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Research

Primary health care services for patients with chronic disease in Newfoundland and Labrador: a descriptive analysis

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Abstract

Background: Newfoundland and Labrador has a rapidly aging population, much of which is rural, with poor health behaviours and high rates of chronic disease. These factors contribute to a unique challenge in health care delivery. Our aim was to describe the availability of publicly funded primary health care programs and services delivered by regional health authorities across the province.

Methods: We performed a descriptive analysis using data from a cross-sectional provincial primary health care survey deployed across Newfoundland and Labrador. Survey data included location, disease-specific chronic disease prevention programming, types of routine primary care, allied health prevention and promotion, chronic disease prevention and management services, and team-based care. The mode of service delivery was identified for most programs and services.

Results: Surveys were returned by 153 sites (99.4% response rate). Family physician services were available at 66% of sites (95/145) and nurse practitioner services were available at 51% (74/144) of sites. Many sites offered screening for cervical (60%, 86/144), colon (42%, 59/142) and prostate cancers (43%, 60/141), in addition to various self-management and education services. Allied health services, such as clinical nutrition counselling (47%, 68/46) and occupational therapy (46%, 68/147), were available at many sites. Available health care services were most often offered by on-site staff, and few sites provided primary health care services through telehealth. Overall, rural sites offered a greater variety of services than urban sites.

Interpretation: Considerable variability exists in the range of primary health care services available across Newfoundland and Labrador, with limited delivery of some programs and services. Future research should examine how availability of programs and services affects health outcomes and costs.

Health systems with a strong primary health care sector achieve better outcomes at lower cost.[1] Primary health care is a critical component of quality health care delivery for people with chronic disease.[2,3] For Canadians, the most prevalent conditions include diabetes, chronic obstructive pulmonary disease (COPD), ischemic heart disease and cancer.[4] About 29% of Canadians have at least 1 chronic disease (i.e., cancer, diabetes, cardiovascular diseases [heart disease, stroke], chronic respiratory diseases [asthma, COPD] and mood and anxiety disorders), and 7% have 2 or more.[4] The prevalence of chronic disease in Newfoundland and Labrador is higher than the national average; almost one-third of the population has 1 or more chronic diseases, and about 9% have 2 or more.[4] This burden on the provincial health care system is further challenged by high health care use and rates of hospital admission, in addition to poor retention of primary health care providers, particularly in rural and remote communities.[5,6]

To address the increasing prevalence of chronic diseases and their associated costs, Canada's provinces and territories are reforming primary health care delivery and examining specific attributes of primary health care systems that support or hinder high-quality care.[7] The goal of the provincial and territorial health care systems is to ensure patients have access to the care they need, when and where they need it.[8,9] National studies have suggested inequities in care between urban and rural areas, with rural regions of the country reporting lower likelihoods of accessing health care services owing to greater barriers to accessing care (e.g., travel times, cost).[10,11] As a result, Canadians who live in rural areas are more likely to report poorer health outcomes than their urban counterparts. Given that about 50% of people in Newfoundland

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and Labrador reside in a rural community,[12] identifying primary health care attributes for populations living in different geographical settings is important. We sought to describe the availability of primary health care programs and services provided by regional health authorities across Newfoundland and Labrador. Our objectives were to describe the availability of primary health care programs and services for chronic diseases provided by regional health authorities across the province, and to examine the differences in the nature of these programs and services in urban and rural regions.

Methods

Design

We performed a descriptive analysis on data gathered through a cross-sectional provincial primary health care survey of publicly funded primary health care sites conducted by the Newfoundland and Labrador Centre for Health Information.

Setting

Primary health care sites funded through regional health authorities in Newfoundland and Labrador (i.e., Eastern Health, Central Health, Western Health and Labrador-Grenfell Health) identified by the Primary Health Care Review Working Group were surveyed (n = 154). A primary health care site was defined as any location that offered primary health care services (e.g., primary care, community support centres, mental health care). This sample represents publicly funded primary health care sites across the province. Privately funded sites, such as fee-for-service practices, are not represented in these data (such sites account for ~65% of physicians in Newfoundland and Labrador).[13]

Source of data

This survey was administered by the Newfoundland and Labrador Centre for Health Information, in partnership with the Department of Health and Community Services, Government of Newfoundland and Labrador. The goal of the survey was to identify primary health care services offered across the province. To develop the questionnaire, a working group was established by the Newfoundland and Labrador Centre for Health Information. This working group was chaired by an employee of the Newfoundland and Labrador Centre for Health Information and consisted of 2 members from each provincial regional health authority who were employed at the primary health care management–level and an additional representative from the Newfoundland and Labrador Department of Health and Community Services.

The questionnaire consisted of 21 questions, distributed across 13 pages (Appendix 1, available at www.cmajopen.ca/content/7/1/E8/suppl/DC1). Responses to items on the questionnaire were categorical. For each program or service, respondents could indicate whether it was "not delivered" or offered by "on-site personnel," "a visiting health care professional," or "telehealth." Respondents could choose all delivery modes that applied, although responses were not mandatory. If a program or service was delivered by any mode, it was coded as "Delivered." The survey was reviewed in detail by all members of the Primary Health Care Review Working Group for content and clarity and to ensure that the questions would have meaning for respondents within each regional health authority across the province.

Data were collected from June 2015 to February 2016. A member of the Primary Health Care Review Working Group identified all primary health care sites in their region, as well as a representative at each site to complete the survey. An email was distributed by the chair to representatives, informing them they had been identified to complete the survey. The survey was voluntary and completed by the employee at the workplace. No incentives were offered. Representatives were sent instructions to complete the survey and a link to the site where the survey was hosted (SurveyMonkey). Each respondent was asked to indicate site name and address, ensuring there was only 1 response per site. Respondents were free to go back in the questionnaire and change answers as required.

The survey collected data on site location, hours of operation and details about primary health care programs and services delivered at the site (e.g., chronic disease prevention and management, prenatal and early child development, team-based care). Select variables from the survey were requested from the Newfoundland and Labrador Centre for Health Information for use within this study. Location of site was requested to analyze primary health care by rural versus urban status. Data were also provided for types of routine primary care services (e.g., family physician, laboratory, and nurse practitioner services), chronic disease prevention and management services (e.g., cancer screening, diabetes education), and types of chronic disease prevention and management programming (e.g., arthritis, hypertension).

Statistical analysis

Descriptive analyses were performed (R.B.) to determine percentages and frequencies of each response within each question. Sites that were missing responses for individual questions were removed from analyses of those questions, but were maintained for analyses where responses were present. Thus, each question has slightly different sample sizes. We used χ^2 tests to compare differences in responses between urban and rural sites.

Rural and urban status were determined with standard geographical classification codes for the census subdivision in which the site was located. These census subdivision codes were grouped into statistical area classification, which indicates whether a census subdivision is part of a metropolitan area, census agglomeration, census metropolitan influenced zone or neither. Statistical area classification types are ordered hierarchically, from 1 (within a metropolitan area) to 7 (outside of census metropolitan area or a census agglomeration area having no metropolitan influence).[14] Sites with a code of 1–3 (metropolitan areas or census aglomerations) were coded as "urban," whereas those with a code of 4 or greater were coded as "rural."[14] This definition was developed by Statistics

Canada and allows for national comparisons of study results. We used IBM SPSS Statistics version 24 (IBM Corporation) for analysis.

Ethics approval

This study was approved by the Newfoundland and Labrador Health Research Ethics Board.

Results

The response rate for the survey was 99.4% (153/154 questionnaires returned). The completion rate was 96.7%; 4 respondents returned questionnaires that were missing responses to most of the questions and were therefore excluded from the analysis. Position titles of respondents were site manager/site lead/director (69.3%, 106/153), nurse (17.0%, 26/153), facilitator/coordinator (4.6%, 7/153), executive (3.3%, 5/153), administrative personnel (2.6%, 4/153) or other (3.3%, 5/153). Most sites were classified as rural (75.2%, 115/153).

Description of primary health care services

Table 1 shows types of routine primary care services delivered at or by primary health care sites. Family physician services were available in 65.5% (5/145) of sites and nurse practitioners were available at 51.4% (74/144). Fewer sites had 24-hour, 7-day/week emergency departments (32.1%, 45/140) or 4-hour, 7 day/week primary care services (32.1%, 44/137) available. Table 2 shows allied health services available at primary health care sites in Newfoundland and Labrador. Clinical nutritional counselling and education (46.6%, 68/146) and occupational therapy (46.3%, 68/147) services were most commonly offered by sites; few sites offered respiratory therapy (14.6%, 21/144) or audiology (15.9%, 23/145) services. Table 3 shows the availability of chronic disease prevention and management services within primary health care sites. Cancer screening services, such as those for cervical (59.7%, 86/144), colon (41.5%, 59/142) and prostate (42.6%, 60/141) cancers, were commonly available across sites. Various education and self-management services such as healthy eating (76.8%, 106/38), tobacco cessation (74.3%, 107/144), diabetes education (52.8%, 76/144) and a local self-management program entitled "Improving Health: *My Way*" (46.5%, 66/142) were also offered by sites.

Most programs and services were delivered by an on-site employee, followed by delivery by visiting health care professionals, then telehealth (Tables 1–3).

Focused, team-based care was offered at 40.9% (n = 149) of sites. Rural sites were more likely to offer team-based care (45.6% v. 25.7%), although this difference was not significant. Table 4 shows types of team-based care offered at primary health care sites across Newfoundland and Labrador. For example, team-based care was available for diabetes education (20.8%, 31/149), mental health and addictions (13.4%, 20/149), and chronic disease prevention and management (12.2%, 18/149). Data for targeted, disease-specific chronic disease prevention and management programming are available in Appendix 2 (available at www.cmajopen.ca/content/7/1/E8/suppl/DC1).

Availability of services in urban versus rural sites

When comparing services available between urban and rural sites, a greater proportion of rural sites offered various primary health care programs and services. A significantly greater percentage of rural sites offered family physician services (76.6% v. 29.4%, $p < 0.001$), laboratory (47.7% v.

Table 1: Types of routine primary care services delivered at or by primary health care site by urban versus rural status*

	No. (%)					
Status	Nurse practitioner services n = 144	Family physician services n = 145	Radiography services n = 141	Laboratory services n = 142	24-h Emergency department services n = 140	24-h Primary care services n = 137
Delivered	74 (51.4)	95 (65.5)†	42 (29.8)	61 (43.0)‡	45 (32.1)‡	44 (32.1)
Urban	14 (40.0)	10 (29.4)	6 (18.8)	9 (27.3)	6 (18.2)	7 (21.2)
Rural	60 (55.0)	85 (76.6)	36 (33.0)	52 (47.7)	39 (36.4)	37 (35.6)
On-site delivery§	59 (79.7)	63 (66.3)	41 (97.6)	55 (90.2)	44 (97.8)	43 (97.7)
Urban	13 (92.9)	6 (60.0)	6 (100.0)	8 (88.8)	6 (100.0)	7 (100.0)
Rural	46 (76.7)	57 (67.1)	35 (97.2)	47 (90.4)	38 (84.4)	36 (97.3)

*Sample sizes differ between tables owing to differing response rates for each question.
†$p < 0.001$.
‡$p \leq 0.05$.
§Data shown for delivery by an on-site employee. If not delivered by on-site employee, service was delivered by visiting health care professional or telehealth.

Table 2: Types of allied health prevention and promotion services delivered, by urban versus rural status

Status	No. (%)							
	Audiology *n* = 145	Occupational therapy *n* = 147	Injury prevention and education *n* = 141	Clinical nutritional counselling/ education *n* = 146	Physiotherapy *n* = 147	Recreation therapy *n* = 144	Respiratory therapy *n* = 144	Speech language pathology *n* = 145
Delivered	23 (15.9)	68 (46.3)	56 (39.7)	68 (46.6)	45 (30.6)	23 (16.0)	21 (14.6)	41 (28.3)*
Urban	4 (11.8)	15 (42.9)	14 (41.2)	17 (48.6)	11 (31.4)	8 (22.2)	5 (14.7)	4 (11.4)
Rural	19 (17.1)	53 (47.3)	42 (39.3)	51 (45.9)	34 (30.4)	15 (13.9)	16 (14.5)	37 (33.6)
On-site delivery	10 (43.5)*	31 (45.6)†	33 (58.9)	41 (60.3)	25 (55.6)*	19 (82.6)	12 (57.1)	16 (39.0)‡
Urban	4 (100.0)	13 (86.7)	11 (78.6)	12 (70.6)	9 (81.8)	7 (87.5)	4 (80.0)	4 (100.0)
Rural	6 (31.6)	18 (34.0)	22 (52.4)	29 (56.9)	16 (47.1)	12 (80.0)	8 (50.0)	12 (32.4)

*$p \leq 0.05$.
†$p < 0.001$.
‡$p < 0.01$.

27.3%. $p < 0.05$), and 24-hour emergency department services (36.4% v. 18.2%. $p < 0.05$) compared with urban sites. A greater percentage of rural sites reported offering speech and language pathologist services compared with urban sites (33.6% v. 11.4%, $p < 0.05$). No other significant differences regarding allied health services were found between urban and rural sites. In addition, a significantly greater percentage of respondents from primary health care sites in rural settings reported offering screening for prostate (50.0% v. 18.2%; $p < 0.01$), cervical (67.6% v. 33.3%; $p < 0.001$) and colon (46.8% v. 24.2%; $p \leq 0.05$) cancer, as well as cholesterol (53.7% v. 30.3%; $p \leq 0.05$). Diabetes education services were reported to be offered at a greater percentage of rural sites (59.1% v. 32.4%; $p \leq 0.01$), whereas physical activity services were more often offered by urban sites (76.5% v. 57.8%; $p \leq 0.05$).

Interpretation

The aim of this study was to describe the delivery of primary health care programs and services by regional health authorities across Newfoundland and Labrador, and to examine differences in availability of these programs and services between urban and rural regions of the province. Routine primary health care services, cancer screening, and self-management and education services were offered by the greatest proportion of sites. Our findings suggest that rural sites funded by the regional health authority offer a greater variety of services when compared with their urban counterparts. Furthermore, results suggest that telehealth is underused for primary health care. Primary health care services, such as self-management and education, and routine primary care services, such as family physician or nurse practitioner services, could be made more widely available through telehealth.

Although the study results describe the many primary health care services that were delivered in Newfoundland and Labrador, this study does not offer evidence for how this affects the health of people in the province. Typically, the health of people in rural communities, as compared with those in urban communities, is worse.[13,15,16] Future studies should link data from this survey with administrative health data sources (e.g., laboratory, hospital admission, emergency department visits) and other health outcomes data, such as the Canadian Chronic Disease Surveillance System or Chronic Disease Registry, to determine the efficacy of primary health care services. Although our results describe the types or locations of available services, they do not include rates of access to or awareness of these services. Potential barriers to service access at these sites should also be examined. It is expected that differences in access to primary health care services will be related to differences in chronic disease outcomes. Identifying health system characteristics and other factors associated with disease outcomes would offer direction for future health policy and health care system reform.

Of the sites examined in this study, most sites were considered rural (75.2%, 115/153). A greater percentage of people living in Newfoundland and Labrador reside in rural communities (~50%), compared with the national average (~17%).[12,17] Newfoundland and Labrador's population is sparse and spread over a large geographic area, creating the need for many primary health care sites servicing small communities. In addition, these sites may be the only ones available to the people in these communities and may thus act as a "one-stop shop" for health care. This is similar to Local Health Hubs proposed for communities in rural Ontario. This model stipulates that core services be offered by hubs (e.g., mental health and addictions, emergency, primary care) to ensure a comprehensive range of services are available.[18] Patients can therefore access the care they need closer to home, thereby removing this barrier to health care and improving health outcomes for rural patients.

Findings from this study confirm previous research on use of telehealth in Newfoundland and Labrador. Although tele-

Table 3: Types of chronic disease prevention and management services delivered, by urban versus rural status

Status	No. (%)							
	Blood pressure *n* = 143	Breast screening *n* = 142	Cervical screening *n* = 144	Colon screening *n* = 142	Prostate screening *n* = 141	Cholesterol screening *n* = 141	Improving Health: *My Way* *n* = 142	Self-management *n* = 141
Delivered	96 (67.1)	66 (46.5)	86 (59.7)*	59 (41.5)†	60 (42.6)‡	68 (48.2)†	66 (46.5)	52 (36.9)
Urban	20 (58.8)	11 (33.3)	11 (33.3)	8 (24.2)	6 (18.2)	10 (30.3)	12 (36.4)	12 (34.3)
Rural	76 (69.7)	55 (50.5)	75 (67.6)	51 (46.8)	54 (50.0)	58 (53.7)	54 (49.5)	40 (37.7)
On-site delivery	83 (86.5)	56 (84.8)	71 (82.6)	55 (93.2)	50 (83.3)	56 (82.4)	37 (56.1)	37 (71.2)
Urban	17 (85.0)	10 (90.9)	10 (90.9)	8 (100.0)	6 (100.0)	8 (80.0)	7 (58.3)	9 (75.0)
Rural	66 (86.8)	46 (83.6)	61 (81.3)	47 (92.2)	44 (81.5)	48 (82.8)	30 (55.6)	28 (70.0)
Telehealth	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.5)	2 (3.0)	2 (3.8)
Urban	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Rural	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.7)	2 (3.7)	2 (5.0)

Status	No. (%)							
	Diabetes education *n* = 144	Foot assessment *n* = 138	Healthy eating *n* = 138	Heart failure *n* = 139	Injury prevention *n* = 142	Obesity management *n* = 138	Physical activity *n* = 143	Tobacco cessation *n* = 144
Delivered	76 (52.8)‡	78 (56.5)	106 (76.8)	33 (23.7)	70 (49.3)	35 (25.4)	89 (62.2)†	107 (74.3)
Urban	11 (32.4)	14 (42.4)	25 (75.8)	7 (21.2)	17 (51.5)	6 (18.2)	26 (76.5)	28 (82.4)
Rural	65 (59.1)	64 (61.0)	81 (77.1)	26 (24.5)	53 (48.6)	29 (27.6)	63 (57.8)	79 (71.8)
On-site delivery	61 (80.3)	66 (84.6)	85 (80.2)	20 (60.6)	56 (80.0)	25 (71.4)	74 (83.1)	90 (84.1)
Urban	9 (81.8)	12 (85.7)	22 (88.0)	5 (71.4)	15 (88.2)	5 (83.3)	24 (92.3)	24 (85.7)
Rural	52 (80.0)	54 (84.4)	63 (77.8)	15 (57.7)	41 (77.4)	20 (69.0)	50 (79.4)	66 (83.5)
Telehealth	8 (10.5)	0 (0.0)	2 (1.9)	2 (6.1)	0 (0.0)	1 (2.9)	0 (0.0)	1 (0.9)
Urban	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Rural	8 (12.3)	0 (0.0)	2 (2.5)	2 (7.7)	0 (0.0)	1 (3.4)	0 (0.0)	1 (1.3)

*$p < 0.001$.
†$p \leq 0.05$.
‡$p < 0.01$.

health has been available in Newfoundland and Labrador for more than 30 years, the province has been slow to implement the delivery of primary health care services through telehealth.[19,20] Telehealth services have the potential to improve disease self-management and reduce disparities in health service access across rural communities.[21,22] Although telehealth is used extensively at many rural sites in the province for specialist chronic disease management services, it appears to be underused in primary health care.[5] Increased use of technology has the potential to improve access to primary health care services in the province.

Limitations

This study included all primary health care sites funded by regional health authorities. Services offered by employees not funded by the regional health authority, such as fee-for-service physicians, were not included. Fee-for-service physicians are more likely to work in urban Newfoundland and Labrador, and it is uncommon for these physicians to offer allied health services from their offices. This may account for some of the rural/urban disparities we saw. Future studies should consider primary care services offered by all primary health care sites, including fee-for-service.

The data collection tool used in this study presented some limitations, including a lack of testing for psychometric properties. The questionnaire was descriptive in nature, and the working group developed each item to ensure that it would be relevant to respondents across all regional health authorities. Participants were asked to indicate whether the service was delivered at the site (yes/no), and the mode of delivery. Data do not indicate whether the services are regularly accessed by patients or how health care professionals are offering services to their patients. Future studies should examine whether patients are aware of services, whether the services are accessible and how frequently the services are accessed.

Strengths of this survey include the high response rate (96.7%) and the inclusion of almost all primary health care

Table 4: Types of focused, team-based care delivered at site

Type of care	No. (%) *n* = 149
Diabetes care and education	31 (20.8)
Mental health and addictions	20 (13.4)
Chronic disease prevention and management	18 (12.2)
Childhood development, intellectual and physical disabilities	14 (9.4)
Primary health care	11 (7.4)
Cancer care and screening	9 (6.0)
Rehabilitative care	7 (4.7)
Acute/emergency care	6 (4.0)
Home and community care	6 (4.0)
Long-term care services/placements	6 (4.0)
Respiratory chronic disease management	6 (4.0)
Allied health care	5 (3.4)
Community support	5 (3.4)
Palliative care	5 (3.4)
Public health	5 (3.4)
Autism care	3 (2.0)
Individual support services program	3 (2.0)
Refugee health	3 (2.0)
Sexual health	3 (2.0)
Social services	3 (2.0)
Community advisory committee	2 (1.3)
Community care	2 (1.3)
Discharge planning	2 (1.3)
Dressing clinic	2 (1.3)
FASD care	2 (1.3)
Orthopedic clinic	2 (1.3)
Other*	7 (4.7)

Note: FASD = fetal alcohol spectrum disorder.
*Hematology, inpatient care team, interim care, medical day care, mentoring students, occupational health, preadmission clinic.

sites funded by regional health authorites, as well as the breadth of details the questionnaire captured.

Conclusion

The results of this study suggest that there is variability in the availability and nature of primary health care services across Newfoundland and Labrador, with a greater proportion of rural sites offering programs and services compared with urban sites. Considering that half of the people in Newfoundland and Labrador live in rural communities,[12,17] it may be that these sites must act as a "one-stop-shop" for health care. This description of primary health care programs and services in Newfoundland and Labrador suggests areas of health care delivery in need of optimization and is an important first step for future health care policy and reform. Future research is needed to determine which components of primary health care are associated with improvements in chronic disease prevalence and outcomes.

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