

**Registered Nurse
Supply Report 2000/2001
Newfoundland and Labrador**

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Prepared by:

**Andrew Wells
Management Engineer
Health and Community Services Human Resource Sector Study**

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Executive Summary

The registered nursing (RN) workforce in Newfoundland and Labrador is comprised of approximately 5600 individuals, and this number has remained relatively constant over the last 10 years. Approximately 32 percent of the current RN population are over 45 years old compared to 48 percent of Canadian RNs in general. The average age of an RN in this Province is currently 40.6 years old. RNs are older in long term care with 49 percent over 45 years of age compared to 22 percent over 45 years of age in acute care settings. In educational institutions the percentage of RNs over 45 is 54 percent.

The majority of RNs, 70 percent, work in the acute care sector. The long term care sector accounts for a further 11 percent of RNs.

There was a steady rise in the casual workforce throughout the 1990s going from 12 percent in 1990 - 1991 to 25 percent in 1997 - 1998. This trend has reversed in registration years 1999 – 2000 and 2000 – 2001, with 11 and 12 percent respectively reporting casual employment.

The basic education requirement for RNs in this Province is now a Baccalaureate of Nursing (BN) degree. A decrease in funded seats for nursing education was agreed to for the new BN (Collaborative) Program based on a surplus supply in the mid-nineties. The planning committee of the day, however, noted that this reduction should be subject to annual review, as an increase in enrollment would be needed as the impact of an ageing workforce drew closer. The net number of new graduates is currently 40 percent less than in the early 1990's when the number of funded seats was higher (160 verses an average of 273). This figure will stabilize at 34 percent less in 2002 (180 verses 273). There continues to be double the number of qualified applicants for each funded seat in the BN (Collaborative) Program.

Recent trends indicate that 30 to 40 percent of new graduates leave the province after their first year of practice. If this out-migration trend continues and the province continues to graduate 34 percent fewer RNs than the early 1990s and retirements increase as expected, the province will be unable to maintain an adequate supply of RNs. A deficit in the current and future supply is projected, exceeding 50 RNs in the year 2004 and steadily increasing to an annual deficit of almost 150 in 2014. These key results are shown in Figure 13, page 30.

The impact of recent interventions will need to be monitored closely to determine effectiveness.

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1. Introduction

1.1. Background

In September 1999, a Steering Committee was established through the Department of Health and Community Services, to study human resource (HR) planning. Three subcommittees were also established to represent the following groups:

1. Registered Nurses (RN)/Licensed Practical Nurses (LPN)
2. Allied Health Professionals
3. Physicians

The purpose of the RN/LPN Human Resource Planning Subcommittee is to:

- Advise the Steering Committee on current RN/LPN human resource issues.
- Advise the Steering Committee on plans to address the immediate human resource priorities.
- Identify realistic goals reflecting provincial and national labour market realities.
- Co-ordinate and direct an integrated RN/LPN Human Resource Plan for the province into the future.

In the **short term**, the Subcommittee shall:

1. Advise the Steering Committee on the current status of RN/LPN supply and demand in the province.
2. Advise the Steering Committee on strategies to address gaps and barriers to recruiting and retaining appropriate RN/LPN human resources in the province.
3. Work in partnership with the applicable stakeholders.

In the **medium term**, the Subcommittee shall:

1. Select, based on an in-depth analysis of global models, a model that can be used for provincial, integrated, RN/LPN human resources planning taking into account the fiscal capacity. In evaluating models, realities relating to data availability and collection need to be considered.
2. Make recommendations to the Steering Committee on changes in provincial human resource policy directions that support a stabilizing and appropriate workforce.

In the **long term** the Subcommittee shall:

1. Apply the selected model and prepare a five-year forecast of the demand and supply for RNs/LPNs.
2. Make recommendations to the Steering Committee to address identified gaps between forecasted demand and supply that reflect fiscal and other realities.
3. Make recommendations to the Steering Committee concerning how to sustain RN/LPN human resource planning and to link this process on a timely basis with the Province's annual budget process and provincial/employers' strategic planning.
4. Provide an advisory role in recruitment and retention strategies, the implementation of incentive programs in the Province, and school enrollment (undergraduate, postgraduate, and continuing education).

The Subcommittee will report to the Deputy Minister of the Department of Health and Community Services through the Provincial Human Resource Planning Steering Committee.

Other reporting relationships may exist based on established agreements or other requirements. Regular reports will be provided to the Steering Committee.

This report is a repeat of a report published in July 2000. It was updated in August 2001 to reflect registration year 2000/2001 data from the Association of Registered Nurses of Newfoundland and Labrador (ARNNL) and other recent reports. New sections have also been added.

1.2. Limitations of the Report

The current electronic information system on RNs with the Association of Registered Nurses of Newfoundland and Labrador (ARNNL) has been in place for four years. Data from the previous information system is currently unavailable in electronic format and was accessed from printed reports only. This made long-term trending of more detailed registered nursing data difficult in some areas.

The Canadian Institute for Health Information (CIHI) summarizes registration data provided by the nursing regulatory bodies in Canada six months after the start of each province's registration year. Provincial Associations, including our own, report data based on registration year end data. As a result, caution should be taken in comparing various tables and figures, as CIHI data undercounts RNs.

2. Graduates

The BN program has been in place at Memorial University of Newfoundland since 1965. Prior to 1996, the following schools offered a 2.5 to 3-year Diploma of Nursing Program:

- Western Regional School of Nursing, Corner Brook
- St. Clare's Mercy Hospital School of Nursing, St. John's
- General Hospital School of Nursing, St. John's
- Grace General Hospital, School of Nursing, St. John's

In 1996, a four-year BN (Collaborative) Program was introduced and the Diploma programs were discontinued. The last class of diploma-prepared nurses graduated in 1998. In 1999 there were only 40 new graduates from the BN program at MUN due to the transition to the new program. Based on current funding arrangements, the number of graduates will level off at approximately 180 per year by 2002, with enrollments of 220 per year.

2.1. Applicants, Enrollments and Graduates

The number of nursing applicants, enrollments, and graduates for the past 10 years are shown in Table 1:

Table 1. Number of Applicants, Enrollments, & Graduates from Newfoundland Schools of Nursing by Credential and Year of Graduation

Year of Graduation ¹	Applicants			Enrollments ²			Graduates		
	Diploma ³	BN ⁴	Total	Diploma	BN	Total	Diploma	BN	Total
1991	1396	122	1518	347	66	413	243	25	268
1992	1533	108	1641	356	54	410	252	47	299
1993	1677	108	1785	354	54	408	260	44	304
1994	1647	105	1752	339	42	381	249	27	276
1995	1879	99	1978	326	50	376	227	31	258
1996 ⁵	1744	73	1817	314	45	359	241	41	282
1997	1046	96	1142	246	51	297	211 ⁶	45	256
1998	926	100	1026	244	60	304	198	49	247
1999 ⁷	x	107	107	x	52	52	x	40	40
2000 ⁸	x	419	419	x	221	221	x	163	163
2001	x	416	416	x	221	221	x	-	162
2002	x	399	399	x	221	221	x	-	180 ⁹
2003	x	482	482	x	226	226	x	-	180 ⁹
2004	x	556	556	x	227	227	x	-	180 ⁹
2005	x	493	493	x	223	223	x	-	180 ⁹

Source: Applicants and enrollments: BN Consortium Office. Graduates: School of Nursing Annual Reports to Association of Registered Nurses of Newfoundland and Labrador [ARNNL] (1954 to 2001) and Memorial University School of Nursing.

Notes:

¹Applicants are for the stated **year of graduation**. For example: the Diploma 1994 graduating class had 1647 applicants (duplicates not removed) in 1991 (program was three-year duration) whereas the BN 1994 graduating class had 105 applicants in 1990 (program is four-year duration).

²Enrollment in year one (does not include enrollment in other program years)

³Duplicate applications to two or more schools not removed

⁴Data for the BN Program does not include Post Basic BN

⁵In 1996 the BN (Collaborative) Program started

⁶ARNNL registration data used as three schools did not report the number of graduates

⁷No diploma graduates; graduates of 'phasing out' Basic BN Program only

⁸First graduates of the BN (Collaborative) Program in 2000

⁹Projected figures for a steady-state system

The decline in funded seats for nursing education was agreed to for the new BN (Collaborative) Program based on a surplus supply of RNs in the mid-nineties.

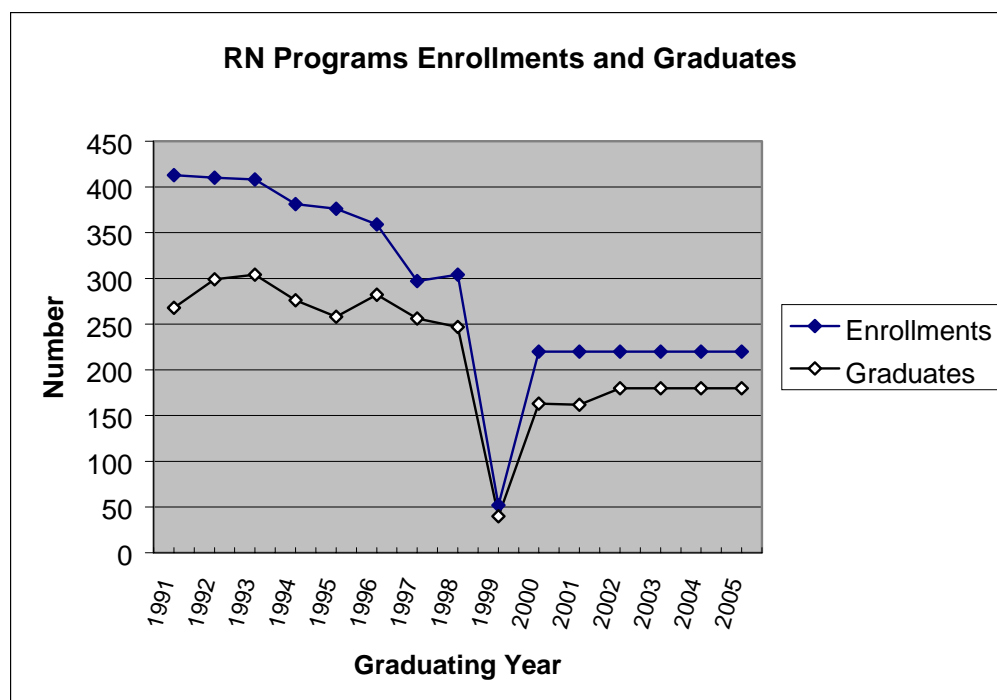
The group coordinating the introduction of the BN (collaborative) Program was the Advisory Committee on Basic Nursing Education (BEAC). In their analysis, the group compared basic retirement estimates with the retention of graduates to arrive at a net surplus or deficit. It did not consider other movement out of (and into) the RN workforce that in fact is shown in this report to outweigh the effects of retirements. Potential increases in demand for RNs were acknowledged but not estimated.

A report published in 1994 titled “Final Report on Collaborative Curriculum Development and Proposal for Implementation recommended that:

“The admissions to St. John’s Diploma Schools of Nursing are reduced by 25 percent to commence with the September 1994 class. We suggest that the reduction be subject to annual review.”

There has been no formal annual review since the introduction of the BN (Collaborative) Program and the number of enrollments and graduates has decreased much more than 25 percent since 1994. This trend is shown in Figure 1:

Figure 1. RN Programs Enrollments and Graduates by Graduating Year.



Source: Applicants and enrollments: BN Consortium Office. Graduates: School of Nursing Annual Reports to Association of Registered Nurses of Newfoundland and Labrador [ARNNL] (1954 to 2001) and Memorial University School of Nursing.

The net number of new graduates is currently 40 percent less than in the early 1990’s when the number of funded seats was higher (160 verses an average of 273). This figure is estimated to stabilize at 34 percent less in 2002 (180 verses 273).

Attrition (percentage not completing the program) from the BN (Collaborative) Program was 23 percent for the graduating class of 1999, 26 percent for the graduating class of 2000, and 27 percent for the graduating class of 2001. Flexibility in the program means graduation could be delayed by one or more years, decreasing the attrition rates. These attrition figures are in keeping with other nursing education programs in Canada.

2.2. New Graduate Retention

Initial registration with ARNNL is mandatory for all new graduates and any other RNs wishing to practice in the province. One indicator of out migration is the number of new graduates who did not renew practicing licenses following initial registration. These numbers are given in Table 2:

Table 2. Summary of Initial Newfoundland and Labrador Nursing Registrants Renewals by Graduation Year.

Graduation year	Registration Year				
	1997/8	1998/9	1999/0	2000/1	2001/2 As of May 17, 2001
	<i>Number of Practicing Licenses from Initial Pool</i>				
1997	262	150	147	150	141
1998	-	250	170	166	156
1999	-	-	46	31	27
2000	-	-	-	162	120
	<i>Number of Practicing Licenses as a Percentage of Initial Pool</i>				
1997	100.0% ¹	57.3%	56.1%	57.3%	53.8%
1998	-	100.0%	68.0%	66.4%	62.4%
1999	-	-	100.0%	67.4%	58.7%
2000	-	-	-	100.0%	74.1%

Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL].

Notes:

¹ All graduates must register upon graduation if they intend to work, but not all stay to work.

In the year 2000, the Government of Newfoundland and Labrador introduced a one-time \$3,000 signing bonus for new graduates of which 148 were accepted. Most of these were graduates from Newfoundland programs. As of May 18, 2001, a total of 20 failed to complete the contract and will pay back the proportion of the bonus equal to the proportion of the unfulfilled time however some reneged on the contract by only a few weeks (Newfoundland and Labrador Health Boards Association data).

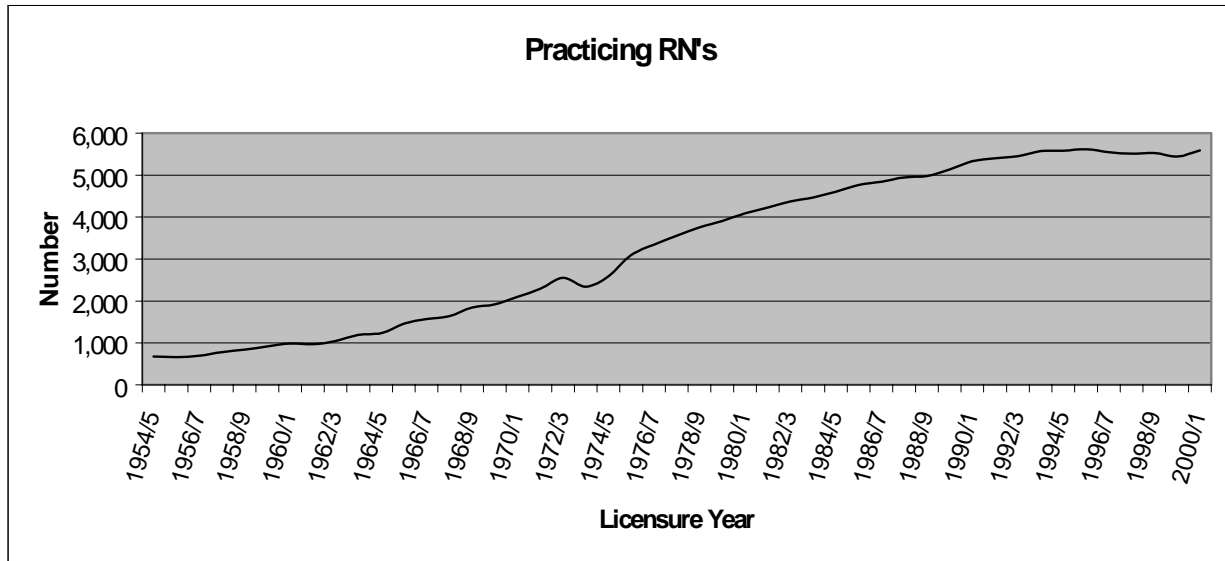
Recently formed new positions, position conversions to permanent status, reinvestment in non-nursing support positions, position reclassifications, and other incentive packages also impact retention statistics.

3. Workforce

3.1. Total Number of RNs

There were 5,592 RNs with practicing licenses in the province in the registration year 2000 - 2001. The total number has remained greater than 5000 over the last decade. The historical trend for the total nursing population is shown in Figure 2:

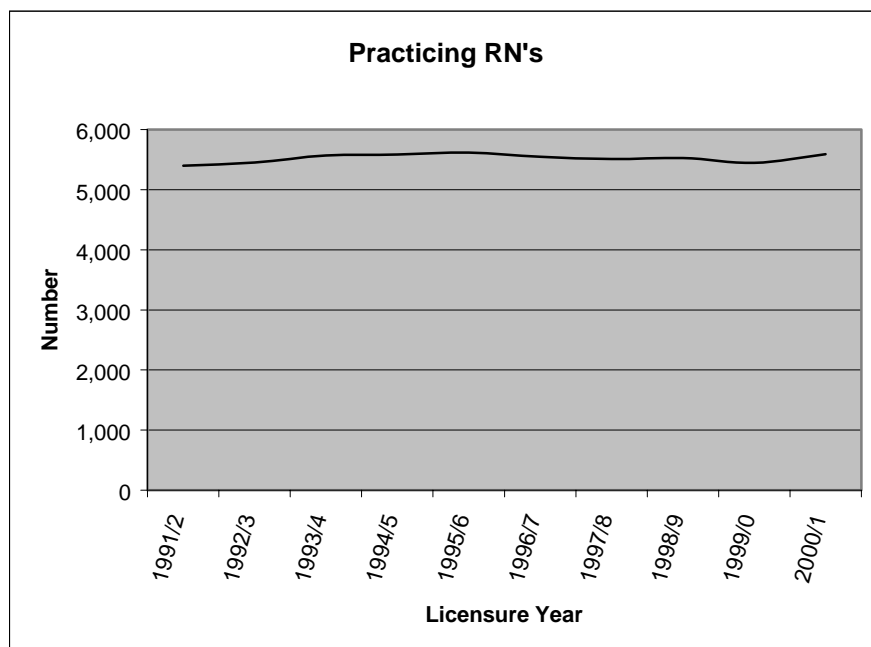
Figure 2. Trends in Nursing Population, 1954 - 2001.



Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1954 to 2001).

Considering changes in the RN workforce on a linear basis since 1954, annual growth has been 107 RNs or about 1.9 percent of today's workforce.

The peak number of RNs in the province occurred in the registration year 1995 - 1996 at 5617 practicing members. Since that time the number of practicing members has been essentially stable. This is shown in Figure 3.

Figure 3. Trends in Nursing Population, 1991 - 2001.

Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1954 to 2001).

A national comparison of RN to population ratios are shown in Table 3:

Table 3. Provincial Practicing RN to 1000 Population Ratios, 1994 - 2000.

Province	1994	1995	1996	1997	1998	1999	2000
N.W.T.	10.2	10.4	10.0	8.9	10.0	9.2	10.3
Nfld.	9.1	9.2	9.4	9.5	9.8	9.7	10.0
N.B.	10.1	10.0	9.9	9.8	9.9	10.2	9.7
N.S.	9.9	9.5	9.4	9.2	9.1	9.2	9.2
P.E.I.	8.7	8.8	9.8	9.4	9.3	8.9	9.0
Man.	9.0	9.0	9.2	9.3	8.9	8.9	8.8
Sask.	8.4	8.3	8.3	8.3	8.2	8.4	8.4
Qué.	8.5	8.6	7.9	8.1	7.8	7.9	8.0
Y.T.	6.7	6.9	7.1	7.9	7.8	7.9	7.8
Alta.	8.0	7.1	7.4	7.5	7.5	7.4	7.4
Ont.	7.5	7.2	7.2	6.9	6.9	6.8	7.0
B.C.	7.4	7.3	7.2	7.3	7.0	6.9	6.8
Nun.	5.4	5.0	5.3	4.2	4.5	3.9	3.3
Canada	8.0	7.9	7.7	7.6	7.5	7.5	7.5

Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada May 2000.

Newfoundland and Labrador had the second highest proportion of RNs per 1000 population in 2000, second only to the NWT. A rise in the ranking over the last four years has been due in part to a decline in the Newfoundland and Labrador population. Another factor influencing the change in position is reductions in nursing positions across Canada during the mid-1990's (losses of thousands of positions) when most provinces were going through reform, thereby reducing the RN to population ratios in these provinces. Figure 2 shows that similar reductions in the RN population did not occur in this province.

Other contributing factors that must be considered in a closer analysis of the RN to population ratio include minimum staffing levels, staffing mix, beds per population, numbers and types of services being offered, geography, and population health.

3.2. Demographics

About 96 percent of this province's current nursing workforce is female.

The age distribution for practicing RNs is given in Table 4:

Table 4. Age Distribution of Practicing RNs in Newfoundland and Labrador 1990 - 1991 and 2000 - 2001.

Age Range	1990 - 1991 (number)	1990 - 1991 (percent)	2000 - 2001 (number)	2000 - 2001 (percent)
<25	326	6.8%	178	3.2%
25 - 34	1977	41.2%	1671	29.9%
35 - 44	1494	31.2%	1958	35.0%
45 - 54	819	17.1%	1373	24.6%
55 - 64	169	3.5%	402	7.2%
65 +	11	0.2%	10	0.2%
Over 45	999	20.8%	1785	31.9%

Source: 1990 - 1991 Centre for Health Services and Policy Research Data Tables (1998) University of British Columbia BC. 2000 - 2001 Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1980 to 2001).

Over the last ten years there has been an 11 percent increase in the number of practicing RNs over the age of 45 going from 21 percent in 1990 - 1991 to 32 percent in 2000 - 2001. The average age of RNs practicing in Newfoundland and Labrador in for year-to-date registration statistics was 40.6 years on May 31 2001.

The national figures for the age distribution of RNs in Canada are given in Table 5:

Table 5. Age Distribution of RNs Practicing in Canada in 2000.

Age Range	Canada (number)	Canada (percent)
<25	4890	1.9%
25 – 34	48,398	19.0%
35 – 44	78,219	30.7%
45 – 54	86,028	33.8%
55 +	37,093	14.6%
Over 45	123,121	48.4%

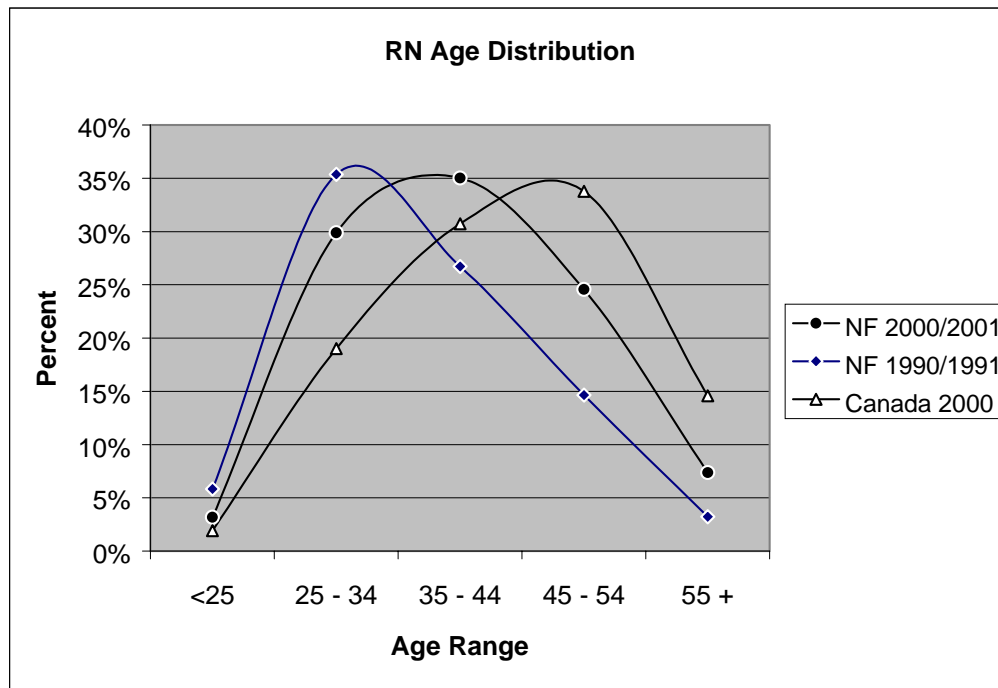
Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000 2001

The percentage of RNs in Canada in 1997 over the age of 45 (48 percent) is significantly higher than the percentage of RNs in Newfoundland and Labrador in 2000 – 2001 over the age of 45 (32 percent). This difference (13 percent) demonstrates that Newfoundland and Labrador has a much younger RN workforce compared to the Canadian average.

The fact that there were reductions in nursing positions across Canada but not in Newfoundland and Labrador during the mid-1990s may have contributed to this imbalance in RN age in that junior RNs and new graduates were not retained in the rest of Canada.

Graphically, trends for Newfoundland and Labrador and Canada are shown in Figure 4 as a percentage:

Figure 4. Age Distribution of RNs Practicing in Newfoundland and Labrador 1990 – 1991, 2000 – 2001 and Canada 2000.



Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1980 to 2001) and Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada May 2000.

The percentage of practicing RNs over the age of 45, by practice setting in 1990 and 1997, is given in Table 6:

Table 6. Number and Percent of RNs over Age 45 in 1990 and 2000 by Practice Setting in Newfoundland and Labrador in 1990 and 2000.

RNs Reporting Employment in this Practice Setting	Number over 45 in 1990	Percent over 45 in 1990	Number over 45 in 2000	Percent over 45 in 2000
Hospital	555	15.9%	850	21.9%
Nursing Home/Long Term Care	246	42.9%	291	48.9%
Community Health	84	22.1%	198	38.2%
Educational Institution	38	27.0%	64	54.2%
Other	64	34.2%	140	60.9%

Source: Centre for Health Services and Policy Research Data Tables (1998) University of British Columbia. ARNNL (2000)

The percentage of educators over the age of 45 has risen dramatically from 27 percent in 1990 to over 54 percent in 2000. The combined effect of retirements and potential increased demand for more faculty members, particularly if student enrollments are increased, will create serious shortages in this group. (Note that faculty members are required to have a minimum of a Masters degree to teach in current BN programs and this standard is moving towards a Doctorate degree. These RNs therefore require additional time to be prepared.)

The percentage of RNs over the age of 45 employed in Nursing Homes remains high at 49 percent.

RNs working in managerial positions are also older than their colleagues:

Table 7. Percentage of RNs 45 of Age or Older by Position in Newfoundland and Labrador in 2000.

Position	Percent
Managerial	59.8%
Staff Nurse/Community Health Nurse	26.7%
Other	48.4%

Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000 2001

3.3. Retirements

This section contains two estimates of RN retirements. The first estimate is calculated using data from the Pensions Administration Division of the Provincial Department of Finance on years of service and age. The second analysis simply assumes RNs retire at an average age of 58 (This is the average age of RNs becoming eligible to retire with an unreduced pension as calculated from the pensions analysis).

3.3.1. Pensions Data

To produce this analysis, data on all RNs (including those in management) participating in the provincial pension plan was obtained and their earliest date to retire with an unreduced pension was calculated. The assumption is that RNs will retire at or near their earliest date of unreduced pension as the penalty for retirement before that time is significant.

Results by Health Board are provided in Table 8:

Table 8. Number of RNs Becoming Eligible to Retire with an Unreduced Pension by Health Board by Calendar Year.

Board ¹	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
AHCIB		4		1	2	3	6	7	11	6	3	11	8	11	9	82
CEHIB		1	2	2	3		2	3	2	4	6	8	3	6	2	44
CWHB	1	2	1	1	4	4	4	3	2	5	4	8	11	7	8	65
GRHS		2		3	5	4	6	3	3	5	2	2	4	2	3	44
HCS-C	1	2		2	1	1	2	1	4	4	2	4	6		3	33
HCS-E	1	1	1		1		1	2	1	4	3	4	1	3	1	24
HCS-SJR	2			2	4	1	3	1	5	11	1	5	6	5	2	48
HCS-W				1			3	2	3	2	4	1	1	4	3	24
HCCSJ	10	9	13	10	18	26	21	34	37	51	56	58	55	57	70	525
HLC	1				5	6	2	6	3	3	4	4	3	3	3	43
NCTRF				1		3			1	1		1	2	1	1	11
PHCC		2	2		6	1	6	5	2	7	2	5	3	7	4	52
SJNHB	3		7	6	7	9	8	5	8	5	4	5	11	7	5	90
WHCC	1	1	4	4	8	5	14	7	14	24	14	20	17	21	19	173
Total (Boards)	20	24	30	33	64	63	78	79	96	132	105	136	131	134	133	1258
Total (Province)²	22	26	32	35	69	68	84	85	103	142	113	146	141	144	143	1353

Notes:

- AHCIB Avalon Health Care Institutions Board
 CEHIB Central East Health Care Institutions Board
 CWHB Central West Health Corporation
 GRHS Grenfell Regional Health Services Board
 HCS-C Health and Community Services - Central Region
 HCS-E Eastern Health and Community Services
 HCS-SJR Health and Community Services - St. John's Region
 HCS-W Western Regional Health and Community Services
 HCCSJ Health Care Corporation of St. John's
 HLC Health Labrador Corporation
 NCTRF Newfoundland Cancer Treatment & Research Foundation
 PHCC Peninsulas Health Care Corporation
 SJNHB St. John's Nursing Home Board
 WHCC Western Health Care Corporation

- This amount estimated by assuming the total number of RNs becoming eligible to retire in Health Boards represents 93 percent of the total Provincial RNs becoming eligible to retire. This assumption may be conservative as RNs working outside of Health Boards may be older (Government, Teaching, Private Industry, etc.)

Boards with the highest total projected RN retirements (up to the year 2014) as a percentage of the RN workforce (RN count as of December 31 1999) are shown in Table 9:

Table 9. Total Number of RNs Becoming Eligible to Retire by 2015 by Board as a Percent of RN Workforce.

Board	Number of RNs ¹ (December 31, 1999)	Number of RNs becoming Eligible (January 1 2000 to January 1 2015)	As a Percent of Total
HCS-W	62	24	39%
AHCIB	231	82	35%
SJNHB	259	90	35%
NCTRF	34	11	32%
HCS-SJR	152	48	32%
GRHS	145	44	30%
HLC	145	43	30%
HCS-C	113	33	29%
HCS-E	84	24	29%
WHCC	642	173	27%
HCCSJ	2052	525	26%
CWHB	295	65	22%
PHCC	237	52	22%
CEHIB	242	44	18%
Total	4693	1258	27%

¹ Source: Provincial Health and Community Services Interim Human Resource Planning Report (July 2000).

Health and Community Services, Western Region is projected to lose the highest percentage of RNs to retirement by 2015 at 39 percent.

The average age of RNs becoming eligible for an unreduced pension is 58 years. The above figures should be regarded as conservative as there will be RNs retiring with reduced pensions or no pensions.

Note that the above numbers do not account for the 2520 people in the GMPP – part time pension plan which is made up from many professions. Just 348 of these employees were 50 years old or over (to approximate becoming eligible to retire in the next 15 years) in the entire province. It is unknown what percentage of these are RNs. Human Resources staff at the HCCSJ believes that employees participating in the GMPP are not a significant consideration for retirements planning for RNs due to their low average age and high turnover.

3.3.2. Age Data

Another method for estimating retirements is to assume that all RNs retire at an average age of 58 years, and determine how many will turn 58 in each of the next 14 year. Considering all 5447 practicing RNs in the year registration year 1999/2000, results are given in Table 10:

Table 10. Number of RNs Reaching Age 58 by Calendar Year.

Age in Registration Year 1999/2000	Retirement Year (Year Reaching Age 58)	Count of RNs
58	Already 58 or older	131 ¹
57	2000	63
56	2001	55
55	2002	91
54	2003	89
53	2004	105
52	2005	98
51	2006	94
50	2007	129
49	2008	123
48	2009	150
47	2010	139
46	2011	163
45	2012	197
44	2013	188
43	2014	182
	Total	1997

Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Database for Registration Year 1999 – 2000.

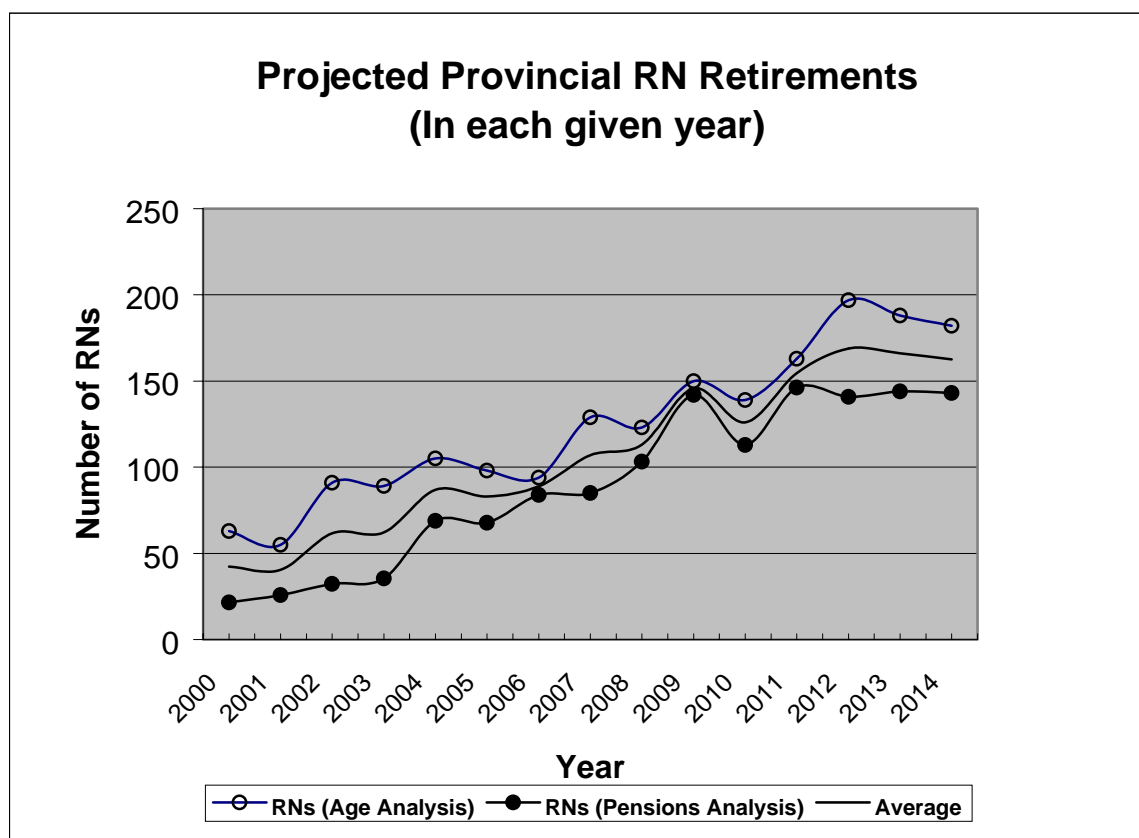
Notes:

1 Note that because of the average age of retirement equal 58 years assumption, there are 131 RNs that reached or exceeded the age of 58 years by 1999 but still hold practicing licenses in the 1999 – 2000 registration year.

It is estimated (by this analysis) that by the year 2015, almost 2000 RNs will retire.

3.3.3. Retirement Estimates

Results from Table 8 (provincial estimates) and Table 10 are provided graphically in Figure 5:

Figure 5. Number of Potential RN Retirements by Calendar Year.

The retirement's analysis using the age assumption shows higher losses than the pensions analysis. This may be because there will be RNs retiring with reduced pensions and RNs working outside of Health Boards may be older than their Board counterparts. To factor in both analyses for supply forecasting, the average number of RNs retiring each year is plotted in Figure 5 and shown in Table 11.

Table 11. Estimated Number of RNs Retiring in Province by Calendar Year.

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Total	42	40	62	62	87	83	89	107	113	146	126	155	169	166	163	1609
Incremental Change¹	0	-2	19	20	44	40	46	64	71	103	83	112	126	124	120	-

Note:

1 The incremental change reduces each year's retirements by the number of retirements in the base year 2000. The reason for this calculation is further explained in Section 4. Note that numbers may not add exactly due to rounding during calculations.

It is apparent that RN retirements will be steadily increasing over the next 15 years. The linear trend averages about 10 more RNs each year. Years 2004, 2009, and 2012 show spikes in the curve for both methodologies. These peaks have important human resource planning implications.

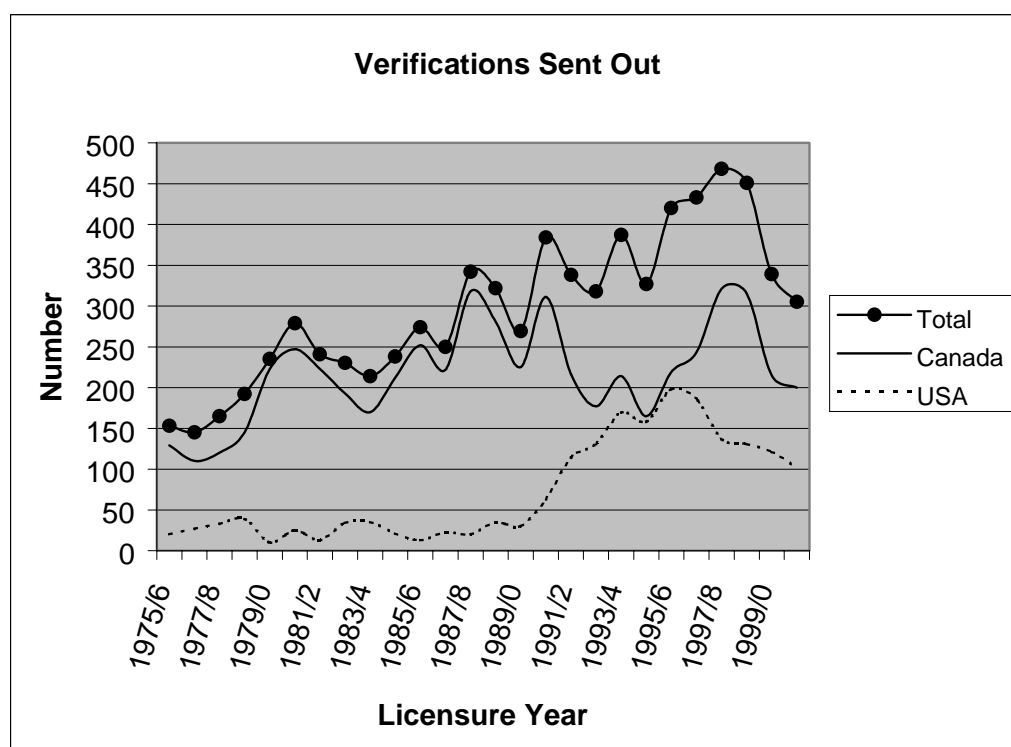
3.4. Migration

RN migration is difficult to measure directly. An indication of the intent to migrate is the number of requests the ARNNL receives to forward verification of registration documents to another regulatory body. As one RN may generate several verifications to explore possibilities for employment, yet may never leave, these numbers must be viewed with caution.

Note also that a verification can be requested for a nurse who has been out of practice in Newfoundland and Labrador for many years but who is required to provide proof of original registration when seeking registration in another jurisdiction.

The trend in verification requests is shown in Figure 6:

Figure 6. Number of Verifications Sent by ARNNL within Canada or to the USA by Registration Year.



Source: Canadian Nurses Association [CNA] Policy, Regulation and Research Division (2000).

There have been two notable spikes, one in 1980 – 1981 and another in 1997 – 1998. The nursing workforce has moved through regular cycles of shortage and surplus for several decades, provincially, nationally and internationally. During periods of RN surplus, increased migratory activity would be expected. The 1996 – 1997 period is an example of the response to lack of RN positions available in the province.

In the early 1990's a shift was noted with a decline in verifications sent within Canada, and an increase in verifications sent to the USA. More recently, recruiters from other provinces and the USA have increased activities in recent years through local job fairs and advertising.

3.5. Net Change in Practicing RNs

Table 12 outlines ARNNL membership trends including RNs with practicing licenses and non-practicing memberships.

Table 12. Number of Practicing Licenses and Non-practicing Memberships by Registration Year.

Year	Total RNs	Practicing Licenses	Non-Practicing Memberships	New Registrants NF ¹	New Registrants Other ²	Total New Registrants	Renewals ³ (to Practicing Licenses)	Net Change in Renewals ⁴
91-92	5868	5397	471	269	51	320	5077	-252
92-93	5990	5452	538	306	40	346	5106	-291
93-94	6084	5568	516	300	30	330	5238	-214
94-95	6192	5584	608	278	27	305	5279	-289
95-96	6265	5617	648	266	19	285	5332	-252
96-97	6300	5549	751	277	26	303	5246	-371
97-98	6271	5511	760	262	24	286	5225	-324
98-99	6198	5528	670	250	21	271	5257	-254
99-00	6097	5447	650	46	35	81	5366	-162
00-01	6163	5592	572	183	26	209	5383	-64

Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL].

Notes

1. Initial registrants graduating from Newfoundland schools. Note that the number of initial registrants may differ from the number of graduates because graduates may fail the nation exam, delaying registration until the following year, or the graduate may choose not to work and therefore not require a practicing license.
2. Initial registrants from outside Newfoundland. Average = 30, standard deviation = 9.7.
3. Renewals can include any nurse who was registered at least once in Newfoundland. This can include RNs with practicing licenses, non-practicing memberships, or lapsed memberships that may or may not be working within the province or away.
4. The net change in renewals is shown in the last column. For example, in 1999 – 2000, one would expect 5528 practicing members from the previous year plus 81 new registrants for a total of 5609 practicing members. In fact there were actually 5447, or a net change of 162 less renewals.

Data in Table 12 shows how variable this net change in renewals can be. The latest figure for 2000 shows a much smaller net loss (64) which is probably due to the comparatively small class of 2000 filling the void left by the very small class of 1999 i.e. two small classes meeting the demand normally addressed by two normal sized classes. Additionally, in the same year the provincial government created 125 new positions and converted some 400 positions from casual to permanent status. Recent salary increases and incentive packages also impact retention statistics.

Data was available to further analyse net changes for the last four registration years as shown in Table 13:

Table 13. Breakdown of Net Change in Practicing Licenses 1997 to 2001.

Transition Years	New Registrants	RNs renewing to a practicing license from non-practicing or lapsed license	New RN Graduates not renewing practicing licenses	Other RNs not renewing practicing licenses	Net change in renewals	Net change in practicing licenses
	A	B	C	D	B-C-D	A+B-C-D
97/98 to 98/99	271	108	117	245	-254	17
98/99 to 99/00	81	154	84	232	-162	-81
99/00 to 00/01	209	153	15	202	-64	145

Table 13 shows that in each year there are RNs who return to the workforce (Column B – assuming that RNs obtaining practicing licenses actually work - some may obtain a practicing license but choose to retire or drastically reduce their workload) and many more who leave the workforce (Column C and D). Historically, new registrants (those entering the Newfoundland and Labrador workforce for the first time) usually offset the net loss in renewals. Historically, this has led to an overall increase in the number of practicing RNs in the province.

This movement of RNs highlights the difficulty in predicting changes in the workforce. RNs obtain non-practicing memberships, let their licenses lapse, or return to a full practicing license, for many and varied reasons. Planning is further challenged by the fact that these statistics reflect individual licenses only, and do not reflect labour force participation.

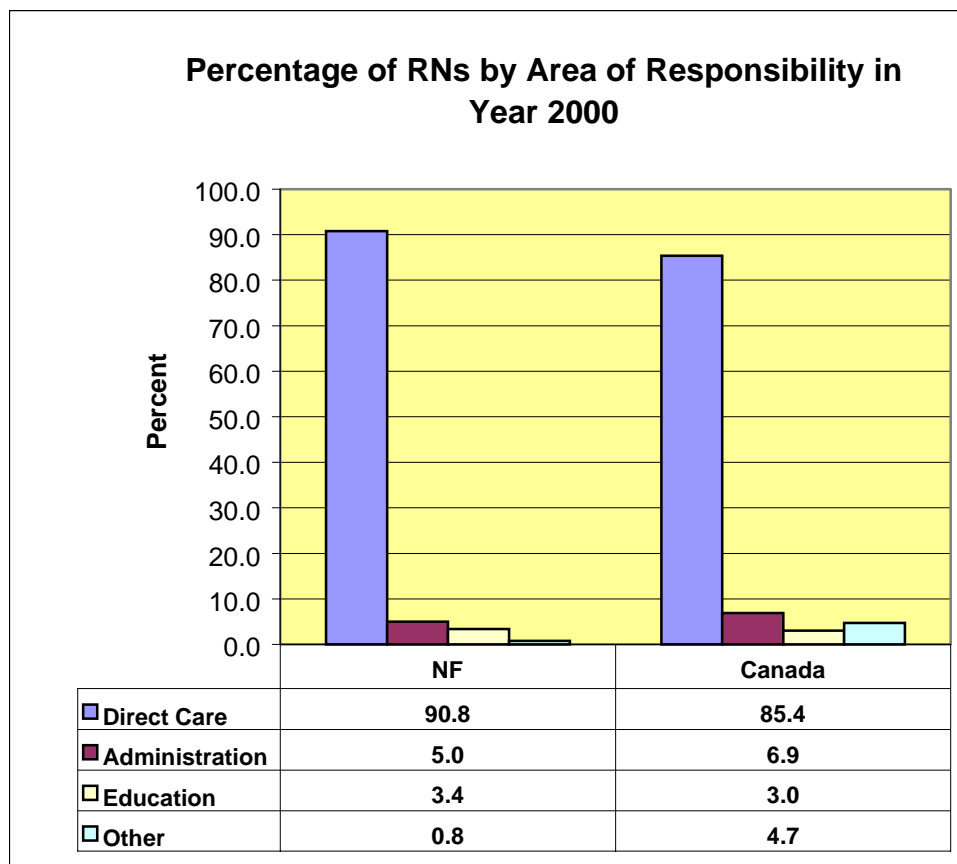
Returning to Table 12, the next step is to identify how these figures could support a forecasting model. The breakdown of the net change in renewals to practicing licenses in Table 13 is only available for the last four years and should not be used for forecasting purposes. The net change in renewals is the most reasonable approach for estimating movement into and out of the RN workforce, given the present data. Considering the average net loss, a reasonable range for variation, and that graduating fewer nurses means less out migration than years with higher graduation numbers, use an annual net loss of 226 plus or minus 73. For a detailed explanation, see Appendix A. These calculations are performed to support projections provided in Section 4.

3.6. Employment Type

3.6.1. Area of Responsibility

The percentage of RNs by area of responsibility for the year 2000 is shown in Figure 7:

Figure 7. Percentage of RNs by Area of Responsibility in 2000.



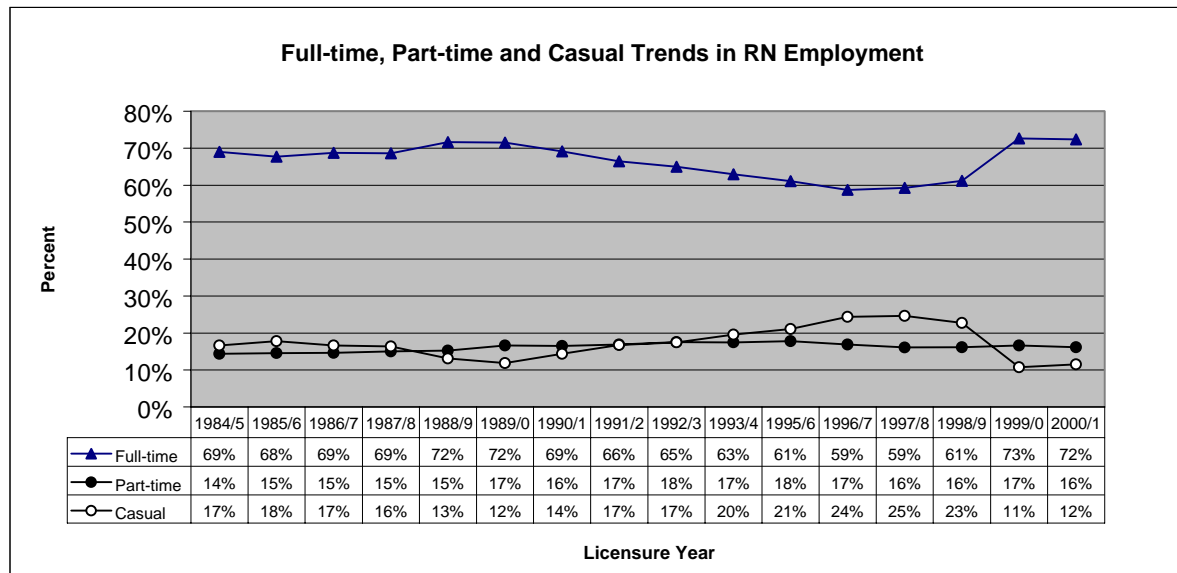
Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000, 2001

Newfoundland and Labrador has a higher percentage of RNs in direct care and education and a lower percentage of RNs working in administrative and other roles, when compared to the national average. This implies there may be leadership issues for our province.

3.6.2. Full-time, Part-time and Casual

Present employment status is indicated on the RN registration form as full-time, part-time and casual. Trends are given in Figure 8:

Figure 8. Percentage of RNs by Full-time, Part-time and Casual Employment in Newfoundland and Labrador by Registration Year.



Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1980 to 2001).

There was a steady rise in casual employment from 1990 – 1998, peaking at 25 percent. Registration data for 2000 – 2001 shows this trend has reversed with only 12 percent of RNs reporting casual employment.

Table 14 shows the percentages for employment trends in Canadian provinces. Caution is noted where the Not Stated category could greatly affect the other percentages. Caution should also be used when interpreting the figures as definitions for full-time and part-time may differ from province to province.

Table 14. Employment Trends in Canada in 2000.

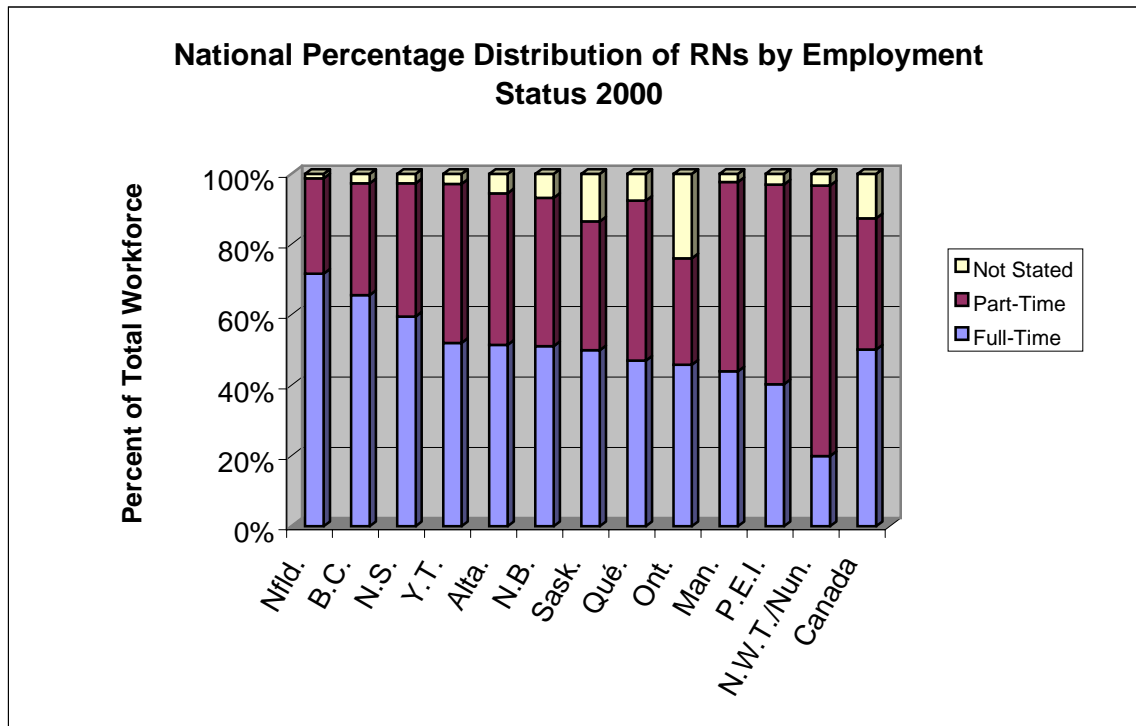
Province	Full-Time	Part-Time and Casual	Not Stated
NF	71.7	27.0	1.3
BC	65.6	31.7	2.7
NS	59.6	37.8	2.7
YT	52.0	45.1	2.9
Alta	51.5	43.0	5.5
NB	51.1	42.0	6.8
Sask	49.9	36.5	13.5
Qué	47.0	45.4	7.6
Ont	45.8	30.2	23.9
Man	44.0	53.7	2.3
PEI	40.3	56.6	3.0
NWT/Nun	19.9	76.8	3.3
Canada	50.1	37.3	12.6

Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000, 2001

The data shows that Newfoundland and Labrador currently has the highest proportion of RNs employed on a full-time basis.

The 2000 national picture is shown graphically in Figure 9:

Figure 9. National Percentage Distribution of RNs by Employment Status in 2000.



Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada May 2000.

In 2000, Newfoundland and Labrador had the highest percentage of full-time and the lowest percentage of part-time RNs in Canada. Note that CIHI includes casuals with part-time RNs.

3.6.3. Management and Supervisory Positions

Changes in the number of management/supervisory positions are given in Table 15:

Table 15. Number of Management and Supervisory Positions and Number per 100 RNs in Newfoundland and Labrador by Registration Year.

Year	Chief Nursing Officers/Directors and Assistant/Associate Directors	Supervisors or Coordinators	Head Nurses	Total Management /Supervisory Positions	Management /Supervisory Position/100 Nurses ¹
1985/6	113	255	89	457	9.6
1986/7	131	307	89	527	10.9
1987/8	116	304	81	501	10.1
1988/9	120	309	80	509	10.2
1989/0	132	351	83	566	11.0
1990/1	130	361	89	580	10.9
1991/2	129	376	88	593	11.0
1992/3	120	392	79	591	10.8
1993/4	124	384	82	590	10.6
1994/5	119	360	74	553	9.9
1995/6	105	340	68	513	9.1
1996/7	101	308	80	489	8.8
1997/8	86	258	67	411	7.5
1998/9	108	242	80	430	7.8
1999/0	132	226	82	440	8.1
2000/1	88	382 ²		470	8.4

Source: Statistics Canada, Health Statistics Division Registered Nurses Management Data (1985 - 1998). Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000 2001

Notes:

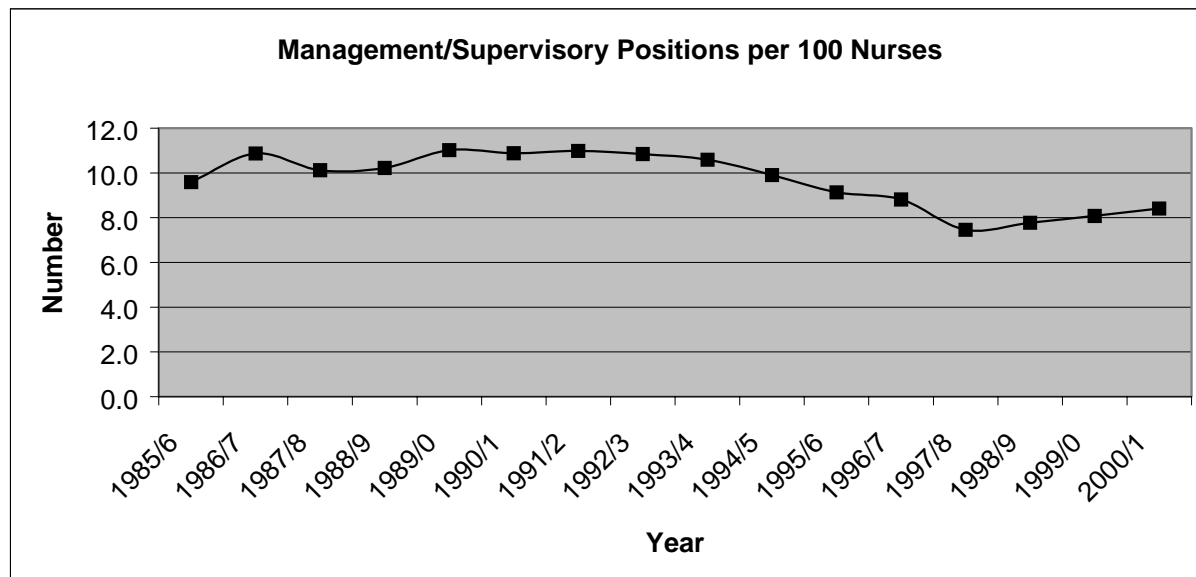
¹ The number of management/supervisory positions per 100 nurses is calculated to show the trend and is not a true measure of span of control for managers and supervisors who often manage other categories of staff such as LPNs, ward clerks, and other support staff

² Categories combined in year 2000.

There was a steady drop since 1991/2 from 11 supervisory positions per 100 nurses to a low of 7.5 in 1997/8. This was a loss of 182 positions. The trend has reversed in the last three years.

The trend in supervisory positions per 100 nurses is shown in Figure 10:

Figure 10. Number of Management and Supervisory Position per 100 Nurses in Newfoundland and Labrador by Registration Year.



Source: Statistics Canada, Health Statistics Division Registered Nurses Management Data (1985 - 1998). Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada 2000 2001

In a program management model of health care delivery, as is in place in some provincial Health Boards, these management/supervisory positions may also be responsible for Allied Health personnel, LPNs, and other support staff, in multiple clinical settings.

There is a wide range within this ratio with some managers indicating that as many as 100 employees report to them, and others with very few or none. RN educators, government staff and others are included in these figures. Additionally, some managers are responsible for staff across several sites or locations, further reducing the accessibility to employees and vice-versa.

3.7. Employer Types

The national picture shows differences in the distribution of RNs by place of work. This is given in Table 16:

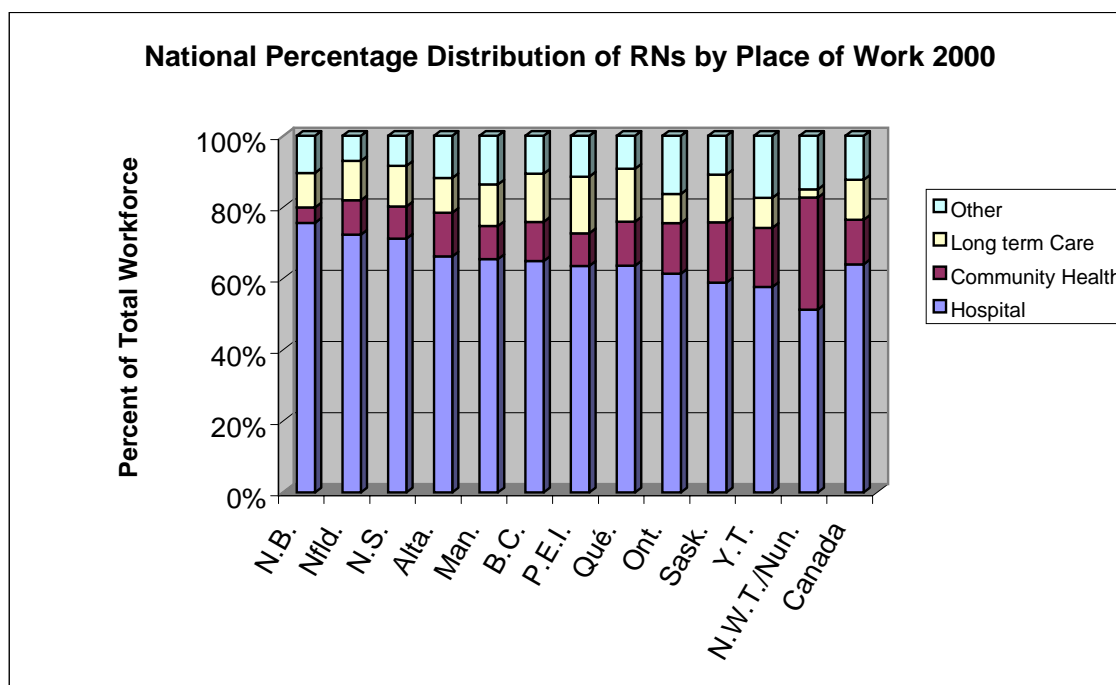
Table 16. National Percentage Distribution of RNs by Place of Work in 2000.

Province	Place of Work			
	Hospital	Community Health	Long term Care	Other
N.B.	75.1	4.3	9.6	10.3
Nfld.	72.1	9.6	11	7
N.S.	71.2	9.1	11.4	8.4
Alta.	66.1	12.2	9.7	11.8
Man.	65.3	9.3	11.6	13.6
B.C.	64.9	11	13.5	10.6
P.E.I.	63.5	9.1	15.9	11.4
Qué.	63.5	12.3	14.8	9.2
Ont.	61.3	14.1	8.2	16.3
Sask.	58.5	16.9	13.3	10.8
Y.T.	57.4	16.5	8.4	17.3
N.W.T./Nun.	51.3	31.4	2.3	15
Canada	63.8	12.4	11.2	12.3

Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada May 2000.

Graphically this data is shown in Figure 11:

Figure 11. National Percentage of RNs by Place or Work in 2000.

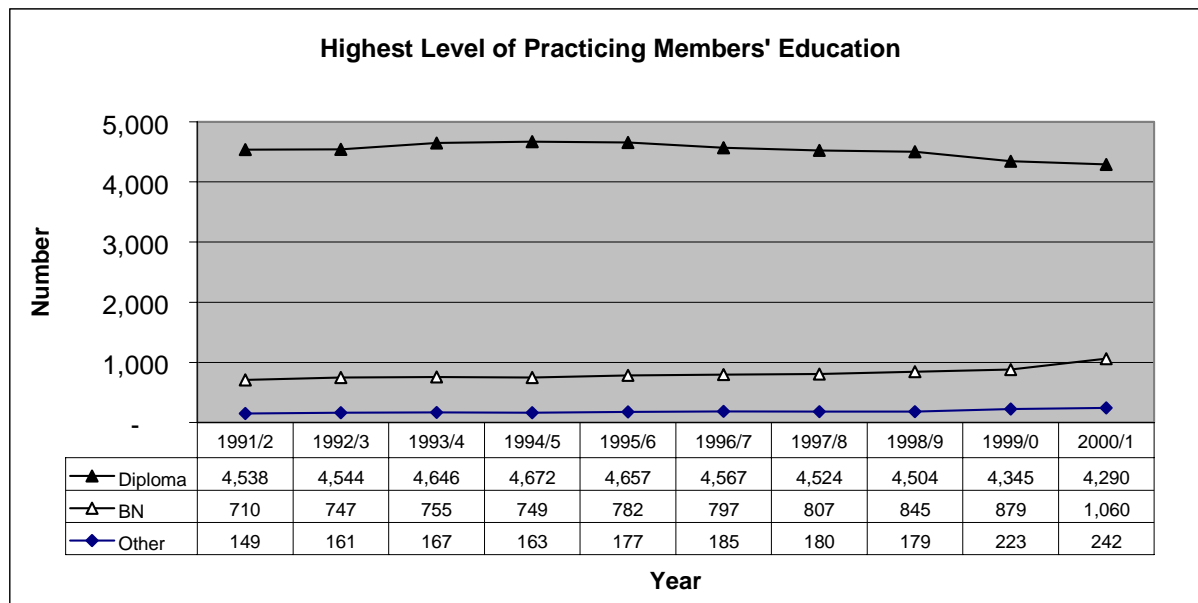


Source Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada May 2000.

3.8. Highest Level of Education

Figure 12 gives the highest level of education of RNs practicing in the province.

Figure 12. Highest Level of Practicing Members' Education, 1991 – 2000.



Source: Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1980 to 2001).

Note: “Other” includes non-nursing Bachelor degrees, nursing Masters, non-nursing Masters and Ph.D. RNs with specialty courses are not reflected in this data.

Approximately 77 percent of RNs in the province are diploma-prepared as their highest level of education. This is close to the national average of 76 percent. All current graduates are BN-prepared and the number of BN-prepared RNs will rise each year as a result. Also, many diploma-prepared RNs continue to pursue BN (Post RN) programs at Memorial University and other universities.

4. Supply Forecast

A supply forecast must address all inputs to, and outputs from, the RN workforce. The previous sections of this report have addressed these factors in as much detail as possible, given the current data.

The movements into and out of the RN workforce are summarized below:

For Reference	Movement	In or Out	Section of Report	Page
A	Initial Registrants from Newfoundland: These are RN graduates from Newfoundland programs registering for the first time. This is relatively predictable, although they may move to another province or country immediately after they qualify as an RN.	In	2.1	4
B	Initial Registrants not from Newfoundland: These numbers change from year to year but average 30 with a range of 16 to 44 (85 percent of all cases). These include foreign-trained nurses.	In	3.5	18
C	Those obtaining practicing licenses from a lapsed or non-practicing status.	In	3.5	18
D	Those allowing license to lapse or obtaining non-practicing licenses.	Out	3.5	18
E	Increment change in retirements from base year 2000.	Out	3.3.3	15

The forecast for movement into and out of the RN workforce is equal to $A + B + C - D - E$.

A: Use the projected number of graduates rather than the total number of initial registrants from Newfoundland schools, which have fluctuated above and below the number of graduates.

B: Use the average number of 30 RNs from outside the province registering for the first time.

C and D: Cannot be estimated separately, only trends in the net change for these categories as described in Section 3.5. Previous analysis indicates that this trend can be described as average net loss of 226 practicing licenses plus or minus 73.

E: As the net change in practicing licenses ($C + D$) includes those that retire, one must alter the retirement projections to incorporate the figures in a forecasting exercise. Assuming the average net loss of 226 practicing licenses includes a steady state of 42 retirements annually (this is the number estimated to retire in the year 2000 from Table 11) then in 2001 the average net loss will be expected to be $226 + (40 - 42) = 224$ plus or minus 73. In 2003, the net loss will be $226 + (62 - 42) = 246$ plus or minus 73. This explains the need to calculate the incremental change in retirements in Table 11. It is important to note that in the year 2000, retirements (42) are estimated to account for only about 20 percent of the net change ($C + D$) in the workforce.

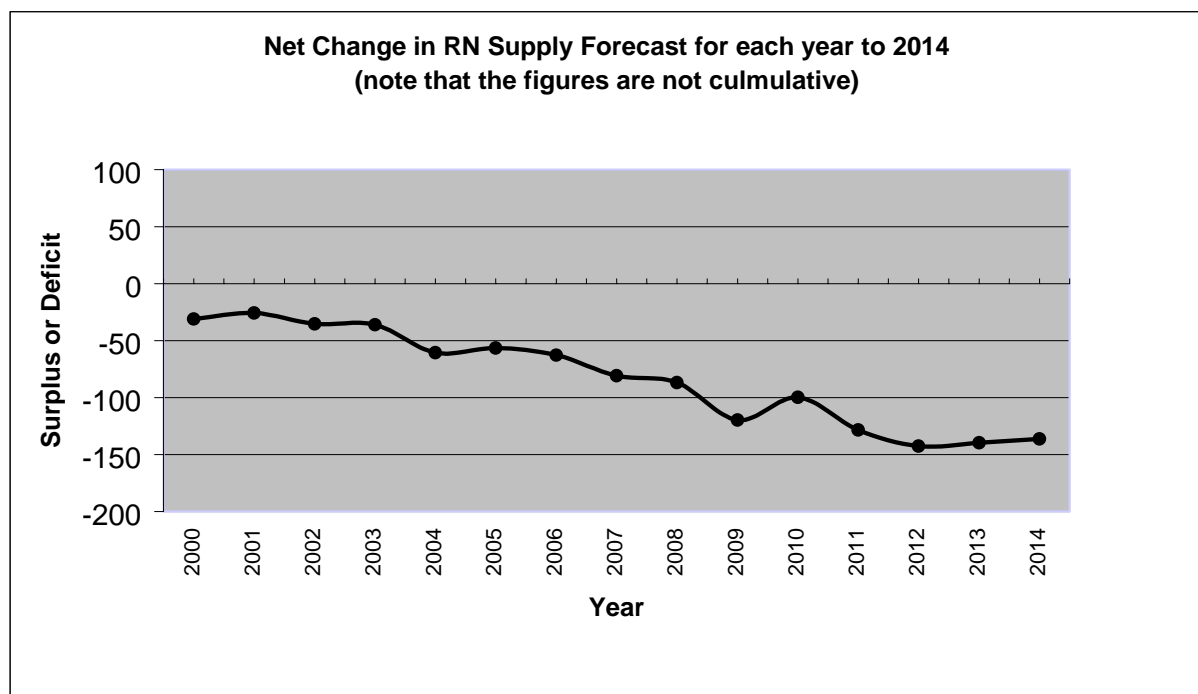
The projected figures are given in Table 17, which shows for High, Medium and Low cases how much the RN workforce inputs mismatch the outputs. Negative figures indicate a deficiency:

Table 17. RN Supply Forecast to 2014.

Year	A	B	C + D	E	Net Change in RN Supply		
					Lower Range	Expected	Upper Range
2000	163	26	-220 ± 73	0	42	-31	-104
2001	162	30	-220 ± 73	2	47	-26	-99
2002	180	30	-226 ± 73	-19	38	-35	-108
2003	180	30	-226 ± 73	-20	37	-36	-109
2004	180	30	-226 ± 73	-44	12	-61	-134
2005	180	30	-226 ± 73	-40	16	-57	-130
2006	180	30	-226 ± 73	-46	10	-63	-136
2007	180	30	-226 ± 73	-64	-8	-81	-154
2008	180	30	-226 ± 73	-71	-14	-87	-160
2009	180	30	-226 ± 73	-103	-47	-120	-193
2010	180	30	-226 ± 73	-83	-27	-100	-173
2011	180	30	-226 ± 73	-112	-55	-128	-201
2012	180	30	-226 ± 73	-126	-70	-143	-216
2013	180	30	-226 ± 73	-124	-67	-140	-213
2014	180	30	-226 ± 73	-120	-63	-136	-209
Total	2665	446	-	-	-	-1242	-

The data in Table 17 shows that in the year 2000, there could be a surplus of 42 RNs or a deficit of 104, but the expected value is a deficit of 31.

The amount by which the workforce inputs mismatch the outputs is also shown in Figure 13:

Figure 13. RN Supply Forecast to 2014.

The inputs to the workforce fall short of the outputs by 30 to 40 RNs each year until 2004. From 2004 to 2008 the shortfall increases to 50 to 80 RNs annually. A large deficit of 120 is forecast for 2009 while in 2012 the shortfall may approach as many as 143 RNs.

Increases in enrollments today would not have an effect on the workforce until 2004 by which time the cumulative shortfall (2000 to 2004) will be an estimated 189 RNs. This is the earliest that increased enrollments in the accelerated BN program could emerge as graduates.

It is important to note that the above forecast is only intended to address the supply side of the forecasting equation. It does not consider several other important factors that will have a significant impact on the need for RNs. These factors include:

- Population health needs
- Advancing technologies
- Social policy
- Provincial Staffing Standards of Care
- Scope of practice adjustments
- Labour force participation
- Other unknowns

For illustration purposes only, if the aging population requires just 0.5 percent more RNs annually than currently available, this increases the deficit by 28 more RNs every year. Seemingly small changes in demand or any of the factors listed above can have major impacts on RN requirements.

5. Conclusions

This report has highlighted a number of issues with RN human resource planning in this province. The aging of the workforce is noteworthy, particularly in areas such as long-term care and nursing education. The supply of new nurses into the workforce has been reduced by 34 to 40 percent due to a decline in funded seats in the mid-1990s when this province was experiencing a surplus of RNs.

The combined factors of declining graduate numbers, increasing retirement rates, and the out-migration of RNs, will challenge the ability of employers to meet the staffing requirements of the health system. Further study of RNs, particularly related to determination of demand variables, is required.

6. Next Steps

The next step involves developing RN demand forecasts and quantifying any other factors that play a role in determining an appropriate number of RNs for the province.

Also, it is important to develop methodologies for continued collection and reporting of HR information from ARNNL, employers, and Pensions Division to develop a trending model to support forecasting methodologies.

The final goal is to have the necessary data, on an on-going basis, to be able to make policy recommendations to ensure an adequate supply of RNs in the province.

7. Bibliography

Author/originator title (year). Source, location

1. Advisory Committee on Health Human Resources [ACHHR] Towards a Nursing Strategy for Canada: A Consultation Paper for Stakeholders (March 2000). Health Human Resource Planning Section, Policy and Consultation Branch, Health Canada, ONT
2. Canadian Institute for Health Information [CIHI] (May 2000). CIHI Web Site <http://www.cihi.ca/Roadmap/HHRDBD/start.htm>
3. Canadian Institute for Health Information [CIHI] Supply and Distribution of Registered Nurses in Canada, 2000 (2001) ONT
4. Canadian Healthcare Association [CHA] Health Human Resources Review Nursing: National Resources, Initiatives and Issues (July 1999) ONT
5. Canadian Nurses Association Web Site (June 2000) <http://www.cna-nurses.ca/frames/resources/statsframe.htm>
6. Canadian Nurses Association [CNA] Policy, Regulation and Research Division (May 1999) and (2000) ONT
7. Centre for Health Services and Policy Research Data Tables (1998) University of British Columbia BC
8. Centre for Nursing Studies [CNS] Applicant and Graduate Data (1997 to 2000). Health Care Corporation of St. John's [HCCSJ], NF
9. Association of Registered Nurses of Newfoundland and Labrador [ARNNL] Annual Reports (1954 to 2001). NF
10. Groupe de recherche interdisciplinaire en santé, Faculté de sciences infirmières, Département d'administration de la santé The Nursing Labour Market in Canada: Review of the Literature Report (Dec. 1999). Université de Montréal, PQ
11. Elliott, Doug Labour Market Analysis Saskatchewan Nursing (October 1999) Government of Saskatchewan, Saskatchewan Health
12. Pensions Administration Division, Department of Finance Projected Retirements Data (May 2000). Government of Newfoundland and Labrador, NF
13. Ryten, Eva A Statistical Picture of the Past, Present and Future of Registered Nurses in Canada (September 1997). Canadian Nurses Association, ONT
14. Statistics Canada Population (May 2000). Statistics Canada Web Site <http://www.statcan.ca/english/Pgdb/People/Population/demo02.htm>
15. Statistics Canada, Health Statistics Division Registered Nurses Management Data (1985 - 1998). Canadian Institute for Health Information [CIHI], ONT

8. Appendix A: Calculation of Average Net Loss in RN Practicing Licenses

The following details how an average net loss was calculated in Section 3.5.

Consider the net change in renewals: excluding the low of -64 in 2000 and the high of -371 in 1996, the average and standard deviation of the remaining figures are 258 and 51 respectively. If the net loss is normally distributed, one must consider 1.44 standard deviations on both sides of the average, to cover 85 percent of all possible cases, or 258 plus or minus 73. This net loss includes a percentage of new graduates from previous years. The average number of graduates was historically 273 annually. As the number of graduates will stabilize at 180, one might expect a decreased net loss i.e. less graduates means lower numbers leaving the workforce. To compensate for this, assume that 35 percent of new graduates leave the workforce and reduce the net loss by 35 percent of the reduction in graduates (273 minus 180) or 32 RNs. For forecasting purposes, use an annual net loss of $258 - 32$, or 226 plus or minus 73.

While numbers in the lower end of the range will occur, there is a limited pool of RNs with lapsed and non-practicing licenses to draw from. It is unlikely that net changes in the lower end of the range are sustainable.