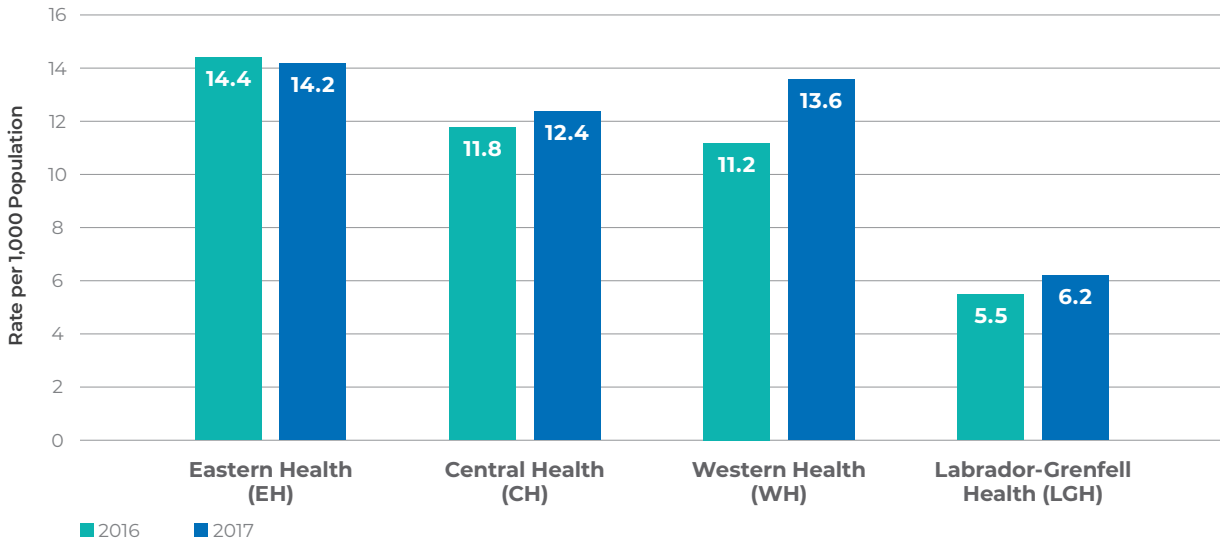


Figure 1. Rate of Low Risk Procedures per 1,000 Population by Regional Health Authority (RHA)

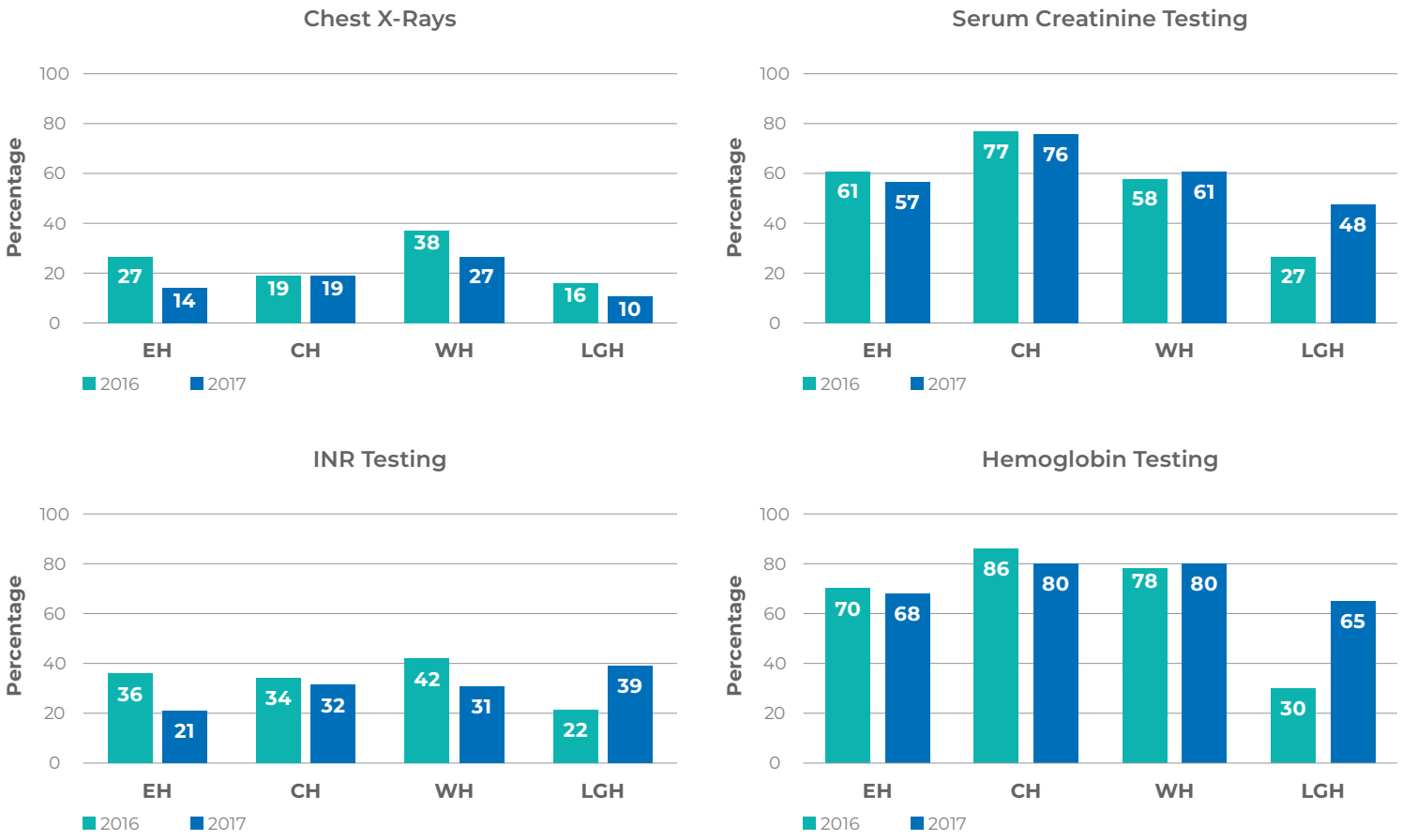


Figure 2. Percentage of Procedures That Had at Least One Test, Analyzed by RHA

Conclusions

1. Implementing a medical directive in two EH hospitals resulted in significant reductions in pre-operative testing for low risk surgical procedures, although rates of biochemical and hemoglobin testing continued to be high.

2. In 2017 in Central, Western and Labrador-Grenfell Health, the rate of biochemical and hemoglobin testing continued at a high rate for low risk surgery compared to 2016.

3. The implementation of these guidelines requires a multi-faceted approach and a barriers assessment study is currently underway. The aim of this interview-based study is to inform a province-wide intervention over the next 2–4 years.

Quality of Care NL

(Practice Points Vol. 4, May–Dec 2018)

Incidence and Appropriateness of Admission to Long-Term Care Facilities in NL

Objective

To determine the annual incidence by region and clinical characteristics of clients admitted to Nursing Homes (NHs).

Data

- The initial Resident Assessment Instrument—Minimum Data Set (RAI-MDS 2.0 ©) completed on admission to NHs 1 Apr 2016–31 Mar 2017 for 1,045 incident clients.

Results

- The annual incidence rate per 1,000 people aged 65 years and older was 9.3 and varied by region. Mean age was 81.2 years; 43% were aged 85 years and older; 61% were female; 33% were admitted because of reduced physical function only; 37% had severe impairment of cognition.
- Of 487 clients admitted because of impaired cognition or reduced physical function only 6.4% (N=31) did not have extensive to total dependence for activities of daily living and had intact or moderate impairment of cognition.

Conclusions

1. The incidence rate of clients admitted to NHs varied by region, with the highest rate in Central Health.
2. The degree of disability was such that the vast majority of clients required admission to a NH.

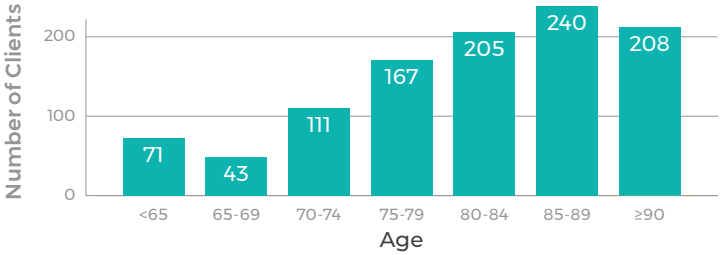


Figure 1. Age Distribution

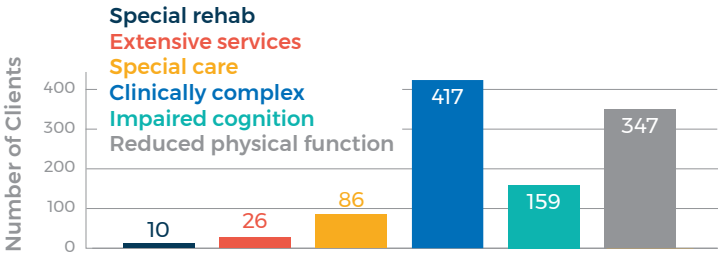


Figure 2. Primary Reason for Admission RUGs Hierarchical Category

Table 1. Patient Characteristics by Region

	St. John's N = 297	Tri-Peninsulas N = 240	Central N = 268	Western N = 183	Labrador-Grenfell N = 57
Demographics					
N/1,000 people ≥ 65 yrs	8.68	8.27	11.34	9.11	9.99
≥ 85 yrs	43%	38%	44%	48%	37%
Female	62%	58%	62%	59%	40%
Reason for admission					
Impaired cognition	18%	10%	16%	13%	28%
Reduced Physical Function	28%	24%	43%	38%	37%
Other factors					
CHESS* scale zero	62%	47%	44%	55%	61%
Independent/some limitation activities of daily living	27%	21%	14%	16%	32%
Intact/mild to moderate impairment of cognition	65%	63%	65%	55%	76%

*CHESS (changes in health, end-stage disease and signs and symptoms):
A scale to detect frailty and health instability and was designed to identify residents at risk of serious decline.

(Practice Points Vol. 5, Jan–Jun 2019)

Incidence and Characteristics of Incident Clients Assessed for Long-Term Care Services in NL

Objective

To determine the annual incidence by region and clinical characteristics of clients being assessed for long-term care services.

Practice Point

1. The RAI-HC is an assessment system that informs and guides comprehensive care and service planning in community based settings, and facilitates referrals when appropriate.

Data

- The initial RAI-HC assessments completed on 4,166 individuals from 1 April 2016 – 31 Mar 2017.

Results

- The annual incidence rate per 1,000 people aged 65 and older was 39.8 and varied by region. 61.5% of those assessed were female; 37.2% scored high or very high on the Method for Assigning Priority Levels (MAPLe) score; 19.9% were assessed in an acute care hospital or unit; and 61.8% had reduced physical functioning.

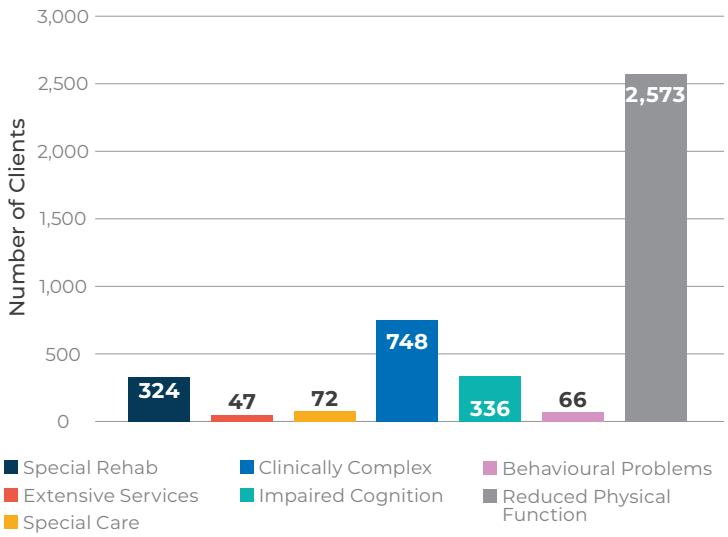


Figure 1. Resource Utilization Group (RUG-III)

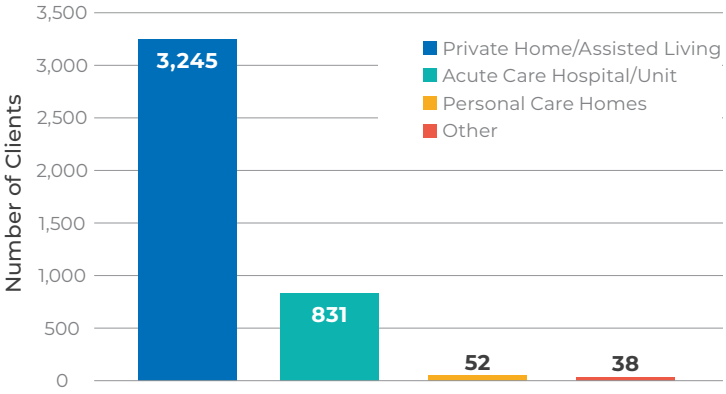


Figure 2. Location of Assessment

Patient Characteristics by Region	Eastern N=2,374	Central N=997	Western N=768	Labrador-Grenfell N=117
Demographics				
N/1,000 people ≥ 65 years	40.8	43.7	36.8	22.1
% Female	62.3	62.4	57.2	62.4
Clinical Characteristics				
% intact/mild to moderate cognitive impairment	91.8	91.1	93.8	80.3
% independent/some limitation in activities of daily living	73.1	73.7	80.2	62.4
% no to low health instability on changes in health, end-stage disease and signs and symptoms scale	85.9	84.6	81.1	79.5
Method for Assigning Priority Levels				
% low need	11.6	17.3	17.6	12.8
% mild need	8.3	8.0	8.4	2.6
% moderate need	42.5	39.2	39.2	27.4
% high need	25.0	23.5	23.9	40.2
% very high need	12.6	12.0	10.9	17.1

Conclusions

1. The incidence rate of clients assessed by the RAI-HC varied by region, with the highest rate in Central Health.

2. The vast majority of clients presented with reduced physical function, and were assessed in their homes.

3. The number of incident clients with high to very high need (N=1550) exceeds the number of people actually admitted to long-term care facilities (N=1,045).

(Practice Points Vol. 6, Jul–Dec 2019)

Reduction in Antibiotic Use for Urinary Tract Infections in Long-Term Care Facilities

Choosing Wisely Canada Recommendation

Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

Practice Points

1. In long-term care facilities (LTCFs), antibiotics are prescribed more often for urinary tract infections (UTIs) than any other diagnosis.

2. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects.

Methods

1. Data was obtained from the Infection Prevention and Control Programs of Eastern Health (EH), Central Health (CH) and Western Health (WH).

2. Antibiotic use rate was calculated as the number of prescriptions per 10,000 resident days.

3. Inappropriate antibiotic use was determined based on consensus criteria developed by each Regional Health Authority (RHA).

Results

Table 1. Antibiotic Use and Inappropriateness by RHA

RHA		2016	2017
Eastern Health	Antibiotics Prescribed; (N)	737	694
	Inappropriate Antibiotic Use; N (%)	506 (69)	364 (52)
Central Health	Antibiotics Prescribed; (N)	252	292
	Inappropriate Antibiotic Use; N (%)	115 (46)	164 (56)
Western Health	Antibiotics Prescribed; (N)	234	268
	Inappropriate Antibiotic Use; N (%)	140 (60)	180 (67)

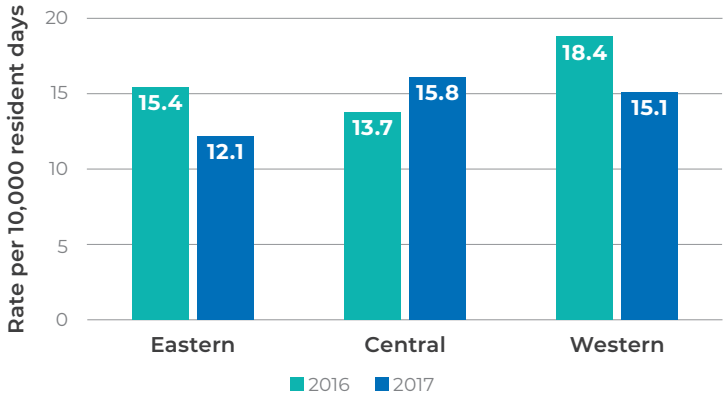


Figure 1. Rate of Antibiotic Use in Long-Term Care Facilities Analyzed by RHA

- Rate of antibiotic use and percentage of inappropriate use varied by LTCF.

Conclusions

1. From 2016–2017, rate of antibiotic use decreased overall for both EH and WH but increased for CH. Inappropriateness rate decreased only for EH.

2. Overall, from 2016–2017, the percentage of antibiotics prescribed that were inappropriate decreased from 62% to 56% and varied by LTCF and RHA.

3. Inappropriate antibiotic use for asymptomatic bacteriuria in LTCFs in NL is still high. Targeted interventions to reduce inappropriate use are necessary.

Choosing Wisely NL

(Practice Points Vol. 5, Jan–Jun 2019)

Reduction of Antipsychotic Use in Long-Term Care Facilities in NL

Choosing Wisely Canada Recommendation

Don't use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

Practice Points

1. Health Canada has issued a black box warning for antipsychotic prescriptions in seniors, indicating that their use is strongly contraindicated and poses a significant risk to seniors, including premature death.

2. Antipsychotic drugs should only be used when symptoms are severe, disabling and/or threatening patient or caregiver safety and when environmental and non-pharmacologic techniques have been implemented.

3. Attempts at drug withdrawal/reduction should be made regularly to avoid and reduce serious side effects.

Methods

1. Data were obtained from the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) 2.0.©

2. Thirty-five long-term care facilities (LTCFs) from the four regional health authorities (RHAs) were included:

   Eastern Health (EH)–14 LTCFs;
   Central Health (CH)–11 LTCFs;
   Western Health (WH)–6 LTCFs; and
   Labrador-Grenfell Health (LGH)–4 LTCFs.

3. Overall percentage of residents using antipsychotic drugs, as well as the percentage of residents receiving antipsychotics that were potentially inappropriate, were calculated provincially and regionally.

Results

	2016	2017	2018
Valid Assessments	8,718	9,190	9,352
Antipsychotic Use; N (%)	3,377 (39)	3,398 (37)	3,076 (33)
Potentially Inappropriate Antipsychotic Use; N (%)	2,467 (73)	2,498 (74)	2,030 (66)

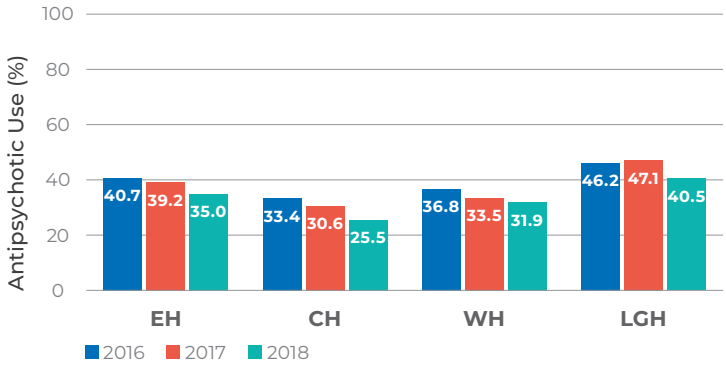


Figure 1. Antipsychotic Use by RHA

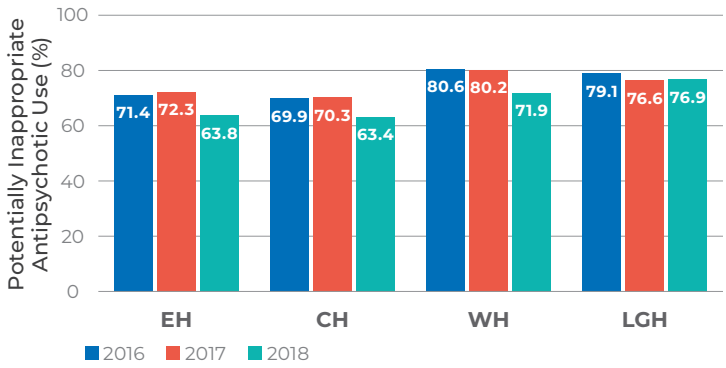


Figure 2. Potentially Inappropriate Antipsychotic Use by RHA

Conclusions

1. In 2018, antipsychotic use in the residents of 35 LTCFs was 33%, a 15% reduction from 2016.

2. The use of potentially inappropriate antipsychotic use was 66%, a 10% reduction from 2016.

3. The lowest use of antipsychotics was in CH (26%) and the highest was in Labrador-Grenfell Health (41%).

(Practice Points Vol. 5, Jan–Jun 2019)

Potentially Unnecessary Biochemical Testing by Family Physicians in NL

Practice Points

1. Blood urea is not a necessary test to measure kidney function in stable patients if serum creatinine and eGFR are measured.
2. Serum ferritin is likely not indicated as screening test for iron status in patients with normal hemoglobin and MCV/MCH, except maybe in females of reproductive age where oral iron may be prescribed.
3. Creatine Kinase is no longer recommended for monitoring asymptomatic patients on statins.
4. Bilirubin and ALT are reasonable tests to evaluate liver function and AST is usually unnecessary.
5. Other than on occasions in the management of gout and cell breakdown disorders, uric acid is not usually clinically helpful.
6. LDH is generally indicated only in growth disorders and hemolytic anemia.
7. The volume of testing for these six tests reduced in Eastern Health following the provision of a new requisition form in 2016 and academic detailing in 2017.

Methods

1. Tests ordered by family physicians in the four Regional Health Authorities (RHAs) for the fiscal year 2017–2018 were obtained from NL Centre for Health Information.
2. The rate of testing was calculated as volume per 100 people in each region.

Results

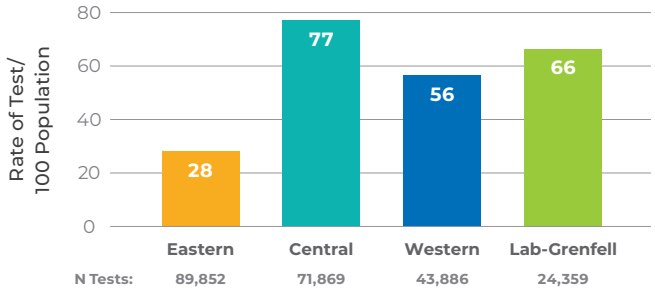


Figure 1. Rate/100 Population: Urea

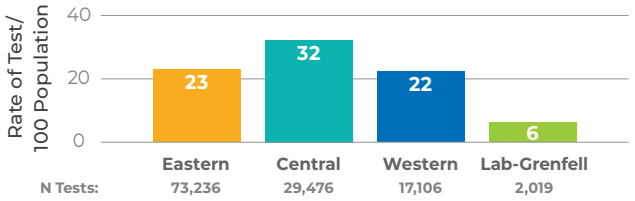


Figure 2. Rate/100 Population: Ferritin

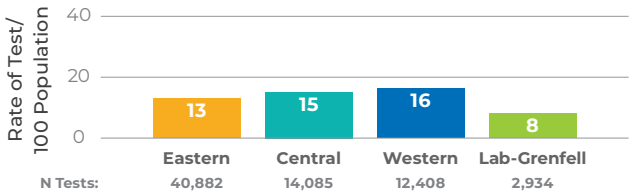


Figure 3. Rate/100 Population: Uric Acid

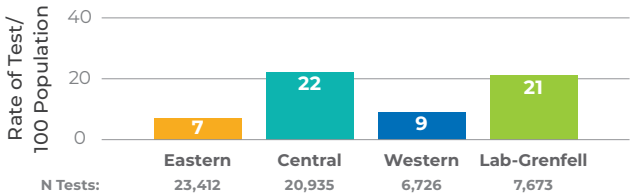


Figure 4. Rate/100 Population: AST

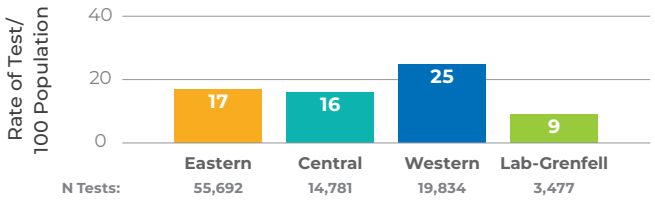


Figure 5. Rate/100 Population: Creatine Kinase

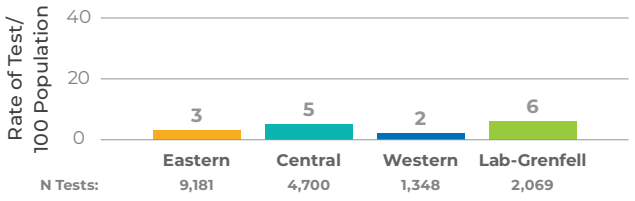


Figure 6. Rate/100 Population: LDH

Conclusions

1. Across the province there is potential for the reduction of potentially unnecessary biochemical testing.
2. A requisition form omitting blood urea, creatine kinase, AST, uric acid, and LDH may be helpful.
3. Reflex testing for ferritin in patients with anemia or microcytosis may be helpful.

(Practice Points Vol. 6, Jul–Dec 2019)

Reduction in Creatine Kinase Tests by Family Physicians in NL

Guideline from College of Family Physicians of Canada

Testing Creatine Kinase (CK) and ALT levels at baseline on statin initiation or for monitoring is not required.

Perform CK as clinically indicated.

Practice Points

1. CK is a useful test in patients with a high index of suspicion for muscle disease.
2. Nearly 120,000 CK tests were performed in 2015/16 in NL, a population rate of nearly 1 in 4 people.
3. In 2016/17, Quality of Care NL provided audit, feedback and academic detailing to individual Family Physicians (FPs) in Eastern Health (EH).
4. Practice Points Volume 2 contained advice on use of CK and was sent to every FP in NL in 2017.

Methods

1. Testing for CK in NL was obtained from the NL Centre for Health Information for 1 Apr 2015 – 30 Mar 2018 (three years), and analysed by region, and by FP.
2. For EH and Western Health (WH) 2015/16 data served as baseline.
3. Data from Central Health (CH) for 2015/16 was problematic and data from 2016/17 was used as baseline in this region.

Results

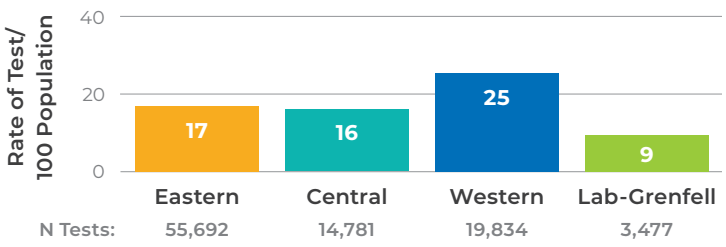


Figure 1. Rate of CK Testing/100 Population by Region in 2017/18

- Rate of CK testing is highest in WH at 25 /100 population.

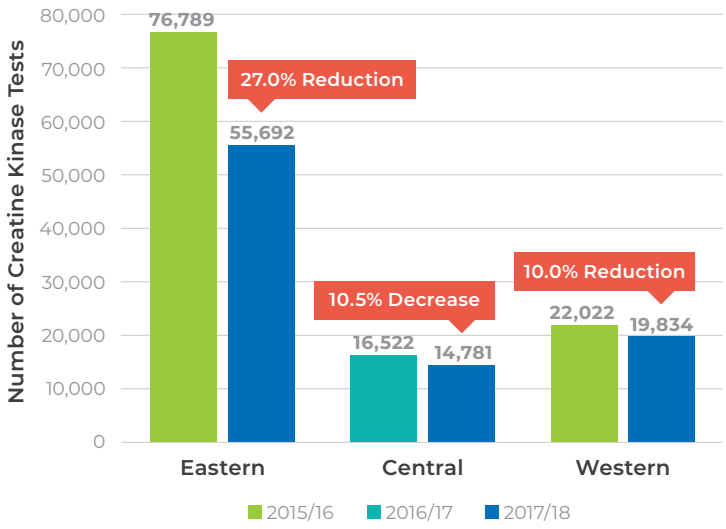


Figure 2. Reductions in Number of CK Tests by Region

- Compared to baseline, CK testing was reduced in EH by 27%, by 10.5% in CH, and by 10% in WH.

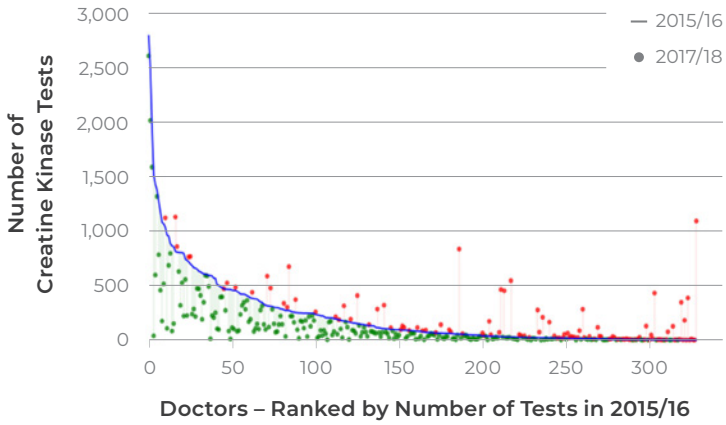


Figure 3. Change in the Number of CK Tests at EH by FPs Comparing 2017/18 to 2015/16

Note: On the x-axis doctors are ranked by volume of tests in 2015/16 (solid line) and each individual FP's 2017/18 data is provided as a dot (linked by a vertical line to 2015/16 usage), with a reduction revealed by the dot being below the solid line and an increase by the dot being above the line.

- Of 329 FPs in EH, 65% had a reduction in testing in 2017/18 compared to 2015/16.
- A small number of very high users had little change in the volume of testing.

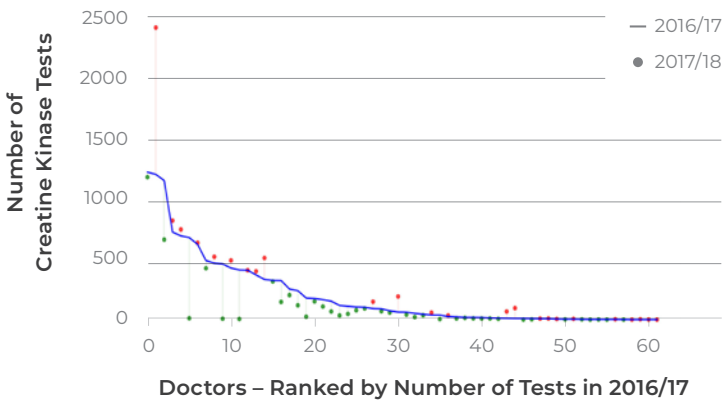


Figure 4. Change in the Number of CK Tests at CH by FPs Comparing 2017/18 to 2016/17

See note of Fig. 3 for interpretation.

- Of 62 FPs in CH, 52% had a reduction in CK testing, mostly of small extent.
- In 2017/18 two FPs ordered >1,000 CK tests.

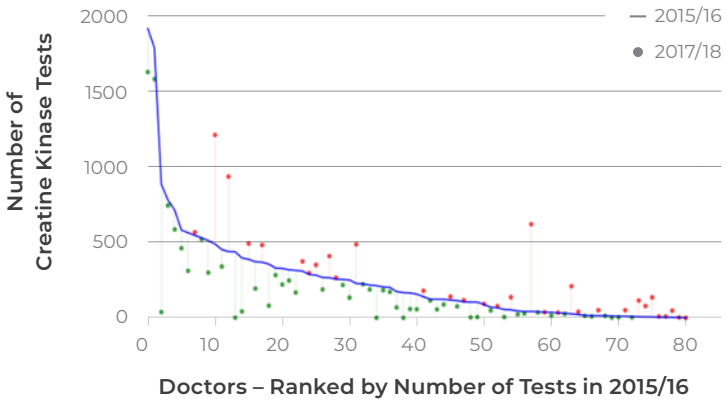


Figure 5. Change in the Number of CK Tests at WH by FPs Comparing 2017/18 to 2015/16

See note of Fig. 3 for interpretation.

- Of 81 FPs at WH, 60% had a reduction in CK tests.
- Three FPs ordered >1,000 CK tests in 2017/18.

Conclusions

1. Rate of CK testing/100 population is highest in WH.
2. A small number of FPs ordered >1,000 CK tests annually.
3. In EH, audit, feedback and academic detailing was associated with 27% reduction in CK testing by FPs, compared to 10% in CH and WH.
4. Consideration should be given to taking CK from the requisition form and doing the test for a written order on the form.

(Practice Points Vol. 6, Jul–Dec 2019)

Reduction in Serum IgE Allergy Tests in NL

Choosing Wisely Canada Recommendation

Do not perform screening panels (IgE tests) for allergy without previous consideration of pertinent medical history.

Practice Points

1. Most allergic reactions are immediate hypersensitivity reactions caused by IgE antibodies.
2. Common triggers include environmental allergens (pollens, pets, and dust), food, venom and medications. Symptoms occur within minutes to two hours after exposure.
3. Symptoms of food allergy include cutaneous (e.g. hives), respiratory (e.g. wheeze), gastrointestinal (e.g. vomiting) and cardiovascular (e.g. hypotension). Allergy testing for foods may be associated with high rates of false positives, up to 50%.
4. Allergy testing includes skin prick testing and serum specific IgE to the given allergen. Skin prick testing is more sensitive than specific IgE testing. Specific IgE testing for environmental allergens is not necessary.
5. Allergy testing should only be ordered if the history is suggestive of an allergic reaction and only to allergens suspected on history.
6. Ordering more than three IgE tests at a time may be inappropriate.

Methods

1. Provincial data from the Meditech Laboratory Information System from Eastern Health for 2015/16 was analyzed in 2017 and distributed in a physician campaign in May of 2018. Other educational resources were provided such as an accredited online module.
2. Potential inappropriateness was defined as ordering more than three serum specific IgE tests for one patient at one time.
3. Provincial data from 1 Jan 2017 – 31 Aug 2019 was obtained, analyzed and compared to the previous data to assess for change in ordering patterns.

Results

- In the 32 months from 1 Jan 2017 – 31 Aug 2019, 14,861 IgE tests were ordered and 66% of tests were bundled inappropriately, compared to 16,822 in the 24 months from 1 Jan 2015 – 31 Dec 2016, 69% of which were bundled inappropriately.
- There has been a 38% decrease in overall test ordering annually from 2015–2018, and adjusting for the remainder of 2019, the decrease is 50%.
- The largest decrease in test ordering was seen amongst Family Physicians and Pediatricians.

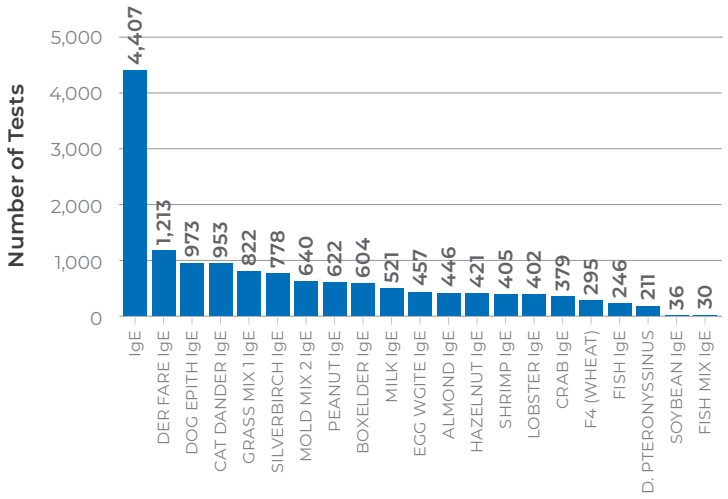


Figure 1. Number of Orders for Each IgE Test (1 Jan 2017 – 31 Aug 2019)

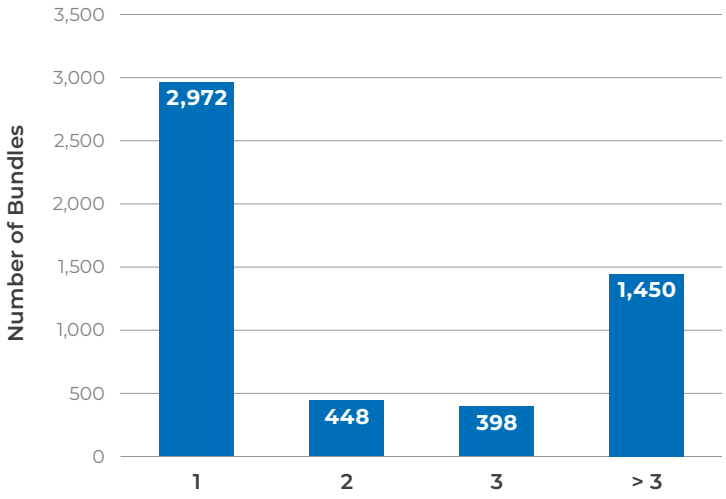


Figure 2. Number of Bundles by Number of Tests per Bundle (1 Jan 2017 – 31 Aug 2019)

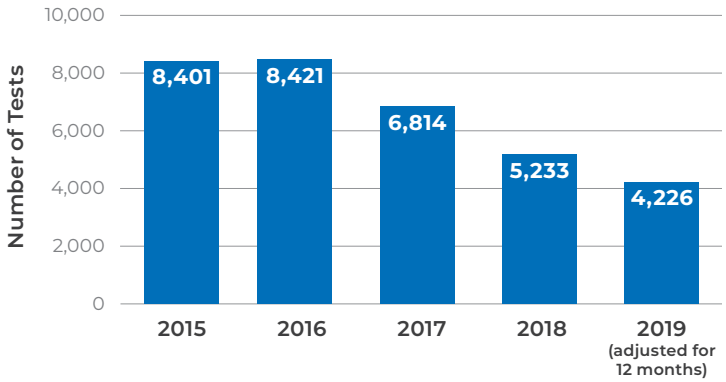


Figure 3. Number of Tests per Year by all Specialties (1 Jan 2016 –31 Aug 2019 (Adjusted))

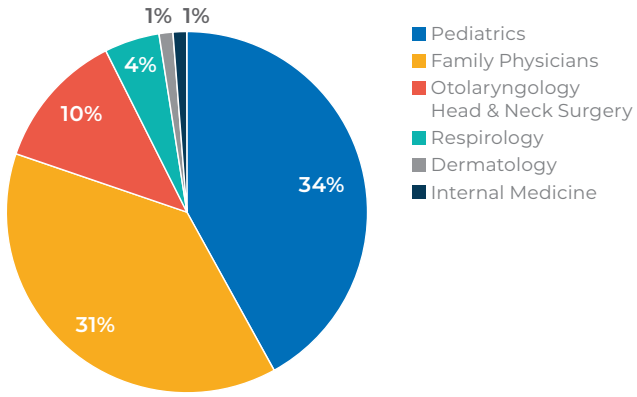


Figure 4. Percentage of Tests Ordered by Specialty (32 Months)

Conclusions

1. Only order allergy testing if the history is suggestive of an allergic reaction and only to allergens specified on history.

2. Ordering of more than three IgE tests per bundle, which is likely inappropriate, is decreasing but still occurs quite frequently.

3. There has been a 50% reduction comparing serum IgE testing in 2019 to that in 2015.

(Practice Points Vol. 6, Jul–Dec 2019)

Use of Thyroid Tests by Family Physicians in NL

Choosing Wisely Canada Recommendation

Don't use Free T4 or T3 to screen for hypothyroidism or to monitor and adjust levothyroxine (T4) dose in patients with known primary hypothyroidism, unless the patient has suspected or known pituitary or hypothalamic disease.

Don't do thyroid function tests in asymptomatic people.

Practice Points

1. In most people a normal Thyroid Stimulating Hormone (TSH) indicates either a normal endogenous thyroid function or an adequate T4 replacement dose.
2. TSH only becomes unreliable in patients with known or suspected pituitary or hypothalamic disease when TSH cannot respond physiologically to altered T4 or T3.
3. In stable patients, TSH needs to be monitored no more often than every six months.
4. Costs per test are: TSH $10, T4 $12, and T3 $9.
5. 84% of TSH tests are ordered by Family Physicians (FPs), as well as 79% of T4 tests, and 57% of T3 tests.
6. The practice of endocrinologists is substantially different from that of FPs which accounts for the higher rate of T4 and T3 testing undertaken by endocrinologists.

Methods

1. All TSH, T4, and T3 tests ordered by FPs in NL from 1 Apr 2018 - 31 Mar 2019 were analysed by year, age, sex, and clinician who ordered the test. The rate of TSH tests per 1,000 billings was calculated for 2017.

Results

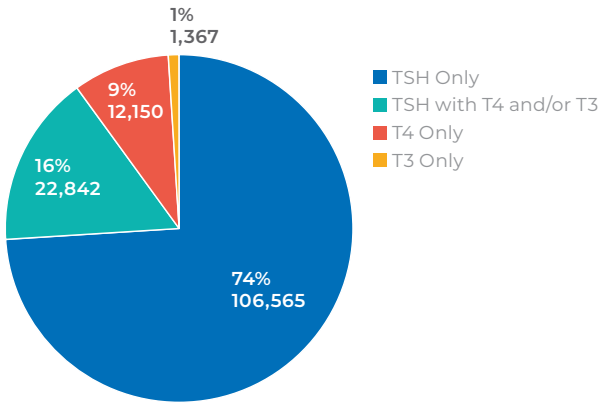


Figure 1. Number of TSH, T4 and T3 Tests by FPs in 2018/19

- In 12 months there were 129,407 TSH tests ordered by FPs, 18% of which were accompanied by a T4 and/or T3 test order.
- Thyroid Tests amounts to one test per four people in the population.

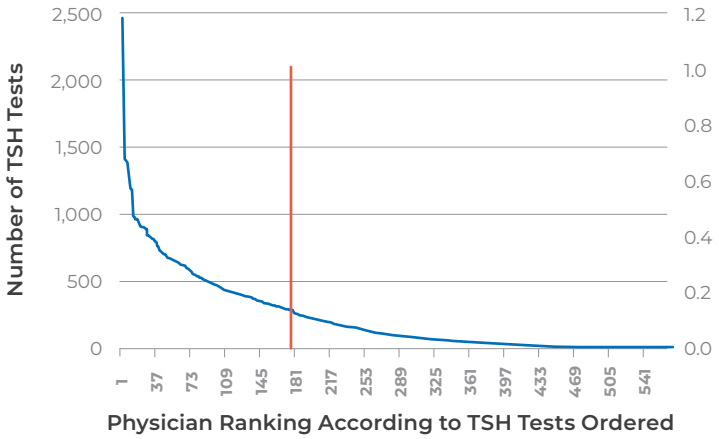


Figure 2. Total TSH Tests Requested Ranked by FP in 2018/19

- 80% of total TSH tests were ordered by 31% of FPs (red line), 88 FPs ordered 500 or more TSH tests in 12 months.

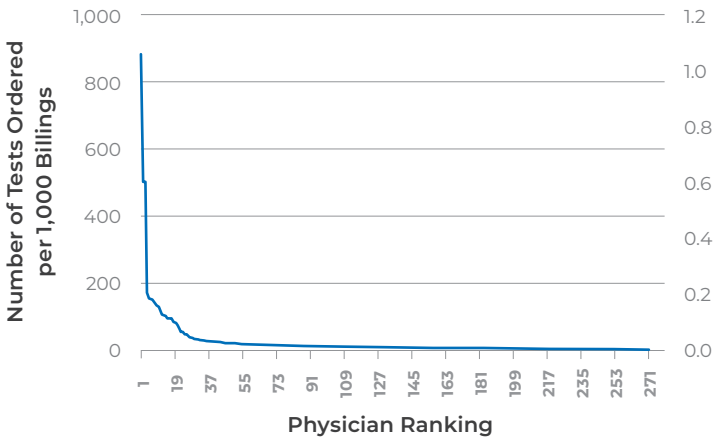


Figure 3. Rate of TSH Tests Ordered per 1,000 Billings Ranked by FP in 2017

- 23 FPs ordered more than 50 TSH tests per 1,000 billings.

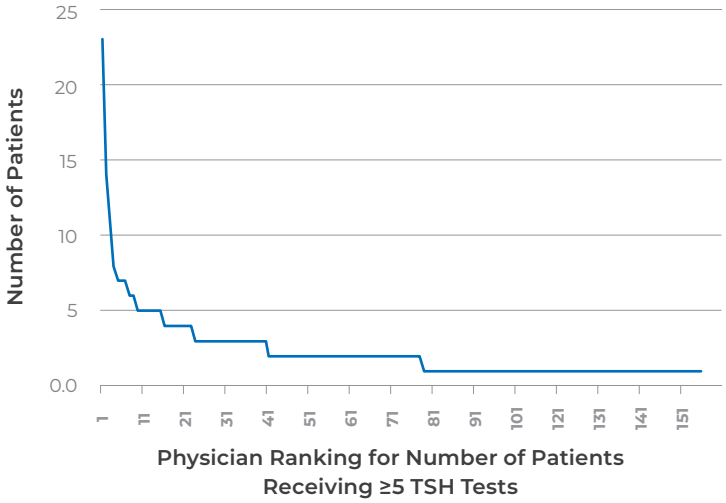


Figure 4. Number of Patients Receiving Five or More TSH Tests Ranked by FP

- 156 FPs ordered five or more TSH tests for one patient over 12 months, 17 of which ordered five or more tests for five or more patients.

Conclusions

1. T4 and T3 ordering is frequently coupled with TSH testing. Reflex testing for T4 occurs within laboratories in patients with an abnormal TSH, making T4 and T3 ordering unnecessary.

2. In patients with known or suspected pituitary or hypothalamic disease the order for T4 or T3 should contain this information.

3. The number of patients receiving five or more TSH tests per year is high (N=511).

4. Some FPs ordered a large number of TSH tests per year, whether analyzed by number or by rate/1,000 billings.

(Practice Points Vol. 6, Jul–Dec 2019)

Modest Reduction in Use of Oral Antibiotics by Health Care Providers but Continued High Inappropriate Use of Ciprofloxacin

Choosing Wisely Canada Recommendation

Multiple recommendations exist for not using antibiotics for upper respiratory infections, sore throat and otitis media that are most likely viral in origin or for asymptomatic bacteriuria in non-pregnant women.

See www.choosingwiselycanada.org/campaign/antibiotics-primary-care.

Practice Points

1. NL has the highest use of antibiotics per capita in Canada.
2. Based on NLPDP data, there was a 9% decrease in the number of prescriptions of antibiotics by Family Physicians (FP) and 15% by Nurse Practitioners (NP) in 2017 compared to 2016.
3. In 2017, the NL Pharmacy Network started to capture all antibiotic prescriptions in the community.
4. Rates of Ciprofloxacin resistant E. coli (18%) are high in NL.
5. For respiratory tract infections, urinary tract infections, and skin and soft tissue infections, ciprofloxacin should be limited to conditions likely or proven to be caused by Pseudomonas aeruginosa.

Methods

1. Data from the NL Pharmacy Network on prescriptions for antimicrobials given to outpatients were provided by the NL Centre for Health Information from 1 Jul 2017 - 30 Jun 2019.

Results

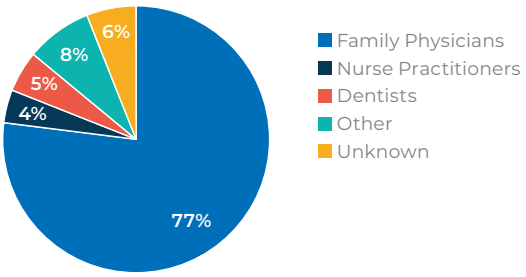


Figure 1. Proportion of Prescriptions by Health Care Provider

- 77% of antibiotic prescriptions were provided by FPs, 5% by dentists, and 4% by NPs.

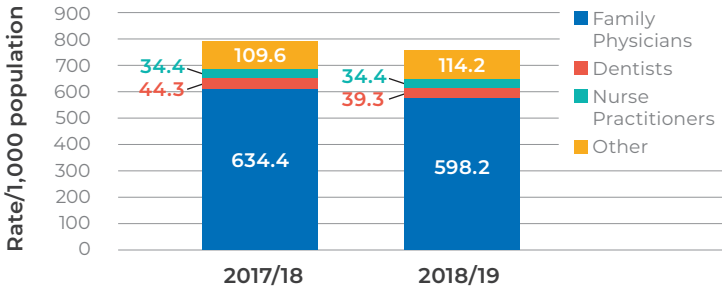


Figure 2. Population Rate of Antibiotics Prescribed by Health Care Provider

- The rate of use of oral antibiotics in NL was 786/1,000 population. Rate of use of antibiotics by FPs decreased by 5.7%, 11.3% by dentists, and there was no change in NP's rate.

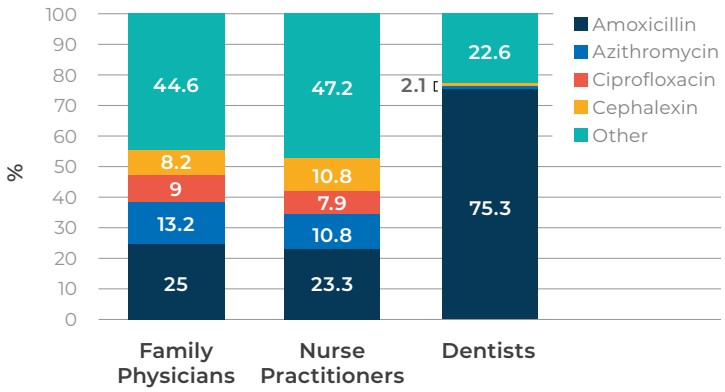


Figure 3. Type of Antibiotics Prescribed by Health Care Provider

- Amoxicillin was the most prescribed drug by FPs, NPs and dentists at a rate of 25, 23.3, and 75.3% respectively.
- Ciprofloxacin comprised 9% of prescriptions by FPs, 7.9% by NPs and 0.3% by dentists.

Conclusions

1. There was a 6% reduction in use of oral antibiotics by FPs, 11% by dentists, and no change for NPs.
2. Use of antibiotics remains high.
3. Use of ciprofloxacin is high. Restricted use of ciprofloxacin is indicated in view of high E. coli ciprofloxacin resistance.

(Practice Points Vol. 6, Jul–Dec 2019)

Wide Variability in the Use of Antibiotics by Family Physicians

Choosing Wisely Canada Recommendation

Multiple recommendations exist for not using antibiotics for upper respiratory infections, sore throat and otitis media that are most likely viral in origin or for asymptomatic bacteriuria in non-pregnant women.

See www.choosingwiselycanada.org/campaign/antibiotics-primary-care.

Practice Points

1. NL has the highest use of antibiotics per capita in Canada.
2. Based on NLPDP data there was a 9% decrease in the number of prescriptions of antibiotics by Family Physicians (FP) and 15% by Nurse Practitioners (NP) in 2017 compared to 2016.
3. In 2017, the NL Pharmacy Network started to capture all antibiotic prescriptions in the community.

Methods

1. Data from the NL Pharmacy Network on prescriptions for antimicrobials given to outpatients were provided by the NL Centre for Health Information from 1 Jul 2017–30 Jun 2019.
2. Indications for prescriptions were not available.
3. 912,435 prescriptions, representing 2,841 unique prescribers, were written between 1 Jul 2017–30 Jun 2019. 70,026 non-oral prescriptions (7.7%) were excluded.
4. Billing information from 2017 was derived from the MCP Fee-for-Service Physician Claims database.

Results

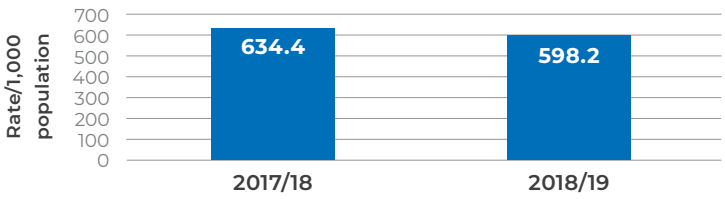


Figure 1. Population Rate of Antibiotic Use by FPs

- Rate/1,000 population of antibiotic use by FPs decreased by 5.7% compared to 2017/18.

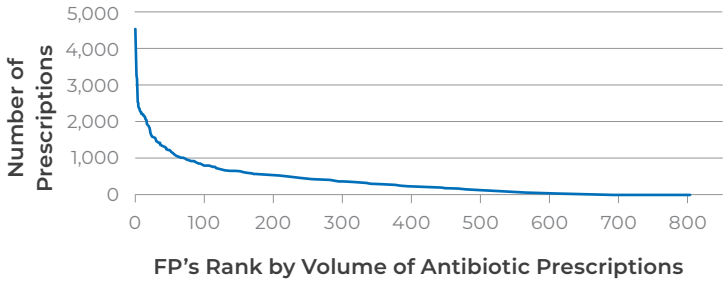


Figure 2. Number of Oral Antibiotic Prescriptions Ranked by FP (1 Jul 2018 - 30 Jun 2019)

- 20% of FPs prescribed 58% of all oral antibiotics in 2018/19.

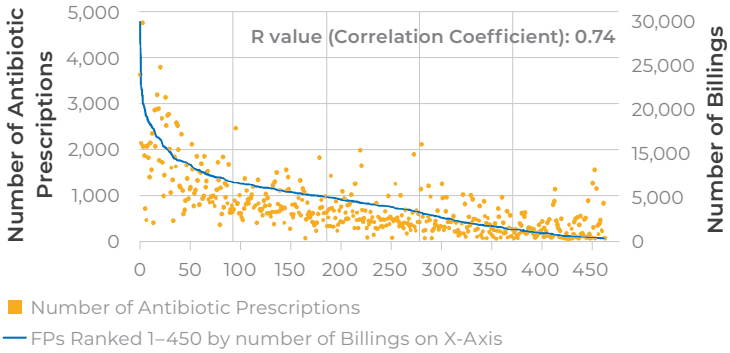


Figure 3. Physicians Ranked by Number of Billings in 2017 (X-axis) and Matched with Number of Antibiotic Prescriptions (1 Jun 2017 – 31 May 2018) (Y-axis)

- There is a strong correlation between the number of antibiotics prescribed and the number of billings by FPs. However, within each quintile of billings (vertical line) there is still a wide variability by FP.

Conclusions

1. Although there was a decrease in the number of antibiotics prescribed comparing 2018/19 to 2017/18, some FPs were high prescribers.
2. The highest prescribers correspond to the busiest FPs, however there is wide variability as some FPs prescribe more antibiotics compared to their peers when matched by number of billings.

(Practice Points Vol. 7, Jan–Jun 2020)

Geospatial Mapping of the NL Population by Age, Sex and Standardized Rates of Antibiotic Use

Objective

To determine whether there are particular regions in NL with high antibiotic use.

Practice Points

1. Antibiotic resistant bacterial infection is one of the top 10 concerns of the WHO and a major public health problem in Canada. It is associated with unnecessary antibiotic prescribing, often driven by patient demand.

2. Despite audit, feedback and academic detailing to family physicians (FPs) in Eastern Health (EH) and provision of Practice Points advice to all FPs in the province, only a modest decrease in antibiotic use has occurred.

3. Antibiotic use is associated with the volume of patients seen by FPs, but there is wide variability in the quantity of prescriptions provided by FPs seeing similar volumes of patients.

4. Antibiotics are prescribed more frequently in females and in those ≥65 years. Consequently, comparisons of different regions of the province requires controlling for differences in demography between regions.

5. Geo-spatial mapping of prescriptions using postal codes, together with age and sex standardized rates, may identify areas of high use for public education and prescriber communication.

Methods

1. Data on all antibiotic prescriptions provided to outpatients in NL was obtained from the NL Pharmacy Network from 1 Jul 2017 to 30 Jun 2019.

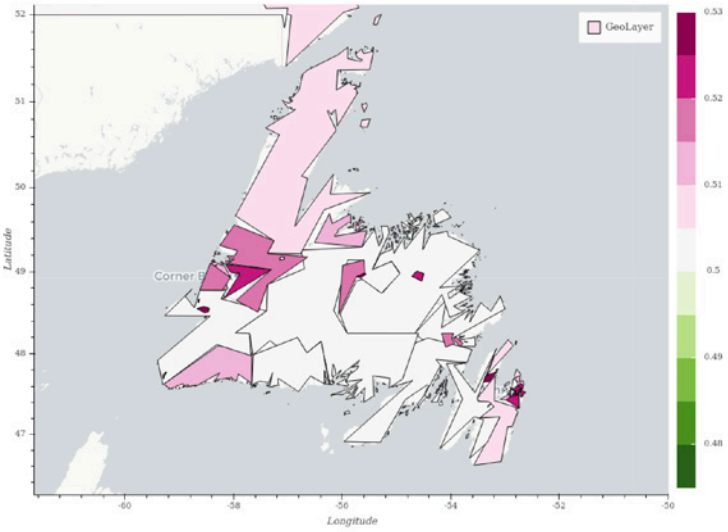
2. The Defined Daily Dose (DDD)/1,000 inhabitant days was calculated (see previous summary paper) to facilitate comparisons between regions.

3. Geo-spatial mapping of the amount of antibiotics DDD/1,000 inhabitant days was mapped based on patients' postal code. For calculating the DDD/1,000 inhabitant days of each postal code, region population rates by postal code was obtained from Census 2016 on www.statscan.gc.ca.

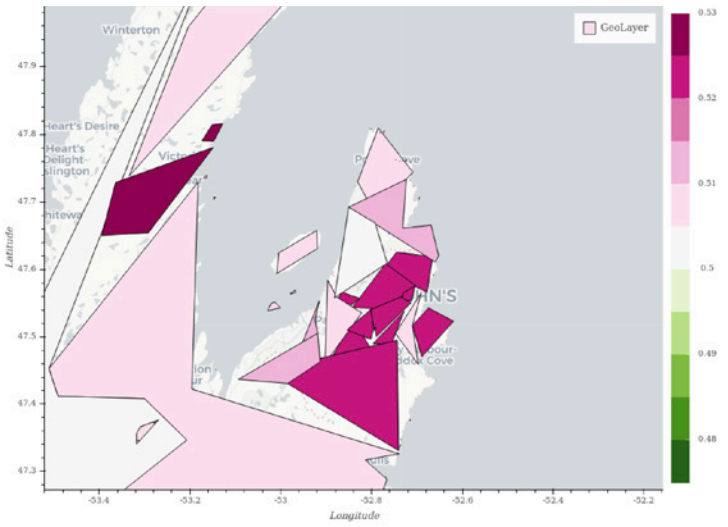
**Antibiotics rates were standardized according to proportions in NL of males and females in four age categories (<10 years, 10–19, 20–64, and ≥65 years).*

Results

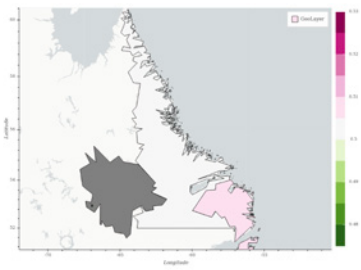
A. Newfoundland



B. St. John's



C. Labrador

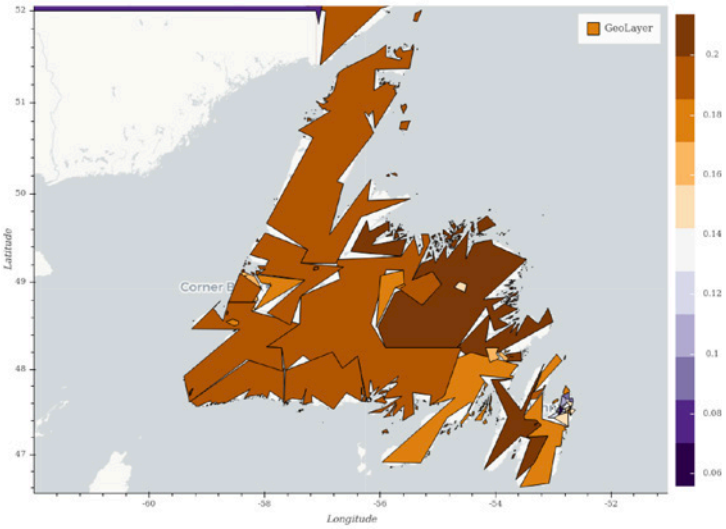


*Dark Purple = Regions With a Higher Rate of Females

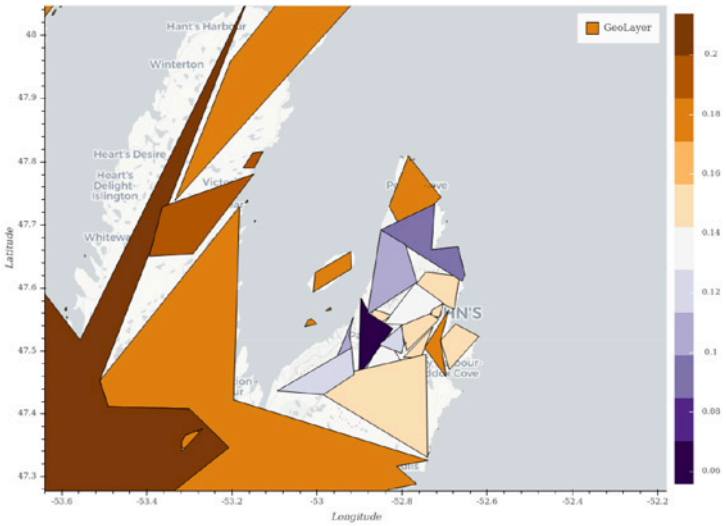
- St. John's and Corner Brook areas have higher female population compared to the rest of the province.

Figure 1. Map of NL Showing the Rate of Females in the Population by Postal Code

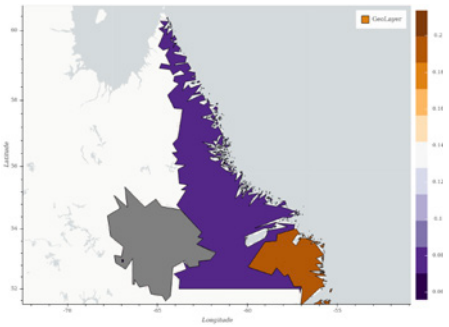
A. Newfoundland



B. St. John's



C. Labrador

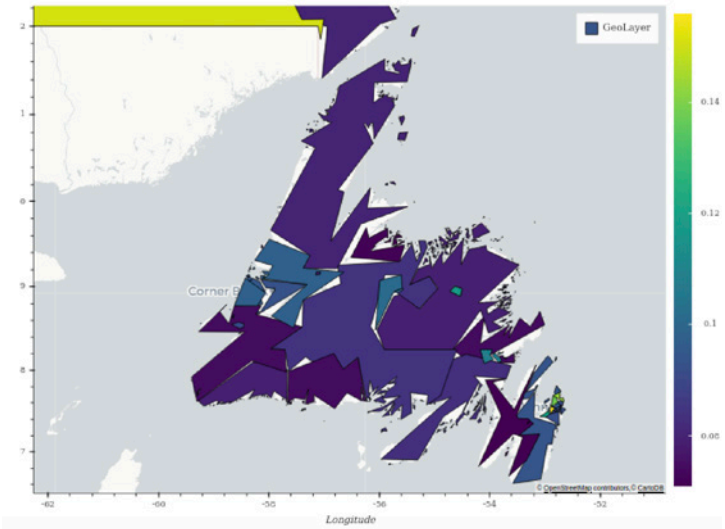


*Dark Brown = Regions with the highest proportion of seniors

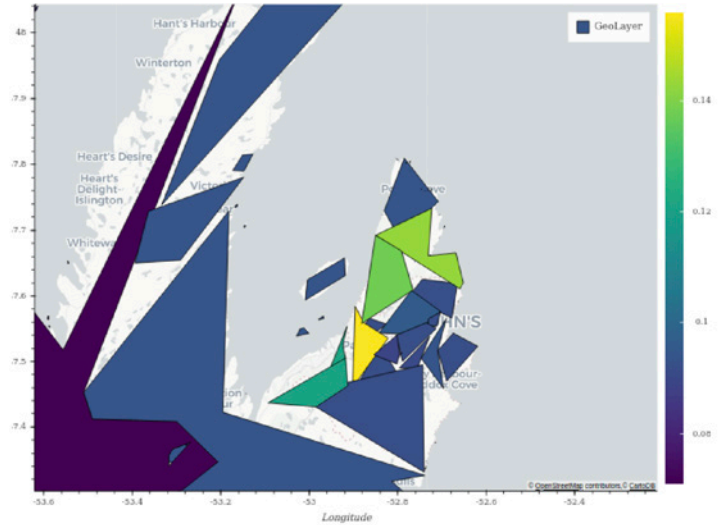
Figure 2. Map of NL Showing the Rate of Persons ≥65 Years in the Population by Postal Code

- The regions with the highest proportion of persons ≥65 years were Western Avalon, Bonavista Peninsula, North East Newfoundland, and Northern Newfoundland.

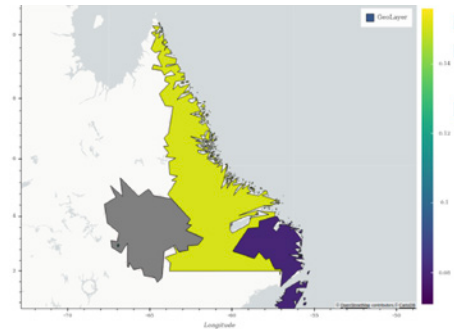
A. Newfoundland



B. St. John's



C. Labrador

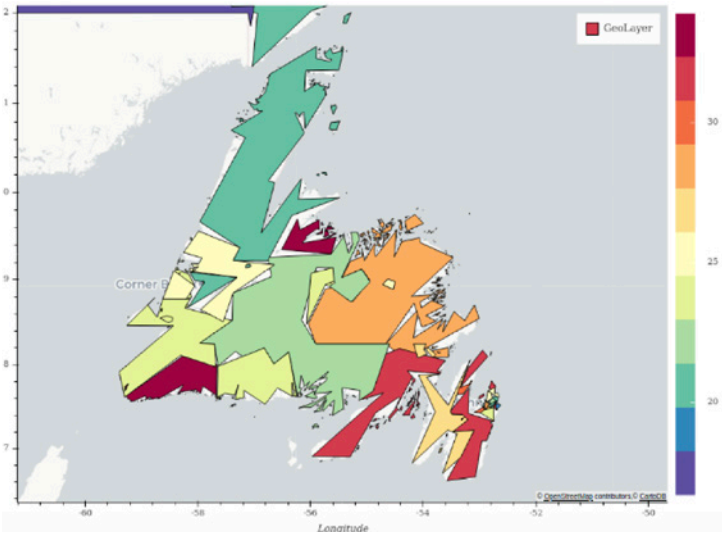


*Light Green = Areas With a Higher Rate of Children

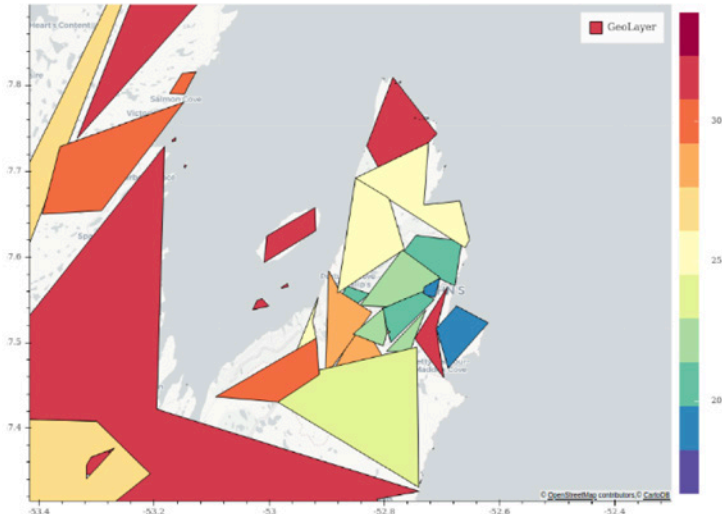
Figure 3. Map of NL Showing the Rate of Children <10 Years Old in the Population by Postal Code

- Areas with the highest proportion of children are Paradise, Torbay, Portugal Cove-St. Phillips, and CBS.

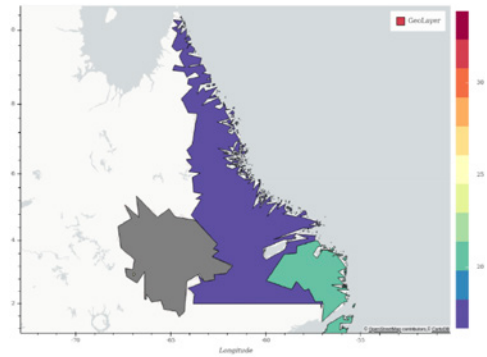
A. Newfoundland



B. St. John's



C. Labrador



*Dark Red = Regions with highest rate of antibiotics

Figure 4. Map of NL Showing the Age and Sex Standardized DDD/1,000 Inhabitant Days by Postal Code

- The highest rates of antibiotic use, corrected for difference in sex and age, were in the rural areas area of La Poile Bay, Northern Newfoundland, South East Avalon, and the Burin Peninsula.
- Higher rates were also observed in St John's South West, Conception Bay, Paradise, North Eastern Newfoundland, and Carbonear.

Conclusions

1. There are substantial demographic differences across the regions of NL with more women and children in urban areas and more seniors in rural areas.
2. Even with correction for these differences, the highest rates of antibiotic use are in rural areas of NL. To limit antibiotic use in these areas, prescriptions could be post-dated for use if symptoms persist.
3. Some urban areas have high rates, which could be ameliorated by education of mothers/females on unnecessary antibiotics in an attempt not to provide a prescription.

(Practice Points Vol. 7, Jan–Jun 2020)

Substantial Use of Long-term Proton Pump Inhibitors in NL

Choosing Wisely Canada Recommendation

Don't maintain long-term Proton Pump Inhibitors (PPIs) for gastrointestinal symptoms without an attempt to stop/reduce PPI at least once per year in most patients.

Practice Points

1. Long-term PPI use predisposes to gastric cancer, enteric infection, fractures, pneumonia, acute interstitial nephritis, hypomagnesemia, Vitamin B12 deficiency.

2. Exemption from the guideline include patients with Barrett's esophagus, gastrointestinal bleeding, severe esophagitis, or those requiring prednisone/ NSAIDs.

3. In a study of NLPDP patients, about 6% of patients on PPIs for at least one year were also on NSAIDs or prednisone for at least 75% of the time.

4. For mild-moderate gastroesophageal reflux PPIs are necessary for 4–6 weeks, and for peptic ulcer disease for up to 12 weeks.

Data Source

Pharmacy Network of NL at NL Centre for Health Information provided prescriptions to outpatients for PPIs from 1 Jun 2017 – 30 Jun 2019 (25 months).

Results

- During the study there were 996,946 dispenses for 526,425 prescriptions of PPIs provided to 138,455 patients, 86% provided by family physicians (FPs) and 4.3% by registered nurses (RNs)/nurse practitioners (NPs).

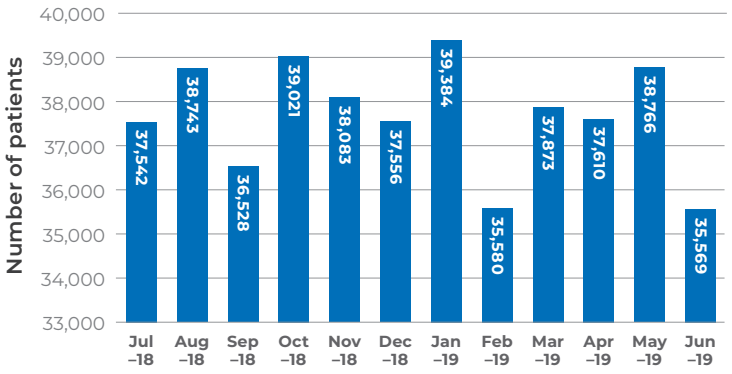


Figure 1. The Number of Patients Prescribed PPIs Each Month From 1 Jul 2018 – 30 Jun 2019

- During one year, 114,186 patients received at least one prescription for PPIs, a rate of 22/100 population.

- In June 2019, the number of patients taking PPIs was 73,047 (73,047/521,542), a prevalence rate of 14/100 population.

- The number of new patients started on PPIs during the year was 25,686, an incidence rate of 5/100 population.

- The number of patients during the year who were prescribed PPIs for longer than 3 months was 97,228, 85% of total.

- Excluding incident patients, the number of patients in the year prescribed PPIs for at least one year was 70,904, a rate of 14/100 population.

Table 1. Patients on PPIs for >3 Months or >1 Year by Age, Sex, and Locality for the Year 1 Jul 2018 – 30 Jun 2019

Patients		>3 months (>90 days)		>12 months (>365 days)	
		N	%	N	%
Sex	Male	42,958	44	31,164	44
	Female	54,268	56	39,740	56
Locality	Urban	46,863	48	33,793	48
	Rural	50,084	52	36,985	52
Age		Median		Median	
	Male	60		61	
	Female	61		62	

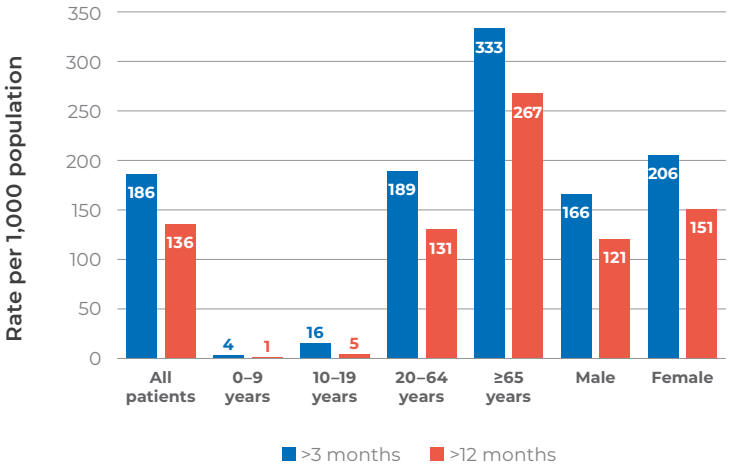


Figure 2. Prescription Rate/1,000 Population for Patients on PPIs for >3 Months and >12 Months

- There was little use of long-term PPIs in people <20 years. Although the quantity used was higher in adults 20–64 years the rate/1,000 people was highest in those ≥65 years.
- Women were more frequent long-term users of PPIs than men whether analysed by quantity or rate/1,000 population.

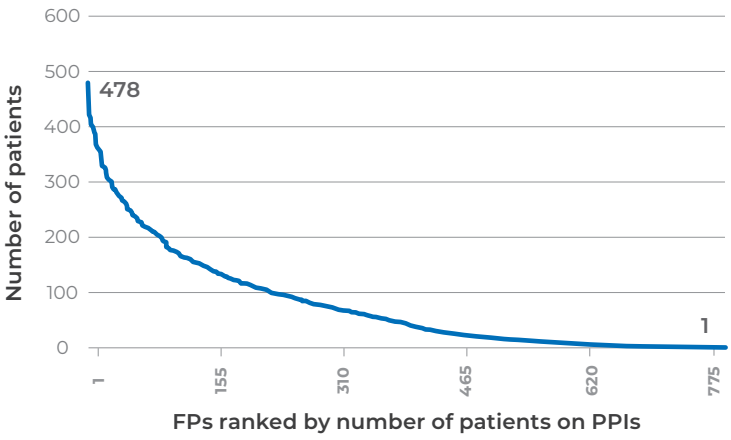


Figure 3. Ranking of FPs by the Number of Patients on PPIs for ≥12 months (1 Jul 2018 – 30 Jun 2019)

- When analyzed by prescriber, 80% of long-term prescribing by FPs is undertaken by 44% of FPs.
- 225 FPs prescribed PPIs for >1 year in >100 patients.

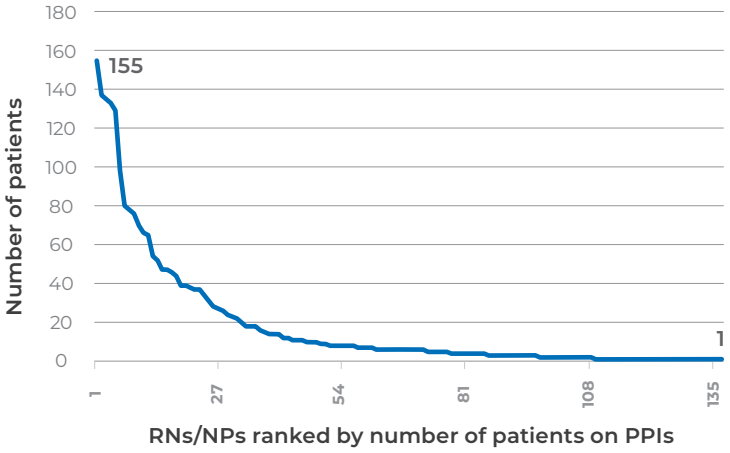


Figure 4. Ranking of Registered Nurses (RNs)/Nurse Practitioners (NPs) by the Number of Patients on PPIs for ≥12 months, 1 Jul 2018 – 30 Jun 2019

- 4 RNs/NPs prescribed PPIs for >1 year in >100 patients.

Conclusions

1. The use of PPIs in NL is high and they are generally prescribed for >3 months.
2. Long-term use for >1 year occurs in 14% of the population. Although the quantity of prescriptions was highest in adults 20–64 years, the rate/1,000 people was highest in those ≥65 years. Women were more frequent users of long-term PPIs than men.
3. The prescription of long-term PPIs was a practice common to the majority of FPs suggesting de-prescribing will be a challenge.

(Practice Points Vol. 6, Jul–Dec 2019)

High Rates of Inappropriate Referrals for Lumbar CT in Eastern Health

Choosing Wisely Canada Recommendation

Don't routinely image patients with low back pain regardless of the duration of symptoms unless:

- There are clinical reasons to suspect serious underlying pathology (ie. red flags: severe or progressive neurological deficits, suspicion of osteomyelitis, cancer or fracture).
- Imaging is necessary for the planning and/or execution of a particular evidence-based therapeutic intervention on a specific spinal condition.

Practice Points

1. The risk of cancer associated with radiation, particularly in younger people, needs to be balanced with the likelihood of benefit from CT imaging.
2. NL orders more CTs/1,000 people than any other province/territory, more than twice as many as Alberta, and 50% more than the overall Canadian rate (CADTH, March 2016).
3. In 2017, 13/1,000 people in NL had a spinal CT.
4. 83% of lumbar CT scans are ordered by Family Physicians (FPs).

Methods (Dr. A. Hall)

1. A retrospective audit of administrative electronic health records (Meditech and PACS) was performed for all adults (≥18 years) referred for lumbar spine CT by all FPs in Eastern Health in 2016.
2. Indications were categorized as appropriate (red flag present), unclear appropriateness (Radicular Syndrome) and inappropriate (nonspecific low back pain).

Results

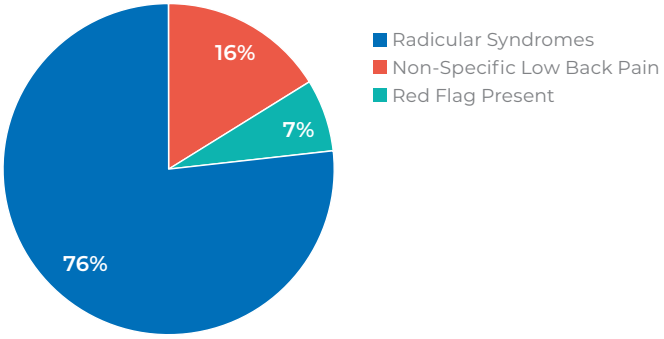


Figure 1. Lumbar CTs in Adults Ordered by FPs (N=3,609)

- It is unknown the proportion of patients with radicular syndromes in which an epidural or surgery was being considered, which would enhance the degree of appropriateness.

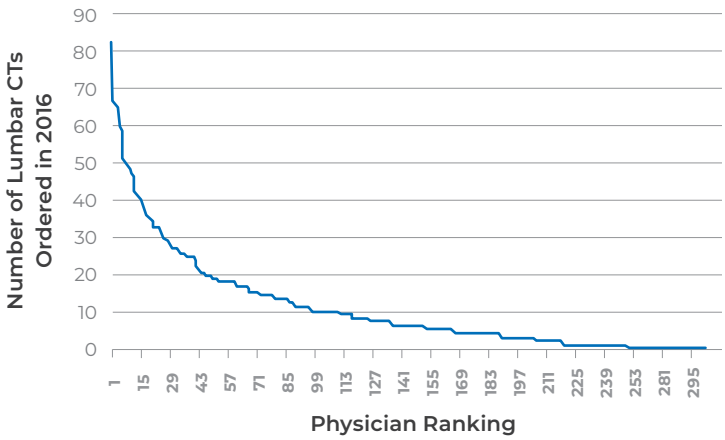


Figure 2. CT Ordering Volume Ranked by FP

- 80% of lumbar CTs were ordered by a small number of FPs.
- 13% of FPs ordered ≥20 lumbar CTs in 2016.

Conclusions

1. The rate of inappropriate or questionable referrals for lumbar CT was high.
2. A small proportion of FPs order 80% of lumbar CTs.
3. The harm associated with radiation needs to be balanced against the likely benefits from CT imaging.

(Practice Points Vol. 6, Jul–Dec 2019)

What is the Best Method to Reduce Low-Value Care? An Example Using Blood Urea Testing by Family Physicians across Newfoundland (Island Only) Regions

Objective

To determine whether the nudge of audit, feedback and academic detailing had an additional effect on the more aggressive intervention of changing the requisition form on blood urea testing by Family Physicians (FPs).

Practice Points

1. Blood urea is a redundant test of kidney function in stable out-patients as it is almost always ordered with serum creatinine.

2. Interventions to reduce unnecessary laboratory utilization include education, audit and feedback, alteration of requisition forms, or administrative restrictions on performing tests.

3. FPs prefer education, audit and feedback to restrictions on ordering.

Methods

1. NL Centre for Health Information provided blood urea and serum creatinine data on outpatients in NL from 1 Apr 2015 - 31 Mar 2018.

2. Urea was removed from the laboratory requisition in Eastern Health (EH) in August 2016 and in Western Health (WH) in spring 2016.

3. FPs in EH received feedback on their ordering of urea in fall 2016 and academic detailing between fall 2016 and spring 2017.

Results

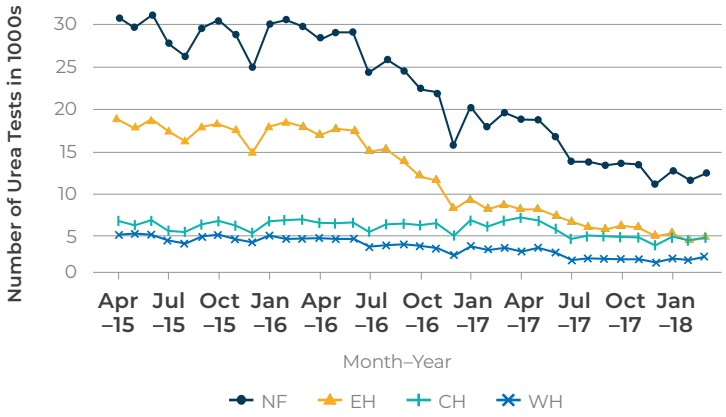


Figure 1. Volume in Thousands of Blood Urea Tests per Month by Region

- There was little difference in serum creatinine testing in EH and WH over the three years.

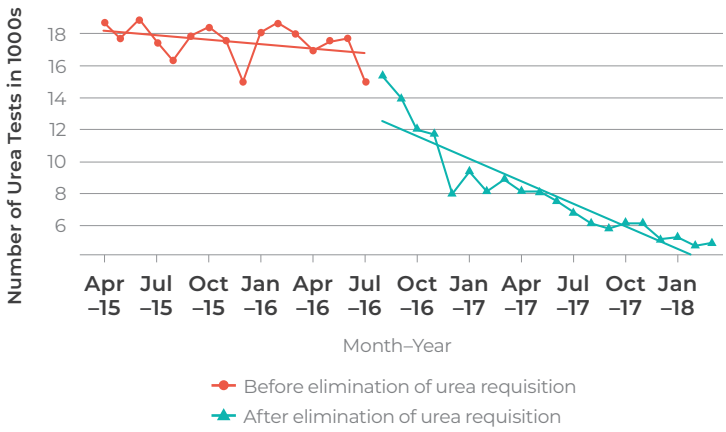


Figure 2. Volume in Thousands of Blood Urea Tests per Month at EH

- Analysis reveals a statistically significant breakpoint when the requisition changed in EH ($p<0.001$). Urea test volume reduced by 35% within four months. A further reduction to a total of 63.6% was seen after feedback and academic detailing.

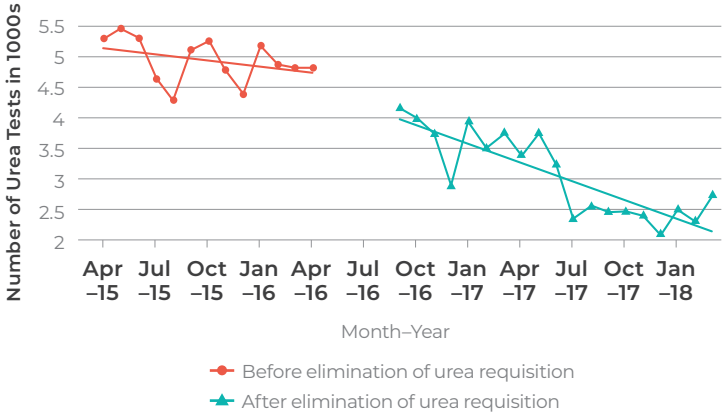


Figure 3. Volume in Thousands of Blood Urea Tests per Month at WH

- Analysis also revealed a statistically significant breakpoint aligned with requisition change in WH (p=0.0018) with urea test volume reduced by 38.1% by the end of the study period.

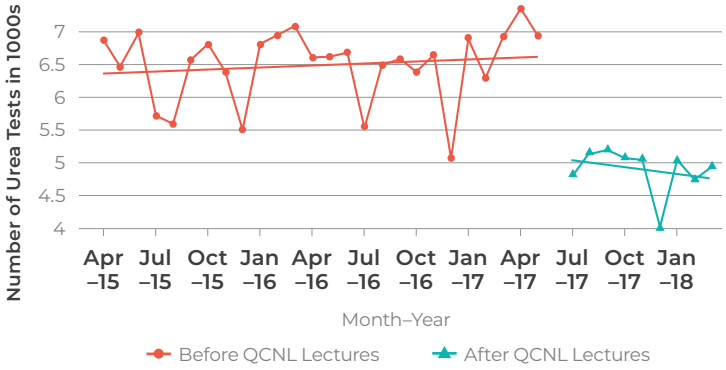


Figure 4. Volume in Thousands of Blood Urea Tests per Month at CH

- Until June 2017 there was little change in CH ordering (who did not change the requisition form). After this time there was a 24.6% reduction (p<0.001) in the region in testing which coincided with lectures from Quality of Care NL on unnecessary biochemical testing.

Conclusions

1. Elimination of blood urea on laboratory requisitions was associated with a reduction in test orders in both EH and WH.

2. Academic detailing had a separate effect additional to the effect of changing the requisition form.

3. A small commitment of time to provide lectures in CH was associated with a 25% reduction.

(Practice Points Vol. 7, Jan–Jun 2020)

Interventions to Change Behavior in the Use of Health Care Resources in NL

Objective

To identify lessons learned from the evaluation of interventions that change behavior in the use of health care resources.

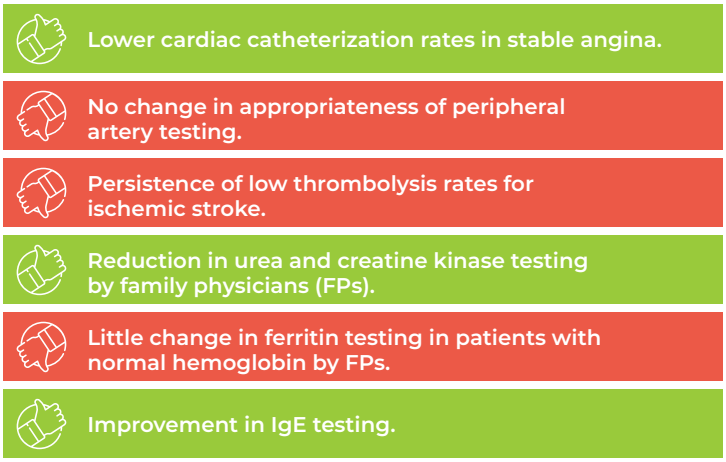
Practice Points

1. Quality of Care NL has compared clinical practice in multiple areas to best practice as defined by guidelines (including Choosing Wisely Canada). These areas include imaging (cardiac catheterization, peripheral artery testing, carotid artery testing, screening mammography, CT scanning), testing (biochemical, immunological, endocrine), drug use (antibiotics, proton pumps inhibitors, antipsychotics, benzodiazepines, thrombolytics in ischemic stroke), and various other interventions (colonoscopy, remote monitoring).

2. Interventions to change behavior in the use of health care resources have included 1) audit, feedback, and academic detailing, 2) eTechnology, 3) implementation teams that change care processes, 4) system change.

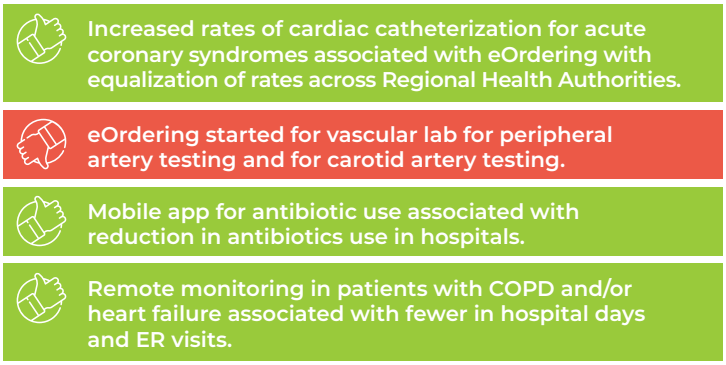
Results

A. Audit, feedback, and academic detailing



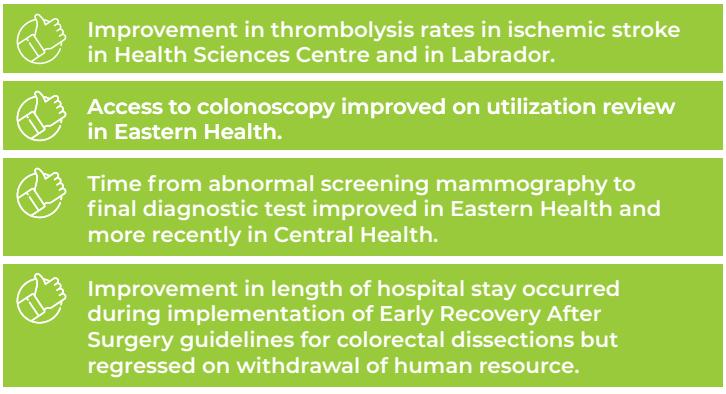
- For every evaluation of FP's use of various health care resources, there is a group of 'over-users.; It is uncertain how many of these doctors examine their personal use in comparison to their peers when utilization data is sent by email or when delivered to them in-person by Quality of Care NL.
- Audit, feedback, and academic detailing has been associated with improvement in some areas but not in others.

B. eOrdering and eTechnology



- eOrdering for cardiac catheterization and vascular lab testing and use of mobile apps and remote monitoring have been implemented with some indications of success.
- Remote monitoring in patients with serious disease is indicated.

C. Implementation teams to improve process care



- Implementation teams to improve care processes have been successful, but they are human resource intensive. The impact may be short lived without continued effort.

D. System Change

Medical directive in pre-operative testing prior to low risk surgery decreased use of chest xrays and INR but not blood testing.

Decrease in antibiotic use for UTI in Long-Term Care Facilities (LTCFs).

Reduction of antipsychotic use in LTCFs.

Reduced urea, AST, LDH testing by FPs by taking test off requisition form.

- System change that creates a barrier to inappropriate use, like taking a test off the requisition form, were more effective than changes that do not include a barrier, such as programs to reduce antibiotic or anti-psychotic use in a long-term care facility or a medical directive to reduce testing.
- More broad-based system change to improve accountability for the use of health care resources may be necessary in hospitals, long-term care facilities and primary care.

Conclusions

1. Audit, feedback and academic detailing can reduce unnecessary use of health care resources but its effectiveness is dependent on uptake by high users.
2. In areas where audit and feedback has not been successful, more aggressive interventions may be needed, such as eTechnology solutions, implementation teams to improve care processes, or system change.
3. eOrdering for blood testing and imaging is indicated, but require evaluation to ensure clinical practice matches best practice.
4. Some interventions depend on complex processes and failure of one step on the pathway will lead to poor quality. Consequently, evaluation of the entire care process will be necessary to identify the step/steps that require intervention.
5. System changes that provide barriers to the provision of core value care may ultimately be necessary.
6. Consideration should be given to linking licensure with participation in audit and feedback, and to economic incentives that reward low use of low-value care.

(Practice Points Vol. 5, Jan–Jun 2019)

The Case for a Quality of Care Council in Newfoundland and Labrador

Objective

To understand the value of a Quality of Care Council in Newfoundland and Labrador for better use of health care resources.

Current Health System in NL

- Health care spending is high while health outcomes remain poor compared to the rest of Canada.
- Demographic change in the province is substantial.
- The structure of the health system is not optimal.
- There is inappropriate and unnecessary use of drugs, laboratory medicine and diagnostic imaging, and deficits in getting the right treatment to the right patient at the right time.

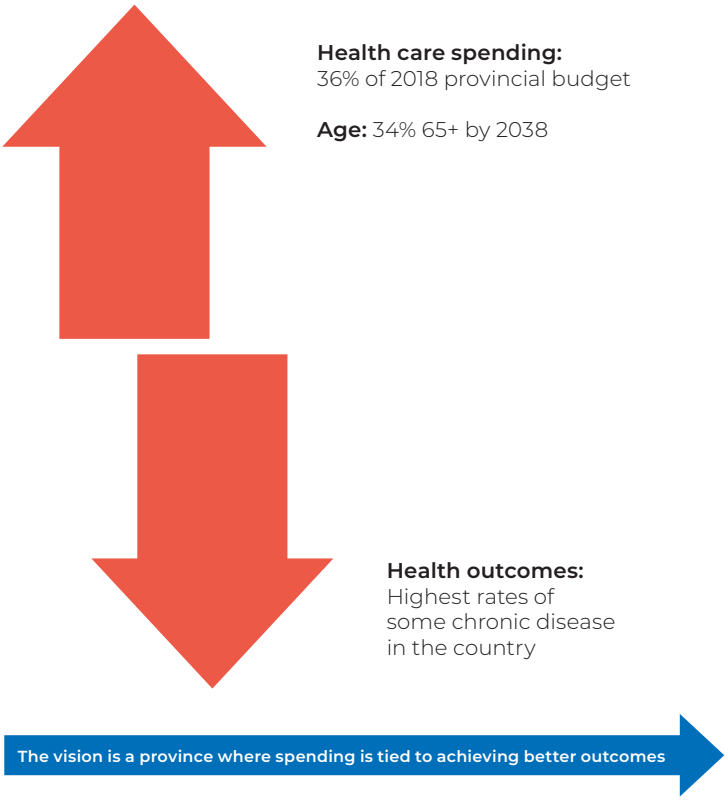


Figure 1. Provincial Context

Barriers to Quality Care in NL

Quality of Care NL has identified a number of barriers to quality care and issues influencing inappropriate use of health care resources:

1. Fragmentation of health care sector.
2. Shift in recent years from acute care to chronic disease prevention and management, and addressing requirements of an aging population.
3. Difficulty in implementing change.
4. Patient demand and difficulty in meeting demand.
5. No single entity responsible for quality of care.

Solution

Optimize current resources to provide the best care and improve health outcomes by:

Making evidence-based decisions about how to best use resources

Engaging with the public and the health care system

Ensuring an entity is responsible for health quality and safety in the province

Provincial Health Quality Councils

- Independent, third-party, government funded entities with legislated mandates to improve health quality.
- Governed by a Board of Directors that reports to Minister of Health.
- Include a view of quality that is system-wide and patient-centred, with elements of efficiency, safety, accessibility, and effectiveness.

Table 1. Comparison of Provincial Health Councils

Province	Year Created	Legislation	Operating Budget	Patient Engagement	Develops Tools & Guidelines	Patient/Client Surveys
BC	2008	☒	$7.0M	☑	☑	☒
AB	2002	☑	$6.7M	☑	☑	☑
SK	2002	☑	$5.5M	☑	☑	☑
ON	2005	☑	$40.5M	☑	☑	☒
NB	2008	☑	$2M	☑	☒	☑

Value and Strength of Health Quality Councils, According to Their CEOs:

1. Accountability infrastructure in place for quality of care in the province.
2. Independent entity to bring health care stakeholders together on quality agenda:
    a. Objective
    b. Legislation gives credibility and force to mandates
    c. Builds trust and likability among stakeholders
3. Accelerators/influencers of change to help other organizations meet goals faster:
    a. Get information into the hands of those that need it
    b. Monitor and report on improvements
4. Apply a consistent approach to measurement and surveying.
5. Increases patient/public involvement.

What Would a Quality of Care Council Look Like in NL?