

Résumé

**Pour travailler et étudier :
la migration interne des infirmières
rurales du Canada**

**J. Roger Pitblado, Jennifer M. Medves
et Norma J. Stewart**

S'appuyant sur la *Base de données sur les infirmières autorisées* et sur un récent sondage pancanadien, cette étude s'est penchée sur les tendances relatives à la migration interne des I.A. rurales qui ont fait leurs études au Canada. Les taux de migration interprovinciaux, variant de 11 % à 27 % selon la base de données utilisée, cache des variations beaucoup plus grandes quant aux taux de mouvement à l'intérieur des provinces, lesquels sont particulièrement pertinents en ce qui a trait à la prestation de services infirmiers dans les communautés rurales et éloignées. Parmi les effectifs infirmiers, ceux qui ont tendance à migrer sont les femmes, celles plus âgées, celles travaillant dans des dispensaires et celles vivant dans des communautés éloignées. La majorité des I.A. qui ont migré en raison de la poursuite d'études après l'obtention de leur diplôme de base ne retournent pas dans la région où elles ont originalement été accréditées. Des études ciblées portant sur la migration doivent être menées pour bien cerner les tendances précises et les variables associées à de tels mouvements, dans le but d'évaluer, de façon plus efficace, les politiques de recrutement et de rétention et d'améliorer l'ensemble de nos modèles de planification des ressources humaines œuvrant dans le domaine de la santé.

Mots clés : migration interne, planification des ressources humaines œuvrant dans le domaine de la santé

For Work and For School: Internal Migration of Canada's Rural Nurses

**J. Roger Pitblado, Jennifer M. Medves,
and Norma J. Stewart**

Using data from the Registered Nurses Database and a recently conducted national survey, this study examined the internal migration patterns of Canadian-educated rural RNs. Inter-provincial migration rates, ranging from 11% to 27% depending on the database used, mask much wider variations in sub-provincial movement rates, which are particularly relevant when considering the provision of nursing services in rural and remote communities. Rural RNs are more likely to migrate if they are female, older, working in nursing stations, and living in remote communities. A majority of RNs whose migration is associated with going to school after their initial nursing education do not return to the jurisdiction where they were first registered. Targeted migration studies are needed to fully understand both the detailed patterns and the predictors of such movements in order to better assess recruitment and retention policies and to enhance our overall health human resources planning models.

Keywords: internal migration, schooling, employment, health human resources planning

Introduction

“Having the right people with the right skills in the right place at the right time to provide the right services to the right people” (Birch, 2002, p. 109) is the goal of health human resources planning (HHRP). Of these elements, the present paper focuses on “place” in the context of registered nurses (RNs). More specifically, this study presents the results of empirical analyses of the principal internal migration patterns of Canada's rural RNs. The focus is on nurses who attained their first level of nursing education in Canada and whose migration involves provinces and territories — that is, inter-provincial or inter-jurisdictional migration.

Given reports of past, present, and future shortages of nurses (Ryten, 1997, 2002), it is clear that we still do not have HHRP “right.” Debates continue as to whether we are oversupplied or undersupplied with health-care providers while creating new or variations of existing forecasting models, none of which seems to work particularly well (O'Brien-Pallas, 2002; Pong, 1997). On the other hand, significant progress is being made, particularly in articulating the capabilities and limitations of those

models (Birch, 2002; Tomblin Murphy, 2002). This is being done as forecasting and planning is increasingly “seen as a continuous quality-improvement process that is updated regularly” (O’Brien-Pallas, p. 7).

One element of our HHRP models that is not well described is migration. In many discussions, RN migration is equated with emigration and/or immigration — that is, international migration. Ryten (2002) speculates that emigration during the 1990s, particularly to the United States, was substantial. But neither her data nor the work undertaken by the Canadian Institute for Health Information (CIHI) can adequately determine actual rates of out-migration. Immigration information is much more readily available, as the majority of RNs employed in Canada identify on their annual registration forms the province or territory (or country, if from outside Canada) where they attained their initial nursing education. “Since 1998, the proportion of foreign graduates in the Canadian RN workforce has remained between 6 and 7%” (Canadian Institute for Health Information [CIHI], 2003). But without figures for both immigration and emigration the overall net migration rate will continue to be a subject of debate. Based on interviews with 51 baccalaureate nurse graduates from St. Francis Xavier University in Nova Scotia, Gillis, Jackson, and Beiswanger (2004) report that “although a number of the graduates had migrated to the United States for employment, the majority returned to Canada” (p. 104).

For Canada’s rural nurses, there are no published accounts that accurately enumerate emigration rates; and less than 4% of this country’s rural RNs were educated outside the country (CIHI, 2002). While emigration and immigration for this group of nurses may not be totally inconsequential, it is likely that internal migration (inter-provincial and intra-provincial or intra-territorial mobility) is of much more significance for HHRP.

Internal migration is explicitly recognized as a major component of RN recruitment and retention in some provinces. For example, “Historically, BC has relied on net immigration and inter-provincial migration for about half of its nursing workforce. In other words, we have trained only about half of the nurses needed for our health system” (Ministry of Health and Ministry Responsible for Seniors of B.C., 2000). Even in that report, unfortunately, the migration (including immigration) discussions do not deal explicitly with problems in the rural and remote nursing workforce.

Across the country, there is an information gap when it comes to migration in general and internal migration in particular (Dussault et al., 2001). No surveys of Canadian RNs exist that focus explicitly on inter- or intra-provincial migration. The most recent discussion of the mobility of nurses in Canada is that provided by Baumann, Blythe, Kolotylo,

and Underwood (2004). Bauamann et al. offer an excellent review of some of the databases (including their limitations) that can be used to analyze the internal migration patterns of Canadian nurses. They also provide a useful summary of inter-jurisdictional mobility patterns of RNs (as well as licensed practical nurses and registered psychiatric nurses) in comparison with the internal migration patterns of the general population. However, their analysis is limited to an examination of aggregated statistical information and therefore their discussion of the migration barriers, challenges, and motivations is drawn from analyses of the general population (rather than nurses specifically), local studies with small numbers of participant nurses, and ecological suppositions that are not based on the responses or views of individual nurses. The Baumann et al. work does not provide any information on the mobility patterns of rural nurses, as it was not designed to do so.

The purpose of the present study was to explore some of the internal migration patterns of Canadian-educated, rural RNs. This was done using two sets of data, neither of which was designed specifically for analyses of migration. The first was the Registered Nurses Database (RNDB), the most frequently cited national database used in Canada to portray internal migration patterns of RNs (Baumann et al., 2004; CIHI, 2002, 2003); the second is from a self-report survey instrument that was administered to a sample of rural RNs throughout Canada. The latter is referred to in this paper as "the survey." The RNDB was used to identify provincial or territorial sources and destinations of RN migrants and to examine correlates of migration within the limits of that administrative database. The survey was used to determine how often rural RNs move, and why — to seek work or for schooling. It contains one possible migration event for work, but for schooling the possible migration events include various levels of nursing education (diploma, baccalaureate, master's, or doctorate) and non-nursing university education (baccalaureate, master's, or doctorate).

Methods

Defining Rural

The term "rural" used in this study is the area of Canada described by Statistics Canada as "rural and small town." It includes those communities with core populations of less than 10,000, whereas urban centres are referred to as census metropolitan areas or census agglomerations. In the RNDB analyses, rural communities have been subdivided into four categories of metropolitan influenced zones (MIZ) based on commuting flow patterns. The four categories are: Strong MIZ, Moderate MIZ, Weak MIZ, and No MIZ. These zones identify the rural community's proxim-

ity to an urban centre, with Strong MIZ being the closest and No MIZ the furthest away. These terms are used and defined in many Statistics Canada publications and are summarized in du Plessis, Beshiri, Bollman, and Clemenson (2001).

Registered Nurses Database

The RNDB is a collation of provincial and territorial RN registration information compiled annually by the CIHI. Based on the definition outlined above, 41,502 of the 232,412 RNs employed in nursing in Canada in the year 2000 were identified as rural (CIHI, 2002). For the present study, the number of rural RNs was reduced to 40,036 by excluding RNs whose entry to practice or initial nursing education was outside of Canada or not stated, and who did not explicitly provide any of the following pieces of information: sex, age, place of graduation, place of registration, highest nursing education, full-time/part-time employment status, place of work, primary responsibility, or position. Definitions, categories, and associated limitations of these RNDB variables are described in detail by the CIHI (2002, 2003). Also excluded were those RNs who could not be located within any of the MIZ categories.

RNs in Canada do not have unique registration numbers at the national level. At the present time, if an RN migrates it is impossible to follow that individual from province to province or identify movements within a province or territory — that is, from community to community. As a consequence, migration patterns using the RNDB are estimated by comparing place of graduation with place of registration. Thus, a mover or migrant is an RN whose place of graduation and place of registration are different. In this paper, aggregate migration patterns are summarized by province and territory as well as by census division (CD). CDs are the equivalent of counties or districts in many provinces or administrative units constructed for the purpose of disseminating census information. To further analyze the characteristics of migrant and non-migrant RNs, binary logistic regression analysis was performed using the SPSS statistical package. This analysis was undertaken in order to generate odds ratios that would allow us to compare the simultaneous influences of the RNDB variables or correlates of migration.

The Nature of Nursing Practice in Rural and Remote Canada: A National Survey

Virtually all migration studies suffer from the fact that administrative databases, such as the RNDB, rarely include information about possible moves between two or more events or time periods, and even more rarely record the reasons for those moves. In the context of these two methodological issues, a unique opportunity to supplement our knowledge about the

migration patterns of Canada's rural RNs was afforded by the availability of data derived from questionnaires administered to a sample of nurses across Canada through the National Survey ("the survey"), a component of The Nature of Nursing Practice in Rural and Remote Canada study (MacLeod, Kulig, Stewart, Pitblado, & Knock, 2004).

The details of the data-gathering protocols of the survey and initial demographic and workplace profiles are provided by Stewart et al. elsewhere in this issue of the *CJNR*. Administered in 2001 and 2002, the questionnaire elicited responses to many of the complex dimensions of rural nursing practice: demographics, employment issues, community context, roles, satisfaction, health, work environment, practice supports, and career plans. Only a minute part of the data is used here, with the following two principal characteristics of note.

First, the questionnaire was administered to a sample of RNs who were randomly selected from the rural and small-town (i.e., the same "rural" as described above for the RNDB) areas of each province. In addition, with the collaboration of the professional nursing associations of each province and territory, the questionnaire was sent to: (1) the total population of Canadian RNs who indicated on their registration forms that their primary workplace was a nursing station or outpost setting, and (2) all RNs registered in the territories. A total of 3,933 valid questionnaires were completed, making for a 68% response rate.

Second, in the context of this paper, the survey gathered information on a number of key career milestones by asking a series of *what, when, where* questions. The nurses were asked these three questions in terms of their nursing and non-nursing (university-level) education. While this information could not provide for an analysis of employment mobility (Hiscott, 1998), it allowed for the assessment of geographic mobility in greater detail than the information elicited by the RNDB.

For each respondent to the survey, a chronology of educational attainment milestones was created and then ended with a "work milestone" — that is, the nurse's current place of residence/registration. Each of the milestones in these chronologies was characterized by province/territory of occurrence. Thus, "for work" migration patterns similar to those of the RNDB could be determined by comparing the location where initial nursing education was attained with current location. In addition, "for school" migration patterns could be determined by following the location or locations of the attainment of either or both nursing-level and non-nursing-level educational milestones. An examination of the educational components of these milestone chronologies also allowed us to determine whether return migration occurred.

The unique milestone patterns were labelled using a string of symbols — for nursing education: Dn – diploma, Bn – baccalaureate, Mn –

master's, and Pn – PhD; and for non-nursing university (i.e., “other”) education: Bo – baccalaureate, Mo – master's, and Po – PhD. An equivalent string of provincial/territorial locations where these events took place was also constructed for each of the nurses, with an appended symbol for current location.

To illustrate, the educational career pathway DnBnBo indicates that the nurse earned, in chronological order, a diploma in nursing, a baccalaureate in nursing, and a baccalaureate in a non-nursing subject. The survey data for this hypothetical case might indicate that the diploma and degrees were earned in Newfoundland and Labrador, Nova Scotia, and Nova Scotia, respectively. If the nurse is now working in Newfoundland and Labrador, migration occurred for schooling purposes (i.e., from Newfoundland and Labrador to Nova Scotia) and a return migration to Newfoundland and Labrador occurred for work. Our data cannot account for many of the intervening complexities of migration. In this example the RN may have returned to Newfoundland and Labrador for work, or may have gone to another province/territory for work, between her times in Nova Scotia. Nor does the survey provide information about the delivery method (e.g., by correspondence or Internet) of the various education milestones that would not have required internal migration.

A subset of 3,460 nurses from the total of 3,933 RNs in the survey was used for this migration study. Respondents were excluded if any of the *what, when, where* milestone questions were left unanswered. They were also excluded if their initial nursing education was not attained in Canada. This provided some degree of comparability with the analysis of the RNDB data. Nurses who were initially educated in Canada but received additional nursing or non-nursing education outside the country were included. As this is the first exploratory examination of the survey data in terms of migration patterns, no multivariate analyses have yet been attempted. However, as this section of the study has relied on a relatively small number of cases, we have provided 95% confidence intervals for proportional estimates, where appropriate. These have been calculated using the rigorous estimation procedures described in detail by Newcombe (1998). Confidence intervals are not provided with the RNDB estimates, as those proportions are derived from the statistical population of all Canadian-educated rural RNs.

Ethics Reviews

The overall study, *The Nature of Nursing Practice in Rural and Remote Canada*, and its component parts were conducted following review and approval by the ethics committees of Laurentian University, the University of Saskatchewan, the University of Northern British Columbia, and the

University of Lethbridge. In addition, data from the RNDB were made available only after the study had been reviewed by the CIHI's Privacy and Confidentiality Committee.

Results

RNDB – “For Work”

Transition matrices, cross-tabulating province where RNs received their initial nursing education by province or territory of current registration, highlight overall inter-jurisdictional retention and migration patterns (Table 1) and the resulting composition of provincial and territorial rural RN workforces (Table 2).

Saskatchewan is the province least able to retain the RNs who were educated there. In the year 2000, of all the rural RNs who were nursing in Canada and whose initial nursing education had been attained in Saskatchewan, only 77.3% were still in the province (Table 1). The remaining 22.7% of Saskatchewan-educated RNs were located in other

Table 1 *Retention and Migration: Proportions (%) of Canadian-Educated Rural RNs by Province of Graduation and Current Province/Territory of Registration*

		Province/Territory of Registration											
		NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	TR	Totals
Province of Graduation	NL	86.8	0.4	3.8	0.5	0.1	2.8	0.6	0.2	1.9	1.3	1.6	100.0
	PE		85.9	5.5	2.3		2.3	0.3	0.5	1.8	1.3		100.0
	NS		2.0	87.2	2.3	0.1	3.9	0.5	0.3	1.7	1.4	0.6	100.0
	NB		1.5	5.7	83.9	3.3	2.9	0.5	0.1	0.5	1.2	0.4	100.0
	QC		<0.1	0.4	0.5	95.7	2.2	0.1	0.1	0.3	0.6	0.1	100.0
	ON		0.1	0.9	0.3	1.0	90.7	0.8	0.5	2.2	2.8	0.7	100.0
	MB		0.1	0.8	0.1	0.1	4.0	80.1	5.0	4.7	4.4	0.7	100.0
	SK		0.1	0.3	0.1	0.2	1.1	3.3	77.3	11.5	5.4	0.7	100.0
	AB		0.1	0.6	0.2		1.6	1.0	5.0	79.6	10.9	1.0	100.0
	BC		<0.1	0.8	1.0		2.1	0.8	1.3	7.0	86.0	1.0	100.0

Source: RNDB (2000).

Notes: Row percentages may not add up to exactly 100% due to rounding. Because of small numbers, the territories (TR) have been combined for province of registration and have not been included as a location of graduation.

Table 2 Provincial Composition: Proportions (%) of Canadian-Educated Rural RNs in Current Province/Territory of Registration by Source Province of Graduation

		Province/Territory of Registration										
		NL	PE	NS	NB	QC	ON	MB	SK	AB	BC	TR
Province of Graduation	NL	100.0	1.8	2.9	0.5	<0.1	0.5	0.5	0.2	1.0	0.9	12.8
	PE		74.2	0.8	0.5		0.1	<0.1	0.1	0.2	0.2	
	NS		10.6	83.0	2.9	<0.1	0.8	0.5	0.3	1.0	1.2	5.8
	NB		7.2	4.7	90.1	0.7	0.5	0.4	0.1	0.3	0.9	3.3
	QC		0.7	1.6	2.5	97.9	1.9	0.4	0.2	0.8	2.2	3.3
	ON		3.6	4.2	1.9	1.2	94.2	3.7	2.3	6.7	11.6	35.5
	MB		0.7	0.8	0.2	<0.1	0.9	88.4	5.2	3.2	4.1	7.9
	SK		0.4	0.3	0.1	0.1	0.3	3.8	83.4	8.1	5.2	8.3
	AB		0.7	0.9	0.4		0.5	1.6	7.3	75.3	14.1	14.9
	BC		0.2	0.6	1.0		0.4	0.7	1.0	3.6	59.7	8.3
Totals		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: RNDB (2000).

Notes: Row percentages may not add up to exactly 100% due to rounding. Because of small numbers, the territories (TR) have been combined for province of registration and have not been included as a location of graduation.

provinces, primarily in Alberta or British Columbia, or in the territories. By contrast, Quebec had the highest retention proportion (95.7%). Quebec-educated RNs who did move were most likely to have moved to Ontario. Retention proportions for the other provinces ranged from 79.6% (Alberta) to 90.7% (Ontario). As a corollary, provincial migration proportions ranged from the low of 4.3% for Quebec to the high of 22.7% for Saskatchewan. Overall, using the RNDB 2000 data, 11.8% of Canada's rural RN workforce has migrated at least once from the province where they attained their initial nursing education to a province or territory where they are now practising.

The consequences of combined retention and migration are shown (Table 2) by examining the resulting makeup of provincial and territorial workforces in terms of where RNs received their initial nursing education. Newfoundland and Labrador is the province least likely to attract RNs from other provinces. In the year 2000, no RN educated in another province worked in rural Newfoundland and Labrador. Quebec was very similar. With only a small migration flow into that province, 97.9% of the rural RN workforce was made up of Quebec-educated RNs. The other

extreme is found in British Columbia. There, only 59.7% of the rural RN workforce received their initial nursing education in the province; 40.3% were initially educated in nursing elsewhere in Canada.

The provision of nursing education in the territories is very recent, and there are still no programs in the Yukon; Aurora College (Northwest Territories) has graduated nurses only since 1996; and the first class of nurses from the Nunavut Arctic College in Iqaluit graduated in 2003. Thus, the territories are the most dependent areas of Canada in terms of the need to attract nurses who were educated in other jurisdictions. As indicated in Table 2, the nursing workforce in the territories depends heavily on attracting RNs from Ontario (35.5%), Alberta (14.9%), and Newfoundland and Labrador (12.8%).

The transition matrices (Tables 1 and 2) for rural RNs are similar in construction to those found elsewhere for all Canadian nurses (Baumann et al., 2004; CIHI, 2002, 2003). These cross-tabulations provide useful overviews of the migration streams of Canadian nurses, but they mask the considerable regional variations that exist, especially within provinces. Some of the more complex migration patterns are illustrated in Figure 1.

Figure 1 *Census Division Proportions of Rural RNs Whose Initial Nursing Education Was Attained in a Different Province or Territory*

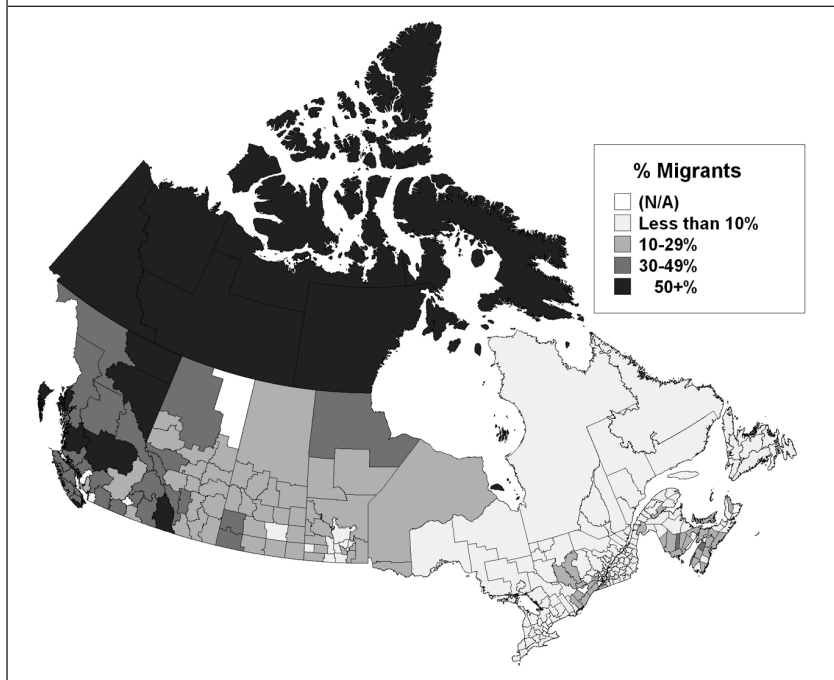


Table 3 *Odds Ratios for Internal Migration of Rural RNs by Selected Correlates*

Correlates of Internal Migration	% Migrants	Odds Ratio	95% CI
<i>Sex</i>			
Male	7.2	1.00	
Female	12.0	1.25*	1.14–0.38
<i>Age group (years)</i>			
< 25	2.6	1.00	
25–34	7.7	0.81*	0.72–0.91
35–44	10.8	1.22*	1.10–1.35
45–54	13.3	1.55*	1.40–1.72
55+	18.8	2.41*	2.15–2.71
<i>Highest nursing education</i>			
Diploma	11.0	1.00	
Baccalaureate	14.9	0.97	0.86–1.09
Graduate degree (MA/PhD)	24.0	1.52*	1.23–1.88
<i>Full-time/part-time employment</i>			
Part-time	10.8	1.00	
Full-time	12.7	1.03*	1.00–1.07
<i>Place of work</i>			
Hospital	10.6	1.00	
Nursing station	34.4	2.43*	2.02–2.93
Nursing home/long-term care	10.4	0.68*	0.63–0.75
Home care/community health centre	14.1	0.85*	0.78–0.92
Education/association/government	17.8	1.09	0.92–1.29
Other	12.8	0.91	0.82–1.02
<i>Primary responsibility</i>			
Direct care	11.9	1.00	
Administration	10.8	0.65*	0.54–0.79
Teaching/education	18.2	1.34*	1.08–1.67
Research	11.1	1.28	0.81–2.00
<i>Position</i>			
Manager	14.5	1.00	
Staff/community nurse	11.7	1.14*	1.07–1.22
Other	10.1	0.71*	0.65–0.78
<i>Metropolitan Influenced Zone</i>			
Strong MIZ	8.4	1.00	
Moderate MIZ	10.1	0.84*	0.79–0.89
Weak MIZ	15.4	1.31*	1.24–1.38
No MIZ	16.5	1.34*	1.21–1.49

* Significant difference from reference category ($P \leq 0.05$)

Source: RNDB (2000).

Note: The reference category for each correlate is identified with an odds ratio equal to 1.0.

For each census division, this map identifies the proportions of rural RNs who graduated from a different province. The map and a careful examination of Tables 1 and 2 highlight the three major migration flow patterns of Canadian-educated RNs working in rural and small-town areas of the country: most moves are to provinces immediately adjacent to the province of graduation; also common are moves to the large "magnet" provinces of Ontario, Alberta, and British Columbia; and finally, as particularly evident in Figure 1, there is a very strong overall east-to-west flow of Canada's rural RNs.

The relative influences of potential predictors or correlates of internal migration for all of Canada's locally educated, rural RNs are summarized in Table 3. This table is based on the limited number of characteristics that are available from the RNDB. While just under 12% of these nurses migrated from one province/territory to another at some point since their initial nursing education, the proportions vary considerably, from a low of 2.6% for young RNs (under 25 years of age) to a high of 34.4% for those RNs who indicated that their place of work was a nursing station (either outpost or clinic). The characteristics of those RNs with a higher likelihood of having migrated are identified with statistically significant (shown with an asterisk) odds ratios with values greater than one. For example, when taking into consideration the remaining correlates: RNs whose place of work is a nursing station are 2.43 times more likely to migrate than hospital RNs; and joining migration flows increases with age, with RNs who are 55 years of age and older 2.41 times more likely to have migrated than the youngest (under 25) age group of RNs. Those RNs less likely to participate in inter-provincial movement include those who work in nursing-home or long-term-care settings and those whose primary responsibility is characterized as administration.

National Survey – "For Work and For School"

The smaller but more detailed dataset from the survey suggests that Canadian-educated rural RNs may be a much more mobile population than indicated by the RNDB. Using the methods previously outlined, 26 unique career-milestone events and 353 unique geographical patterns were generated for the 3,460 nurses in the survey whose initial entry to nursing education was undertaken in Canada. Table 4 summarizes the most predominant of these milestone patterns. To avoid the over-emphasis of the migration patterns that percentages may give, especially when small numbers are involved, the table itself contains only the raw counts.

The majority of RNs working in Canada hold a diploma or a baccalaureate in nursing, and no other university-level degree in nursing or a non-nursing subject. As well, an increasing proportion of RNs whose

Table 4 *Types and Numbers of Internal Migration Moves of 3,460 Canadian-Educated Rural RNs by Career Milestone Patterns*

Milestone Patterns ^a	N	Migration for Work	Migration for School					
			Diploma in Nursing – Nursing Baccalaureate		Nursing Baccalaureate – Nursing Master's or Doctorate		Non-nursing Degrees	
			Migrants	Return	Migrants	Return	Migrants	Return
Dn	2,466	576						
Bn	442	132						
DnBn	352	125	104	33			5	1
DnBo	41	16					0	
BoDn	37	16						
BoBn	21	11						
DnBnMn	17	9	3	1	9	2		
DnBnMo	16	7	6	1	0		8	2
BnMo	12	5					5	1
DnBoBn	10	5	1	0			1	1
Other ^b	46	21	5	2	8	2	5	0
Totals	3,460	923	119	37	17	4	24	5

^a The symbols used for the career milestone patterns are as follows: for nursing-level education – Dn diploma, Bn baccalaureate, Mn master's or doctorate; for other non-nursing education – Bo baccalaureate, Mo master's or doctorate.

^b In addition to those specified in this table, there were 16 "Other" milestone patterns, each with fewer than 10 RNs.

Source: National Survey, The Nature of Nursing Practice in Rural and Remote Canada Study.

initial nursing education was diploma-level have earned a baccalaureate in nursing, but again, with no additional non-nursing university education. This sample of rural RNs is no exception. What is different is that the mobility rates of these nurses are far greater than those reported elsewhere using the RNDB. For the three groups of nurses just identified, the rates of internal migration are: diploma in nursing 23.4% (95% CI: 21.7, 25.1), baccalaureate in nursing 29.9% (95% CI: 25.8, 34.3), and diploma plus baccalaureate in nursing 35.5% (95% CI: 30.7, 40.6). A total of 923 of the 3,460 (26.7%, 95% CI: 25.2, 28.2) RNs in this sample currently work in a different province/territory from the one where they first earned their nursing credentials. And the mobility rates of these nurses tends to increase with increasing levels of education, both nursing and non-nursing.

Another major component of the internal migration patterns of rural RNs, as illustrated in Table 4, is the fact that substantial numbers of these nurses move inter-provincially to attain higher levels of both nursing and non-nursing education. And many do not return. For example, 29.5% (104 of 352) of the RNs who earned both a diploma and a baccalaureate in nursing, but no other nursing or non-nursing degree, migrated to study for their baccalaureate. Less than a third (33 of 104) of those nurses are now working in the province where they earned their diploma. Overall, only 31.1% (37 of 119) of the RNs who migrated to earn a baccalaureate in nursing after receiving their diploma returned. Although the numbers are small, these return rates decrease even further when nurses migrate for graduate work in nursing (23.5%) or for non-nursing degrees (20.8%).

Discussion

With few exceptions, inter-provincial migration patterns of the general population of Canada have persisted over many decades. The so-called have-not provinces (those in the Atlantic area, Manitoba, and Saskatchewan) have been net losers, while the so-called have provinces of Ontario, Alberta, and British Columbia have had net gains of inter-provincial migrants (Liaw & Qi, 2004; Vachon & Vaillancourt, 1999; with additional reviews in Baumann et al., 2004). Quebec is a special case, as it is a have province that "has endured a net loss of inter-provincial migrants every year since at least the late 1960s" (Liaw & Qi, p. 169). The inter-provincial migration patterns of Canada's rural RNs may mirror those of the general population. Analyses of this potential correlation have not yet been done. Nor have there been analyses of whether the inter-provincial migration flows of other health-care providers (physicians, occupational therapists, etc.) follow similar patterns.

The provinces best able to retain high proportions ($\geq 90\%$) of locally educated rural RNs are Quebec and Ontario. Saskatchewan is least able to retain RNs who were initially educated there (77%). Most other provinces have lost from 12% to 20% of their graduates. Most migrants from Newfoundland and Labrador and Prince Edward Island relocate in Nova Scotia, with Ontario being their secondary destination. Ontario is the primary destination of graduates from Nova Scotia and New Brunswick, although adjacent provinces receive a significant proportion of RNs migrating from Nova Scotia and New Brunswick.

Very few RNs educated in Quebec participate in inter-provincial migration, but those who do are most likely to relocate in Ontario or British Columbia and, to a lesser extent, in New Brunswick. But Quebec is also a major destination province for nurses educated in New Brunswick. Similarly, Ontario-educated rural RNs are less likely to migrate. Those who do migrate differ significantly from most other provincial migrants in that they tend not to relocate in an adjacent province. While a small number of Ontario graduates do move to Quebec, most migrant RNs first educated in Ontario move to Alberta or British Columbia. Rural RNs in the western provinces continue to move further westward until they reach the Pacific Ocean. The majority of B.C.-educated rural RNs who participate in the migration stream relocate in Alberta, with Ontario being their second-most-common destination.

Annual rates of migration for Canadian-educated rural RNs cannot be computed in a reliable manner at this time. However, our analysis of the RNDB indicates that the overall inter-provincial rate is 11.8%. A similar figure of 13.3% has been reported (Baumann et al., 2004; CIHI, 2003) for all Canadian RN graduates working in Canada — that is, both urban and rural. These figures are close to half of the overall migration rate (26.7%) that we have computed using the survey data. This may be due to the fact that the survey has a greater proportion of nursing station/outpost and territorial nurses than the general population of rural RNs. As well, the survey may contain higher proportions of nurses from the Weak and No MIZ regions of Canada, who, we have shown, have a higher likelihood of migrating. But the survey may also be capturing mobility patterns that administrative databases such as the RNDB are unable to pick up, as the latter figure is closer to some of the migration rates that Baumann et al. include in their literature review, which are based on smaller datasets than the RNDB.

It is apparent that attaining graduate-level nursing education tends to lead to higher proportions of migrants. RNs with master's or doctoral levels of nursing education are 1.52 times more likely to have migrated than RNs whose highest level of education is a diploma in nursing. The

results of our logistic regression analysis (Table 3) also highlight the relatively more dynamic aspects of migration in those areas of Canada that are least influenced by large urban centres. An RN working in a nursing station is almost two and a half times as likely to have migrated as an RN working in a hospital. As well, RNs living in Weak and No MIZ zones of the country (i.e., the most remote) are significantly more mobile (OR: 1.3) than rural RNs living in areas adjacent to metropolitan areas. Rural hospitals tend to be located in Strong and Moderate MIZ zones, while nursing stations are more commonly found in Weak or No MIZ zones. RNs in Moderate MIZ areas are less likely to migrate (OR: 0.68). It is possible that these nurses are located in small towns that have reasonable services yet are not far from large, full-service communities. But this is speculation at this time and will require much more detailed analyses.

Somewhat surprising is the apparent contradiction in terms of teaching activity. While the activity or primary responsibility of teaching/education is significantly associated with a higher proportion of migrants compared to direct-care RNs, the place of work does not necessarily reflect the same pattern. Although the place-of-work category of Education/Association/Government has a higher proportion (17.8%) of migrants than Hospital (10.6%), there is no statistically significant difference in the odds ratio. This may be due to the fact that we have collapsed the numerous place-of-work and primary-responsibility categories of the RNDB.

Because we do not have surveys in Canada that were specifically designed to examine why individual RNs migrate, we hypothesize that their reasons for migrating are similar to those of the general population or we make educated guesses about those reasons. Baumann et al. (2004) list a number of possible barriers, challenges, and motivations regarding internal migration. It may be logical to assume that these apply to Canada's RNs. But the factors that they list are derived from studies or reports that did not specifically ask nurses themselves about these factors or from migration studies that did not specifically target nurses, and certainly not rural RNs in Canada. Consequently, Baumann et al. are careful to preface the factors they list using words such as "can act as" or "researchers suggested that." Some of these factors may have very little or no influence at all. For example, full-time employment is one of the factors that may motivate nurses to move between jurisdictions. But how does this operate? Is it that RNs who are employed part-time migrate to gain full-time employment? Our analysis of more than forty thousand Canadian-educated rural RNs in the RNDB suggests otherwise. While the difference between full-time and part-time employment as correlates of internal migration is relatively small, it was the full-time RNs who

were more likely to migrate (OR 1.03). Migration-specific studies will be required to sort out this and other factors of mobility directly.

Migration associated with attaining higher qualifications, in both nursing and non-nursing subjects, is also an area that needs further study, and will require data that are not specifically included in the RNDB. In our analysis of the survey data, slightly less than 5% of the RNs moved to another province to earn higher qualifications. That may be considered a small and perhaps inconsequential proportion. But the striking message that the analysis carries is the fact few RNs who migrate for school return. With "the demand for increased skills and qualifications, experienced in virtually every profession" and being felt by registered nurses across Canada (CIHI, 2002), it is likely that more and more of our rural RNs will see a need to attain higher levels of education. If the pattern that we have observed in the survey is characteristic, then inter-provincial migration might increase with losses experienced by the source jurisdictions if there is low return migration. Studies of the supply of nurses, recruitment and retention, and university enrolment projections and programming may have to consider this factor more seriously than has been the case in the past.

In addition to the need for migration-specific studies, a fuller understanding of the flows of migrating RNs could be gained through routine data-gathering programs that already exist. Statistics Canada now collects migration information through the Census. But even custom tabulations focusing on nurses would be available only for 5-year intervals. A better solution would be enhancement of the annual compilations of the RNDB, through the assignment of a national unique identifier for each RN in Canada; by ensuring that a sub-provincial geographic locator (e.g., 6-character postal code or census subdivision identifier) is included for the residence and/or primary workplace of each RN; and perhaps through descriptors of the nurses' workplaces. Many of these suggestions have been proposed in the past (Baumann et al., 2004; CIHI, 2001, 2002, 2003) but have not been implemented. Without them we will not be able to examine the more detailed characteristics of nurse migration, particularly the features of rural-urban migration that play a significant part in the dynamics of the Canadian population (Rothwell, Bollman, Tremblay, & Marshall, 2002). With these and possibly other enhancements to the RNDB, we will have a better chance of addressing Birch's (2002) "right people with the right skills in the right place at the right time" issues of HHRP.

As a result of their very careful, detailed analyses of the age cohorts of our RNs, again using the RNDB, O'Brien-Pallas, Alksnis, and Wang (2003) predict that with a typical retirement age of 65 years "Canada is projected to lose 29,746 RNs aged 50 or older to retirement or death by

2006, a total equivalent to 13% of the nursing workforce in 2001” (p. iv). With overall internal migration rates in the 10% to 30% range or higher, some areas of Canada, particularly small and vulnerable rural communities, mobility may be even more important than retirement with respect to the loss of nursing-care providers. There, the losses consist of not only health-care providers but also community members who directly contribute to the social and economic well-being and therefore the sustainability of those communities.

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Comments or inquiries may be directed to Dr. J. Roger Pitblado, Department of Geography, Laurentian University, Sudbury, Ontario P3E 2C6 Canada. E-mail: rpitblado@laurentian.ca

J. Roger Pitblado, PhD, is Professor of Geography and Faculty Investigator, Centre for Rural and Northern Health Research, Laurentian University, Sudbury, Ontario, Canada. Jennifer M. Medves, RN, PhD, is Assistant Professor, School of Nursing, Queen's University, Kingston, Ontario. Norma J. Stewart, PhD, RN, is Professor and Associate Dean (Graduate Studies and Research), College of Nursing, University of Saskatchewan, Saskatoon, Canada.