

# Practice Points

Jul 2020 – Apr 2021

Volume 8



The right treatment, for the right patient,  
at the right time.



Our partnership with Choosing Wisely Canada builds upon established national guidelines and recommendations that cross all disciplines to support the reduction of low-value health care, particularly where harms outweigh benefits.



A task force on health, reimagining health care in Newfoundland and Labrador.



## Who We Are

Quality of Care NL is an applied health systems research and evaluation program aimed at improving the quality of care delivered in Newfoundland and Labrador (NL). We work to ensure the right treatment gets to the right patient at the right time.

Our partnership with Choosing Wisely Canada builds upon established national guidelines and recommendations that cross all disciplines to support the reduction of low-value health care, particularly where harms outweigh benefits. This work is carried out by Quality of Care NL on behalf of Choosing Wisely NL.

## Our Approach

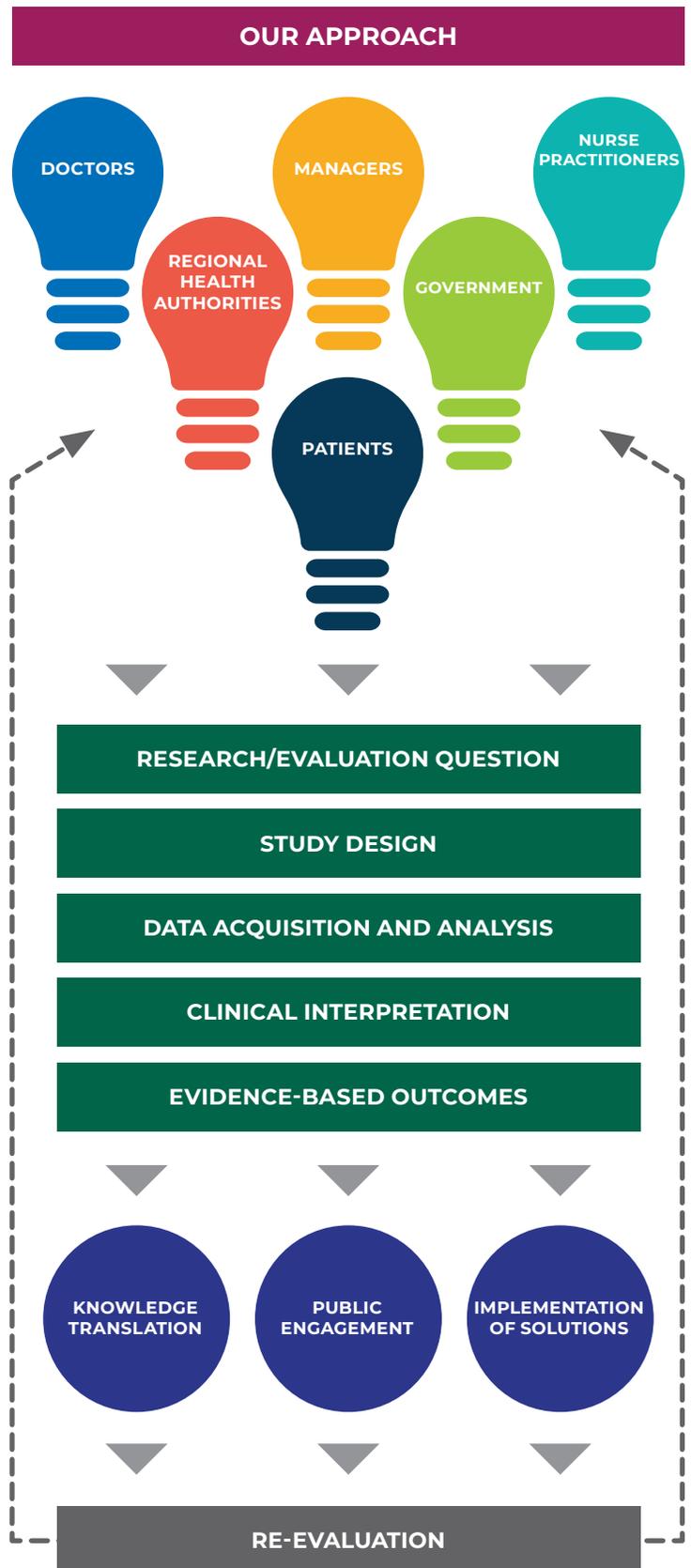
Our research and evaluation projects are centered on health care system priorities and are directed by many partners within the system. Project ideas are generated by health care providers, managers, policy decision-makers, and patients all with questions on how the system can be improved to deliver better quality care.

Quality of Care NL works with project teams to define methodologies, analyze data, provide clinical interpretation, and engage patients to ensure project outcomes are meaningful. We work with and engage all stakeholders to encourage the implementation of evidence-based research and evaluation outcomes through interventions that make it easier to determine the best course of treatment.

Do you have an idea for delivering improved quality of care? Let us help.

For more information on our projects and what we can do to move your idea forward, please contact:

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## Practice Points Volume 8

# Preface

The work published in Practice Points Volume 8 is a combination of work completed as part of the standard agenda for Quality of Care NL, Choosing Wisely NL and NL SUPPORT, as well as the agenda for Health Accord NL, the provincial Task Force on Health.

Health Accord NL was announced in November 2020 by Premier Andrew Furey and the Honourable John Haggie, Minister of Health and Community Services. Dr. Patrick Parfrey and Sister Elizabeth Davis were named Co-Chairs of Health Accord NL. With a responsibility to present a report to the Premier and the Minister in January 2022, Dr. Parfrey and Sister Davis compiled a team to work as part of Health Accord NL.

Supporting the work of Health Accord NL are various stakeholders with specific capacity, skills and expertise. Such organizations include, the Government of Newfoundland and Labrador, Regional Health Authorities, NL Centre for Health Information, and Quality of Care NL.

Section 1 of this Volume is work completed by Health Accord NL supported in part by Quality of Care NL.

For more information on Health Accord NL, please visit [www.healthaccordnl.ca](http://www.healthaccordnl.ca).

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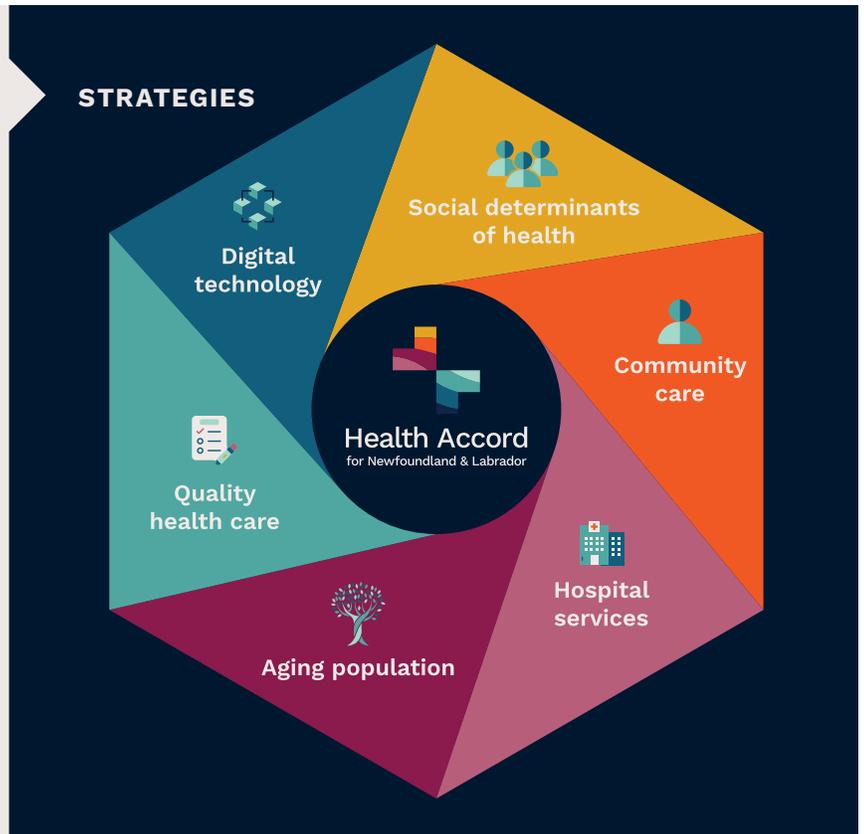
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# The Background and Approach to Health Accord NL

## FACTS

- |  |  |
|--|--|
| <p><b>1</b> Worst life expectancy, highest death rates for cancer, cardiac disease and stroke, and highest rate of chronic disease in Canada</p> | <p><b>2</b> Since 1981, only 6% increase in social spending but 232% increase in health spending</p>                                   |
| <p><b>3</b> Worst health system performance across all Canadian provinces</p>  | <p><b>4</b> Highest per capita spending on health care in Canada.<br/><br/>NL provides the worst value for spending in health care</p> |
| <p><b>5</b> Population shift to a low percentage of children, a high percentage of seniors, with a drop in rural populations</p>                 | <p><b>6</b> 50-year-old institution-based system with an imbalance between community-based services and hospital services</p>          |

## STRATEGIES



## Six Health Myths in Newfoundland and Labrador

**Myth:** We are the healthiest people in Canada

**Myth:** Health spending is more important than social spending

**Myth:** We need a doctor in every community and a full-service hospital in every region

**Myth:** Care for seniors is well resourced

**Myth:** Many tests and a drug for every ailment mean better care

**Myth:** Digital solutions are not very helpful in patient care

## Agenda for Health Accord NL

1. Increase awareness of and interventions in the social factors that influence health (social determinants of health)
2. Balance community-based (primary health care, allied health care, elder care, social care) and institution-based services
  - ◇ Public engagement is a priority in shaping the agenda
  - ◇ Six strategies are intended to implement that agenda (see figure above)

## Guiding Beliefs

**We believe** that social, economic, and environmental factors, together with personal characteristics (biology, genetics, gender and personal behaviours) and health systems, help determine health outcomes for individuals and communities.

**We believe** that, only by attending to all these factors together, will we find the culture change needed to ensure better health outcomes, while helping people become and stay healthy, find well-being and thrive economically.

**We believe** that people and communities will decide how best to address these factors in ways that reflect their values, their perspectives, and their preferences — therefore, public engagement is key in bringing about healthy culture change.

**We believe** that partnerships across all sectors are essential in transforming health outcomes and coming closer to health equity in this province over the next 10 years.

**We believe** that digital technology and funding consistent with our priorities are important resources in reorienting and rebalancing our health system.

## Guiding Principles

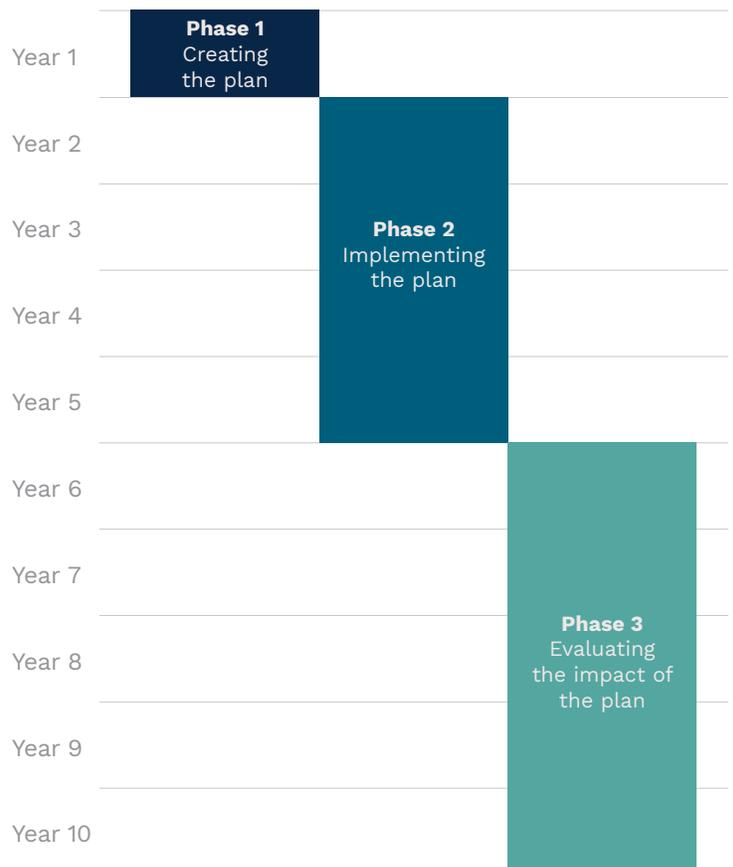
The Task Force and the six strategy committees will be visionary yet pragmatic, working within the fiscal envelope provided by the provincial government. We will develop a 10-year Health Accord for Newfoundland and Labrador using the following guiding principles:

1. Focus on **HEALTH OUTCOMES**
2. Lead with **INTEGRITY**
3. Insist upon **EQUALITY & INCLUSIVITY**
4. Listen **RESPECTFULLY & COLLABORATIVELY**
5. Engage **HOLISTICALLY** & integrate **ACROSS SECTORS**
6. Uphold **ACCOUNTABILITY & TRANSPARENCY**

## Engagement Framework



## Timeline



Learn more about Health Accord NL at [www.healthaccordnl.ca](http://www.healthaccordnl.ca).

# The Major Directions Arising from Health Accord NL

## Objective

In the initial phase of Health Accord NL, each of the six strategy committees was asked to state their major directions for improvement of health in NL by focusing more on vision than implementation.

## Vision for Health Accord NL

Our Vision is improved health and health outcomes for Newfoundlanders and Labradorians through acceptance of and interventions in social determinants of health, and a higher quality health system that balances community, hospital, and long-term care services.

## Direction Statements

### 1. Social Determinants of Health

- ◇ We will continue to seek a clearer understanding of the social, economic, and environmental factors that have led to continuing health inequity in NL. We will engage communities in identifying and addressing specific areas of concern.
- ◇ We will challenge the health care system to strengthen its role in promoting health equity.
- ◇ We will champion the **Health in All Policies**© approach by provincial and municipal governments and encourage its expansion to include public, community and private organizations.
- ◇ We will build on our strengths and existing initiatives to bring about a cross-sectoral approach, essential to improving the health of Newfoundlanders and Labradorians.

### 2. Community Care

- ◇ Every person in Newfoundland and Labrador will have timely access to social and health services and to continuous care centered in the community as part of a well-connected network.
- ◇ This structure will be enabled and strengthened by interdisciplinary teams working collaboratively with individuals and their families and focusing on all aspects of health and wellness.

### 3. Hospital Services

- ◇ Quality hospital services will be delivered through a better-integrated hub-and-spoke team-based care where all practitioners will be able to fully utilize their skills.
- ◇ The care model will be delivered in collaboration with community services to provide sustainable, appropriate, equitable and person-focused care that supports the needs of the patients in their communities.
- ◇ Patient travel will be minimized by the utilization of virtual technology.
- ◇ When travel is necessary, patients will access a better transportation system.

### 4. Aging Population

- ◇ The people of Newfoundland and Labrador will be enabled and empowered to transition seamlessly through age and health-related changes with dignity and autonomy.
- ◇ This will be rooted in family and community supports and strengthened by a commitment to aging-in-place in age friendly communities.



## 5. Quality Health Care

- ◇ We will improve individual and population health, as well as the performance of our social and health systems.
- ◇ All people of the province will receive high value, timely services in a way which matches actual practice with best practice.
- ◇ Accountability, oversight, research and beneficial innovation will ensure optimal quality of care.

## 6. Digital Technology

- ◇ Digital technology will improve health and health outcomes in the province by empowering people with information, access, and choice.
- ◇ By connecting people and systems, we will integrate systems, and we will link health and social factors.
- ◇ Using an agile, iterative, and evidence-based approach, we will spur leading innovation and a culture of exploration, which will become a driving force for inclusion.

Integration of the six directions will be important in creating a structure that is stable and coordinated.

### We will improve the health of Newfoundlanders and Labradorians

Address specific areas of concern relating to social, economic and environmental factors

Creatively use digital technology to connect systems and people and to link health and social factors

Empower people to transition seamlessly through age-related health changes

Ensure high quality health care in social and health systems

Balance the health system with an accessible team-based network of community, hospital, and long-term care services

Learn more about Health Accord NL directions and how they integrate at <https://www.youtube.com/watch?v=sctX9wLBCq4>.

# Public Engagement: The Results of Questionnaires Completed at Health Accord NL Virtual Town Halls (Engagement Series #1)

## Objective

To determine the opinions of people in NL about health.

## Practice Points

1. At ten virtual town halls from regions across the province undertaken during Dec 2020, information was collected using short questionnaires at the start of the town hall, and surveys completed online after the town hall.

## Data

- 185 questionnaires were completed at the start of each town hall and 211 surveys submitted online after the town hall finished. In Labrador City, the survey was extended to others in the community via Facebook but this method did not bias results presented here.
- 77% of survey respondents were female, 83% aged 18–64 years, 25% were from St. John’s, 42% from Labrador City, and the remaining 33% from NL, excluding these two regions.

## Results

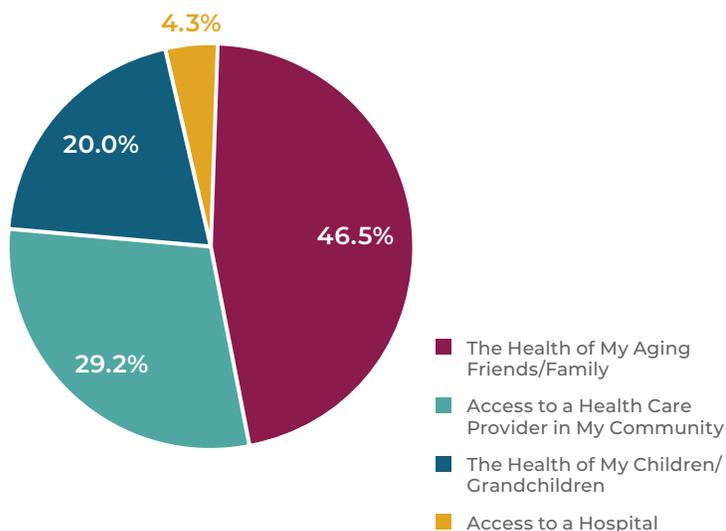


Figure 1. Question: Which of the Following is Your Top Concern Around Health?

- The top concern was the health of aging friends/family.

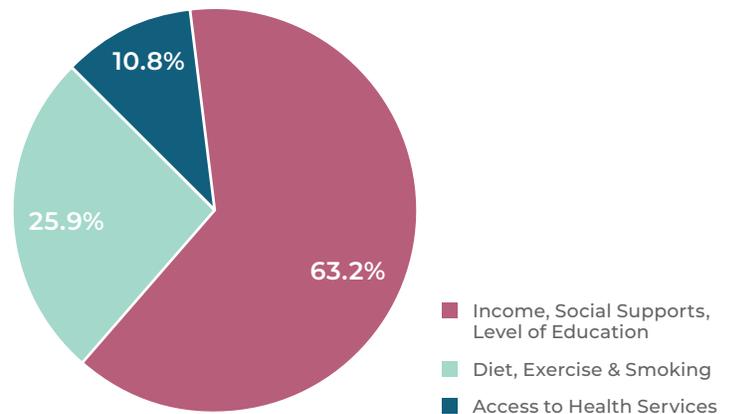


Figure 2. Question: What is the Biggest Factor That Affects Health?

- Nearly two in three (63%) respondents stated that social determinants of health were the biggest factor that affected health, followed by lifestyle factors, and access to health services.

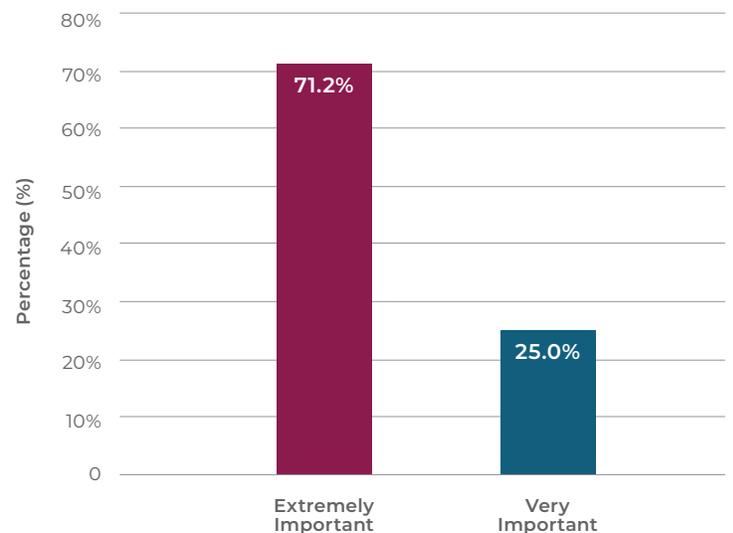
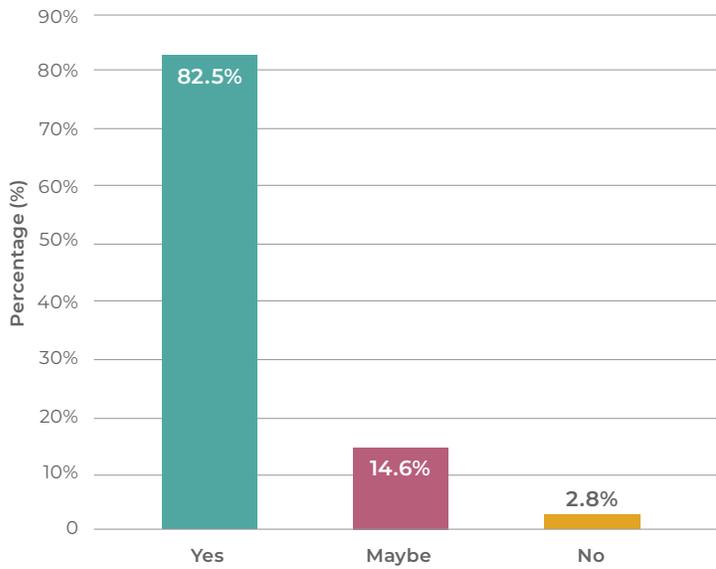


Figure 3. Survey: Is it Important to Provide Solutions to Social Factors That Affect Our Health Like Level of Education, Employment, Our Social Circumstances, Culture, Race?

- Over 95% of respondents felt that providing solutions to social factors that affect health were extremely or very important.



**Figure 4. Survey: Do You Believe That the Way We Receive Regular Care From Doctors, Nurses or Other Providers Needs to Change?**

- The vast majority believe that the way we receive care from health providers needs to change.

## Conclusions

1. The people who attended the virtual town halls reported that the health of aging friends/family was their top concern; the social determinants of health were the biggest factor that affected health; solutions to social factors were extremely important; and the way we receive regular care from health providers needs to change.

# Public Engagement: Themes Arising From Questions and Comments at Health Accord NL Virtual Town Halls (Engagement Series #1)

## Objective

To provide an overview of the themes arising from questions asked and comments provided on surveys at the virtual town halls.

## Background

In Dec 2020, ten town halls were organized in ten regions of the province using virtual technology; each meeting was attended by in the range of 23–125 people. Following a 20-minute presentation on Health Accord NL, questions were asked by attendants using the Question and Answer or Chat function, with people being unmuted to ask their question. The regions were the areas around Happy Valley-Goose Bay, Labrador City, St. Anthony, Corner Brook, Port aux Basques, Grand Falls-Windsor, Gander, Clarenville-Burin-Bonavista, Carbonear-Placentia, and St. John’s.

In addition, attendees were asked to complete a survey online with questions and space for comments.

In Labrador City, some attendees forwarded the surveys to other members of their community. In themes biased by the different method used in Labrador City, we note the differences.

Themes were classified as related to the social determinants of health (SDH) or the health system. The health system themes were classified as related to access and system performance.

## Results

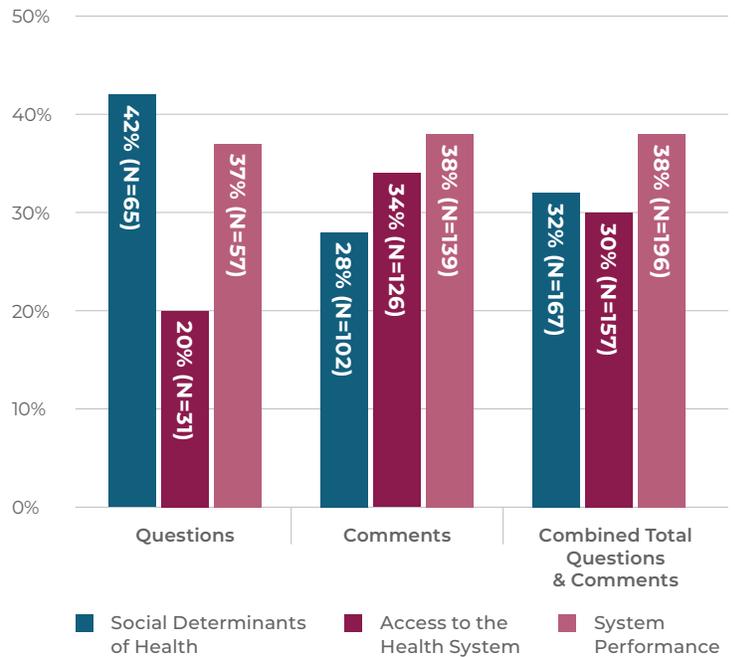


Figure 1. The Major Themes Arising From the Questions Asked and Comments Made in the Surveys

- Sixty-five of the 153 (42%) comments made during the town hall concerned the SDH, as did 102 of the 367 (28%) comments made in the surveys.

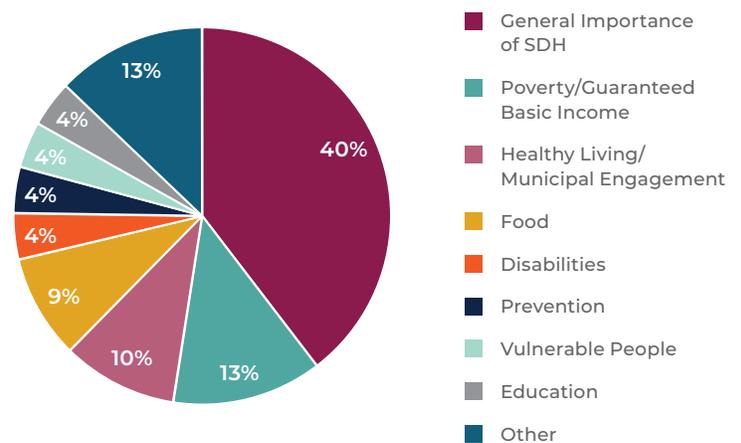
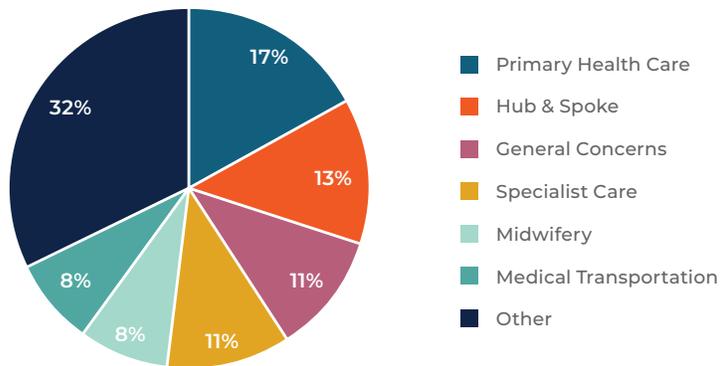


Figure 2. Themes Associated With the Social Determinants of Health Arising From Questions Asked (N=65) and Survey Comments (N=102)<sup>#</sup>

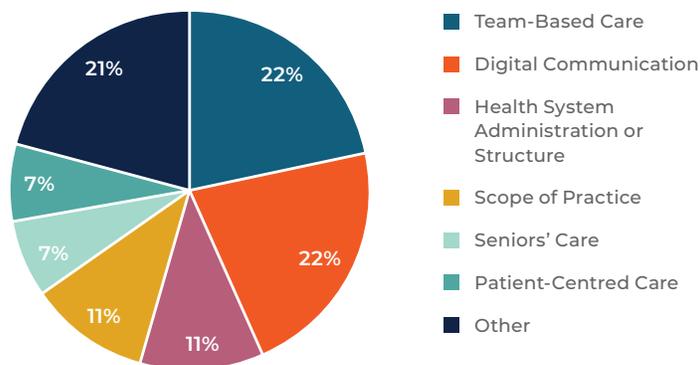
<sup>#</sup> An additional 11 comments were made on cost of transport/health by survey respondents from Labrador City; 24% of SDH themes in the survey were from this region



**Figure 3. The Major Sub-Themes Identified on Access to the Health System From Questions Asked and Comments Made in the Surveys<sup>#</sup>**

<sup>#</sup> In Labrador City, of 131 comments provided on the surveys, 24 (18%) were about primary care access

- The major sub-themes associated with access to the health system were access to primary care, a better hub-and-spoke model, access to specialty care, midwifery, seniors care and medical transportation.



**Figure 4. The Major Sub-Themes Identified on Health System Performance From Questions Asked and Comments Made in Surveys**

- The major sub-themes on health system performance included team-based care, provision of digital communication, improvements to health system structure or administration, health providers working to their full scope of practice, and seniors care.
- In addition to the numbers provided above, there were 98 comments that were deemed as “Miscellaneous” — 32 were from the Questions section of the town hall and 66 were included in the Comments section of the survey. These were generally comments on Task Force processes or statements of appreciation that the work was underway.

## Conclusions

- Analysis of the virtual town hall questions and comments revealed residents’ of the province desire for change in both SDH and in the health system.
- In addition to the general importance of SDH, major themes identified included poverty, healthy living and food, which included food security, education on healthy food choices and ability to grow food.
- For the health system, the major themes concerned improving access and better health system performance.
- The major sub-themes on health system performance were progressive and reflected themes discussed by the strategy committees.

# Public Engagement: Themes Arising From Electronic Communication Between the Public and Health Accord NL (Engagement Series #1)

## Objective

To provide a summary of social and health system themes in public engagement using the Health Accord NL website and email.

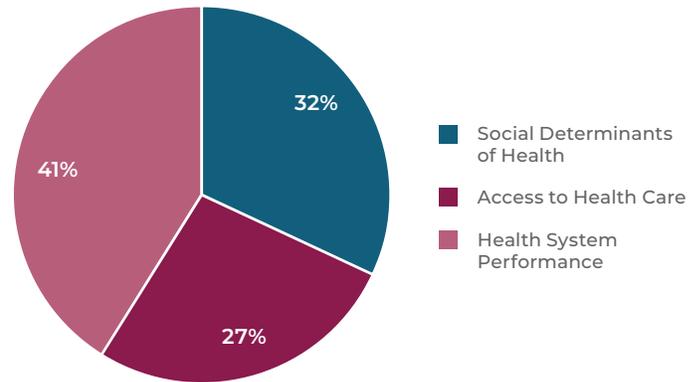
## Practice Points

1. Health Accord NL is committed to public engagement on the strategies that could be undertaken to improve health in NL. In Phase 1, this engagement has included virtual town halls and various other types of electronic communication.
2. Adverse health outcomes are more the result of social determinants of health (SDH) than the health system, but health spending is far higher than social spending.
3. Having completed the first two phases of public engagement and to discuss the directions envisaged for improvement in both the social and health systems, Health Accord NL plans two further phases of public engagement on implementation.
4. The third engagement series will inform the draft final report and occur during the Jun – Aug 2021 timeframe. Engagement will occur focused on a framework for change and potential actions.
5. The fourth and final engagement series will occur in the Sept – Nov 2021 timeframe and focus on ensuring “we got it right” so that the implementation plan in the final report is reflective of the change that needs to occur to improve the health of the people of the province.

## Data

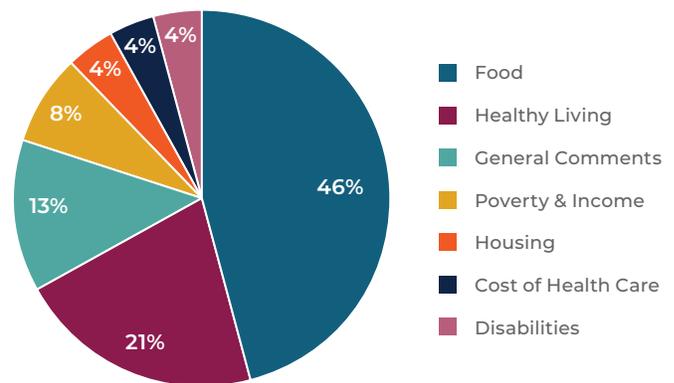
- During Dec 2020 and the first two weeks of Jan 2021, Health Accord NL received 38 emails and 33 contributions to the website.
- Themes were classified as related to the SDH, access to the health system and health system performance. However, some comments were of a general nature and were not classifiable.

## Results



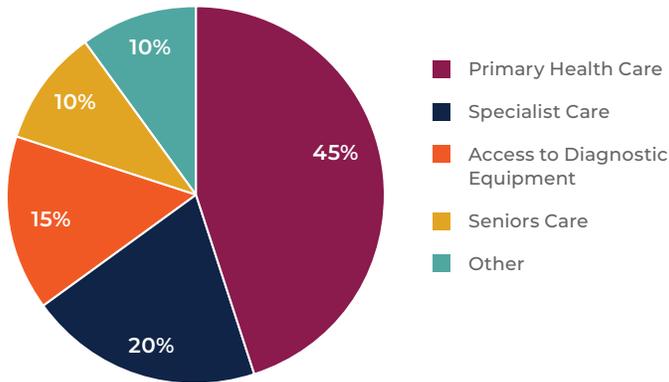
**Figure 1. The Relative Contribution of Social and Health Themes Arising From Electronic Communication With the Public**

- Comments were roughly equally distributed across the themes of social determinants of health, access to the health system, and health system performance.



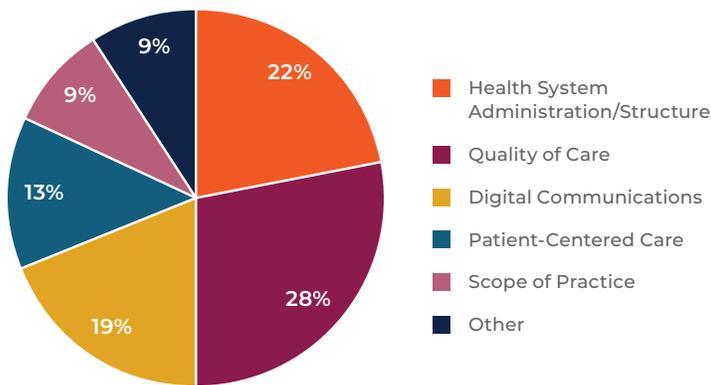
**Figure 2. Themes Arising From Email or Website Contributions Related to the Social Determinants of Health**

- The dominant themes concerning the SDH were food (which included food security, education on healthy food choices and growing produce locally) and healthy living.



**Figure 3. Sub-Themes Arising From Email or the Website Related to Health System Access**

- The major sub-themes concerning health system access were access to primary health care, specialists and diagnostic equipment.



**Figure 4. Sub-Themes Arising From Email or Website Related to Health System Performance**

- The themes arising from email/website communications on health system performance concerned ways of improving health system performance through improved health system administration/structure, improved quality of care, digital communications, patient-centered care, providers working to the full scope of their practice, and seniors care.

## Conclusions

1. Electronic communications from the public confirmed conclusions arising from the questions asked and comments made on surveys at the virtual town halls: the importance of the SDH and the need for change in the health system through better access and improved health system performance.
2. The recognition of the need for improvements to health system administration/structure, team-based care, use of digital communication, improved quality of care, the need for patient-centered care, health providers working to the full scope of their practice and seniors care was evident.

# Public Engagement: Community Health Assessment Surveys in Eastern, Central and Western Health

## Objective

To assess health service delivery and health-related needs of the populations of Eastern Health (EH), Central Health (CH), and Western Health (WH).

## Practice Points

1. EH has ten primary health care service areas, CH has nine, and WH has seven.
2. A provincial Community Health Assessment survey was developed to assess health service delivery and health-related needs.

## Data

In 2019, in EH there were 4,094 respondents to Community Health Assessment surveys, and in CH and WH there were 1,254 and 1,471 respondents, respectively. Labrador-Grenfell Health (LGH) performed assessments differently, and data from LGH will be provided in the next summary.

## Results

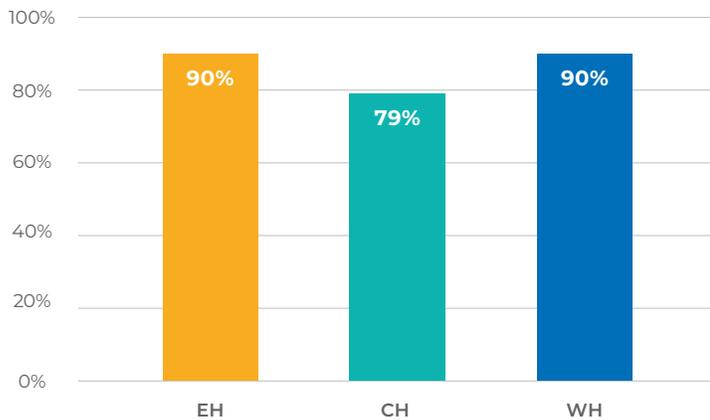


Figure 1A. Per Cent of Respondents With a Regular Family Physician or Nurse Practitioner by RHA

- The per cent of respondents with a regular family physician (FP)/nurse practitioner (NP) varied by RHA.
- In EH, the per cent of respondents with a FP/NP varied by region. The rate ranged from 72% in St. Mary’s Bay to 98% in the Clarenville area.

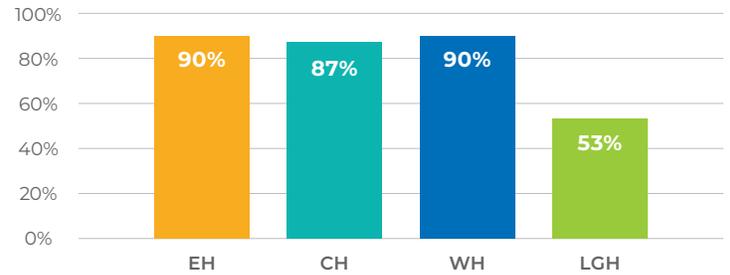


Figure 1B. Per Cent of Population With a Regular Health Care Provider by RHA Reported by the Canadian Institute for Health Information (CIHI)

- CIHI reported that 87% of NL’s population had a regular health care provider, compared to Canada’s rate of 85%.
- By far, the lowest rate occurred in LGH.

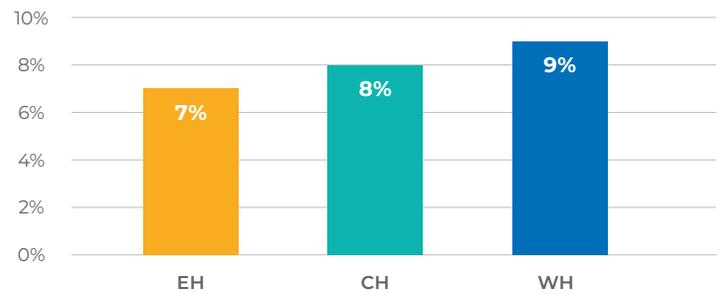


Figure 2. Per Cent of Respondents Dissatisfied With Their FP/NP by RHA

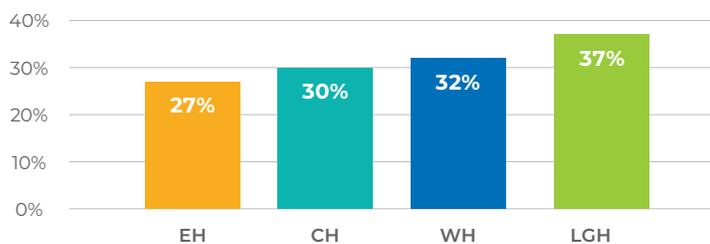
- Less than 10% were dissatisfied with their health care provider (HCP).

Table 1. Top Five Reasons for Dissatisfaction with FP/NP (%) in EH, CH and WH

Top Five Reasons for Dissatisfaction with FP/NP	EH% (N=245)	CH% (N=103)	WH% (N=119)
Wait list for appointment too long	57	54	53
Wait time in clinic too long	37	36	23
No trust or confidence in HCP	37	50	47
No chance to ask questions	27	28	22
Inconvenient hours of service	20	18	21

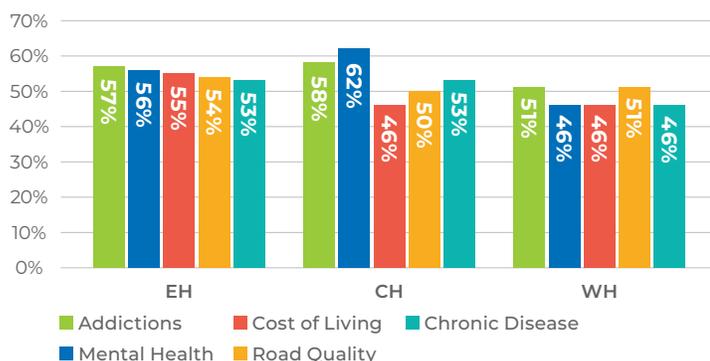
- Of the small proportion of respondents who were dissatisfied with their HCP, three of the top five reasons concerned access, and two were related to the HCP’s practice.





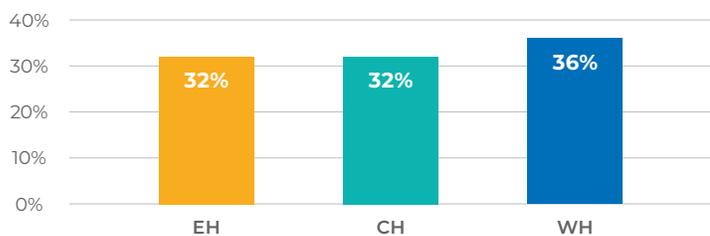
**Figure 3. Percentage of Respondents Unable to Access Health Care Services in the Past 12 Months by RHA**

- Per cent of respondents unable to access health care services in the past 12 months ranged from 27% in EH to 37% in LGH.



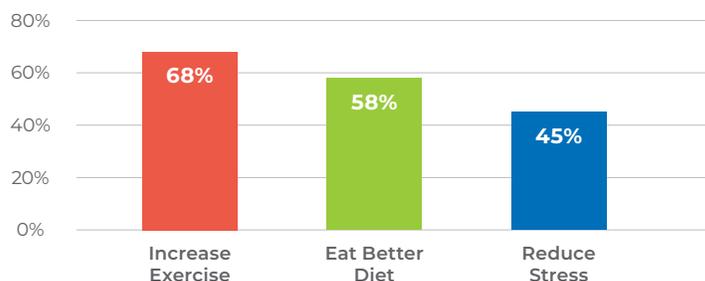
**Figure 4. Top Five Areas/Issues of Concern in the Community by RHA**

- In addition to addictions and mental health, cost of living, road quality and chronic disease, the next five areas/issues of concern included distracted driving, bullying, unemployment, seniors' resources and food security.
- Emergency services were among the top five most commonly identified areas of greatest concern in Bonavista Peninsula, Southern Shore and St. Mary's Bay.

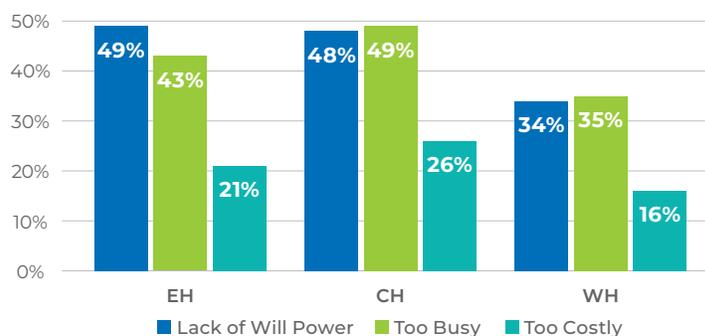


**Figure 5. Per Cent of Respondents Satisfied With Health and Wellness Resources by RHA**

- In EH, rate of satisfaction varied from 22% in St. Mary's Bay, 23% in Trinity/Conception Bay North, to 41% on the Burin Peninsula.



**Figure 6. Top Three Health-related Personal Improvements Noted by Respondents in NL**



**Figure 7. Barriers to Increasing Physical Activity Noted by Respondents**

## Conclusions

- The per cent of respondents that did not have a regular FP/NP varied by RHA and by primary health care area.
- A low per cent of respondents were dissatisfied with their HCP.
- CIHI reported that 13% of NL's population were without a regular HCP and the Newfoundland and Labrador Medical Association (NLMA) reported it as 17%.
- 30% of respondents were unable to access health services in the past year, with the highest rate in LGH.
- Among the areas of concern, the top two were addictions and mental health.
- A minority of respondents were satisfied with health and wellness resources.
- Although the majority identified more exercise and a better diet for personal health-related improvements, the barriers to achieving these appear difficult to surmount (lack of will power, too busy, too costly).

# Population Diversity and Major Issues within Labrador-Grenfell Health

## Objective

To compare demographic and socio-economic factors within the six regions of Labrador-Grenfell Health (LGH), and to report the major issues in LGH.

## Practice Points

1. Labrador is the size of the United Kingdom and the population density is more similar to a territory of Canada than a province.
2. A third of the population in the LGH region is Indigenous.
3. The rate of food insecurity in Nunatsiavut is five times the rate of the province. The weekly cost of a nutritious food basket is \$402, compared to \$264 on the island of Newfoundland (52% higher).
4. Life expectancy is 1.6 years shorter in LGH than in the province.
5. According to Statistics Canada, in 2011 the life expectancy for Indigenous people in Canada was 9.3 years less than that for non-Indigenous Canadians.

## Data (PI: Dr. T. Piggott)

Community profiles were obtained from Statistics Canada Census of Population 2016 and 2006, and from the NL Centre for Health Information (NLCHI).

The six regions studied were Labrador West, Central Labrador, Innu First Nations, Nunatsiavut communities, Southern Labrador and the Northern Peninsula. Information concerning Nunatsiavut was obtained from Nunatsiavut Government DHSD Regional Health Plan 2019–2024.

## Results

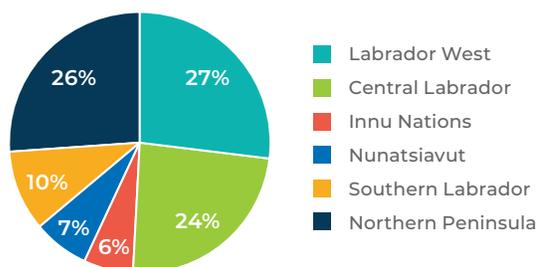


Figure 1. The Population Distributions of the Six Regions of LGH

Table 1. The Demography of the Six Regions of LGH

	Labrador West	Central Labrador	Innu Nations	Nunatsiavut	Southern Labrador	Northern Peninsula
Population	9,831	8,710	1,959	2,558	3,645	9,281
% Population change <sup>#</sup>	+1.8	+7.2	+11.3	+6.0	-16.5	-13.9
Birth rate/1,000 pop	11.8	11.6	35.2	20.3	8.8	5.8
Median age	36.9	39.4	21.5	33.4	48.5	51.7
Seniors %	7.8	11.5	2.3	8.2	20.6	24.9

<sup>#</sup>Population change between 2006 and 2016

- The Northern Peninsula and Southern Labrador have had the biggest drop in population, have the lowest birth rate, the highest median age and the highest proportion of seniors.
- The Innu First Nations population, although small in number, has the highest growth, the highest birth rate, and the smallest proportion of seniors.

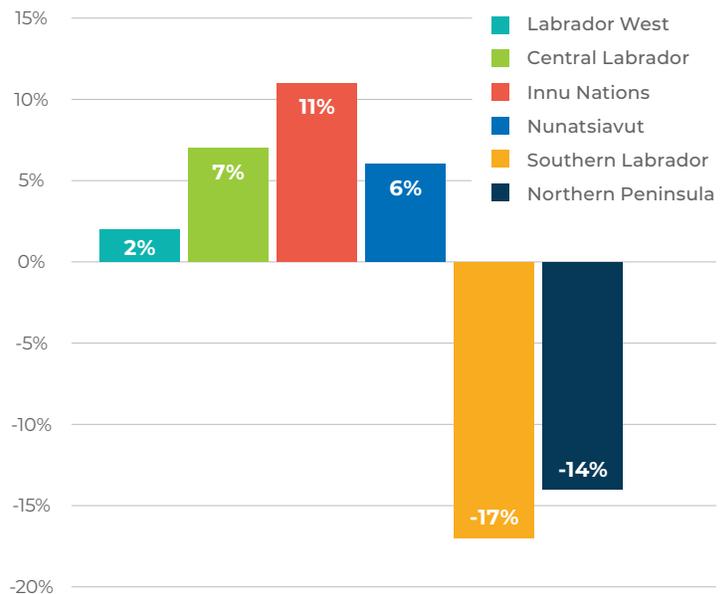


Figure 2. Population Change Between 2006 and 2016 Within Six Regions of LGH

**Table 2. Socio-Economic Factors in the Six Regions of LGH**

	Labrador West	Central Labrador	Innu Nations	Nunatsiavut	Southern Labrador	Northern Peninsula
Secondary Education <sup>#</sup>	86.5	80.0	34.4	57.2	59.4	62.0
Unemployment rate %	8.5	8.6	25.5	29.4	36.5	38.0
Median household income \$	127,077	110,362	83,314	70,614	81,309	65,090

<sup>#</sup> Percentage of adults that have completed a certificate, diploma and/or degree at the secondary level or above

- Labrador West and Central Labrador have the lowest unemployment rates and the highest median household incomes, whereas the Northern Peninsula has the highest unemployment rate and the lowest income.



**Figure 3. Major Issues of Concern in LGH**

- Like the island of Newfoundland, the top issues included mental health and addictions, high cost of living, food insecurity and lack of resources for seniors, but high priority was also given to cultural sensitivity/empathy education for health professionals regarding language and culture.
- The per cent of respondents in LGH unable to access health services in the past 12 months was 37%.

**Table 3. Opportunities in the 6 LGH Primary Health Regions to Improve Broader Health and Access to Health Care Services**

<b>Labrador West:</b> <ul style="list-style-type: none"> <li>• Need more community support groups</li> <li>• Support services for mental health</li> </ul>	<b>Central Labrador:</b> <ul style="list-style-type: none"> <li>• Activities that promote better mental health</li> <li>• Promotion of community health and wellness</li> </ul>
<b>Innu First Nations:</b> <ul style="list-style-type: none"> <li>• Cultural sensitivity/empathy education for health professionals</li> <li>• Need better partnerships between Innu and LGH</li> <li>• Need regular community visits by professionals like Diabetic nurse</li> <li>• Improved communication about existing services</li> </ul>	<b>Nunatsiavut Communities:</b> <ul style="list-style-type: none"> <li>• Community freezers, eat local/traditional</li> <li>• Orientation on cultural sensitivity</li> <li>• Community wellness clinics</li> <li>• Outreach to promote healthier lifestyles</li> <li>• Increase health education in schools</li> <li>• Education on existing services</li> </ul>
<b>Southern Labrador:</b> <ul style="list-style-type: none"> <li>• Activities that benefit physical, social and mental health in the elderly</li> <li>• More access to fresh fruit and vegetables</li> </ul>	<b>Northern Peninsula:</b> <ul style="list-style-type: none"> <li>• Better access to quality and affordable foods</li> <li>• Educate residents on existing health and community services</li> <li>• Mental and health social programs for seniors</li> </ul>

Information obtained from community health assessment surveys and focus groups

## Conclusions

1. The diversity of populations in LGH is substantial in that:
  - A. Labrador West and Central Labrador are similar in having a relatively small proportion of seniors, a relatively low unemployment rate, and reasonable household incomes.
  - B. Southern Labrador and the Northern Peninsula have a high proportion of seniors, a low birth rate, high unemployment, and low household incomes.
  - C. The Innu First Nations and Nunatsiavut have a low proportion of seniors, high birth rate, high unemployment rates, and low household incomes.
2. The top issues of concern in LGH were similar to that of the island RHAs and included mental health, but language and culture was also given a high ranking.
3. The per cent of respondents unable to access health services in the past 12 months was high (37%).

# Introduction to the Social Determinants of Health

## Objectives

- To describe social determinants of health (SDH).
- To outline models used to address the SDH.
- To provide examples of programs addressing SDH.

## Practice Points

1. The SDH are the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.
2. Socioeconomic development and health systems development are mutually reinforcing; addressing determinants of health alongside clinical services leads to greater sustainability of results.

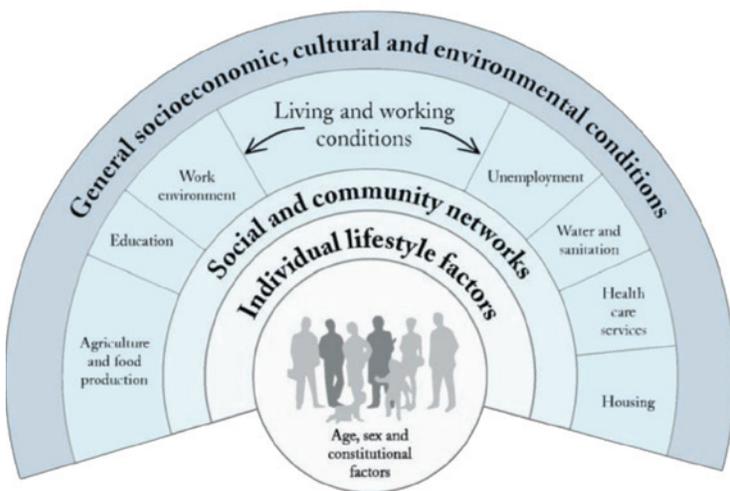


Figure shows one influential model of the determinants of health that illustrates how various health-influencing factors are embedded within broader aspects of society.

Source: Dahlgren G. and Whitehead, M (1991), Policies and Strategies to Promote Social Equity in Health (Stockholm: Institute for Futures Studies, 1991).

Figure 1. The Classic Diagram That Encompasses the SDH

## Model to Address SDH



Figure 2. Model Outlining How to Address the Health Inequities Resulting From the SDH

- This model is taken from resources on the website of the National Alliance to Impact the Social Determinants of Health (NASDOH) <https://www.nasdoh.org/>.

## Examples of Programs Addressing SDH

- A. A framework for clinical practice on taking action on the SDH in clinical practice was published in CMAJ, Dec 2016.

### The key points were:

- Asking patients about social challenges in a sensitive and caring way.
- Referring patients and helping them access benefits and support services.
- Improving access and quality of care for hard-to-reach patient groups/organizations.

- Integrating patient social support navigators into the primary care team.
- Partnerships with community groups, public health, and local leaders.
- Using clinical experience and research evidence to advocate for SDH.
- Getting involved in community needs assessment and health planning.
- Community engagement, empowerment and changing SDH.

**Table 1. The Barriers to and Facilitators for Taking Action on the SDH in Clinical Practice**

Barrier	Facilitator
Medical model bias and the treatment imperative in health care	Health care provider reminder and recall systems to adopt a more holistic and biopsychosocial approach
Patients who experienced prior stereotyping and discrimination in clinical care	Treating patients with dignity and respect and creating “safe spaces” for disclosure
Physicians feeling overwhelmed, overworked and lacking time	Taking a few extra minutes per consultation to address complex health and social needs
Physicians not knowing what resources exist in the local community	Providing a mapping of benefits and local referral resources for specific social challenges
Physicians unsure of what concrete actions to take to address social determinants	Resources, training and ongoing support of physicians and allied health care workers

## B. Social prescribing in health centres in Ontario has been initiated.

- To view *Social Prescribing In Ontario Final Report-March 2020*, visit [https://cdn.ymaws.com/aohc.site-ym.com/resource/group/e0802d2e-298a-4d86-8af5-21156f9c057f/rxcommunity\\_final\\_report\\_mar.pdf](https://cdn.ymaws.com/aohc.site-ym.com/resource/group/e0802d2e-298a-4d86-8af5-21156f9c057f/rxcommunity_final_report_mar.pdf).

### The key points for taking action on SDH include:

- Build around Community Health Centres.
- Requires a shift in health care culture.
- Dedicated staff (or time) crucial to success.
- Involving clients in the process is crucial to success.
- Need to continually adapt model to best fit local community needs.

## Conclusions

1. The SDH encompass many aspects of society and include geography, economics, housing, culture, education, and political policy — to name a few.
2. Programs to address the SDH require inclusiveness, consultation, adaptability and a shift in the culture of traditional health care delivery.

# Homelessness in Canada and NL

## Objective

To describe the extent of homelessness in Canada and in St. John's, NL.

## Practice Points

1. The Institute of Global Homelessness defines homelessness as people without accommodation, people living in temporary or crisis accommodation, or people living in severely inadequate and insecure accommodation.
2. Data in Canada arises from stays in emergency shelters and is limited by not including those using violence against women shelters, transitional shelters or refugee shelters. Thus, it underestimates the size of the problem.
3. In 2014, 8% of Canadians previously experienced hidden homelessness.
4. The hourly wage needed to rent an average two-bedroom apartment without spending >30% earnings is \$18.48.

## Data

Data were obtained from the National Shelter Study 2005–2016 and for St. John's from a point-in-time count on 11 Apr 2018.

## Results

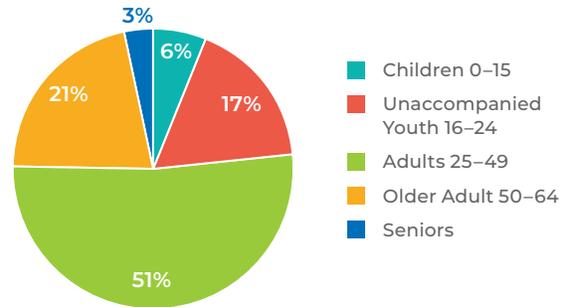


Figure 1. Age Distribution of Bed Nights (N=5,121,681) in Emergency Shelters in Canada in 2016

- Occupancy rate of shelters was 91%.
- In all age groups and families, the number of days in shelters is increasing.
- 70% were male. Male shelter use increases with age, whereas female use decreases.
- Indigenous people comprised 31% of shelter users, over six times more than their representation in the population (5%).

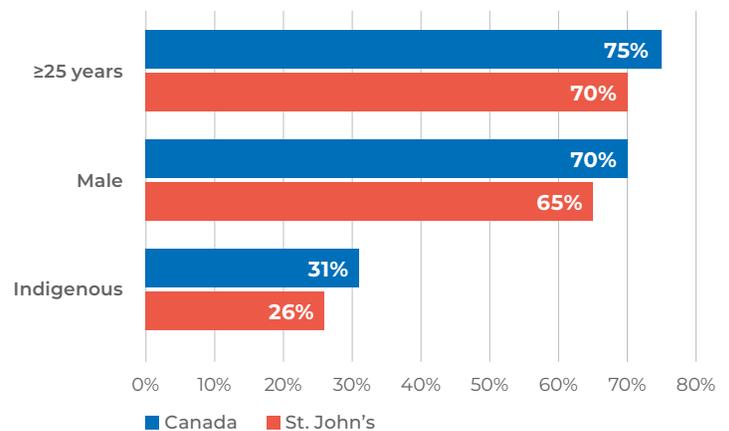


Figure 2. Comparison of Characteristics of Homeless People in St. John's on 11 Apr 2018 (N=165) to Homeless People in Canada in 2016

- St. John's homeless people were similar to those in Canada, with the majority being ≥25 years of age and male, and over representation of Indigenous people relative to the number in the population.
- 64% of homeless people in St. John's migrated to the city from outside or around the province.

**Table 1. Monthly Cost of Homelessness in St. John's**

Setting	Monthly Cost
Hospital	\$10,900
Provincial jail	\$4,333
Shelter bed	\$1,932
Rental supplement	\$701
Social housing	\$200

- Hospital costs comprise by far the biggest cost of homelessness.

**Table 2. Factors Impacting or Influenced by Homelessness**

Affordability/availability	Un/underemployment
Substance use	Mental illness
High comorbidity	Poor health care
Violence	Law enforcement
LGBTQ youth	Ethnicity
Elderly	Single mothers

- For more detail, visit <https://www.canada.ca/en/employment-social-development/programs/homelessness/reports-shelter-2016.html>.

## Conclusions

1. Homelessness is underestimated and a frequent social determinant of health in Canada and in St. John's.
2. The demographic characteristics of the homeless in St. John's are similar to those in Canada.
3. Hospitalization comprises by far the biggest cost of homelessness.
4. Risk factors for homelessness cross social, health and societal domains.
5. Strategies to reduce homelessness are urgently needed and could provide health benefits to homeless people (who do not have a voice) and reduce health costs.

# Food Insecurity in NL

## Objective

To determine the extent of food insecurity in NL compared to other Canadian provinces.

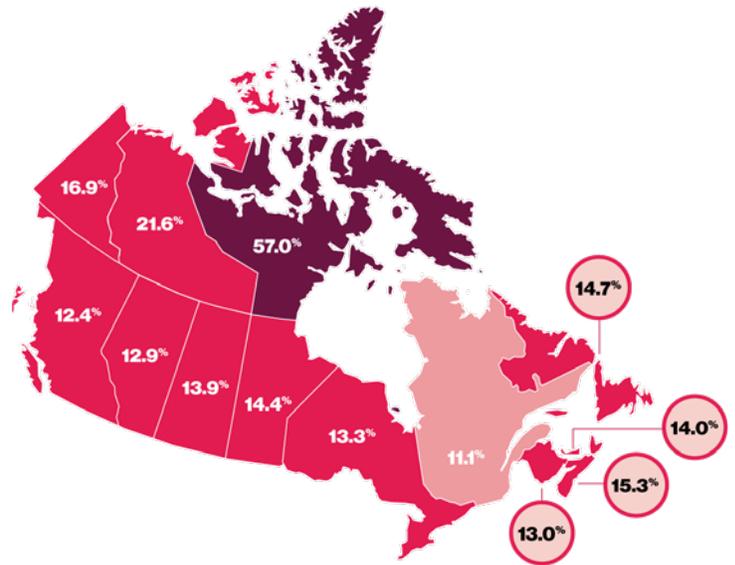
## Practice Points

1. Household food insecurity refers to the inadequate or insecure access to food because of financial constraints. It denotes pervasive material deprivation. It is most prevalent in single-parent families, renters and among individuals who identify as Indigenous or black.
2. In Ontario, compared with total annual health/drug costs in food-secure households, these adjusted annual costs were 23% higher in households with marginal food insecurity, 49% higher in those with moderate food insecurity, and 121% higher in those with severe food insecurity (Tarasuk et al., CMAJ, 2015). Whether this is cause or effect is uncertain.
3. In 2017–18, in Canada, 12.7% of households experienced some level of food insecurity in the previous 12 months.
4. In NL, reductions in food insecurity among social assistance recipients from 2007–12 correlate with the increase in social assistance benefits that accompanied the 2006 poverty reduction strategy.
5. Food costs in NL have risen 11.4% from 2012–17. The weekly cost of a nutritious food basket in 2017 for a family of four was \$261 in Eastern Newfoundland, \$263 in Central Newfoundland, \$275 in Western Newfoundland, \$258 in Grenfell, \$256 in Central West Labrador, \$308 in South Coast Labrador and \$402 in North Coast Labrador. Comparable cost in Montreal in 2018 was \$232.

## Data

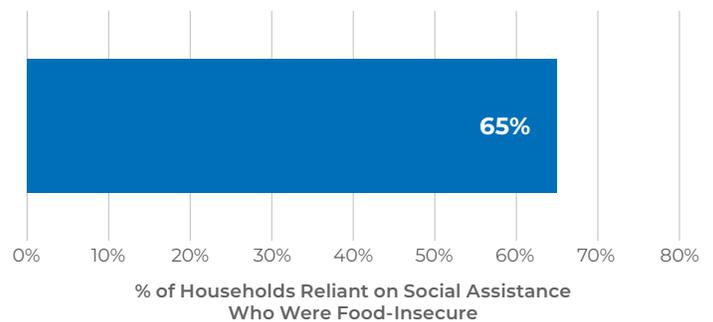
Statistics Canada Canadian Community Health Survey conducted in 2017–18 in 103,500 households reported by Tarasuk V. Miller A. <https://proof.utoronto.ca/>

## Results



**Figure 1. Household Food Insecurity by Province and Territory (taken from: PROOF – Research to identify policy options to reduce food insecurity (utoronto.ca))**

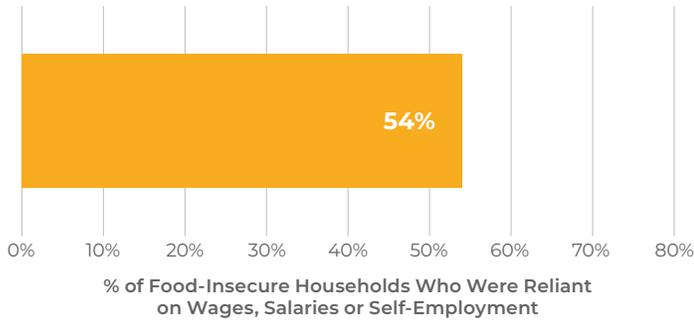
- The rate of food insecurity in NL was 14.7%, which ranked 9th out of the ten provinces. This comprised 3.3% of households with severe, 6.8% with moderate, and 4.7% with marginal food insecurity.
- The number of people living in food-insecure households in NL was 67,100.



**Figure 2A. Proportion of Households Reliant on Social Assistance Who Were Food-insecure in NL**

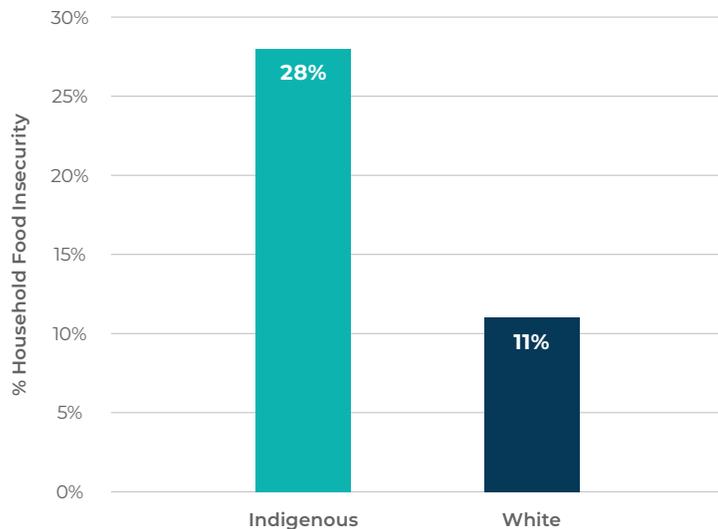
- Social assistance recipients are at highest risk of food insecurity, but they comprise a minority of food-insecure households (15% in Canada).
- There were 32,632 individuals receiving income assistance in NL in 2019.





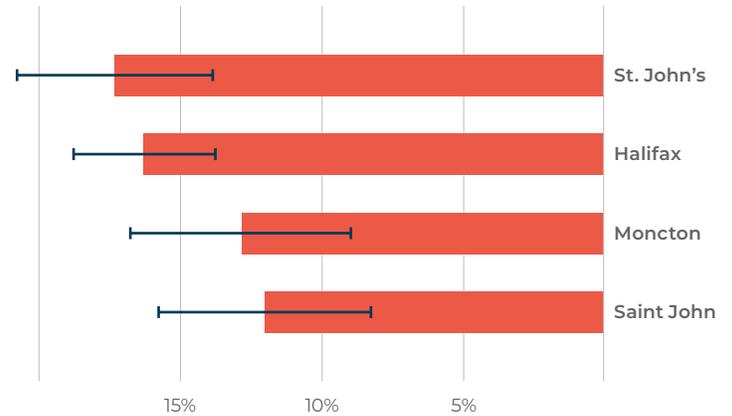
**Figure 2B. Proportion of Food-Insecure Households Who Were Reliant on Wages, Salaries or Self-Employment in NL**

- In Canada, the prevalence of food insecurity among households reliant on wages and salaries is low, but they make up the majority of food-insecure households. In NL, this proportion of food-insecure households who were reliant on wages, salaries or self-employment was 54%, the lowest in Canada.



**Figure 3. Prevalence of Household Food Insecurity in Indigenous People in Canada**

- The prevalence of household food insecurity is substantially higher in Indigenous people than in white people.



**Figure 4. Prevalence of Household Food Insecurity in St. John's Compared to Maritime Cities in 2017-18**

- Compared to 34 other major urban areas, St. John's had the highest prevalence of food insecurity in Canada (17.3%) (Data source: Statistics Canada, Canadian Health Survey (CCHS), 2017-18 and 2015-16).

## Conclusions

- The prevalence of food insecurity in NL is the second highest among the Canadian provinces, and St. John's is the highest among Canadian major urban areas.
- In NL, two of every three households reliant on social assistance are food-insecure.

# Behavioural Determinants of Health, Ambulatory Care-Sensitive Conditions and Vascular Outcomes by Region in NL

## Objective

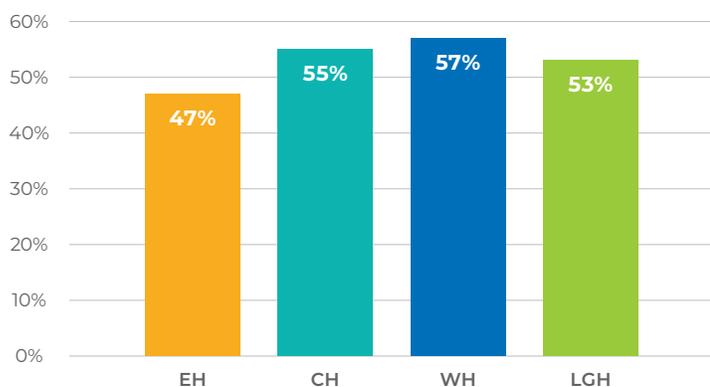
To compare personal behavioural determinants of health, ambulatory care-sensitive conditions and vascular outcomes by region in NL.

## Practice Points

- NL had the highest rate of personal behavioural determinants of health in Canada related to diet, obesity, smoking and alcohol use.
- Avoidable hospital admissions are a marker of effective primary care, and NL has among the worst rates for congestive heart failure, diabetes and asthma in Canada.
- NL has among the worst rates for heart disease and stroke mortalities in Canada, with the highest provincial in-hospital 30-day mortality rates for acute myocardial infarction and for stroke.

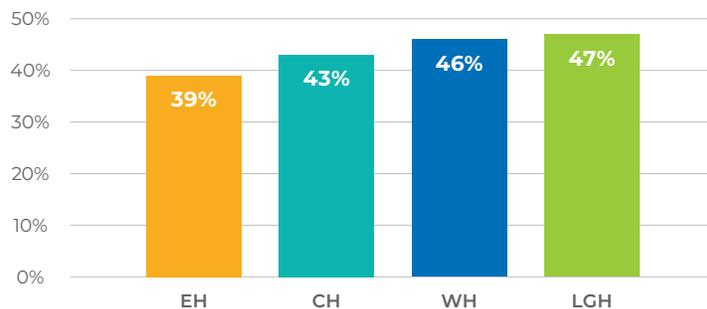
## Data

Aggregate rates of health indicators by region, collected for national registries, were obtained from Statistics Canada: Canadian Community Health Survey 2015–16 and from the Canadian Institute for Health Information (CIHI).



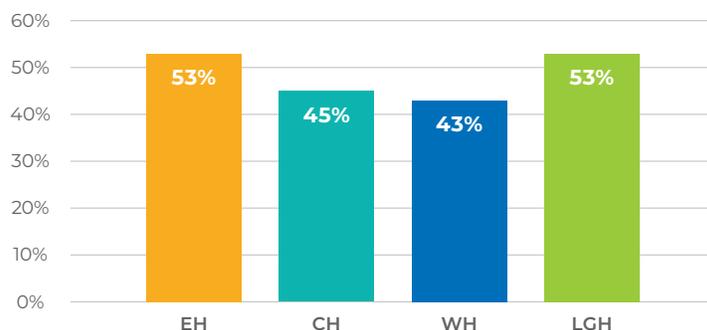
**Figure 1. Rates of Physical Activity Less Than 150 Minutes/Week by Region**

- 50% of people in NL have low levels of physical activity compared to 42% in Canada, with the highest rates being in Central Health (CH) and Western Health (WH).



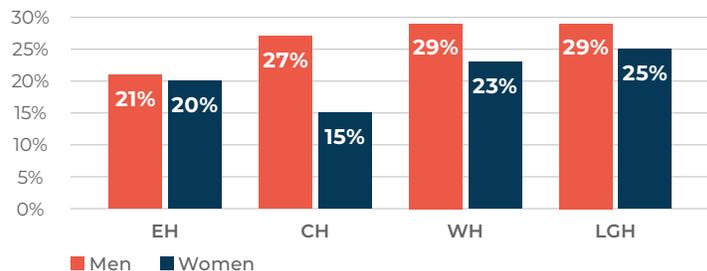
**Figure 2. Rates of Obesity by Region**

- 41% of people in NL are obese compared to 26% in Canada, with the highest rates in Labrador-Grenfell Health (LGH) and WH.



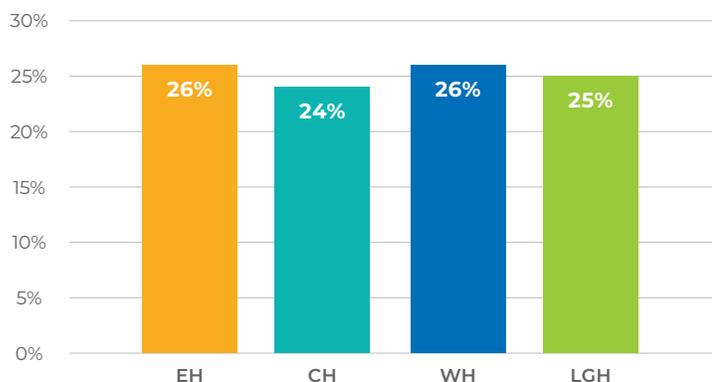
**Figure 3. Rates of Eating Fruits/Vegetables Six or More Times a Week by Region**

- 50% of people in NL eat fruits and vegetables frequently compared to 58% in Canada, with the lowest rates being in CH and WH.



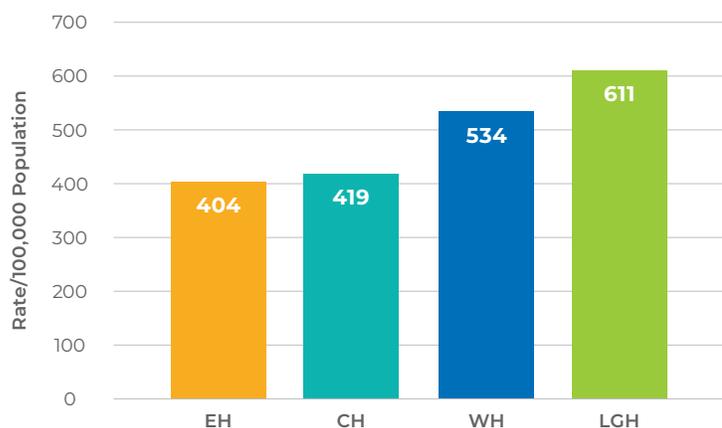
**Figure 4. Rates of Smoking in Men and Women by Region**

- In NL, smoking rates in men were 24% compared to 20% in Canada, with the highest rates being in WH and LGH.
- In women in NL, the rates (20%) were lower than in men but higher than in Canada (15%), with the highest rates being in WH and LGH.



**Figure 5. Rates of Heavy Drinking Among Adults by Region**

- In NL, the rate of heavy drinking was 26% compared to 19% in Canada, with similar rates across the four regions.

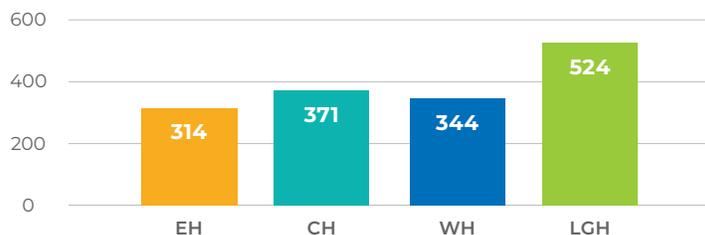


**Figure 6. Ambulatory Care-Sensitive Conditions per 100,000 Population<sup>#</sup> by Region**

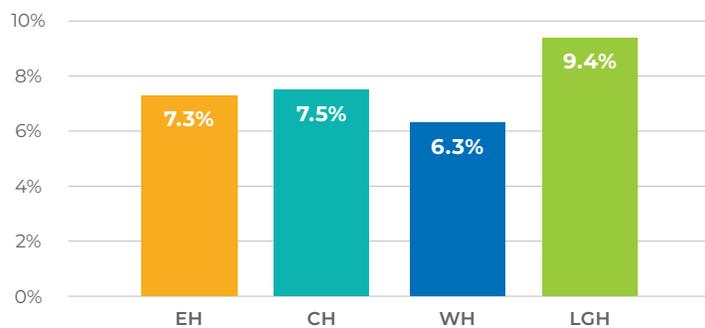
<sup>#</sup> Age-standardized acute care hospitalization rate for conditions where appropriate ambulatory care prevents or reduces the need for admission to hospital, per 100,000 population younger than age 75

- The rate for ambulatory care-sensitive conditions in NL was 35% higher than in Canada (443 vs. 327), with the highest rates in LGH and WH.

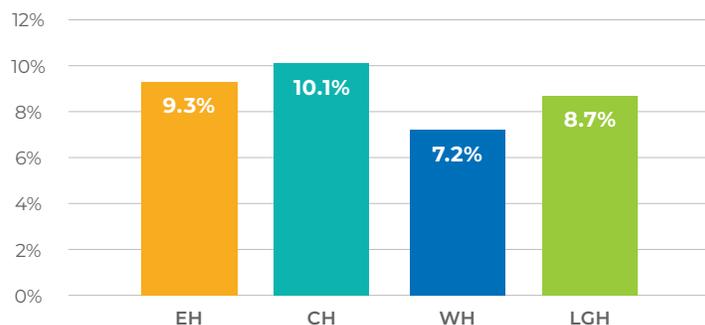
**Hospitalized AMI Rate/100,000**



**30-Day Mortality**



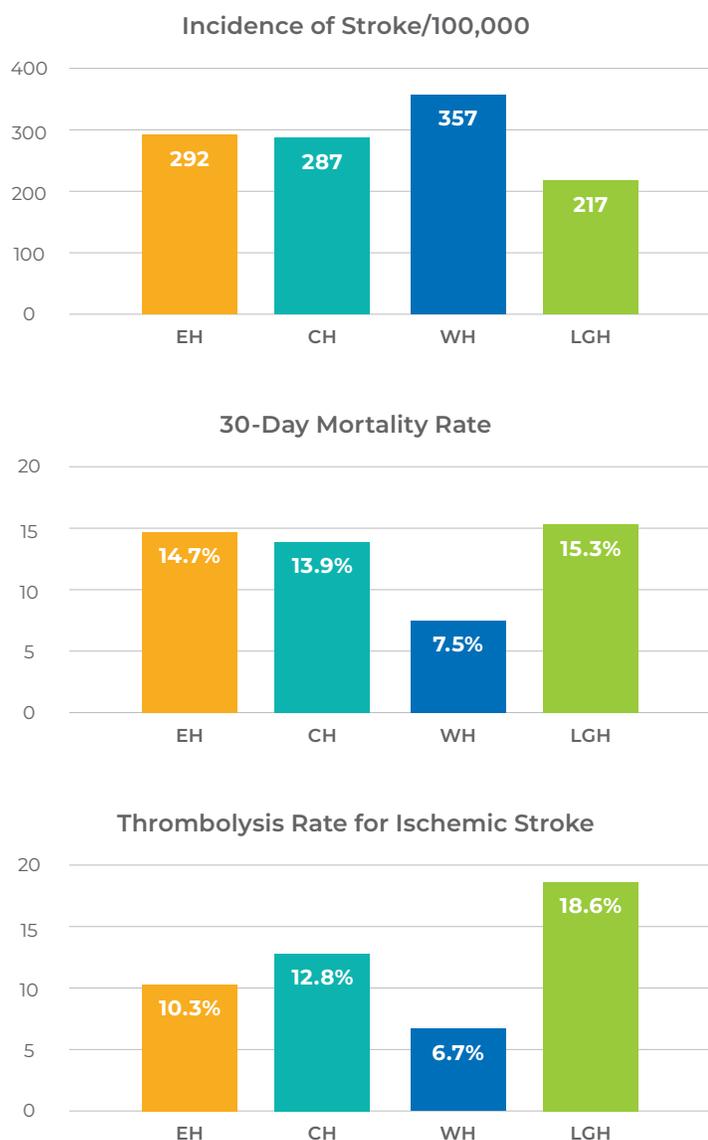
**30-Day Re-Admission**



**Figure 7. Rates of Annual Hospitalized Acute Myocardial Infarction/100,000 in Adults<sup>#</sup>, 30-Day Mortality, and 30-Day Re-Admission by Region**

<sup>#</sup> Age-standardized rate of new Acute Myocardial Infarctions (AMIs) admitted to an acute care hospital for patients aged 20 years and older per 100,000 population

- Annual hospitalization rate in NL was 41% higher than in Canada (343 vs. 243), with the highest rate in LGH.
- 30-day mortality was 22% higher in NL compared to Canada (7.3% vs. 6.0%).
- 30-day re-admission rate was lower than in Canada (9.2% vs. 10.1%).



**Figure 8. Annual Incidence of Hospitalization for Stroke<sup>#</sup>, 30-Day In-Hospital Stroke Mortality Rate, and Thrombolysis Rate for Ischemic Stroke by Region**

<sup>#</sup> The number of admissions for stroke per 100,000 population

- The provincial hospitalization rate/100,000 for stroke was 295 because 66 transfers were not included in the Regional Health Authority (RHA) rate.
- The 30-day in-hospital stroke mortality rate was 13.5% in NL compared to 12.6% in Canada, with a surprisingly low rate in WH.
- The thrombolysis rate for ischemic stroke was the worst in Canada (10.6% vs. 19%), with WH having a low rate of 6.7%.

## Conclusions

1. Personal behavioural determinants of health were high in all regions, particularly outside of EH.
2. Ambulatory care-sensitive conditions, a metric of good care in the community, was high in all regions, particularly in WH and LGH.
3. The incidence of AMIs was high in all regions, reflecting high rates of personal behavioural determinants of health, and the 30-day mortality was high in all regions, except WH, reflecting care in hospital.
4. The low thrombolysis rates for ischemic stroke in all regions except LGH, and the high 30-day in-hospital mortality rate suggest areas for improvement in quality of care.

# Current Structure and Cost of the Health System in NL

## Objective

To update the current structure of the health system by Regional Health Authority (RHA), current spending and workforce.

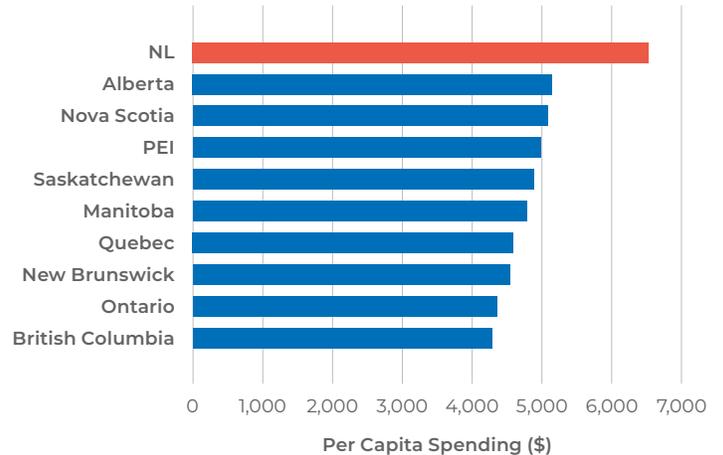
## Practice Points

1. In NL, there are four RHAs, 15 hospitals (including a children's hospital, a mental health hospital, and a rehabilitation hospital), 23 health centres, 23 long-term care facilities, 65 medical clinics (primary care), 59 community health offices, and five addiction treatment centres.
2. Per capita, government spending on health is the highest among the ten Canadian provinces.
3. The biggest proportion of health spending is on human resources (health care providers and other health workers).

## Data

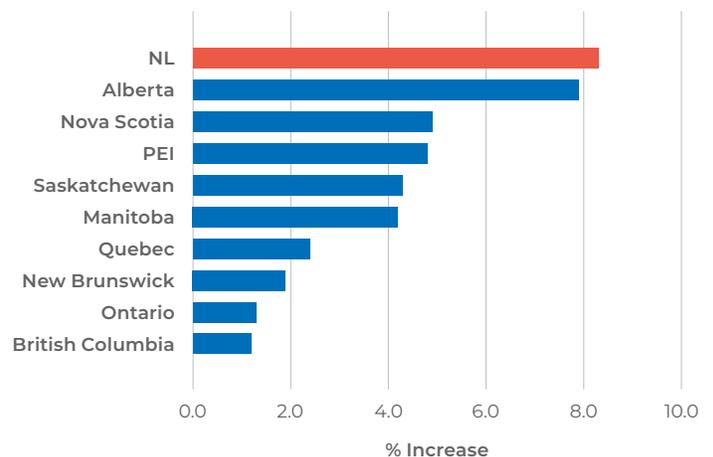
Data were obtained from the Department of Health and Community Services, the Canadian Institute for Health Information (CIHI), and the Human Resources Benchmarking Network (HRBN) Surveys.

## Results



**Figure 1. Forecasted Health Spending in NL Compared to the Other Provinces for 2019–20**

- NL has the highest provincial government per capita health spending in Canada.
- From the perspective of population density, Labrador-Grenfell Health (LGH) is more akin to a territory than a province, and one could anticipate higher per capita spending in this region.



**Figure 2. Forecasted Per Cent Increase in per Capita Health Spending in the Canadian Provinces From 2018–19 to 2019–20**

- NL had the highest provincial per cent increase in public health spending in Canada over the past year.

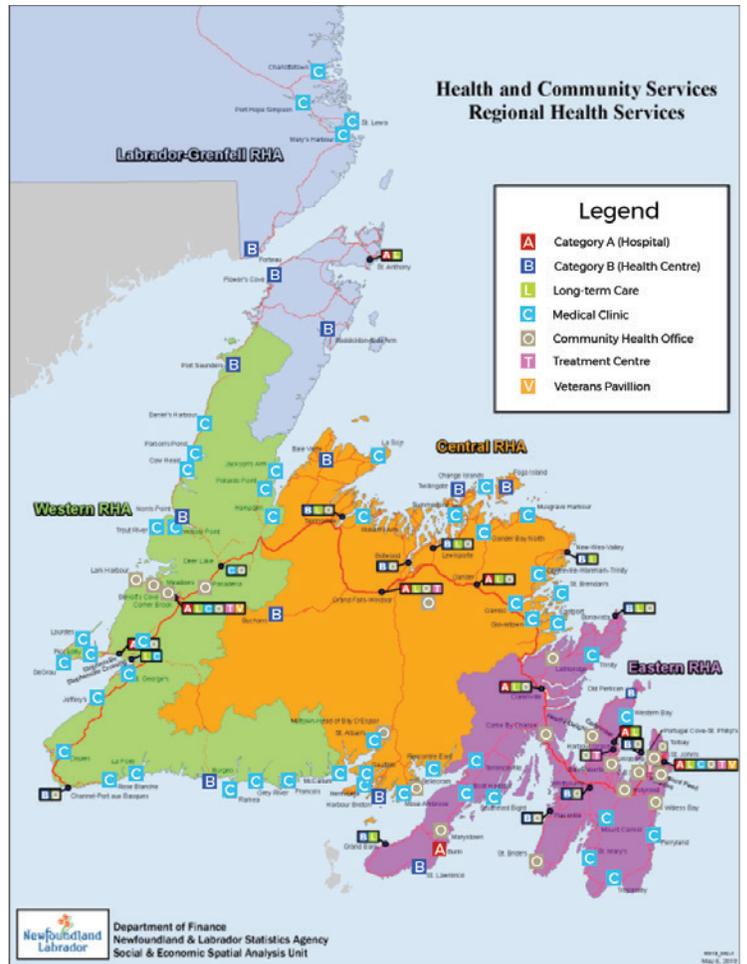
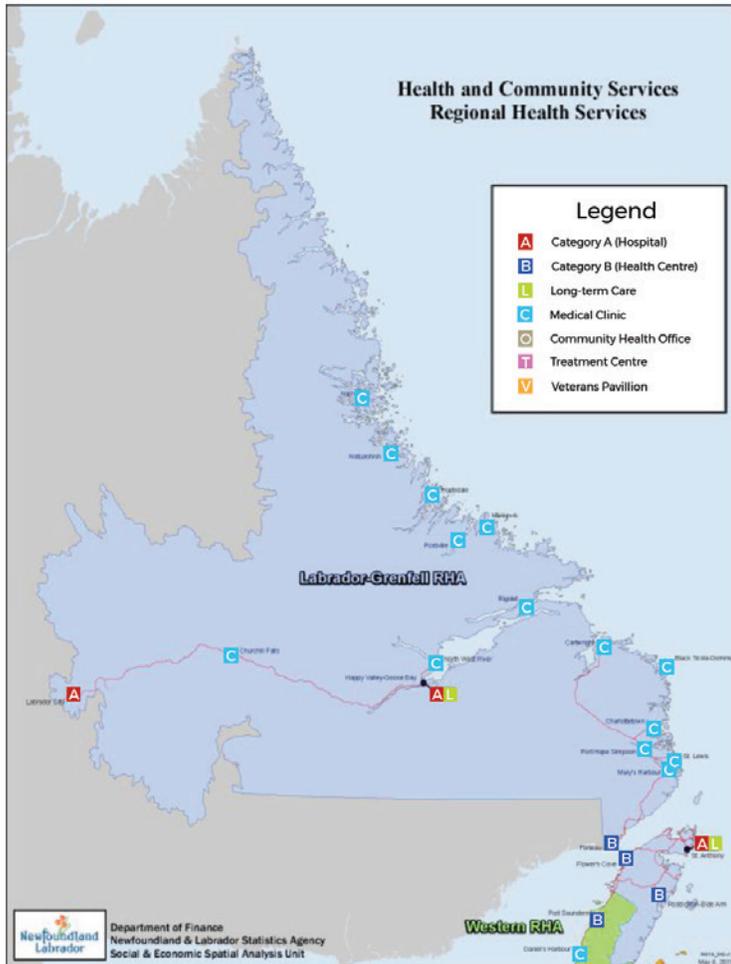
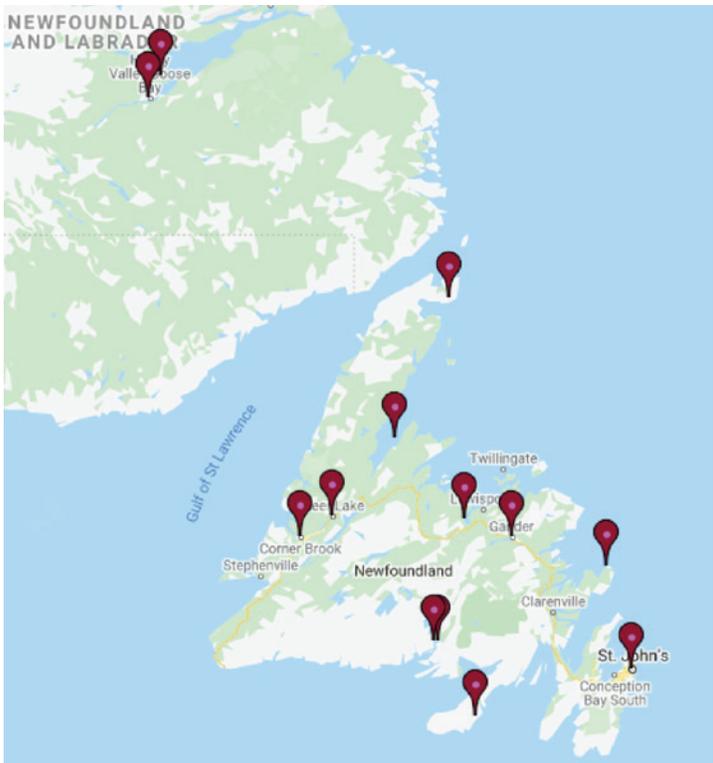
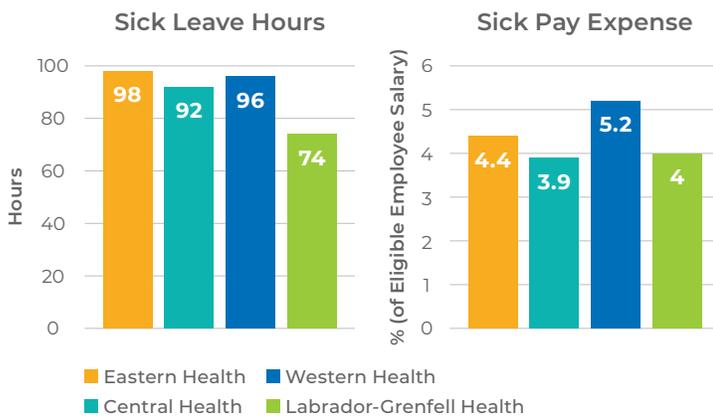


Figure 3. The Geographic Distribution of Health Services in NL



**Figure 4. The Geographic Distribution of Primary Health Care Teams in NL**

- This map includes both primary care teams and other primary care initiatives being undertaken by an RHA, but excludes clinics of fee-for-service family physicians.



**Figure 5. Sick Leave Hours and Expense per Eligible Employee in 2017-18 by RHA**

- In addition to the cost, sick leave has a big effect on the management of a hospital (finding replacements).

**Table 1. Provincial Government Health Expenditures by Category in NL Compared to Canada, With the Change in Spending Required to be at the Canadian per Capita Average**

Categories:	Canada Per Capita Health Expenditure (\$)	NL Per Capita Health Expenditure (\$)*	Per Capita Variance from Canadian Avg. (\$)	Increase (Decrease) in \$ (in millions) required to be at Canadian Avg.
Hospitals and Public Health**	1,930.57	2,690.99	(760.42)	(395.20)
Other Institutions	534.43	906.78	(372.35)	(193.50)
Physicians	994.80	951.36	43.44	22.60
Other Professionals	58.81	24.63	34.18	17.80
Drugs	324.71	282.63	42.08	21.90
Capital	173.07	135.29	37.78	19.60
Administration (DHCS)	44.10	58.37	(14.27)	(7.40)
Other Health Spending Less Faculty of Medicine***	415.85	780.40	(364.55)	(189.50)
<b>Total</b>	<b>4,476.34</b>	<b>5,830.45</b>	<b>(1,354.11)</b>	<b>(703.70)</b>

Source: CIHI and Department of Health and Community Services, Teledata System

\*Based on population of Newfoundland and Labrador in 2016 – 519,716.

\*\*Public Health cost is included with hospitals because in Newfoundland and Labrador Public Health is part of the regional health authority structure.

\*\*\*Cost of Faculty of Medicine, Memorial University, \$114.60 per capita or \$59.6M removed from health spending for comparison purposes as Faculties of Medicine are not funded by the Department of Health and Community Services in other Canadian jurisdictions.

- Institutional health spending in NL in 2018 was higher than in Canada. If spending were at the Canadian per capita average, the cost decrease in the NL budget would be \$703 million.
- The higher proportion of the NL budget spent on other institutions is related to long-term care for seniors without the money to pay for it.

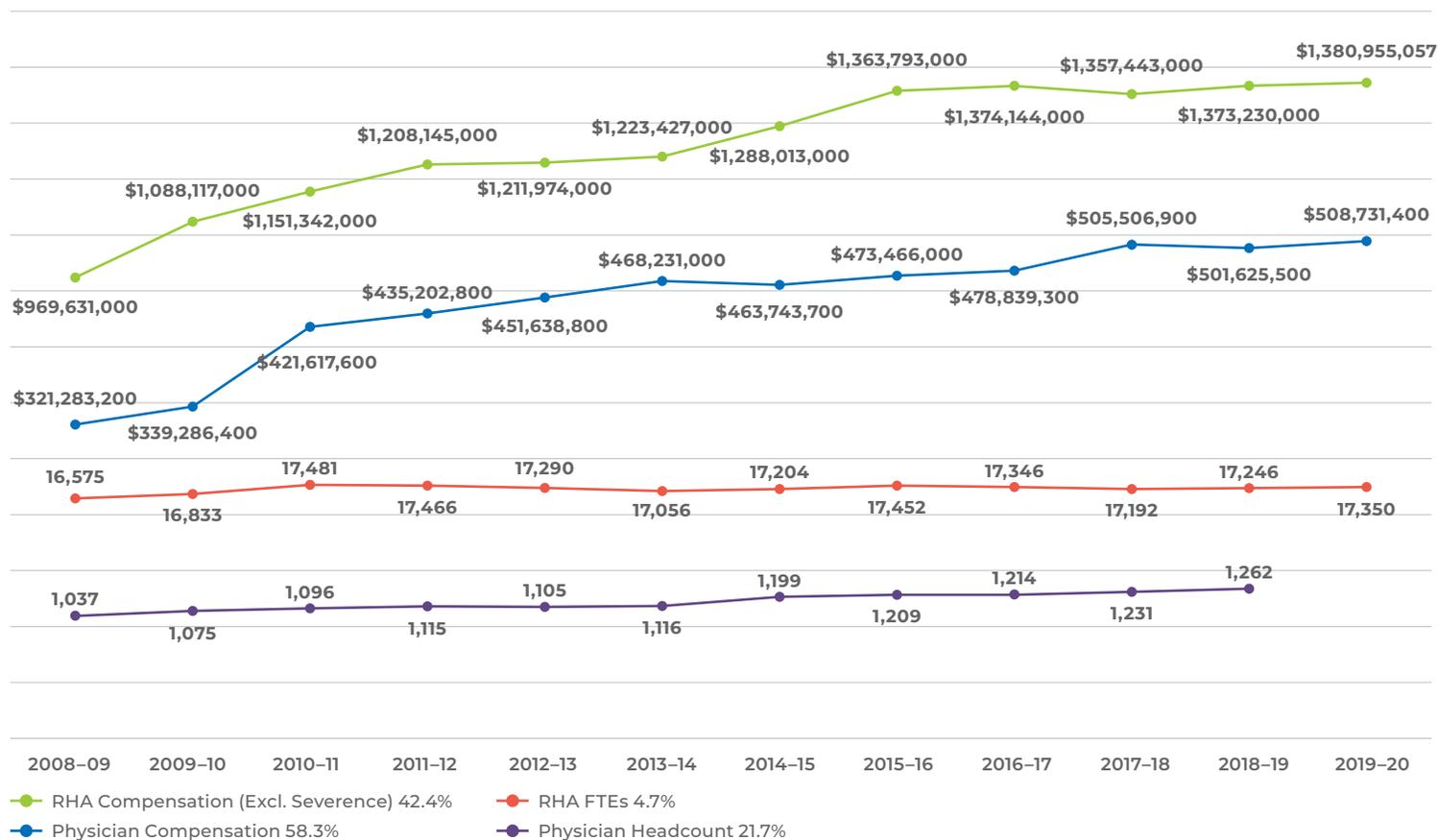


Figure 6. Spending on RHA Employees and Physicians From 2008-09 to 2019-20

- RHA compensation for employees in 2019-20 was \$1,380,955,057 — an increase of 42.4% since 2008-09 (a 12-year period). However, the number of Full Time Equivalent employees increased by only 4.7%. Thus, most of the compensation cost increases were the result of negotiated salary increases.
- In 2019-20, physician compensation was \$508,731,400, an increase of 58.3% since 2008-09. The number of physicians has increased by 21.7%. The number of services provided by fee-for-service physicians has increased by 4% from 2008-09 to 2017-18. Together with negotiated compensation increases, these accounted for the increase in compensation.

## Conclusions

1. NL has the highest provincial government health spending per capita in Canada and the highest forecast per cent increase in spending during 2019-20.
2. Institutional care is manifest across NL in different ways, all of which impacts on the disparity between NL and Canada in the proportion of the health budget spent on institutional care.
3. Nearly \$2 billion is spent on human resources, over 66% of the provincial health spending. From 2008-09 to 2019-20, RHA spending on employees increased by 42.4% and on physicians by 58.3%.
4. Although the sick leave hours lost are high, the bigger impact may be the disruption caused to the continuity of care and services by replacing workers calling in sick.



# High Users of Acute Care Hospitals in NL

## Objective

To describe the frequency of high users of the health system by region and their characteristics in NL.

## Practice Points

1. The top 5% of health users account for approximately 75% of health costs.
2. Primary care is considered to be an effective way to improve the efficiency of use of the health system among high users.
3. Remote monitoring in patients with COPD and/or congestive heart failure in Eastern Health (EH) has demonstrated reduced hospitalization, particularly in those with more severe disease.

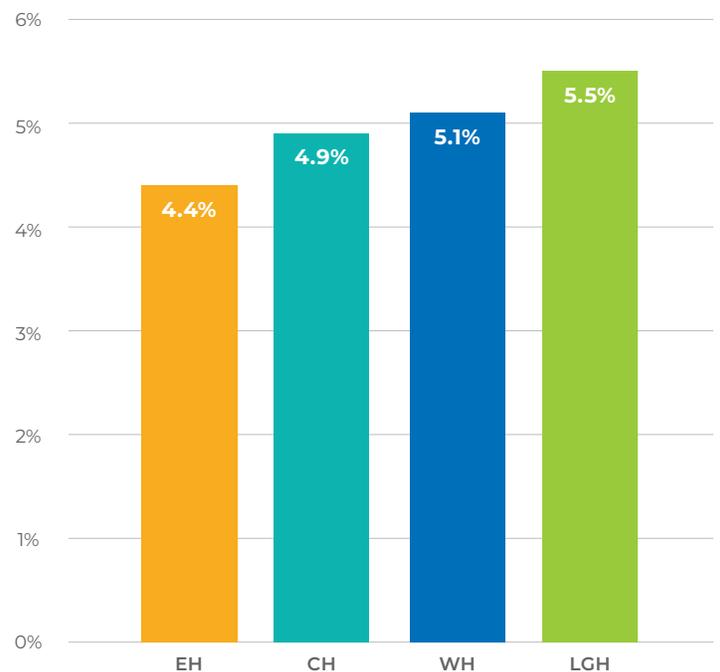
## Data (PI: Dr. K. Aubrey-Bassler)

This information was obtained from a report submitted to the Department of Health and Community Services in 2019 entitled “Patterns of high cost acute-care hospitalization and emergency department utilization in Newfoundland and Labrador” using data from 2011–12 to 2014–15.

More recent data were obtained from the Canadian Institute for Health Information (CIHI).

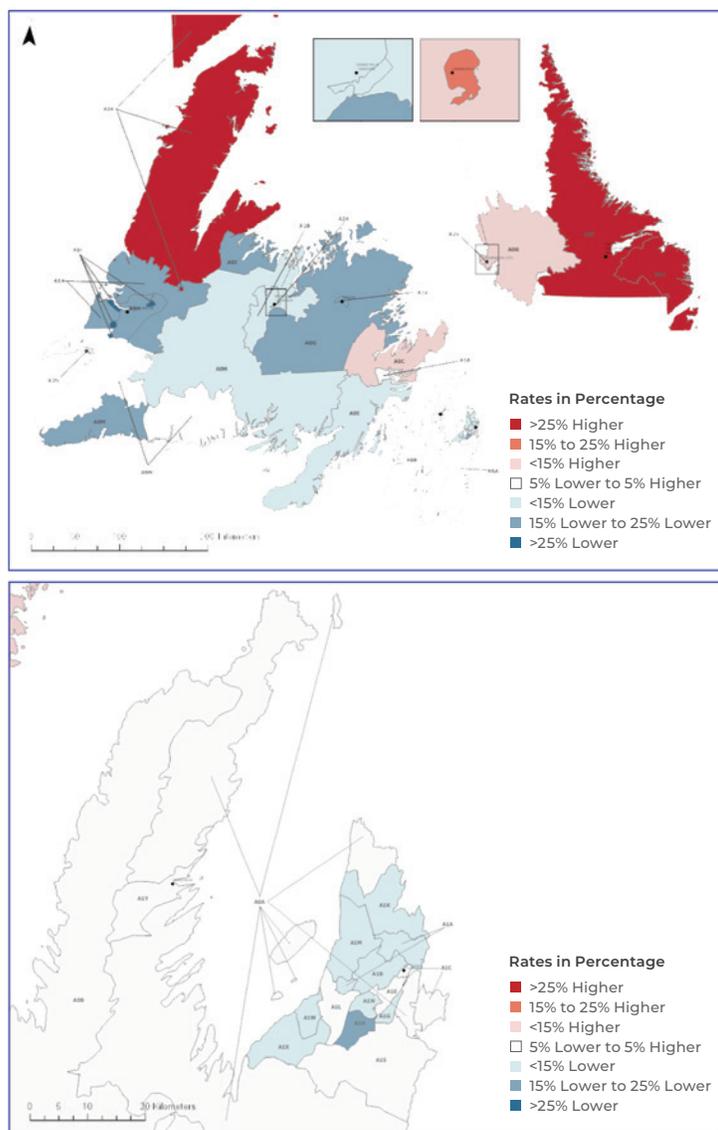
## Results

- The top 5% of hospital users in NL account for almost 80% of acute hospital and 39% of emergency department costs.
- 10–30% of costs for high users were attributable to potentially preventable hospitalizations, depending on the definitions used.



**Figure 1. Per Cent of Users of Hospital Beds Considered High by the Definitions Used by CIHI Analyzed by Region (2017–18)**

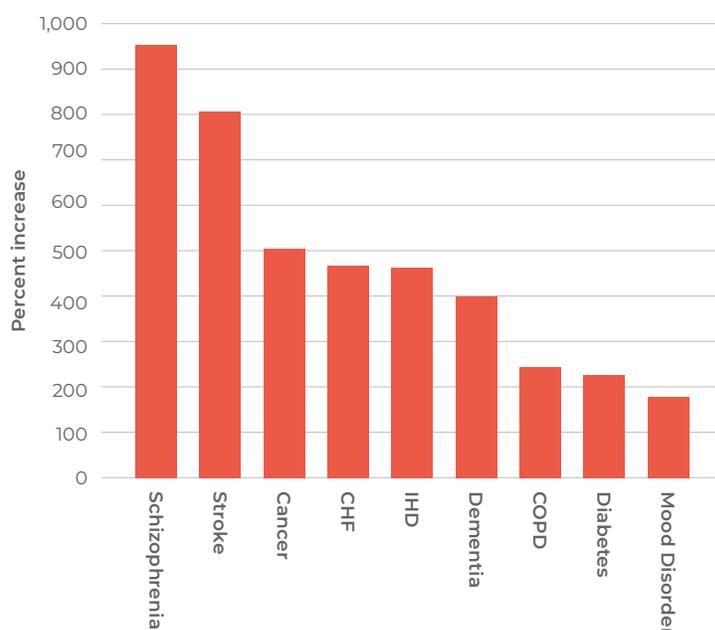
- High users rate in the province was 4.7% compared to 4.5% in Canada, with highest rate in Labrador-Grenfell Health (LGH).



**Figure 2. Adjusted Rates of High-cost Hospital Use Compared to the Provincial Average (2011/12 – 2014/15) by Region**

Areas that are orange or red had rates higher than the provincial average, while blue had rates below the provincial average.

- Rates in LGH are substantially higher than the provincial average and rates in St. John's are lower.



**Figure 3. Association Between Chronic Disease and Increased Likelihood of Being a High-Cost Hospital User**

- Chronic diseases are associated with a substantially increased likelihood of being a high-cost user, particularly schizophrenia and stroke.
- The effects of virtually all socio-economic indicators on the rate of high-cost use are statistically significant, even after adjustment for age, other demographics and chronic disease. However, the size of the risks are smaller than those for chronic diseases.
- Rates of high-cost utilization are higher in regions with greater family physician turnover.

## Conclusions

1. High users of hospitals have a major impact on hospital costs.
2. There is large variability in rates of high-cost utilization across the province that is not explained by differences in age, other demographics, physician distribution or chronic disease rates.
3. The advent of primary care teams has the potential to reduce hospital use by high users, but this potential needs evaluation as these teams roll out.

*(Practice Points Special Edition, November 2020)*

# Interventions to Change Behaviour in the Use of Health Care Resources in NL

## Objective

To identify lessons learned from the evaluation of interventions that change behaviour 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 behaviour 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

-  Lower cardiac catheterization rates in stable angina.
-  No change in appropriateness of peripheral artery testing.
-  Persistence of low thrombolysis rates for ischemic stroke.
-  Reduction in urea and creatine kinase testing by family physicians (FPs).
-  Little change in ferritin testing in patients with normal hemoglobin by FPs.
-  Improvement in IgE testing.

- 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

-  Increased rates of cardiac catheterization for acute coronary syndromes associated with eOrdering with equalization of rates across Regional Health Authorities.
-  eOrdering started for vascular lab for peripheral artery testing and for carotid artery testing.
-  Mobile app for antibiotic use associated with reduction in antibiotics use in hospitals.
-  Remote monitoring in patients with COPD and/or heart failure associated with fewer in hospital days and ER visits.

- 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

-  Improvement in thrombolysis rates in ischemic stroke in Health Sciences Centre and in Labrador.
-  Access to colonoscopy improved on utilization review in Eastern Health.
-  Time from abnormal screening mammography to final diagnostic test improved in Eastern Health and more recently in Central Health.
-  Improvement in length of hospital stay occurred during implementation of Early Recovery After Surgery guidelines for colorectal dissections but regressed on withdrawal of human resource.

- 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.

# The Rate of Institutional Beds by Population in NL by Regional Health Authority

## Objective

To compare the current population rate of acute care (AC), long-term care (LTC) and personal care home (PCH) beds in the province by Regional Health Authority (RHA).

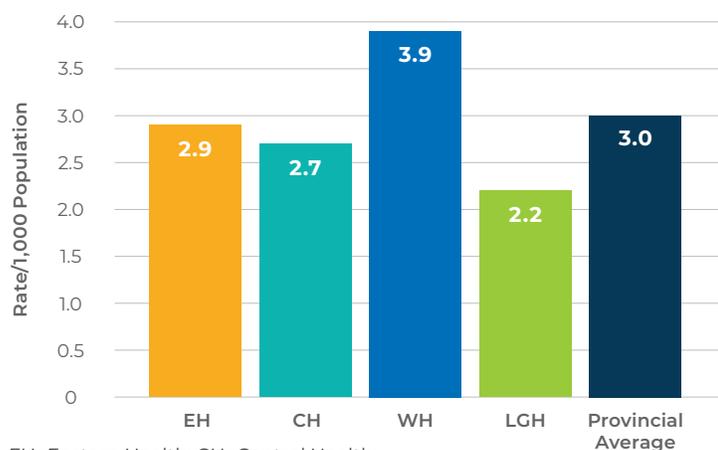
## Practice Points

1. In 2017, there were twice as many acute medical beds on the island of NL outside St. John's as in St. John's (0.8/1,000 population versus 1.6/1,000 population) with 1.1/1,000 population in Labrador.
2. There were 34% fewer LTC beds on the island, compared to St. John's, and 52% more PCH beds. Labrador had few PCH beds.

## Data

The number of beds by type was obtained from the Department of Health and Community Services for Mar 2021 and rates/1,000 population calculated.

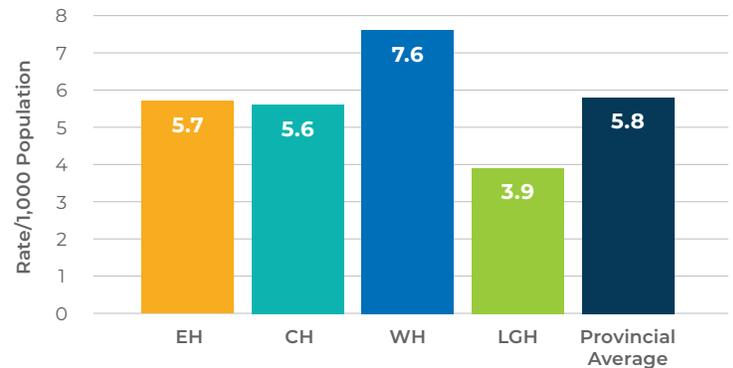
## Results



EH=Eastern Health; CH=Central Health;  
WH=Western Health; LGH=Labrador-Grenfell Health

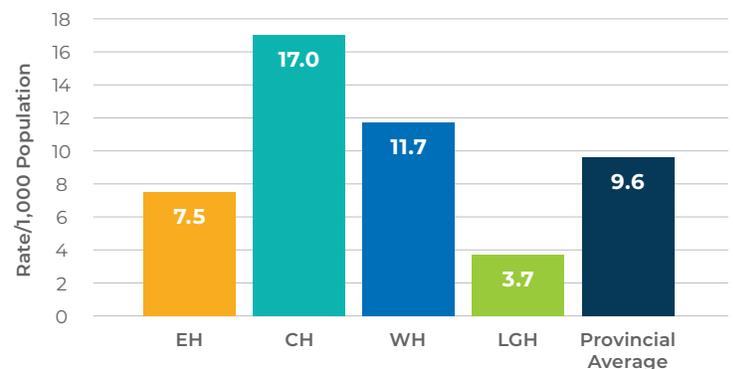
**Figure 1. The Rate of Acute Care Beds/1,000 Population in NL by RHA**

- Western Health (WH) has the highest rate of acute care beds in the province (3.9/1,000 population), 30% above the provincial average.
- Despite the presence of the province's tertiary level beds in St. John's, the rate of acute care beds in Eastern Health (EH) was 2.9/1,000 population.



**Figure 2. The Rate of Long-Term Care Beds/1,000 Population in NL by RHA**

- WH has the highest rate of LTC beds in the province (7.6/1,000), 31% above the provincial average.
- Labrador-Grenfell Health (LGH) has the lowest rate of LTC beds, consistent with the lowest proportion of seniors.



**Figure 3. The Rate of PCH Beds/1,000 Population in NL by RHA**

- There are wide disparities in the rates of PCH beds by RHA, with Central Health (CH) having a rate 80% more than the provincial average.

## Conclusions

1. NL has 25% more acute hospital beds/1,000 population than the Canadian average, and WH has 30% above the NL rate.
2. In addition, WH's rate of LTC beds is 31% higher than the provincial rate.
3. CH has a very high rate of PCH beds, despite the rate of LTC beds being similar to EH.

# Emergency Department Utilization and Emergency Calls for Ambulance in NL

## Objectives

1. To report the number of visits to Emergency Departments (EDs) in NL defined by acuity and analyzed by hospital and health centre.
2. To report the emergency call volumes to responding ambulance bases in NL.

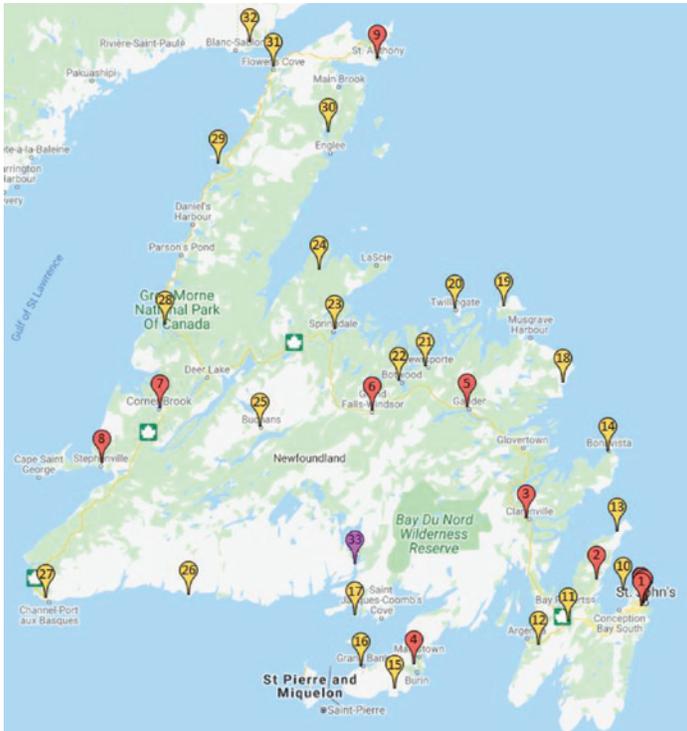
## Practice Points

1. The Canadian Triage and Acuity Scale (CTAS) is based on a five-level scale: Level 1: Resuscitation, Level 2: Emergent, Level 3: Urgent, Level 4: Less urgent, Level 5: Non-urgent.
  - ◇ Level 1 patients have a problem with their airways, breathing, and circulation requiring immediate intervention or continuing treatment.
  - ◇ Level 2 conditions are considered threats to life, limb, or function requiring rapid medical interventions and the use of condition-specific controlled medical acts.
  - ◇ Level 3 conditions could potentially progress to a serious problem requiring emergency interventions, and may be associated with significant discomfort or affect ability to function at work or activities of daily living.
  - ◇ Level 4 conditions relate to patient age, distress, potential for deterioration, or complications that would benefit from intervention or reassurance.
  - ◇ Level 5 conditions are minor complaints that do not pose any immediate risk to the patient.
2. There are 37 EDs in NL in 13 hospitals, 23 health centres, and one medical clinic. In Northern and Southern Labrador, community clinics provide emergency services.

3. For CTAS levels 1–3, it is important to have access to timely, experienced care. For example, in ischemic stroke, an effective therapy is available, provided the patient presents and has a CT scan within 4.5 hours of symptom onset. For a ST elevation myocardial infarction, thrombolysis is effective within 6 hours and a cardiac catheterization should be performed within 24 hours to determine the need for coronary revascularization.
4. Concerns exist about quality of care and sustainability in small EDs. A rota of three family physicians in an ED receiving few resuscitation/emergency cases a week, of varying causes, is not conducive to maintenance of skills. Alternate options include advanced paramedic services connected to regional EDs and collaborative ED models using interdisciplinary teams.

## Data

ED data were obtained from the NL Centre for Health Information (NLCHI) by the Harris Centre, and analyzed for 2017–18. EDs were defined by the number of level 1 and 2 cases seen per day, and by the percentage of cases that were level 4 or 5. The emergency call volumes made in 2018–19 for responding ambulance bases in the province was obtained from the Department of Health and Community Services.



**Hospitals**

1. St. John's
  - Health Sciences Centre 55,872
  - St. Clare's 38,413
  - Janeway 37,116
2. Carbonear 27,013
3. Clarenville 22,445
4. Burin 20,473
5. Gander 29,937
6. Grand Falls-Windsor 24,013
7. Corner Brook 39,063
8. Stephenville 29,718
9. St. Anthony 8,652

**Labrador Hospitals**

- Happy Valley-Goose Bay 20,753
- Labrador City 17,679

**Health Centres**

10. Bell Island 5,458
11. Whitbourne 8,567
12. Placentia 4,691
13. Old Perlican 6,421

**Health Centres continued**

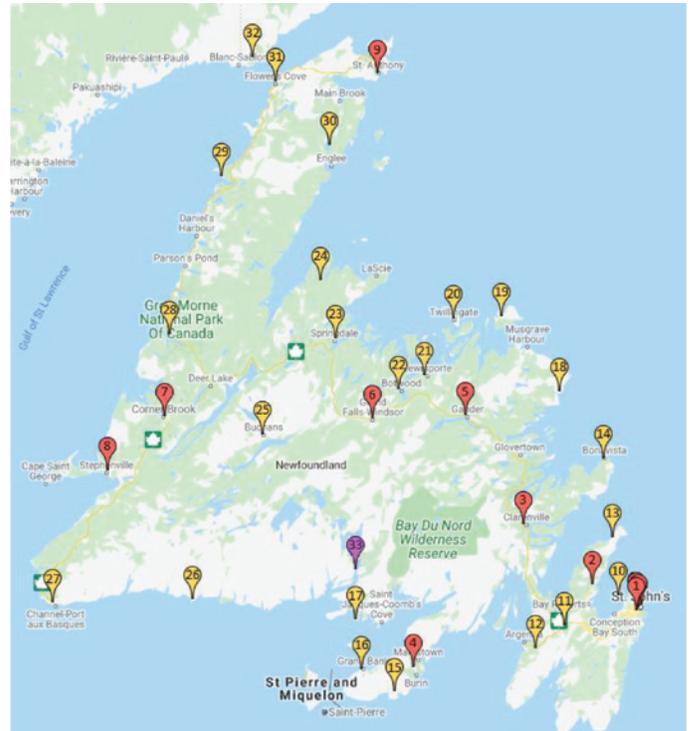
14. Bonavista 10,443
15. St. Lawrence 3,337
16. Grand Bank 8,114
17. Harbour Breton 3,293
18. New-Wes-Valley 2,247
19. Fogo 3,929
20. Twillingate 13,210
21. Lewisporte 6,039
22. Botwood 8,041
23. Springdale 7,809
24. Baie Verte 6,754
25. Buchans 1,572
26. Burgeo 1,520
27. Port aux Basques 6,718
28. Bonne Bay 4,253
29. Port Saunders 6,977
30. Roddickton 2,522
31. Flowers Cove 5,551
32. Forteau 1,673

**Medical/Community Clinics**

33. St. Albans 4,123
  - Labrador South Clinics 704
  - Labrador North Clinics 2,958

Figure 1. Geographic Location of Hospitals (Red), Health Centres (Yellow), and Clinics (Purple), With Number of ED Visits in 2017/18

- All hospitals had >15,000 visits/year, except St. Anthony (N=8,652).
- All health centres and clinics had <10,000 visits/year, except Bonavista (N=10,443) and Twillingate (N=13,210).



**Hospitals**

1. St. John's
  - Health Sciences Centre 5,252
  - St. Clare's 4,510
  - Janeway 2,020
2. Carbonear 1,108
3. Clarenville 1,544
4. Burin 311
5. Gander 369
6. Grand Falls-Windsor 1,108
7. Corner Brook 1,941
8. Stephenville 206
9. St. Anthony 91

**Labrador Hospitals**

- Happy Valley-Goose Bay 1,153
- Labrador City 143

**Health Centres**

10. Bell Island 33
11. Whitbourne 37
12. Placentia 149
13. Old Perlican 85

**Health Centres continued**

14. Bonavista 156
15. St. Lawrence 78
16. Grand Bank 46
17. Harbour Breton 25
18. New-Wes-Valley N/A
19. Fogo N/A
20. Twillingate N/A
21. Lewisporte 225
22. Botwood 34
23. Springdale 149
24. Baie Verte 23
25. Buchans 49
26. Burgeo 38
27. Port aux Basques 78
28. Bonne Bay N/A
29. Port Saunders N/A
30. Roddickton N/A
31. Flowers Cove N/A
32. Forteau N/A

**Medical/Community Clinics**

33. St. Albans N/A
  - Labrador South Clinics 13
  - Labrador North Clinics 25

N/A: not available by CTAS score

Figure 2. Geographic Location of Hospitals (Red), Health Centres (Yellow), and Clinics (Purple), With Number of CTAS Level 1 and 2 Cases Seen per Year

- The following four hospitals saw <365 level 1 and 2 cases per year: Burin, Stephenville, St. Anthony, and Labrador City.
- No health centre saw >365 level 1 and 2 cases per year.

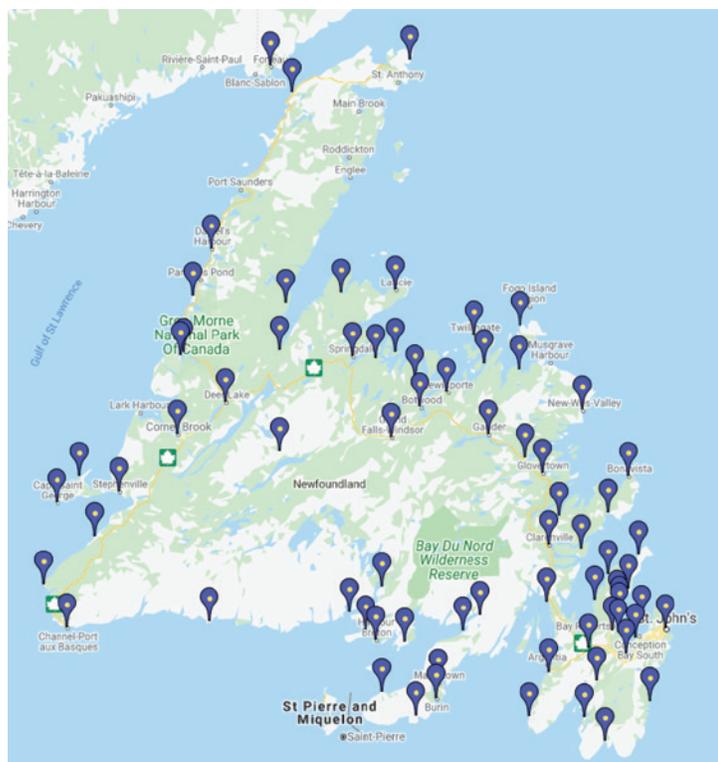
Table 1. Number per Day of CTAS Level 1 and 2 Visits and the Percentage of Visits That Were Level 4 and 5

Facility	Days to see one Level 1 or 2 case	% visits Level 4 or 5	% of ED visits that did not go to the nearest ED	% of Level 1-3 visits that did not go to nearest ED
<b>Eastern Health – Hospitals</b>				
Health Sciences Centre	0.07	41.2	–	–
St. Clare's	0.08	50.5	–	–
Janeway	0.18	50.8	–	–
Carbonear	0.33	61.0	17.4	17.7
Clareville	0.24	56.3	10.4	9.1
Burin	1.17	74.2	9.6	14.9
<b>Eastern Health – Health Centres</b>				
Bell Island	11.06	91.1	47.4	79.4
Whitbourne	9.86	79.4	54.8	80.0
Placentia	2.45	58.2	17.3	22.7
Old Perlican	4.29	78.3	19.8	38.2
Bonavista	2.34	72.9	14.0	24.6
St. Lawrence	4.68	80.1	37.7	39.2
Grand Bank	7.93	91.8	13.1	43.9
<b>Central Health – Hospitals</b>				
Gander	0.99	69.6	9.9	12.4
Grand Falls-Windsor	0.33	69.8	9.1	8.8
<b>Central Health – Health Centres</b>				
New-Wes-Valley	N/A	N/A	N/A	N/A
Fogo Island	N/A	N/A	N/A	N/A
Twillingate	N/A	N/A	N/A	N/A
Botwood	10.74	89.7	23.5	43.5
Lewisporte	1.62	86.2	36.6	60.4
Springdale	2.45	80.1	22.8	35.2
Baie Verte	15.87	84.4	8.4	28.0
Buchans	7.45	79.5	13.3	20.7
Harbour Breton	14.60	82.9	20.2	33.5
<b>Central Health – Medical Clinic</b>				
St. Albans	6.89	77.4	15.6	23.3
<b>Western Health – Hospitals</b>				
Corner Brook	0.19	69.9	5.8	5.7
Stephenville	1.77	79.7	4.8	9.6
<b>Western Health – Health Centres</b>				
Port Saunders	N/A	N/A	N/A	N/A
Bonne Bay	N/A	N/A	N/A	N/A
Port aux Basques	4.68	66.5	11.5	16.9
Burgeo	9.61	N/A	N/A	N/A
<b>Labrador-Grenfell Health – Hospitals</b>				
St. Anthony	4.01	76.4	4.8	11.1
Goose Bay	0.32	66.6	5.2	5.0
Labrador City	2.55	89.2	4.3	13.4
<b>Labrador-Grenfell Health – Health Centres</b>				
Roddickton	N/A	N/A	N/A	N/A
Flowers Cove	N/A	N/A	N/A	N/A
Forteau	N/A	N/A	N/A	N/A

- In Conception Bay North, the health centre in Old Perlican saw a level 1 or 2 case every 4.3 days, and the Carbonear hospital 0.3 per day. Of level 1–3 cases whose nearest ED was Old Perlican, 38% did not go there.
- In Central Health, a level 1 or 2 case was seen once every 7 days or more in New-Wes-Valley, Botwood, Baie Verte, Buchans, Harbour Breton, and St. Albans. Of level 1–3 cases whose nearest ED was Botwood, 43.5% did not go there. The comparable rate for Lewisporte was 60.4%, for Springdale 35.2%, Baie Verte 28.0%, Buchans 20.7% and Harbour Breton 33.5%. The rate for Gander Hospital was 12.4% and for Grand Falls-Windsor Hospital 8.8%.
- In Western Health, the frequency of level 1 or 2 cases were low in all four health centres.
- On the Northern Peninsula, a level 1 or 2 case was seen infrequently in the two health centres and the hospital.
- The percentage of visits that were level 4 or 5 in health centres ranged from 73% to 92%, except for Placentia (58%).

N/A: not available by CTAS score





## Conclusions

1. For reasons related to quality of care and sustainability, the model of emergency care requires change in health centres. A low number of resuscitation or emergent patients go to the health centres and a high proportion of visits are less urgent or non-urgent. In addition, a high percentage of level 1–3 visits whose closest ED is a health centre do not go to that ED. This change is contingent on having advanced care paramedics to provide ABC care (airways, breathing, circulation), a restructured ambulance system, models of urgent care in primary care networks, and collaborative care models.
2. The low volume of emergency calls to many responding ambulance bases suggests that a province wide ambulance system with a central dispatch would improve the efficiency of the system.

### Ambulance Base

Adam's Cove 145  
 Arnold's Cove 253  
 Bay D'Espoir 297  
 Bay L'Argent 160  
 Bell Island 452  
 Bonavista 794  
 Botwood 487  
 Boyd's Cove 309  
 Brigus 236  
 Buchans 58  
 Burin 196  
 Cape St. George 15  
 Carmanville 465  
 Cartwright 22  
 Clarenville 1,453  
 Clarke's Beach 1,314  
 Codroy 148  
 Corner Brook 332  
 Cow Head 99  
 Daniel's Harbour 142  
 Deer Lake 939  
 Ferryland 424  
 Fogo 159

Forteau 313  
 Gambo 532  
 Glovertown 657  
 Grand Bank 621  
 Hampden 94  
 HV-GB 505  
 Harbour Breton 210  
 Harbour Grace 375  
 Heart's Delight 302  
 Hermitage 65  
 Holyrood 718  
 Jackson's Arm 98  
 Jeffrey's 165  
 Kelligrews 2,072  
 La Scie 115  
 Lethbridge 385  
 Lewisporte 1,075  
 Lourdes 205  
 Marystown 803  
 Mose Ambrose 102  
 Mount Carmel 191  
 New-Wes-Valley 499  
 Norris Point 202  
 Old Perlican 382

Placentia 411  
 Point Leamington 92  
 Port Aux Basques 594  
 Port Hope Simpson 68  
 Port Rexton 92  
 Random Island 212  
 Roberts Arm 88  
 St. Bride's 79  
 St. Lawrence 192  
 St. Lunaire-Griquet 59  
 St. Mary's 231  
 Stephenville 1530  
 Terrenceville 139  
 Trepassey 150  
 Triton 98  
 Upper Island Cove 426  
 Whitbourne 715  
 Winterton 174  
 Woody Point 151

Figure 3. Emergency Call Volumes to Responding Ambulance Bases in NL in 2018/19

- 41 of 66 (62%) responding ambulance bases had less than one emergency call per day.

# Disposition of NL Health Line Callers

## Objective

To determine the disposition of people who contacted NL Health Line during 2018–19 and 2019–20.

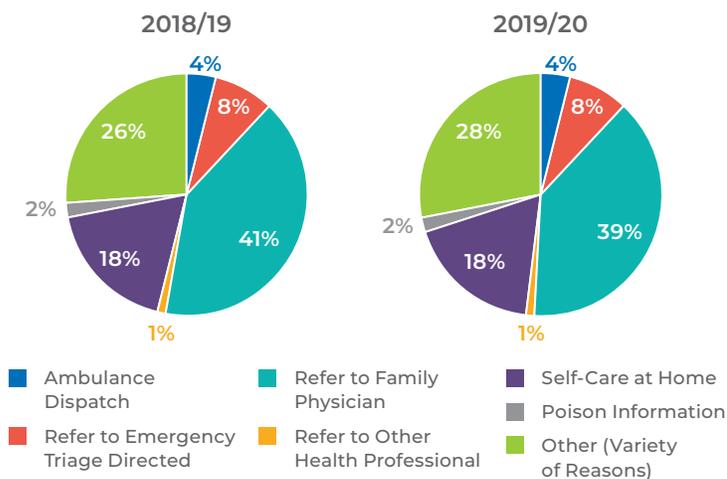
## Practice Points

1. The NL Health Line was established to provide people access to advice concerning a medical problem by calling 811. Clinical algorithms are used to establish acuity. Calls are answered by agents but calls are elevated to registered nurses who are available 24/7 should the call require this professional support.
2. Disposition included ambulance dispatch, refer to emergency with triage directed, refer to family doctor, refer to other health care professional, self-care at home, or poison information with triage.

## Data

Data were obtained from the Department of Health and Community Services who received the data from the NL Health Line. From 1 Mar 2018 to 28 Feb 2019 there were 43,196 calls and in the same period of 2019–20 there were 49,430.

## Results



**Figure 1. The Disposition of People Who Contacted NL Health Line in 2018–19 and 2019–20**

- In both years, 12% were dispatched by ambulance or referred to the emergency room, and about 40% were referred to their family physician.

**Table 1. The Number of People Who Called the NL Health Line Analyzed by Disposition**

Disposition	2018/19	2019/20	Difference	% Difference
Ambulance	1,593	1,900	307	19.3
Emergency	3,553	3,785	232	6.5
Family Physician	17,899	19,189	1,290	7.2
Other Health Professionals	432	376	-56	-13.0
Self-Care at Home	7,610	9,030	1,420	18.7
Poison Information	800	951	151	18.9
Other (Variety of Reasons)	11,309	14,199	2,890	25.6
<b>Total</b>	<b>43,196</b>	<b>49,430</b>	<b>6,234</b>	<b>14.4</b>

- Comparing the number of calls made to the NL Health Line in 2019–20 to the previous year, there was a 14.4% increase. Almost half of this increase (2,890 of 6,234 = 46%) was for reasons which were classified as other (variety of reasons), but specific categories also had notable increases, including a 19.3% increase in those who required dispatch of an ambulance, an 18.7% increase in those who were recommended self-care at home, and an 18.9% increase in those who were provided poison information.

## Conclusions

1. 12% of those who called NL Health Line went or were advised to go to the emergency room, and 40% were referred to their family physician. However, 18% were advised they required no further engagement with other health services at the time and to continue self-care at home.
2. The increase in calls in 2019–20 was, to a major extent, for other (variety of reasons), as well as people who were directed to their family physician or were advised that self-care at home was sufficient. There was also a relative increase in those who required an ambulance or poison information, but these did not contribute as much to the overall increase in calls.

# Select Medical Imaging Modalities and Utilization in NL

## Objective

To examine the utilization of specific medical imaging modalities for NL compared to the Canadian average for 2019–20.

## Practice Points

1. Modern imaging includes computed tomography (CT); medical resonance imaging (MRI); positron emission tomography (PET); single-photon emission computed tomography (SPECT); and single-photon emission computed tomography-computed tomography (SPECT-CT). SPECT is a nuclear medicine tomographic imaging technique using gamma rays and the additional CT uses a lower dose radiation to help the SPECT scan a better image.
2. NL has 15 CT units; five MRI; one PET-CT; three SPECT and nine SPECT-CT.

## Data

- This information was taken from the CADTH Health Technology Review report titled: The Canadian Medical Imaging Inventory 2019–20.
- Table 1 compares units provided per million population for specific medical imaging modalities used in NL compared to the Canadian average.
- Table 2 compares tests performed per thousand population for specific medical imaging modalities used in NL compared to the Canadian average.

## Results

Table 1: Units Available per Million Population in 2019–20

	Population	CT	MRI	PET-CT	SPECT	SPECT-CT
NL	521,922	28.7	9.6	1.9	5.7	17.2
Canada	37,797,496	14.5	10.0	1.5	8.1	7.2

- NL has double the rate of CT and SPECT-CT units provided compared to Canada.

Table 2: Tests Performed per Thousand Population in 2019–20

	Population	CT	MRI	PET-CT	SPECT/SPECT-CT
NL	521,922	189.6	42	3.3	63.4
Canada	37,797,496	143.3	61.6	3.3	32.9

- The rate of CT testing in NL is 32% higher compared to Canada and the rate of SPECT/SPECT-CT is 93% higher, whereas the rate of MRI testing is 32% lower in NL.

## Conclusions

1. The higher rate of CT and SPECT units provided in NL is associated with higher rates of testing than in Canada.
2. The rate of MRI testing is lower than in Canada. It is possible that an increase in appropriate MRI testing may reduce the rate of CT scanning. Adherence to Choosing Wisely Guidelines in the use of CT scanning could rebalance the ratio of CT:MRI in NL from the current ratio of 4.5:1 down towards 2.3:1.

# Lessons Learned From the COVID-19 Pandemic in NL (2020–2021)

## Objective

To examine the epidemiology of the COVID-19 pandemic in NL.

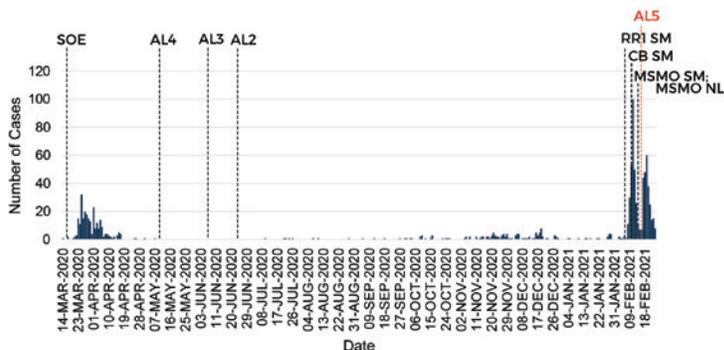
## Practice Points

1. COVID-19 was first diagnosed in NL on 14 March 2020. A super spreader event occurred at a funeral home in St. John's from 13–15 Mar 2020.
2. The Coronavirus is spread by respiratory transmission. Management of clusters depends on social isolation, physical distancing, masks, and contact tracing.
3. Importation of cases can be ameliorated by banning travel, 14-day isolation on arrival and testing for the virus at the border, with a second test done 5–10 days before or after arrival.
4. Physical distancing to more than two meters can be enhanced by a combination of working from home, limiting workplaces to essential services, closing restaurants and bars, closing schools, and limiting the number and size of gatherings.
5. Mortality from COVID-19 can be prevented by shielding the vulnerable, especially long-term care residents, and having hospital and ICU beds available during community transmission.

## Methods

1. Data on incidence of new cases were obtained from media presentations by Public Health from 14 Mar 2020 – 24 Feb 2021.
2. Quality of Care NL defined (a) flattening of the curve as <10 cases/1,000,000 population/day for 1 week, and (b) eradication of the virus as no new cases for >14 days (excluding travel-related cases).

## Results



**Legend:** SOE: Public Health State of Emergency (Lockdown) (March 18); AL4: Alert Level 4 (May 11); AL3: Alert Level 3 (June 8); AL2: Alert Level 2 (June 25); RRI SM: Some restrictions re-imposed (St. John's Metro area) (February 8); CB SM: Circuit Breaker for St. John's Metro area (February 10); MSMO SM: Modified Special Measures Order for St. John's Metro area (February 11); MSMO NL: Modified Special Measures Order for All NL (February 11); AL5: Alert Level 5 (Entire Province) (February 12)

**Figure 1. Incidence of New Cases**

### First Wave

- Peak incidence of daily cases occurred within 11 days of first case.
- The virus was eradicated within 48 days of first case.
- No community acquired cases were detected from mid-Apr 2020 until mid-Nov 2020.

### Cluster Control of Four Community Outbreak(s):

1. On 17 Nov 2020, the first community case in more than seven months was identified in Grand Bank (Eastern Health). Nine cases were connected to the cluster. Three of these cases were residing in a long-term care residence. The last case was identified on 28 Nov 2020. Local restrictions were applied.
2. On 20 Nov 2020, a case was identified in Deer Lake (Western Health). Seven cases were connected to the cluster and one individual tested positive in Alberta. The cluster was linked to travel with no evidence of wide-spread community transmission. The last case was identified on 26 Nov 2020. Local restrictions were applied.

3. On 5 Dec 2020, a case was identified in Harbour Breton (Central Health). Three cases were linked to the first case with the last case identified on 10 December 2020. Individuals living in Harbour Breton and surrounding areas were asked to take extra precautions — stay home as much as possible and avoid holding or attending social gatherings. The source of the cluster was eventually linked to travel outside the province.
4. On 27 Jan 2021, a case was identified in St. John’s (Eastern Health). Five additional cases were linked to this case.

### Second Wave

- On 6 Feb 2021, a case was identified in Mount Pearl (Eastern Health). On 7 Feb 2021, another case was identified in Mount Pearl.
- On 8 Feb 2021, it was announced there were three non-epidemiologically linked clusters of 11 cases in Eastern Health signalling community transmission. Transmission was facilitated by high school attendees and by sports. Group and team sports, recreation activities and cultural activities were suspended in the St. John’s and Metro area.
- On 10 Feb 2021, a 2-week ‘circuit breaker’ was announced for the St. John’s and Metro area. All K–12 schools and post-secondary institutions closed.
- On 11 Feb 2021, 99 new cases were reported in Eastern Health. A modified special measures order was issued for the entire province (group and team sports, recreation activities and cultural activities suspended). The NL English School District (NLESD) closed all schools on the Avalon Peninsula.
- On 12 Feb 2021, it was announced that a variant of concern (B.1.1.7 variant) had been identified in NL and cases had occurred in other regions. All 19 samples sent to the National Microbiology Lab since 5 February had the B.1.1.7 variant. The entire province moved to Alert level 5 (Lockdown).
- Peak incidence of daily cases occurred within five days of the first case. Flattening of curve occurred within 32 days. Eradication of the virus occurred within 47 days.

## Lessons Learned

1. Rapid lockdown and adherence to restrictions during the first wave eradicated the virus 48 days after the first case.
2. Restriction of visitors and 14-day isolation of visitors prevented community transmission.
3. Four local epidemiologically linked clusters were controlled by local restrictions.
4. Young people with asymptomatic or mild disease in environments not conducive to social distancing contributed to the rapid transmission of a more transmissible variant of COVID-19.
5. It is unlikely that sentinel testing of at-risk environments (such as long-term care homes or hospital workers) would have identified the pandemic earlier.
6. It is also unlikely that testing of sewage for the virus would have provided an earlier diagnosis date in a situation with a more transmissible virus in a more transmissible environment than previous.
7. It is unclear whether the New Zealand strategy of lockdown on diagnosing new non-epidemiologically linked COVID-19 cases or the Canadian strategy of a circuit breaker of more limited restrictions was the better initial policy.
8. Peak incidence of new cases in Eastern Health occurred before lockdown was ordered, implying that the circuit breaker was already having a beneficial effect.

# Lessons Learned About Control of COVID-19 From Populations Comparable to NL

## Objective

To monitor COVID-19 events and interventions undertaken in the island communities of New Zealand, Australia and Iceland.

## Practice Points

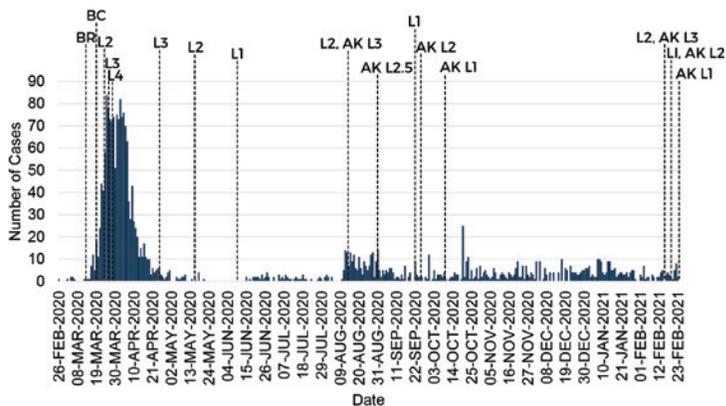
1. The major elements of COVID-19 control are prevention of importation of new cases and management of clusters.
2. Border control to prevent importation of new cases depends on either 14-day isolation or double testing.
3. Previous work showed that strict lockdown was associated with eradication of the virus, even in big communities (Auckland and Melbourne), but gradual or more limited imposition of restrictions was less effective (Iceland).

## Methods

1. Examination of actual events in real time in comparable populations, together with predictive modelling of future events, provides good information for public health decision making. The former requires assumptions be made to extrapolate the results to NL, whereas the latter requires assumptions be made to obtain results from the models.
2. Quality of Care NL decided early in the COVID-19 pandemic to follow events in New Zealand (island population of 4.8 million), Tasmania (island population 540,000), Victoria state in Australia (population 6.5 million), and Iceland (island population 364,000).
3. Data on incidence of new cases and deaths, together with a description of various types of interventions imposed or loosened, were obtained from government websites up to 23 Feb 2021.
4. Events analyzed included first cases, time to peak of incidence curve, and time to virus eradication (day after 14 days without any new cases of community acquired infection).

## Results

### New Zealand



**Legend:** BR: Border restrictions, compulsory self-isolation (March 16); BC: Border closed to all but NZ residents & citizens (March 19); L2: Alert level 2 – Reduce (March 21); L3: Alert level 3 – Restrict (March 23); L4: Alert level 4 – Lockdown (March 25); L3: Alert level 3 – Restrict (April 28); L2: Alert level 2 – Reduce (May 14); L1: Alert level 1 – Prepare (June 9); L2, AK L3: NZ Alert Level 2 – Reduce, Auckland Alert Level 3 – Restrict (August 12); AK L2.5: Auckland Alert Level 2 with some extra restrictions (August 31); L1: NZ Alert Level 1; Excludes Auckland (September 22); AKL2: Auckland Alert Level 2 with no restrictions (September 24); AKL1: All NZ (including Auckland) Alert Level 1 (October 8); L2, AKL3: NZ Alert Level 2, Auckland Alert Level 3 (February 15); L1, AKL2: NZ Alert Level 1, Auckland Alert Level 2 (February 18); AKL1: All NZ (including Auckland) Alert Level 1 (February 23)

**Figure 1. Incidence of New Cases in New Zealand From Start of Pandemic up to 23 Feb 2021**

- New Zealand eradicated the first wave of the virus within 80 days of first case and the Auckland community cluster (first cases detected on 11 Aug 2020) within 58 days.
- From 30 Apr to 11 Aug 2020, new cases were all travel related (over 100 days without any community-acquired transmission).
- For the Auckland Aug cluster, NZ employed a rapid lockdown and locality approach to re-imposing restrictions — Auckland versus the rest of NZ. The last case related to this cluster was identified on 24 Sept 2020.
- Three deaths were associated with the Auckland community cluster.

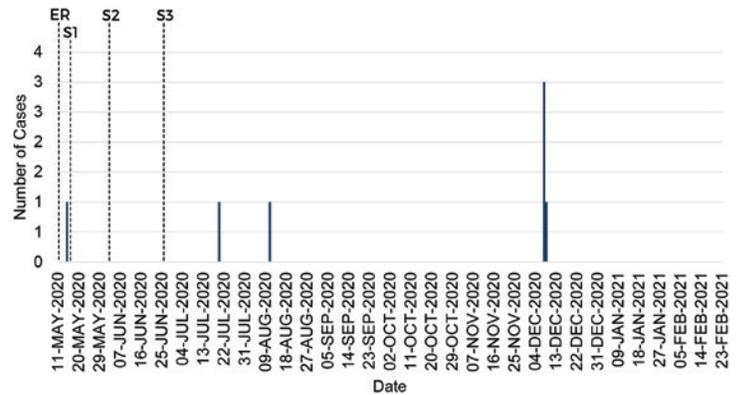
### Cluster Control of Three Other Community Outbreaks:

1. In Oct and Nov 2020 (first case identified on 17 Oct 2020), NZ had three separate small clusters linked to staff members at their port of entry and their managed isolation and quarantine (MI & Q) facilities (N=12 cases total). Last case was identified 20 Nov 2020. No restrictions were re-imposed.
2. On 25 Jan 2021, the first community case in more than 2 months was identified in a recent returnee who had completed their stay in a MI & Q facility and returned two negative tests before leaving. Four cases were connected to this cluster. The last case was identified on 3 Feb 2021. Whole genome sequencing identified it to be a variant of concern (B.1.3.5.1 variant). No restrictions were re-imposed.
3. On 13 Feb 2021, three community cases were identified with an unknown source. Whole genome sequencing identified it to be a variant of concern (B.1.1.7 variant). Lockdown measures were re-imposed and loosened over an eight-day period. Eleven cases from three households currently linked to this cluster.

**Border Control:** Obtained by three interventions — travel ban, 14-day isolation in government facilities for returnees and initially virus testing at day three and day 12 of isolation.

- As of 18 Jan 2021, all travelers must have a COVID-19 test taken and a negative result returned within 72 hours of their first scheduled international flight. They are required to also have day 0/1 tests and stay in their room until a negative result is returned.

### Tasmania



**Legend:** ER: Easing of some Restrictions (May 11); S1: Stage 1 Reopening (May 18); S2: Stage 2 Reopening (June 5); S3: Stage 3 Reopening (June 25)

**Figure 2. Incidence of New Cases in Tasmania Since the First Stage of Loosening Restrictions up to 23 Feb 2021**

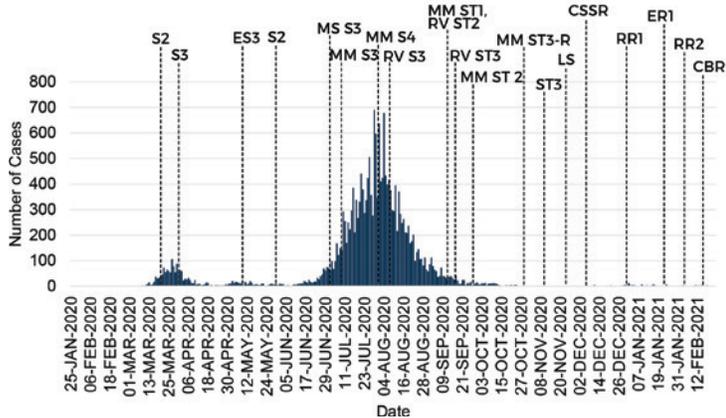
- There have been 232 cases and 13 deaths since the beginning of the pandemic in Tasmania.
- Restrictions started to loosen 70 days after first case detected and 53 days after lockdown.

**Cluster Control:** There has been no community transmission or deaths since start of loosening restrictions.

**Border Control:** Obtained by 14-day isolation in government facilities on coming into Australia and a further 14 days on coming into Tasmania.

- As of 22 Jan 2021, all individuals travelling or transiting through Australia must provide evidence of a negative COVID-19 (PCR) test taken 72 hours or less before their scheduled departure.

## Victoria



**Legend:** S2: Stage 2 Stay Safe Directions (March 23); S3: Stage 3 Stay at Home Restrictions – 1st wave Lockdown (March 30); ES3: Easing of some Stage 3 Restrictions (May 11); S2: Stage 2 Stay Safe Directions (June 1); MS S3: 36 Melbourne Suburbs Stage 3 Stay at Home Restrictions (July 1); MM S3: Metropolitan Melbourne Stage 3 Stay at Home Restrictions (July 8); MM S4: Metropolitan Melbourne Stage 4 Stay at Home Restrictions (August 2); RV S3: Regional Victoria Stage 3 Stay at Home Restrictions (August 5); MM ST1, RV ST2: Metropolitan Melbourne First Step of New Reopening Roadmap, Regional Victoria Second Step of New Reopening Roadmap (September 14); RV ST3: Regional Victoria Third Step (September 17); MM ST2: Metropolitan Melbourne Second Step (September 28); MM ST3-R: Metropolitan Melbourne Third Step with Restrictions (October 28); ST3: Statewide Third Step (November 9); LS: Last Step Restrictions (Statewide) (November 23); CSSR: COVID Safe Summer Restrictions (December 7); RRI: Private Gathering Size Decreased and Public Indoor Mask Usage Mandatory (December 31); ERI: Private Gathering Size Increased (January 23); RR2: Private Gathering Size Decreased and Public Indoor Mask Usage Mandatory (February 4); CBR: 'Circuit Breaker' Restrictions for Victoria (Statewide) (February 13); CSSR-R: COVIDSafe Summer Restrictions with some revised conditions (February 18)

**Figure 3. Incidence of New Cases in Victoria From Start of Pandemic up to 23 Feb 2021**

- Victoria never eradicated the first wave of the virus but eradicated the second wave (which unofficially began on 1 Jun 2020) of the virus within 165 days.
- For the second wave, Victoria used a gradual to strict locality approach to re-imposing restrictions — Metropolitan Melbourne versus regional Victoria. Stay at home restrictions were re-imposed for 2.5 months, followed by a Four-Step Roadmap to Recovery plan that was followed for over two months.

- Failure to adhere to lockdown caused the virus to spread rapidly. As many as nine out of ten people who later tested positive were not isolating between the onset of symptoms and getting a test. In addition, 53% of positive cases did not isolate between being tested and receiving their results.
- Nineteen deaths were attributed to COVID-19 in the first wave, and close to 800 in the second wave.

### Cluster Control of Three other Community Outbreak(s):

1. On 21 Dec 2020, Victoria had its first locally acquired case in 53 days (due to interstate travel). Statewide restrictions on gathering size (30 to 15) and mandatory mask usage were implemented for 24 days. Twenty-nine individuals were linked to this cluster, with the last case identified on 5 Jan 2021.
2. On 3 Feb 2021, a locally acquired case was identified in a hotel quarantine worker. Statewide restrictions on gathering size (30 to 15) and mandatory mask usage was re-imposed.
3. On 7 Feb 2021, a locally acquired case was identified in a hotel quarantine worker at a separate hotel. Whole genome sequencing identified it to be a variant of concern (B.1.1.7 variant). 'Circuit breaker' restrictions were implemented for five days, after which Victoria returned to their COVIDSafe summer restrictions (with some revised conditions). Twenty-two individuals have been linked to this hotel cluster.

**Border Control:** Obtained by 14-day isolation in government facilities. Failures in hotel quarantine by private security firms that were contracted to operate them, such as illegal socializing between staff and physical contact between guards and quarantined travellers, led to the second wave.

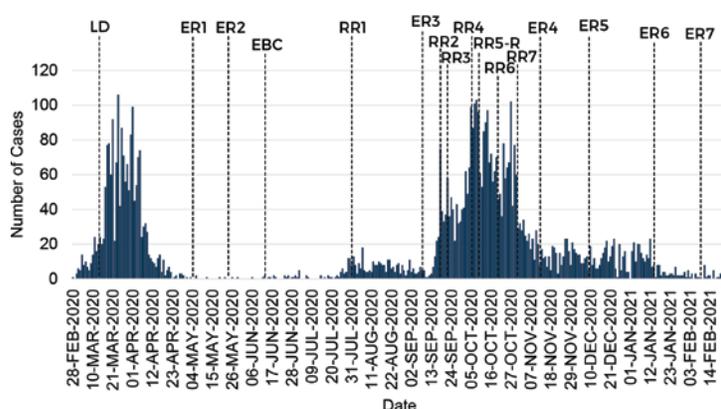
- Victoria resumed its hotel quarantine program on 7 Dec 2020 with virus testing on day three and day 11 (or later) of isolation. If the day 11 (or later) test is refused, individuals must quarantine for an extra ten days.



- As of 11 Jan 2021, Victoria implemented a “traffic light” permit system for all domestic travel based on risk of transmission. Regions are classified into Red zone (no entry without an exemption), Orange zone (can enter but must immediately self-isolate, get tested within 72 hours and continue to self-isolate until a negative result is received) and Green zone (can enter but must monitor for symptoms and get tested if unwell).
- As of 22 Jan 2021, all individuals travelling or transiting through Australia must provide evidence of a negative COVID-19 (PCR) test taken 72 hours or less before their scheduled departure.

- On 13 Jul 2020, double PCR testing was required for Icelandic citizens and residents, with special precautions to be taken for the first five days after arrival until the 2nd PCR test. This was expanded on 31 Jul 2020 to include all those arriving from high-risk areas and who intended to stay in Iceland for ten days or more.
- As of 19 Aug 2020, all passengers arriving in Iceland must either undergo a double testing procedure, one test upon arrival and another five-six days later (along with quarantine between tests), or a 14-day quarantine.
- From 10 Dec 2020, travelers from within the EEA who had already contracted and recovered from COVID-19 were exempt from infection prevention protocols on arrival.
- From 15 Jan 2021, the option for 14-day quarantine instead of double screening (19 Aug protocol) was removed. Arriving passengers from within the EEA/EFTA-area with valid documentation proving prior infection or vaccination against COVID-19 were exempt from all screening and quarantine measures.
- From 19 Feb 2021, all arriving passengers must present a negative PCR test taken within 72 hours of their time of departure to Iceland. This is in addition to the current system of double screening. Additionally, those who now test positive upon arrival are required to isolate in managed isolation facilities (quarantine hotels) if the infected individual is unable to provide credible plans for self-managed isolation.

## Iceland



**Legend:** LD: Lockdown measures started (March 13–24); ERI: Easing of Many Restrictions (May 4); ER2: Further easing of Restrictions (May 25); EBC: Easing of Border Control Measures (June 15); RRI: Some Restrictions Re-imposed (July 31); ER3: Easing of Restrictions (September 7); RR2: Some Restrictions Re-imposed (September 18–27); RR3: Further Restrictions (September 21); RR4: Further Restrictions (October 5); RR5-R: Stricter Restrictions for Reykjavik (October 7); RR6: Further Restrictions (October 20); RR7: Further Restrictions (October 31); ER4: Minor Easing of Some Restrictions (November 13); ER5: Some Social Restrictions Moderately Relaxed (December 10); ER6: Further Easing of some Restrictions (January 13); ER7: Further Easing of Restrictions (February 8);

\*Iceland never eradicated the virus until 4 February 2021 (last case of community acquired transmission on 20 January 2021)

**Figure 4. Incidence of New Cases in Iceland From Start of Pandemic up to 23 February 2021**

**Cluster Control:** Reactive approach to re-imposing restrictions with no predetermined set of guidelines.

**Border Control:** No full travel ban, testing on arrival and initially no isolation. On 15 Jun 2020, Iceland allowed single PCR testing at the border for Icelandic citizens/residents and travelers of other EU and Schengen states instead of 14-day self-isolation.

## Conclusions

- Mitigation of community spread by rapid lockdown was demonstrated by New Zealand and belatedly by Victoria. The failure of Iceland to eradicate the virus may be related to a reactive approach to imposing restrictions in the community and at the border.
- The importance of preventing importation of COVID-19 was demonstrated by the successful border control measures in New Zealand and Tasmania, and by the less than successful measures taken by Victoria before the second wave, and by Iceland.

# COVID-19 Epidemiology in PEI and Vancouver Island and the Other Canadian Provinces

## Objective

To monitor COVID-19 events in Canada with an emphasis on Prince Edward Island (PEI) and Vancouver Island.

## Practice Points

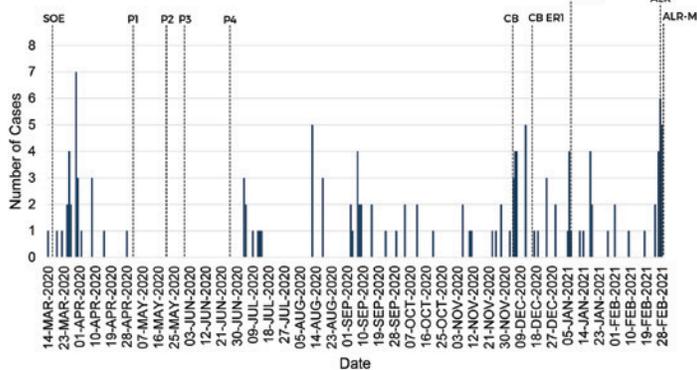
- Two island communities of PEI (population 157,000) and Vancouver Island (population 870,300) are comparable to NL.
- COVID-19 first wave started in mid-Mar 2020 in Canada necessitating restricted travel. The Atlantic provinces formed a bubble to permit interprovincial travel within the four provinces on 3 Jul 2020. Due to increasing cases in some regions (with community transmission), PEI exited the bubble on 24 Nov 2020 followed by NL on 25 Nov 2020. Both provinces have extended their restrictions on Atlantic bubble travel.

## Methods

- Incidence of new cases and interventions was obtained from provincial websites up to 28 Feb 2021. Low rate of new cases was defined as <10/1,000,000 population/day for seven days.
- For PEI and Vancouver Island, events analyzed included: first cases and time to virus eradication (day after 14 days without new cases).

## Results

### Prince Edward Island



**Legend:** SOE – Public Health State of Emergency (March 16); P1 – Phase 1 Reopening (May 1); P2 – Phase 2 Reopening (May 22); P3 – Phase 3 Reopening (June 1); P4 – Phase 4 Reopening (June 26); CB – Circuit Breaker (December 7); CB ER1 – Circuit Breaker with some easing of restrictions (December 17); CB ER2 – Further easing of circuit breaker restrictions (January 6); ALR – Alert level: Restricted (Circuit Breaker until March 14) (February 28); ALR-M – Alert level: Restricted with further Modifications (will last for 72 hours) (March 1)

**Figure 1. Incidence of New Cases in PEI From Start of Pandemic up to 28 Feb 2021**

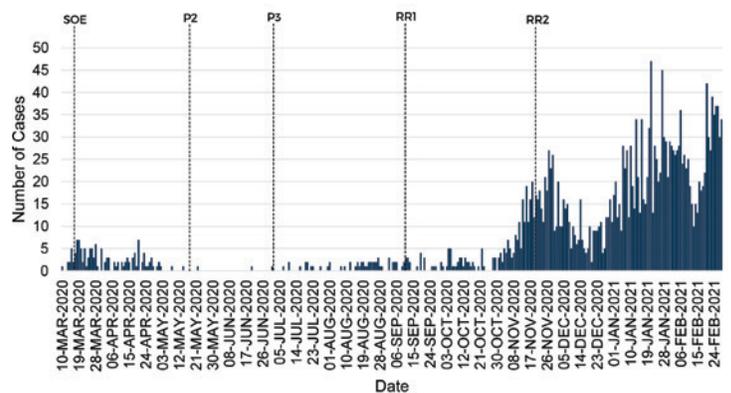
- PEI eradicated the first wave of the virus within 60 days.
- There have been no COVID-19 related deaths.

### Cluster Control of Community Outbreak(s):

- On 7 Dec 2020, PEI implemented a circuit breaker lockdown to quell a small outbreak in Charlottetown. Some restrictions were eased on 17 Dec 2020 followed by further loosening of restrictions on 6 Jan 2021.
- On 28 Feb 2021, PEI again implemented a circuit breaker lockdown for two weeks due to clusters in both Charlottetown and Summerside. From 1 Mar 2021 (for 72 hours), the island will have further modifications made to the circuit breaker (Alert Level: Restricted).

**Border Control:** Travel into PEI is restricted and 14-day self-isolation is required. As of 1 Mar 2021, all travelers arriving from outside the Maritime provinces (NS and NB) will be required to be tested on days 0–1, 4–6, and 9–11. A negative COVID-19 test result does not shorten the self-isolation period.

### Vancouver Island



**Legend:** SOE – Provincial State of Emergency (March 17) (Phase 1: Public health measures enacted March 14–21); P2 – Phase 2: Start of reopening (May 19); P3 – Phase 3: Continued reopening (July 1); RRI – Some restrictions re-imposed (September 9) RR2 – Further restrictions (November 19)

**Figure 2. Incidence of New Cases in Vancouver Island From Start of Pandemic up to 28 Feb 2021**

### Cluster Control of Community Outbreak(s):

1. Vancouver Island appeared to have eradicated the virus in May 2020 – Jun 2020 but travel related cases occurred regularly thereafter. Community acquired cases continued to occur in the summer and fall and a substantial number of new cases occurred from Nov 2020 – Feb 2021.
2. The province-wide ban on social gatherings and events that was implemented on 19 Nov 2020 has been extended indefinitely.

**Border Control:** Travel within British Columbia (BC) is permitted but should be limited to essential travel. There is no need to self-quarantine when entering BC from another province or territory.

### Atlantic Provinces

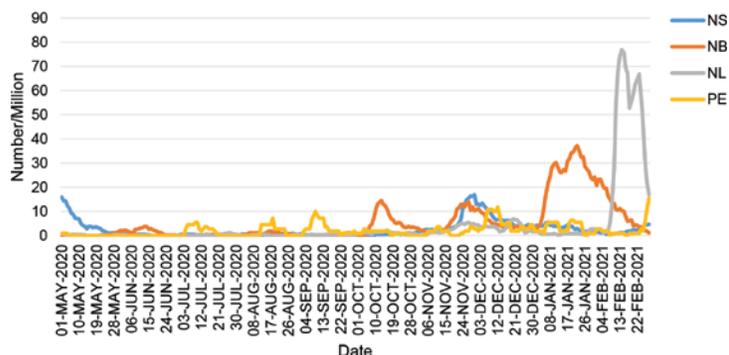


Figure 3. Incidence of New Cases in Atlantic Provinces From 1 May 2020 to 28 Feb 2021 (Rolling Seven-Day Daily Average Rate per 1,000,000 Population)

- High incidence of new cases (with community transmission) in New Brunswick (NB) and Nova Scotia (NS) led to the closure of the Atlantic bubble in late Nov 2020.
- As of 28 Feb 2021, the rolling seven-day average (daily number of new cases/million) was 17 for NL, 15 for PEI, five for NS and one for NB.

### Non-Atlantic Provinces

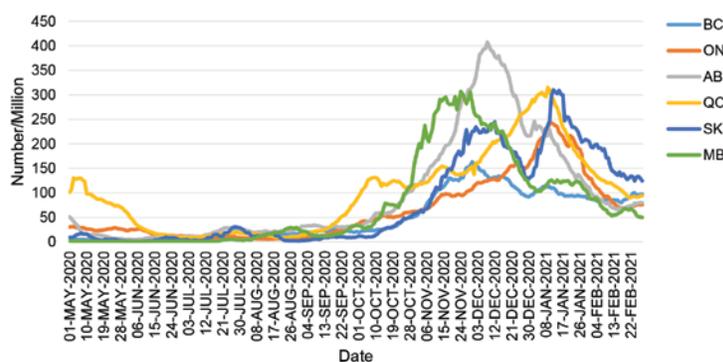


Figure 4. Incidence of New Cases in Non-Atlantic Provinces From 1 May 2020 to 28 Feb 2021 (Rolling Seven-Day Average Rate per 1,000,000 Population)

- Loosening of restrictions over the summer (without achieving virus eradication) in the non-Atlantic provinces predisposed to a substantial increase in virus starting in late Sept.
- Strict restrictions were re-imposed over the fall/winter in many provinces leading to a gradual decline of cases.
- As of 28 Feb 2021, the rolling seven-day average (daily number of new cases/million) for all non-Atlantic provinces was 50 or above, with BC, Quebec (QC) and Saskatchewan (SK) above 90.

### Conclusions

1. Despite a more restricted access into PEI compared to NL, clusters of COVID-19 have occurred during the past year.
2. Vancouver Island has less restricted access compared to NL and has never really eradicated the virus. It experienced a high incidence of new cases in the fall and winter.
3. NB and NS have experienced clusters of cases but not to the same extent as the non-Atlantic provinces, all of whom had never eradicated the virus and had substantial exacerbation in the fall. Despite restrictions in the non-Atlantic provinces, at the end of Feb 2021 incidence remained high.

# The Impact of COVID-19 on Acute Hospital Bed Utilization

## Objective

To determine the extent and duration of reduction in acute care hospital bed use during COVID-19 by Regional Health Authority (RHA).

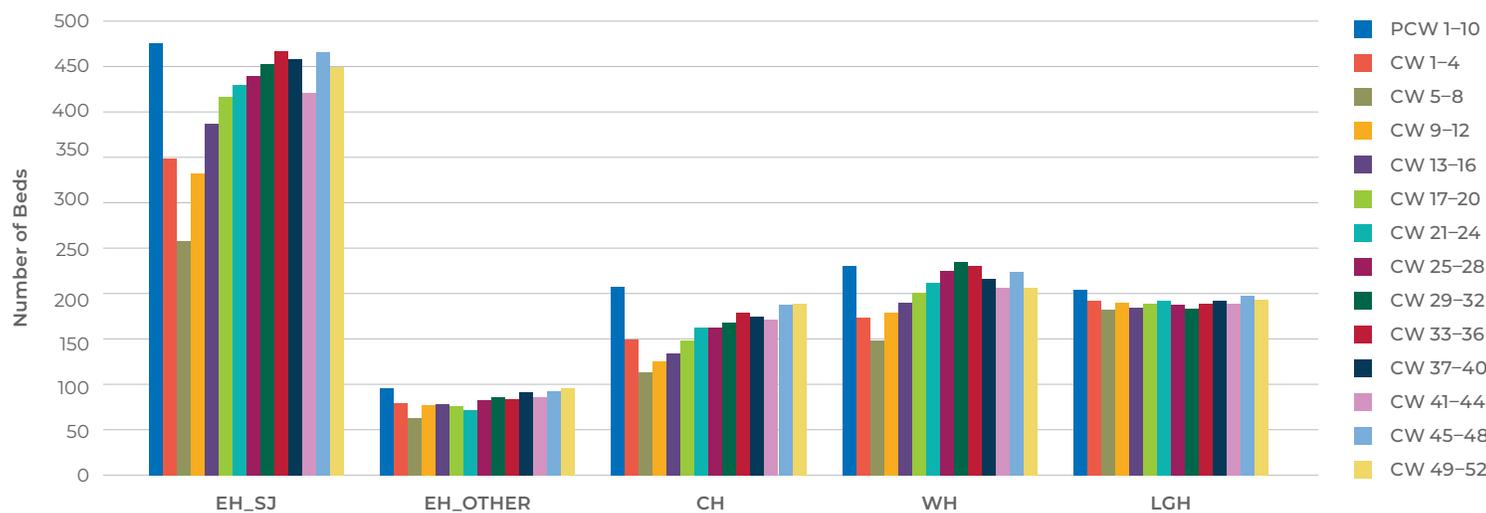
## Practice Points

1. During the first wave of COVID-19, which started around 16 Mar 2020, elective use of hospitals was limited and efforts were made to place alternate level of care (ALC) patients elsewhere. In particular, ALC had been a problem in Gander, Grand Falls-Windsor and Corner Brook, and predisposed to over-capacity pressures.
2. The province was free of community spread of the virus from early May 2020 until late Feb 2021, and had experienced only four local clusters after the first wave.

## Methods

1. Data on daily hospital bed use by RHA were obtained from the Newfoundland and Labrador Centre for Health Information (NLCHI). Baseline daily average bed use before COVID-19 from 6 Jan – 15 Mar 2020 was calculated, as was the average daily use over four-week blocks from the start of COVID-19 for the following 52 weeks. Using pre-COVID winter bed use in 2020 as a baseline is a limitation in interpreting the data.
2. Fifty-one patients considered long-term care (LTC), palliative or rehabilitation, who occupied acute hospital beds pre-COVID-19 in Corner Brook are retained in the data during COVID-19.

## Results



#Eastern Health was separated into hospitals within St. Johns (EH\_SJ) and outside St John's (EH\_OTHER); PCW = pre-COVID week; CW = COVID week

**Figure 1. The Number of Hospital Beds in Use Pre-COVID-19 and in Four- Week Blocks During COVID-19# by RHA**

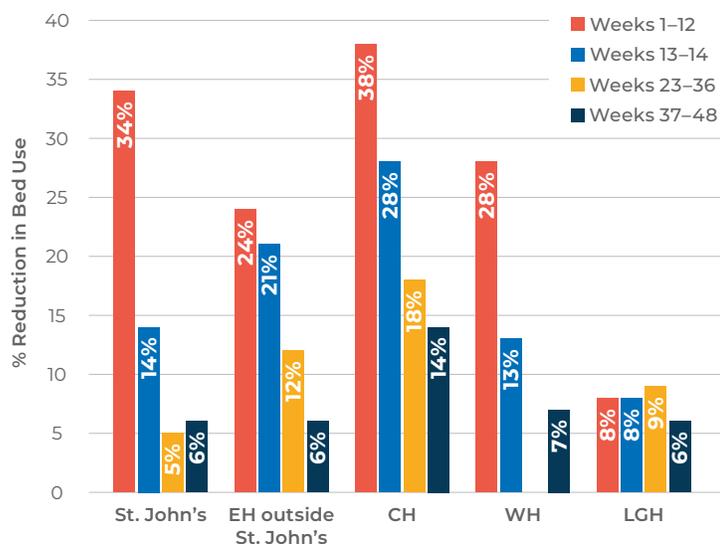
- Following the early reductions in bed use during COVID-19, gradual return towards prior bed use was evident in all four regions: Eastern Health (EH), Central Health (CH), Western Health (WH), and Labrador-Grenfell Health (LGH).

**Table 1. Rates of Hospital Beds/1,000 Population Pre-COVID-19 and in Weeks 45-52 During COVID-19**

RHA	Pre-COVID-19 Weeks	COVID-19 Weeks 45-52
EH	1.8	1.4
CH	2.3	2.1
WH <sup>#</sup>	2.3	2.2
LGH	5.7	5.4

<sup>#</sup>51 patients designated LTC, palliative or rehabilitation removed from this calculation

- In all four regions, use of acute care hospital beds during COVID-19 was lower than pre-COVID-19.



**Figure 2. Average Percent Reduction in Bed Use by RHA in Four 12-Week Blocks From the Start of COVID-19**

- CH had the biggest and most prolonged reduction in hospital bed use during COVID-19.
- LGH had the smallest reduction in beds during the first 24 weeks of the pandemic.

## Conclusions

1. The reduction in hospital bed use in the short term reflected no elective admissions and disposition of ALC patients out of hospital.
2. The use of hospital beds was less 45-52 weeks after COVID-19, compared to pre-COVID-19, noteworthy in those hospitals exposed to over-capacity pressures pre-COVID-19.

# Use of Personal Protective Equipment During COVID-19 by Regional Health Authority (2020)

## Objective

To compare the use of masks, gloves and gowns during the COVID-19 pandemic up to the end of 2020 to use before the pandemic in each Regional Health Authority (RHA).

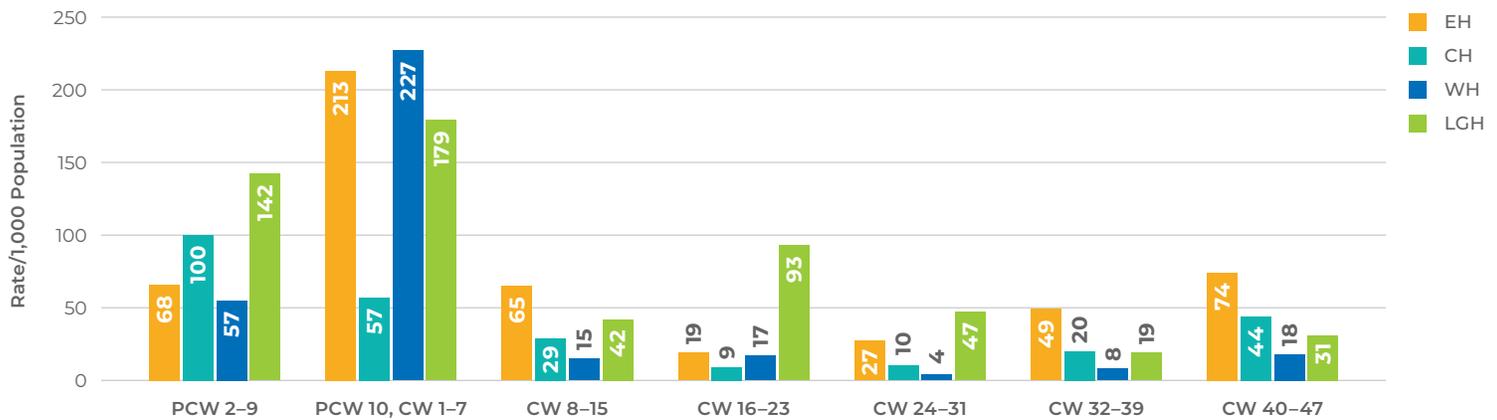
## Practice Points

1. Substantial and sustained increase in the use of Personal Protective Equipment (PPE) occurred during the first 12 weeks of COVID-19, not only in Eastern Health (EH) exposed to a cluster of cases, but in the other RHAs with little exposure.
2. Eradication of COVID-19 in the community occurred within six weeks of the start of the pandemic. Since then, three small clusters of infection have occurred in the province despite frequent identification of travel-related cases in all four RHAs.
3. Electronic capture of distribution of each kind of PPE to the RHAs was initiated, together with estimates of PPE on hand given the prior burn rate of PPE, particularly as lack of PPE would be catastrophic for health care delivery should community transmission occur.

## Methods

1. The daily dashboard provided by the NL Centre for Health Information (NLCHI) on PPE supplied from inventory to all departments in each RHA was analyzed. The average four-weekly supply was calculated for the eight weeks prior to COVID-19 (6 Jan – 8 Mar 2020) and compared to the supply.
2. From 9 Mar – 27 Dec 2020 (42 weeks), the four-weekly rate of PPE use/1,000 population was calculated to facilitate comparisons between RHAs.

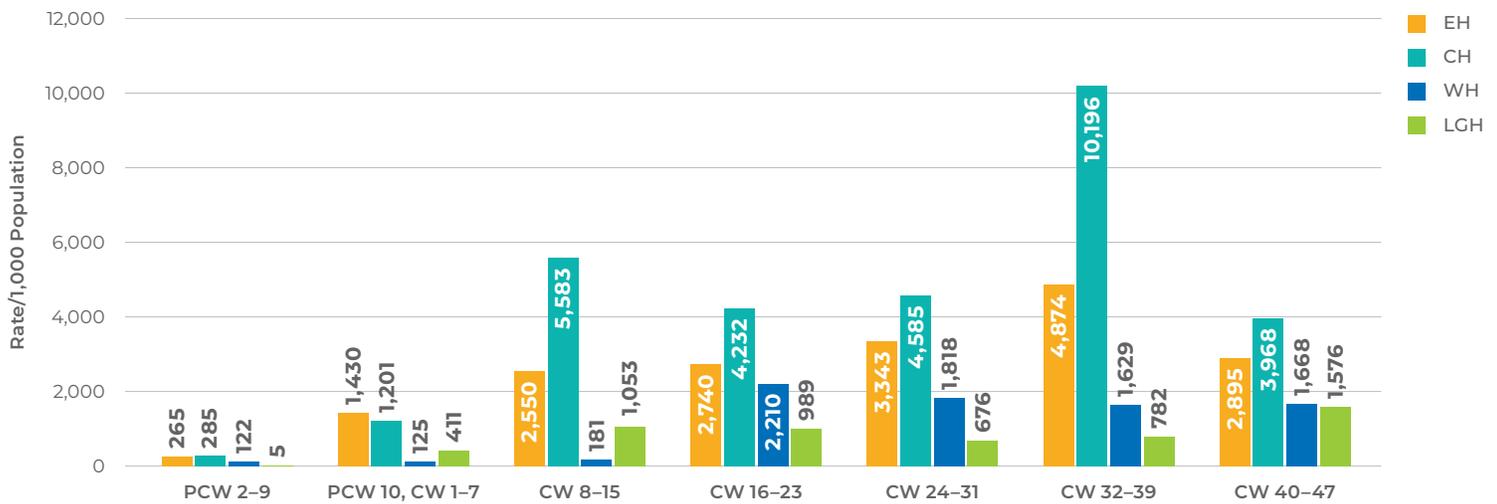
## Results



PCW=Pre-COVID Week; CW=COVID Week

**Figure 1. Quantity of N95 Masks/1,000 Population for the Eight Weeks Pre and the Six Eight-Week Blocks During COVID-19 by RHA**

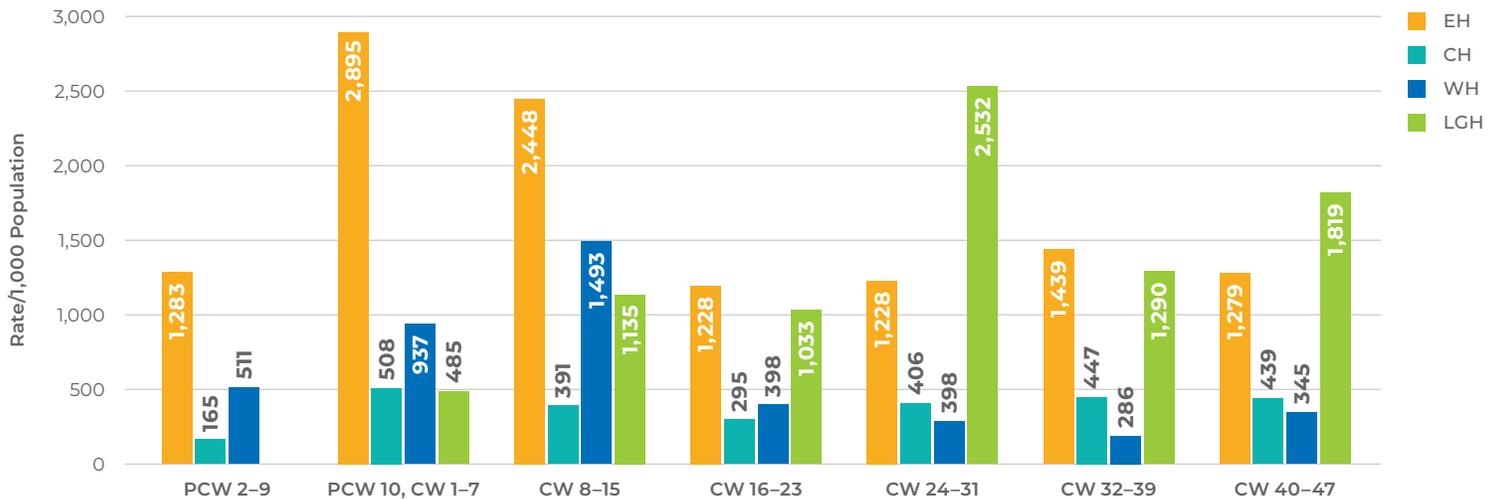
- In each region except Central Health (CH), there was a substantial increase in N95 mask use during COVID-19 first eight weeks. Subsequently, there was a substantial reduction below baseline in all four regions.



PCW=Pre-COVID Week; CW=COVID Week

**Figure 2. Quantity of Other Masks/Shields/1,000 Population for the Eight Weeks Pre and the Six Eight-Week Blocks During COVID-19 by RHA**

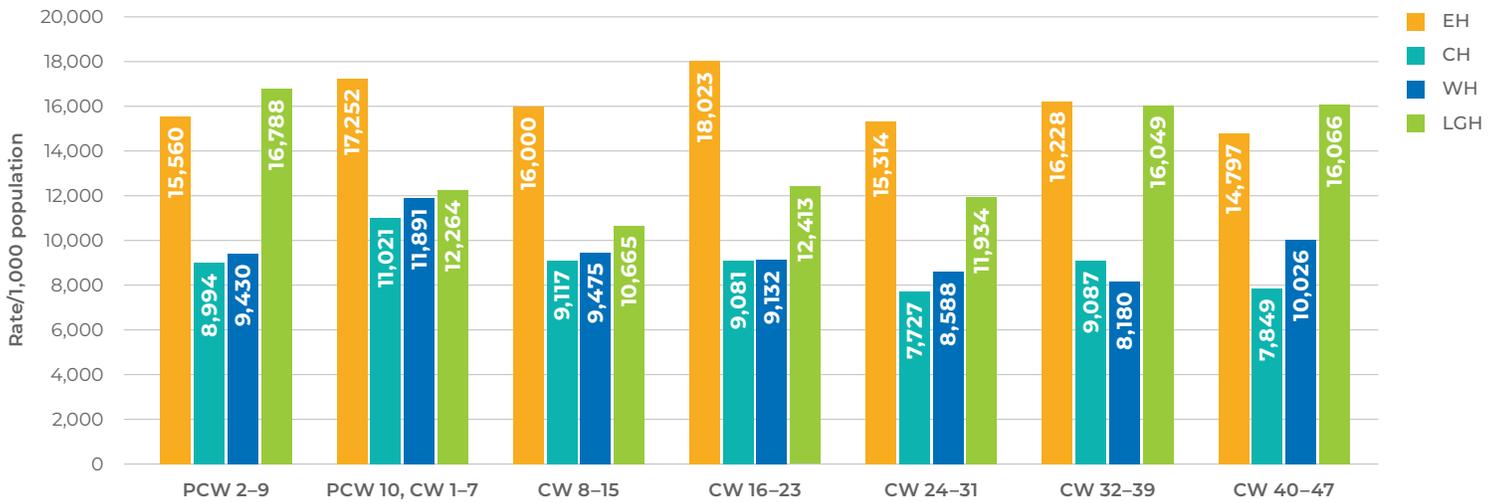
- There were massive increases in the supply of other masks/shields in all four RHAs, particularly in CH.



PCW=Pre-COVID Week; CW=COVID Week

**Figure 3. Quantity of 12-Inch Gloves/1,000 Population for the Eight Weeks Pre and the Six Eight-Week Blocks During COVID-19 by RHA**

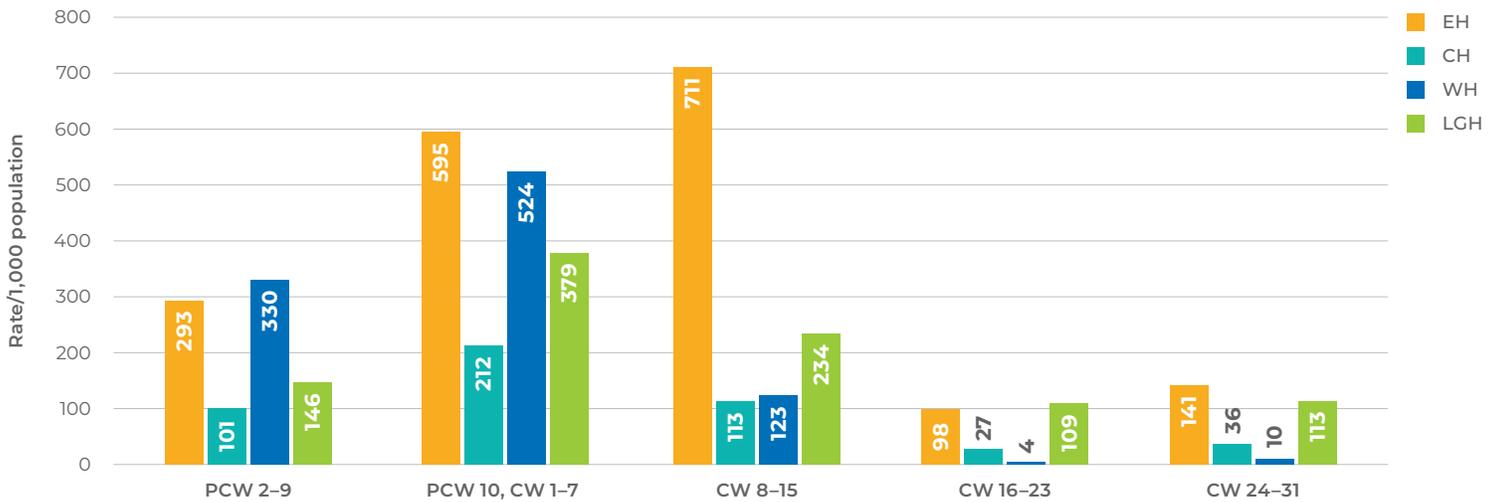
- There was an initial surge in supply of 12-inch gloves in the first 16 weeks of the pandemic. In EH and Western Health (WH), the supply returned to baseline thereafter, stayed high in CH and surged in Labrador-Grenfell Health (LGH) in the later weeks.



PCW=Pre-COVID Week; CW=COVID Week

**Figure 4. Quantity of 9-Inch Gloves/1,000 Population for the Eight Weeks Pre and the Six Eight-Week Blocks During COVID-19 by RHA**

- Massive quantities of 9-inch gloves were supplied in all regions before and during the pandemic, and a surge in supply during COVID-19 was not evident.



PCW=Pre-COVID Week; CW=COVID Week

**Figure 5. Quantity of Gowns/1,000 Population for the Eight Weeks Pre and the Six Eight-Week Blocks During COVID-19 by RHA**

- In all regions, there was an initial surge in supply in gowns that lasted 8-16 weeks. Subsequently, the supply was below the baseline use.



**Table 1. Average Daily Usage for Past 14 Days During Second Wave of COVID-19 (17 Feb – 3 Mar 2021), and Days on Hand on 3 Mar 2021 in NL**

PPE	Per Day Usage (14-day average)	Days on Hand (using 14-day average)
<b>N95</b>		
N95 1860	280	157
N95 1860S	335	110
N95 KC46727 Regular	256	52
N95 KC46727 Small	242	40
<b>Shields</b>		
Full Face Shield	551	2,324
Mask Earloop w/ Shield	4,384	81
Mask Tie-on w/ Shield	1,368	121
<b>Other Masks</b>		
Level 1	1,236	1,272
Level 3	2,486	54
<b>12-inch Gloves</b>		
12-inch Glove Small	6,014	217
12-inch Glove Medium	9,136	391
12-inch Glove Large	5,321	404
12-inch Glove Extra Large	1,068	374
<b>9-inch Gloves</b>		
9-inch Glove Small	26,886	73
9-inch Glove Medium	79,700	44
9-inch Glove Large	32,886	141
9-inch in Glove Extra Large	6,429	259

- Days on hand using the past 14-day average during the second wave of COVID-19 was good for most PPE, except for three of nine types of masks most commonly used, and 9-inch medium gloves. Nearly 80,000 of these gloves were provided daily!

## Conclusions

1. Real-time daily capture of data on PPE, electronic calculation of days on hand of each type of PPE, and graphic representation of the data facilitated management of the PPE supply.
2. Translation of data with actionable information is critical for decision-makers, particularly for decisions on buying PPE during a pandemic with limited suppliers.
3. Limitations exist in the information, particularly as the recording of data is that of supply rather than use, and the multiplicity of inventories across regions, using different definitions of supply, is not integrated.

# Resident Well-Being and Quality of Care in Long-Term Care Facilities During COVID-19 by Regional Health Authority

## Objective

To determine whether there was a deterioration in physical or mental health in residents of long-term care facilities (LTCFs) by Regional Health Authority (RHA) during the first three months of COVID-19.

## Practice Points

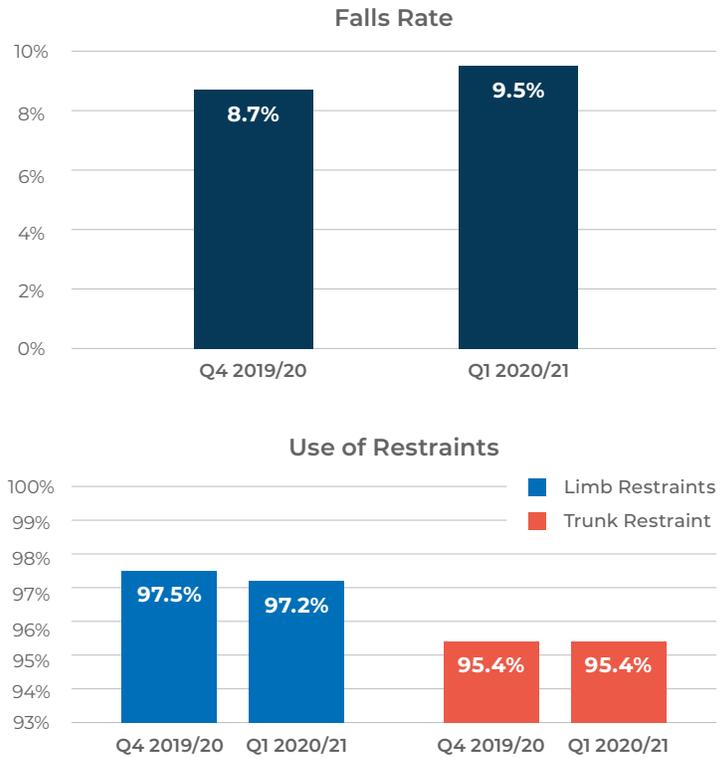
1. The vast majority of residents of LTCFs are extremely or totally dependent for the activities of daily living and/or have severe/very severe cognitive impairment. In addition, over 25% die every year.
2. Social engagement with family and close friends is very important to their quality of life, but during COVID-19, this engagement was prohibited to protect residents from becoming infected with the virus. This isolation commenced around 18 Mar 2020.

## Methods

1. The Resident Assessment Instrument (RAI) questionnaire is completed every quarter (Q) by health care providers in LTCFs, and patient level data was obtained from the Newfoundland and Labrador Centre for Health Information (NLCHI).
2. The data for the pre-COVID-19 era Q4 of 2019–20 (1 Jan – 31 Mar 2020) were compared to that from the first three months of the COVID-19 era: Q1 2020–21 (1 Apr – 30 Jun 2020). There were 2,454 questionnaires completed in Q1 2020–21, 1,391 in Eastern Health (EH), 513 in Central Health (CH), 421 in Western Health (WH), and 129 in Labrador-Grenfell Health (LGH).

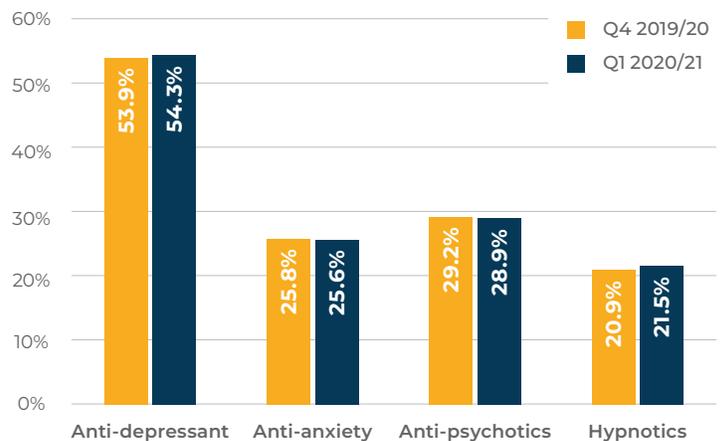
## Results

- Compared to Apr – Jun 2019, during COVID-19 for the same quarter in 2020, there was a reduction in admissions of 26.5% (N=191).
- During COVID-19, there was no change in health instability, dependence for the activities of daily living, or severity of cognitive impairment of residents in the first three months of COVID-19, when analyzed by the province or RHA.



**Figure 1. The Rate of Falls and the Use of Restraints in NL Before and During COVID-19**

- There was a 9% increase in the rate of falls, and the use of restraints was unchanged in the province during COVID-19.



**Figure 2. Use of Psychotropic Drugs in NL Before and During COVID-19**

- There was no change in the use of anti-depressants, anti-anxiety drugs, anti-psychotic drugs or hypnotics in the province during COVID-19.

**Table 1. Experiences of Residents in LTCFs With No Statistically or Clinically Significant Change in the First Three Months of COVID-19**

Experiences of Residents in LTCFs in the First Three Months of COVID-19	
• More severe pain	• Pressure Ulcer
• Activities of daily living	• Behaviour
• Bladder continence	• Cognitive ability
• Communication	• Delirium
• Locomotion	• Distress
• Repetitive speech	• Persistent anger, self deprecation, fear
• Repetitive complaints	• Sleep
• Loss of interest	• Mood persistent/worsening
• Wandering	• Verbally abusive
• Sad, apathetic, or anxious appearance	

- Bowel continence worsened during COVID-19 (22%), compared to pre-COVID-19 (18.4%) ( $p=0.05$ ).
- Percentage in whom pain worsened was lower during COVID-19 (7.9%), compared to pre-COVID-19 (9.4%) ( $p=0.001$ ).
- Wandering behaviour that was not easily altered was lower during COVID-19 (9.1%), compared to pre-COVID-19 (10.7%) ( $p=0.05$ ).

## Conclusions

1. During COVID-19, admissions to LTCFs were reduced by 27% compared to 2019.
2. Initial analysis of clinical status, clinical events, use of psychotropic drugs, or other metrics of physical and mental health did not indicate a deterioration during the first three months of COVID-19 for residents of LTCFs.

# The Extent of Digital Communication With Patients in NL During COVID-19 Pandemic

## Objective

To compare billings by fee-for-service doctors for digital calls during COVID-19 to total billings in 2019.

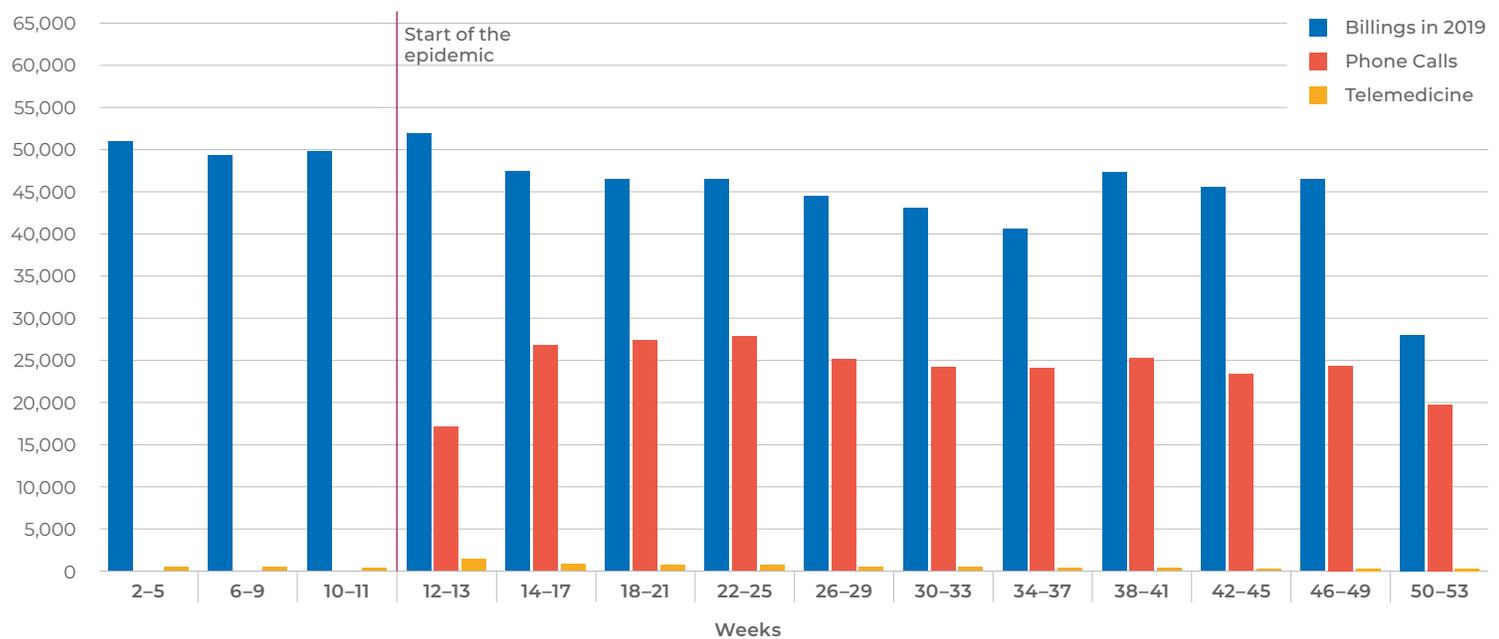
## Practice Points

1. During COVID-19, which started on 14 Mar 2020, a new fee code was established to facilitate communication with patients virtually. This occurred either by telephone or using telemedicine.

## Data

Aggregate weekly billings for telemedicine, virtual meetings and total billings were obtained from the NL Centre for Health Information (NLCHI) from 6 Jan 2020 – 31 Dec 2020 for both family physicians and specialists. Total billings were obtained for 2019. Data are provided as average weekly volumes over four-week blocks. At time of print, total billings for 2020 were not available.

## Results



**Figure 1. The Average Weekly Total Number of Billings by Family Physicians for 2019 and Billings for Telemedicine Plus Phone Calls in 2020**

- The total number of billings for phone calls and telemedicine by family physicians during COVID-19 from week 11 of 2020 to Christmas week 2020 was 1,027,682 (16 Mar to 27 Dec 2020). In the comparable period of 2019, the total number of billings was 1,841,301 (17 Mar to 28 Dec 2019). Compared to 2019 billings during COVID-19, phone calls and telemedicine comprised 56% of billings.
- The average weekly billings for telemedicine in the ten weeks before COVID-19 was 274. During the first 46 weeks of COVID-19, the average weekly billings for telemedicine was 378 and for telephone meetings was 24,047.
- The increase in average weekly telemedicine calls during COVID-19 was 38%. However, the ratio of phone calls to telemedicine during COVID-19 was 64:1.

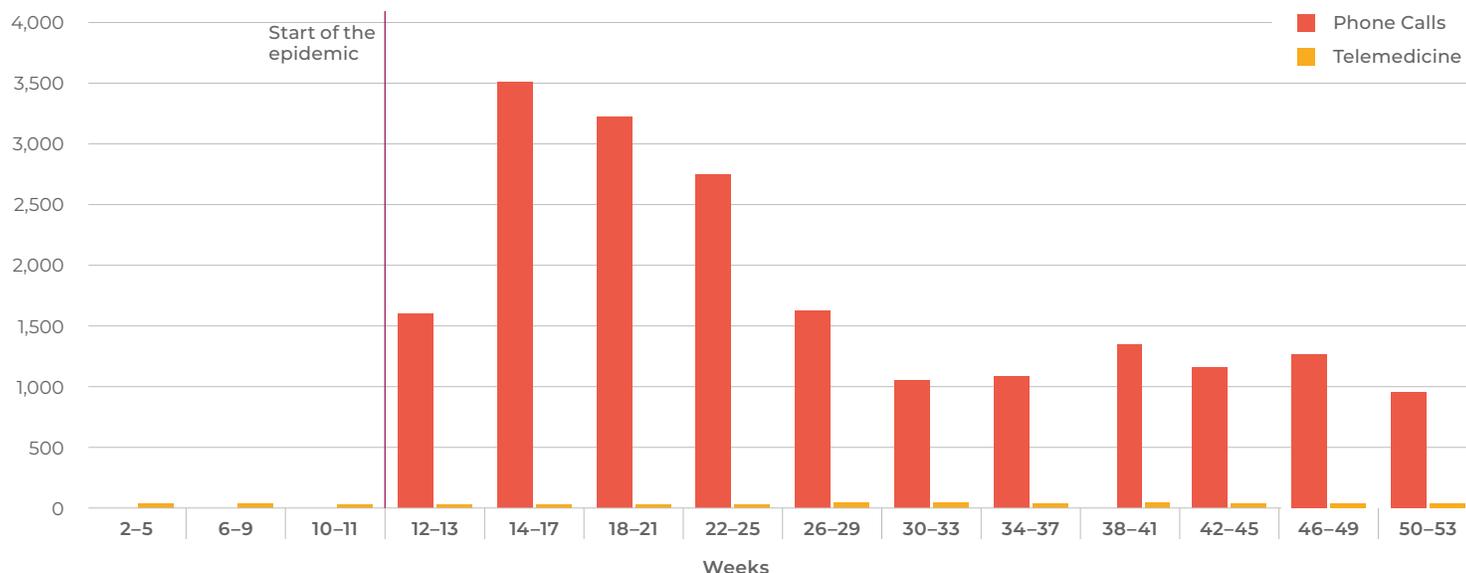


Figure 2. Average Total Number of Billings by Specialists per Week for Telemedicine and for Phone Calls in 2020

- The total number of billings by specialists during COVID-19 from week 11 of 2020 to Christmas week 2020 was 75,364 comprising 6.8% of total virtual care billings.
- The average weekly billings for telemedicine in the ten weeks before COVID-19 was 22. During the first 46 weeks of COVID-19, the average weekly billings for telemedicine was 26 and for telephone meetings 1,758.
- Few telemedicine calls were made before or during COVID-19. The ratio of phone calls to telemedicine was 64:1.

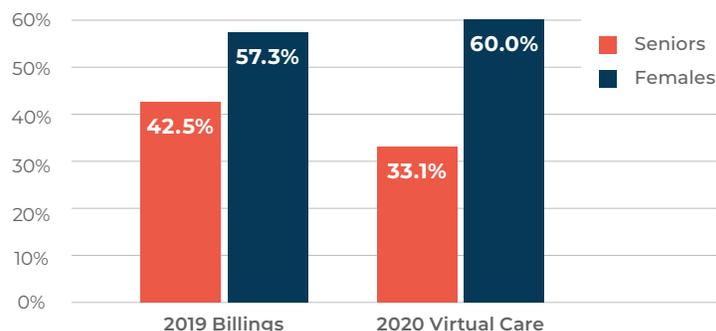


Figure 3. Per Cent of Billings for Women and Seniors in 2019 and for Virtual Communication in 2020 During COVID-19

- The proportion of seniors using virtual care (33%) during COVID-19 was lower than the proportion of total billings in 2019 (43%).

## Conclusions

1. There was a massive increase in virtual communication between patients and fee-for-service doctors during COVID-19. The volume of calls were predominantly made by family physicians.
2. Compared to billing in 2019, during COVID-19 56% of calls were virtual.
3. Selection of seniors for virtual calls was less than anticipated, based on proportion of seniors in 2019 billings.

# Guidelines for Medical Laboratory Testing

In the COVID-19 era, it is particularly important to optimize the need for laboratory testing. The following guidelines from Choosing Wisely Canada and other sources are provided to support this endeavour.

**To read more about the source for each guideline, visit <https://bit.ly/37M5M2U>.**

## A. Screening and Chronic Disease Testing

1. Don't do annual screening blood tests unless directly indicated by the risk profile of the patient. ([Choosing Wisely Canada](#))
2. In the frail elderly, don't order screening or routine chronic disease testing just because a blood draw is being done. ([Choosing Wisely Canada](#))
3. Don't order baseline laboratory studies (complete blood count, coagulation testing, or serum biochemistry) for asymptomatic patients undergoing low risk non-cardiac surgery. ([Choosing Wisely Canada](#))

Quality of Care NL advises that in patients with stable, non-progressive disease, monitoring does not need to occur every quarter.

## B. Thyroid Tests

1. 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. ([Choosing Wisely Canada](#))
2. Don't order thyroid function tests in asymptomatic patients. ([Choosing Wisely Canada](#))

Quality of Care NL advises that in stable asymptomatic patients on levothyroxine, order TSH 1–2 times/year.

## C. HbA1c

1. In many adults 65 years or older, moderate control of diabetes is generally better, with the aim of achieving glycemic control between 7.0 and 8.5, depending on life expectancy. ([Choosing Wisely Canada](#))

Consequently, Quality of Care NL advises that less HbA1c testing is required compared to in insulin dependent diabetes.

## D. Specific Tests

1. Don't request uric acid as part of the routine evaluation of cardiovascular risk, obesity or diabetes. ([Choosing Wisely Canada](#))
2. Testing creatine kinase and ALT levels at baseline on statin initiation or for monitoring is not required; perform CK as clinically indicated. ([College of Family Physicians of Canada](#))
3. In patients established on lipid lowering therapy, routine monitoring of lipid profiles is not required. ([College of Family Physicians of Canada](#))
4. Screening of the general population for iron deficiency is not indicated. ([Ontario Association of Medical Laboratories](#))

Quality of Care NL advises that in anemic patients, ferritin testing should be done, and in female patients of reproductive age with normal hemoglobin and MCV/MCHC, ferritin testing would be reasonable if oral iron would be prescribed for hypoferritinemia.

5. Don't routinely measure Vitamin D in low risk adults. ([Choosing Wisely Canada](#))
6. Don't order ANA as a screening test in patients without specific signs or symptoms of systemic lupus erythematosus (SLE) or another connective tissue disease (CTD). ([Choosing Wisely Canada](#))
7. Don't request a serum protein electrophoresis in asymptomatic patients in the absence of otherwise unexplained hypercalcemia, renal insufficiency, anemia or lytic bone lesions. ([Choosing Wisely Canada](#))

## E. INR

1. In patients on warfarin with a stable INR, many patients are monitored once monthly. Very stable patients can be monitored as infrequently as every 12 weeks. ([Thrombosis Canada](#))

Unstable INR is often related to overly frequent monitoring or to excessively large dose adjustments.

# The Impact of COVID-19 on the Frequency of Blood Draws Ordered by Family Physicians in Eastern Health (2020)

## Objectives

1. To determine the degree of reduction in blood draws ordered by family physicians (FPs) in Eastern Health (EH) during the first 36 weeks of the COVID-19 pandemic.
2. To assess the extent of the reduction for individual FPs.

## Practice Points

1. The reduction in blood draws in the first four weeks of the pandemic was 73% and by week ten it was 49%.
2. By week ten, very few FPs exceeded the 75th centile of ordering observed in the pre-COVID-19 era.
3. Following the first six weeks of the pandemic, there were three small clusters of the virus in NL in 2020.

## Methods

1. Weekly quantity of blood draws ordered by FPs in EH from 6 Jan – 15 Mar 2020 (10 weeks pre-COVID-19) and from 16 Mar – 1 Dec 2020 (35 weeks during COVID-19) were obtained from EH.
2. The number of blood draws ordered by individual FPs on week 35 of the pandemic was compared to the average number they ordered during the ten weeks pre-pandemic.

## Results

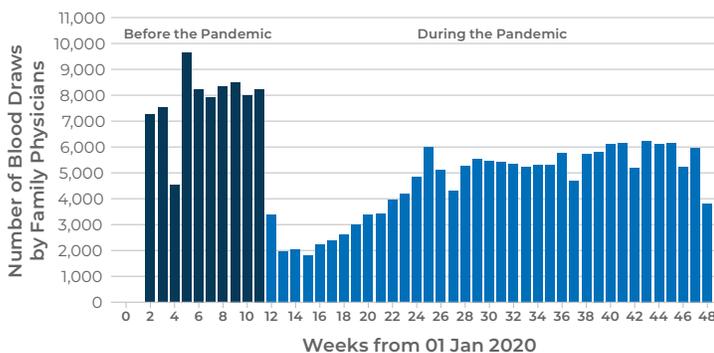
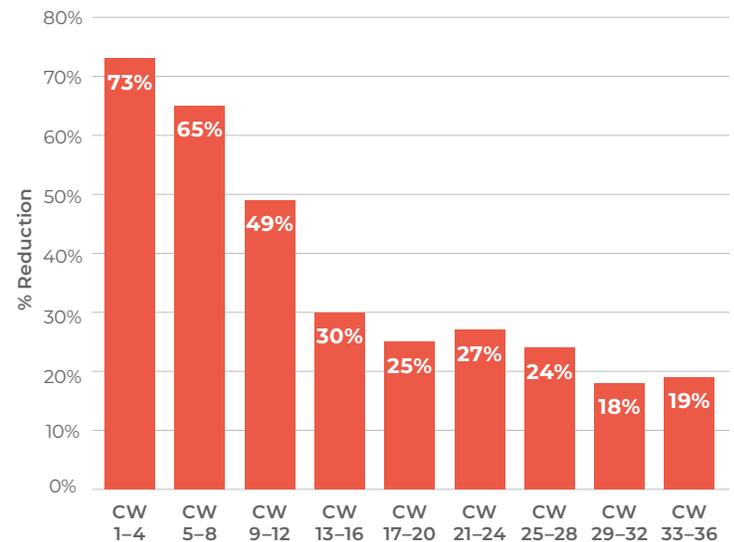


Figure 1. Number of Blood Draws Ordered Weekly by FPs in EH in 2020

- At weeks 13–16 after the start of the pandemic, the reduction in blood draws was 30%, and at weeks 33–36 it was 19%.

Table 1. Average Weekly Draws During the Ten Weeks Before COVID-19 and Four-week Blocks During the COVID-19 Pandemic

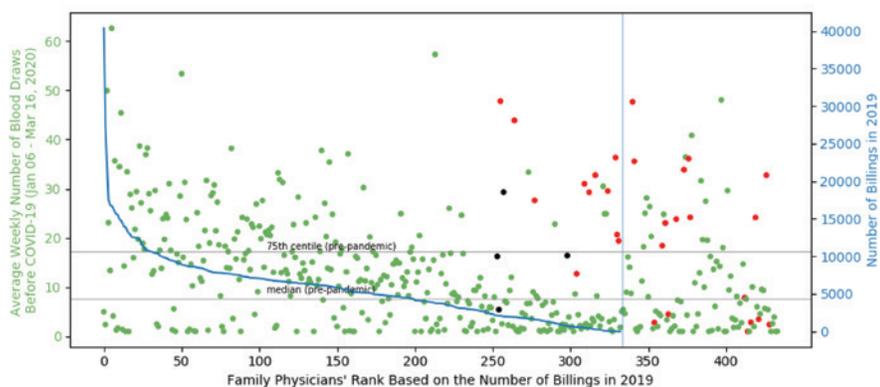
Average Weekly Blood Draws Before the Pandemic	Four-Week Blocks During the Pandemic	Average Weekly Draws in Each Four-Week Block
7,212	1	1,947
	2	2,527
	3	3,707
	4	5,051
	5	5,401
	6	5,277
	7	5,464
	8	5,899
	9	5,834



CW = COVID Week

Figure 2. The Per Cent Reduction in Blood Draws for Each Four-Week Block Following the Start of COVID-19 Restrictions

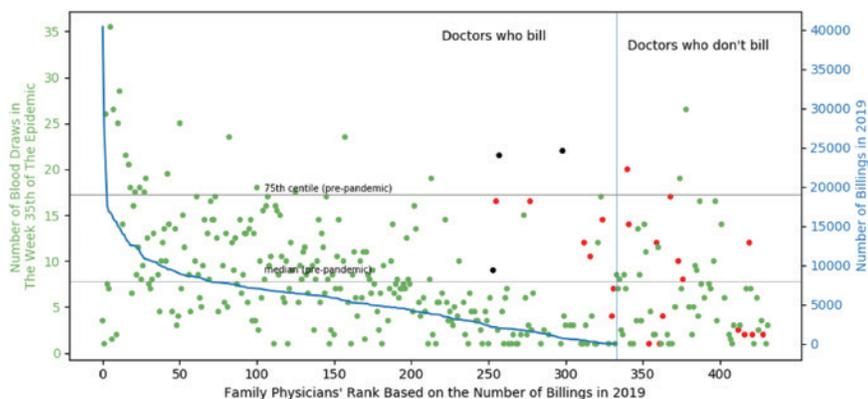
- After the first 12 weeks of COVID-19 (CW 1–12), the number of blood draws was consistently 18–30% less than in the pre-COVID-19 era.



**Figure 3. Average Weekly Number of Blood Draws by Individual FPs in the Ten Weeks Pre-COVID-19 (Y-axis Left) for Doctors Who Bill and Don't Bill, and Number of Billings for Doctors in 2019 (Y-axis Right)**

**Legend:** The x-axis is the ranking of FPs based on the number of billings in 2019 (person with rank 1 has the highest number of billings in 2019), the green dots are clinic doctors, the red dots are ER doctors, and the black dots are unknown. The vertical line separates the doctors who bill from those who do not. The horizontal lines represent the median and 75th centile for blood draws pre-pandemic.

- 18.4% of 333 FPs who billed, ordered >18 blood draws on average each week pre-COVID-19.
- 15.1% of 101 FPs who did not bill ordered the same quantity of blood draws as those who billed.



**Figure 4. Number of Blood Draws Ordered by FPs Who Billed and Who Did Not Bill During Week 35 of the Pandemic (Y-axis) and the Ranking of FPs Based on Number of Billings in 2019 centile.**

**Legend:** The x-axis is the ranking of FPs based on the number of billings in 2019 (person with rank 1 has the highest number of billings in 2019), the green dots are clinic doctors, the red dots are ER doctors, and the black dots are unknown. The vertical line separates the doctors who bill from those who do not. The horizontal lines represent the median and 75th centile for blood draws pre-pandemic.

- 5.7% of FPs who billed (N=19) ordered more than the pre-COVID-19 75th centile of blood draws.
- 3% of FPs who did not bill (N=3) ordered more than the pre-COVID-19 75th centile

## Conclusions

1. The substantial reduction of blood draws ordered by FPs during the first 12 weeks of the pandemic was ameliorated during the following 24 weeks, but the size of the reduction compared to pre-pandemic era persisted at 19% for weeks 33–36. The next summary examines the actual tests involved in the blood draws.
2. By week 35 of the pandemic, most FPs remained below the 75th centile of pre-pandemic blood draw ordering.



# The Impact of COVID-19 on Blood Tests Ordered by Family Physicians in Eastern Health (2020)

## Objectives

1. To determine the extent and duration of reduction of blood testing by family physicians (FPs) during the COVID-19 pandemic for tests used for acute illness and chronic disease (hemoglobin and serum creatinine), assessment of anticoagulation (INR), endocrine disease (TSH), and diabetic control (HbA1c).
2. To assess whether better selection of patients for testing had improved during the rationing enforced by COVID-19. Per cent abnormal results is a marker for appropriate ordering.

## Practice Points

1. During the first 12 weeks of the pandemic, hemoglobin (Hb) and serum creatinine reduction was substantial and sustained, but weekly INR reduction was never greater than 30%, and by week ten reduction was 10%.
2. Reduction in TSH and in HbA1c was over 90% for the first four weeks of the pandemic and remained well over 50% for the first 12 weeks.
3. Guidelines for Medical Laboratory testing are provided on p. 62.

## Methods

1. Average weekly number of tests ordered (Hb, eGFR, INR, TSH, HbA1c) by FPs were obtained from Eastern Health from 6 Jan – 15 Mar 2020 (ten weeks pre-COVID-19) and compared to those ordered from 16 Mar – 1 Dec 2020 (35 weeks during COVID-19).
2. Weekly per cent reduction was calculated using the average weekly number of tests for the ten weeks pre-COVID.

## Results

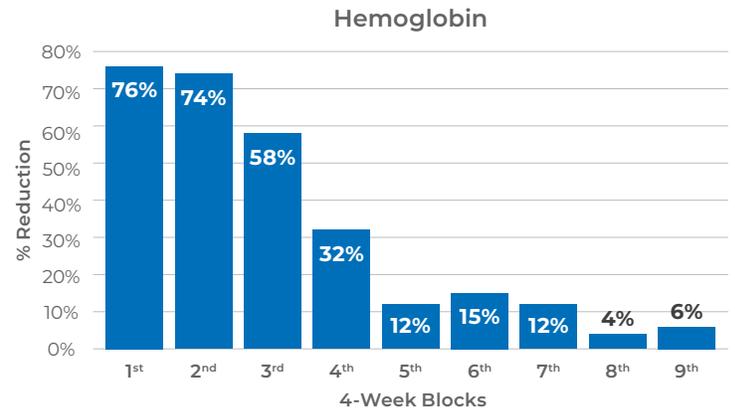


Figure 1. Per Cent Reduction in Number of Hemoglobin Tests Done in Four-Week Blocks Following the Start of COVID-19

- At weeks 13–16 of the pandemic, the reduction in Hemoglobin testing was 32% but by weeks 33–36 the reduction was 6%.

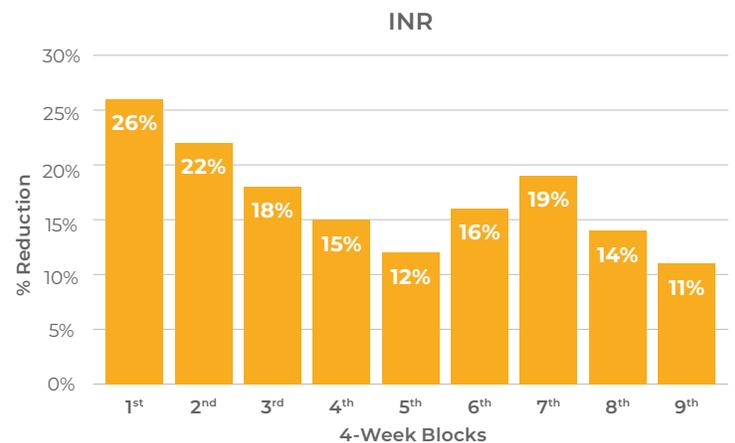
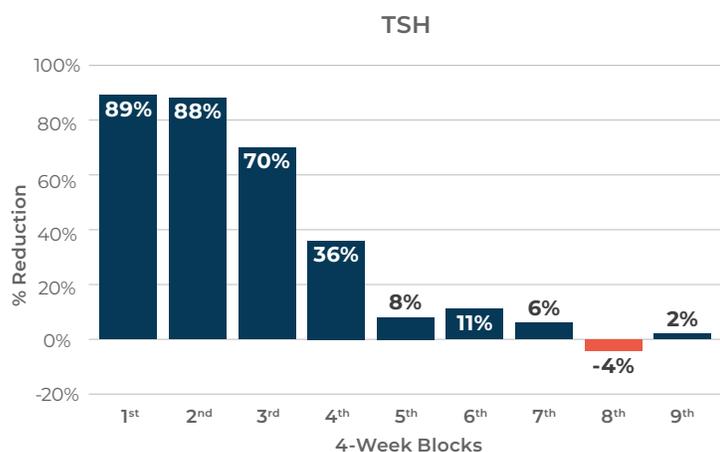


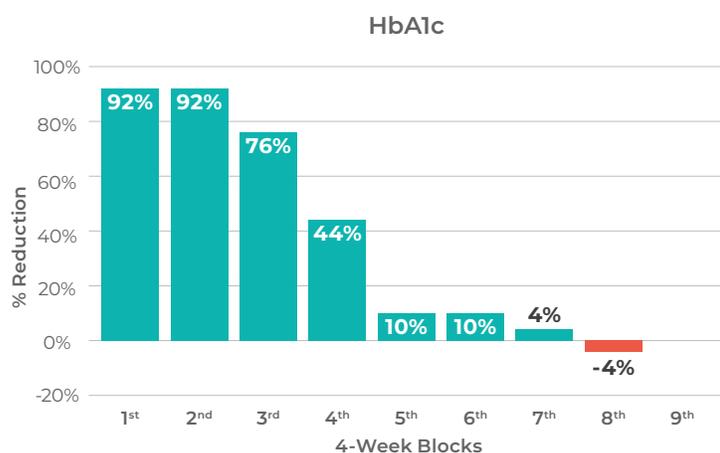
Figure 2. Per Cent Reduction in INR Tests Done in Four-Week Blocks Following the Start of COVID-19

- The reduction in INR testing during the first 12 weeks of the pandemic was substantially less than for the other tests. At weeks 13–16 the reduction was 15% and this reduction persisted until weeks 33–36 (11% reduction compared to pre-COVID-19 era).



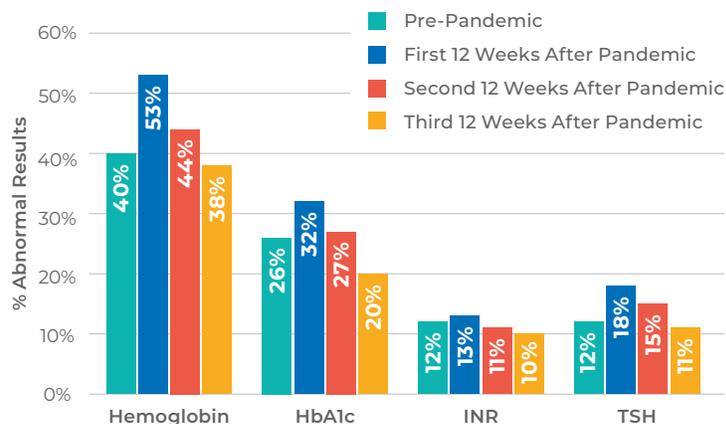
**Figure 3. Per Cent Reduction in TSH Tests Done in Four-Week Blocks Following the Start of COVID-19**

- Although there was substantial reduction in TSH testing for the first 16 weeks of the pandemic, by weeks 29–32 the rate of testing was back to pre-COVID-19 rates.



**Figure 4. Per Cent Reduction in HbA1c Done in Four-Week Blocks Following the Start of COVID-19**

- Although there was substantial reduction in HbA1c testing for the first 16 weeks of the pandemic, by weeks 29–32 the rate of testing was back to the pre-COVID-19 rate.



**Figure 5. Per Cent Abnormal Results Pre-COVID-19 Compared to Those During COVID-19, Analyzed in 12 Four-Week Blocks for Hb, HbA1c, INR and TSH**

- For Hb, TSH and HbA1c during the first 12 weeks of the pandemic, the substantial reduction in testing was associated with an increase in the per cent results abnormal. However, during weeks 25–36 of the pandemic when the volume of testing was nearly back to pre-COVID-19 levels, the per cent abnormal returned to pre-COVID-19 levels.
- The less substantial but more sustained reduction in INR testing was not associated with much change in per cent of tests that were abnormal.

## Conclusions

1. Hemoglobin testing at weeks 33–36 of the pandemic was reduced by 6% compared to pre-COVID-19 volumes. The volumes of TSH and HbA1c were back to pre-COVID-19 levels, but a reduction in INR testing was sustained at 11%.
2. The very large reductions in volumes of Hb, TSH and HbA1c at weeks 1–12 were not associated with any increase in abnormal test results at weeks 25–36, suggesting that the enforced rationing did not result in deterioration of chronic disease control. The recommendations to reduce the frequency of testing in stable patients with chronic disease could be observed.
3. Sustained reduction in INR testing during the 36 weeks of the pandemic without any increase in abnormal results suggests that the frequency of INR tests in stable patients on warfarin may be reduced.

# The Impact of COVID-19 on the Incidence and Management of Ischemic Stroke in Eastern Health Hospitals

## Objective

To determine whether presentation to hospital with ischemic stroke (IS) had decreased and whether thrombolysis rates had deteriorated during the first six months of COVID-19.

## Practice Points

1. Best practice for IS is administration of intravenous thrombolytics (tPA) within 4.5 hours of stroke onset.
2. Before the pandemic in Eastern Health (EH), nearly half of the patients with IS were treated at the Health Sciences Centre (HSC) and the other half at St. Clare's Mercy Hospital (SCM), and the hospitals in Carbonear, Clarenville and Burin.
3. Thrombolysis rate in IS at HSC had improved in recent years, whereas the rates in the other four hospitals were below 10%.

## Data (PI: P.B. Parfrey)

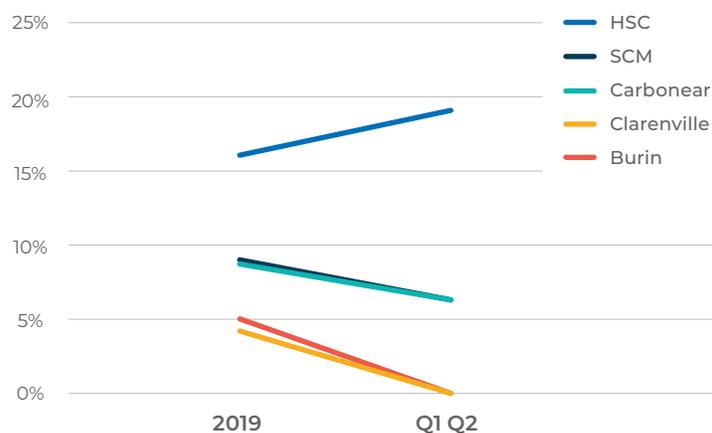
Patient level data were obtained from the NL Centre for Health Information (NLCHI) project 340 examining stroke care. Patients who presented to hospital with IS from Apr – Dec (six months) of fiscal year 2020–21 during the COVID-19 pandemic (which started on 16 Mar 2020) were compared to the six years before the pandemic and to 2019–20.

## Results

**Table 1. Number of Ischemic Strokes and Thrombolysis Rates Before and During COVID-19 by Hospital**

Hospital	2014–2020		2019–2020		Q1 + Q2 2020/21	
	N IS	% Thrombolysis	N IS	% Thrombolysis	N IS	% Thrombolysis
HSC	1,469	10.9	286	16.1	131	19.1
SCM	685	8.6	111	9.0	32	6.3
Carbonear	425	8.5	69	8.7	18	5.6
Clarenville	261	8.8	48	4.2	23	0
Burin	176	8.0	20	5.0	12	0

- In the six years 2014–2020, there were, on average, 503 IS/year, with 534 in 2019–20. During the first six months of COVID-19, there were 216 IS, 35 (14%) less than the anticipated numbers using incidence from the last six years and 51 (19%) less than anticipated using incidence from 2019–20.
- During COVID-19, the proportion of IS that presented to the HSC was 61% of the total, whereas before COVID-19, this proportion was 49%.



**Figure 1. Change in Thrombolysis Rate During COVID-19 Compared to the Year Before COVID-19**

- Compared to 2019–20, the thrombolysis rate at HSC increased from 16.1% to 19.1% during COVID-19, whereas at the other four hospitals it decreased.
- In fact, the rate was 3.5% in the four hospitals during COVID-19, with only three of 85 IS patients receiving tPA.

## Conclusions

1. During COVID-19, the incidence of IS presenting to the five adult acute care hospitals of EH decreased by 14–19%.
2. tPA use increased during COVID-19 at the HSC but decreased in the other four hospitals. Fortunately, the majority of patients went to HSC. Unfortunately, hospitals with low prior use of tPA had lower quality of care during the pandemic.

# The Impact of COVID-19 on Stroke Incidence and Thrombolysis Rates for Ischemic Stroke by Regional Health Authority

## Objective

To determine whether the incidence of stroke had decreased during COVID-19 and whether thrombolysis rates for ischemic stroke had deteriorated in the Regional Health Authorities (RHAs).

## Practice Points

1. During COVID-19, other jurisdictions had reported decreased numbers of patients presenting to hospitals with cardiovascular events.
2. In Eastern Health (EH), thrombolysis rates in ischemic stroke had deteriorated in some hospitals during the pandemic.

## Data

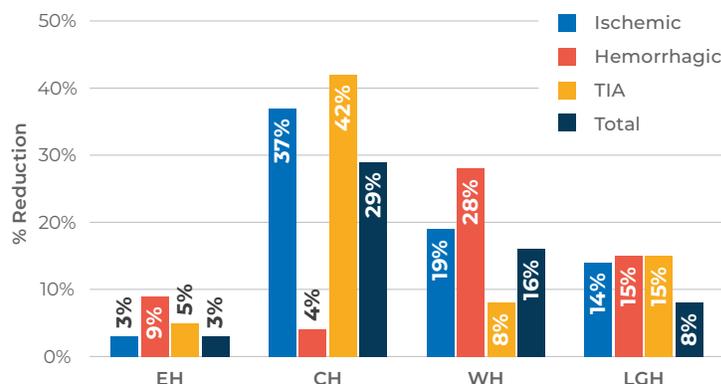
Aggregate data were obtained from the Newfoundland and Labrador Centre for Health Information (NLCHI) from 1 Apr 2019 – 30 Sept 2020. The impact of COVID-19 was assessed by comparing events for Apr – Sept 2020–21 fiscal year (COVID-19 era) to 2019–20 (pre-COVID-19 era).

## Results

**Table 1. Number of Stroke Hospitalizations by Stroke Type 12 Months Pre (2019/20) and During COVID-19 (Six Months 2020/21) Analysed by RHA**

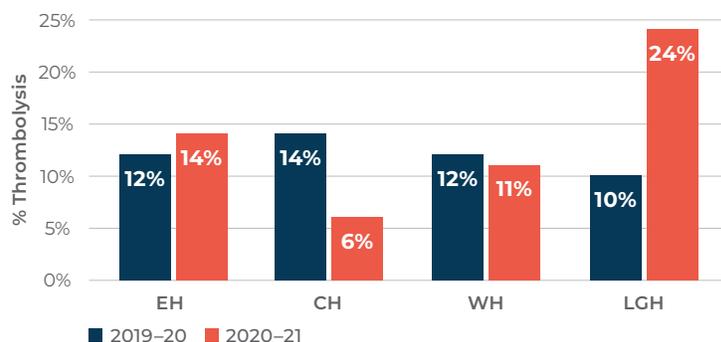
RHA	Pre-COVID-19 2019/20				During COVID-19 (Six Months) 2020/21			
	Ischemic	Hemorrhagic	TIA	Total	Ischemic	Hemorrhagic	TIA	Total
EH	546	139	220	893	264	63	104	431
CH	211	35	31	275	66	10	22	98
WH	173	25	96	292	70	9	44	123
LGH	51	9	33	93	21	3	19	43
<b>Total</b>	<b>981</b>	<b>208</b>	<b>380</b>	<b>1,552</b>	<b>421</b>	<b>85</b>	<b>189</b>	<b>695</b>

- In NL, there was a 14% reduction in ischemic strokes, 18% in hemorrhagic strokes, and only 1% in TIAs, comparing the first six months of COVID-19 to that expected from 2019/20.
- Overall, there was an 11% reduction in stroke hospitalizations in the province during COVID-19.



**Figure 1. Per Cent Reduction in Types of Stroke During Six Months of COVID-19 Compared to the Number Anticipated in Six Months Based on the Incidence in 2019–20, Analysed by RHA**

- In EH, the reduction in stroke hospitalizations during COVID-19 was small (3%) but in Central Health (CH) it was much larger (29%), and in Western Health (WH) the reduction was 16%.



**Figure 2. Thrombolysis Rates in Ischemic Stroke Before and During COVID-19 Analysed by RHA**

- In the province, the thrombolysis rate was 12.2% pre-COVID-19 and 12.6% during COVID-19.
- In CH, the thrombolysis rate deteriorated during COVID-19, and in Labrador-Grenfell Health (LGH) it improved.

## Conclusions

1. In the province, the incidence of hospitalization for stroke decreased by 11% during COVID-19. This decrease was most evident in CH and WH.
2. The thrombolysis rate for ischemic stroke during COVID-19 was 12.6%, similar to that of pre-COVID-19. However in CH the rate dropped to 6%.

# The Impact of COVID-19 on Access to Colonoscopy in Eastern Health

## Objective

To determine the extent of reduction in the number of colonoscopies performed and the efficiency with which colonoscopies were performed when referred during COVID-19 at Eastern Health (EH).

## Practice Points

1. Optimal times for colonoscopy is based on priority:

Urgency	Population	Acceptable Time Frame
Priority 1 Urgent	Conditions for which the procedure facilitates diagnosis and/or directs health management, and must be done quickly to prevent adverse patient outcomes.	0–14 Days
Priority 2 Non Urgent	Conditions for which the diagnostic procedure supports patient health care planning and appointment scheduling does not usually adversely affect patient outcomes.	0–60 Days
Priority 3 Baseline Screening	Asymptomatic patients for whom the procedure is required based on average risk.	0–182 Days

2. COVID-19 induced a reduction in hospital services starting 16 Mar 2020.

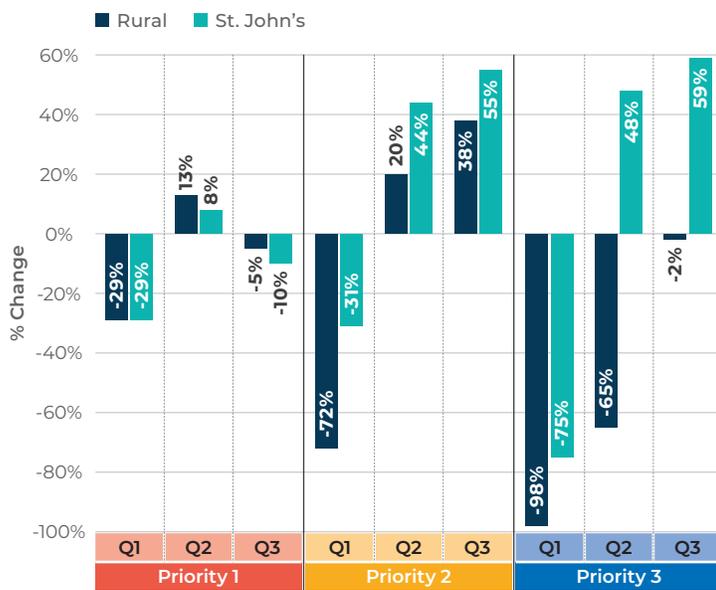
## Methods

1. Data were obtained from Community Wide Scheduler for five hospitals in EH: Burin, Carbonear, GB Cross, Health Sciences Centre (HSC) and St. Clare's Mercy (SCM).
2. Referral rates and wait time evaluation for Q1, Q2 and Q3 of Apr – Dec 2020–2021 (during COVID-19) was compared to Q4 of Jan – Mar 2019–2020 (pre-COVID-19).

			Region		
			Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Number of Colonoscopies Performed in 2020	Priority 1	Q4 <sup>3</sup>	191	162	353
		Q1 <sup>4</sup>	135	115	250
		Q2 <sup>5</sup>	215	175	390
		Q3 <sup>6</sup>	182	145	327
	Priority 2	Q4 <sup>3</sup>	365	618	983
		Q1 <sup>4</sup>	101	425	526
		Q2 <sup>5</sup>	437	889	1,326
		Q3 <sup>6</sup>	504	957	1,461
	Priority 3	Q4 <sup>3</sup>	95	65	160
		Q1 <sup>4</sup>	2	16	18
		Q2 <sup>5</sup>	33	96	129
		Q3 <sup>6</sup>	93	103	196

<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM; <sup>3</sup>January-March; <sup>4</sup>April-June; <sup>5</sup>July-September; <sup>6</sup>October-December

- In the rural hospitals, the overall reduction/quarter (average over the three quarters) during COVID-19 for priority 1 was 7.1% when compared to number pre-COVID-19, for priority 2 there was an overall reduction/quarter (4.8%), and for priority 3 the overall reduction per quarter was 55.1%.
- Comparable changes in the St. John's hospitals were: for priority 1 an overall reduction/quarter of 10.5%, for priority 2 an increase of 22.5%, and for priority 3 an increase of 10.3%.



**Figure 1. Per Cent Reduction in Colonoscopies Done During the First Three Quarters of the Pandemic by Region and by Priority**

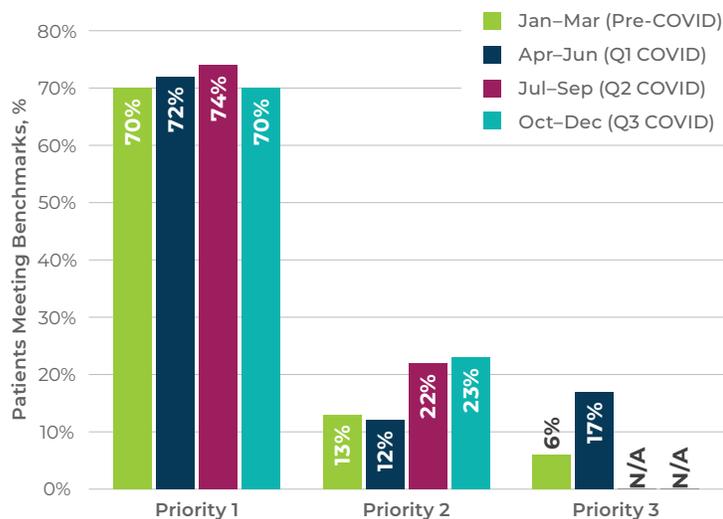
- In the first quarter of COVID-19, the reduction in colonoscopies for priority 1 patients was 29% in both regions, but there were far larger reductions for priority 2 and 3 patients.
- In the second and third quarters, catch-up in numbers done for priority 2 occurred in both regions.
- For priority 3 patients, catch-up did not occur in the rural region but did in St. John's.

**Table 1. Summary of Colonoscopy Referrals in 2020 by Priority, Quarter and Region**

			Region		
			Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Number of Referrals	Priority 1	Q4 <sup>3</sup>	190	143	333
		Q1 <sup>4</sup>	130	93	223
		Q2 <sup>5</sup>	193	156	349
	Priority 2	Q3 <sup>6</sup>	168	125	293
		Q4 <sup>3</sup>	466	703	1,169
		Q1 <sup>4</sup>	169	248	417
		Q2 <sup>5</sup>	420	914	1,334
	Priority 3	Q3 <sup>6</sup>	570	922	1,492
		Q4 <sup>3</sup>	76	84	160
		Q1 <sup>4</sup>	18	14	32
		Q2 <sup>5</sup>	64	115	179
		Q3 <sup>6</sup>	74	108	182

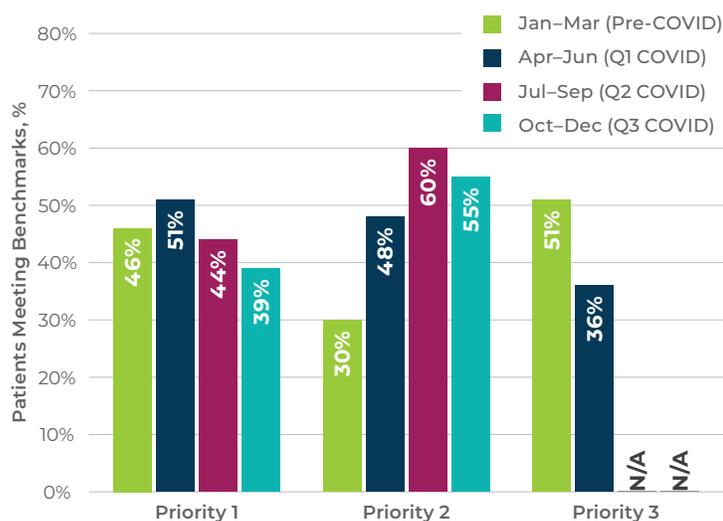
<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM; <sup>3</sup>January–March; <sup>4</sup>April–June; <sup>5</sup>July–September; <sup>6</sup>October–December

- The number of priority 1–3 referrals pre-COVID-19 was greater than the number actually performed.
- The number referred/quarter for priority 1 patients on average (for the three quarters of COVID-19) was 13.9% less than in the pre-COVID-19 era in the rural region and 12.8% in St. John's.
- For priority 2 patients, the number referred/quarter was 17.0% less in the rural region and little change was seen in St. John's (-1.2%).
- For priority 3 patients, the changes were on average 31.6% fewer/quarter in the rural region and 6.0% fewer in St. John's.



**Figure 2. Percentage of Patients Meeting Benchmarks in Rural Hospitals by Priority and Quarter**

- In the rural hospitals, per cent achieving benchmark wait times did not deteriorate compared to pre-COVID-19 quarter, but for priority 2 and 3 they were low.



**Figure 3. Percentage of Patients Meeting Benchmarks in St. John's by Priority and Quarter**

- In the St. John's hospitals, per cent achieving benchmark wait time for priority 1 was low throughout the year; for priority 2, timelines improved during COVID-19 but deteriorated for priority 3 patients.

## Conclusions

1. The number of patients who actually had a colonoscopy performed for urgent reasons during the first quarter of COVID-19 decreased by 29% in EH.
2. The initial reduction in colonoscopies for non-urgent reasons was offset by subsequent increase in colonoscopies in Q2 and Q3 of COVID-19.
3. There was a substantial reduction during COVID-19 in colonoscopies indicated because they were identified for colorectal screening in the rural hospitals but not in St. John's.
4. Time to colonoscopy during COVID-19 for Priority 3 patients was 17% performed within 6 months in the rural, and 36% in the St. John's hospitals.

# The Impact of COVID-19 on the Use of Oesophago-Gastro-Duodenoscopy in Eastern Health

## Objective

To determine the change in referrals for oesophago-gastro-duodenoscopy (OGD) and the efficiency with which they were performed during COVID-19 at Eastern Health (EH).

## Practice Points

- COVID-19 induced a reduction in hospital services starting 16 Mar 2020.

- Wait time benchmarks for OGD are:

Priority 1 (Urgent): 0–14 days

- High likelihood of cancer, progressive/rapid dysphagia, odynophagia

Priority 2 (Non-Urgent): 0–60 days

- Iron deficiency, confirmation of celiac disease, reflux, dyspepsia, stable dysphagia

Priority 3 (Screening): 0–182 days

## Methods

- Data were obtained from Community Wide Scheduler for five hospitals in Eastern Health (EH): Burin, Carbonear, GB Cross, Health Sciences Centre (HSC) and St. Clare's Mercy (SCM).
- Referral rates and wait time evaluation for Q1, Q2 and Q3 of 2020–21 (during COVID-19) was compared to Q4 of 2019–2020 (pre-COVID-19).

## Results

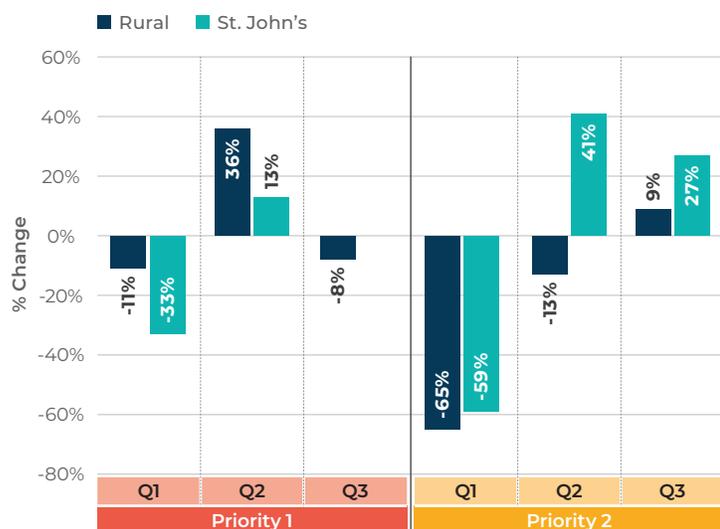
**Table 1. Summary of OGD referrals in 2020 by Priority, Quarter and Region**

		Region		
		Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Priority 1	Q4 <sup>3</sup>	200	160	360
	Q1 <sup>4</sup>	179	107	286
	Q2 <sup>5</sup>	271	180	451
	Q3 <sup>6</sup>	184	160	344
Priority 2	Q4 <sup>3</sup>	371	449	820
	Q1 <sup>4</sup>	129	186	315
	Q2 <sup>5</sup>	324	633	957
	Q3 <sup>6</sup>	403	572	975
Priority 3	Q4 <sup>3</sup>	7	21	28
	Q1 <sup>4</sup>	0	5	5
	Q2 <sup>5</sup>	4	22	26
	Q3 <sup>6</sup>	5	20	25

<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM; <sup>3</sup>January–March; <sup>4</sup>April–June; <sup>5</sup>July–September; <sup>6</sup>October–December

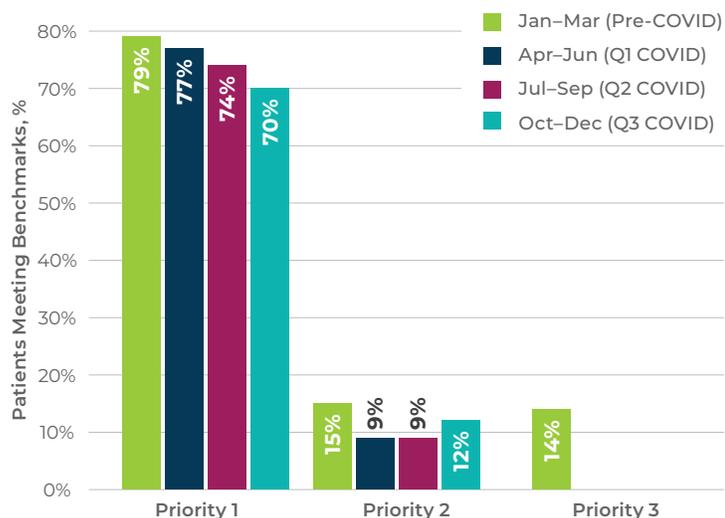
- During the first three months of COVID-19 in EH, there was a 21% reduction in urgent referrals but over the next four months referrals increased.
- For non-urgent referrals in EH, the average number/quarter for the three quarters during COVID-19 was 9% lower than in the quarter pre-COVID-19.
- The number of patients referred for screening was low pre-COVID-19, and during COVID-19 the average number/quarter fell by 33%.





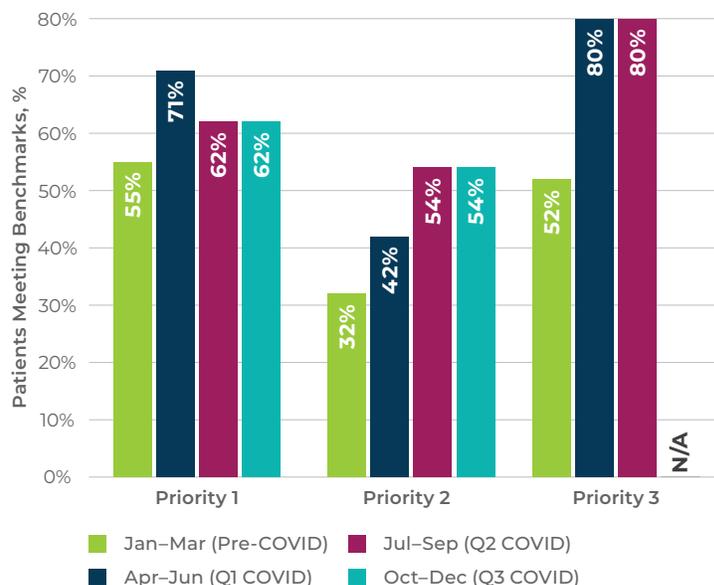
**Figure 1. Change in Urgent and Non-Urgent OGDs Referred in Each Quarter During COVID-19 Compared to the Quarter Before COVID-19 in EH, Analyzed for Hospitals in and Outside St. John's**

- During COVID-19, the pattern of change in referring for OGD differed in St. John's compared to the three rural hospitals.



**Figure 2. Percentage of Patients Meeting Benchmarks in Rural Hospitals by Priority and Quarter**

- During COVID-19, achievement of benchmark time to OGD in urgent patients in the three rural hospitals was over 70% but in non-urgent patients the rate was 10%.



**Figure 3. Percentage of Patients Meeting Benchmarks in St. John's by Priority and Quarter**

- In St. John's, achievement of benchmark times to OGD in urgent patients improved but was less than 70%. For non-urgent patients, achievement of benchmark times also improved but was still only around 50%.

## Conclusions

1. During the first three months of COVID-19, urgent referrals for OGD decreased by 21% but increased subsequently. Time to OGD did not deteriorate. These data are consistent with the reduction in referrals for other urgent procedures like colonoscopy and cardiac catheterization.
2. For non-urgent and screening referrals, there was an overall reduction of 10% during COVID-19.

# The Impact of COVID-19 on Carotid Artery Testing at St. Clare’s Hospital

## Objective

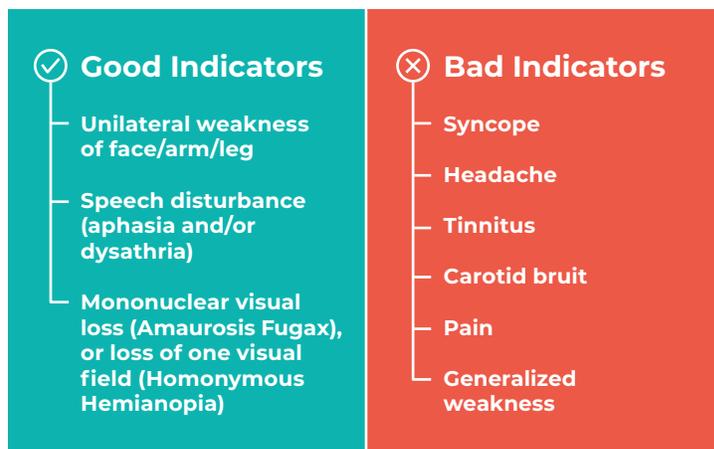
To determine whether the reduction of carotid artery testing during COVID-19 was associated with improved selection of patients for testing and a higher rate of diagnosis of clinically important stenotic disease.

## Practice Points

1. People who develop symptoms of a carotid artery territory Transient Ischemic Attack (TIA) require urgent carotid artery imaging to prevent a secondary stroke because detection of stenotic disease can be corrected by revascularization.
2. The use of this test is a concern because nearly half of the patients referred to St. Clare’s Hospital did not have symptoms consistent with a carotid artery territory TIA. Furthermore, patients referred with appropriate symptoms had the same rate of diagnosis of critical/potentially significant arterial disease as those without consistent symptoms, implying a problem with the diagnosis of TIAs.
3. The COVID-19 pandemic started in Eastern Health (EH) on 16 Mar 2020, providing an opportunity to study the effect of decreased access on selection of patients for carotid artery testing. The hypothesis was that during COVID-19, the reduction in testing would be associated with a higher proportion of patients with appropriate symptoms and diagnosed with critical/potentially significant disease.

## Data

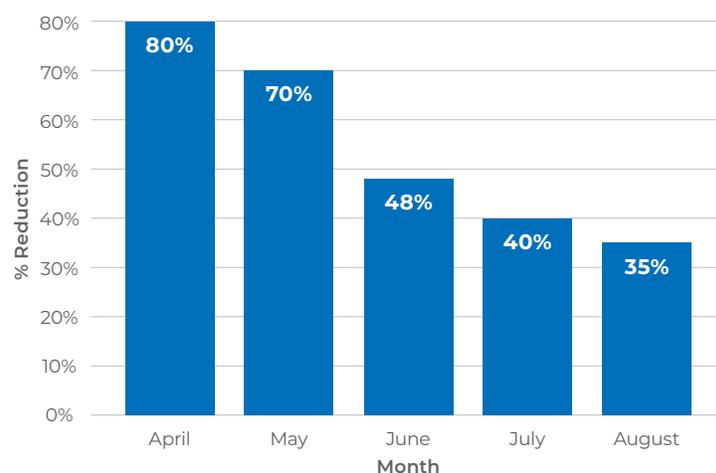
Data on carotid artery ultrasound were obtained from St. Clare’s Vascular Laboratory for the months Apr – Aug 2020 (5 months) and compared to comparable months in 2019.



Appropriate and inappropriate indicators for carotid artery testing are listed above. Indications were classified as: appropriate based on symptoms of TIA, pre-operative/follow-up, and inappropriate based on symptoms inconsistent with carotid artery territory TIA.

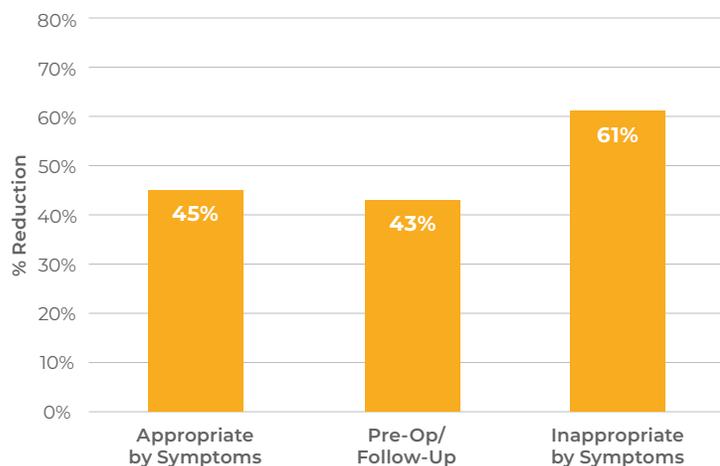
The definition for diagnosis of critical carotid disease was greater than 70% stenosis (an ICA velocity above 230), potentially significant was 50–69% stenosis (126–230 ICA velocity) and the remainder were classified as non-significant.

## Results



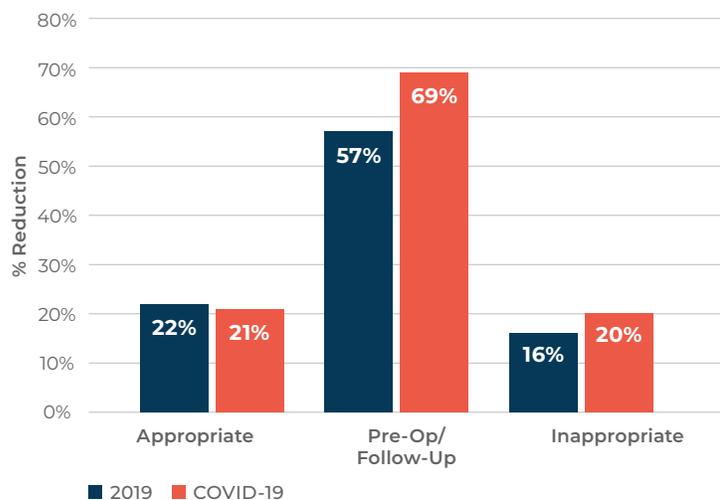
**Figure 1. The Reduction in Carotid Artery Testing by Month During COVID-19 Compared to the Same Five Months in 2019**

- For the first two months of COVID-19, reduction in testing was greater than 70%, and by month five it was still reduced by 35%.



**Figure 2. Reduction in Carotid Artery Testing by Indication for the First Five months of COVID-19**

- Although the reduction in testing for patients with symptoms inconsistent with a carotid artery TIA was 61%, the reduction in those with appropriate symptoms was 45%.



**Figure 3. Comparison of Rates of Diagnosis of Critical/Potentially Significant Carotid Disease by Indication for Testing During COVID-19 and in the Same Period of 2019**

- There was little indication that the need to select patients improved the diagnosis of critical/potentially significant disease in either those with appropriate or inappropriate indications.

## Conclusions

- The 45% reduction in those with appropriate symptoms for a carotid artery TIA implies that either these types of patients when previously referred did not have a TIA or, if they did, doctors were not concerned about secondary stroke prevention.
- The failure to improve the rate of detection of critical/potentially significant disease in those with either inappropriate or appropriate symptoms during a time of rationing implies failure to identify patients at higher risk of having important disease.

# The Impact of COVID-19 on the Incidence of Invasive Cancer and on Radiation Therapy in NL

## Objective

To determine whether the diagnosis of new invasive cancers had decreased during COVID-19 and whether radiation therapy volume was maintained.

## Practice Points

1. Colorectal cancer (CRC) screening started in 2012 and may be associated with a subsequent reduction in the diagnosis of invasive cancer.
2. The incidence of lung cancer is high in NL, associated with the relatively high incidence of smoking.
3. Mammography screening for breast cancer has been undertaken in many females 50–70 years old and may be associated with increased incidence of invasive breast cancer, but a reduction in breast cancer deaths.
4. COVID-19 resulted in substantial reduction of admissions to hospital for surgery and for CT scanning.

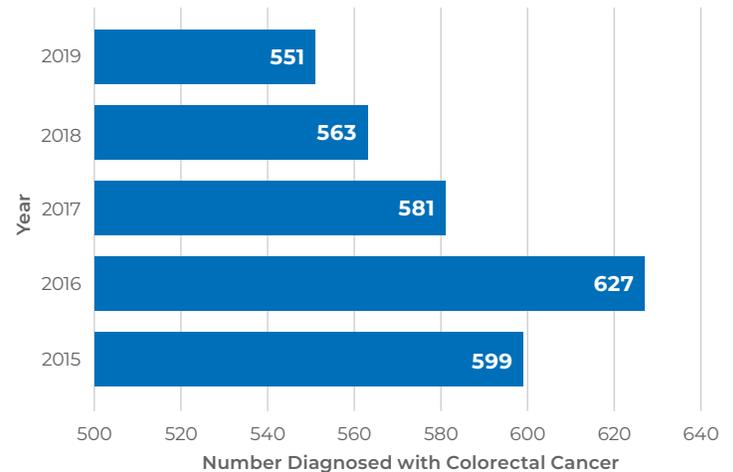
## Data (PI: Dr. T. Stuckless)

The annual incidence of invasive colorectal, lung and breast cancer was obtained from the NL Cancer Care Program Solid Tumor Registry for years 2015-2020, and the volume of radiation treatments was obtained for 2016–2020.

Radiation indications included palliative, radical and adjuvant. In 2019, the number of palliative courses was 638 (38%), radical courses 625 (37%), and adjuvant 427 (25%).

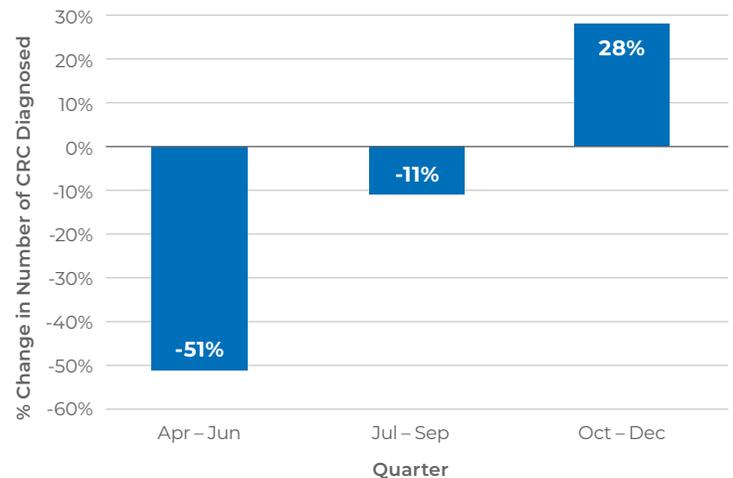
The nine months during COVID-19, Apr–Dec 2020, were compared to the same period pre-COVID-19 in 2019.

## Results



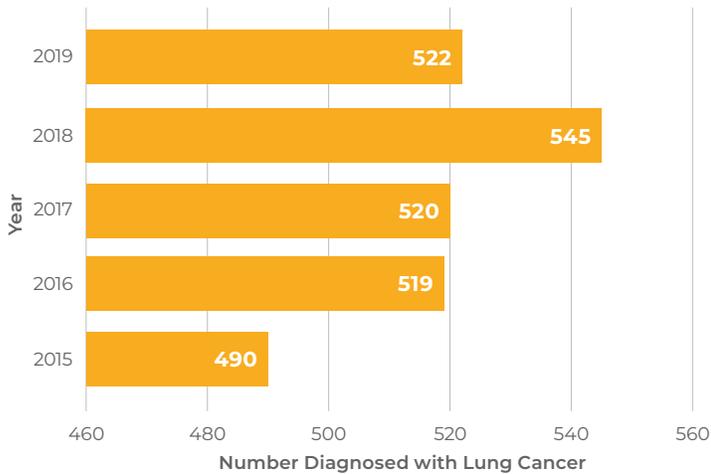
**Figure 1. Number of People Diagnosed With Colorectal Cancer From 2015–2019**

- Comparing the number of invasive CRC in 2018–19 to 2015–16 there was a 9.1% reduction.



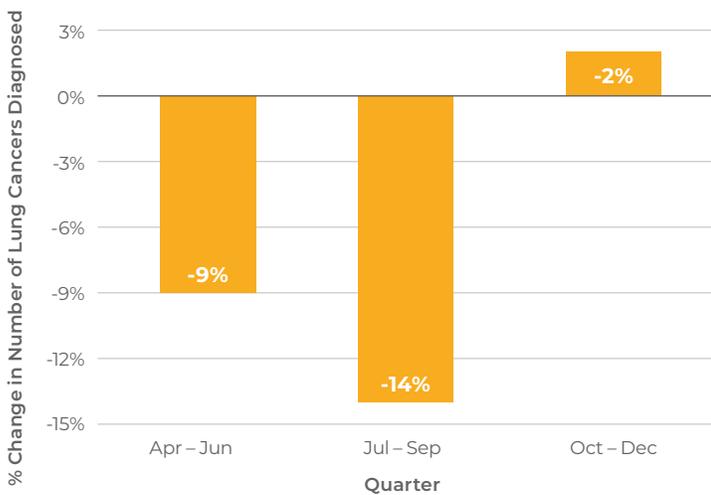
**Figure 2. Change in the Number of CRC Diagnosed by Quarter During COVID-19 Compared to the Comparable Quarters in 2019**

- A large reduction in number diagnosed with CRC occurred during the first quarter of COVID-19, but during the initial nine months, the overall reduction was 16% (355 CRC during COVID-19 vs. 424 pre-COVID-19).



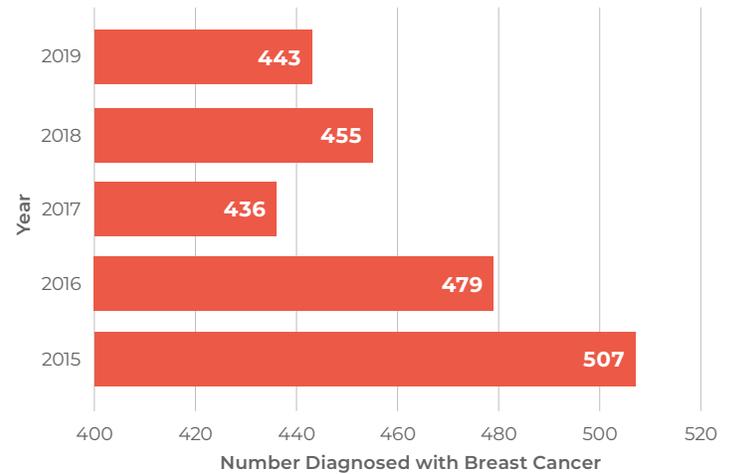
**Figure 3. Number of People Diagnosed With Lung Cancer From 2015–2019**

- Comparing the number of lung cancers diagnosed in 2018–19 to 2015–16, there was an increase of 2.7%.



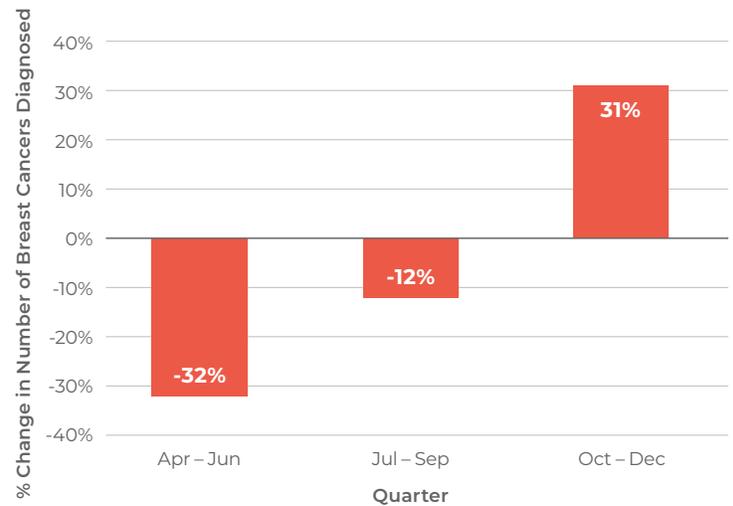
**Figure 4. Change in the Number of Lung Cancers Diagnosed During COVID-19 Compared to the Comparable Quarters in 2019**

- During the initial nine months of COVID-19, there was 6.8% reduction in the number of lung cancers diagnosed, compared to the comparable period in 2019 (372 vs. 399).



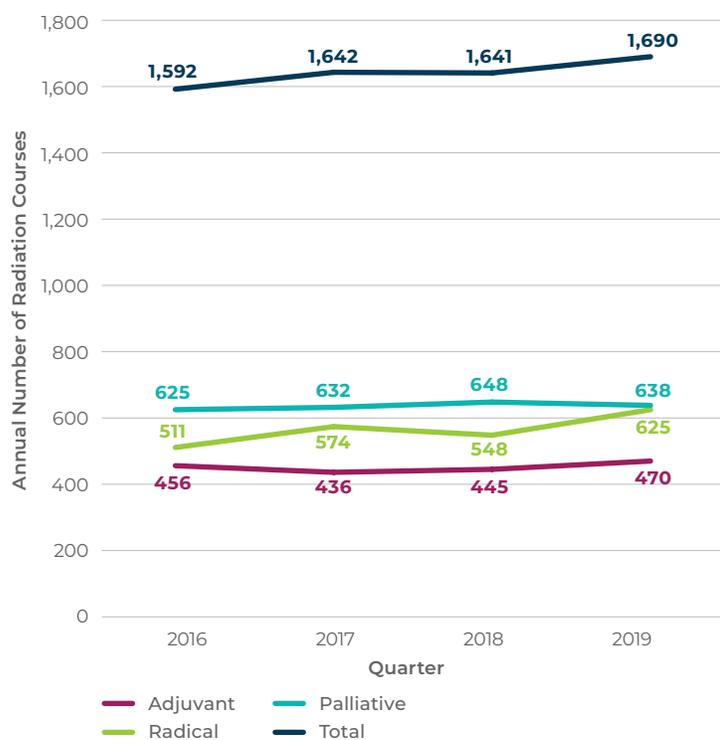
**Figure 5. Number of People Diagnosed With Breast Cancer in 2015–2019**

- Comparing the number of breast cancers diagnosed in 2018–19 to 2015–16, there was a reduction of 7.7%.



**Figure 6. Change in the Number of Breast Cancers Diagnosed During COVID-19 Compared to Comparable Quarters in 2019**

- During the first nine months of COVID-19, there was 5% reduction in the number of breast cancers diagnosed, compared to comparable quarters in 2019 (325 vs. 342).



**Figure 7. The Annual Number of Radiation Courses by Indication Undertaken at the Cancer Care Program from 2016–2019**

- The total number of radiation courses has increased in 2019 by 6.2% compared to 2016, driven by 22.3% increase in courses for radical therapy.



**Figure 8. Change in the Number of Radiotherapy Courses during COVID-19 Compared to the Comparable Quarters in 2019**

- During the first nine months of COVID-19, the total number of courses of radiation therapy increased by 2.4% compared to the nine months April to December 2019.
- When analyzed by indication, there was 8.8% increase in courses for adjuvant therapy, 4.1% increase in courses for palliation, and 3.7% decrease in radical radiation courses.
- During the first three months of COVID-19, the total number of radiation courses increased by 0.9%.

## Conclusions

1. During the initial nine months of COVID-19, there was a 16% reduction in the number of CRCs diagnosed, 6.8% reduction in lung cancers, and 5% reduction in breast cancers.
2. The volume of radiation courses, whether for palliative, radical or adjuvant indications, was maintained during COVID-19.
3. Longer follow-up plus information on stage at diagnosis of invasive cancer will be necessary to determine the overall effect of COVID-19 on cancer.

# A Description of the Overall Adverse Health Outcomes During COVID-19 in NL

## Objective

To determine the change in adverse health outcomes that occurred during COVID-19.

## Practice Points

1. The first case of COVID-19 was diagnosed in NL on 16 Mar 2020. Subsequently, elective admissions to hospital were stopped for a period of time.
2. Other jurisdictions have observed a decrease in presentation to hospitals of patients with acute coronary syndromes and stroke.

## Data

This summary includes data reported in other summaries in Practice Points Volumes 7 and 8 on reduction during COVID-19 in the province for bed use, surgeries, and admission to Long-Term Care Facilities (LTCFs), together with change in incidence of STEMI, NSTEMI and unstable angina referred for coronary catheterization, and stroke.

Other events studied included severe peripheral vascular disease referred to the vascular laboratory at St. Clare’s Mercy hospital and patients referred for urgent colonoscopy in Eastern Health. The number of deaths for the province were obtained from the NL Centre for Health Information (NLCHI) for the months of Jan 2019 – Nov 2021. The duration of follow-up during COVID-19 differed for each event, described by weeks from the start of the pandemic.

## Results

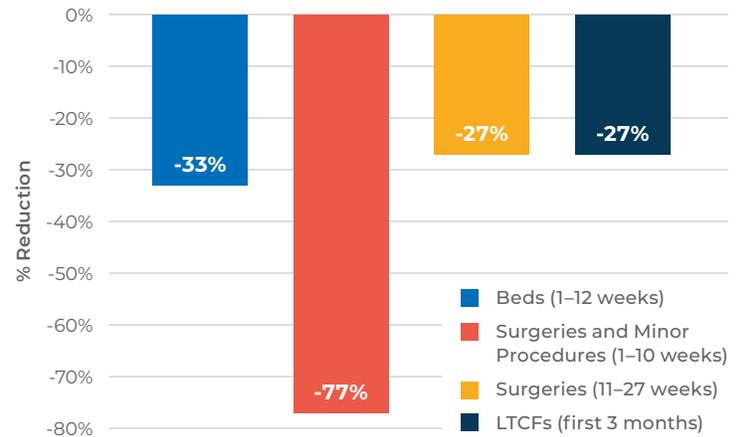


Figure 1. Per Cent Reduction in Acute Care Beds, Surgeries and Admissions to LTCFs During COVID-19 in NL

- Access to hospital, particularly for surgery, and to LTCFs was diminished during COVID-19.

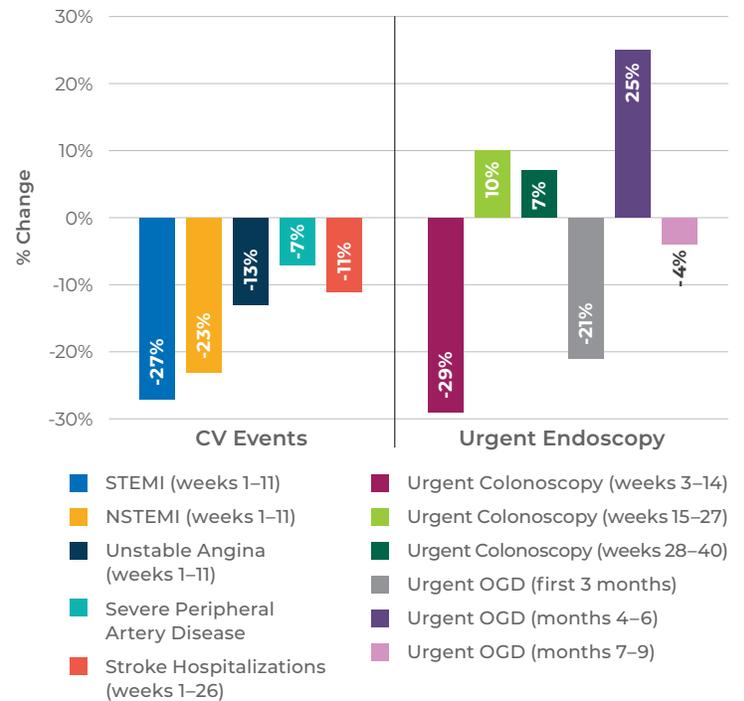
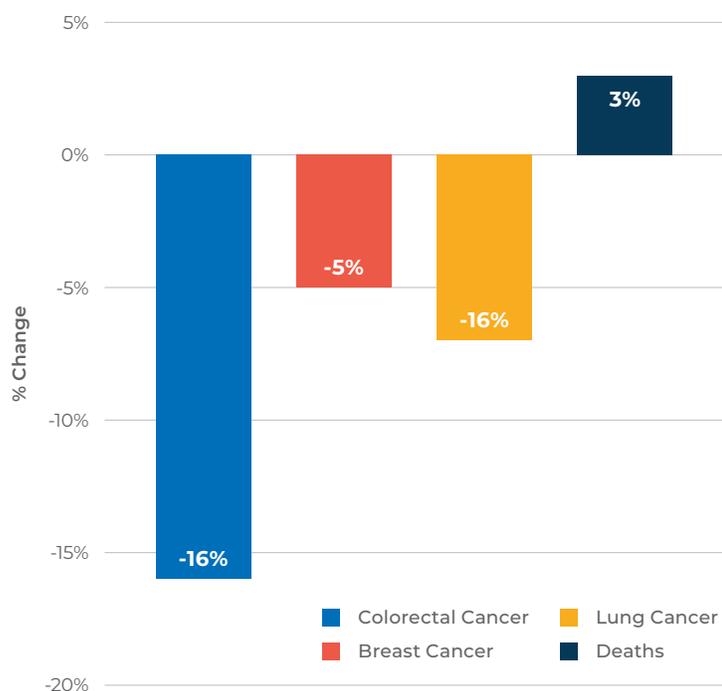


Figure 2. Per Cent Change in Cardio-Vascular Events and Urgent Endoscopy During COVID-19 in NL

- During the first three months of COVID-19, there were reductions in cardiac catheterizations for acute coronary syndromes and urgent colonoscopies, and smaller reductions in patients hospitalized for stroke.



**Figure 3. Per Cent Change in Invasive Cancers and Deaths During COVID-19 in NL**

- During the initial nine months of COVID-19, there was a 16% reduction in colorectal cancer, a 6.8% in lung cancer, and a 5% reduction in breast cancer.
- There was a small per cent increase in deaths (2.7%), comparing deaths from Apr–Nov 2020 during COVID-19 to those in the comparable period of 2019. This amounted to 80 deaths.

## Conclusions

1. There was a decrease in access to hospitals, particularly surgery, and a decrease in cardiovascular events presenting to hospital for cardiac catheterization, and in urgent endoscopy (both colonoscopy and oesophago-gastro-duodenoscopy) during COVID-19.
2. There was a decrease in diagnosis of invasive cancers that may manifest itself in later years as an increase in cancers at a later phase of invasiveness.
3. The numerical increase in deaths, while proportionately small, is a concern. It is possible that in future years cancer deaths could increase because of large reductions in surgery, CT scanning and screening programs during COVID-19.



# Persistence of Poor Thrombolysis Rates for Ischemic Stroke in NL

## Canadian Stroke Best Practice Recommendation

Administer intravenous thrombolytics within 4.5 hours of ischemic stroke onset.

## Objective

To determine whether interventions to improve thrombolysis rates for ischemic stroke in the province had succeeded.

## Practice Points

1. Thrombolysis with tissue plasma activator (tPA) is a proven intervention that will improve outcomes in ischemic stroke but needs to be provided within 4.5 hours of symptom initiation.
2. Thrombolysis rates were poor (<10%) in NL prior to 2017. Knowledge translation efforts by Quality of Care NL, implementation team visits to Regional Health Authorities (RHAs) by content experts, and initiation of an e-record for stroke patients in emergency rooms occurred in 2017–19 with the objective of improving thrombolysis rates to over 20%.
3. The pathway to thrombolysis involves multiple steps: recognition of symptoms, paramedics and transport, ER response, CT to diagnose ischemic stroke, and administration of tPA. Delay in any step can limit thrombolysis use.

## Data (PI: P.B. Parfrey)

Aggregate thrombolysis rates by RHA were obtained from the NL Centre for Health Information (NLCHI) using the data from project 340 on management of stroke in the province from 2014–15 to 2019–20. For Eastern Health (EH), patient level data were analysed by hospital for the same period.

## Results

- In the province in 2018–19, there were 1,204 strokes, 69.4% (N=836) of which were ischemic, and the remainder (N=368) hemorrhagic.

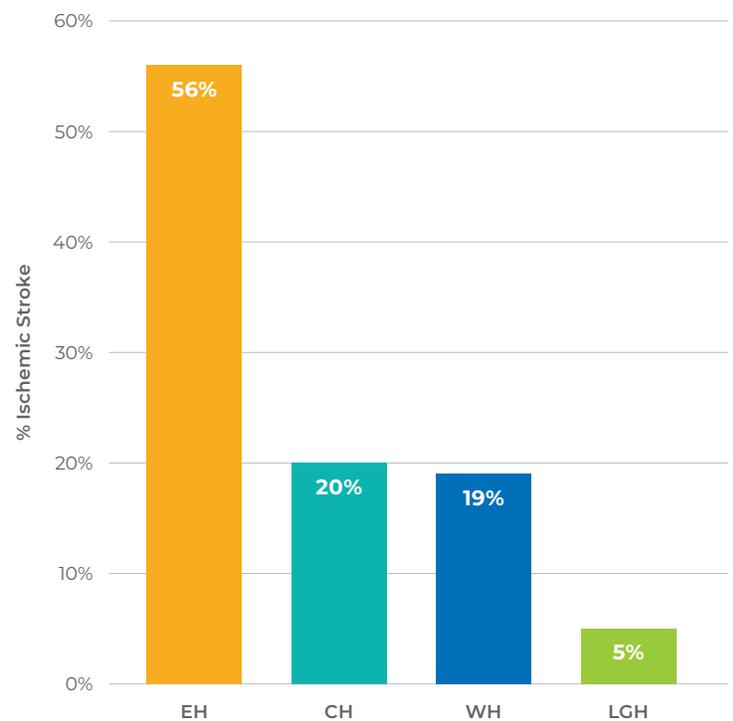
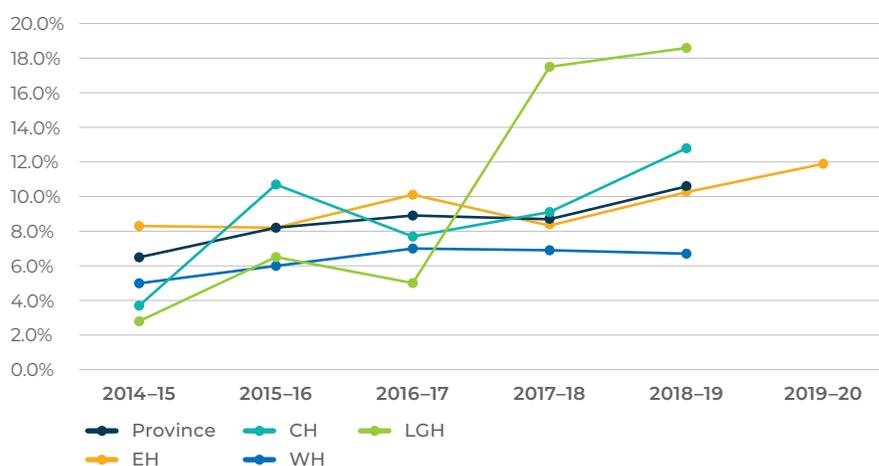


Figure 1. Per Cent of Ischemic Strokes by RHA for 2018–19

- 56% of ischemic strokes occurred in EH, which has 60% of the population.

**Table 1. The Number of Ischemic Strokes and the Number Who Received Thrombolysis in Each RHA From 2014–2020 by RHA**

RHA of Service	Fiscal Year											
	2014–15		2015–16		2016–17		2017–18		2018–19		2019–20	
	N	tPA	N	tPA	N	tPA	N	tPA	N	tPA	N	tPA
Eastern Health	355	8.3%	440	8.2%	436	10.1%	415	8.4%	486	10.3%	547	11.9%
Central Health	119	3.7%	128	10.7%	132	7.7%	127	9.1%	171	12.8%	N/A	N/A
Western Health	153	5.0%	138	6.0%	142	7.0%	134	6.9%	155	6.7%	N/A	N/A
Labrador-Grenfell Health	34	2.8%	29	6.5%	36	5.0%	34	17.5%	42	18.6%	N/A	N/A



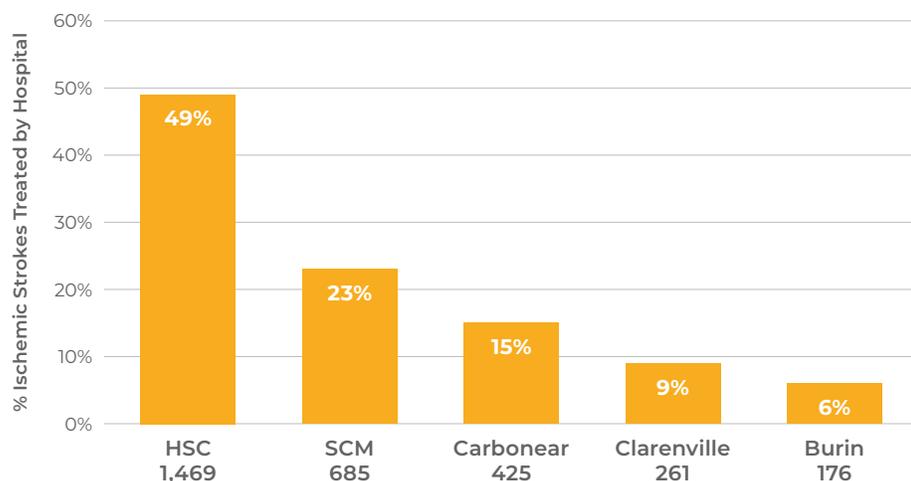
- Thrombolysis rates improved in the province from 2014–15 to 2018–19 but remained below target rates.
- Labrador-Grenfell Health (LGH) had substantial and sustained improvement in thrombolysis rates following visit from the implementation team and subsequent change in process of care.

**Figure 2. Per Cent of Ischemic Strokes That Received tPA in Each RHA From 2014–2020**

**Table 2. The Number of Ischemic Strokes and the Number Who Received Thrombolysis in the Five Hospitals of EH and in Four Health Centres From 2014–15 to 2019–20**

Hospital	Fiscal Year											
	2014–15		2015–16		2016–17		2017–18		2018–19		2019–20	
	N	n	N	n	N	n	N	n	N	n	N	n
HSC	210	14	233	17	229	22	234	22	277	39	286	46
SCM	100	12	115	6	127	13	113	9	119	9	111	10
Carbonear	41	8	63	5	76	3	73	4	103	9	69	6
Clarenville	41	0	50	9	45	8	35	3	42	1	48	2
Burin	38	2	39	4	32	5	26	2	21	0	20	1
Other	13	0	4	0	14	0	13	0	13	0	10	0

- It is not surprising that no patients received thrombolysis in the health centres, as they do not have a CT scanner to diagnose ischemic stroke. Stopping at these Emergency Rooms (ERs) was a barrier to receiving tPA.



- Although the Health Sciences Centre (HSC) treated nearly half of the strokes, a substantial number (N=1,547) were treated in the other four hospitals.

Figure 3. Percentage of Ischemic Strokes Treated by Hospital From 2014–15 to 2020–21

Table 3. Per Cent of Ischemic Strokes That Received tPA in the Five Hospitals of EH (all with a CT scanner)

Hospital	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21 Q1–Q2
Health Sciences Centre	6.7%	7.3%	9.6%	9.4%	14.0%	16.1%	19.1%
St. Clare’s Mercy Hospital	12.0%	5.2%	10.2%	8.0%	7.6%	9.0%	6.3%
Dr. G.B. Cross Memorial Hospital	0.0%	18.0%	17.8%	8.6%	2.4%	4.2%	0.0%
Carbonear General Hospital	19.6%	7.9%	3.9%	5.5%	8.7%	8.7%	5.6%
Burin Peninsula Health Centre	5.3%	10.3%	15.6%	7.7%	0.0%	5.0%	0.0%

- The HSC had a substantial improvement in thrombolysis rates following implementation efforts by the hospital.
- Thrombolysis rates at St. Clare’s Mercy Hospital (SCM) and at the three rural hospitals were low and did not improve over time.

## Conclusions

1. Although thrombolysis rates have improved in the province since 2014–15, the overall rates are not good.
2. Bringing a patient with stroke symptoms to a health centre without a CT scanner is harmful because it delays access to tPA.
3. Beneficial improvements in thrombolysis rates were observed at the HSC and in LGH following engagement with content experts.
4. The majority of ischemic strokes are occurring in regions with low thrombolysis rates or in EH in hospitals with low thrombolysis rates. Improvement is urgently required.

# Carotid Artery Testing for Stroke Prevention at St. Clare's Vascular Laboratory (2018–2020)

## Canadian Stroke Best Practice Guideline

Carotid artery transient ischemic attack (TIA) is a medical emergency and patients need either a carotid artery ultrasound or CT angiogram within 24 hours.

### Practice Points

1. Secondary strokes are preventable in patients with symptoms of a carotid artery TIA because early carotid revascularization is efficacious in symptomatic patients with critical carotid stenosis.
2. When to test?

✓ Good Indicators	✗ Bad Indicators
Unilateral weakness of face/arm/leg	Syncope
Speech disturbance (aphasia and/or dysarthria)	Headache
Monocular visual loss (Amaurosis Fugax), or loss of one visual field (Homonymous Hemianopia)	Tinnitus
	Carotid bruit
	Pain
	Generalized weakness

3. The volume of carotid artery testing at St. Clare's has decreased as more testing is performed elsewhere. However, the proportion of appropriate tests has remained unchanged, approaching 50%.

## Data

St Clare's Vascular Laboratory provided data on carotid artery ultrasound for 1 Apr 2018 – 31 Mar 2020. Indications for tests were appropriate based on symptoms consistent with carotid artery territory TIA, or pre-operative or post-operative follow up, or inappropriate based on symptoms not consistent with TIA.

Critical carotid artery disease was defined as  $\geq 70\%$  stenosis (an ICA velocity above 230), potentially significant as 50–69% stenosis (126–230 ICA velocity), and non-significant as less than 50% stenosis (125 and under).

## Results

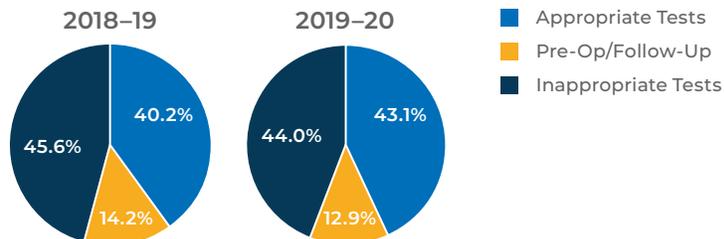


Figure 1. Indications for Carotid Artery Testing in 2019–20

- There were 1,520 tests done in 2018–19, and 1,282 in 2019–20, a reduction of 15.7%.
- The per cent of inappropriate tests based on symptoms was 44% in 2019–20, similar to that in 2018–19 (46%).

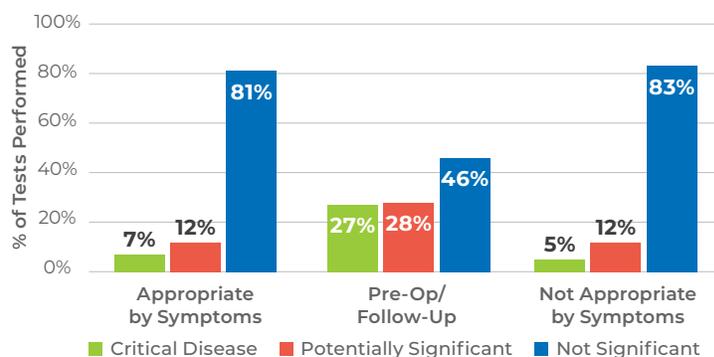


Figure 2. Results of Carotid Artery Tests in 2018–2020 by Indication

- 77% of tests revealed no or non-significant disease in 2019–20, similar to that in 2018–19 (78%).
- There was little difference in the diagnosis of critical or potentially significant carotid artery disease, based on whether the indication was appropriate or not.

## Conclusions

1. The use of carotid artery testing is a problem because 46% of tests are inappropriate, based on symptoms. In those appropriate based on symptoms, the rate of diagnosis of critical or potentially significant disease was little different from those with inappropriate indications.
2. There is a clear need for education of referring doctors on the use of carotid testing to prevent secondary stroke. An objective of e-ordering of carotid artery testing is more appropriate referral, as well as faster time to testing in those with symptoms consistent with TIA.

# Hysterectomy Rates by Regional Health Authority

## Objective

To determine whether hysterectomy rates differed by Regional Health Authority (RHA).

## Practice Points

1. The Society of Obstetricians and Gynaecologists of Canada recommend hysterectomy for:
  - a. benign disease: Leiomyomas, abnormal uterine bleeding, endometriosis, pelvic relaxation, occasionally for pelvic pain,
  - b. pre-invasive disease,
  - c. invasive disease,
  - d. acute conditions: intractable postpartum hemorrhage, unresponsive tubo-ovarian abscess, refractory acute menorrhagia,
  - e. familial ovarian cancer.
2. For benign disease, the patient’s decision to proceed with the hysterectomy is influenced by the perception of the improvement in quality of life likely to occur because of hysterectomy versus the risk of the procedure.
3. There is wide variability in Canada’s provinces for the age-standardized rates of total hysterectomy.

## Methods

1. Aggregate data on hysterectomies performed in NL from 2017–19 were obtained from the NL Centre for Health Information (NLCHI) and analysed by age and by RHA.
2. Total and partial hysterectomies were combined because of concern about coding. A partial hysterectomy excises the uterus but not the cervix. For age-standardized rates, the denominator was 100,000 women aged ≥18 years.

## Results

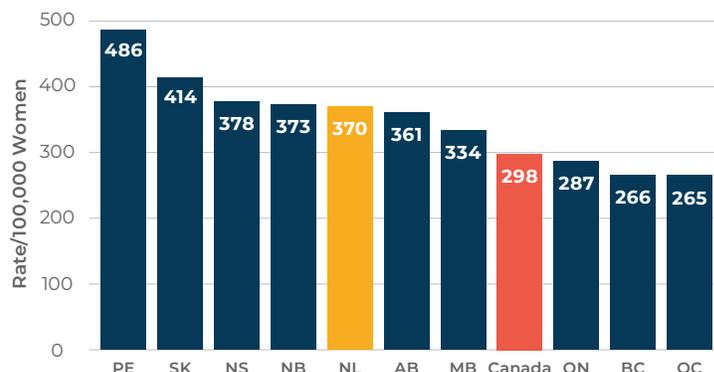


Figure 1. Age Standardized Rates of Total Hysterectomy/100,000 Women Aged ≥18 Years by Province for 2018 (Canadian Institute for Health Information (CIHI))

- NL had the 6th highest rate of total hysterectomy in Canada.

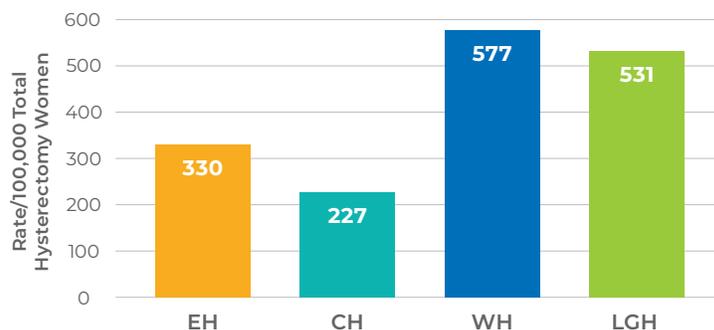


Figure 2. Age Standardized Rates/100,000 of Total Hysterectomy Women aged ≥18 years by RHA for 2018 (CIHI)

- The highest rate of total hysterectomy was reported in Western Health (WH).

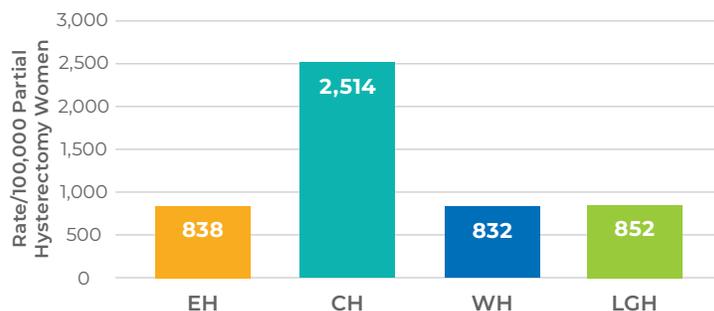
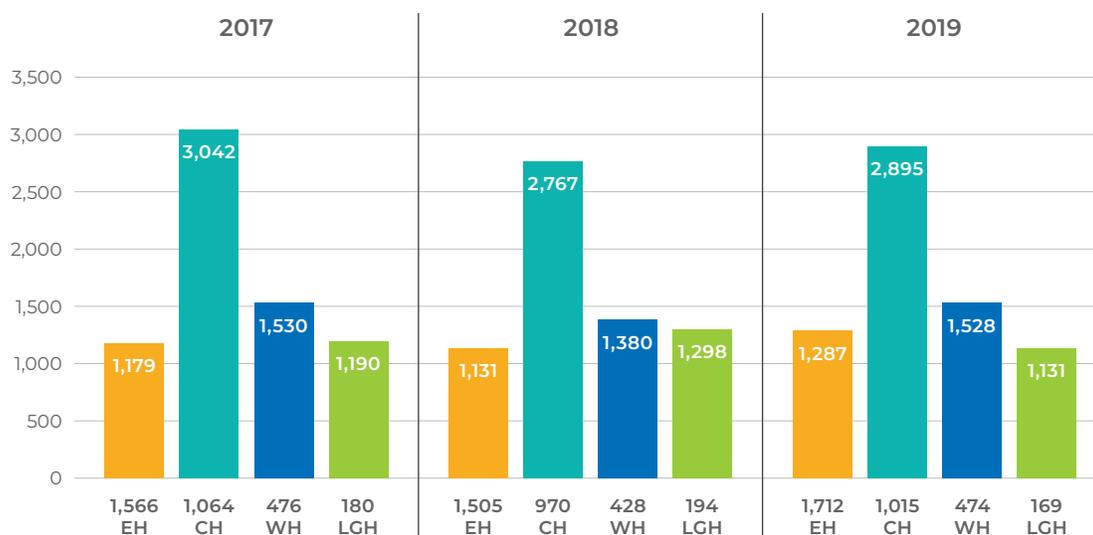


Figure 3. Age Standardized Rates of Partial Hysterectomy/100,000 Women Aged ≥18 Years by RHA for 2018 (NLCHI)

- Central Health (CH) had three times the rate of partial hysterectomy, compared to the other three regions.



- CH had the highest rate of combined hysterectomies for each of the three years, and in 2019, it was 125% higher than that of Eastern Health (EH).

Figure 4. Age Standardized Rates/100,000 Women Aged ≥18 Years by RHA and by Year. Combined Partial and Total Hysterectomy (NLCHI)

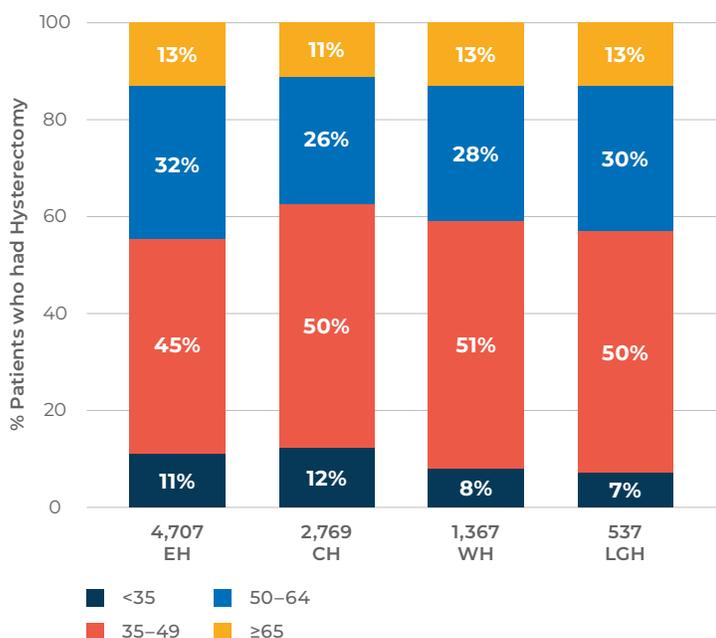


Figure 5. Per Cent of Patients Who had Hysterectomy (Total + Partial) From 2017–19 by RHA and by Age

- The age distribution was similar in each RHA, with the majority being <50 years old.

## Conclusions

1. It is highly unlikely that the rate of partial hysterectomies would be higher than that of total hysterectomies. Consequently, it is likely that coding is not consistent with the definitions of the Canadian Institute for Health Information (CIHI).
2. Although WH has the highest rate of 'total' hysterectomies when analysed by RHA, the rate of combined partial and total hysterectomies is not the highest.
3. CH has the highest rate of combined partial and total hysterectomies.
4. It is uncertain whether these rates are of clinical concern because patient choice is determined by the ratio of risk:quality of life benefit in a procedure often undertaken vaginally or by laparoscope.

# Decreased Access to Colonoscopy in Eastern Health

## Guideline

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

## Practice Points

- Optimal times for Priority 1 (Urgent): 0–14 days; Priority 2 (Non-Urgent): 0–60 days; Priority 3 (Baseline Screening): 0–182 days.
- Previous review of colonoscopy referrals showed that access to colonoscopy had significantly improved from 2016–18 in Eastern Health (EH).

## Methods

- Data were obtained from Community Wide Scheduler for five hospitals in EH: Burin, Carbonear, GB Cross, Health Sciences Centre (HSC) and St. Clare's Mercy (SCM).
- During 2017, waitlist management was ongoing in the rural hospitals of EH and continued in the remaining two city hospitals in 2018.
- Referral rates and wait time evaluation by year were compared within EH.

## Results

Table 1. Colonoscopy Referrals to EH by Priority, by Region and by Year

		Year	Region		
			Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Number of Referrals	Priority 1	2016	830	805	1,635
		2017	827	625	1,452
		2018	880	571	1,451
		2019	738	592	1,330
	Priority 2	2016	1,777	3,068	4,845
		2017	1,640	3,174	4,814
		2018	1,842	3,111	4,953
		2019	2,075	2,978	5,053
	Priority 3	2016	616	622	1,238
		2017	533	577	1,110
		2018	355	453	808
		2019	315	502	817

<sup>1</sup> Burin, Carbonear & GB Cross; <sup>2</sup> HSC & SCM

- Comparing 2019 to 2016, the number of colonoscopies referred to EH colonoscopists deemed priority 1 decreased by 18.7%, deemed priority 2 increased by 4.3%, and deemed priority 3 decreased by 34%.

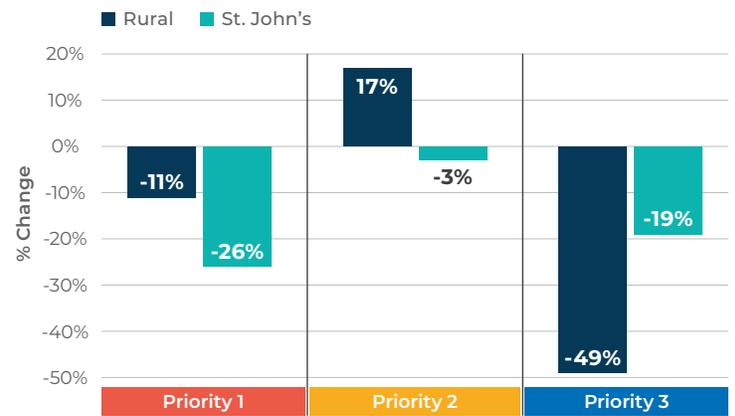


Figure 1. Percentage Change in the Number of Referrals Comparing 2019 to 2016 in the Rural and the St. John's Hospitals by Priority

- The change in referrals in the rural hospitals was likely related to utilization review.

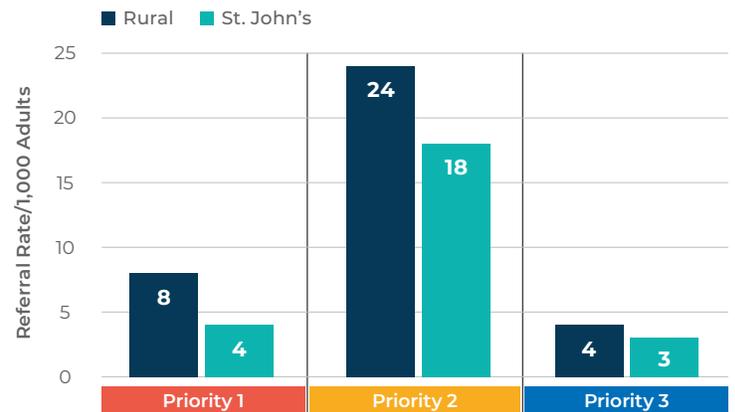


Figure 2. Referral Rates/1,000 Adults in 2019 by Priority and by Region

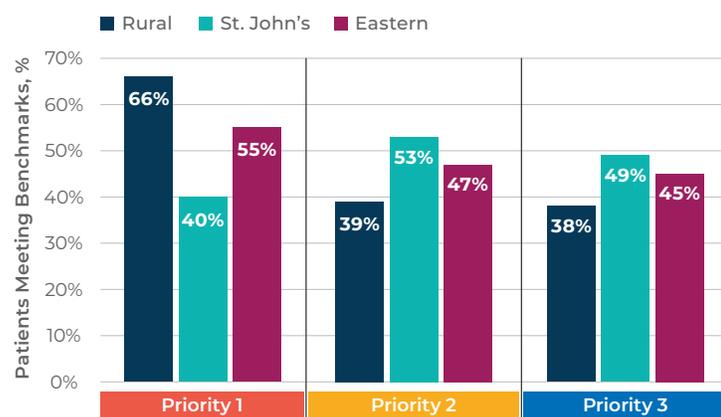
- In 2019, the referral rate/1,000 adults in the three rural hospitals was 140% higher than in the two St. John's hospitals for priority 1, 34% higher for priority 2, and 20% higher for priority 3.

**Table 2. Comparison of Percentage of Patients Meeting Benchmarks for Time to Colonoscopy by Priority and Region for 2016–2019 Data**

			Region		
			Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Number of Referrals	Priority 1	2016	52	36	44
		2017	68	41	56
		2018	70	44	60
		2019	66	40	55
	Priority 2	2016	32	63	52
		2017	40	63	55
		2018	57	63	61
		2019	39	53	47
	Priority 3	2016	25	47	36
		2017	64	60	62
		2018	58	76	67
		2019	38	49	45

<sup>1</sup> Burin, Carbonear & GB Cross; <sup>2</sup> HSC & SCM

- Comparing times to colonoscopy in 2019 to 2016, the per cent meeting benchmark times in the rural hospitals improved by 26.9% for priority 1 and St. John's improved by 11.1%. For priority 2, the rural hospitals improved by 21.9% and the St. John's hospitals deteriorated by 15.9%. For priority 3, there was a 52% improvement in the rural and 4.3% improvement in St. John's.



**Figure 3. Percentage of Patients Meeting Benchmarks by Priority and Region in 2019**

## Conclusions

1. In EH, the number of colonoscopies referred for priority 1–3 conditions decreased from 7,718 in 2016 to 7,200 in 2019. This decrease was particularly for priority 1 and 3 referrals. In the rural hospitals, this may be partly related to improved labelling of priority as a result of utilization review.
2. Referral rates for priority 1 and 2 were substantially higher in the rural hospitals, compared to St. John's.
3. The per cent meeting benchmark time to colonoscopy by priority was better in the rural hospitals than in St. John's. Improvement in St. John's requires improvement in the infrastructure to perform colonoscopies, and in particular, the number of spaces available to perform colonoscopy.



# Use of Oesophago-Gastro-Duodenoscopy in Eastern Health

## Choosing Wisely Recommendation

Avoid performing an endoscopy for dyspepsia without alarm symptoms for patients under the age of 65 years.

## Practice Points

1. Wait time benchmarks for oesophago-gastro-duodenoscopy (OGD) are:

Priority 1 (Urgent): 0–14 days

- ◇ High likelihood of cancer, progressive/rapid dysphagia, odynophagia

Priority 2 (Non-Urgent): 0–60 days

- ◇ Iron deficiency, confirmation of celiac disease, reflux, dyspepsia, stable dysphagia

Priority 3 (Screening): 0–182 days

2. Dyspepsia occurs in at least 20% of the population and, although it does not affect life expectancy, it can significantly impact quality of life and is responsible for substantial health care costs.
3. OGD is an accurate test for diagnosing dyspepsia. Most guidelines recommend as the first line approach for managing dyspepsia either empirical proton pump inhibitor therapy or a non-invasive test for *Helicobacter pylori* and then offering therapy if the patient is positive. If the patient has alarm features (such as unintentional weight loss, anemia, progressive dysphagia, persistent vomiting, palpable mass) endoscopy is appropriate.
4. Previous review of OGD referrals showed that rate of OGD referrals per 1,000 people (aged 20–64 years) in rural hospitals was 63% higher than in St. John's. It also showed access to OGD was better in the rural region than in St. John's.

## Methods

1. Data were obtained from Community Wide Scheduler for five hospitals in Eastern Health (EH): Burin, Carbonear, GB Cross, Health Sciences Centre (HSC) and St. Clare's Mercy (SCM).

2. Referral rates and per cent who received OGD within optimal time were compared for those 20 to 64 years of age and those 65 years and older for 2018–19.

## Results

Table 1. OGD Referrals to EH by Priority and by Region for 2018–19

			Priority 1	Priority 2	Priority 3	Total
Rural <sup>1</sup>	2018	20–64	416	963	15	1,394
		65+	546	601	16	1,163
	2019	20–64	425	1,081	5	1,511
		65+	517	767	7	1,291
St. John's <sup>2</sup>	2018	20–64	391	1,425	112	1,928
		65+	361	815	48	1,224
	2019	20–64	367	1,243	118	1,728
		65+	308	676	50	1,034
Eastern	2018	20–64	807	2,388	127	3,322
		65+	907	1,416	64	2,387
	2019	20–64	792	2,324	123	3,239
		65+	825	1,443	57	2,325

<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM

- In the three rural hospitals of EH, the number of OGDs performed for non-urgent reasons in people aged 20–64 years increased by 12.3% compared to 2018, whereas in St. John's there was a 12.8% decrease.

Table 2. Referral Rate/1,000 Adults by Priority and by Region for 2018–19

			Priority 1	Priority 2	Priority 3	Total
Rural <sup>1</sup>	2018	20–64	6.9	15.9	0.3	23.1
		65+	19.9	21.9	0.6	42.4
	2019	20–64	7.1	18.1	0.08	25.3
		65+	18.2	27.1	0.2	45.5
St. John's <sup>2</sup>	2018	20–64	2.9	10.4	0.8	14.1
		65+	11.1	25.0	1.5	37.6
	2019	20–64	2.7	9.2	0.9	12.8
		65+	9.0	19.9	1.5	30.4
Eastern	2018	20–64	4.1	12.1	0.6	16.8
		65+	15.1	23.6	1.1	39.8
	2019	20–64	4.1	11.9	0.6	0.9
		65+	13.2	23.1	0.9	37.2

<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM

- The rate/1,000 adults of OGD for urgent and non-urgent reasons was substantially higher in the three rural hospitals compared to St. John's.
- In particular, in 2019 the rate of OGD/1,000 adults aged 20–64 years for non-urgent indications was 18 in the rural hospitals and 9.2 in St. John's.

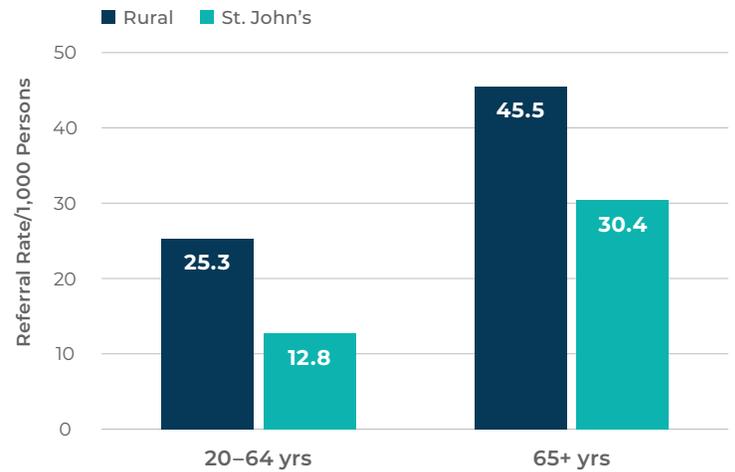


Figure 1. OGD Referral Rates per 1,000 Persons by Age and by Region in 2019

- In 2019, referral rate per 1,000 persons aged 20–64 in the rural hospitals was 98% higher than in St. John's. In people ≥65, the rate was 50% higher in the rural hospitals.

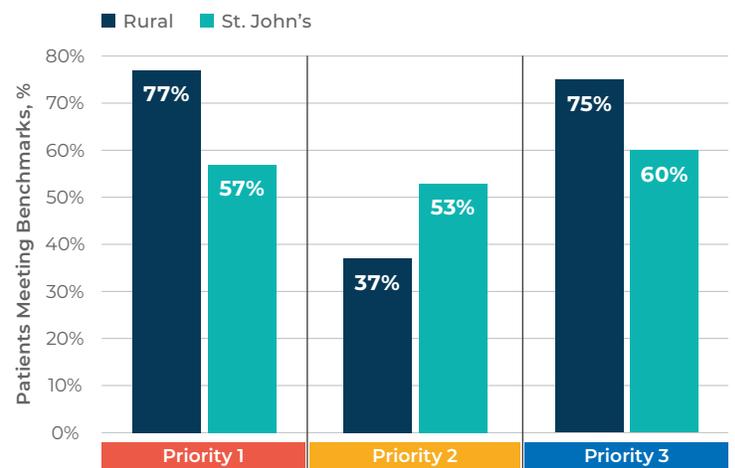


Figure 2. Percentage of Patients Meeting Benchmarks by Priority and by Region in 2019

- Percent meeting benchmark times to OGD in both urgent and non-urgent patients is not optimal. In the rural hospitals timelines of OGD for non-urgent patients has deteriorated.

**Table 3. Comparison of Percentage of Patients Meeting Benchmarks by Priority and by Region for 2018–19 Data**

			Region		
			Rural <sup>1</sup>	St. John's <sup>2</sup>	Eastern
Percentage of Patients Meeting Benchmarks	Priority 1	2018	79	59	70
		2019	77	57	69
	Priority 2	2018	76	63	68
		2019	37	53	45
	Priority 3	2018	85	89	88
		2019	75	60	61

<sup>1</sup>Burin, Carbonear & GB Cross; <sup>2</sup>HSC & SCM

- Comparing times to OGD in 2019 to 2018, the per cent meeting optimal times for non-urgent reasons deteriorated in both the rural and St. John's hospitals.

## Conclusions

1. The population rate of OGD in the three rural hospitals of EH for both urgent and non-urgent patients is substantially higher than in St. John's. This is consistent with higher rates of other interventions that may be appropriate, such as antibiotics and CT scanning, in rural compared to urban areas of the province.
2. The high rate of OGD for non-urgent patients aged 20–64 years in the rural hospitals suggests that Choosing Wisely Canada guidelines should be followed.
3. The non-optimal achievement of optimal times to OGD in St. John's is similar to that for colonoscopy, and supports the need for better infrastructure to improve the timeliness of OGD.

# The Impact of Antibiotic Stewardship Measures and of COVID-19 on In-Hospital Use of Broad Spectrum Antimicrobials in St. John’s

## Objective

To determine (a) rates of antimicrobial use (AMU) at the Health Sciences Centre (HSC) and at St. Clare’s Mercy Hospital (SCM) in 2019 and 2020, (b) whether COVID-19 was associated with changes in AMU, and (c) whether broad spectrum AMU rates improved in association with antibiotic stewardship.

## Practice Points

1. Antimicrobial resistance causes 5,400 deaths and a loss of \$2 billion annually in Canada, and is increasing. Antimicrobial resistance is created by AMU.

NL has the highest rate of AMU in Canada. A large proportion of AMU is unnecessary and can be reduced without harming patient outcomes.

Antimicrobial stewardship reduces AMU by stopping unnecessary prescriptions, narrowing antimicrobial spectrum, and reducing treatment duration.

2. Ten per cent of AMU in Canada occurs in hospitals. AMU among inpatients in Canada is increasing. In 2018, Canadian hospitals purchased 652 Defined Daily Doses (DDD)/1,000 patient days.
3. Local inpatient antimicrobial stewardship interventions include the Spectrum™ decision support application, and prospective audit and feedback of prescriptions for broad spectrum antimicrobials (carbapenems and piperacillin/tazobactam) at day three of prescription.

## Data (PI: Dr. P. Daley)

AMU was collected using Pyxis automated dispensing system for the HSC and for SCM from 1 Jan 2019 – 30 Dec 2020.

Although first cases of COVID-19 in EH were reported on 16 Mar 2020, for this analysis we consider the pre-COVID-19 period to be the first three months of 2020 and during COVID-19 the following nine months.

The Spectrum Decision support app was introduced in Feb 2019.

From 1 Feb to 22 Sept 2020, 373 written recommendations were made by infectious diseases physicians, as part of a program to reduce broad spectrum AMU.

## Results

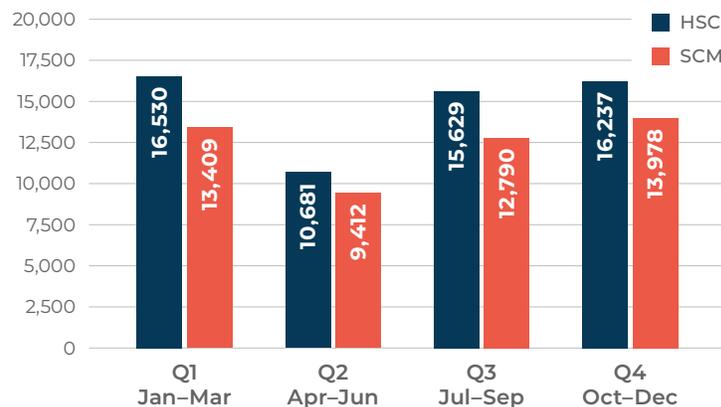


Figure 1. Patient Days/Quarter in 2020 at HSC and SCM

- During the first three months of COVID-19, patient days decreased by 35% at HSC and by 30% at SCM; during the second three months, the reductions were 5.5% and 4.6%, respectively.

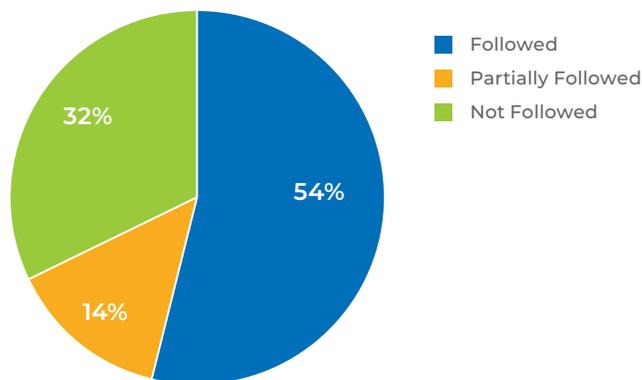


Figure 2. Adherence to Recommendations Made During Audit and Feedback for Broad Spectrum Antibiotics in 2020

- Of 373 prescriptions for piperacillin-tazobactam or carbapenems, 201 of recommendations were followed, 51 partially followed, and 121 were not followed.
- Any compliance with the audit and feedback reduced duration of target antibiotic treatment (piperacillin-tazobactam or carbapenems) from 6.2 to 2.5 days ( $p < 0.001$ ).

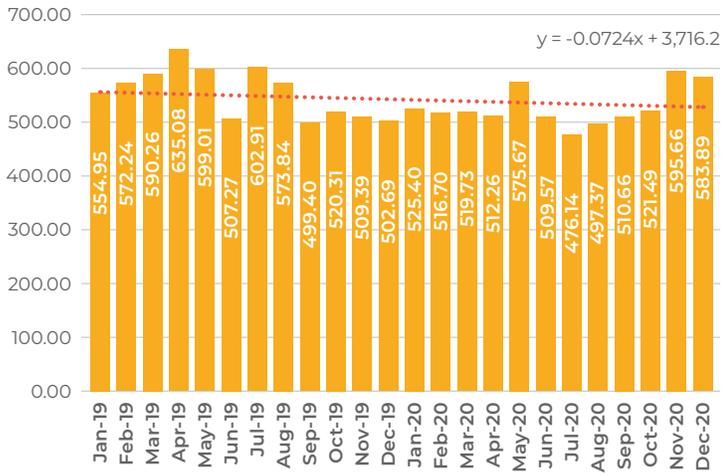


Figure 3. DDD/1,000 Patient Days of All AMU for Both HSC and SCM for 2019 and 2020

- DDD/1,000 patient days for all AMU in the St. John’s hospitals was 555.6 in 2019 and 528.7 in 2020, a 4.8% reduction.

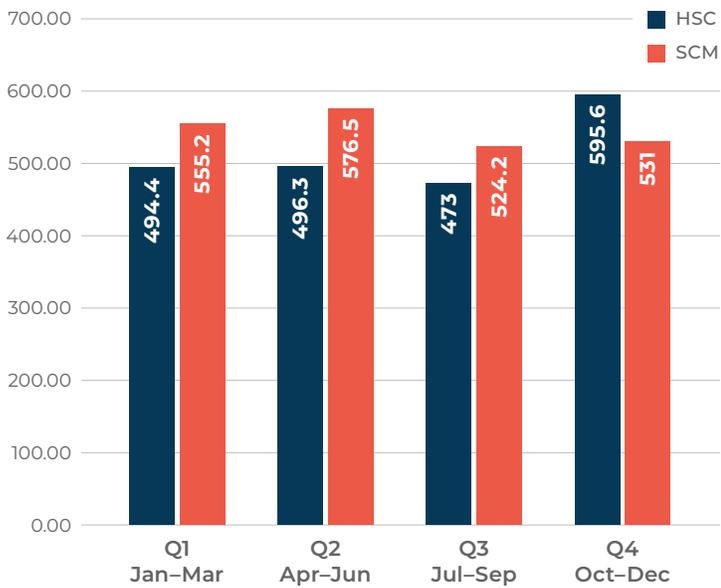


Figure 4. DDD/1,000 Patient Days of All AMU at HSC and SCM Separately for Each Quarter in 2020

- COVID-19 had little impact on total AMU rate: Q1 – 524.8 vs. Q2 – 536.4.
- AMU rate was higher at SCM than at HSC during 2020 (546.7 vs. 514.8).

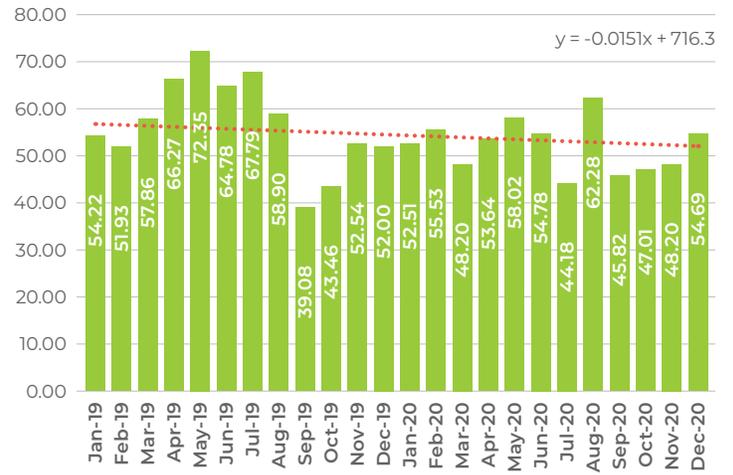


Figure 5. DDD/1,000 Patient Days of Piperacillin-Tazobactam at Both HSC and SCM for 2019 and 2020

- DDD/1,000 patient days for piperacillin-tazobactam in 2019 was 56.77, compared to 52.07 in 2020, a reduction of 8%.

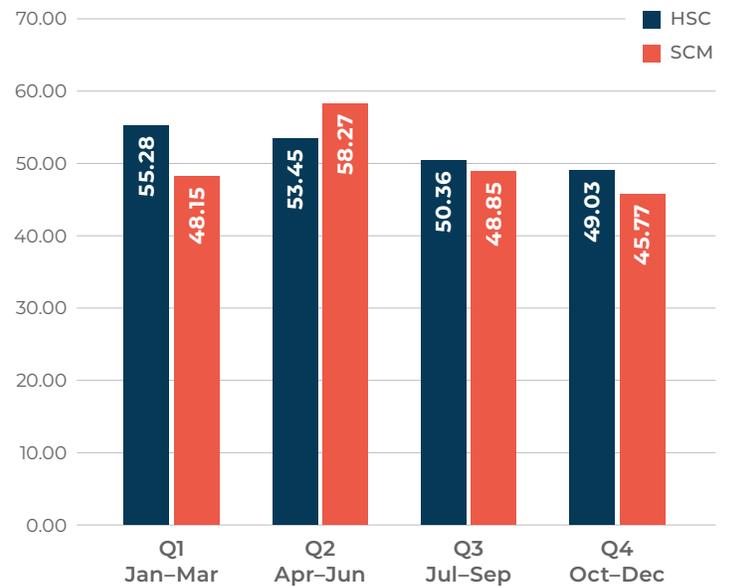


Figure 6. DDD/1,000 Patient Days of Piperacillin-Tazobactam for HSC and SCM Separately for Each Quarter of 2020

- Piperacillin-tazobactam rate went up in the first three months of COVID-19: Q1 rate 51.72 vs. Q2 rate 55.86.
- DDD for piperacillin-tazobactam was 50.26 at SCM and 52.03 at HSC in 2020.



Figure 7. DDD/1,000 Patient Days of Glycopeptides at Both HSC and SCM for 2019 and 2020

- The DDD for glycopeptides was 42.34 in 2019 and 39.06 in 2020, a reduction of 7.7%.

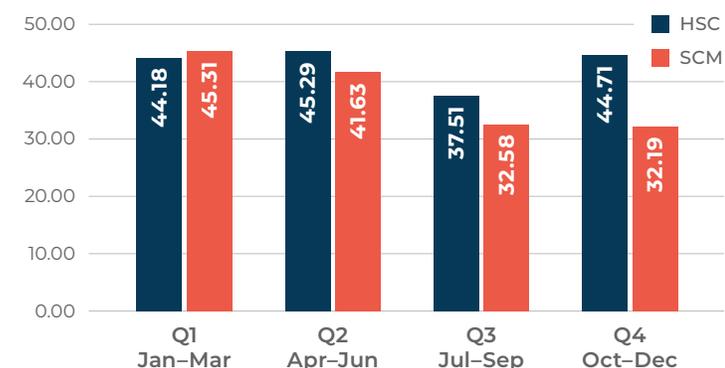


Figure 8. DDD of Glycopeptides for HSC and SCM Separately in Each Quarter of 2020

- During COVID-19, there was little impact on glycopeptide rate: Q1-44.75 vs. Q2-43.46.
- Use of glycopeptides was 13.2% higher at HSC, compared to SCM (DDD/1,000 patient days was 37.93 vs. 42.92).

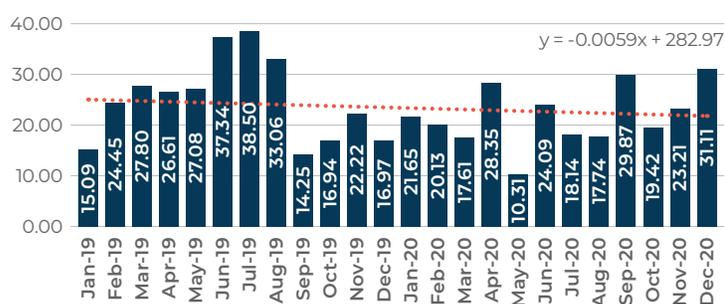


Figure 9. DDD/1,000 Patient Days of Carbapenems at Both HSC and SCM for 2019 and 2020

- DDD/1,000 patient days for carbapenems in 2019 was 25.03, and in 2020 it was 21.80, a reduction of 12.9%.

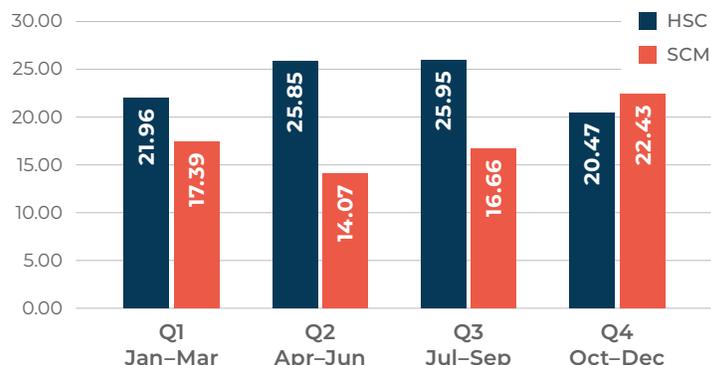


Figure 10. DDD/1,000 Patient Days of Carbapenems in HSC and SCM Separately in Each Quarter of 2020

- During COVID-19, there was little impact on carbapenem rate: Q1-19.68 vs. Q2-19.96.
- Carbapenem use was 33.6% higher at HSC than at SCM (17.64 vs. 23.56).

## Conclusions

- Despite COVID-19 with the consequent reduction of in-hospital patient days and disproportionate reduction in surgery, there was little impact on total or broad spectrum AMU rate.
- Audit and feedback on broad spectrum antibiotic use resulted in adherence to recommendations made by infectious disease physicians in two of every three prescriptions and a consequent reduction in duration of piperacillin-tazobactam/carbapenems use.
- Comparing 2020 to 2019, total AMU rate was reduced by 4.8%, with bigger reductions in broad spectrum AMU (piperacillin-tazobactam, glycopeptide and carbapenems reductions of 8%, 7.7% and 12.9%, respectively).
- Comparing SCM to HSC in 2020, total AMU rate was higher but rates of broad spectrum antibiotics were lower. Rates of piperacillin-tazobactam were just 3.5% higher at HSC, but rates for glycopeptides were 13.2% higher and for carbapenems 33.6% higher. Whether these differences reflect a different patient mix is uncertain.

# The Use of Urinary Catheters in Eastern Health

## Choosing Wisely Canada Recommendation

Do not place or leave in place a urinary catheter without reassessment.

### Practice Points

1. Appropriate indications for urinary catheter include acute urinary obstruction, critical illness, and end-of-life-care.
2. Urinary catheter use is associated with preventable harm, such as catheter-associated urinary tract infection, sepsis and delirium. Strategies that reduce inappropriate use of urinary catheters reduce health care-associated infections.

### Data

Aggregate data were obtained from the NL Centre for Health Information (NLCHI) for 2019–20 on number of days a catheter was in use as a proportion of total patient days for the two St. John’s hospitals by ward, the three rural hospitals of Eastern Health (EH) (medical-surgery beds) and the seven non-faith based long-term care facilities.

### Results

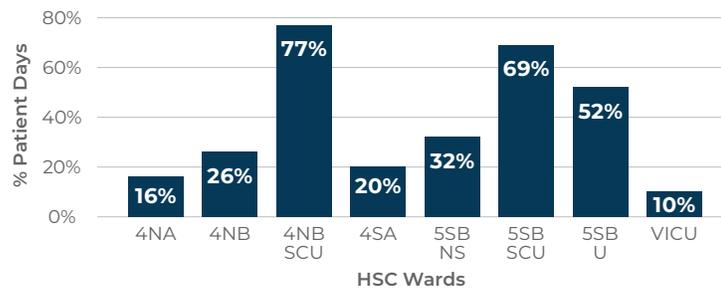


Figure 1. Per Cent of Patient Days Associated With Urinary Catheter Use at the Health Sciences Centre by Ward

- Anticipated high use was observed in Special Care units and in urology at the Health Sciences Centre (HSC). Use in other wards varied from 16–32%.

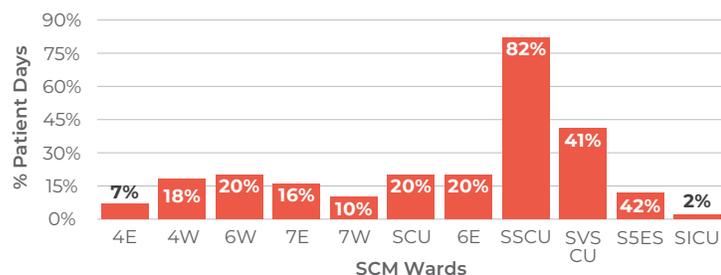


Figure 2. Per Cent of Patient Days Associated With Urinary Catheter Use at St. Clare’s Mercy Hospital by Ward

- At St. Clare’s Mercy Hospital (SCM), anticipated high use was observed in Special Care units, and ward use of urinary catheters ranged from 7–20%.

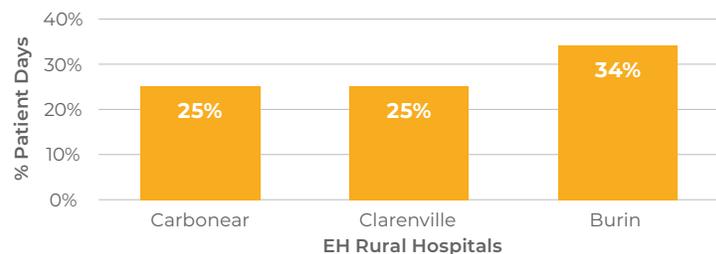


Figure 3. Per Cent Use of Patient Days Associated With Urinary Catheter Use in the Medical — Surgery Beds in the Three Rural Hospitals of Eastern Health

- The rate of urinary catheter use was higher at the hospital in Burin than in Carbonear or Clareville.

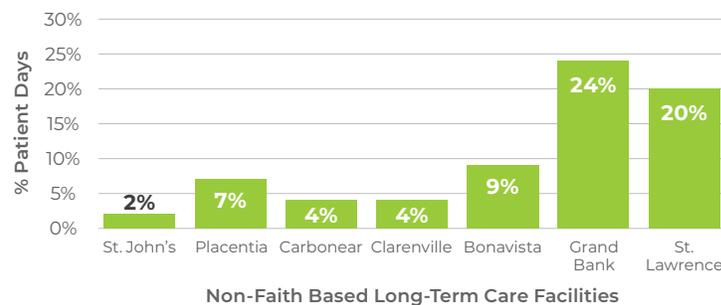


Figure 4. Per Cent Use of Patient Days Associated With Urinary Catheter Use in the Non-Faith Based Long-Term Care Facilities

- Outliers for urinary catheter use at long-term care facilities were Grand Bank and St. Lawrence.

### Conclusions

1. Institutional efforts to reduce urinary catheter use are indicated in acute care hospitals because they predispose to infection and prolong length of stay.
2. The disparity of urinary catheter use in some long-term care facilities is substantial.
3. These data provide a baseline for institutional urinary catheter use to evaluate the effectiveness of interventions to lower use.

# Pre-Operative Testing in Patients Having Low-Risk Surgery by Regional Health Authority (2019)

## Choosing Wisely Canada Recommendation

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

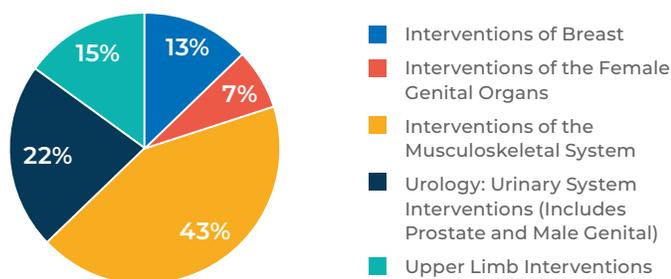
## Practice Points

1. In 2017, a medical directive to follow the Choosing Wisely Canada (CWC) recommendation was made at the two St. John's hospitals, which was associated with substantial reductions in INR tests and chest x-ray but continued high use of Hemoglobin (Hb) and serum creatinine (s.creatinine) tests.
2. Low-risk procedures are categorized as interventions of breast, female genital organs, musculoskeletal system, urinary system interventions, upper limb interventions, and other.

## Data

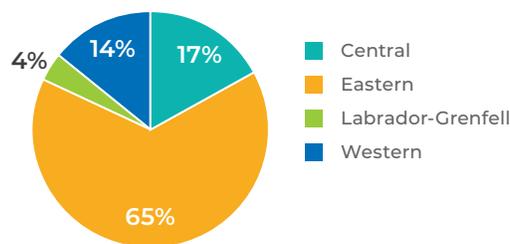
Aggregate data were obtained from the NL Centre for Health Information (NLCHI) on the number of low-risk procedures undertaken in each Regional Health Authority (RHA) from 2015–16 to 2019–20. Pre-operative tests (s.creatinine, Hb, INR and chest x-ray) undertaken within 30 days prior to surgery were determined. The percentage of patients tested in 2019–20 were compared to the baseline in 2016–17.

## Results



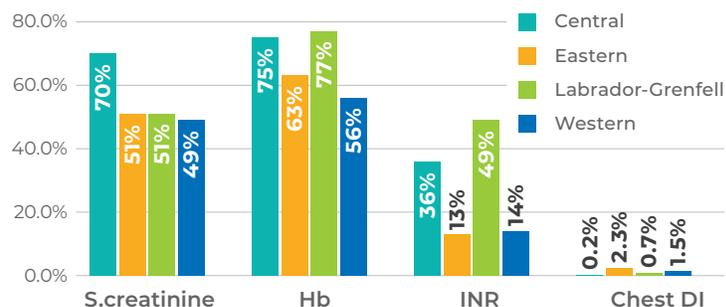
**Figure 1. Per Cent Distribution of Low-risk Procedures by System in NL in 2019–20**

- In 2019–20, there were 7,524 low-risk procedures undertaken, compared to 7,709 in 2016–17.
- The distribution of procedures by system in 2019–20 differed little from 2016–17.



**Figure 2. Per Cent Distribution of Low-risk Procedures Undertaken in Each RHA in 2019–20**

- Compared to population size, proportionately more low-risk procedures were performed in Eastern Health (EH) and less in Labrador-Grenfell Health (LGH): 65.8% of procedures were performed in EH, which has 60.8% of the population, whereas 3.8% of procedures were undertaken in LGH with 7.0% of the population. In Central Health (CH), percentages were 16.7% and 17.5%, and in Western Health (WH), they were 14.2% and 14.7%, respectively.



**Figure 3. Per Cent of Patients Who Had Low-risk Procedures and a Pre-operative Test Undertaken Prior to Surgery Analyzed by RHA in 2019–20**

- The per cent of patients with s.creatinine or Hb testing prior to low-risk surgery in the province was high (51% had s.creatinine, 61% Hb).
- INR testing was particularly high in CH and LGH, compared to EH and WH.
- Chest x-ray was performed infrequently (1.7% of patients in the province).

## Conclusions

1. The majority of patients prior to low-risk surgery had s.creatinine and Hb tests.
2. Rate of INR testing varied by region, being high in CH and LGH.
3. Despite a medical directive in the St. John's hospitals, prior blood testing in EH remains high.



# The Annual Incidence and Clinical Characteristics of Clients Admitted to Long-Term Care in NL by Regional Health Authority

## Objective

To determine the annual incidence of clients to long-term care facilities (LTCFs) in NL by region, and to determine whether the clinical characteristics of clients are similar across Regional Health Authorities (RHAs).

## Practice Points

1. In 2016–17, 1,044 people were admitted to LTCFs in NL, 43% were aged 85 years or older, and 61% were female.
2. 47% were admitted because of cognitive impairment or reduced physical function only, of whom 94% had either extensive to total dependence for activities of daily living or had severe impairment of cognition. Together with the 53% admitted because of need for special rehabilitation, extensive services or special care, or because their needs were clinically complex, these data implied that the vast majority required admission to a LTCF.

## Data

The Resident Assessment Instrument-Minimum Data Set (RAI-MDS) 2.0 is completed on admission to LTCF and quarterly thereafter. These data were obtained from The NL Centre for Health Information (NLCHI) from 2016–17 to 2019–20.

## Results

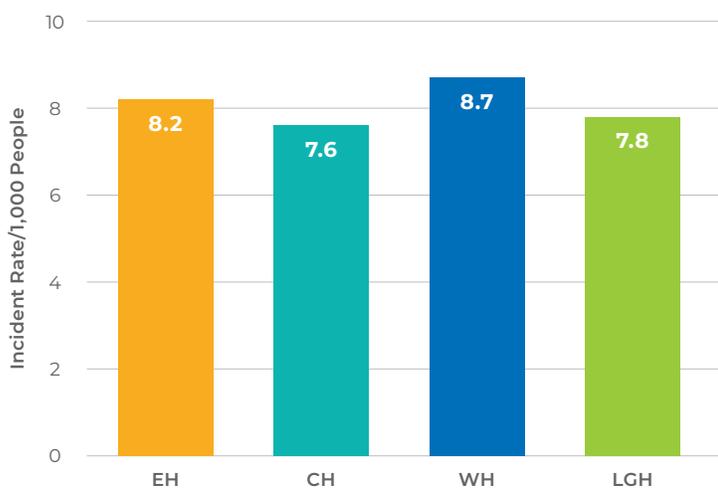


Figure 1A. Incidence Rate of Clients 65 Years or Older/1,000 People 65 Years or Older in 2019–20 by RHA

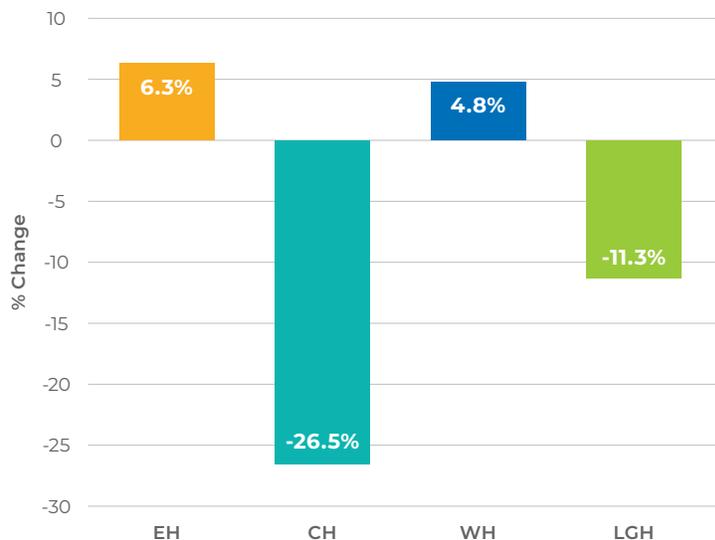


Figure 1B. Percentage Change in Annual Incidence of Clients From 2016–17 to 2019–20 by RHA

- In 2019–20, 1,015 clients were admitted to LTCFs in the province.
- Central Health (CH) has the lowest incident rate and the biggest drop in incidence rate since 2016–17, suggesting limited access to LTCFs in that region.

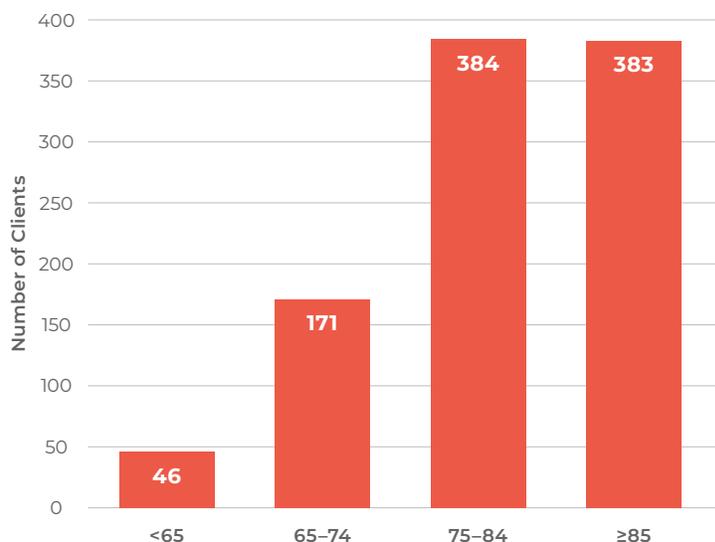
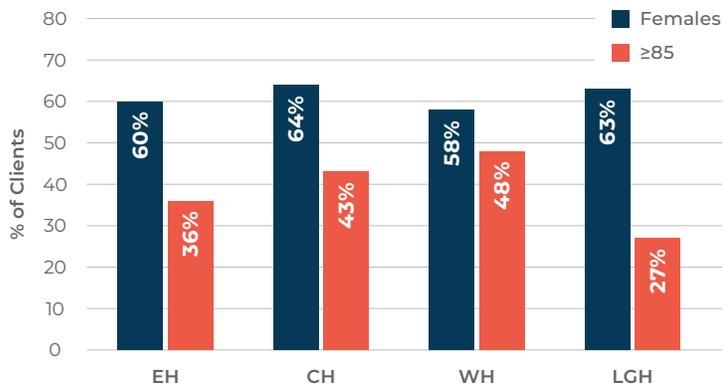


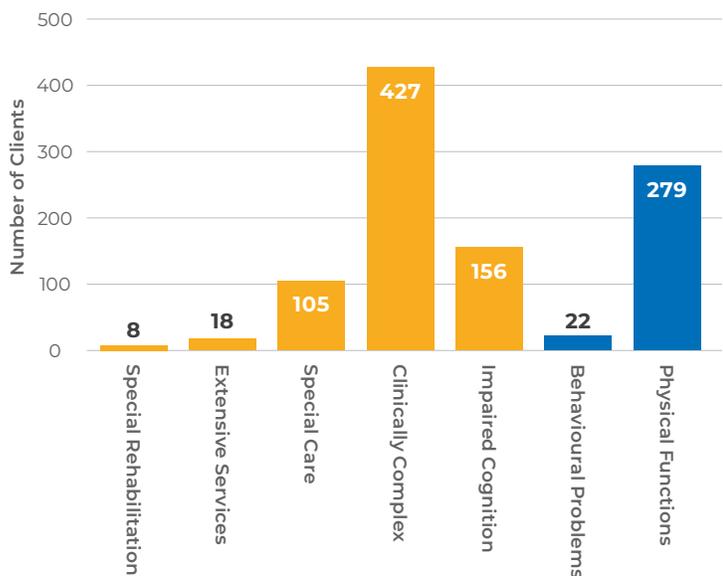
Figure 2. Age Distribution of Incident Clients to LTCFs in NL in 2019–20

- 5% of incident clients were <65 years, 17% were 65–74 years, 39% were 75–84 years, and 39% were ≥85 years.



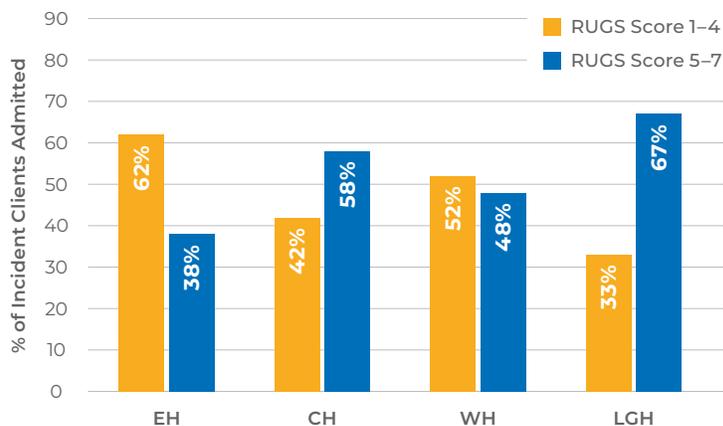
**Figure 3. Age and Sex of Incident Clients Admitted to a LTCF in 2019–20 Analyzed by RHA**

- In each RHA, the majority of clients were female. Labrador-Grenfell Health (LGH) had the lowest percentage of clients aged ≥85 years, and CH had the highest.



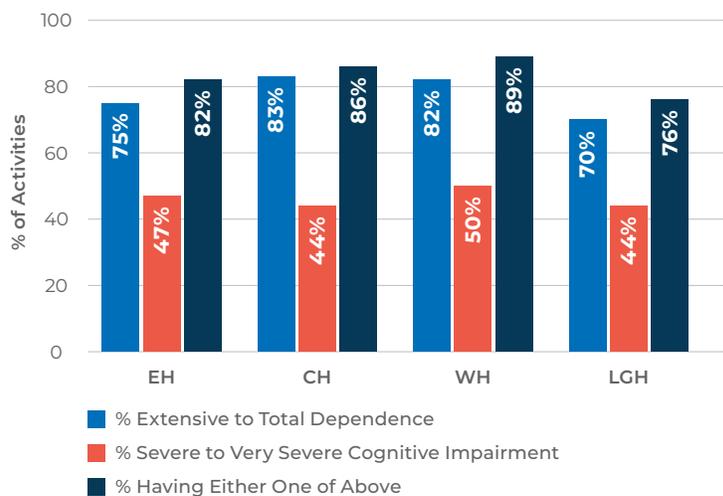
**Figure 4. Primary Reason for Admission Using the RUGs Hierarchical Classification in NL in 2019–20**

- The primary reasons for admission to a LTCF in the province were special rehabilitation, extensive services or special care required (RUGs score 1–3) in 13%, clinically complex (RUGs score 4) in 42%, impaired cognition or behavioural problems (RUGs score 5 and 6) in 18%, and decreased physical function (RUGs score 7) in 27%.



**Figure 5. Clinical Characteristics of Incident Clients Admitted Because of Impaired Cognition, Behaviour or Reduced Physical Function by RHA in 2019–20**

- The RUGs score in incident clients differed by region, with the highest proportion admitted for special rehabilitation, extensive service or special care, or because they were clinically complex (RUGs scores 1–4) in Eastern Health (EH) and the lowest in LGH.



**Figure 6. Activities of Daily Living and Cognitive Performance in All Clients Admitted to a LTCF in 2019–20 Analyzed by RHA**

- 82% of incident clients in EH, 86% in CH and 89% in Western Health (WH) had extensive/total dependence for the activities of daily living and/or severe to very severe cognitive impairment. The lowest was 76% in LGH.

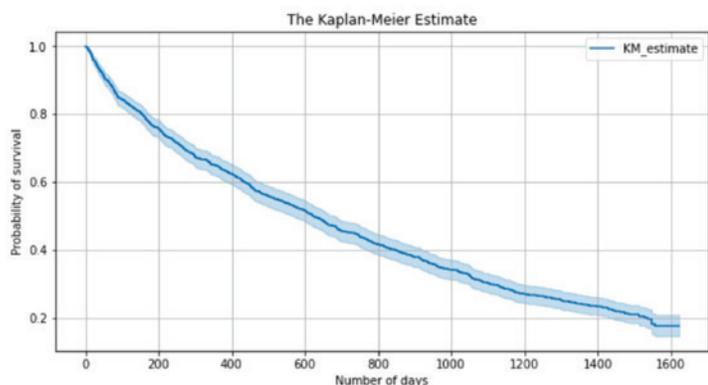


Figure 7. Survival of New Admissions to a LTCF in NL Analyzed for 2016–17

- The one-year survival of incident clients admitted in 2016–17 was 65%, two-year 45%, three-year 31%, and four-year 22%.

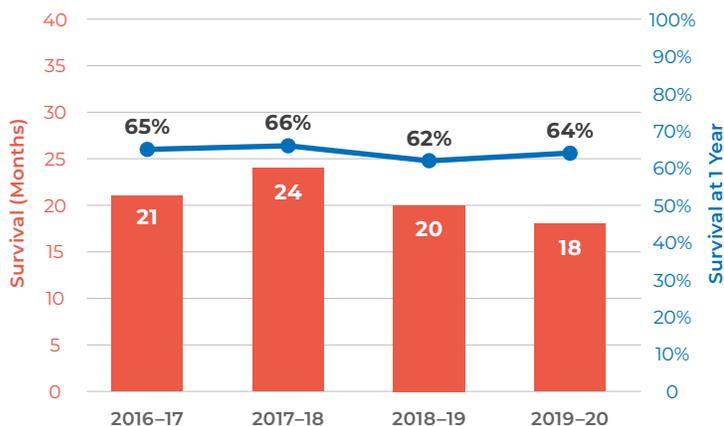


Figure 8. The Median Survival in Months and One Year Cumulative Percentage Survival for Each of the Four Annual Incident Cohorts From 2016–17 to 2019–20 in NL

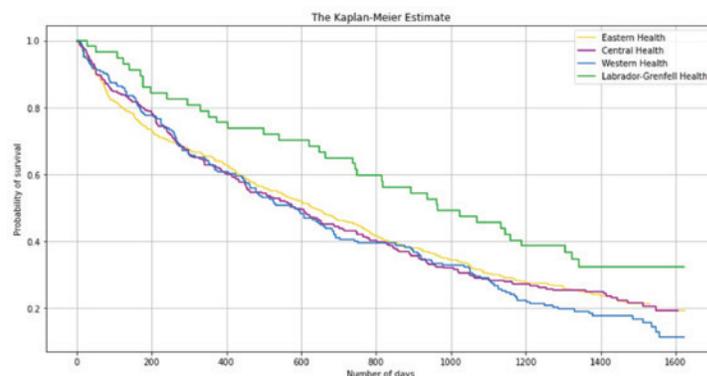


Figure 9. The Survival of Incident Clients in 2016–17 by RHA

- The different case mix of admissions to LTCFs in LGH is consistent with the better survival.

## Conclusions

- Over 1,000 new admissions to a LTCF occur every year in NL, whose average survival is 21 months.
- Limitations in access to a LTCF in CH may be the cause of the drop in the number of clients admitted comparing 2016–17 to 2019–20.
- LGH has a different case mix, compared to the other regions, with a low proportion aged  $\geq 85$  years, a lower proportion admitted because they had special needs or were clinically complex, and a lower proportion with extensive to total dependence for the activities of daily living.
- The vast majority admitted LTCF in NL had extensive to total dependence for the activities of daily living and/or severe cognitive impairment.
- Average survival of incident clients to LTCFs is less than two years. The better survival in LGH is consistent with the different case-mix of clients admitted to LTCFs in that region.

# The Demographic and Clinical Characteristics of Long-Term Care Residents by Regional Health Authority (2020)

## Objective

To describe the prevalence, demographic and clinical characteristics of long-term care facility (LTCF) residents in 2020, and to determine whether changes had occurred since 2016.

## Practice Points

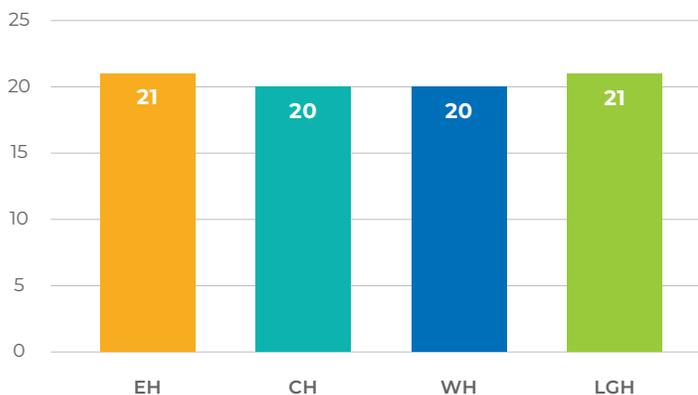
1. In 2016, there were 2,605 residents of LTCFs in the province, 66% of whom were female, and 42% 85 years or older.
2. Although the majority (78.4%) had no or minimal health instability, 80% had extensive/total dependence for the activities of daily living, and 53% had severe/very severe cognitive impairment.

## Data

The results of the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) questionnaire, completed every quarter on all residents by each LTCF, were provided by the NL Centre for Health Information (NLCHI) for the fiscal years 2016–17 to 2019–20.

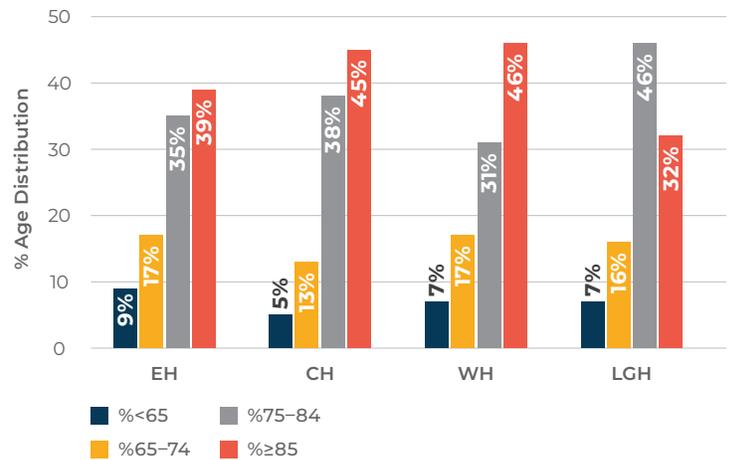
Annual mortality was calculated from the date of RAI in the first quarter of the year to the date of RAI in the first quarter of the next year.

## Results



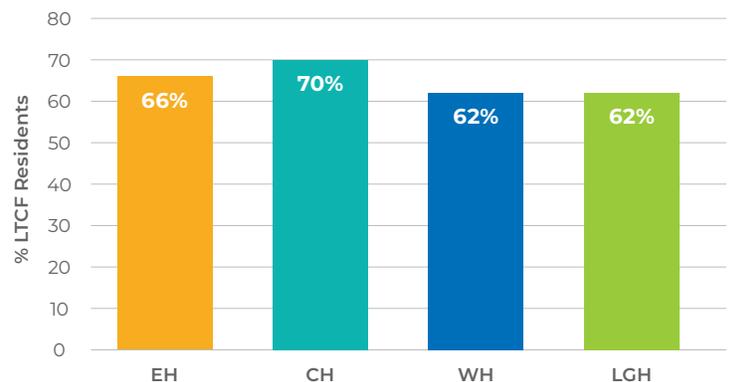
**Figure 1. The Prevalence of Residents Aged ≥65 Years/1,000 People Aged ≥65 Years for Each RHA in Q4 of 2019–20**

- The prevalence rate of LTCF residents aged ≥65 years was 20.3/1,000 people ≥65 years.



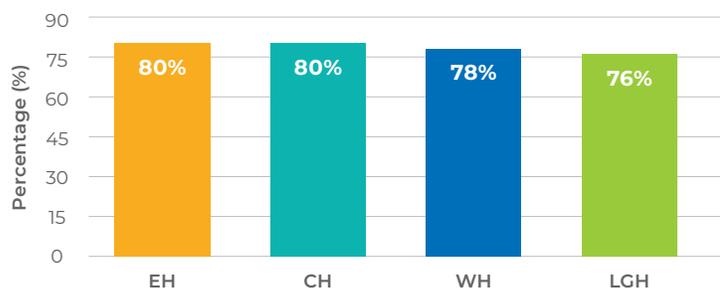
**Figure 2. Age Distribution of Residents of LTCFs in Q4 of 2019–20 by RHA**

- The age distribution in each RHA's population is reflected in the age distribution of the residents of LTCFs. Labrador-Grenfell Health (LGH) has the youngest population and has the lowest percentage of residents aged 85 years or older, whereas Central Health (CH) and Western Health (WH) have the oldest populations with the highest percentage that are aged 85 years or older.
- In 2019–20, 7.5% of LTCF residents in the province were aged <65 years, compared to 8.6% in 2016–17, and 42.1% were ≥85 years; little change from 2016–17 (42.4%).



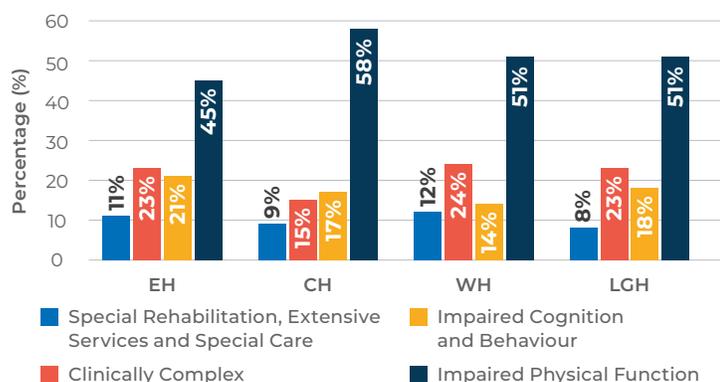
**Figure 3. Per Cent of Residents of LTCFs That Were Female in Q4 of 2019–20 by RHA**

- In 2019–20, 66% of residents of LTCFs in the province were female, which was unchanged from the previous three years.



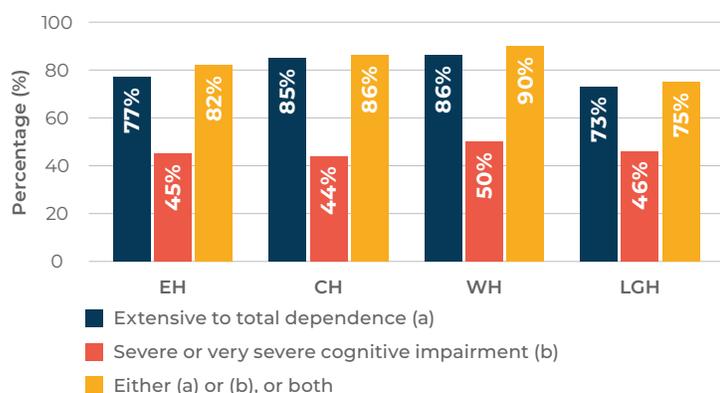
**Figure 4. Per Cent with no or Minimal Health Instability, Defined by the CHES Score, in LTCF Residents in Q4 of 2019–20 by RHA**

- 79.4% of provincial LTCF residents had no/minimal health instability in 2019–20, revealing little change in the previous three years.



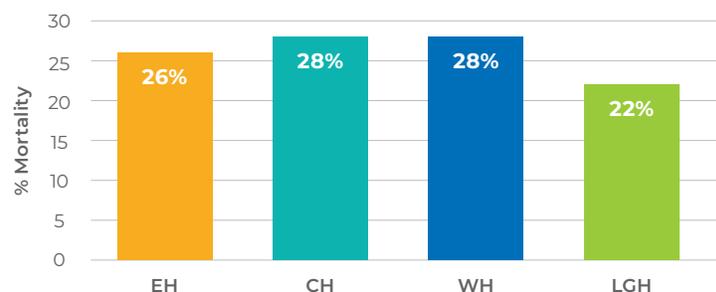
**Figure 5. The Primary Reason for Being in a LTCF, Using the Hierarchical RUGs Classification, in 2019–20 by RHA**

- One in ten residents had need of special rehabilitation, extensive services or special care and a further 22% were considered clinically complex. This differed little from 2016.



**Figure 6. Activities of Daily Living and Cognitive Impairment in Provincial LTCF Residents in Q4 of 2019–20 by RHA**

- In the province in 2019–20, 80% of LTCF residents had extensive/total dependence for the activities of daily living, 45% had severe/very severe cognitive impairment, and 84% had either one or the other, or both disability. Comparable percentages in 2016–17 were 81%, 46% and 85%.



**Figure 7. Average Annual Mortality of LTCF Residents From 2016–17 to 2019–20 by RHA**

- The average provincial annual mortality of residents of LTCFs was 26.4%.
- The differences in annual mortality reflects differences in case mix by RHA.

## Conclusions

- The age distribution of residents differed by region: the percentage less than 65 years was 4.5% in CH and 8.8% in Eastern Health (EH), whereas the percentage 85 years or older was 31.6% in LGH and 45.5% in WH.
- The proportion of residents requiring special services was one in ten and differed little by region. The vast majority of residents had either extensive to total dependence for the activities of daily living, or severe/very severe cognitive impairment, with the lowest rate being 75% in LGH.
- The average annual mortality of residents of LTCFs was 26%.

# Quality of Care in Long-Term Care Facilities by Region (2019)

## Objective

To compare quality of care in long-term care facilities (LTCFs) in the RHAs to that in Canada.

## Practice Points

1. The Resident Assessment Instrument-Minimum Data Set (RAI-MDS) facilitates collection of data on quality of care in LTCFs and is reported from five provinces to the Canadian Institute for Health Information (CIHI).
2. Choosing Wisely Canada recommends not to use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia. In 2018, antipsychotic use in residents of LTCFs was 33%, with 66% of this being inappropriate. Compared to 2016, there had been a 15% reduction in the use of antipsychotics.
3. Use of restraints in LTCFs has been high in NL — 12.4% of residents in 2018.
4. Falls cause more than 90% of hip fractures in the elderly, which predispose to earlier death.

## Data

This was obtained from reports by CIHI for 2019, and from the RAI-MDS collected by the NL Centre for Health Information (NLCHI) from 2016–17 to 2019–20.

## Results

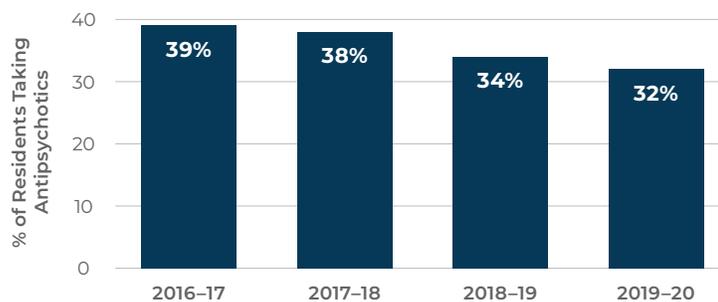


Figure 1. Per Cent of LTCF Residents Taking Antipsychotics in NL From 2016–17 to 2019–20

- There has been a 22% reduction in use of antipsychotics at LTCFs over the past four years.

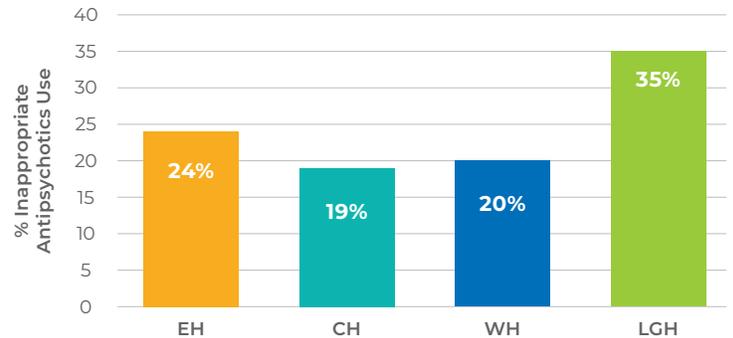


Figure 2. Per Cent of Residents of LTCFs with Inappropriate Use of Antipsychotics Analyzed by Region for 2019

- The per cent of residents in the province given antipsychotics for a potentially inappropriate reason was 23.1% compared to Canada's 20.2%. Of five provinces, NL ranked 3rd.
- The highest rate was in Labrador-Grenfell Health (LGH), but since 2017, this has been reduced from 50% to 35%.

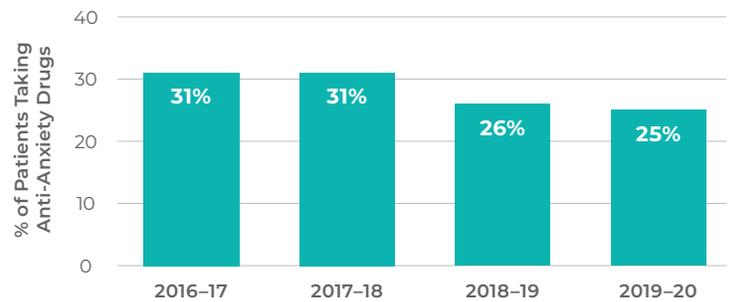


Figure 3. Per Cent of Residents of LTCFs Taking Anti-anxiety Drugs in NL From 2016–17 to 2019–20

- There has been an 18% reduction in the use of anti-anxiety drugs during the past four years.

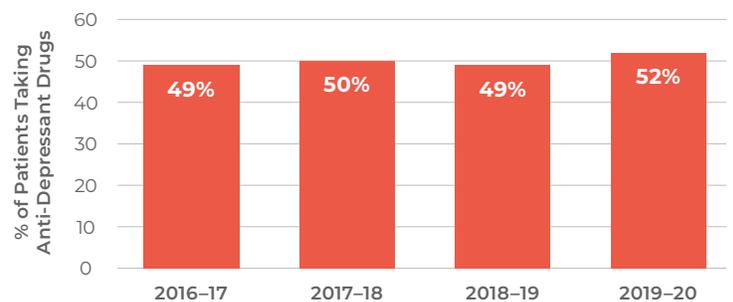


Figure 4. Per Cent of Residents of LTCFs Taking Anti-depressant Drugs From 2016–17 to 2019–20

- There has been a 6% increase in the use of anti-depressant drugs during the past 4 years.

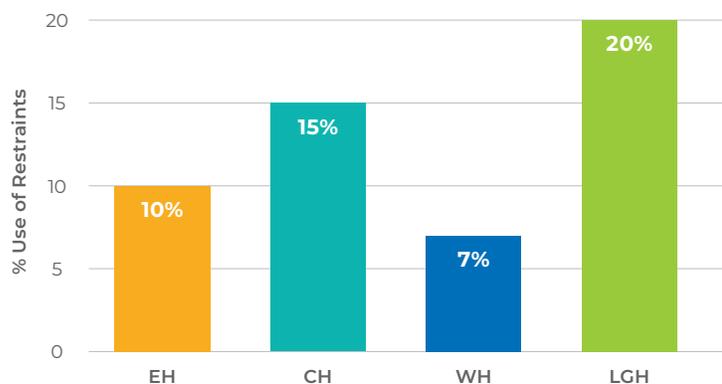


Figure 5. Use of Restraints in Residents of LTCFs Analyzed by Region for 2019

- The per cent of residents treated with restraints was 11.1, far higher than in Canada (4.6%). Of five provinces, NL ranked 5th. Only Western Health (WH) had a rate comparable to Canada’s rate, with the highest in LGH.

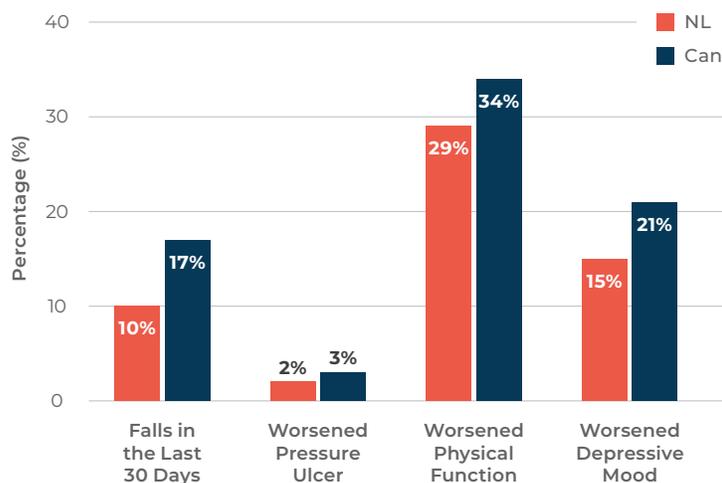


Figure 6. Falls, Ulcers, Physical Function and Depression in Residents of LTCFs in NL Compared to Canada for 2019

- Of five provinces, NL had the lowest rates for falls, worsened pressure ulcer, or physical function or depressive mood.

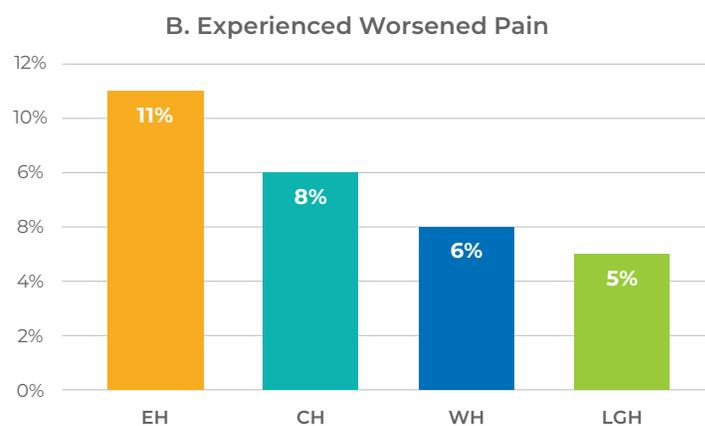
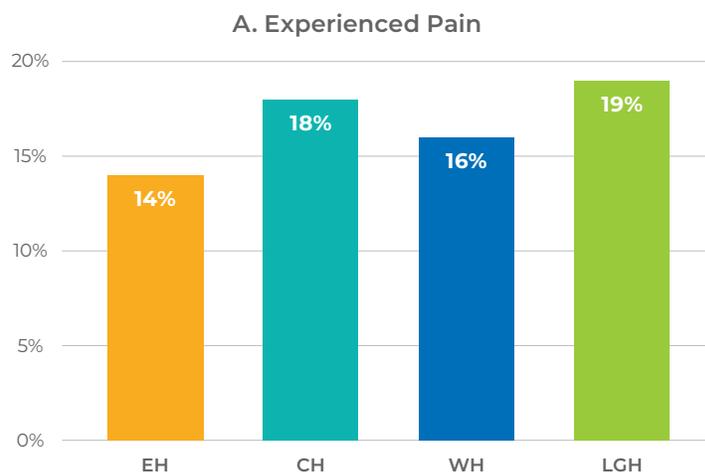


Figure 7. Pain in Residents of LTCFs Analyzed by Region in 2019

- Compared to Canada, a higher proportion of NL residents experienced pain (15.3% vs. 6.2%) but the proportion who experienced worsened pain was about the same (9.0% vs. 10.0%).

## Conclusions

- The rate of use of inappropriate antipsychotics in NL LTCFs is improving but remains quite high at 23% of residents.
- The rate of use of anti-anxiety drugs has also improved but the rate of anti-depressant drugs has increased somewhat.
- Use of restraints is a concern as use is higher than in the other four provinces.

# Improved Appropriateness of Ferritin Testing Following Introduction of Reflex Testing in Eastern Health’s Laboratory

## Guideline from Ontario Association of Medical Laboratories

Screening of the general population for iron deficiency is not indicated.

### Practice Points

1. Patients with microcytic anemia and at-risk groups with manifestations suggestive of anemia should be considered for ferritin testing.
2. Substantial screening for iron deficiency in low-risk groups without anemia (females >50 years, males) has been undertaken by Eastern Health (EH) family physicians (FPs).
3. In EH, audit, feedback and academic detailing were associated with a 14% reduction in ferritin testing, whereas in Central Health (CH), without this intervention there was an increase of 17%, and in Western Health (WH) a reduction of 4%.
4. In the EH biochemistry laboratory, reflex testing of serum ferritin was started in Jun 2020. A test was done when the blood count test revealed microcytic anemia, provided serum ferritin had not been performed within 90 days and sufficient blood sample was available.

### Methods (PI: Dr. E. Randell)

1. Data on Hb, MCV and ferritin were obtained from EH from Jan 2019 to Nov 2020. Anemia was defined as Hb < 130 g/L, MCV < 80 FL, and hypoferritinemia as < 50ug/L.
2. COVID-19 pandemic started 16 Mar 2020.

## Results

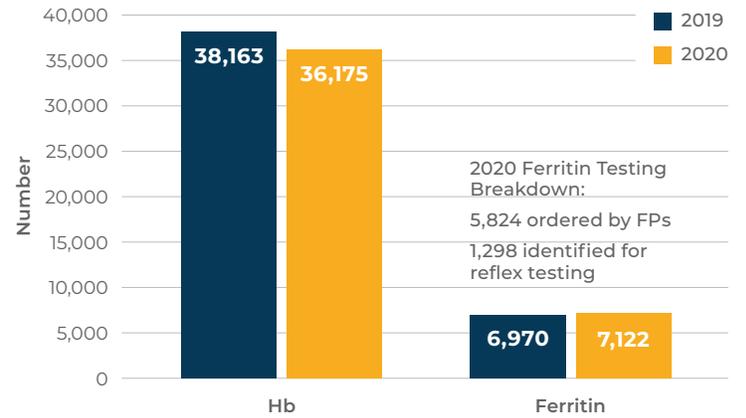


Figure 1. Average Monthly Hb and Ferritin Tests for 2019 and 2020

- There was no change in monthly number of ferritin tests in 2020, despite 1,298 tests being the result of reflex testing, and despite COVID-19.

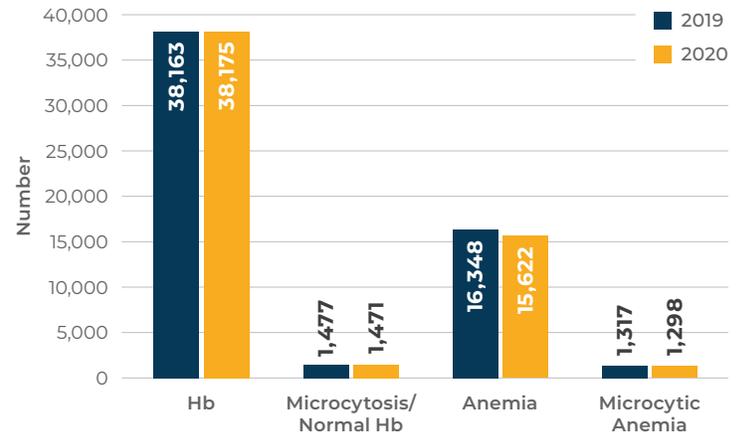
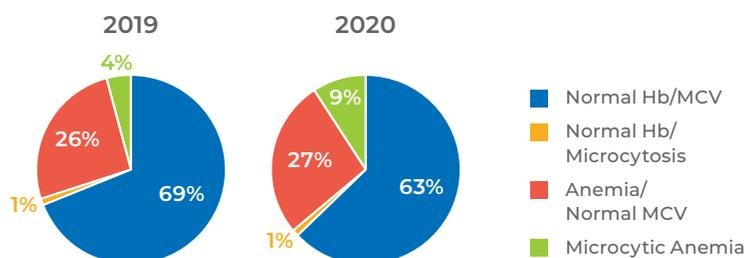


Figure 2. Monthly Average of Tests with Anemia and/or Microcytosis in 2019 and 2020

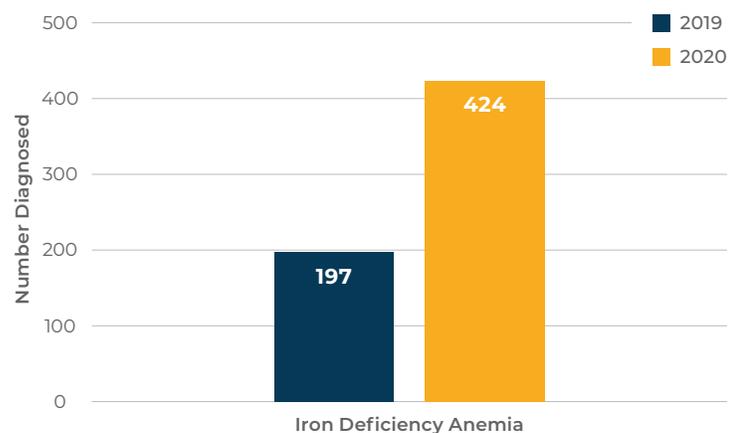
- 43% of blood count tests revealed anemia.
- 4% of tests revealed microcytosis.
- 90% of those with microcytosis were anemic.





**Figure 3. Percent Serum Ferritin Ordering by FPs Defined by Anemia and Microcytosis in 2019 and 2020**

- The number of ferritins ordered monthly in patients with normal Hb and MCV decreased by 12%.
- The number of ferritins performed monthly in patients with Hb < 130 G/L and MCV < 80 increased by 153% when reflex testing is included.
- In 2019, 69% of ferritins were performed in patients without anemia and microcytosis, and 4% in patients with microcytic anemia. In 2020, these proportions improved: 63% of ferritins performed were in those without anemia or microcytosis, and 9% in those with microcytic anemia.



**Figure 4. Diagnosis of Iron Deficiency Anemia in 2019 and 2020**

- There was a 115% increase in the monthly number with anemia, microcytosis and hypoferritinemia following the use of reflex testing.

## Conclusions

1. Although there was no change in the volume of ferritin testing comparing 2019 to 2020, despite COVID-19, introduction of reflex testing was associated with 115% increase in the diagnosis of iron deficiency anemia and 12% reduction of potentially unnecessary testing in those with normal Hb and MCV.
2. Further educational interventions to reduce potentially unnecessary testing of serum ferritin are required, particularly in low-risk groups such as women ≥50 years and men with normal Hb.

# Utilization of CT Scanning by Body Part and by Regional Health Authority

## Choosing Wisely Canada Recommendations

To view CT scan recommendations visit [https://qualityofcarenl.ca/wp-content/uploads/2019/05/CT\\_Scan\\_CWC\\_Recommendations.pdf](https://qualityofcarenl.ca/wp-content/uploads/2019/05/CT_Scan_CWC_Recommendations.pdf).

## Practice Points

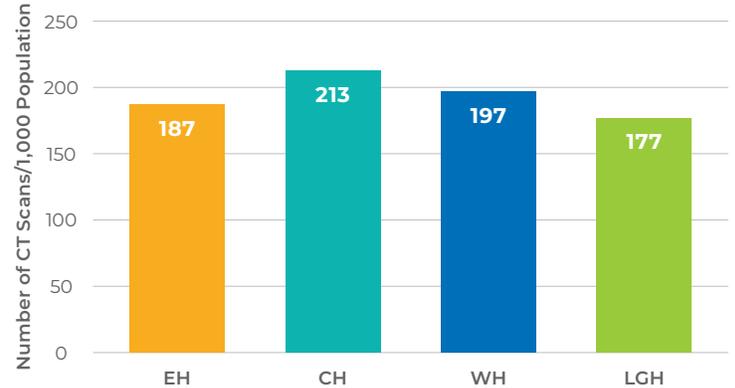
1. The benefits of CT scanning to diagnose a clinically important condition must be weighed against the dose of radiation and the consequent risk of cancer. The harms to benefits ratio should be of particular consideration in children and younger adults.
2. NL has the highest number of CT units/million population in Canada (28.7). The province with the next highest rate was New Brunswick, at 21.8.
3. In NL, the use of CT scanning had increased by 37% from 2008 to 2017.

## Data

This was obtained from the NL Centre for Health Information (NLCHI) and analyzed by body part scanned and by Regional Health Authority (RHA).

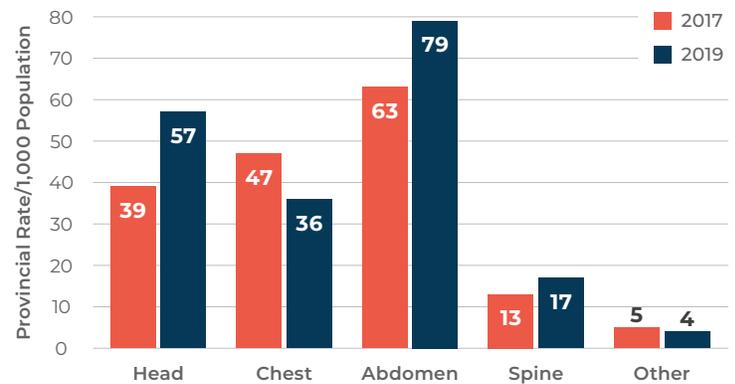
Expression of CT use/1,000 population facilitates comparisons across RHAs. The populations in Eastern Health (EH), Central Health (CH), Western Health (WH), and Labrador-Grenfell Health (LGH) in 2020 were estimated to be 318,453; 91,846, 76,746; and 36,441, respectively.

## Results



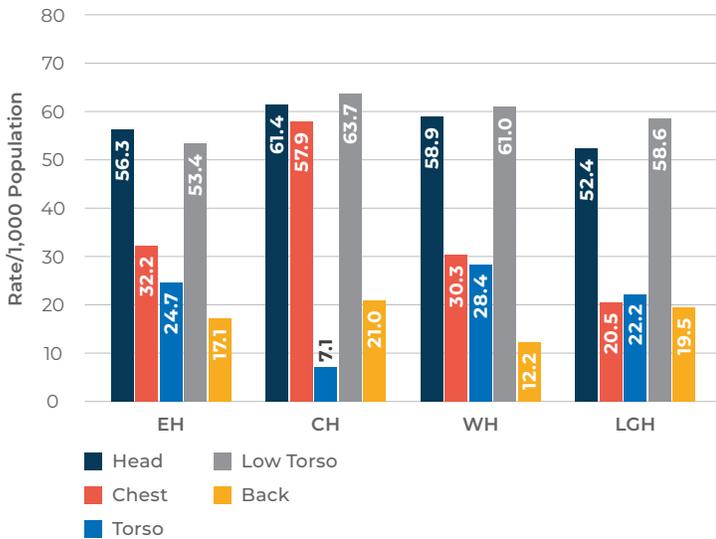
**Figure 1. The Number of CT Scans/1,000 Population Analyzed by RHA in 2019**

- The provincial annual rate of CT scans was 192/1,000 people in 2019 (N=100,725). This was compared to the Canadian rate of 143. Of the ten Canadian provinces, NL has the second highest rate after New Brunswick.
- The number of scans undertaken in EH was 59,562, CH 19,600, WH 15,095, and LGH 6,468.



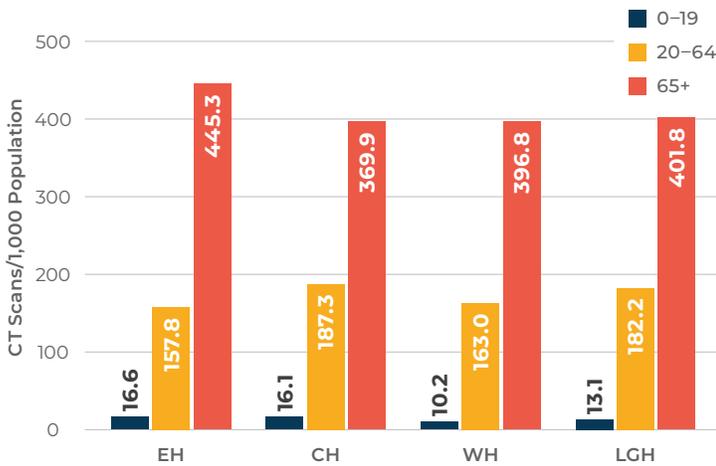
**Figure 2. The Provincial Rate/1,000 Population of CT Scans Analyzed by Body Part in 2017 and in 2019**

- During the past two years, the rate of head scans and of abdomen scans in particular increased.



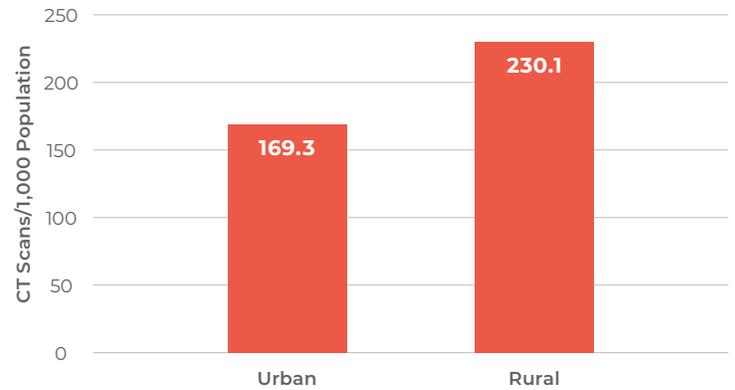
**Figure 3. Comparison of Rates/1,000 Population of CT Scans by Body Part in Each RHA**

- CH has the highest rates for CT head, chest, low torso, and back.



**Figure 4. Rates of CT Scans/1,000 Population for Groups Aged 0-19 Years, 20-64 and 65 Years or Older Analyzed by RHA in 2019**

- EH has the highest rate for those aged 0-19 and 65+, while CH has the highest for those aged 20-64.



**Figure 5. Rates of CT Scans/1,000 Population for Urban vs. Rural Groups in 2019**

- The rate of CT scans in rural NL is 36% higher than in urban areas.

## Conclusions

1. NL's rate of CT scans/1,000 population is 34% higher than the rate for Canada. The highest regional rate in the province is in CH.
2. The rate of CT scanning/1,000 population is highest in seniors and in rural NL.
3. Adherence to Choosing Wisely Canada recommendations should reduce the rates of CT scanning.

# Virtual Care in High Risk Patients With Diabetes

## Objective

To develop a virtual care team focused on people with diabetes at risk for poor outcomes.

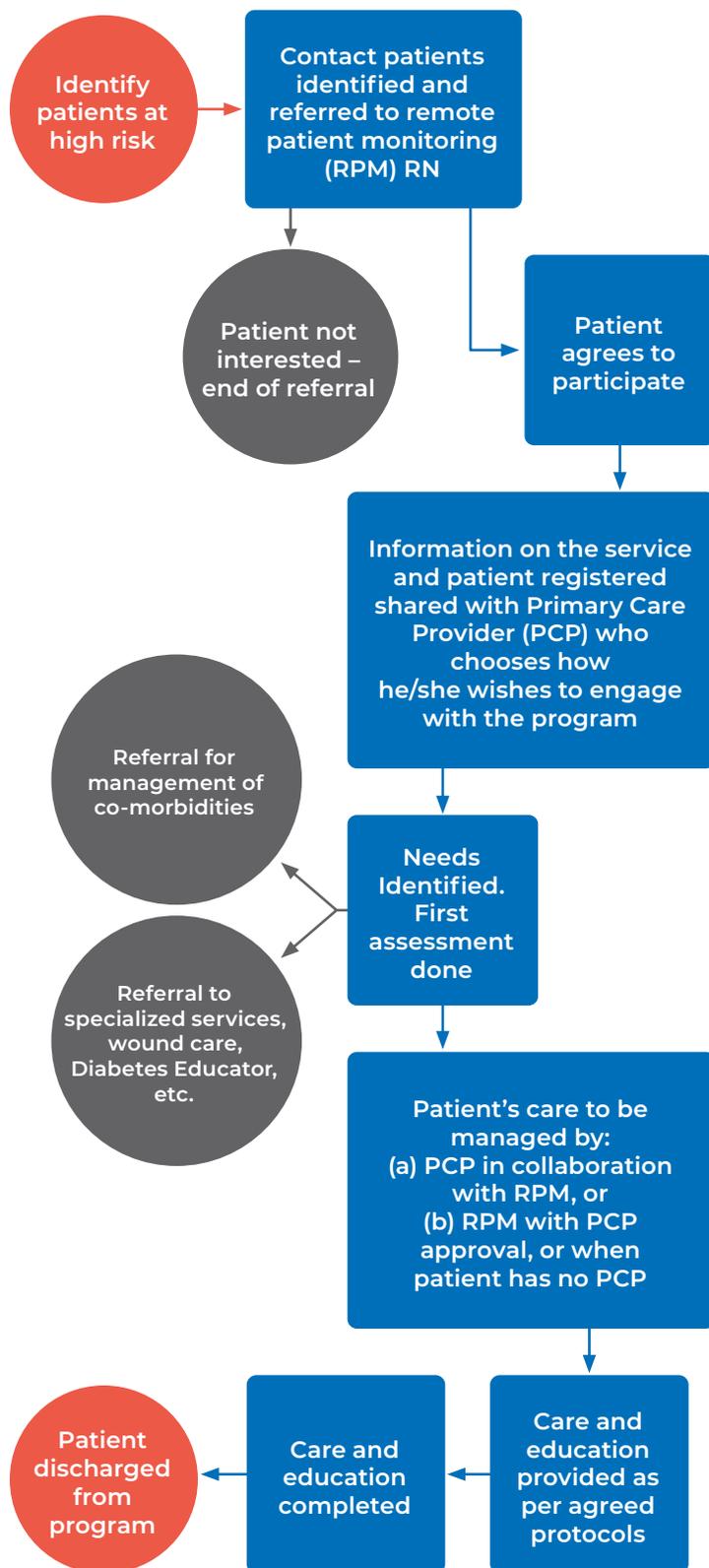
## Practice Points

1. People with chronic disease often have gaps in care and challenges with self-management.
2. An effective virtual care team integrating service providers with primary care may address some gaps and support self-management.
3. Innovation is required to achieve true integration across the team and with patients.

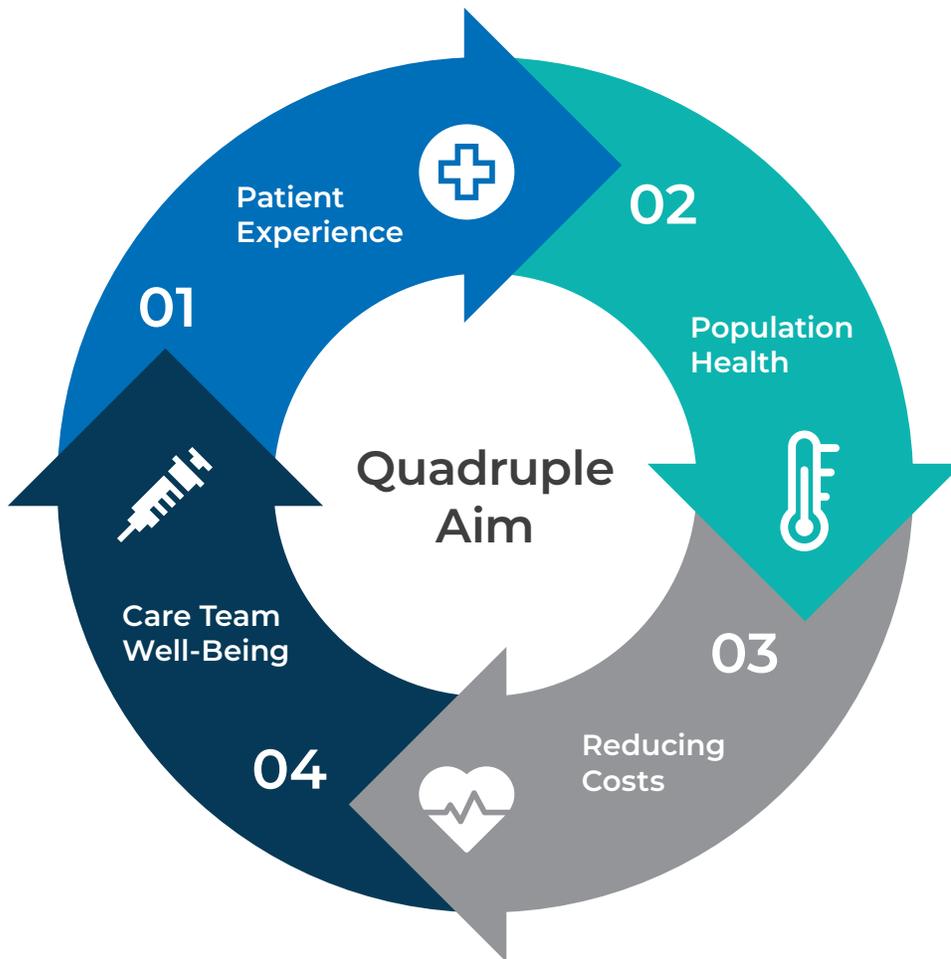
## Methods (PI: Dr. B. Barrett)

1. The team will consist of existing resources linked in new ways (Remote Patient Monitoring, Diabetes educators, primary care and specialist physicians, and others such as mental health services).
2. Patients will be identified from existing databases and offered an opportunity to participate.
3. Focus will be on identifying gaps and care needs, prevention of adverse outcomes, team inter-referral and communication using tools such as the e-Health Record (EHR) and e-Medical Record (EMR).
4. Eastern Health, the NL Centre for Health Information (NLCHI) and researchers from the Faculties of Medicine and Nursing at Memorial University are involved. The hope is to expand provincially and to include other chronic diseases over time.
5. This work will be linked to the work of Diabetes Action Canada, the Strategy for Patient Oriented Research (SPOR) network, and will engage patients as research team members.

## Patient Flow



- The program will be fully evaluated by incorporating feedback from the participants with diabetes and health care providers. The range of outcomes will include process measures, health outcomes, self-reported outcomes, and cost effectiveness.
- The evaluation will be based on the quadruple aim framework.



## Conclusions

1. This program is in development and external funding is being sought. The initial pilot phase is expected to last for three years .

# Prevalence of Point-of-Care Ultrasonography in NL

## Objective

To determine the prevalence of point-of-care ultrasonography (POCUS) devices in NL and to characterize the patterns of POCUS use among physicians in NL.

## Practice Points

1. Physicians describe POCUS as essential for patient care, especially for procedural guidance, with rural physicians highlighting its utility in making a timely and correct diagnosis.
2. Barriers to POCUS training include rural worksites, travel costs, difficulty getting time off work, lack of institutional support, and availability of POCUS machines.
3. Implementing POCUS training by engaging both rural clinics and urban centers using competency-based frameworks can provide an excellent learning experience for residents and nurse practitioners in NL.

## Methods (PI: Dr. G. Sheppard)

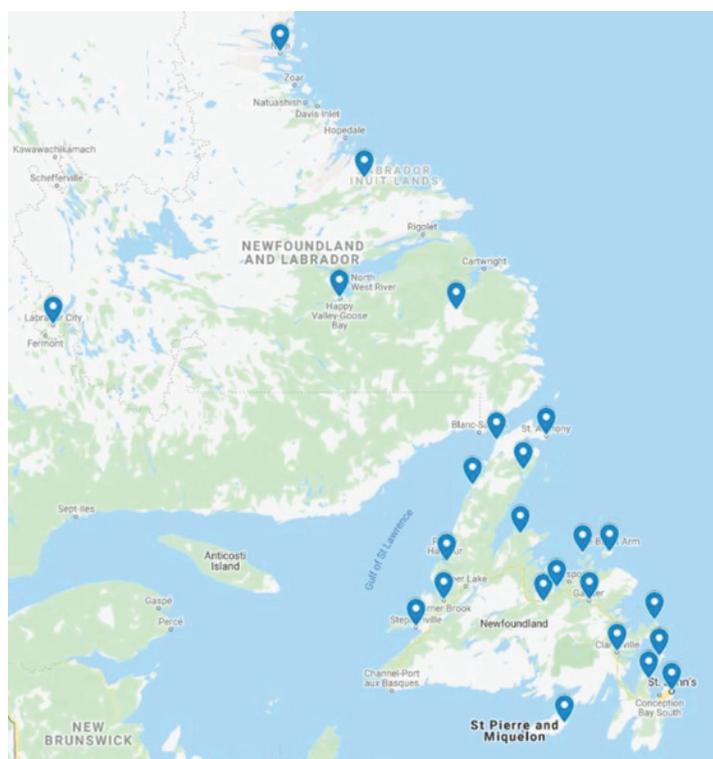
1. Data were collected in two phases with a combination of quantitative and qualitative methods.
2. In the first phase, the prevalence of POCUS devices in NL was estimated using purchase orders obtained under the Access to Information and Protection of Privacy Act (ATIPPA) from the four provincial Regional Health Authorities (RHA). The total number of POCUS devices within the geographic limits of the four RHAs were cross-verified through email or telephone with respective administrative officers.
3. In the second phase, the patterns of POCUS use among ten physicians practicing in NL were assessed through a standardized questionnaire to determine the level of confidence in using POCUS and a semi-structured theme-based interview to characterize the patterns of POCUS use in their clinical practice.

## Results

**Table 1. Prevalence of Point-of-Care Ultrasonography Devices in NL**

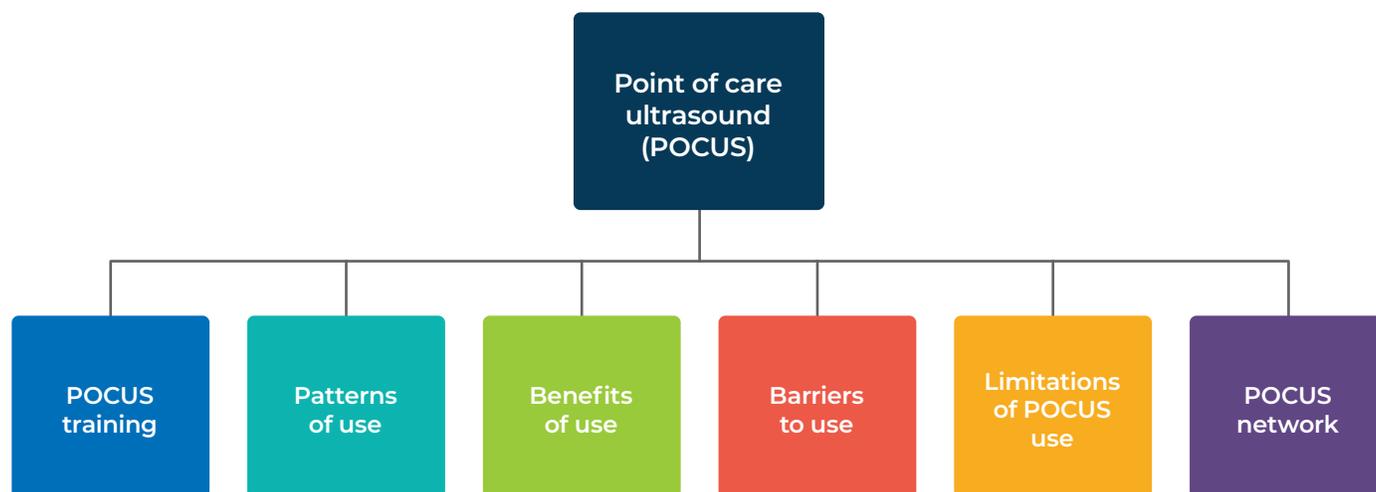
Location	Population Census 2016	Devices per Region	Devices per 100,000
Labrador-Grenfell	36,072	14	38.8
Western	77,687	12	15.4
Central	92,690	4	4.3
Eastern	313,267	35	11.2
<b>Total</b>	<b>519,716</b>	<b>65</b>	<b>12.5</b>

- The overall prevalence of POCUS devices in NL was 12.5 per 100,000 population.
- The highest prevalence of POCUS devices was in Labrador-Grenfell Health.



**Figure 1. Location of Point-of-Care Ultrasonography Devices in NL**

- The prevalence of POCUS devices in urban centers in NL was 20.0 versus 12.6 per 100,000 population in rural NL.



**Figure 2. Common Themes Identified From the Interviews**

- Participants reported that there were significant barriers in training and acquiring competence in POCUS, especially for rural physicians.
- The majority of physicians in NL described the importance of continuing medical education and support for POCUS and endorsed the idea of developing a province-wide POCUS network.
- There were significant concerns amongst physicians about privacy, documentation, and legal accountability of POCUS findings that need further research and assessment.

**Table 2. Degree of Comfort With Using POCUS**

Most Comfortable	Least Comfortable
<ul style="list-style-type: none"> <li>• Trauma</li> <li>• Early pregnancy</li> <li>• Pneumothorax</li> <li>• Aortic aneurysm</li> <li>• Ascites</li> </ul>	<ul style="list-style-type: none"> <li>• Testicular torsion</li> <li>• Pneumonia</li> <li>• Deep vein thrombosis</li> </ul>

**Table 3. Degree of Confidence in Doing Procedures Using POCUS**

Most Confident	Least Confident
<ul style="list-style-type: none"> <li>• Central lines</li> <li>• Arterial lines</li> <li>• Peripheral intravenous lines</li> <li>• Paracentesis</li> <li>• Thoracocentesis</li> <li>• Abscess drainage</li> <li>• Jugular venous pressure assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Pericardiocentesis</li> <li>• Peripheral nerve blocks</li> <li>• Peritonsillar abscess drainage</li> <li>• Lumbar puncture</li> <li>• Peripherally inserted central catheter (PICC)</li> </ul>

## Conclusions

1. The prevalence of POCUS devices in NL was 12.5 per 100,000 population. The majority of the POCUS equipment is located in urban locations.
2. All participants were confident in their overall ability to acquire and interpret images and operate the portable ultrasound device.
3. The analysis of 10 interviews showed that there were barriers to training in POCUS for rural physicians, suggesting a need for a province-wide POCUS training network.

# Are BRCA Carriers in NL Receiving Cancer Screening According to Risk Management Guidelines?

## Objective

To evaluate uptake of recommended risk-reducing interventions in NL women at high hereditary cancer risk due to BRCA mutation.

## Practice Points

1. Inherited mutations in tumour suppressor genes BRCA 1 and 2 cause hereditary cancer predisposition syndrome and elevated lifetime risks of malignancy.

Lifetime Risk	BRCA 1	BRCA 2
Breast	60–75%	40–60%
Ovarian	20–40%	15–20%
Prostate	30%	30%

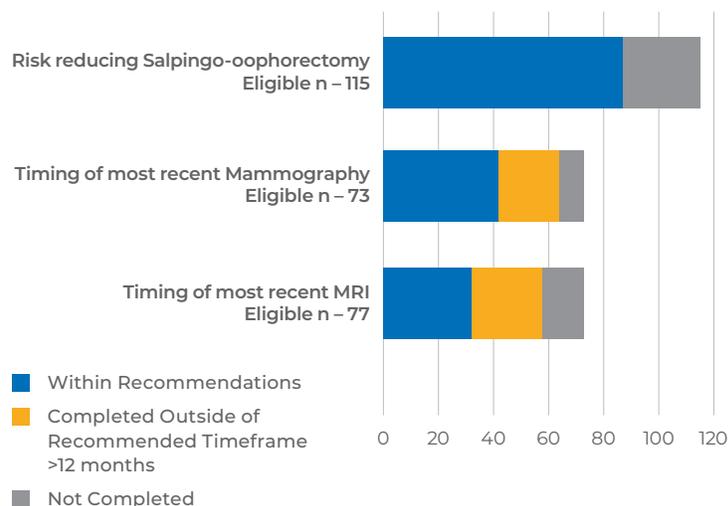
2. Risk Reducing Salpingo-oophorectomy (RRSO) in female BRCA carriers confers a 70% improvement in all-cause mortality.
3. RRSO is recommended for women with BRCA1 between 35–40y and BRCA2 40–45y.
4. Annual breast MRI age 25–70y with the addition of annual mammography at 30–70y has a sensitivity of >90% in the detection of breast cancers at an early stage.

## Methods (PI: Dr. L. Dawson)

1. A comprehensive province-wide study of all female BRCA carriers in NL.
2. Evaluation of rates of breast MRI, mammography, risk reducing salpingo-oophorectomy.
3. Determination of predictors of successful adherence to cancer screening and prevention recommendations.

## Results

- Of 276 BRCA carriers identified in NL, 156 are living females currently residing in NL.
- 57/156 (37%) had breast cancer; 8/156 (5%) had ovarian cancer.



**Figure 1. Adherence to Recommended Screening and Prevention in BRCA Carriers**

- Of women eligible for breast MRI, 47% (36/77) accessed MRI within 12 months, as per recommendations.
- Screening mammography was done within the 12 months guidelines in 58% (42/73) women.
- Risk reducing salpingo-oophorectomy has been completed in 76% of women (87/115).
- Access to speciality cancer genetics care was the most important factor influencing compliance with optimal screening and prevention.

Women who had received speciality care were more likely to be very adherent with prevention or screening (73.2% versus 13.4%;  $p < 0.001$ ).

## Conclusions

1. Consultation with speciality clinics (virtual or in person) offering cancer genetics expertise was the strongest predictor of adherence to inherited cancer risk management guidelines.
2. Findings support the development of a provincial system of identification and follow up management for high risk families.



# An Introduction to Learning Health Systems

## Objective

One of the aims of NL SUPPORT is to promote Learning Health Systems for the province.

## Practice Points

1. Learning Health Systems (LHS) are systems in which “science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience” (Institute of Medicine, 2015).
2. LHS rely on vision, data, analytics, leadership, organization and culture to foster and achieve improvements in practice and systems of care.
3. LHS merge health care delivery with research, data science, and quality improvement processes continuously informed by practice and seeking to influence practice in turn.
4. The concept of the Eastern Health Regional Health Authority (RHA) as a “Living Lab” and the NL Centre for Health Information (NLCHI)’s development and subsequent use of the Electronic Health Record is consistent with a LHS.
5. Engagement of health care providers of all types is necessary in a LHS.

## Methods

1. NL SUPPORT will work with NLCHI and others to ensure that data necessary to evaluate current health care and efforts to improve it are available and used.
2. NL SUPPORT, through Quality of Care NL and Choosing Wisely NL, will support researchers, practitioners and policy and decision-makers in formulating, implementing and interpreting learning health cycles throughout the system.
3. NL SUPPORT will engage in training activities locally and nationally (via the Strategy for Patient-Oriented Research (SPOR) National Training Entity) and will support Health System Impact Fellows.

4. NL SUPPORT will work to increase the role and engagement of patients/citizens and health care providers in LHS activities and planning.

## Results

- Examples of current activities in support of a LHS in NL include the role of Quality of Care NL in supporting 1) the work of Health Accord NL, 2) the development and evaluation of a virtual care service for diabetes, 3) introduction and evaluation of electronic ordering systems, and 4) the multiple campaigns to reduce low-value care.



Figure 1. A Learning Health System

## Conclusions

1. In the coming five years, NL SUPPORT will strive to increase the assets and reduce the gaps towards developing a culture of LHS in NL.
2. Assets and gaps toward creating LHS in NL were summarized in a rapid evidence synthesis in early 2019. The report is available at: [https://www.mcmasterforum.org/docs/default-source/product-documents/rapid-responses/creating-rapid-learning-health-systems-in-canada---appendix-b11-nl.pdf?sfvrsn=1c2554d5\\_2](https://www.mcmasterforum.org/docs/default-source/product-documents/rapid-responses/creating-rapid-learning-health-systems-in-canada---appendix-b11-nl.pdf?sfvrsn=1c2554d5_2) (accessed 25 Jan 2021).

# Services for Seniors Living with Hearing Loss in NL

## Objective

To understand the support and service needs of seniors living with hearing loss (HL) in NL and provide this information to policy makers.

## Practice Points

1. There is a need to bridge the gap of cost and access to health care, specifically in rural areas, to facilitate early intervention and treatment of HL.

## Methods (PI: Dr. A. Pike)

1. Using a patient-oriented research (POR) approach, the HL community were involved in the research process from inception to completion.
2. A Patient Advisory Committee (PAC) was formed of five individuals who had HL. The PAC, along with patients, government, and the Canadian Hard of Hearing Association-NL (CHHA-NL) worked with the researchers through all stages of the research project.
3. A Grounded Theory (GT) approach, which is closely aligned to the guiding principles of patient engagement, guided the research process — the researcher values the expertise of the patient and experiential knowledge as evidence.
4. Sample selection and size were not predetermined but continued until no new themes/categories emerged. Researchers simultaneously collected, coded, and analyzed data until the core category of “embodying hearing loss” emerged.
5. 68 participants included seniors across NL over the age of 50 in St. John’s, Labrador, Grand Falls-Windsor, and Corner Brook that self-identified as having HL.
6. Six focus group interviews and 39 individual interviews were completed. Interviews were audiotaped and transcribed verbatim. Transcriptions were used to code themes which were then reviewed by PAC members to ensure themes/categories were relevant to patients and project objectives.

## Results

- The psychosocial process ‘embodying hearing loss’ was found to be a gradual process that changes over the trajectory of an individual’s lifespan.
- There are three main theoretical constructs to the process with various sub-categories in each construct:
  - ◊ ‘Realizing that something is just not quite right with my hearing’ captured individuals’ earliest experiences in awakening to the fact that they had HL;
  - ◊ ‘Confronting the issue’ captured individuals’ experiences in accessing health care services and supports for their hearing loss; and
  - ◊ ‘Adjusting to a new norm’ captured individuals’ experiences in developing management and advocacy skills in living with hearing loss.

Realizing that something is just not quite right with my hearing	Confronting the issue	Adjusting to a new norm
Justifying hearing loss	Accessing services: engaging with health care professionals	Recognizing psychosocial and device challenges
Managing the invisible	Getting the news: receiving the diagnosis	Developing coping strategies
Reaching a turning point	Fine-tuning: teasing out options	Envisioning the future

Figure 1. The Constructs Embodying Hearing Loss

**Listen Here**

Hearing loss can affect our safety, learning, work, relationships and ability to communicate **AT ANY AGE.**

20% of adults over 19;  
 40% of adults between 40-59;  
 80% of those aged 60-79  
 have hearing loss.

Taking care of your Hearing Health is an **IMPORTANT** part of healthy living!

**Be Proactive : What YOU can do !!!**

**BE AWARE** hearing loss can develop gradually and may not affect sound quite like we expect- if unsure, **GET** your hearing checked.

**GET TESTED** by an Audiologist, who can explain test results, make recommendations and refer you to appropriate services.

**RECOGNIZE** the early signs of hearing loss:

- Difficulty understanding conversations
  - Need to move closer to hear
  - Need to see speakers face
  - "Miss-hearing" words
- Asking others to repeat themselves
- Relying on others to relay conversations
  - Turning up volume on TV
  - Sounds are dull or muffled
  - Buzzing or ringing in the ears.

**DISCUSS** your concerns with your family doctor.

**TAKE CARE** of your hearing health so you can continue to enjoy your family, friends and community life.

Get additional information  
 Canadian Hard of Hearing Association Email [info@chha.ca](mailto:info@chha.ca) phone 1-800-263-8068

Produced by Pike/Young Research Team Memorial University of Newfoundland  
 contact: [aprilpike@mun.ca](mailto:aprilpike@mun.ca)

## Conclusions

1. Further research to examine the role that self-efficacy and other motivators play in disclosing HL is needed. Knowledge gleaned from such research can inform the development of a national screening program for HL and facilitate the development of patient-oriented healthy public policies.
2. Reduced access to health care in rural areas occurs due to increased transportation difficulties, fewer providers, and financial constraints.
3. A process or strategy to address the needs of the HL community is critical.

Figure 2. Listen Here Poster for the Canadian Hard of Hearing Association

Visit <http://listenherenl.com/> for more information.

# Introduction to a Pilot Study on Infant Feeding eHealth Resource to Assist Expecting Parents to Achieve Desired Goals (iFEED)

## Objective

To determine whether targeted interventions help pregnant parents reach their infant feeding goals and improve breastfeeding rates.

## Principles

- We aim to respect parents' choices and intentions while providing them with the educational and support resources to make an informed decision.
- We want to ensure that parents are aware of any barriers and struggles other parents have faced and to help them feel more prepared or know where to go if they have a similar experience.

## Practice Points

1. Breast milk is the optimum nutrition source for infant development and growth. Benefits of breastfeeding include a reduced risk of infections, sudden infant death syndrome (SIDS), and infant mortality, as well as reduced risks of postpartum hemorrhage, and ovarian and breast cancers in mothers.
2. Early breastfeeding (EBF) to six months is uncommon amongst women in NL and breastfeeding rates remain lower than any other province in Canada.
3. Maternal attitudes towards breastfeeding can be measured through the Iowa Infant Feeding Attitude Scale (IIFAS) and are shown to be a strong predictor of breastfeeding intent, initiation and duration.

## Methods (PI: Dr. L. Twells)

1. Design: the pilot study will follow a pre-test post-test single group design to evaluate the feasibility and effect of an eHealth information resource on women's breastfeeding intent, efficacy, and perceived support.

This pilot will precede a larger provincial pragmatic randomized control trial. We have chosen to pilot the intervention group specifically as the control group will consist of usual care.

The eHealth resource was designed by a collaboration between researchers, health care professionals and Perfect Day, a creative branding agency.

2. Participant Recruitment: 50 pregnant parents, aged 18 or older, expecting their first single child will be recruited for the study. Recruitment will take place via social media and posters in local clinics with high traffic of mothers.
3. Intervention: the intervention will consist of an educational animation with the IIFAS embedded into it, and an eHealth resource in the form of a webpage.
4. The webpage will include resources such as education, answers to common questions, and videos to help support a pregnant woman in their infant feeding journey.
5. The intervention begins with a Qualtrics survey that will collect demographics information, a self-efficacy questionnaire, and a perceived social support questionnaire.
6. Participants will then be asked to watch an animation that will guide participants through the IIFAS questions and briefly explain what their response says about their infant feeding preferences, as well as common challenges associated with this feeding method.
7. The challenges have been identified by previous research within the province.
8. Participants will then be directed to resources to help ensure they receive the best information and support to meet their infant feeding goals. They will also be linked to the BabyFriendlyNL website.
9. Data Collection: participants will be given a link to a Qualtrics survey, which will collect demographic information as well as perceived support and self-efficacy.
 

Support will be measured using the Multidimensional Scale of Perceived Social Support and self-efficacy will be measured using the General Self-Efficacy Scale (GSE).
10. They will also be given access to an animation that has the Iowa Infant Feeding Attitudes Scale (IIFAS) questionnaire embedded within it to assess their infant feeding attitudes.

# Dysphagia and Oral Health: Implementing a Modified Free-Water Protocol in Long-term Care Residents

## Objective

To examine the feasibility of implementing a modified free-water protocol with oral hygiene care.

## Practice Points

1. Routine oral hygiene care facilitated by a nursing staff member with a child-sized soft toothbrush was well-tolerated in older adults with neuro-cognitive decline.
2. The Registered Dental Hygienist (RDH)'s oral assessment and debridement of accumulations and biofilm can be effectively managed in the patient's own accommodation.
3. Familiarity with the clinician, and the routine of the twice-daily oral cleaning promotes tolerance and cooperation. Individuals who can participate in their own oral hygiene self-care should still be encouraged to do so.
4. The modified free-water protocol aims to allow patients to quench their thirst with the idea that aspiration of water is likely to be a "benign" event. It is well tolerated and does not increase risk of respiratory infections in a cohort of older adults with dysphagia.

## Methods (PI: Dr. R. DiDonato)

1. The participants (N=28) recruited and consented were older adult residents with neuro-cognitive degenerative disease from four nursing units at the Pleasant View Towers long-term care facility. These participants were randomly assigned either to the experimental (modified free-water protocol with oral care) or control condition ('friendly' visit) of the study. This prospective clinical trial was registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) (NCT03672552).
2. All participants received a clinical bedside oral-pharyngeal dysphagia and mealtime assessment, the dental hygiene assessment and debridement of accumulations and biofilm (RDH), and a nutrition assessment.

3. A) The Experimental group received RDH debridement prior to implementing the modified Frazier free-water protocol (FFWP). The FFWP allows for ingestion of thin ('free') or non-thickened water or ice chips any time before or 30 minutes after a meal, following appropriate oral hygiene (tooth-brushing) prior to ingesting of thin water. The resident was approached twice daily (Monday-Friday) and offered the extra oral care prior to being offered the 3-ounces of thin-unmodified water.

B) The Control group received the RDH debridement at the end of the study period. The Control group received the 'sham' intervention; they were approached daily (Monday-Friday) and offered a 5-minute 'friendly' visit from a research assistant.

## Results

- There was no significant difference for symptoms of respiratory infections (congestion, cough, fever, diagnosis of pneumonia or admission to hospital), but the power to detect a difference was low. However, feasibility for doing FFWP was demonstrated.

## Conclusions

1. The FFWP was feasible and gave no signal for harm (first do no harm), consistent with reports from studies of older adults with dysphagia.
2. The FFWP offers an option for management of fluid restrictions for those with dysphagia, autonomy, and the pleasure and comfort for continued ingestion of thin water.

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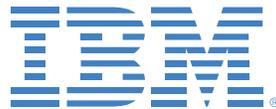
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