Optimizing LPN Practice in Alberta Health Services

Phase 1 Report

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Executive Summary

Background

Based on a recommendation from the 2011 collaborative research study, *Understanding Licensed Practical Nurses' Full Scope of Practice,* the goal of the current research is to examine the roles and opportunities for Licensed Practical Nurses (LPN) in different practice settings across Alberta. To do this, we are studying LPNs in emergency departments, mental health units, and labour and delivery (L&D) units in Alberta Health Services (AHS). The project is broken into two phases. The first phase examines how LPNs are distributed across these three types of units using administrative data from Human Resources and patient databases.

The research question for Phase 1 of this study was:

1. How are LPNs distributed in EDs, L&D units, and mental health units across AHS?
    a. Are there differences in how LPNs are distributed across zones, facility types, or urban vs. rural settings?
    b. Do patient characteristics differ on units with and without LPNs?

Approach

We used staff and patient data from various data systems within AHS. We did descriptive analyses of the data to examine how LPNs are mixed with other staff and distributed across different unit types, facilities, and AHS zones. We also examined the distribution of LPNs in relation to patient volume (using a standardized value of LPN Full Time Equivalents [FTEs] per 1000 patient days to allow comparisons across zones) and workload (using a standardized value of LPN FTEs per 1000 resource intensity weight [RIW]) and classified units or facilities with and without LPNs. For EDs, we also examined staffing in relation to Canadian Triage and Acuity Scale (CTAS) scores. Finally, we examined whether LPN staffing was correlated with staffing of other nursing and non-nursing providers.

Findings

Emergency Departments

- Just over half (58%) of the 64 EDs had LPNs in their staff mix; LPNs represented 6.5% of all nursing FTEs and 5.1% of all provider FTEs.
- The overall LPN FTE per 1000 patient days in EDs (0.73) and per 1000 RIW (4.32) was quite low.
- LPNs were fairly evenly distributed between EDs with higher acuity CTAS scores (54%) and lower CTAS scores (44%).

Mental Health

- The majority (74%) of the 43 mental health units had LPNs in their staff mix; LPNs accounted for 9.7% of all nursing FTEs and 7.6% of all provider FTEs.

- There was wide variation across zones in how LPNs were included in unit staffing relative to other nursing providers: North Zone had the highest percentage of LPNs (19%) whereas Edmonton Zone had the lowest (4.3%).
- The correlations between LPNs and RPNs and between LPNs and HCAs were negative and significant. As staffing for one of these groups increases, it decreases for the other – that is, units that have RPNs or HCAs tend to have fewer LPNs.

Labour and Delivery

- 58% of the 12 L&D units had LPNs in their staff mix; LPNs made up only 2.5% of nursing providers and 2.0% of total providers.
- The highest LPN staffing was in the North Zone, where LPNs were present in 100% of units and accounted for almost 12% of nursing FTEs.
- The South and Central Zones had no LPNs working in L&D units.

Conclusion

Our findings suggest that LPN staffing is not at all consistent across zones or service types. On average, the North Zone had the highest percentage of units with LPNs and the highest LPN FTE percentage of all providers. Patient intensity and acuity did not seem to factor heavily into staffing decisions, as results were inconsistent when we examined this in the context of LPN presence or absence on each unit type.

Alberta Health Services

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Background

In 2011, the College of Licensed Practical Nurses of Alberta (CLPNA) collaborated with Alberta Health Services (AHS) and other groups on a research study entitled *Understanding Licensed Practical Nurses' Full Scope of Practice.* This study identified gaps in Licensed Practical Nurses' (LPN) scope utilization across Alberta and listed several ways in which to address these gaps. The current project is focused on the recommendation to study the roles and opportunities for LPNs in areas such as emergency care, family care clinics and primary care, labour and delivery, mental health, home care, and leadership.

The project is broken into two phases. The first phase consists of an examination of how LPNs are distributed in emergency departments (ED), on labour and delivery (L&D) units, and mental health units across AHS using administrative data from Human Resources and patient databases. The second phase will involve an in-depth examination of 12 units (two with and without LPNs per unit type) using interviews and policy analysis.

The research question to be addressed in Phase 1 was as follows:

> How are LPNs distributed in EDs, L&D units, and mental health units across Alberta Health Services?
>
> a. Are there differences in how LPNs are distributed across zones, facility types, or urban vs. rural settings?
> b. Do patient characteristics differ on units with and without LPNs?

This report briefly summarizes the results from Phase I, which includes the administrative data analysis.

Methods

Data

We used staff and patient data from various data systems within AHS. Staffing information including head counts, Full Time Equivalents (FTE), and provider type by unit and facility was obtained from the AHS eManager data system. Patient information was obtained from three different databases available through Data Integration Management and Reporting (DIMR). We used the Discharge Abstract Database, the Admission Discharge and Transfer database, and the National Ambulatory Care Reporting System database to obtain patient volumes and severity indexes. Patient and staffing data were extracted and aggregated at a unit level and then linked using facility and unit names. Units not found in both staff and patient data were excluded from the analysis. We used job family descriptions to identify different provider types including LPNs and, in a few cases, reclassified them into broader categories. We classified all unit staffs into 10 different provider types. In addition to LPNs, the provider types examined were:

- Registered Nurses (RN)
- Health Care Aides (HCA)
- Registered Psychiatric Nurses (RPNs)
- Nursing + (clinical nurse specialists, graduate nurses, nurse clinicians, and nurse practitioners)
- Allied health (e.g., therapists, outreach workers, psychologists)
- Clerks/secretaries
- Service workers
- Managers
- Other (e.g., paramedics, professional positions)

Analysis

We used the staffing data to find out staffing levels of all of these providers on all L&D, mental health, and emergency units for a three month period (January – March, 2016). We used patient data to calculate number of patient days, resource intensity weight (RIW; for hospitalized patients) and Canadian Triage and Acuity Scale (CTAS) score for ED visitors. RIW is a predictor of overall resource use by patients including the number of days in the hospital. CTAS represents the level of urgency of a case. We did descriptive analyses of the data to examine how LPNs are mixed with RNs, RPNs, HCAs, and other staff and distributed across different unit types, facilities, and AHS zones.

We also examined the distribution of LPNs in relation to patient volume (using a standardized value of LPN FTEs per 1000 patient days to allow comparisons across zones) and workload (using a standardized value of LPN FTEs per 1000 RIW). Each patient is

assigned an RIW score; using a denominator of 1000 RIW allowed us to examine how many LPN FTEs are available relative to the overall effort or workload required to treat patients on a unit. We also classified units or facilities with and without LPNs and split RIW and CTAS scores into high and low scores to examine whether LPN staffing varied based on patient intensity or acuity. Finally, we examined how LPN staffing was correlated with staffing of other nursing and non-nursing providers.

Results

Emergency Departments

Data were collected from all 64 EDs identified (see Table 1). Across all zones, just over half (58%) of the EDs included LPNs in their staff mix; LPNs represented 6.5% of all nursing FTEs and 5.1% of all provider FTEs. RNs made up the highest percentage of nursing providers across all zones (82%). Edmonton Zone EDs were the most commonly staffed with LPNs (78%), but those LPNs made up only a small percentage of the total nursing FTEs (5.6%) and overall provider FTEs (4.0%). Comparatively, Central and North Zones had LPNs working in only 53% and 57% of EDs but LPNs made up a higher proportion of the staff in those zones (11% and 20% of all nursing providers in zones, respectively). On the lower end, Calgary Zone had the lowest percentage of LPN FTEs (2.1% of nursing providers and 1.7% of all providers).

Table 1. FTE% of LPNs relative to all providers and all nursing providers in Emergency Departments

	Overall Units (N=64)		**South Zone Units (n=8)**		**Calgary Zone Units (n=11)**		**Central Zone Units (n=15)**		**Edmonton Zone Units (n=9)**		**North Zone Units (n=21)**	
Provider	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing
RN	64.42	82.23	74.59	90.90	64.73	80.87	71.63	83.49	60.81	84.56	61.86	76.33
RPN	0.74	0.94	0.00	0.00	0.46	0.57	0.00	0.00	1.78	2.48	0.00	0.00
LPN	5.06	6.46	5.34	6.51	1.65	2.06	9.66	11.26	4.02	5.59	15.95	19.69
HCA	5.07	6.47	0.00	0.00	8.78	10.97	0.00	0.00	4.06	5.64	1.08	1.33
Nursing+	3.06	3.90	2.12	2.58	4.43	5.53	4.50	5.25	1.24	1.73	2.15	2.65
Allied	0.49		0.59		0.06		0.00		1.43		0.00	
Clerk	10.57		9.67		10.33		10.35		11.51		9.64	
Service	3.26		3.48		1.47		1.40		6.20		3.40	
Mgmt	2.20		1.62		1.79		0.50		3.32		2.39	
Other	5.14		2.58		6.32		1.94		5.63		3.53	
% with LPNs	**58.00**		**50.00**		**55.00**		**53.00**		**78.00**		**57.00**	

The LPN FTE per 1000 patient days was quite low (0.73; see Table 2). North Zone had the highest FTE (1.15) per 1000 patient visits, followed by Central and Edmonton Zones (0. 84 and 0.75, respectively). Consistent with having the lowest nursing and provider FTEs, Calgary Zone also had the lowest LPN FTE (0.37) per 1000 patient visits, followed by South Zone (0.45).

Both RIW and CTAS scores were available to rate the resource intensity and acuity of patients in EDs. The CTAS score represents the patient's acuity while **in the ED**. The RIW is a patient intensity score based on the **entire hospital stay**. Although the CTAS is a more accurate score for EDs, the RIW was also included here to allow a rough comparison of FTEs across other types of units based on resource intensity. The overall LPN FTE per 1000 RIW was fairly low (4.32) (see Figure 1 and Table 2). The highest LPN FTE per 1000 RIW was seen in North Zone (14.21) and the lowest was Calgary Zone (1.54).

Figure 1. Emergency Department LPN FTEs per 1000 per RIW

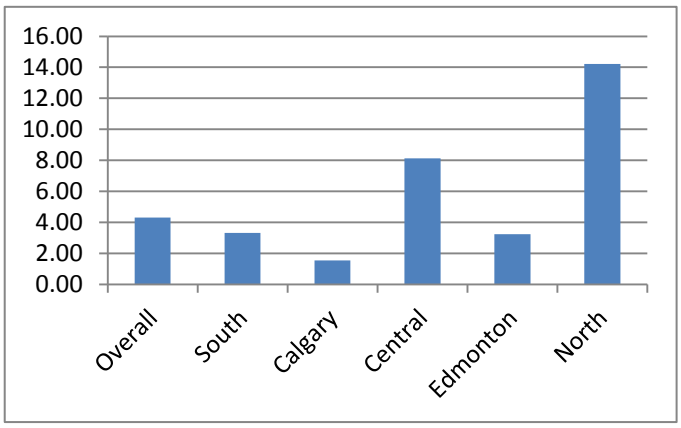


Table 2. Emergency Department LPN FTEs per 1000 patient visits and 1000 RIW

	Total Patient Days	Total LPN FTEs	FTEs per 1000 Patient Days	RIW	Total LPN FTEs	FTEs per 1000 RIW
Overall	438,326	319	0.73	73,837	319	4.32
South	44,160	19.8	0.45	5,981	19.8	3.31
Calgary	116,910	43.7	0.37	28,412	43.7	1.54
Central	69,159	57.8	0.84	7,105	57.8	8.14
Edmonton	103,760	77.5	0.75	23,890	77.5	3.24
North	104,337	120.1	1.15	8,449	120.1	14.21

When we examined LPN staffing in relation to CTAS scores (Table 3), no clear patterns emerged across zones. Overall, units without LPNs were evenly split between high and low average CTAS scores. Units with LPNs were slightly more likely (54%) to have higher average CTAS scores. The majority of South Zone and North Zone EDs with LPNs had low average CTAS (61% in each zone), but the opposite was true in Calgary Zone and Edmonton Zone where 66% and 69% of units with LPNs had higher CTAS scores, respectively.

Table 3. Percentage of high and low CTAS scores on EDs with and without LPNs

	LPN Absent			**LPN Present**		
Zone	Low CTAS 4-5 (%)	High CTAS 1-3 (%)	Unknown CTAS	Low CTAS 4-5 (%)	High CTAS 1-3 (%)	Unknown CTAS
Overall	46.41	48.81	4.78	43.96	53.92	2.11
South	44.80	51.84	3.36	60.77	29.44	9.79
Calgary	24.57	75.29	0.14	32.85	66.43	0.72
Central	64.33	29.66	6.01	53.57	42.34	4.09
Edmonton	56.29	42.11	1.60	31.34	68.66	0.00
North	60.74	27.15	12.11	60.61	36.04	3.35

Correlations between the FTEs of the various providers are shown in Table 4. The correlations show a positive correlation between LPNs, RNs, and RPNs. There was no significant correlation between LPNs and HCAs.

Table 4. Staffing correlations in Emergency Departments

	RN	RPN	LPN	HCA	Nursing+	Allied	Clerk	Service	Mgmt	Other
RN	1.00									
RPN	0.50*	1.00								
LPN	0.29*	0.25*	1.00							
HCA	0.87*	0.33*	0.07	1.00						
Nursing+	0.84*	0.08	0.12	0.76*	1.00					
Allied Health	0.30*	0.43*	0.17	0.13	0.14	1.00				
Clerk/Secretary	0.97*	0.43*	0.32*	0.86*	0.82*	0.35*	1.00			
Service	0.72*	0.68*	0.51*	0.45*	0.42*	0.69*	0.74*	1.00		
Management	0.84*	0.68*	0.38*	0.72*	0.54*	0.48*	0.87*	0.85*	1.00	
Other	0.92*	0.42*	0.20	0.94*	0.76*	0.34*	0.92*	0.65*	0.84*	1.00

Mental Health Units

Forty-three mental health units were identified and staffing data were obtained for all of these. The majority (74%) had LPNs in their staff mix; LPNs accounted for 9.7% of all nursing FTEs and 7.6% of all provider FTEs (see Table 5). Overall and in most zones, RNs made up the highest percentage of nursing providers. However, RPNs were the highest staffed nursing provider in Central Zone (40%) whereas RNs made up only 14% of nursing providers. In Central Zone, HCAs were the second highest nursing provider at 39%.

There was fairly wide variation across zones in how LPNs were included in unit staffing relative to other nursing providers. North Zone had the highest percentage of LPNs (19% of all nursing providers) whereas the Edmonton Zone had the lowest (4.3%). The same patterns held for LPNs' FTE relative to all providers, including allied health and administrative roles. The North and South Zones had LPNs on all mental health units and Calgary Zone had LPNs on 92% of units. Central and Edmonton zones were considerably lower with LPNs on 65% and 50% of mental health units, respectively.

Table 5. FTE% of LPNs relative to all providers and all nursing providers on Mental Health units

	Overall Units (N=43)		**South Zone Units (n=2)**		**Calgary Zone Units (n=13)**		**Central Zone Units (n=17)**		**Edmonton Zone Units (n=8)**		**North Zone Units (n=3)**	
Provider	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing
RN	36.10	46.30	55.05	63.70	54.59	72.67	10.94	13.90	43.83	51.63	44.83	59.58
RPN	19.06	24.45	16.37	18.94	5.90	7.85	31.69	40.25	28.59	33.69	13.09	17.40
LPN	7.56	9.70	5.47	6.33	10.71	14.26	4.66	5.92	3.65	4.31	14.59	19.39
HCA	14.13	18.12	3.88	4.49	2.76	3.68	30.51	38.76	0.00	0.00	0.00	0.00
Nursing+	1.11	1.43	5.65	6.54	1.16	1.55	0.92	1.17	8.81	10.37	2.73	3.62
Allied	9.16		0.00		6.86		13.99		5.79		2.73	
Clerk	7.23		9.70		8.91		4.90		6.69		11.91	
Service	0.10		0.00		0.24		0		0.00		0.00	
Mgmt	3.04		3.88		3.62		2.38		2.64		3.64	
Other	2.52		0.00		5.26		0.00		0.00		6.49	
% with LPNs	**74.00**		**100.00**		**92.00**		**65.00**		**50.00**		**100.00**	

Overall, the LPN FTE per 1000 patient days was 4.20 (see Figure 2 and Table 6). Edmonton Zone again had the lowest LPN staffing when patient days were taken into account (1.19 FTE per 1000 patient days), and North Zone again had the highest (6.16 FTE per 1000 patient days). Interestingly, the picture shifted slightly when FTE per 1000 RIW was calculated; Calgary Zone LPNs had a much higher FTE (51.2) than did LPNs in the other zones. North Zone had the second highest FTE per 1000 RIW (12.4) and Edmonton Zone had the third highest (10.9).

Table 6. Mental Health LPN FTEs per 1000 patient days and 1000 RIW

	Total patient days	Total LPN FTEs	FTEs per 1000 Patient Days	RIW	Total LPN FTEs	FTEs per 1000 RIW
Overall	64,410	270	4.20	24,587	270.4	11.0
South	5,042	16.61	3.29	5030.3	16.6	3.3
Calgary	29,579	153.28	5.18	2996.6	153.3	51.2
Central	16,266	69.04	4.24	13882.3	69.0	5.0
Edmonton	10,431	12.45	1.19	1140.7	12.5	10.9
North	3,093	19.05	6.16	1536.7	19.1	12.4

We also examined differences in average RIW between units with and without LPNs to determine whether patient resource intensity might be driving differences in unit staffing (Table 7). For mental health units, units without LPNs tended to have a slightly higher percentage of patients with high RIW compared to units with LPNs. Overall, 72% of units without LPNs had a high average RIW, whereas 59% of units with LPNs had a high average RIW. Edmonton Zone had the opposite pattern, where units with LPNs tended to have higher average RIW than did units without LPNs.

Figure 2. Mental Health LPN FTEs per 1000 patient days

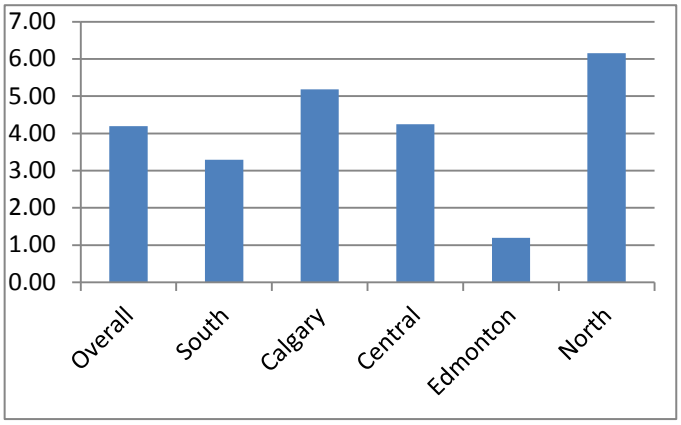


Table 7. Average unit RIW on Mental Health units with and without LPNs

Zone	LPN Absent		LPN Present	
	Low RIW < 1 (%)	High RIW >=1 (%)	Low RIW < 1 (%)	High RIW >=1 (%)
Overall	27.57	72.43	40.99	59.01
South	0.00	0.00	30.31	69.69
Calgary	11.36	88.64	49.93	50.07
Central	25.44	74.56	39.74	60.26
Edmonton	35.08	64.92	25.85	74.15
North	0.00	0.00	46.78	53.22

Correlations between the FTEs of various providers are shown in Table 8. On mental health units, it appears as though some nursing providers may be substituted for others. The correlation between RNs and LPNs is positive, but the correlation between LPNs and RPNs is negative and significant. The same is true for LPNs and HCAs. As staffing for one of these groups increases, it decreases for the other – that is, units that have RPNs or HCAs tend to have fewer LPNs.

Table 8. Staffing correlations in Mental Health units

	RN	RPN	LPN	HCA	Nursing+	Allied	Clerk	Service	Mgmt	Other
RN	1									
RPN	-0.44*	1								
LPN	0.59*	-0.38*	1							
HCA	-0.42*	0.65*	-0.15	1						
Nursing+	0.34*	-0.21	0.55*	-0.09	1					
Allied Health	-0.10	0.19	0.02	0.32*	-0.15	1				
Clerk	0.86*	-0.26	0.60*	-0.25	0.48*	0.07	1			
Service	0.18	-0.17	0.25	-0.12	-0.08	-0.01	0.08	1		
Management	0.54*	-0.31*	0.36*	-0.14	-0.04	0.11	0.44*	0.21	1	
Other	0.46*	-0.12	0.25	-0.25	0.54*	-0.02	0.47*	-0.07	0.08	1

Labour and Delivery Units

Of the 12 dedicated L&D units we identified, 58% had LPNs in their staff mix (see Table 9). These LPNs made up only 2.5% of nursing providers and 2.0% of total providers. By far the most common provider group was RNs, making up more than 90% of nursing FTEs overall and in all but one zone. The highest LPN staffing was in the North Zone, where LPNs accounted for almost 12% of nursing FTEs. Edmonton Zone had 3.7% LPNs; Calgary Zone had 0.7%, and no LPNs worked in L&D units in the South or Central Zones.

Table 9. FTE% of LPNs relative to all providers and all nursing providers on Labour and Delivery units

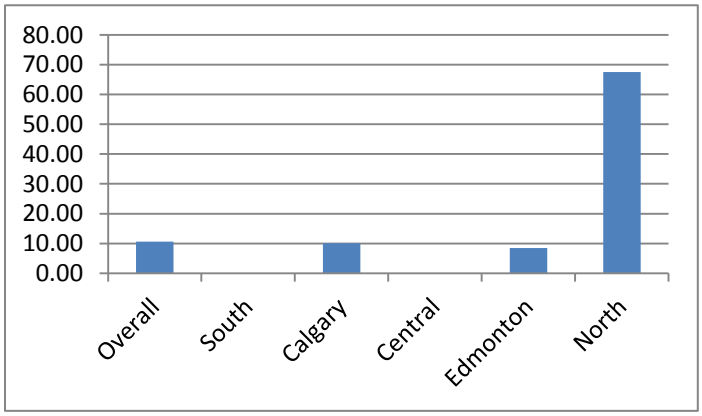
Providers	Overall Units (N=12)		South Zone Units (n=2)		Calgary Zone Units (n=4)		Central Zone Units (n=2)		Edmonton Zone Units (n=2)		North Zone Units (n=2)	
	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing	FTE % of all	FTE % of all nursing
RN	73.50	92.74	83.60	100.00	70.48	92.18	80.34	93.52	72.72	94.12	77.28	86.53
LPN	1.95	2.46	0.00	0.00	0.51	0.66	0.00	0.00	2.84	3.67	10.69	11.97
HCA	1.40	1.77	0.00	0.00	2.64	3.45	0.61	0.71	0.00	0.00	0.00	0.00
Nursing+	2.40	3.03	0.00	0.00	2.84	3.71	4.96	5.77	1.70	2.20	1.34	1.50
Clerk	10.48		10.17		11.56		8.87		9.83		8.02	
Service	6.93		2.79		8.09		2.24		10.45		0.00	
Mgmt	1.95		3.45		1.78		1.49		1.70		2.67	
Other	1.38		1.38		2.11		1.49		0.76		0.00	
% with LPNs	**58.00**		**0.00**		**75.00**		**0.00**		**100.00**		**100.00**	

In Calgary and Edmonton, LPNs were present on 75% and 100% of L&D units, respectively. The data show that although LPNs are staffed on most units in these zones, they made up only a tiny proportion of the staff. As shown in Table 10, when taking patient days into account, the results were consistent with those in Table 9; North Zone had more FTEs per 1000 patient days (27.10) than did any of the other zones. When we examined RIW (Figure 3), we found a slightly different pattern; although North Zone again had more (67.45) FTEs per 1000 RIW, Calgary had the second most with 10.05 FTEs per 1000 RIW.

Table 10. Labour and Delivery LPN FTEs per 1000 patient days and 1000 RIW

	Total patient days	Total LPN FTEs	FTEs per 1000 Patient Days	RIW	Total LPN FTEs	FTEs per 1000 RIW
Overall	9,807	45	4.59	4,232	45	10.63
South	452	0.00	0.00	21.1	0.00	0.00
Calgary	4,292	6.00	1.40	596.9	6.00	10.05
Central	1,881	0.00	0.00	1479.2	0.00	0.00
Edmonton	2,296	15.00	6.53	1779.3	15.00	8.43
North	886	24.00	27.10	355.8	24.00	67.45

Figure 3. Labour and Delivery LPN FTEs per 1000 RIW



When we analyzed the average RIW on units with and without LPNs, there were no consistent patterns. Overall, units with LPNs were slightly more likely to have higher average RIW than units without LPNs, but given the differences in staffing across zones, we cannot draw any conclusions about whether acuity is a factor in the decision to hire LPNs for L&D units.

Examination of the correlation table (Table 11) shows that LPN staffing is not significantly related to staffing of any other providers.

Table 31. Staffing correlations in Labour and Delivery units

	RN	LPN	HCA	Nursing+	Clerk	Service	Mgmt	Other
RN	1.00							
LPN	-0.03	1.00						
HCA	0.20	-0.17	1.00					
Nursing+	0.67*	-0.03	-0.16	1.00				
Clerk	0.96*	-0.05	0.29	0.62*	1.00			
Service	0.91*	-0.13	0.17	0.48	0.86*	1.00		
Management	0.78*	-0.16	0.26	0.62*	0.68*	0.72*	1.00	
Other	0.87*	-0.28	0.34	0.67*	0.90*	0.78*	0.68*	1.00

Discussion

Our results showed that as expected, LPNs are present on just over half of EDs and L&D units. More mental health units had LPNs than we anticipated. The low proportion of LPNs relative to other staff was striking on all three unit types.

LPN staffing appeared to be inconsistent both within and across zones. LPNs were not more likely to be staffed in zones with bigger centres (i.e., Calgary and Edmonton zones) or in the zones with more rural sites. Within the zones, we did not see data suggesting there were zone-wide policies directing the staffing of LPNs on the different kinds of units. For example, LPNs were present on only around 50% of EDs in four of the five zones. Even within the zones, LPNs were being inconsistently staffed.

The staff mix data also showed that within the units that were staffing LPNs, utilization was inconsistent. For instance, LPNs were present in 100% of the L&D units in the Edmonton and North zones; however, LPNs made up 3.7% of the nursing providers in Edmonton but 12% of the nursing staff in the North zone.

Taken as a whole, our findings suggest that LPN staffing is not at all consistent across zones or service types. On average, the North Zone had the highest percentage of units with LPNs and the highest LPN FTE percentage of all providers. Patient intensity and acuity did not seem to factor heavily into staffing decisions, as results were inconsistent when we examined this in the context of LPN presence or absence on each unit type. The lack of trends in the data suggests that LPNs were not being systematically included or excluded in units with higher or lower patient acuity or workload. There are a number of potential reasons for this which will be explored further in Phase 2.

Limitations

There are some limitations to the administrative data results. First, staffing data is based on FTEs *assigned* to the units. Some unit staff are attached to the units whereas others may work as casuals or are drawn from the general hospital pool. As such, we cannot say conclusively that we have included every staff member who works on a unit.

We included only L&D units that exclusively provide labour and delivery services. Many units that include other services, such as rural units that provide all care, were excluded from our analyses in order to ensure that the data represented true labour and delivery staff.

Finally, RIW and CTAS scores have limitations in their ability to determine workload. RIW is a predictor of overall resources use by patients including the number of days in the hospital. CTAS represents the level of urgency of a case. Neither of these is a perfect representation of patient acuity.

Conclusions

Data from this study suggest that LPN staffing in Emergency Departments, Mental Health units, and Labour & Delivery units is not based on zone- or AHS-level policies. There were no consistent patterns to indicate system-level planning for LPN staffing. Some might argue that LPNs would be hired more into lower acuity units, but our data show that RIW and CTAS scores, used here as proxy measures of acuity, were not consistently related to LPN staffing. In summary, we found that there is substantial room for improvement in terms of standardizing and optimizing the use of LPNs across the three unit types under study.