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ABSTRACT

Background

Low staffing levels and high turnover rates are longstanding issues in long-term care (LTC) facilities that were further exacerbated by the COVID-19 pandemic. Consequently, residents and staff were disproportionately affected, with high morbidity and mortality rates. This study examines changes in staffing levels, overall and by direct care worker category, across the LTC facilities sector by ownership status in Canada before and during the pandemic. It also explores differences in facility expenditures allocated towards employee wages, benefits, and subcontracts across homes by ownership status.

Data and methods

Data were from the 2020 and 2021 Nursing and Residential Care Facility Survey, which collected information on facility characteristics, including expenses, revenue, ownership status, and staffing levels. Summary statistics and multivariate linear regression models were used to examine the association between staffing levels and ownership status, with analyses stratified by direct care worker category.

Results

On average, public LTC facilities had higher staffing levels and spent a greater proportion of their total costs on employee wages and benefits before and during the pandemic, compared with for-profit and non-profit private facilities. While the total hours of care per resident day (HPRD) increased during the pandemic, there were notable variations by region, ownership status, and direct care worker category. For example, Ontario public nursing homes provided 10% more HPRD from registered nurses during the pandemic, compared with the period before.

Interpretation

Staffing levels of direct care workers in LTC facilities, overall and separately, are associated with ownership status. Allocation of employee-related expenses also differed by ownership. Further research is needed to explore interactions between ownership status, staffing levels, and quality of care for residents.

Keywords

Staffing levels, expenses, long-term care, nursing homes, ownership, Canada.

AUTHORS

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What is already known on this subject?

- Previous studies using data from the mid-1990s to 2010 indicate that for-profit long-term care (LTC) facilities in Canada provided fewer hours of care per resident day (HPRD) than non-profit facilities.
- For-profit ownership was associated with increased COVID-19 outbreaks and resident deaths across Ontario LTC facilities.
- The evidence on staffing levels by occupation across ownership statuses is inconclusive, and there is little information on how the staffing levels in LTC facilities with different ownership statuses were affected by the pandemic.

What does this study add?

- Public LTC facilities provided more HPRD by registered nurses following the pandemic, and all homes increased the HPRD provided by registered practical nurses and personal support workers, regardless of ownership status.
- For-profit LTC facilities provided residents with 50 fewer minutes of total direct care in 2019 and 34 fewer minutes of total direct care in 2020, compared with public LTC facilities.
- Public LTC facilities, followed by non-profit facilities, spent a greater proportion of their total expenditures on employee wages and benefits during the COVID-19 pandemic, whereas for-profit facilities allocated a greater proportion of their total expenditures to subcontracting employees.

Residents of long-term care (LTC) facilities, also known as nursing homes, were disproportionately affected by the COVID-19 pandemic, with over 80% of COVID-19 deaths during the first wave in Canada occurring among residents living in these facilities.[1] While residents of LTC facilities experienced more adverse outcomes from COVID-19 infections because of advanced age and underlying comorbidities,[2] research shows that the characteristics of the facilities were key contributors to excessive morbidity and mortality among residents during the pandemic.[3-7] Notably, for-profit ownership was associated with increased COVID-19 outbreaks and resident deaths across Canadian LTC facilities.[3,6-8] The association between COVID-19 resident mortality and for-profit ownership has been attributed to a prevalence of older design standards and chain affiliation.[7] However, low staffing levels of front-line health care workers are another potential risk factor that may also vary across nursing homes with different ownership statuses (public, non-profit, and for-profit facilities), particularly during the pandemic, given the reports of critical staff shortages.[9] Pandemic staffing levels in LTC facilities have been insufficiently researched in the Canadian context.

According to an American study, ownership status matters: for-profit nursing homes had lower quality ratings and more COVID-19 infections among staff, compared with non-profit homes.[10] Lower quality ratings include health inspection violations, poor resident health indicators, and low staffing levels. Lower quality of care in for-profit homes was associated with higher rates of resident infection and death during the pandemic.[10] Among homes with at least one case of COVID-19, those with low quality ratings and low staffing levels had more COVID-19 cases than their higher-quality, well-staffed counterparts.[11] Given the relationship between ownership, staffing levels, and resident outcomes during the pandemic, staffing levels in Canadian LTC facilities with differing ownership statuses during the pandemic warrant examination.

In Canada, ownership is a structural characteristic of LTC facilities that affects how services are delivered, who delivers them, the procurement of additional funding, and how resources are allocated. While they can be publicly or privately owned, all LTC facilities are publicly funded by provincial or territorial governments through per diem payments or global budgets to cover facility costs associated with nursing and personal care services. However, accommodation services are privately financed by residents through income-adjusted copayments, which constitute about 25% of total facility expenses.[12-13] Levels of government funding and the number of additional funding sources supporting LTC facility costs vary between and within jurisdictions, depending on the ownership status of the facility.[13]

LTC facilities across Canada are either publicly or privately owned. Public nursing homes include those owned by municipalities, regional health authorities, or provincial governments. Privately owned nursing homes include non-profit and for-profit homes. Non-profit homes are governed by charitable organizations or religious establishments and receive additional funding through donations. Conversely, for-profit homes deliver care as sole operators or as part of larger business entities, known as chains. These homes are geographically distinct, but function in similar ways, generating economies of scale through market control while applying uniform standards across the homes.[14-15]

To date, the small number of studies using older data (i.e., from 1996 to 2010) to examine the relationship between the ownership status and staffing levels of LTC facilities in Canada have shown that staffing levels vary by ownership and chain affiliation.[16-20] This research also suggested that public and

private non-profit LTC facilities provided residents with more total hours of direct care than for-profit facilities.[17-18,20] Evidence examining staffing levels by occupation across ownership statuses is inconclusive, possibly because of changes in the labour supply of direct care workers in LTC facilities over time.[17] Therefore, further research is needed. The current study aims to address knowledge gaps in the Canadian context before and during the pandemic. Staffing levels are often used as a proxy for nursing home quality of care.[10] As the pandemic resulted in severe staff shortages in the LTC sector, the present study examines staffing levels across LTC ownership statuses in Canada. Consistent with previous research, it is hypothesized that public and non-profit LTC facilities would have higher staffing levels than for-profit facilities. However, as nursing homes experienced staff shortages across the sector during the pandemic, the hours of care provided to residents may have been reduced across homes regardless of ownership status. Differences in facilities' funding or resource allocation may contribute to variations in staffing levels by ownership status.[21] This study also examines differences in total facility costs allocated to employee wages, benefits, and subcontracts across nursing homes by ownership status.

Methods

Design and data sources

This pre-post observational study used two cycles (2020 and 2021) of Statistics Canada's Nursing and Residential Care Facility Survey (NRCFS).[22] The survey collected information on facility characteristics, including revenue, expenses, and staffing levels of the previous fiscal year, and COVID-19 information (e.g., staff and resident infections) for each calendar year of the survey. The NRCFS's sampling frame was all public and private sector establishments classified under the North American Industry Classification System (NAICS) 2017 code 623, "nursing and residential care facilities." Although the survey was mandatory, the overall response rate was 73% in 2020 and 60% in 2021, with rates varying by province and year.

The present study included facilities classified under the NAICS 2017 code 623110 across 9 of Canada's 10 provinces that reported having at least one bed, one resident, and one nurse employed in the facility. The following facilities were excluded from this study:

1) facilities that did not report at least one employed nurse or at least one resident (approximately 6% of reporting facilities)
2) facilities in the territories (the survey reporting guidelines indicated an insufficient number of in-scope facilities)
3) facilities in Quebec (public facilities in Quebec were excluded because of non-participation in the NRCFS and the lack of comparable data).

Exposure and outcomes

This study's main exposure variable is facility ownership status, classified as public, for-profit, and non-profit, with the latter two categories reflecting private ownership. The main outcome

Table 1
Characteristics of long-term care home survey samples, before (April 2019 to March 2020) and during (April 2020 to March 2021) the COVID-19 pandemic, Canada, excluding Quebec and the territories

	Long-term care home respondents							
	Before the COVID-19 pandemic				During the COVID-19 pandemic			
	Full cycle (n = 1,091)		Dual cycle[1] (n = 807)		Full cycle (n = 1,014)		Dual cycle[1] (n = 807)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Size (number of beds)	104.52	2.44	110.78	2.96	104.05	2.53	111.74	2.90
Proportion of expenses on wages	61.39	0.34	61.64	0.39	61.22	0.41	61.10	0.43
Proportion of expenses on benefits	12.76	0.18	12.84	0.20	10.76	0.19	10.84	0.21
				percent				
Ownership								
Public facilities	29.81	…	29.94	…	32.60	…	31.37	…
Non-profit facilities	23.52	…	26.50	…	21.73	…	23.62	…
For-profit facilities	46.67	…	43.56	…	45.66	…	45.02	…
Subcontracting								
Yes	11.02	…	12.52	…	26.42	…	27.80	…
No	88.98	…	87.48	…	73.58	…	72.20	…
Region								
Ontario	47.22	…	46.50	…	42.57	…	46.74	…
British Columbia	13.98	…	13.74	…	17.45	…	13.65	…
Prairie provinces	21.76	…	22.70	…	23.63	…	22.51	…
Atlantic provinces	17.04	…	17.06	…	16.35	…	17.10	…

… not applicable

1. Dual cycle respondents refer to long-term care facilities that participated in both cycles (2020 and 2021) of the Nursing and Residential Care Facility Survey.

Notes: SE = standard error. The study samples exclude facilities in Quebec and the territories.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

variables are staffing levels and the proportion of total expenses allocated to employee wages, benefits, and subcontracts. Facilities reported information for various categories of employees, and the present study focuses on reporting for registered nurses (RNs), registered practical nurses (RPNs), and personal support workers (PSWs). RNs are responsible for the overall delivery of resident care and are involved in addressing resident needs, administering clinical interventions and medications, and overseeing the work carried out by RPNs (also known as licensed practical nurses in some jurisdictions) and PSWs (also known as nurse orderlies or health care aides). While RPNs provide clinical and personal care, PSWs assist residents with personal care, including bathing and feeding, and engage in physically demanding activities, such as transferring or repositioning residents.

Staffing levels were measured as the total hours of care per resident day (HPRD). The mean HPRD was calculated by dividing the total annual hours worked for each direct care worker by the total number of resident days in one year for each facility. A composite variable for direct care hours was created by summing the mean number of HPRD provided by RNs, RPNs and PSWs. The average proportion of total expenses allocated to employee wages, benefits, and subcontracts with third-party agencies by each facility was calculated by dividing the amount spent on wages, benefits, and subcontracts by the total expenditures for each facility. Information on subcontracting was collected in the 2021 NRCFS only.

Statistical analysis

Analyses reflect facility-level characteristics. Descriptive statistics were calculated for the HPRD and the proportions of expenditures on employee wages, benefits, and subcontracting. These statistics were stratified by ownership status (three categories) and the following Canadian regions (four categories): (1) British Columbia, (2) the Prairie provinces (Manitoba, Alberta, and Saskatchewan), (3) Ontario, and (4) the Atlantic provinces (New Brunswick, Newfoundland and Labrador, Nova Scotia, and Prince Edward Island). There were enough homes within each facility ownership category in these four regions to conduct subsequent analyses. Separate statistics for the HPRD were computed for each direct care worker category (i.e., RN, RPN, and PSW) and for the composite measure of direct care. Differences in mean HPRD by ownership status were examined using the non-parametric Kruskal–Wallis test for multiple comparisons.

Table 2

Hours of care per resident day in the fiscal years before (April 2019 to March 2020) and during (April 2020 to March 2021) the COVID-19 pandemic, overall and by occupation, by region and facility ownership status

	Total hours of care per resident day				RN hours of care per resident day				RPN hours of care per resident day				PSW hours of care per resident day			
Region and ownership status	Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)		Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)		Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)		Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Overall																
Public facilities	3.91 §†	0.18	3.85 §†	0.11	0.67 §†	0.07	0.56 §†	0.05	0.85 §†	0.07	0.79 §†	0.04	2.38 §	0.10	2.50 §	0.07
Non-profit facilities	3.37 ‡	0.14	3.50 ‡	0.16	0.47 ‡	0.04	0.43 ‡	0.04	0.62 ‡	0.04	0.69 ‡	0.06	2.29 ‡	0.10	2.38	0.11
For-profit facilities	2.98	0.18	3.17	0.12	0.35	0.05	0.31	0.02	0.49	0.06	0.51	0.03	2.13	0.09	2.35	0.10
Atlantic provinces																
Public facilities	4.17 §†	0.28	4.67 §	0.31	0.63 §	0.08	0.69 §	0.10	1.15 §	0.12	1.20 §	0.15	2.40 †	0.19	2.78	0.22
Non-profit facilities	3.28	0.25	4.37	0.46	0.63 ‡	0.09	0.60 ‡	0.07	0.93 ‡	0.13	1.09 ‡	0.22	1.71	0.15	2.67	0.39
For-profit facilities	3.52	0.39	3.14	0.23	0.30	0.05	0.28	0.04	0.47	0.09	0.42	0.06	2.75	0.33	2.44	0.20
Ontario																
Public facilities	3.51 §	0.35	4.00 §†	0.23	0.43	0.05	0.57 §†	0.12	0.73 §	0.10	0.80 §†	0.06	2.35 §	0.23	2.62 §	0.14
Non-profit facilities	3.20 ‡	0.16	3.27	0.24	0.42	0.07	0.40	0.08	0.51 ‡	0.02	0.62	0.06	2.27 ‡	0.11	2.25	0.14
For-profit facilities	2.94	0.27	3.37	0.21	0.42	0.08	0.36	0.03	0.53	0.09	0.60	0.04	1.99	0.10	2.41	0.16
Prairie provinces																
Public facilities	4.04 §	0.18	3.69 §	0.15	0.76 §†	0.09	0.64 §†	0.05	0.67 §	0.07	0.55 §	0.04	2.60 §	0.11	2.50 §	0.10
Non-profit facilities	3.97 ‡	0.39	4.06 ‡	0.27	0.50 ‡	0.08	0.52 ‡	0.10	0.64 ‡	0.11	0.70 ‡	0.10	2.84 ‡	0.32	2.84 ‡	0.21
For-profit facilities	2.58	0.17	3.07	0.25	0.22	0.03	0.29	0.07	0.38	0.05	0.37	0.06	1.98	0.13	2.41	0.23
British Columbia																
Public facilities	4.21 §	0.73	3.09 †	0.19	1.15 §	0.46	0.31 §	0.07	1.11 §	0.33	0.74 §†	0.10	1.95	0.18	2.04	0.12
Non-profit facilities	2.88	0.22	2.34	0.27	0.37	0.09	0.21	0.03	0.53	0.07	0.43	0.07	1.97	0.15	1.70	0.20
For-profit facilities	2.94	0.40	2.68	0.17	0.27	0.08	0.17	0.02	0.46	0.06	0.49	0.06	2.21	0.32	2.02	0.14

§ significant difference between for-profit and public facilities ($p < 0.05$)

† significant difference between non-profit and public facilities ($p < 0.05$)

‡ significant difference between for-profit and non-profit facilities ($p < 0.05$)

Notes: PSW = personal support worker, RN = registered nurse, RPN = registered practical nurse, and SE = standard error. The study samples exclude facilities in Quebec and the territories.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

Table 3
Proportion of expenses spent on wages and benefits in the fiscal years before (April 2019 to March 2020) and during (April 2020 to March 2021) the COVID-19 pandemic, by region and facility ownership status

	Proportion of expenses on wages				Proportion of expenses on benefits			
Region and ownership status	Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)		Before the COVID-19 pandemic (n = 1,091)		During the COVID-19 pandemic (n = 1,014)	
	Mean (%)	SE	Mean (%)	SE	Mean (%)	SE	Mean (%)	SE
Overall								
Public facilities	64.43 †	0.59	65.78 §†	0.70	14.90 §†	0.31	15.22 §†	0.29
Non-profit facilities	61.34	0.66	61.95 ‡	0.85	13.08 ‡	0.35	10.16 ‡	0.35
For-profit facilities	59.77	0.47	57.57	0.59	11.16	0.25	7.82	0.24
Atlantic provinces								
Public facilities	65.77	1.01	66.46	1.11	14.19 †	0.53	14.60 †	0.76
Non-profit facilities	61.98	1.29	65.07	1.38	14.28 ‡	0.68	12.36 ‡	0.94
For-profit facilities	64.49	0.95	64.34	1.01	7.39	0.50	5.87	0.69
Ontario								
Public facilities	60.66	0.81	60.86	0.96	15.61 §†	0.49	15.16 §†	0.49
Non-profit facilities	59.13	0.86	62.30 ‡	1.08	13.00	0.52	8.83	0.55
For-profit facilities	59.34	0.52	58.18	0.66	13.21	0.31	9.66	0.34
Prairie provinces								
Public facilities	68.55 †	0.90	69.06 §†	1.07	14.26 §†	0.52	13.79 §†	0.37
Non-profit facilities	67.63 ‡	1.08	64.41	1.37	11.73 ‡	0.62	9.81 ‡	0.47
For-profit facilities	62.34	1.03	62.06	1.13	8.48	0.60	5.64	0.39
British Columbia								
Public facilities	63.26 †	2.62	68.75 §†	2.21	15.55 †	0.99	18.04 §†	0.70
Non-profit facilities	55.82	2.69	54.57 ‡	2.81	14.36 ‡	1.02	11.52 ‡	0.89
For-profit facilities	51.93	2.05	44.39	2.03	9.56	0.77	6.44	0.64

§ significant difference between for-profit and public facilities ($p < 0.05$)
† significant difference between non-profit and public facilities ($p < 0.05$)
‡ significant difference between for-profit and non-profit facilities ($p < 0.05$)
Notes: SE = standard error. The study samples exclude facilities in Quebec and the territories.
Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

The median HPRD was calculated for the periods before and during the pandemic for each health occupation and across ownership statuses. The relative difference between the periods was calculated as a percentage difference. Within-facility comparisons of staffing levels before and during the pandemic were conducted using the Wilcoxon signed-rank test. Because of sample size constraints, region-specific pre-post analysis could be conducted only for Ontario. Multivariable linear regressions were employed to examine the relationship between staffing levels and ownership status, controlling for covariates such as Canadian region; number of beds; proportion of expenditures on wages and benefits; and whether facilities engaged in subcontracting direct care workers, including PSWs, RNs, and RPNs, from third-party agencies. Separate models were constructed for the HPRD provided by each direct care worker category, before and during the pandemic.

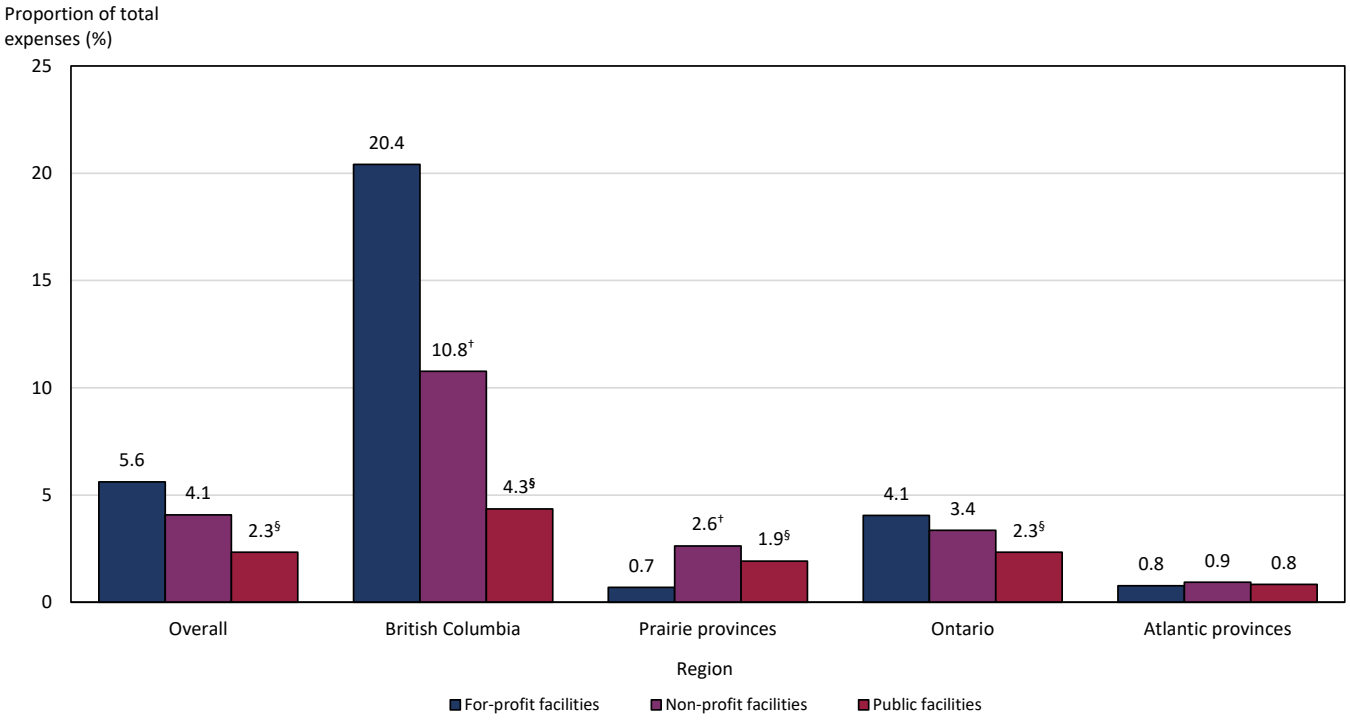
Results

This study included 1,091 LTC facilities from the 2020 NRCFS and 1,014 LTC facilities from the 2021 NRCFS. To account for within-facility differences, the 807 facilities that responded to both NRCFS cycles were examined separately. Comparisons between dual cycle respondents and all responding homes in each survey cycle were conducted (Table 1) to ensure the representativeness of the dual-cycle sample. The analysis revealed similarities between the samples across ownership statuses, regions, and expenditures on wages and benefits before and during the pandemic. There was one difference between dual-cycle and total respondents: the average size of dual-cycle LTC facilities was larger by 7 beds than that of all responding homes in each respective year (104 versus 111 beds; Table 1).

Staffing levels by ownership status and region

Overall, the mean HPRD by direct care workers varied by ownership status. Before the pandemic (fiscal year 2019/2020), residents in public LTC facilities received an average of 3.9 hours of care, compared with 3.4 hours for those in non-profit facilities ($p < 0.001$) and 3.0 hours for those in for-profit facilities ($p < 0.001$; Table 2). The corresponding HPRD during the pandemic (fiscal year 2020/2021) was 3.9 hours of care in public facilities, 3.5 in non-profit facilities, and 3.2 in for-profit facilities. On average, public facilities reported more HPRD provided by PSWs, RNs, and RPNs than private facilities, with some notable differences by region (Table 2).

Chart 1
Proportion of total expenses of long-term care facilities allocated to subcontracting by ownership and region, during the COVID-19 pandemic (April 2020 to March 2021)



§ significant difference between for-profit and public facilities ($p < 0.05$)
† significant difference between for-profit and non-profit facilities ($p < 0.05$)
Note: The study samples exclude facilities in Quebec and the territories.
Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

In British Columbia, PSW HPRD did not differ by ownership status, either before or during the pandemic (Table 2). However, the mean HPRD for RNs and RPNs was higher in both periods in public LTC facilities than in for-profit facilities. RPN HPRD was also significantly higher in public facilities than in non-profit ones during the pandemic. In the Prairie provinces, direct care workers in public and non-profit LTC facilities provided residents with more care hours in both periods, compared with for-profit homes ($p < 0.008$). During the COVID-19 pandemic, PSWs and RPNs in non-profit LTC facilities provided slightly more HPRD than their counterparts in public facilities ($p < 0.004$; Table 2).

In Ontario, RN HPRD before the pandemic was similar across ownership statuses. However, during the pandemic, RN HPRD was higher within public nursing homes, compared with non-profit and for-profit homes ($p < 0.02$). Similar increases in HPRD provided by RPNs and PSWs were observed during the pandemic in public homes, compared with for-profit homes (Table 2). In the Atlantic provinces, public and non-profit homes provided the highest total HPRD during the pandemic, offering 1.7 and 1.9 hours of combined RN and RPN care, respectively. However, during the pandemic, differences in PSW HPRD (from 2.4 to 2.8 hours) by ownership status were not statistically significant (Table 2).

Wages, benefits, and subcontracting expenditures by ownership status and region

Overall, public nursing homes, followed by non-profit homes, spent a greater proportion of their total expenditures on employee wages and benefits during the pandemic, compared with for-profit homes (Table 3). When stratifying by region, this observation persisted across nursing homes in British Columbia and the Prairie provinces. For example, in British Columbia, public homes spent 18.0% of total expenditures on employee benefits, followed by non-profit homes (11.5%), while for-profit homes spent 6.4% of total costs on benefits for workers ($p < 0.0001$). However, variations from this trend were observed in other regions. In the Atlantic provinces, there were no differences in the proportion of expenditures on employee wages before or during the pandemic across ownership statuses. However, public and non-profit homes spent greater proportions on benefits than for-profit homes during both years ($p < 0.0001$). In Ontario, non-profit homes had higher proportions of wage expenditures (62.3%) than for-profit homes (58.2%) during the pandemic ($p = 0.002$). The province's public facilities spent higher proportions of their expenditures on benefits than non-profit and for-profit homes, before and during the pandemic ($p < 0.0001$; Table 3).

Table 4

Difference in the hours of care per resident day in the fiscal years before (April 2019 to March 2020) and during (April 2020 to March 2021) the COVID-19 pandemic, overall and by occupation, for dual-cycle survey respondents

		Total hours of care per resident day					RN hours of care per resident day				
		Median number of hours					Median number of hours				
	n	Before the COVID-19 pandemic	SE	During the COVID-19 pandemic	SE	% difference	Before the COVID-19 pandemic	SE	During the COVID-19 pandemic	SE	% difference
Region											
Overall	807	2.95	0.03	3.18	0.05	7.24 *	0.32	0.01	0.32	0.01	0.95
Atlantic provinces	139	3.53	0.15	3.73	0.15	5.42 *	0.48	0.02	0.48	0.02	-1.02
Ontario	375	2.82	0.03	3.08	0.05	8.50 *	0.29	0.01	0.30	0.01	3.26
Prairie provinces	182	3.38	0.09	3.45	0.12	2.22	0.39	0.02	0.40	0.03	1.51
British Columbia	111	2.97	0.07	2.96	0.11	-0.36	0.23	0.02	0.21	0.02	-9.78 *
Region and ownership status											
Overall											
For-profit facilities	353	2.76	0.03	2.94	0.05	5.97 *	0.27	0.01	0.25	0.01	-6.05
Non-profit facilities	215	3.10	0.06	3.23	0.06	4.14	0.33	0.02	0.32	0.02	-3.03
Public facilities	239	3.25	0.07	3.56	0.09	8.66 *	0.38	0.02	0.41	0.02	8.14 *
Ontario											
For-profit facilities	195	2.71	0.04	2.94	0.06	7.66 *	0.29	0.01	0.29	0.02	0.11
Non-profit facilities	91	2.92	0.07	3.04	0.09	4.25	0.28	0.02	0.28	0.02	1.39
Public facilities	89	2.93	0.06	3.47	0.13	15.63 *	0.30	0.01	0.33	0.02	10.19 *

* significantly different from reference category ($p < 0.05$)

Notes: PSW = personal support worker, RN = registered nurse, RPN = registered practical nurse, and SE = standard error. The sample for this analysis includes dual-cycle respondents, which are long-term care homes that participated in both cycles (2020 and 2021) of the Nursing and Residential Care Facility Survey. The study samples exclude facilities in Quebec and the territories. The percentage difference between facilities during and before the pandemic is calculated by using the equation: (During-Before)/During *100.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

Table 4

Difference in the hours of care per resident day in the fiscal years before (April 2019 to March 2020) and during (April 2020 to March 2021) the COVID-19 pandemic, overall and by occupation, for dual-cycle survey respondents (continue)

	RPN hours of care per resident day					PSW hours of care per resident day				
	Median number of hours					Median number of hours				
	Before the COVID-19 pandemic	SE	During the COVID-19 pandemic	SE	% difference	Before the COVID-19 pandemic	SE	During the COVID-19 pandemic	SE	% difference
Region										
Overall	0.51	0.01	0.55	0.01	8.38 *	2.09	0.02	2.25	0.03	7.23 *
Atlantic provinces	0.72	0.04	0.71	0.03	-1.36	2.16	0.14	2.35	0.16	8.16 *
Ontario	0.49	0.01	0.56	0.02	12.45 *	2.00	0.01	2.23	0.04	10.40 *
Prairie provinces	0.49	0.02	0.48	0.03	-2.19	2.40	0.04	2.45	0.08	1.96
British Columbia	0.53	0.03	0.52	0.04	-1.83	2.11	0.03	2.15	0.07	1.68
Region and ownership status										
Overall										
For-profit facilities	0.43	0.01	0.47	0.02	8.41 *	2.01	0.02	2.14	0.04	5.93 *
Non-profit facilities	0.57	0.02	0.59	0.02	3.69	2.19	0.05	2.26	0.05	2.99 *
Public facilities	0.59	0.02	0.62	0.02	5.63 *	2.21	0.05	2.42	0.08	8.36 *
Ontario										
For-profit facilities	0.45	0.01	0.51	0.03	12.65 *	1.95	0.03	2.11	0.05	7.38 *
Non-profit facilities	0.53	0.03	0.56	0.04	5.23 *	2.09	0.05	2.24	0.06	6.66
Public facilities	0.57	0.03	0.62	0.02	8.72 *	2.04	0.03	2.47	0.11	17.09 *

* significantly different from reference category ($p < 0.05$)

Notes: PSW = personal support worker, RN = registered nurse, RPN = registered practical nurse, and SE = standard error. The sample for this analysis includes dual-cycle respondents, which are long-term care homes that participated in both cycles (2020 and 2021) of the Nursing and Residential Care Facility Survey. The study samples exclude facilities in Quebec and the territories. The percentage difference between facilities during and before the pandemic is calculated by using the equation: (During-Before)/During *100.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

Table 5

Association between facility characteristics and hours of direct care per resident day, in total and by occupation, before and during the COVID-19 pandemic

	Total hours of care per resident day						RN hours of care per resident day					
	Before the COVID-19 pandemic			During the COVID-19 pandemic			Before the COVID-19 pandemic			During the COVID-19 pandemic		
		95% CI			95% CI			95% CI			95% CI	
	coefficient	from	to	coefficient	from	to	coefficient	from	to	coefficient	from	to
Ownership												
Public facilities (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
Non-profit facilities	-0.37	-0.79	0.05	-0.27	-0.70	0.17	-0.14 *	-0.28	-0.01	-0.11	-0.23	0.01
For-profit facilities	-0.83 *	-1.21	-0.45	-0.57 *	-0.99	-0.16	-0.30 *	-0.42	-0.18	-0.24 *	-0.35	-0.12
Subcontracting												
Yes (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
No	-0.81 *	-1.30	-0.31	-0.53 *	-0.88	-0.18	-0.20 *	-0.35	-0.04	-0.08	-0.18	0.01
Size (number of beds, unit as 10 beds)	-0.02	-0.04	0.00	-0.01	-0.03	0.01	-0.01 *	-0.02	-0.01	-0.01 *	-0.02	-0.01
Proportion spent on wages, unit as 10%	0.42 *	0.27	0.56	0.08	-0.05	0.20	0.09 *	0.04	0.14	-0.01	-0.04	0.03
Proportion spent on benefits, unit as 10%	0.04	-0.25	0.33	0.19	-0.10	0.48	0.02	-0.07	0.11	0.04	-0.04	0.12
Region												
Ontario (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
British Columbia	0.26	-0.21	0.73	-0.84 *	-1.27	-0.41	0.09	-0.06	0.24	-0.28 *	-0.40	-0.16
Prairie provinces	0.13	-0.30	0.55	-0.05	-0.45	0.35	-0.03	-0.16	0.11	-0.02	-0.13	0.09
Atlantic provinces	0.38	-0.08	0.84	0.42	-0.04	0.88	-0.04	-0.19	0.11	-0.01	-0.13	0.11

… not applicable

* significantly different from reference category ($p < 0.05$)

Notes: PSW = personal support worker, RN = registered nurse, RPN = registered practical nurse, and CI=confidence interval. The study samples exclude facilities in Quebec and the territories.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

Table 5

Association between facility characteristics and hours of direct care per resident day, in total and by occupation, before and during the COVID-19 pandemic (continue)

	RPN hours of care per resident day						PSW hours of care per resident day					
	Before the COVID-19 pandemic			During the COVID-19 pandemic			Before the COVID-19 pandemic			During the COVID-19 pandemic		
		95% CI			95% CI			95% CI			95% CI	
	coefficient	from	to	coefficient	from	to	coefficient	from	to	coefficient	from	to
Ownership												
Public facilities (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
Non-profit facilities	-0.18 *	-0.30	-0.05	-0.10	-0.23	0.03	-0.05	-0.34	0.25	-0.06	-0.35	0.27
For-profit facilities	-0.33 *	-0.44	-0.21	-0.30 *	-0.42	-0.17	-0.20	-0.47	0.06	-0.04	-0.38	0.27
Subcontracting												
Yes (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
No	-0.15 *	-0.30	0.00	-0.22 *	-0.32	-0.12	-0.46 *	-0.80	-0.11	-0.23	-0.49	0.03
Size (number of beds, unit as 10 beds)	0.00	0.00	0.01	0.00	0.00	0.01	0.00	-0.02	0.01	0.00	-0.01	0.01
Proportion spent on wages, unit as 10%	0.09 *	0.04	0.13	0.01	-0.02	0.05	0.24 *	0.14	0.35	0.07	-0.02	0.16
Proportion spent on benefits, unit as 10%	0.08	-0.01	0.17	0.02	-0.07	0.10	-0.06	-0.26	0.14	0.13	-0.08	0.35
Region												
Ontario (reference)	0.00	…	…	0.00	…	…	0.00	…	…	0.00	…	…
British Columbia	0.12	-0.02	0.27	-0.10	-0.23	0.02	0.04	-0.29	0.37	-0.45	-0.78	-0.13
Prairie provinces	-0.04	-0.17	0.09	-0.15 *	-0.27	-0.03	0.19	-0.10	0.49	0.12	-0.18	0.42
Atlantic provinces	0.25 *	0.11	0.39	0.22 *	0.08	0.35	0.17	-0.15	0.49	0.22	-0.12	0.55

… not applicable

* significantly different from reference category ($p < 0.05$)

Notes: PSW = personal support worker, RN = registered nurse, RPN = registered practical nurse, and CI=confidence interval. The study samples exclude facilities in Quebec and the territories.

Sources: Statistics Canada, Nursing and Residential Care Facility Survey, 2020 and 2021.

Overall, for-profit nursing homes allocated a greater proportion of their total expenditures to subcontracting employees, compared with public and non-profit homes (Chart 1). During the pandemic, non-profit homes allocated 4.1% of their total expenditures to spending on subcontracting workers from third-party agencies, while for-profit homes allocated 5.6% and public homes allocated 2.3% ($p < 0.001$). Across regions, homes in British Columbia spent the highest proportion of their

expenditures on subcontracting, with for-profit homes allocating 20.4% of their expenses to hiring agency workers. In contrast, homes in the Atlantic provinces had the lowest proportion of these expenditures, with less than 1% of total costs allocated to subcontracting, regardless of ownership status.

Staffing levels before and during the COVID-19 pandemic

Among LTC facilities that participated in both NRCFS cycles, the median HPRD increased by 7.24% ($p < 0.001$) from before to during the pandemic (Table 4). By occupation, the average HPRD increased by 7.23% ($p < 0.001$) for PSWs and by 8.38% for RPNs, across both periods ($p < 0.001$). In contrast, there was no change in RN HPRD over the same period. Occupation-specific staffing level differences were also observed by ownership status. RN HPRD increased by 8.14% in public facilities ($p = 0.01$) during the pandemic but did not change significantly in non-profit or for-profit facilities (Table 4). During the pandemic, regardless of ownership status, PSW HPRD increased, with the greatest increases in public facilities, which have consistently provided more hours of PSW care than non-profit and for-profit facilities. Finally, over time, RPN HPRD increased in for-profit (+8.41%) and public (+5.63%) facilities ($p < 0.001$). Notable regional variations were observed over the same period. For example, total HPRD rose in LTC facilities in Ontario ($p < 0.0001$) and the Atlantic provinces ($p = 0.0004$), and this was primarily driven by increases in HPRD provided by RPNs and PSWs. In contrast, RN HPRD dropped by approximately 10% in British Columbia during the pandemic ($p < 0.05$). Lastly, the direction of the change to HPRD, overall and by occupation, in facilities with different ownership statuses across the two years was similar in Ontario and Canada. However, the magnitude of the change was slightly higher provincially, compared with the national average (Table 4).

Multivariable associations: Staffing levels, ownership, and other facility characteristics

After adjusting for covariates, the relationship between HPRD and facility ownership remained statistically significant (Table 5). On average, for-profit LTC facilities provided residents 0.83 ($p < 0.0001$) fewer HPRD before the pandemic and 0.57 ($p = 0.007$) fewer HPRD during the pandemic, compared with public facilities. Additionally, for-profit facilities provided significantly fewer RN and RPN HPRD compared with public facilities, before and during the pandemic. After controlling for other covariates, PSW HPRD did not differ by ownership status. During the pandemic, differences in total HPRD between public and non-profit private nursing homes were not statistically significant after adjusting for confounders. Also, no differences were observed in HPRD provided by each direct care worker between public and non-profit LTC facilities (Table 5).

Other significant predictors of the increase in overall HPRD include subcontracting direct care workers, the proportion spent on employee wages, the number of beds in a facility, and the Canadian region. Compared with nursing homes that subcontracted agency workers, those that did not provided fewer hours of RN, RPN and PSW care before the pandemic ($p < 0.05$). During the pandemic, subcontracting was not associated with HPRD provided by RNs or PSWs, but homes that did not subcontract provided 0.22 fewer hours of RPN care than those that did. Before the pandemic, for every 10% increase in wage expenditure proportions, total HPRD rose by 0.4 hours, corresponding to gains in PSW HPRD of 0.2 hours, RN HPRD of 0.1 hours, and RPN HPRD of 0.1 hours ($p < 0.001$). However, during the pandemic, this positive association lost statistical significance in the adjusted model. Furthermore, for every additional 10 beds in an LTC facility, RN HPRD decreased, both before and during the pandemic. The same association for RPNs and PSWs was not significant (Table 5). Finally, before the pandemic, only homes in the Atlantic provinces provided significantly more hours of RPN care than homes in Ontario ($p = 0.0003$; Table 5). During the pandemic, however, there was more variation across Canadian regions. For example, nursing homes in British Columbia provided 0.28 fewer hours of RN care and 0.45 fewer hours of PSW care, compared with homes in Ontario. During the pandemic, LTC facilities in the Prairie provinces provided fewer hours of RPN care, while those in the Atlantic provinces continued providing more hours of RPN care, compared with facilities in Ontario (Table 5).

Discussion

Overall, this study found that HPRD increased in some Canadian regions from before to during the pandemic, but not in others. Regional variations were also observed in occupation-specific analyses. For example, compared with before the pandemic, Ontario LTC facilities increased the number of hours of care by RPNs and PSWs, while those in the Atlantic provinces provided more hours of direct care by PSWs. In contrast, RNs in British Columbia provided fewer hours of care during the pandemic. This may be attributable to increases in their voluntary turnover rate in nursing homes, as revealed by Havaei and colleagues (2023) when examining the impact of pandemic staffing policies.[23] Differences by ownership status were also noted across nursing homes that participated in the survey. For example, public homes increased RN HPRD following the pandemic overall (+8.14%) and in Ontario (+10.19%). Overall, LTC facilities either increased or maintained their HPRD provided by RPNs and PSWs. These increases were greatest in public facilities for PSW HPRD and in for-profit facilities for RPN HPRD. Public nursing homes provided more HPRD overall and by occupation than for-profit homes, before and during the pandemic.

This study shows that for-profit nursing homes provided residents with 50 fewer minutes of direct care per day than public homes before the pandemic and that this difference decreased to 34 fewer minutes of direct care per day compared

with public homes during the pandemic. The loss of 30 minutes of care per resident per day is a meaningful difference, as, over time, this translates to 15 fewer hours of care per nursing home resident per 30-day month. Previous literature suggests that public and private non-profit LTC facilities have historically offered residents more total hours of direct care than for-profit facilities,[20] translating to approximately 20 more minutes of care per resident day.[17-18] While the findings of this study suggest a similar trend, disparities in total direct care HPRD increased between for-profit and public LTC facilities before and during the COVID-19 pandemic. This study also provides evidence on HPRD by distinct direct care workers, revealing that, before the pandemic, for-profit and non-profit facilities provided residents fewer nursing (RN and RPN) hours of care, compared with public facilities. During the pandemic, only for-profit LTC facilities continued to provide fewer minutes of nursing care, compared with public facilities.

Systematic reviews suggest that higher direct care HPRD in LTC facilities positively influenced resident care quality.[24-26] Increased hours worked by RNs reduced hospital admissions, mortality rates, pressure ulcers, urinary tract infections, and overall deterioration in residents' health status.[25,26] Additionally, increased hours of direct care reduced inspector-identified deficiencies or violations related to quality of care and resident safety.[26] The present study found fewer total and RN HPRD in for-profit LTC facilities, before and during the pandemic. As fewer HPRD have been associated with lower quality of care, deficiencies in regulatory assessments, and increased risks of adverse outcomes for residents, further research is warranted.

The effect of ownership status on nursing home quality of care may be related to differences in resource allocation. This study found that non-profit and for-profit nursing homes had different approaches to resource allocation during the pandemic. For example, public homes, followed by non-profit homes, spent a greater proportion of their total expenses on employee wages and benefits during the pandemic. Conversely, for-profit homes allocated a greater proportion of their expenditures on subcontracting workers, compared with their non-profit counterparts. Further investigation is required to determine whether these differences in employee expense allocation are related to the quality of care in homes. The relationship between nursing home ownership and the quality of care is multifaceted, encompassing staffing levels, residents' needs, and financial resources. Canadian studies have shown that for-profit ownership is associated with higher hospitalization rates and mortality among residents, compared with non-profit or public homes.[27-29] However, more research is needed to examine how ownership status and staffing levels in LTC facilities affect the quality of care for residents in Canada.

Finally, this study revealed variations in direct care worker HPRD by region during the pandemic, demonstrating the effect of different provincial policy responses to the COVID-19 crisis in LTC facilities and the impact of the legacies of each province's policies. For example, before the COVID-19 pandemic, LTC facilities in Ontario provided an average of 2.75 HPRD.[30] Following the implementation of the *Fixing the Long-term Care Act* (2021),[31] the provincial government revised legislation to require at least 4 hours of direct care by nurses and PSWs by 2025, facilitating an incremental approach to increase HPRD. In contrast, Nova Scotia LTC facilities provided an average of 3.57 total HPRD before the pandemic.[32] Following the onset of the pandemic, the province introduced Bill 31, the *Care and Dignity Act* (2021),[33] which requires a minimum of 4.1 hours of personal and nursing care per resident each day. The legislation provides further instruction for nursing homes, mandating the minimum number of HPRD that should be provided by each direct care worker (RN, RPN, and PSW). The different policy approaches of both provincial governments before the pandemic and their converging policy response during the pandemic may affect staffing levels across homes by region. Further analysis is warranted to understand these provincial policy variations in the future.

One of the limitations to this study is the non-response bias from homes that did not participate in the survey or were excluded. Therefore, the generalizability of these findings is limited to the provinces that were included. Another limitation is omitted variable bias. The analysis did not adjust for staffing issues, such as shortages and absenteeism, resident characteristics (e.g., severity of disease or case mix), and skill mix. These factors may influence staffing levels in homes with different ownership and subcontracting statuses, and future research is needed to examine their role in the relationship between staffing levels and the ownership status of LTC facilities. Causal inference of the findings is limited because of the cross-sectional nature of the data.

Conclusion

Canadian LTC facilities increased direct care worker staffing levels following the COVID-19 pandemic, with increases in RN HPRD observed in public facilities. Regional variations were observed in total and occupation-specific HPRD, recognizing the different policy approaches to staffing in LTC facilities across the provinces before and during the pandemic. Overall, public facilities, followed by non-profit facilities, provided their residents more total hours of care, compared with for-profit facilities, before and during the pandemic. Public and non-profit facilities allocated a greater proportion of total expenditures to employee wages and benefits, whereas for-profit facilities spent a larger proportion of total expenditures on subcontracting workers. Further research is needed to explore the effect of staffing levels, ownership status, and quality of care for residents in LTC facilities across Canada.

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