Bringing the Future into Focus

Projecting RN Retirement in Canada

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Canadian Institute for Health Information
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ISBN 1-55392-263-8 (PDF)

Cette publication est disponible en français sous le titre : « Envisager l'avenir : Prévoir la retraite chez les IA au Canada » ISBN 1-55392-264-6 (PDF)

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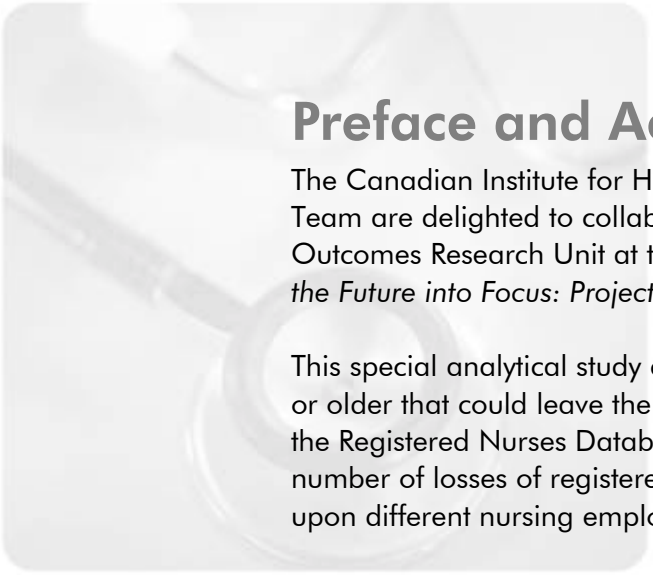

Preface and Acknowledgements

The Canadian Institute for Health Information (CIHI) and its Health Human Resources Team are delighted to collaborate with the Nursing Effectiveness, Utilization and Outcomes Research Unit at the University of Toronto in the presentation of *Bringing the Future into Focus: Projecting RN Retirement in Canada*.

This special analytical study estimates the number of registered nurses (RNs) aged 50 or older that could leave the Canadian nursing workforce by 2006. Using data from the Registered Nurses Database (RNDB) at CIHI, this study calculates the potential number of losses of registered nurses to retirement or death, and measures the impact upon different nursing employment sectors and regions of the country.

CIHI is very grateful to Dr. Linda O'Brien-Pallas and her team of researchers, Dr. Chris Alksnis, Dr. Sping Wang, Dr. Stephen Birch and Gail Tomblin Murphy for authoring this report.

Dr. O'Brien-Pallas is a professor of Nursing at the University of Toronto and is the Canadian Health Services Research Foundation (CHSRF)/Canadian Institutes of Health Research (CIHR) National Chair, Nursing Human Resources.

We extend our thanks to the registered nurses of Canada and the provincial/territorial regulating authorities for registered nursing. They have made possible the CIHI health human resources databases and the publications derived from them.

We believe this report contributes significantly to the work of health human resource planners and decision makers, and to those with an interest in nursing resources.

Any questions or requests pertaining to this report should be directed to the Consultant, Nursing Databases at CIHI or Dr. Linda O'Brien-Pallas at the University of Toronto.

Any questions or requests pertaining to the Registered Nurses Database should be directed to the Consultant, Nursing Databases at CIHI.

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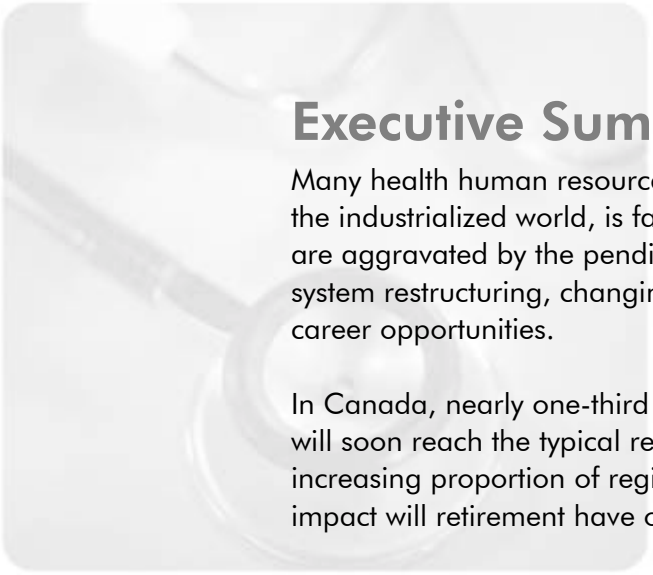


Executive Summary

Many health human resource planners have warned that Canada, like much of the industrialized world, is facing a nursing shortage. Concerns for a shortage are aggravated by the pending retirement of the baby boomer cohort, health system restructuring, changing work environments, and competition from other career opportunities.

In Canada, nearly one-third of RNs in the workforce are aged 50 years or older, and will soon reach the typical retirement age of 65 years. Research also indicates that an increasing proportion of registered nurses are retiring early, many by age 56. What impact will retirement have on the nursing workforce in the next several years?

This joint study by the Canadian Institute for Health Information (CIHI) and the Nursing Effectiveness, Utilization and Outcomes Research Unit at the University of Toronto estimates the number of registered nurses aged 50 or older that will be lost to retirement or death by 2006.

Using Vital Statistics data from Statistics Canada and data from the Registered Nurses Database (RNDB) at CIHI, a cohort supply-based projection model was developed to estimate the number of RN losses due to retirement or death. Projections were made for retirement at age 65 and at age 55, and a scenario was created to illustrate the potential effects of retention incentives.

An Index Ratio was also developed to measure the severity of losses. The Index Ratio reports the total projected loss as a percentage of the 2001 RN workforce, creating a standardized, comparable measure between regions.

The expected number of losses is calculated for six regions of Canada (Atlantic, Quebec, Ontario, Manitoba/Saskatchewan, Alberta and British Columbia), and for four employment sectors (Hospital, Long-Term Care, Community and Other Employment). This work is supplemented by an overview of the workforce characteristics using 1997–2001 data from the RNDB.

Workforce Characteristics

The number of RNs employed in nursing remained stable between 1997 and 2001 in Canada, marginally increasing by 1.1% from 227,656 to 230,261. This rate of growth did not match the population growth rate. As a result, Canada had fewer RNs per person in 2001 than in 1997.

Although, hospitals remain the predominant employer for registered nurses in Canada, the proportion of RNs working in the Hospital sector is decreasing in many parts of the country. As well, the number of RNs working in Long-Term Care decreased in every region of Canada between 1997 and 2001.

The average age of the RN workforce continues to increase, as does the proportion of RNs aged 50 or older. The eldest RNs, on average, work in Long-Term Care and in the Other Employment sector. Registered nurses in Hospitals remain the youngest, on average.

Loss Projections

Based on the assumptions underlying this analysis, including 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. Ontario and Quebec, the two largest provinces in population and RN workforce size, will lose the most RNs by 2006, losing 9,878 and 9,471 RNs, respectively. Manitoba/Saskatchewan (2,060) and Alberta (2,149) will lose the fewest RNs to retirement or death by 2006. These projections are based on a retirement age of 65.

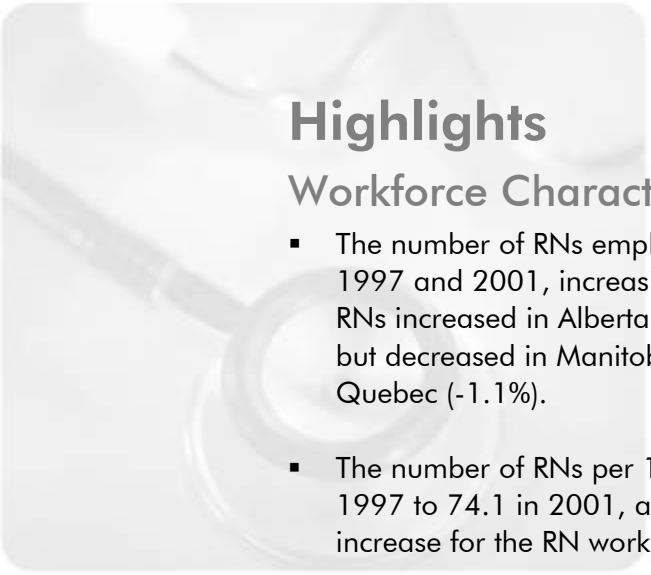
In terms of relative severity of losses, Quebec ranks highest amongst the regions, as its projected loss of 9,471 RNs is equivalent to 16% of its 2001 workforce. Ranking by the Index Ratio also puts British Columbia (14%) above the national figure of 13%. Alberta (9%) and the Atlantic region (10%), two of the three regions to increase the number of RNs employed in nursing between 1997 and 2001 are projected to experience the least severe losses to retirement or death by 2006.

Although 65 remains the typical retirement age for most regions, many RNs are retiring earlier. Thus, projections were also calculated where the retirement age was assumed to be 55 years.

If RNs were to retire at 55, Canada would be expected to lose 64,248 RNs by 2006, a figure equivalent to more than one-quarter (28%) of the 2001 RN workforce. This projected loss is more than double the expected loss based on retirement at age 65. Under this scenario, RN losses were most severe in British Columbia (32%) and least severe in the Atlantic (22%). Quebec, which ranked first for retirement at age 65, falls to fifth for retirement at age 55.

In addition, projections using hypothetical retention scenarios were calculated in order to demonstrate how many experienced RNs might continue to work in the profession if effective retention incentives could be designed. The hypothesized retention incentives could potentially allow the profession to keep a total 14,905 RNs by 2006, which is 52.8% of the RNs projected to retire. This analysis suggests that successful incentives would benefit Quebec most substantially, potentially retaining 65.9% of expected losses to retirement by 2006. The incentives explored would be least effective in Alberta although a substantial proportion of RNs (39.8%) could still potentially be kept from retirement.

This report is intended to assist nursing resource planners and decision-makers by bringing the future into focus; understanding the severity and impact retirement will have on the RN workforce provides a foundation upon which to plan for the future nursing supply.



Highlights

Workforce Characteristics

- The number of RNs employed in nursing in Canada remained stable between 1997 and 2001, increasing only 1.1% from 227,656 to 230,261. The number of RNs increased in Alberta (7.5%), Ontario (3.2%) and the Atlantic region (1.2%), but decreased in Manitoba/Saskatchewan (-2.7%), British Columbia (-2.3%) and Quebec (-1.1%).

- The number of RNs per 10,000 population decreased in Canada, from 75.9 in 1997 to 74.1 in 2001, as the population growth rate exceeded the rate of increase for the RN workforce.

- Employment remains concentrated in the Hospital sector in all regions, accounting for 64.3% of the 2001 RN workforce in Canada, despite the fact that the proportion of RNs employed in the Hospital sector is declining in most regions. The distribution of RNs in the Long-Term Care and Community sectors varies by region.

- The average age of the RN workforce is increasing, from 42.3 years in 1997 to 43.6 years in 2001. British Columbia (44.7 years) and Ontario (44.2 years) claim the eldest workforces, on average. The proportion of RNs aged 50 or older also increased, from 24.7% in 1997 to 30.3% in 2001.

Study Results

- Assuming a typical retirement age of 65 years, Canada is projected to lose a total of 29,746 RNs aged 50 or older to retirement or death by 2006, an amount equivalent to 13% of its 2001 workforce. The index ratios for Quebec (16%) and British Columbia (14%) each exceed the nation figure for this period. Alberta (9%) has the lowest ratio. These figures are based on an assumed retirement age of 65.

- Among the employment sectors, the most severe losses are expected in the Long-Term Care sector, where the equivalent of 19% of the 2001 workforce could be lost to retirement or death by 2006. This compares to 14% in the Other Employment sector, 12% in the Hospital sector and 10% in the Community sector.

- If RNs are assumed to retire early at age 55, rather than at age 65, the number of projected losses more than doubles to 64,248. This is equivalent to more than one-quarter (28%) of the 2001 RN workforce.

- The implementation of successful retention incentives could significantly reduce expected losses of RNs due to retirement. Almost half of the projected losses could be avoided, depending on the region being considered, if retention strategies were successful in retaining 100% of RNs aged 50–54, 75% of those aged 55–59 and 50% of those aged 60–64.

Introduction

Many human resource planners have warned that Canada, like much of the industrialized world, is facing a nursing shortage.[1, 2, 3, 4] Although the number of registered nurses (RNs) employed in nursing in Canada has generally increased over time,[5] in recent years some regions of Canada have experienced decreases.

Concerns for a global shortage of registered nurses are aggravated by the increasing size and proportion of elderly populations, health care system restructuring, changing work environments, and competition from other career opportunities for potential nursing school applicants.

In Canada, nearly one-third* of RNs currently working in nursing are aged 50 years or older and will soon reach the typical retirement age of 65 years.† For a profession fighting to recruit and retain members, it is becoming increasingly difficult to meet the growing demands of patients and the health care system. There is an urgent need to plan now for a strong and vibrant nursing workforce in the future.

This study contributes to this planning by generating national and regional estimates of the number of RNs aged 50 or older that can be expected to leave the RN workforce by 2006. These estimates are then compared by region and nursing employment sector to determine the relative severity of losses.

Specifically, this study aims to:

i) Determine the expected losses of registered nurses in Canada (aged 50 or older) if RNs retire at age 65;

ii) Determine the expected losses of registered nurses in Canada (aged 50 or older) if RNs retire earlier at age 55;

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* In 2001, of 231,512 RNs employed in nursing in Canada, 71,002 (31%) were aged 50 or over (CIHI 2002, Table 1.2, p.106).

† The phrase "typical retirement age of 65 years" is used throughout this document. In six provincial/territorial jurisdictions mandatory retirement after age 65 is allowed; in the other seven jurisdictions mandatory retirement at any age is viewed as discriminatory (Human Resources Development Canada—Labour Program: http://labour.hrdc-drhc.gc.ca/worklife/aw-retirement-legislative-02-en.cfm).

iii) Examine the potential for reduction of losses of registered nursing personnel if retention incentives were used; and

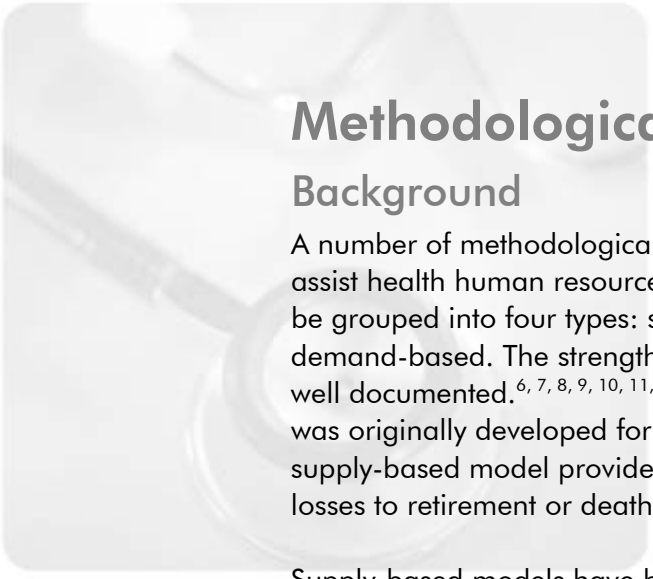
iv) Compare relative losses nationally and by region as well as by employment sector (Hospital, Community, Long-Term Care and Other Employment).

Losses generated in this study are losses of experienced RNs (aged 50 or older) to retirement or death. This study does not calculate net losses for the entire RN supply aged 20 to 65.

The projections are presented for Canada and for six geographic regions: Atlantic, Quebec, Ontario, Manitoba/Saskatchewan, Alberta and British Columbia. Projections for Canada include all provinces and territories.

This study intends to give human resource planners, decision makers and those with an interest in nursing resources, information on potential losses of RN personnel by 2006. This study does not attempt to provide comprehensive explanations or reasons for the level of expected losses of registered nurses. Nor does this report attempt to examine policy matters surrounding the expected losses of RNs or provide potential strategies for retention.

Further, this report does not contain any policy recommendations. On occasion, however, readers may find comments or statements that appear to be editorial in nature. These are solely the responsibility of the authors and may not reflect the views or opinions of the Canadian Institute for Health Information.



Methodological Notes

Background

A number of methodological frameworks have been developed in recent years to assist health human resource planning in Canada. These frameworks (or models) can be grouped into four types: supply-based, utilization-based, needs-based and demand-based. The strengths, limitations and assumptions of each type of model are well documented.[6, 7, 8, 9, 10, 11, 12, 13] The *loss estimate* approach presented in this study was originally developed for the purpose of examining Ontario's nursing supply;[14] this supply-based model provides a relatively accurate count of expected registered nurse losses to retirement or death.

Supply-based models have been used by many scholars to project nursing supply or shortages for Canada[15] or for individual provinces/territories,[16, 17, 18, 19, 20, 21] although the specific simulation methods differ from study to study. For example, Ryten (1997) projected the future supply of RNs for the nation based on the "survivors" from the existing nursing complement and the number of new entrants to nursing based on data between 1980 and 1995. Wells (2001) used a simpler strategy for projecting losses in Newfoundland and Labrador by taking the number of RNs currently aged 43 or older as the expected losses in 15 years, assuming nurses retire at age 58. A summary of the methodologies and major findings of a few selected studies on nursing supply projections is provided in Appendix B.

General Methodology

Target Population

This study uses 1997–2001 data from the Registered Nurses Database (RNDB) at the Canadian Institute for Health Information. The RNDB contains data on all RNs submitting active-practising registration in a Canadian province/territory in the first six months of the registration year. For the *Workforce Characteristics* section of the report, the target population was narrowed to registered nurses aged 20 to 65 who are employed in nursing at the time of annual registration. For the loss projections, the target population was further narrowed to RNs aged 50 to 65.

This study includes only registered nurse data.

Projecting Loss Rates

This study makes two sets of projections:

1. Separate estimates of the expected losses of RNs aged 50 or older due to death or retirement until 2006 where:
   i. RNs are assumed to retire at age 65 (the typical, if not mandatory, retirement age in most provinces/territories); and
   ii. RNs are assumed to retire early at age 55.

2. Estimates of RNs aged 50 or older that could be retained if incentives were available to delay retirement.

The Projection of Losses of Registered Nurses

Annual loss rates between 1997 and 2001 were calculated for each single-year age cohort (i.e. 50 year-olds, 51 year-olds, etc.) and averaged over four years. The 2001 cohort was then "aged forward" toward the final projection year by applying the average loss rates to the survivors at single year intervals for the entire forecast period until 2006. Losses of experienced RNs (those aged 50 or older) to retirement or death were then generated.

This projection method did not take into consideration some components that are known to affect nursing supply, such as rates of new entrants and migration. But replenishments of RNs via new nursing graduates or immigration were minimal for RNs aged 50 or older, and failing to consider such components in this study introduces only minimal errors.

The projections are only calculated for registered nurses aged 50 or older—not the entire workforce—as this study aims to demonstrate the impact of RN retirement and death on the future supply. In addition, RNs aged 50 or older accounted for 30.3% to 42.2% (depending on the employment sector) of the RN workforce in 2001 in Canada; the retirement of this group will have an important impact upon human resource planning in nursing.

Loss Rates

- Canada's projection is based on a national loss rate that incorporates all provinces and territories.
- The average annual loss rate between 1997 and 2001 is used because projection, in general, is best based on trend data with a base period longer than a single year. The rationale for this strategy is to avoid falsely interpreting one-year fluctuations as representative of a longer-term trend.[22] The use of a four-year loss rate minimizes this risk.
- The base year for this study—the year upon which the first calculations of loss rates are made—is 1997, while the launch year—the year upon which the projections begin—is 2001.

Index Ratio

An Index Ratio was developed to determine the severity of losses relative to the size of the nursing workforce in 2001. The Index Ratio provides a means by which to compare the magnitude of losses among the regions and Canada, and among employment sectors, taking into account the number of expected losses and the total number of RNs in the workforce.

- This ratio reflects estimated losses of RNs aged 50 or older until 2006, relative to the number of 20–65 year-old RNs employed in nursing in 2001.
- The rank order of the ratios indicates the relative severity of the losses in a region/sector of employment. The higher the ratio, the more severe the expected losses of RNs in the region/sector of employment.

Projecting the Potential Effects of Retention Incentives

The projection of RN losses due to retirement (after adjusting for estimated deaths) was used to determine the potential effects of retention incentives. These calculations were based on the assumption that incentives could retain 100% of RNs aged 50–54 years, 75% of RNs aged 55–59 years and 50% of RNs aged 60–64 years who would have otherwise retired.

The difference between losses due to retirement only and the reduced losses after these retention scenarios are applied is the number of RNs that could potentially be retained.

Please note that it is beyond the scope of this study to propose new retention strategies or to evaluate the success of existing retention strategies. Projected losses that can be retained were generated to illustrate how retention strategies can alleviate the strains induced by retirement losses.

Data Limitations

All forecasts and projections involve an extrapolation of the past, and estimates are often made under the assumption that rates observed in the most recent years will remain fixed for the forecast period. Because of this, projections are not totally accurate. Although many steps have been taken to increase the accuracy, the projections can still be affected by two key factors.

First, the unit of analysis for the retirement projections in this study is the number of RNs, not nursing hours. Since head counts were used as the unit of analysis for projections, any comparison of absolute losses across regions should be made with caution because the full-time, part-time, and casual employment composition differs by regions.[23] Also, if the full-time employment patterns change considerably in the future, the projections based on the number of RNs in 2001 might not hold. However, the latter point may be less of a concern since employment patterns have remained relatively stable for the past several years for most regions.

Second, some RNs did not provide employment status and/or place of work information. The non-response introduces errors in the calculation of loss rates observed in the periods. Although non-reporting rates of employment status and place of work were low for most regions, the percentage of "not stated" records for employment status was relatively high for Ontario and Quebec.[24] The issue of "not stated" records could be mitigated with a correction mechanism that incorporates non-response into the counts. This type of correction mechanism, however, may actually introduce rather than reduce errors in the projections, as the missing data are unlikely to be randomly distributed across the various employment status or employment sector categories. For this reason, there was no adjustment made for "not stated" records in this study.

Methodological Considerations

Methodological considerations in the projection of RN supply include the unit of analysis, the calculation of mortality rates, the calculation of loss rates, and rationale for using a four-year base period (1997–2001), five-year projection horizon (until 2006), and non-response issue.

The unit of analysis for the retirement projections in this study is the number of RNs, not nursing hours. In many ways, full-time equivalents (FTEs) derived from the nursing hours worked in a year are a better measurement of nursing supply than head counts, as FTEs standardize the differences in the patterns of full-time, part-time, and casual employment across time and location. However, the poor reliability of self-reported working hours means that such data are no longer collected by CIHI, which in turn precludes the study from using nursing hours as the unit of analysis.[‡]

Each region's mortality rate was calculated based on the female population, rather than on health care workers, because the latter is not any higher than that of the general population. The female death rate was used because the registered nursing profession remains predominantly female; in 2001, women accounted for 95 percent of the Canadian RN workforce.

Projection is most effective when based on trend data rather than single-year data, especially for regions that experience fluctuations in funding, population or health system policy. Since growth or loss rates are likely to fluctuate from year to year, data from the longer time period of 1997 to 2001 were used for the calculation of four-year average loss rates. As Smith, Tayman, and Swanson (2001) suggest, a period as short as one year may incorrectly interpret short-run fluctuations as long-run trends, whereas too long a base period may reflect historical trends that are no longer valid in the recent years. The choice of a four-year base period was arbitrary, but includes

[‡] CIHI stopped collecting self-reported working hours since survey year 1999.

the historical time period when recent health restructuring took place. For the Long-Term Care sector in British Columbia, three-year average loss rates (1997–1998, 1998–1999 and 2000–2001) were used for projections. RNDB data shows unusual growth in the Long-Term Care sector between 1999 and 2000 in British Columbia, which in fact is an artifact of inconsistency in the reporting of *Place of Work* data between 1999 and 2000.[i]

Year 2006 was chosen as the final projection year because according to Smith, Tayman and Swanson (2001), a general rule of thumb in making projections is that the length of the base period should correspond to the length of the projection horizon. For this study, the use of a four-year base period approximately corresponds to a five-year projection; thus, projections are made for 2002 to 2006.

Non-response in the employment status and/or place of work information would underestimate the number of RNs employed in nursing, and thus could introduce errors in the calculation of loss rates observed in the periods. The issue of "not stated" records could be handled with a correction mechanism that incorporates non-response into the counts. This type of correction mechanism, however, may actually introduce rather than reduce errors in the projections, as the missing data are unlikely to be randomly distributed across the various employment status or employment sector categories. For this reason, this study did not make adjustment for "not stated" records.

The Cohort Supply-Based Projection Method

The supply-based model used for this study has been developed by the Health Human Resources modeling group working under the auspices of the Nursing Effectiveness, Utilization, and Outcomes Research Unit, University of Toronto. Two sets of projections were generated: the first projects ***losses of RNs due to retirement or death until 2006***, assuming that no one works beyond the age of 65; (an additional projection investigated the effects of early retirement at age 55). The second set projects ***the expected losses of RNs with retention incentives***.

This projection method did not take into consideration some components that are known to affect nursing supply, such as rates of new entrants and migration. But replenishments of RNs via new nursing graduates or immigration were minimal for RNs aged 50 or older, and failing to consider such components in this study introduces only minimal errors. Projections that incorporate the loss rate of single-year age group would be sufficient to provide relatively accurate estimates of losses of RNs in the potential retirement age group.

In projecting expected losses, annual cohort loss rates were first calculated for each single year age group (between 50 and 65) from 1997 to 2001, then averaged across the four years considered. Each cohort's averaged rates were then projected forward to future years by applying the same rate to the age cohort of RNs aged 50 or older in the 2001 data. The losses of RNs were projected under the following assumptions. First, loss rates will remain fixed in the future years. Second, RNs

will work to age 65. Third, registered nurses will work the same mix of full-time/part-time/casual hours as do current registrants. Fourth, current retirement patterns will continue into the future. There are neither more nor fewer incentives to retire than they do now. Step-by-step procedures of how the yearly losses of RNs in Canada were projected are illustrated below.

Table 1 presents the loss rates among RNs working in nursing in Canada in 1997–1998 to 2000–2001. The loss rates vary from year to year, with no clear downward or upward trend of nursing supply. Loss rates were averaged across four-year data.

Table 1. Observed Loss Rates for RNs Employed in Nursing from 1997–1998 to 2000–2001 by Age, Canada

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.020	0.017	-0.004	0.011	0.011
51	0.052	0.017	0.000	0.020	0.022
52	0.064	0.021	-0.001	0.021	0.026
53	0.073	0.024	0.000	0.020	0.029
54	0.083	0.044	0.014	0.042	0.046
55	0.125	0.082	0.029	0.083	0.080
56	0.133	0.096	0.028	0.075	0.083
57	0.132	0.094	0.022	0.078	0.082
58	0.142	0.111	0.039	0.082	0.094
59	0.181	0.125	0.062	0.106	0.118
60	0.235	0.211	0.145	0.185	0.194
61	0.237	0.188	0.078	0.187	0.172
62	0.230	0.191	0.103	0.158	0.171
63	0.252	0.207	0.112	0.201	0.193
64	0.319	0.278	0.187	0.230	0.254
65	0.561	0.477	0.377	0.389	0.451

Source: Loss rates were calculated based on data from RNDB/CIHI

Once the loss rates were calculated, the 2001 cohort was then "aged forward" year by year toward the final projection year 2006 by applying the average survival rates (i.e. 1—loss rate) to the survivors at single year intervals for the entire forecast period until 2006. Table 2 presents the projected survivals of the RN workforce in 2001 until 2006. Loss rates for 45–49 age groups were held constant at zero assuming there is neither loss nor gain among nurses under age 50.

Table 2. Projected RN Supply until 2006, Canada

Age	Average Annual Loss Rate	Average Annual Survival Rate	Current	Projected				
			2001	2002	2003	2004	2005	2006
45	0.000	1.000	8,251					
46	0.000	1.000	8,576	8,251				
47	0.000	1.000	8,878	8,576	8,251			
48	0.000	1.000	8,850	8,878	8,576	8,251		
49	0.000	1.000	8,808	8,850	8,878	8,576	8,251	
50	0.011	0.989	8,254	8,808	8,850	8,878	8,576	8,251
51	0.022	0.978	7,855	8,163	8,711	8,753	8,781	8,482
52	0.026	0.974	7,446	7,681	7,982	8,518	8,558	8,586
53	0.029	0.971	6,988	7,251	7,480	7,774	8,295	8,335
54	0.046	0.954	7,044	6,785	7,040	7,262	7,547	8,054
55	0.080	0.920	5,996	6,721	6,473	6,718	6,929	7,201
56	0.083	0.917	4,777	5,518	6,185	5,957	6,181	6,376
57	0.082	0.918	4,580	4,380	5,059	5,671	5,462	5,668
58	0.094	0.906	4,247	4,207	4,023	4,647	5,209	5,017
59	0.118	0.882	3,477	3,850	3,813	3,647	4,212	4,721
60	0.194	0.806	2,764	3,066	3,395	3,363	3,216	3,714
61	0.172	0.828	1,999	2,228	2,472	2,737	2,711	2,592
62	0.171	0.829	1,573	1,655	1,844	2,046	2,265	2,244
63	0.193	0.807	1,232	1,305	1,372	1,530	1,697	1,879
64	0.254	0.746	903	995	1,053	1,108	1,235	1,370
65	0.451	0.549	658	674	742	786	827	922

Source: Loss rates were calculated based on data from RNDB/CIHI

Note

The loss rates and survival rates presented in Table 2 were rounded off at three decimals, but projected numbers were calculated on rates not rounded off and thus may be slightly different from those presented in this table.

After the future supply of RNs over age 50 was projected, losses of nurses to retirement or death were then generated. It is calculated by subtracting the number of RNs between two age cohorts in two consecutive years, that is, the losses of RNs in a given age cohort as they move from one year to the next. The losses for single year age groups at single year intervals were presented in Table 3. The sum is the yearly losses of the experienced nurses (aged 50+) anticipated to leave the nursing profession due to retirement or death.

Table 3. Losses of RNs Aged 50 or over to Retirement and Death until 2006, Canada

Age	Years				
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006
50	91	97	97	98	94
51	174	181	193	194	195
52	195	201	209	223	224
53	203	211	218	226	242
54	323	311	323	333	346
55	479	536	517	536	553
56	397	458	514	495	513
57	374	357	413	462	445
58	397	394	376	435	487
59	411	455	451	431	498
60	536	595	658	652	624
61	344	384	426	471	467
62	269	283	315	349	387
63	238	252	265	295	327
64	229	252	267	281	313
65	658	674	742	786	827
Total	5,316	5,640	5,982	6,267	6,541

Source: Calculations based on data from RNDB/CIHI

Note

Losses were calculated before rates were rounded to three decimals.

The calculation of RN losses with retention incentives followed the same projection method, but mortality rates were factored in to differentiate between losses due to death and losses due to retirement. Loss rates were calculated adjusting for mortality and then further adjusted for hypothetical retention scenarios that it would be possible to retain 100% of RNs aged 50–54 years, 75% of RNs aged 55–59 years, and 50% of RNs aged 60–64 years who would have otherwise retired. The adjusted loss rate was calculated for each single year of age between 50 and 65 years. Each cohort's losses were then aged and projected forward to 2006 by applying the adjusted survival rate to the single-year age cohort of RNs aged 50 or older in 2001. The *losses due to retirement only* and the *losses under the retention scenarios* were projected. The difference between the two sets of projections of losses is the number of RNs that could potentially be retained with incentives. The percentage of RNs that could be saved from the projected losses due to the retention incentives was then calculated. The method, conditioned on the losses rather than the growth, does not factor the growth of RNs into the calculation of adjusted loss rate. Regions that experience growth could then have a lower number of RNs being retained through the retention incentives.

Geographical Representations

For this study, smaller provinces were combined into "regions" to ensure reliable and stable estimates for the projections.

- Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick were combined into one region called "Atlantic"; and
- Manitoba and Saskatchewan were combined together.

A stand-alone projection of RN retirement was not calculated for the territories.

- The numbers of RNs for Yukon, Northwest Territories and Nunavut were too small to yield stable and reliable estimates even when all three territories were considered together. Less than 1,100 RNs aged 20 to 65 years worked in nursing in the territories in 2001, and only 285 were 50 years of age or older.

In total, projections were made for Canada and for six geographic regions: Atlantic, Quebec, Ontario, Manitoba/Saskatchewan, Alberta and British Columbia. Projections for Canada include all provinces and territories. Thus, the Canada total presented in data tables is not merely a sum of the six regional totals.

Concepts and Definitions

Data Definitions

A complete list of the data elements included in the Registered Nurses Database is available upon request to nursing@cihi.ca. Several of the concepts developed and discussed throughout this study are defined here.

Loss Rate

Defined as the rate of losses of RNs between age cohorts in two consecutive years. That is, the proportion of RNs from a given age cohort who do not register to practice from one year to the next.

Index Ratio

Defined as a ratio of estimated losses of RNs aged 50 or older until 2006 to the number of RNs aged 20–65 employed in nursing in 2001. The index Ratio measures the severity of expected losses.

Computations

All counts and calculations, unless otherwise noted, are based on registered nurses aged 20–65 years and employed in nursing in the data years 1997 to 2001.

*The **Loss Rate** is calculated as follows*:

$$L_x = 1-(P_{x+1,\,y+1} / P_{x,\,y})$$

Where L_x is the loss rate for age group x, $P_{x,y}$ is the number of RNs in age group x in year y and $P_{x+1,\,y+1}$ is the number of RNs in age group x+1 in year y+1.

For example:
In Ontario, 2,641 RNs aged 53 in 2000 and 2,556 RNs aged 54 in 2001. The loss rate for age group 53 is calculated as

$L_{53} = 1 - (P_{54, 2001} / P_{53, 2000}) = 1 - (2556/2641) = 3.2\%$.

*The **Index Ratio** is calculated as follows*:

$$\text{Index Ratio} = \frac{\text{Expected losses of RNs aged 50 or older until 2006}}{\text{Number of RNs employed in nursing in 2001}}$$

For example:
In 2001, 230,261 RNs aged 20–65 were employed in nursing in Canada. The projected losses of RNs aged 50–65 until 2006 are 29,746.

Index Ratio = 29,746 / 230,261 = 0.13

*The **Number of RNs per 10,000 Population** is calculated as follows*:

$$\text{RNs per 10,000 population} = \frac{\text{Number of RNs employed in nursing}}{\text{Population}} \times 10{,}000$$

For example:
In 1997, there were 227,656 RNs aged 20 to 65 years employed in nursing in Canada. At that time, the population of Canada was 29,987,214. Therefore, the number of RNs per 10,000 population is calculated as

$$\text{RNs per 10,000 population} = \frac{227{,}656}{29{,}987{,}214} \times 10{,}000 = 75.9$$

Data Sources

This study explores the expected losses of RNs for Canada and for six regions to 2006. Two data sources were used for this projection: Vital Statistics from Statistics Canada and the Registered Nurses Database (RNDB) at CIHI. Vital Statistics were used to calculate age-specific mortality rates and RNDB data were used for the number of RNs employed in nursing for four employment sectors: Hospital, Long-Term Care, Community, and Other Employment.

Vital Statistics

- The most recent vital statistics available on population and deaths[25] were used to calculate female mortality rates for each province/territory/region for single year age groups between 50 and 65.
- Mortality rates were calculated based on female population, rather than health care professionals because the latter is not any higher than that of the general population.[26]
- Female death rates were calculated, rather than male death rates, because women account for 95% of the nursing workforce.[27]

> Statistics Canada information is used with the permission of Statistics Canada. Users are forbidden to copy the data and re-disseminate them, in an original or modified form, for commercial purposes, without the expressed permission of Statistics Canada. Information on the availability of the wide range of data from Statistics Canada can be obtained from Statistics Canada Regional Offices, its World Wide Web site at http://www.statcan.ca, and its toll-free access number 1-800-263-1136.

Registered Nurses Database (RNDB)

- The RNDB at CIHI includes all registered nurses submitting active-practising registration to a Canadian province/territory within the first six months of the registration year.
- RNDB data will differ from year-end provincial/territorial data for several reasons: (a) CIHI data is collected at the six-month mark of the twelve-month registration year, undercounting the year-end total by approximately 3%–5%,[28] (b) CIHI data undergoes additional editing and processing when received from the provincial/territorial regulatory authority; (c) CIHI identifies and removes "secondary registrations" that do not reflect the primary jurisdiction of practice; and, (d) some jurisdictions review (and/or revise) their data at year-end, after CIHI has received its annual submission.
- The RNDB does not always include first-time registrants for all provinces/territories.[§] This has minimal impact on the projections in the study, as the projections are calculated for RNs aged 50 to 65, an age category that is unlikely to include first-time registrants.[**] However, this will have a minor impact on the calculation of the Index Ratios, which are based on the RN workforce aged 20 to 65.
- The RNDB includes 14 categories in the field Place of Work.[29] These are classified into four broad sectors as presented in Table 4.

[§] For example, the College of Nurses of Ontario (CNO) does not submit data for initial registrants to CIHI (Personal communication with CNO).

[**] Using 2001 CNO data, it was found that less than 0.3% of Ontario registrants aged 50 or over were first-time registrants with CNO.

- CIHI's classification of nursing workplace can be different from provincial or territorial classifications. Caution needs to be exercised when comparing the losses projected in this study and projections presented elsewhere (for example, O'Brien-Pallas, Darlington & Alksnis, 2001).
- Data received by CIHI are standardized to national specifications; provincial/territorial data providers may have more categories in a particular field than the national specifications. For example, College of Nurses of Ontario has more than 20 categories for Place of Work whereas the national specifications request only 14. It is the responsibility of the jurisdictions to map their data to the standardized specifications. In addition, the classification (or mapping) of categories may differ between the national specifications and provincial/territorial reporting: for example, "Mental Health Centre" and "Nursing Station" were grouped in the Hospital sector by CIHI in survey years 2000 and 1999 (CIHI, 2001, 2000), but are classified as "Other" in the CNO database.

Table 4. Nursing Employment Sectors, RNDB Data

Hospital
Hospital (general, paediatric, maternal, psychiatric)
Mental Health Centre
Nursing Station
Rehabilitation/Convalescent Centre
Long-Term Care
Nursing Home/Long-Term Care Facility
Community
Community Health Centre
Home Care Agency
Other
Business/Industry/Occupational Health Office
Private Nursing Agency/Private Duty
Self-employed
Physician's Office/Family Practice Unit
Educational Institution
Association/Government
Other

Source: "Supply and Distribution of Registered Nurses in Canada, 2000"

For more information on the RNDB, contact nursing@cihi.ca or visit http://www.cihi.ca.

Privacy and Confidentiality

The extraction and reporting of RNDB data for this study are consistent with CIHI privacy policies, designed to protect data maintained by the organization.

More information regarding CIHI privacy policies is available in a document titled *Privacy and Confidentiality of Health Information at CIHI: Principles and policies for the protection of health information*. This free document may be accessed from the CIHI Web site at http://www.cihi.ca/ or upon request to nursing@cihi.ca.

Endnote

[i] The number of 20–65 year-old RNs in the Long-Term Care sector in British Columbia increased by 56.8% between 1999 and 2000, from 2,358 to 3,698. In the 50–65 age group, the growth rate was 87%, increasing from 920 to 1,724. This growth is due mostly to the fluctuation in the non-reporting of place of work: Between 1997 and 1999, the number of "Not Stated" records in the *Place of* Work field was 1,457, 1,516, and 1,429, respectively, accounting for approximately 5% of RNs employed in nursing. In 2000 and 2001, the number of "Not Stated" records decreased sharply to 7 and 99 cases, respectively. Over the 1997–2001 period, the Hospital, Community, and Other Employment sectors increased or decreased at an expected rate; it was only the Long-Term Care sector that experienced an abrupt change between 1999 and 2000. This abrupt growth corresponds to the fluctuating level of "Not Stated" records observed in the same period, suggesting under-reporting in Long-Term Care in British Columbia prior to 2000. Therefore, rates calculated for this region and sector between 1999 and 2000 are not reported.

Workforce Characteristics

Note to the Reader

This study uses 1997–2001 data from the Registered Nurses Database at the Canadian Institute for Health Information. To provide both a foundation and a context for the retirement projections presented in this report, the workforce characteristics of supply, employment sector and age demographics are first presented.

The reader should also note that for the purpose of this study:

- The *Workforce Characteristics* section was limited to ***RNs between the ages of 20 and 65***, as this age group covers most of the workforce eligible to practice nursing. However, due to this defined age range, the total number of RNs employed in nursing in this report will not match the total number released in previous CIHI reports.
- To ensure stable and reliable projections, data for the Atlantic Provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick) have been combined into a larger "Atlantic" region. Similarly, data for the provinces of Manitoba and Saskatchewan have been combined into the "Manitoba/Saskatchewan" region. For simplicity, all units of analysis (whether comprised of a single province or multiple provinces) are termed "region" in this report.
- Separate projections and estimates were not calculated for the northern territories (Yukon, Northwest Territories and Nunavut), as the total supply was too small to produce stable and reliable estimates. However, the Canada total used in tables and charts includes data from the provinces and territories; as such, the Canada total is not a sum of the six regional totals presented in the tables.

- The *Workforce Characteristics* section involves a comparison of 1997 and 2001 RN data. These data years correspond to the base year (1997) and launch year (2001) used for the projections in the study.
- Since new graduates and migration are less relevant to the projections of losses for RNs aged 50 or older (see *Methodological Notes*), they are not discussed here.

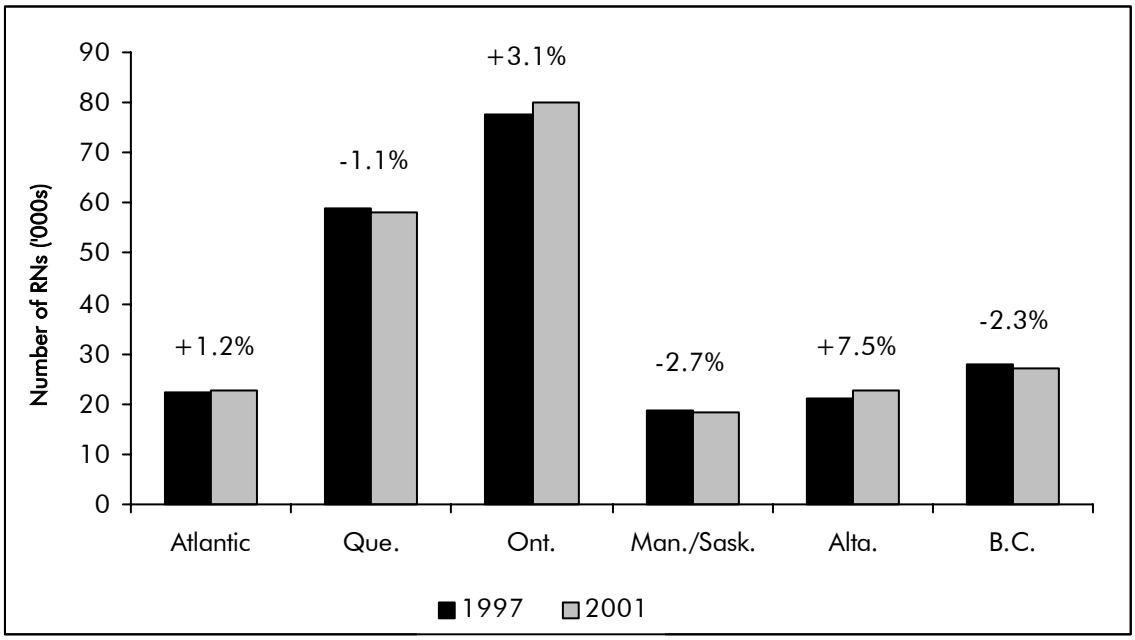
Detailed information on the methodology is provided in the previous section titled *Methodological Notes*.

Supply Trends

To fully understand the impact of potential losses to retirement or death, it is important to first present data on the nursing supply. This section examines how the supply of registered nurses changed from 1997 to 2001.

Between 1997 and 2001, the number of RNs employed in nursing aged 20 to 65 remained relatively stable in Canada, increasing by only 1.1%, from 227,656 to 230,261. This marginal increase was not uniform across the country, as illustrated in Figure 1.

Figure 1. Number of RNs Employed in Nursing Aged 20 to 65 and Overall Growth Rate by Region, 1997 and 2001



Source: RNDB/CIHI

- Alberta experienced the most substantial growth in its nursing workforce between 1997 and 2001, with an increase of 7.5%; Ontario (3.1%) and the Atlantic region (1.2%) also increased over this period.
- The regions of Quebec (-1.1%), Manitoba/Saskatchewan (-2.7%) and British Columbia (-2.3%) had a smaller RN workforce in 2001 than in 1997.

RNs per 10,000 Population

This section ties the basic supply information to the population growth over the same period, to develop the indicator "RNs per 10,000 population".[ii] This is a simple indicator that does not account for factors such as population need or provider skill mix, but it remains a valuable tool for comparison.

Figure 2 compares the growth in the RN workforce to general population growth.

Figure 2. Percent Change in the Number of RNs Employed in Nursing Aged 20–65 and the General Population from 1997 to 2001 by Region, Canada

Source: RNDB/CIHI and Statistics Canada

The population growth rate was greatest in Alberta (8.0%), Ontario (5.6%) and British Columbia (3.4%).

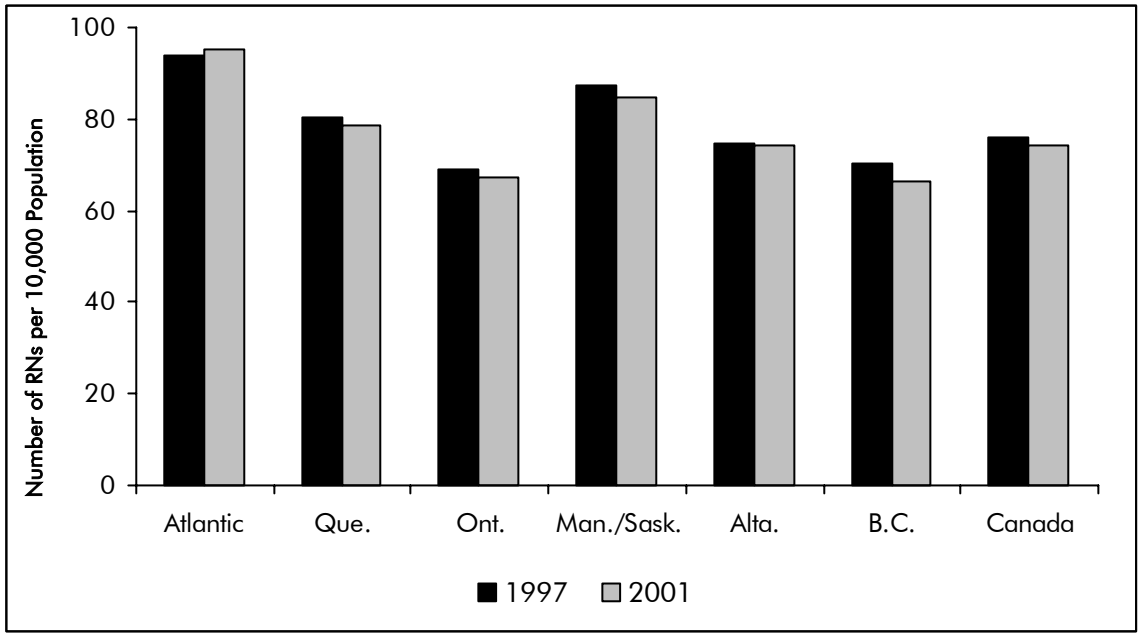
But the RN supply has not kept pace with the increase of population.

In Alberta and Ontario, the population growth rate exceeded the growth in the RN workforce. Therefore, despite a workforce increase of 7.5% in Alberta and 3.1% in Ontario, these regions had comparatively fewer RNs per person in 2001 than in 1997.

British Columbia, Quebec and Manitoba/Saskatchewan, on the other hand, underwent a fall in the RN supply while the population continued to grow. British Columbia experienced one of the largest population growth rates with one of the greatest declines in RN supply. These combined for the most substantial decline in the number of RNs per 10,000 population between 1997 and 2001, as illustrated in Figure 3.

For Canada as a whole, the actual number of RNs employed in nursing increased marginally between 1997 and 2001, the Canadian population grew at a faster rate. As a result, Canada had comparatively fewer RNs per person in 2001 than five years earlier.

Figure 3. Number of RNs Employed in Nursing Aged 20 to 65 Years per 10,000 Population by Region, Canada, 1997 and 2001



Sources: RNDB/CIHI and Statistics Canada

- In 1997, there were 75.9 RNs aged 20–65 for every 10,000 Canadians; in 2001, the ratio was 74.1 RNs per 10,000 Canadians.

Canada had comparatively fewer RNs per person in 2001 than five years earlier. Ontario and British Columbia have RN to population ratios below the national figure.

- Ontario (67.5) and British Columbia (66.5), two of the largest provinces in population size, had the fewest RNs per person of all regions in 2001.
- The Atlantic region was the only region with more RNs per person in 2001 than in 1997, reflecting both an increase in the size of the nursing workforce and a population decline in parts of the region during this period.

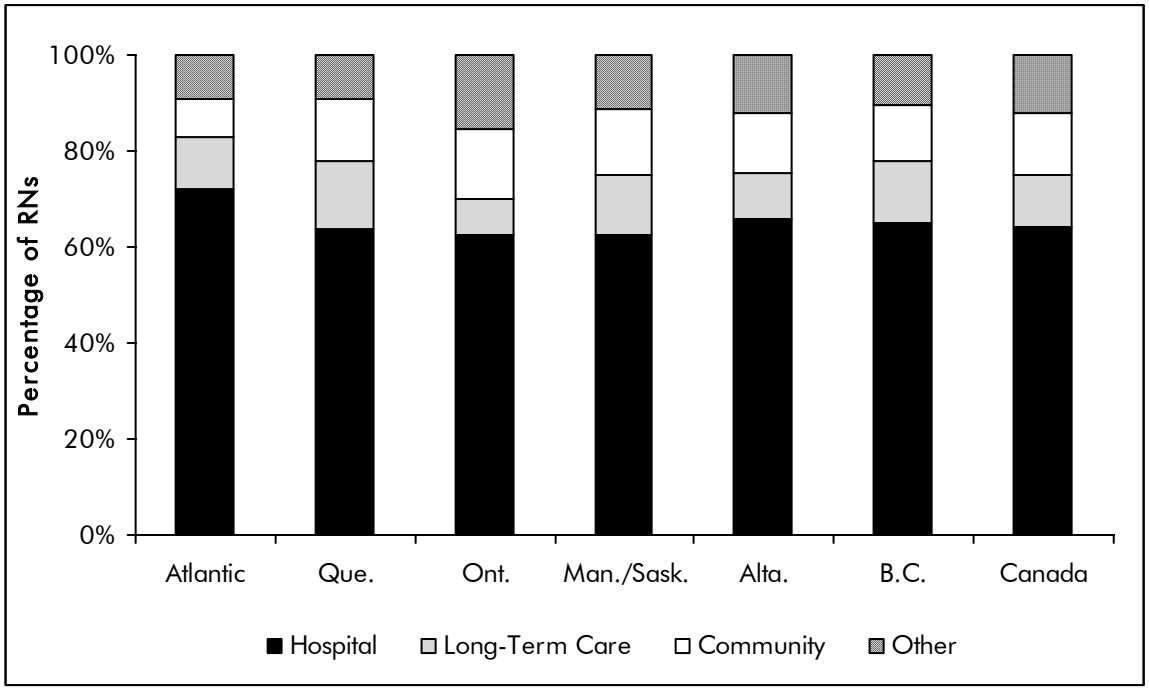
Employment Sectors

This study investigates the impact of retirement losses on different places of work, grouped here into four employment sectors (Hospital, Long-Term Care, Community and Other). This section begins with an examination of the distribution of RNs in each employment sector, and how the distribution changed between 1997 and 2001.

Distribution of RNs by Employment Sector

As illustrated in Figure 4, the size of each employment sector varies by region in Canada.

Figure 4. Percentage Distribution of RNs Employed in Nursing Aged 20 to 65 by Nursing Employment Sector and Region, Canada, 2001



Source: RNDB/CIHI

- The **Hospital** sector is the largest nursing employment sector for RNs in all regions. About two-thirds (64.3%) of Canadian RNs work in a hospital. Among all regions, the Atlantic had the largest proportion of RNs employed in hospitals (71.9%).

- The **Long-Term Care** sector accounts for a larger share of employed RNs (over 12%) in Quebec, Manitoba/Saskatchewan, and British Columbia than in regions such as Ontario (7.7%) or Alberta (9.3%).

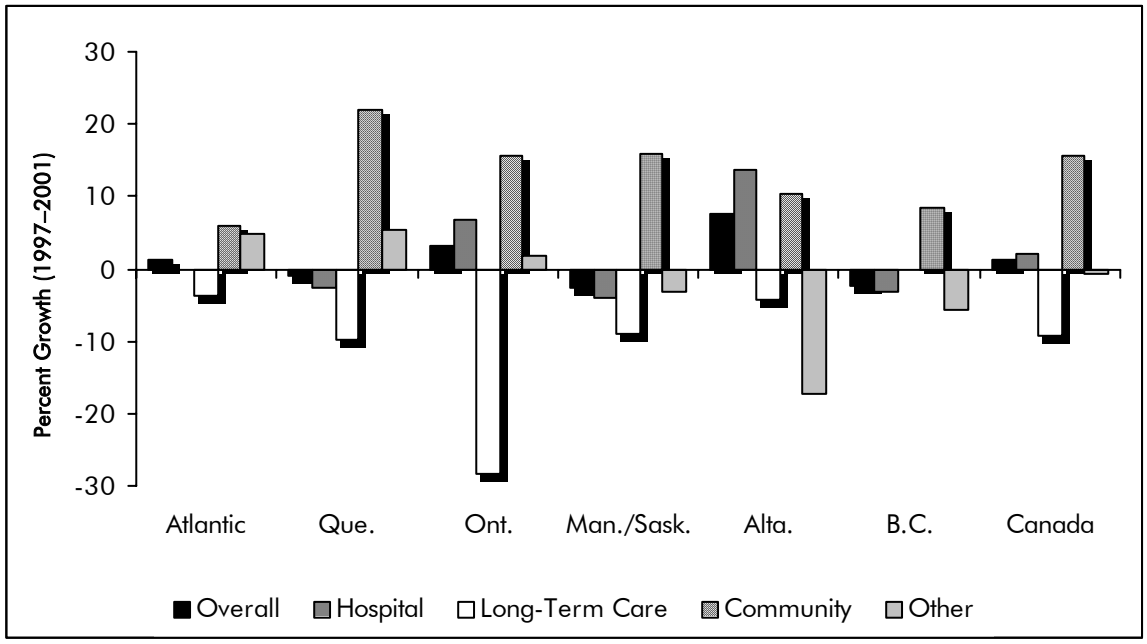
- The **Community** sector is relatively larger in Ontario (14.4%) and Manitoba/ Saskatchewan (13.6%) than in the Atlantic region (8.0%), with the remaining regions falling somewhere in between.

- The **Other Employment** sector consists of a variety of health care settings, such as Physician's Offices, Educational Institutions, and Government. It is the second largest employment sector in Ontario (15.5%), whereas a relatively smaller proportion of RNs work in such settings in the Atlantic and Quebec regions (around 9%).

Employment Sector Trends

The number of RNs employed in each sector varies over time and by region, as illustrated in Figure 5.

Figure 5. Percentage Growth of RNs Employed in Nursing Aged 20 to 65 Between 1997 and 2001 by Employment Sector and Region, Canada



Source: RNDB/CIHI

Notes

Growth not shown for British Columbia in the Long-Term Care sector in 1999–2000, as the data are not reliable. For more information, refers to the Methodological Considerations in the Methodological Notes section.

The percentage growth of the hospital sector in the Atlantic region (<0.1%) is too small to be displayed on the graph.

Although the number of RNs employed in Hospitals increased by 2% for Canada as a whole, the size of the Hospital sector declined for many regions.

- The Hospital sector declined in Manitoba/Saskatchewan (-3.9%), British Columbia (-3.1%), Quebec (-2.7%), and the Atlantic region (-0.1%) between 1997 and 2001; Alberta (13.7%) and Ontario (6.9%) were the only regions to experience growth in the Hospital sector over this period.

The Long-Term Care sector experienced losses in almost all regions during this period.

- The number of RNs working in the Long-Term Care sector in Canada decreased from 27,450 to 24,914, a loss of 9.2% since 1997. Among the regions, Ontario had the smallest percentage of RNs working in this sector in 2001, at 7.7%.
- The decline in the Long-Term Care sector is most marked in Ontario (-28.3%), Quebec (-9.8%) and Manitoba/Saskatchewan (-9.0%).

The number of RNs working in the Community sector increased in all regions during this period.

- The number of RNs employed in the Community sector increased from 25,342 to 29,320 in Canada, a growth of 15.7% between 1997 and 2001.
- The growth was most substantial in Quebec (22.0%), Manitoba/Saskatchewan (16.0%), Ontario (15.6%), and Alberta (10.5%).

The proportion of RNs employed in the Hospital and Long-Term Care sectors declined in most regions from 1997 to 2001, although the Hospital sector remains the largest employer.

The number of RNs working in the Community sector increased between 1997 and 2001, particularly in Quebec, Manitoba/Saskatchewan, Ontario, and Alberta.

The number of RNs employed in the Other Employment sector declined marginally during this period.

- The number of RNs employed in other places of work decreased from 27,767 to 27,548 in Canada from 1997 to 2001, a marginal loss of -0.8%.
- The most substantial declines occurred in Alberta (-17.4%), British Columbia (-5.6%) and Manitoba/Saskatchewan (-3.2%).

Age Demographics

It is beneficial to understand the trends in the aging of the RN workforce to appreciate the potential impact of retirement losses.

This section presents two analyses based on age: the average age of the RN workforce, and the proportion of RNs aged 50 or older in the workforce.

Average Age

Table 5 illustrates a comparison of average ages by region and employment sector for 1997 and 2001.

The average age of RNs employed in nursing in Canada increased from 42.3 years to 43.6 years between 1997 and 2001.

Table 5. Average Age (in years) of RNs Employed in Nursing Aged 20–65 by Sector and Region, Canada, 1997 and 2001

	Atlantic	Que.	Ont.	Man./Sask.	Alta.	B.C.	Canada
1997							
Overall	**40.5**	**41.7**	**43.1**	**41.7**	**42.2**	**43.2**	**42.3**
Hospital	39.5	40.8	42.3	40.7	41.0	42.1	41.3
Long-Term Care	43.0	42.6	44.7	43.8	45.1	45.4	43.8
Community	42.0	43.7	42.8	42.2	42.9	44.8	43.1
Other	44.3	43.6	45.2	44.1	44.8	45.6	44.7
2001							
Overall	**42.3**	**42.7**	**44.2**	**43.8**	**43.7**	**44.7**	**43.6**
Hospital	41.1	41.4	43.3	42.7	42.2	43.5	42.4
Long-Term Care	45.9	45.0	46.4	46.6	47.9	47.6	46.2
Community	44.4	43.9	44.0	44.3	44.7	46.4	44.2
Other	46.2	46.0	46.8	46.6	47.2	47.4	46.6

Source: RNDB/CIHI

The average age of RNs varies by employment sector and by region.

- RNs employed in the Hospital sector have been and continue to be, on average, the youngest. In 2001, the mean age of RNs working in the Hospital sector in Canada is 42.4 years, compared to 46.2 years in the Long-Term Care sector, 44.2 years in the Community sector, and 46.6 years in the Other Employment sector.
- Looking across sectors for Canada as a whole, the aging effect (the greatest increase between 1997 and 2001 figures) is most substantial in the Long-Term Care sector, increasing from 43.8 years to 46.2 years.
- In 2001, the youngest RN workforces in Canada are, on average, the Atlantic region (42.3 years) and Quebec (42.7 years).
- In 2001, the eldest RN workforces in Canada are, on average, British Columbia (44.7 years) and Ontario (44.2 years).

Proportion of RNs Aged 50 or Older

A second method of examining the aging of the nursing supply is to determine the percentage of RNs aged 50 or older, as these RNs will reach the typical retirement age of 65 years within the next fifteen years. This information is presented in Table 6.

Table 6. Proportion of the RN Workforce Aged 50 or Over by Employment Sector and Region, Canada, 1997 and 2001

	Atlantic	Que.	Ont.	Man./Sask.	Alta.	B.C.	Canada
Overall							
1997	18.9	22.5	27.4	22.2	24.7	28.3	24.7
2001	24.5	27.8	32.5	29.0	30.9	34.7	30.3
Increase	5.6	5.3	5.0	6.8	6.2	6.4	5.6
Hospital							
1997	15.2	19.1	23.2	18.1	19.7	23.3	20.5
2001	19.6	23.2	28.3	24.8	25.2	29.9	25.7
Increase	4.4	4.1	5.1	6.6	5.5	6.6	5.2
Long-Term Care							
1997	30.8	28.1	37.7	34.3	39.2	39.7	33.8
2001	40.9	36.7	43.6	42.0	49.0	48.9	42.0
Increase	10.1	8.6	5.8	7.7	9.8	9.1	8.2
Community							
1997	22.2	26.7	27.0	21.6	26.6	34.2	26.9
2001	31.1	31.1	32.7	28.9	34.4	38.5	32.7
Increase	8.9	4.4	5.7	7.2	7.8	4.3	5.7
Other							
1997	31.7	31.0	36.5	30.7	33.1	36.6	34.3
2001	38.6	40.7	43.6	38.6	43.6	43.3	42.2
Increase	6.9	9.7	7.0	8.0	10.5	6.6	7.9

Source: RNDB/CIHI

RNs Approaching Retirement Age

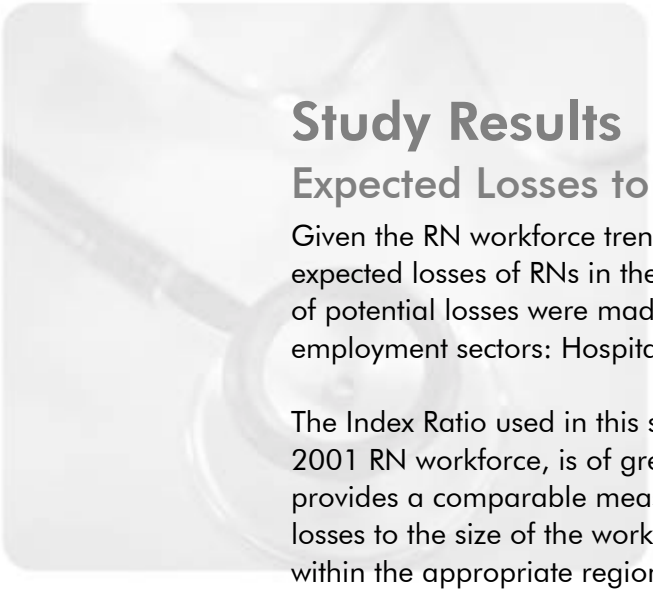
- More than 30% of the Canadian RN workforce was 50 years or older in 2001, an increase of more than 5% since 1997.

Variation by Employment Sector and Region

- In 2001, the percentage of RNs aged 50 or older was highest in British Columbia (34.7%) when looking across all sectors, and lowest in the Atlantic region (24.7%).
- Although the overall proportion of RNs aged 50 or older is comparatively small in the Atlantic region in 2001, the proportion of RNs aged 50 or older in that region increased rapidly in the Long-Term Care and Community sectors between 1997 and 2001.
- The effects of potential losses due to retirement are most evident in the Long-Term Care sector, where between 36% (Quebec) and 49% (Alberta and British Columbia) of RNs are aged 50 or older.

Endnote

[ii] "RN to population" ratios at the national level mask the considerable variation in numbers of RNs per population that are seen at the provincial and territorial levels. The latter, in turn, mask even more significant regional variations when the ratios are computed for smaller geographical units (such as health regions). It is recognized, however, that the computation of provincial/territorial nurse to population ratios may lead to problems of interpretation. The entire range of nursing services and medical requirements of the population would not be expected to be available or identical in every geographical unit examined.



Study Results

Expected Losses to Retirement at Age 65

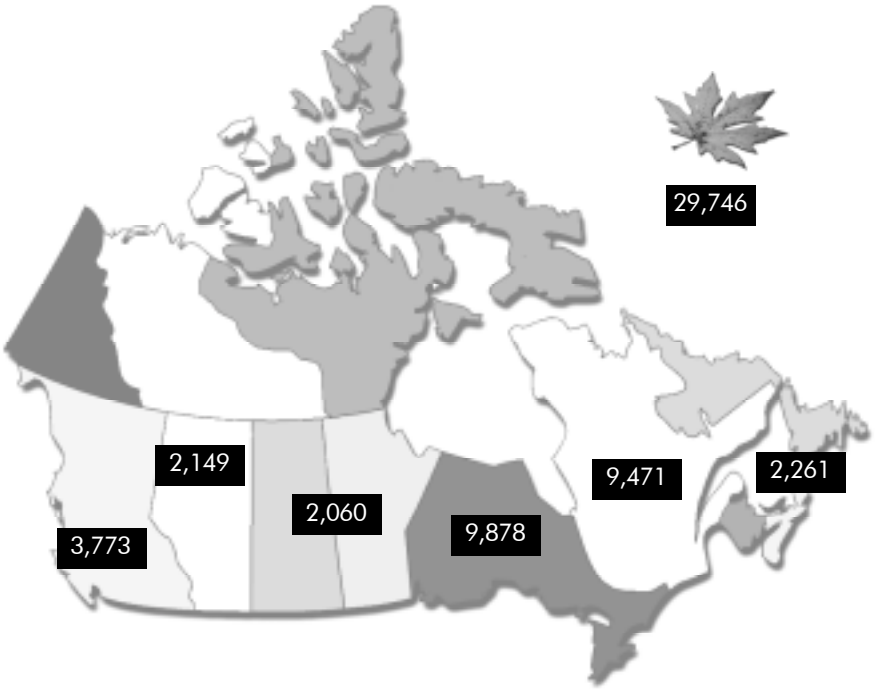
Given the RN workforce trends observed between 1997 and 2001, what are the expected losses of RNs in the next five years due to retirement or death? The projections of potential losses were made for RNs aged 50 to 65 overall and for RNs in the four employment sectors: Hospital, Long-Term Care, Community and Other Employment.

The Index Ratio used in this study, which measure the severity of losses relative to the 2001 RN workforce, is of great value to nursing resource planning. This Index Ratio provides a comparable measure of the severity of losses by linking the total number of losses to the size of the workforce in 2001. However, this indicator must be evaluated within the appropriate regional contextual information and enhanced with supplemental data to provide a more comprehensive picture of the RN workforce.

Expected Losses in Canada

Canada is projected to lose 29,746 RNs aged 50 or older to retirement or death by 2006.

Figure 6. Total Number of Projected Losses of RNs Aged 50 or Older by 2006 if RNs Retire at 65



Source: NRU/CIHI

- Ontario and Quebec, the provinces with the largest RN workforces, are expected to experience the largest losses of RNs. By 2006, Ontario is expected to lose 9,878 RNs and Quebec 9,471 RNs, which together account for 65% of the total losses in Canada.
- Projected losses of RNs aged 50 or older for the remaining regions are: British Columbia (3,773), the Atlantic region (2,261), Alberta (2,149), and Manitoba/Saskatchewan (2,060).

Table 7 outlines the expected number of losses each year, and provides an Index Ratio of losses. For Canada, the expected losses are equivalent to 13% of the 230,261 RNs in the 2001 workforce.

By ranking the Index Ratio in terms of severity, Quebec is expected to experience the most substantial losses, equivalent to 16% of its 2001 workforce. In contrast, Alberta and the Atlantic region have the lowest scores on the Index Ratio.

Table 7. Expected Losses of RNs Employed in Nursing Aged 50 to 65 by Region, Canada, 2002–2006

	Years						
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	Total	Index Ratio Losses : Nurses
Canada	**5,316**	**5,640**	**5,982**	**6,267**	**6,541**	**29,746**	**0.13**
Atlantic	385	423	457	482	513	2,261	0.10
Que.	1,750	1,823	1,917	1,969	2,013	9,471	0.16
Ont.	1,759	1,873	1,992	2,074	2,180	9,878	0.12
Man./Sask.	365	388	417	439	450	2,060	0.11
Alta.	352	392	408	477	520	2,149	0.09
B.C.	681	714	760	790	828	3,773	0.14

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes northern territories data.

Northern territories data too small for separate projections.

Please refer to the *Methodological Notes* section for projection methodology.

The severity of expected losses in a region or employment sector may, in part, be attributed to the age distribution of the workforce, average age of the workforce, recent trends of workforce growth or reduction, recent trends in the employment sector growth or reduction, and health system and nursing policies at the provincial/territorial level.

There is no single explanation for the severity of losses expected for a jurisdiction.

Expected Losses by Employment Sector

The number of expected losses from 2002 to 2006 is presented for each employment sector.

Hospital Sector

In 2001, there were 147,469 RNs employed in hospitals in Canada, among which 37,841 (25.7%) were between ages of 50 and 65.

> *By 2006, a loss of 18,103 RNs due to retirement or death is projected for RNs aged 50 or over, representing 12% of RNs who worked in the Hospital sector in 2001.*

Table 8. Expected Losses of RNs Employed in the Hospital Sector Aged 50 to 65 by Region, Canada, 2002–2006

	Years						
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	Total	Index Ratio Losses : Nurses
Canada	**3,206**	**3,427**	**3,640**	**3,830**	**4,001**	**18,103**	**0.12**
Atlantic	271	292	313	331	351	1,559	0.10
Que.	1,172	1,222	1,263	1,297	1,316	6,270	0.17
Ont.	908	978	1,054	1,116	1,188	5,245	0.11
Man./Sask.	216	225	248	261	274	1,224	0.11
Alta.	163	192	200	237	262	1,053	0.07
B.C.	400	430	461	479	503	2,274	0.13

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes northern territories data.

Northern territories data too small for separate projections.

Please refer to the *Methodological Notes* section for projection methodology.

- Ontario and Quebec, the regions with the largest nursing workforces, are expected to experience the most losses in the Hospital sector: 5,245 RNs for Ontario and 6,270 RNs for Quebec by 2006.
- Quebec's projected losses are the highest, not only in terms of the absolute number but also in terms of the magnitude of the Index Ratio.
- British Columbia, expected to lose 2,274 RNs, ranks the second highest in the Index Ratio for the Hospital sector.
- Alberta had the lowest index ratio (0.07) among all regions for the Hospital sector.

Long-Term Care Sector

In 2001, there were 24,914 RNs working in the Long-Term Care sector in Canada, among which 10,475 (42.0%) were between the ages of 50 and 65. The Long-Term Care sector was the only environment that consistently experienced a decline in the number of RNs between 1997 and 2001; this was true for almost every region.

By 2006, a loss of 4,799 RNs due to retirement or death is expected, equivalent to 19% of the RNs who worked in the Long-Term Care sector in 2001.

Table 9. Expected Losses of RNs Employed in the Long-Term Care Sector Aged 50 to 65 by Region, Canada, 2002–2006

	Years						
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	Total	Index Ratio Losses : Nurses
Canada	**933**	**951**	**973**	**962**	**980**	**4,799**	**0.19**
Atlantic	43	53	58	59	62	275	0.11
Que.	264	271	288	295	304	1,423	0.17
Ont.	341	329	325	294	288	1,577	0.26
Man./Sask.	63	67	70	73	74	346	0.15
Alta.	48	51	52	66	72	290	0.14
B.C.	118	121	126	130	139	634	0.18

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes northern territories data.

Northern territories data too small for separate projections.

Please refer to the *Methodological Notes* section for projection methodology.

The Index Ratio for the Long-Term Care sector overall (0.19) is the highest among all employment sectors. The loss of RNs in this environment is expected to be more severe than in any other sectors when considering the relative size of each workforce.

- Ontario is expected to lose 1,577 RNs from the Long-Term Care sector by 2006. This rate of loss (0.26) is proportionally higher than those of other regions. As noted, only 7.7% of the Ontario RN workforce was employed in the Long-Term Care sector in 2001, compared to 10.9% at the national level. In addition, the average age of Ontario RNs working in Long-Term Care in 2001 was 46.4 years, compared to the overall Ontario average of 44.2 years.
- The losses in British Columbia and Quebec rank second and third in the Index Ratio. The high ratio in British Columbia could be partially explained by its higher average age of RNs employed in this sector: in 2001, the average age of RNs employed in the Long-Term Care sector in British Columbia was 47.6 years.
- The expected losses in the Atlantic, Alberta and Manitoba/Saskatchewan regions are the smallest, not only in terms of absolute size, but also in terms of relation to the regions' workforces in 2001.

Community Sector

In 2001, there were 29,320 RNs working in the Community sector in Canada, among which 9,579 (32.7%) were between the ages of 50 and 65. The number of RNs employed in the Community sector increased in most regions between 1997 and 2001.

A loss of 2,899 RNs in the Community sector is projected for Canada by 2006, representing 10% of the Community sector workforce in 2001.

Table 10. Expected Losses of RNs Employed in the Community Sector Aged 50 to 65 by Region, Canada, 2002–2006

	Years						
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	Total	Index Ratio Losses : Nurses
Canada	**473**	**514**	**584**	**637**	**691**	**2,899**	**0.10**
Atlantic	22	29	35	37	43	166	0.09
Que.	188	198	221	235	250	1,093	0.15
Ont.	137	157	181	195	226	897	0.08
Man./Sask.	11	10	12	17	11	61	0.02
Alta.	39	41	47	54	60	241	0.09
B.C.	73	74	86	93	92	418	0.13

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes northern territories data.

Northern territories data too small for separate projections.

Please refer to the *Methodological Notes* section for projection methodology.

The projected losses of RNs aged 50 or older are lower for the Community sector than for Other Employment sectors.

- Ontario**, though having the highest number of RNs in the Community sector**, is projected to lose a smaller number of RNs than Quebec. The losses in Ontario (0.08) are also projected to be less severe than losses in Quebec (0.15) or British Columbia (0.13).

There is no single explanation for the relative severity of losses expected for a region. The projected loss is partially attributed to the age distribution of the workforce, the average age of the workforce, recent trends of workforce growth or reduction, recent trends in the employment sector growth or reduction, and health system and nursing policies at the provincial/territorial level.

The percentage of RNs employed in the Community Sector increased in Canada each year between 1997 and 2001.

- Manitoba/Saskatchewan and Alberta are projected to lose a small number of RNs employed in the Community sector (61 and 241, respectively). These losses represent only 2% and 9% of the Community sector workforce in 2001. These small losses could be partially related to the recent growth in the number of community health care clients, resulting in an increased number of RNs employed in this sector.[30, 31]

Other Employment Sector

In 2001, there were 27,548 RNs employed in other places of work, categorized as the Other Employment sector. Among these RNs, 11,617 (42.2%) were between the ages of 50 and 65.

The Other Employment sector consists of RNs working in a variety of health care settings, such as physician's offices, private nursing agencies, educational institutions or government. As such, meaningful conclusions may be difficult to draw from estimates for such a heterogeneous category.

A loss of 3,904 RNs is projected for the Other Employment sector by 2006, equivalent to 14% of the workforce employed in these settings in 2001.

Table 11. Expected Losses of RNs Employed in the Other Employment Sector Aged 50 to 65 by Region, Canada, 2002–2006

	Years						
	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	Total	Index Ratio Losses : Nurses
Canada	**688**	**730**	**771**	**835**	**880**	**3,904**	**0.14**
Atlantic	48	49	55	58	59	268	0.13
Que.	69	80	100	108	126	482	0.09
Ont.	292	317	328	365	384	1,686	0.14
Man./Sask.	55	60	62	65	68	311	0.15
Alta.	103	103	104	114	117	541	0.20
B.C.	92	93	95	96	103	478	0.17

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes northern territories data.

Northern territories data too small for separate projections.

Please refer to the *Methodological Notes* section for projection methodology.

The Index Ratio indicates that projected losses are relatively small for Quebec (0.09) but more severe for regions such as Alberta (0.20), British Columbia (0.17) and Manitoba/Saskatchewan (0.15). In the absence of more detail, it is difficult to determine which specific settings are most affected by projected losses.

Expected Losses to Retirement at Age 55

The typical retirement age is 65 years in most Canadian provinces. But research indicates that many workers in Canada, particularly those in the health care industry, are retiring much earlier.

In general, early retirement (i.e. prior to age 65) is more common now than a decade ago.

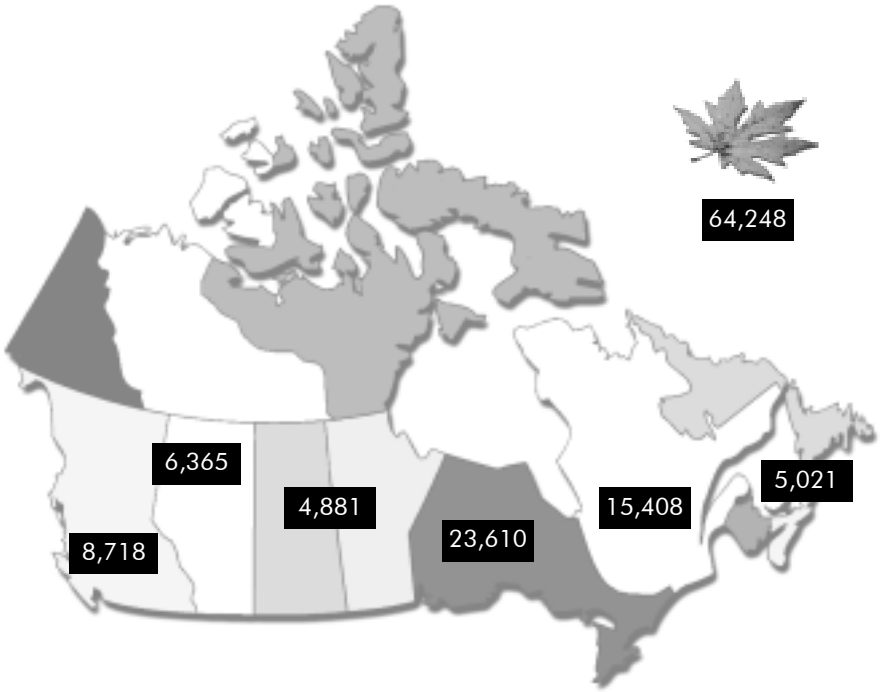
- Across all occupations between 1997 and 2000, 43% of workers retired before age 60, compared to only 29% before 1990.[32]
- Early retirement is more prevalent in the health care industry: between 1997 and 2000, 48.9% of health care professionals retired before age 65.[33]

Research has found that the average age of retirement for Canadian nurses is 56 years,[34] and that many nurses have considered retiring earlier.[35, 36]

Expected Losses in Canada

If RNs were to retire at age 55, Canada could expect to lose 64,248 RNs over the age of 50 to retirement or death by 2006, a figure equivalent to 28% of the total nursing workforce in 2001. These projected losses are more than double the losses than the earlier assumption of RNs retiring at age 65 (29,746).

Figure 7. Total Number of Projected Losses by 2006 if RNs Retired at Age 55



Source: NRU/CIHI

Table 12. Total Expected Losses by 2006 to Retirement or Death by Retirement Age and Region, Canada

	Retirement at Age 55			Retirement at Age 65		
	Total	Index Ratio	Rank	Total	Index Ratio	Rank
Canada	**64,248**	**0.28**	-	**29,746**	**0.13**	-
Atlantic	5,021	0.22	6	2,261	0.10	5
Que.	15,408	0.26	5	9,471	0.16	1
Ont.	23,610	0.29	2	9,878	0.12	3
Man./Sask.	4,881	0.27	4	2,060	0.11	4
Alta.	6,365	0.28	3	2,149	0.09	6
B.C.	8,718	0.32	1	3,773	0.14	2

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total includes data from northern territories.

Please refer to the *Methodological Notes* section for projection methodology and description of Index Ratio.

The expected losses of RNs were highest in British Columbia (0.32) and lowest in the Atlantic region (0.22). These patterns mirror those found in the previous projections, where RNs were assumed to retire at age 65. This is not true, however, for Quebec: if RNs were to retire at 65, Quebec ranks first in severity of losses; but if RNs were to retire at 55, Quebec ranks fifth, below the index ratio for the nation.

Projections with Retention Incentives

This section estimates the effects of retention incentives on RN retirement. While it is beyond the scope of this report to evaluate particular incentives, this projection exercise is useful to demonstrate the potential reduction in losses through incentives.

The estimate of the number of RNs aged 50 or over that could be retained is based on the assumption that incentives can be effectively implemented to keep RNs in the workforce. *The incentives used in this study assume that 100% of RNs aged 50–54, 75% of RNs aged 55–59, and 50% of RNs aged 60–64, who otherwise would have retired, could be retained with incentives.*

From projections presented earlier in this report, Canada is expected to lose a total of 29,746 RNs by 2006 due to retirement or death; of these, 28,242 will be lost to retirement only.

With incentives, 14,905 RNs in the Canadian workforce could be retained by 2006, representing 52.8% of the RNs who would have otherwise retired.

Table 13. Comparison of Total Loss Estimates to Potential Retention Estimates by Region, Canada

	Loss Estimates			Retention Estimates	
	Due to Retirement	Due to Retirement and Death	Due to Retirement After Incentives Implemented	Estimated Retention with Incentives	% Saved from Retirement by Incentives
Canada	**28,242**	**29,746**	**13,337**	**14,905**	**52.8**
Atlantic	2,125	2,261	992	1,133	53.3
Que.	9,169	9,471	3,128	6,041	65.9
Ont.	9,300	9,878	5,091	4,209	45.3
Man./Sask.	1,927	2,060	1,012	915	47.5
Alta.	1,994	2,149	1,200	794	39.8
B.C.	3,578	3,773	1,925	1,653	46.2

Source: Projections are based on data from RNDB/CIHI

Notes

Canada total include northern territories data.

Retention estimates assume 100% of RNs aged 50–54, 75% of RNs aged 55–59, and 50% of RNs aged 60–64, who otherwise would have retired, could be retained with incentives.

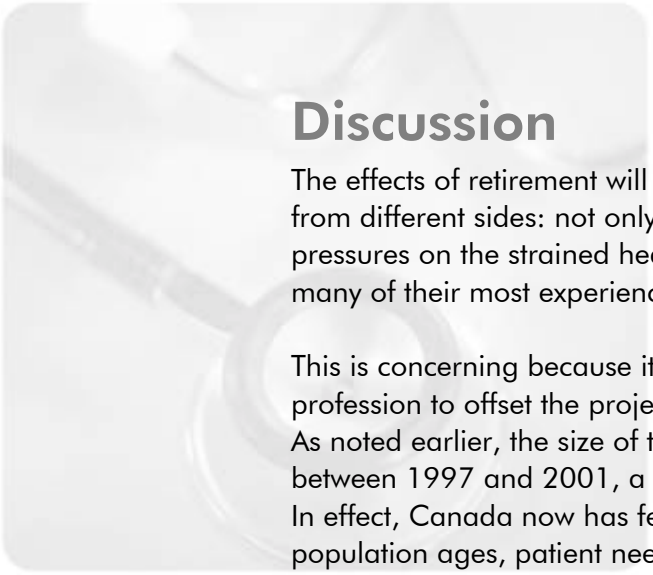
Please refer to the *Methodological Notes* for projection methodology.

Effective retention strategies would benefit Quebec the most, saving 65.9% of expected losses to retirement. Similar strategies would save 53.3% of expected losses in the Atlantic region and 47.5% of losses in the Manitoba/Saskatchewan region.

- Quebec and the Atlantic gain the most from potential retention scenarios in part because the two regions have the youngest workforces, on average, in Canada; thus, a greater proportion of RNs could potentially be retained.
- The lowest estimated retention rate is in Alberta (39.8%), because the projection method, conditioned on losses rather than growth, does not factor in the growth of RNs into the calculation of the number of RNs retained. Regions that experienced strong RN growth, such as Alberta, rank lowest in the number of RNs retained and the percentage of RNs saved due to retention incentives.

In recent years, a number of retention strategies for nurses have been investigated and/or implemented. While an evaluation of particular incentives is beyond the scope of this study, some of the strategies include:

- Flexible work and schedule arrangements (e.g. job sharing, self-scheduling system, etc.)
- Education support (e.g. payment for education program, education leave, etc.)
- Pay increases (e.g. salary increases, bonuses, etc.)
- Relocation expenses (e.g. moving expenses, etc.)
- Other benefits (e.g. parking space, uniforms, etc.)



Discussion

The effects of retirement will soon impact the registered nurse workforce in Canada from different sides: not only will the baby boom cohort begin to place additional pressures on the strained healthcare system, but the RN workforce will also soon lose many of their most experienced personnel to retirement.

This is concerning because it is unknown if there will be enough RNs entering the profession to offset the projected losses that will occur between 2002 and 2006. As noted earlier, the size of the RN workforce remained relatively stable in Canada between 1997 and 2001, a time when the country's population increased by 3.7%. In effect, Canada now has fewer RNs per person than in 1997. As the general population ages, patient needs will increase in both frequency and complexity. And with a nursing workforce that is also aging, there is an urgent need to understand the impact of RN retirement and to plan for the future nursing supply.

This study projected the number of losses of RNs aged 50 or older to retirement or death between 2002 and 2006. The effects of retirement at ages 65 and 55 were each presented, as were the potential effectiveness of retention strategies.

Results found that by 2006, Canada will lose a total of 29,746 RNs, accounting for 13% of the 2001 workforce. However, if RNs were to retire early at age 55, and there is evidence to suggest this is a plausible occurrence, then the potential number of losses balloons to 64,248, reflecting more than one-quarter (28%) of the 2001 workforce. Quite simply, one in four RNs currently caring for patients in this country may be gone by 2006, a date less than three years away from the time of publication.

The severity of expected losses varies by region and employment sector. When expected losses of experienced RNs are expressed as a proportion of the 2001 workforce, Quebec is expected to lose more RNs than any other region, despite having one of the youngest average ages. High loss rates are also expected in Ontario and British Columbia. Alberta, which had the largest percentage increase in workforce size between 1997 and 2001, is least impacted by retirement at age 65. Still, Alberta is projected to lose 9% of its 2001 workforce by 2006.

The Long-Term Care sector, which has the second-highest average age and a decreasing workforce size, is projected to lose 19% of its 2001 workforce to retirement or death by 2006. The Community sector, in contrast, is expected to lose 10% of its 2001 workforce by 2006.

The retention of experienced RNs has been suggested as a key factor in solving the nursing shortage.[37, 38] This study found that incentives that retain 100% of RNs aged 50–54, 75% of RNs aged 55–59, and 50% of RNs aged 60–64 saves almost half the projected losses of RNs. Retaining these RNs would help to alleviate some of the future strain on the workforce.

The simple cohort supply-based projection model portrays a relatively accurate picture of the expected short-term losses of RNs in the potential retirement age group. A comprehensive interpretation of the impact of the projected losses requires an understanding of the roles of other health professionals, including Licensed Practical Nurses and Registered Psychiatric Nurses, and of the staffing mix within the service requirements and health environment. Understanding the impact of retirement on the workforce within this regional context will assist policy- and decision-makers in planning nursing resources for the future.

Other External Data Sources

Source: "Estimates of Population, by Age Group and Sex, Canada, Provinces and Territories, annual (Persons unless otherwise noted)", from the Statistics Canada CANSIM database, http://cansim2.statcan.ca/cgi-win/CNSMCGI.EXE, Table 051-0001.

Source: "Death, by Age Group and Sex, Canada, Provinces and Territories, annual (Persons)", from Statistics Canada CANSIM database, http://cansim2.statcan.ca/cgi-win/CNSMCGI.EXE, Table 051-0002.

Source: "Occupational surveillance in Canada: cause-specific mortality among workers, 1965–1991", from the Statistics Canada Web site, http://www.statca.ca/english/IPS/Data/84-546-XCB.htm.

Source: "Labour Force Survey estimates (LFS), by sex and detailed age group, annual(Persons unless otherwise noted)", from the Statistics Canada CANSIM database, http://cansim2.statcan.ca/cgi-win/CNSMCGI.EXE, Table 282-0002.

Source: "Early Retirement Trends", published in the Statistics Canada publication, "Perspectives on Labour and Income", Catalogue 75-001, Winter 2001, Vol.13, No.04, p.7-13.

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Appendix A

Data Tables

Table 1.0. Number and Percentage Distribution of RNs Employed in Nursing Aged 20–65 by Region, Canada, 1997 and 2001

	1997		2001		% Change 1997–2001
	Count	% of Total	Count	% of Total	
Atlantic	**22,315**	**9.8%**	**22,587**	**9.8%**	**1.2%**
N.L.	5,208	2.3%	5,436	2.4%	4.4%
P.E.I.	1,202	0.5%	1,259	0.5%	4.7%
N.S.	8,569	3.8%	8,523	3.7%	-0.5%
N.B.	7,336	3.2%	7,369	3.2%	0.4%
Que.	**58,833**	**25.8%**	**58,214**	**25.3%**	**-1.1%**
Ont.	**77,700**	**34.1%**	**80,112**	**34.8%**	**3.1%**
Man./Sask.	**18,857**	**8.3%**	**18,347**	**8.0%**	**-2.7%**
Man.	10,421	4.6%	10,189	4.4%	-2.2%
Sask.	8,436	3.7%	8,158	3.5%	-3.3%
Alta.	**21,151**	**9.3%**	**22,740**	**9.9%**	**7.5%**
B.C.	**27,875**	**12.2%**	**27,241**	**11.8%**	**-2.3%**
Territories	**925**	**0.4%**	**1,020**	**0.4%**	**10.3%**
Y.T.	302	0.1%	272	0.1%	-9.9%
N.W.T.	623	0.3%	466	0.3%	20.1%
Nun.			282		
Canada	**227,656**	**100.0%**	**230,261**	**100.0%**	**1.1%**

Source: RNDB/CIHI

Table 2.0. Number of RNs Employed in Nursing Aged 20–65 per 10,000 Population by Region, Canada, 1997 and 2001

	Population ('000s)			RNs Aged 20–65		RNs per 10,000 Population	
	1997	2001	Change	1997	2001	1997	2001
Atlantic	**2,379.7**	**2,372.0**	**-0.3%**	**22,315**	**22,587**	**93.8**	**95.2**
N.L.	554.1	533.8	-3.7%	5,208	5,436	94.0	101.8
P.E.I.	136.9	138.5	1.2%	1,202	1,259	87.8	90.9
N.S.	934.5	942.7	0.9%	8,569	8,523	91.7	90.4
N.B.	754.2	757.1	0.4%	7,336	7,369	97.3	97.3
Que.	**7,302.6**	**7,410.5**	**1.5%**	**58,833**	**58,214**	**80.6**	**78.6**
Ont.	**11,249.5**	**11,874.4**	**5.6%**	**77,700**	**80,112**	**69.1**	**67.5**
Man./Sask.	**2,158.6**	**2,165.8**	**0.3%**	**18,857**	**18,347**	**87.4**	**84.7**
Man.	1,136.6	1,150.0	1.2%	10,421	10,189	91.7	88.6
Sask.	1,022.0	1,015.8	-0.6%	8,436	8,158	82.5	80.3
Alta.	**2,837.2**	**3,064.2**	**8.0%**	**21,151**	**22,740**	**74.5**	**74.2**
B.C.	**3,959.7**	**4,095.9**	**3.4%**	**27,875**	**27,241**	**70.4**	**66.5**
Territories	**100.0**	**98.9**	**-1.1%**	**925**	**1,020**	**92.5**	**103.1**
Y.T.	32.2	29.9	-7.1%	302	272	93.8	91.0
N.W.T.	41.8	40.9	-2.2%	623	466	92.0	108.2
Nun.	25.9	28.2	8.9%		282		
Canada	**29,987.2**	**31,081.9**	**3.7%**	**227,656**	**230,261**	**75.9**	**74.1**

Sources: RNDB/CIHI and Statistics Canada

Table 3.0. Percentage Distribution of RNs Employed in Nursing Aged 20–65 by Employment Sector and Region, Canada, 2001

	Percent				
	Total[a]	Hospital	Long-Term Care	Community	Other
Atlantic	**22,366**	**71.9**	**11.0**	**8.0**	**9.1**
N.L.	5,434	71.3	11.1	10.0	7.7
P.E.I.	1,258	62.5	15.9	10.7	11.0
N.S.	8,523	71.1	11.5	9.0	8.5
N.B.	7,151	75.1	9.5	4.8	10.6
Que.	**58,101**	**63.7**	**14.3**	**12.7**	**9.2**
Ont.	**79,943**	**62.4**	**7.7**	**14.4**	**15.5**
Man./Sask.	**18,198**	**62.3**	**12.8**	**13.6**	**11.4**
Man.	10,066	65.0	12.4	10.9	11.7
Sask.	8,132	59.0	13.2	16.8	11.0
Alta.	**22,483**	**66.0**	**9.3**	**12.5**	**12.2**
B.C.	**27,142**	**65.1**	**13.0**	**11.7**	**10.3**
Territories	**1,018**	**62.4**	**4.3**	**19.4**	**13.9**
Y.T.	272	59.2	9.6	15.1	16.2
N.W.T.	464	67.9	2.6	17.5	12.1
Nun.	282	56.4	2.1	27.0	14.5
Canada	**229,251**	**64.3**	**10.9**	**12.8**	**12.0**

Source: RNDB/CIHI

[a] "Not stated" category not included in the count.

Table 4.0. Number and Percent Change of RNs Employed in Nursing Aged 20–65 by Employment Sector and Region, Canada, 1997 and 2001

	Overall			Hospital			Long-Term Care		
	1997	2001	Change	1997	2001	Change	1997	2001	Change
Atlantic	**22,315**	**22,587**	**1.2%**	**16,097**	**16,081**	**-0.1%**	**2,558**	**2,461**	**-3.8%**
N.L.	5,208	5,436	4.4%	3,709	3,872	4.4%	645	605	-6.2%
P.E.I.	1,202	1,259	4.7%	759	786	3.6%	188	200	6.4%
N.S.	8,569	8,523	-0.5%	6,111	6,056	-0.9%	977	976	-0.1%
N.B.	7,336	7,369	0.4%	5,518	5,367	-2.7%	748	680	-9.1%
Que.	**58,833**	**58,214**	**-1.1%**	**38,036**	**37,024**	**-2.7%**	**9,232**	**8,325**	**-9.8%**
Ont.	**77,700**	**80,112**	**3.1%**	**46,669**	**49,892**	**6.9%**	**8,562**	**6,139**	**-28.3%**
Man./Sask.	**18,857**	**18,347**	**-2.7%**	**11,795**	**11,337**	**-3.9%**	**2,554**	**2,324**	**-9.0%**
Man.	10,421	10,189	-2.2%	6,881	6,540	-5.0%	1,306	1,251	-4.2%
Sask.	8,436	8,158	-3.3%	4,914	4,797	-2.4%	1,248	1,073	-14.0%
Alta.	**21,151**	**22,740**	**7.5%**	**13,048**	**14,840**	**13.7%**	**2,184**	**2,092**	**-4.2%**
B.C.	**27,875**	**27,241**	**-2.3%**	**18,232**	**17,660**	**-3.1%**	**2,317**	**3,529**	**n/a**
Territories	**925**	**1,020**	**10.3%**	**686**	**635**	**-7.4%**	**43**	**44**	**2.3%**
Canada	**227,656**	**230,261**	**1.1%**	**144,563**	**147,469**	**2.0%**	**27,450**	**24,914**	**-9.2%**

	Community			Other		
	1997	2001	Change	1997	2001	Change
Atlantic	**1,691**	**1,790**	**5.9%**	**1,941**	**2,034**	**4.8%**
N.L.	480	541	12.7%	361	416	15.2%
P.E.I.	123	134	8.9%	119	138	16.0%
N.S.	762	770	1.0%	719	721	0.3%
N.B.	326	345	5.8%	742	759	2.3%
Que.	**6,071**	**7,406**	**22.0%**	**5,069**	**5,346**	**5.5%**
Ont.	**9,939**	**11,488**	**15.6%**	**12,218**	**12,424**	**1.7%**
Man./Sask.	**2,127**	**2,467**	**16.0%**	**2,138**	**2,070**	**-3.2%**
Man.	805	1,099	36.5%	1,301	1,176	-9.6%
Sask.	1,322	1,368	3.5%	837	894	6.8%
Alta.	**2,541**	**2,807**	**10.5%**	**3,321**	**2,744**	**-17.4%**
B.C.	**2,916**	**3,164**	**8.5%**	**2,953**	**2,789**	**-5.6%**
Territories	**57**	**198**	**247.4%**	**127**	**141**	**11.0%**
Canada	**25,342**	**29,320**	**15.7%**	**27,767**	**27,548**	**-0.8%**

Source: RNDB/CIHI

Notes

Growth rate between 1997 and 2001 for British Columbia in the long-term care sector is not reported because there is a high chance of under-reporting in long-term care in British Columbia prior to 2000. Numbers for individual territories are not presented because the numbers are too small to depict meaningful picture of growth or decline.

Table 5.0. Average Age of RNs Employed in Nursing Aged 20–65 by Employment Sector and Region, 1997 and 2001

	1997				
	Overall	Hospital	Long-Term Care	Community	Other
Atlantic	**40.5**	**39.5**	**43.0**	**42.0**	**44.3**
N.L.	38.4	37.2	42.0	39.9	42.6
P.E.I.	41.7	39.6	44.8	45.1	46.2
N.S.	41.3	40.5	42.9	42.1	44.9
N.B.	40.8	39.8	43.6	43.7	44.3
Que.	**41.7**	**40.8**	**42.6**	**43.7**	**43.6**
Ont.	**43.1**	**42.3**	**44.7**	**42.8**	**45.2**
Man./Sask.	**41.7**	**40.7**	**43.8**	**42.2**	**44.1**
Man.	41.4	40.5	43.6	42.1	43.3
Sask.	42.2	41.0	44.0	42.3	45.5
Alta.	**42.2**	**41.0**	**45.1**	**42.9**	**44.8**
B.C.	**43.2**	**42.1**	**45.4**	**44.8**	**45.6**
Territories	**40.7**	**39.8**	**40.8**	**44.6**	**43.6**
Y.T.	41.6	40.9	38.7	43.7	43.6
N.W.T./Nun.	40.3	39.5	44.2	46.4	43.7
Canada	**42.3**	**41.3**	**43.8**	**43.1**	**44.7**

	2001				
	Overall	Hospital	Long-Term Care	Community	Other
Atlantic	**42.3**	**41.1**	**45.9**	**44.4**	**46.2**
N.L.	40.1	38.5	45.2	42.3	44.2
P.E.I.	43.9	41.7	48.4	46.3	47.6
N.S.	43.5	42.4	46.3	45.4	46.9
N.B.	42.3	41.3	45.3	44.6	46.5
Que.	**42.7**	**41.4**	**45.0**	**43.9**	**46.0**
Ont.	**44.2**	**43.3**	**46.4**	**44.0**	**46.8**
Man./Sask.	**43.8**	**42.7**	**46.6**	**44.3**	**46.6**
Man.	43.6	42.7	46.4	44.1	46.0
Sask.	44.0	42.7	46.9	44.4	47.3
Alta.	**43.7**	**42.2**	**47.9**	**44.7**	**47.2**
B.C.	**44.7**	**43.5**	**47.6**	**46.4**	**47.4**
Territories	**42.9**	**41.8**	**44.5**	**45.2**	**44.4**
Y.T.	43.5	42.3	43.1	45.0	46.7
N.W.T./Nun.	42.2	40.9	48.0	44.7	44.3
Canada	**43.6**	**42.4**	**46.2**	**44.2**	**46.6**

Source: RNDB/CIHI

Table 6.0. Percentage of RNs Employed in Nursing Aged 50 Years or Older by Employment Sector and Region, Canada, 1997 and 2001

	Overall (%)			Hospital (%)			Long-Term Care (%)		
	1997	2001	Difference	1997	2001	Difference	1997	2001	Difference
Atlantic	**18.9**	**24.5**	**5.6**	**15.2**	**19.6**	**4.4**	**30.8**	**40.9**	**10.1**
N.L.	13.5	18.1	4.6	9.9	12.9	3.0	27.1	38.2	11.1
P.E.I.	23.0	32.2	9.2	16.7	21.8	5.0	33.5	56.0	22.5
N.S.	21.1	27.3	6.2	17.3	22.6	5.3	31.6	41.8	10.2
N.B.	19.6	24.7	5.1	16.1	20.7	4.6	32.2	37.5	5.3
Que.	**22.5**	**27.8**	**5.3**	**19.1**	**23.2**	**4.1**	**28.1**	**36.7**	**8.6**
Ont.	**27.4**	**32.5**	**5.0**	**23.2**	**28.3**	**5.1**	**37.7**	**43.6**	**5.8**
Man./Sask.	**22.2**	**29.0**	**6.8**	**18.1**	**24.8**	**6.6**	**34.3**	**42.0**	**7.7**
Man.	20.9	28.5	7.6	17.7	24.9	7.2	32.5	41.2	8.7
Sask.	23.9	29.7	5.8	18.7	24.5	5.8	36.2	42.9	6.7
Alta.	**24.7**	**30.9**	**6.2**	**19.7**	**25.2**	**5.5**	**39.2**	**49.0**	**9.8**
B.C.	**28.3**	**34.7**	**6.4**	**23.3**	**29.9**	**6.6**	**39.7**	**48.9**	**9.1**
Territories	**18.5**	**27.9**	**9.5**	**16.5**	**24.4**	**7.9**	**23.3**	**36.4**	**13.1**
Y.T.	16.2	28.7	12.5	13.3	26.1	12.8	11.1	30.8	19.7
N.W.T./Nun.	19.6	27.7	8.1	17.6	23.8	6.2	43.8	44.4	0.7
Canada	**24.7**	**30.3**	**5.6**	**20.5**	**25.7**	**5.2**	**33.8**	**42.0**	**8.2**

	Community (%)			Other (%)		
	1997	2001	Difference	1997	2001	Difference
Atlantic	**22.2**	**31.1**	**8.9**	**31.7**	**38.6**	**6.9**
N.L.	14.2	24.0	9.9	24.9	29.3	4.4
P.E.I.	35.0	41.0	6.1	32.8	48.6	15.8
N.S.	24.7	34.0	9.4	35.3	40.2	4.9
N.B.	23.3	31.9	8.6	31.4	40.4	9.0
Que.	**26.7**	**31.1**	**4.4**	**31.0**	**40.7**	**9.7**
Ont.	**27.0**	**32.7**	**5.7**	**36.5**	**43.6**	**7.0**
Man./Sask.	**21.6**	**28.9**	**7.2**	**30.7**	**38.6**	**8.0**
Man.	21.0	28.1	7.1	26.4	35.8	9.4
Sask.	22.0	29.5	7.4	37.4	42.4	5.0
Alta.	**26.6**	**34.4**	**7.8**	**33.1**	**43.6**	**10.5**
B.C.	**34.2**	**38.5**	**4.3**	**36.6**	**43.3**	**6.6**
Territories	**31.6**	**36.9**	**5.3**	**21.3**	**28.4**	**7.1**
Y.T.	23.7	34.1	10.5	23.6	31.8	8.2
N.W.T./Nun.	47.4	37.6	-9.8	19.4	26.8	7.4
Canada	**26.9**	**32.7**	**5.7**	**34.3**	**42.2**	**7.9**

Source: RNDB/CIHI

Table 7.0. Observed Loss Rates for RNs Employed in Hospitals in Canada, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.043	0.032	-0.012	0.021	0.021
51	0.089	0.023	-0.015	0.025	0.030
52	0.102	0.048	-0.018	0.026	0.039
53	0.112	0.042	-0.012	0.033	0.044
54	0.123	0.058	-0.013	0.053	0.055
55	0.180	0.109	0.027	0.098	0.104
56	0.174	0.115	0.028	0.101	0.104
57	0.187	0.124	0.009	0.100	0.105
58	0.172	0.123	0.029	0.105	0.107
59	0.231	0.150	0.039	0.122	0.136
60	0.292	0.255	0.164	0.224	0.234
61	0.301	0.226	0.069	0.201	0.199
62	0.311	0.205	0.077	0.164	0.189
63	0.332	0.249	0.114	0.198	0.223
64	0.394	0.373	0.153	0.261	0.295
65	0.714	0.560	0.460	0.471	0.551

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 8.0. Observed Loss Rates for RNs Employed in Long-Term Care in Canada, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.026	-0.012	0.081	-0.002	0.023
51	0.051	0.018	0.056	-0.017	0.027
52	0.049	-0.035	0.066	0.007	0.022
53	0.056	-0.010	0.055	0.012	0.028
54	0.073	0.022	0.042	0.022	0.040
55	0.099	0.045	0.088	0.070	0.075
56	0.129	0.075	0.072	0.024	0.075
57	0.120	0.054	0.089	0.060	0.081
58	0.157	0.069	0.063	0.049	0.085
59	0.165	0.098	0.134	0.071	0.117
60	0.244	0.156	0.174	0.143	0.179
61	0.206	0.222	0.154	0.177	0.190
62	0.216	0.178	0.192	0.121	0.177
63	0.231	0.168	0.183	0.155	0.184
64	0.307	0.253	0.269	0.242	0.268
65	0.595	0.464	0.477	0.397	0.483

Source: Loss rates were calculated based on data from RNDB/CIHI

Notes

Loss rates were calculated based on data from CIHI RNDB.

1999–2000 loss rates were calculated based RNs working in long-term care for all provinces/territories except RNs in British Columbia due to data quality concerns.

Table 9.0. Observed Loss Rates for RNs Employed in the Community Sector in Canada, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.004	-0.015	-0.052	-0.003	-0.019
51	0.042	-0.041	-0.025	0.010	-0.004
52	0.060	-0.035	-0.024	0.014	0.004
53	0.065	-0.016	-0.030	-0.016	0.001
54	0.088	-0.019	0.013	0.043	0.031
55	0.140	0.014	0.000	0.055	0.052
56	0.127	0.040	0.003	0.041	0.053
57	0.173	0.046	0.008	0.048	0.069
58	0.111	0.067	0.005	0.050	0.058
59	0.188	0.102	0.056	0.104	0.112
60	0.220	0.195	0.153	0.129	0.174
61	0.277	0.144	-0.067	0.147	0.125
62	0.225	0.135	0.051	0.211	0.155
63	0.200	0.090	0.043	0.238	0.143
64	0.250	0.163	0.077	0.227	0.179
65	0.508	0.481	0.463	0.357	0.452

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 10.0. Observed Loss Rates for RNs Employed in Other Places of Work in Canada, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.034	0.005	-0.005	0.010	-0.006
51	-0.056	0.028	0.026	0.051	0.012
52	-0.036	0.004	0.023	0.029	0.005
53	-0.027	0.015	0.021	0.032	0.010
54	-0.031	0.062	0.066	0.035	0.033
55	-0.017	0.065	0.002	0.079	0.032
56	0.018	0.088	0.002	0.080	0.047
57	-0.018	0.074	0.003	0.061	0.030
58	0.069	0.128	0.046	0.074	0.079
59	0.064	0.078	0.057	0.106	0.076
60	0.101	0.158	0.050	0.167	0.119
61	0.107	0.100	0.069	0.202	0.120
62	0.098	0.193	0.074	0.162	0.132
63	0.120	0.203	0.086	0.223	0.158
64	0.247	0.180	0.158	0.163	0.187
65	0.326	0.361	0.114	0.289	0.272

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 11.0. Observed Loss Rates for RNs Employed in the Atlantic Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.013	0.016	0.003	0.006	0.010
51	0.046	-0.010	0.018	0.019	0.018
52	0.031	-0.032	0.035	0.029	0.016
53	0.069	0.005	0.034	0.028	0.034
54	0.058	0.054	0.042	0.020	0.044
55	0.108	0.056	0.081	0.060	0.076
56	0.125	0.035	0.108	0.063	0.083
57	0.073	0.088	0.082	0.041	0.071
58	0.043	0.057	0.078	0.061	0.060
59	0.155	0.136	0.120	0.075	0.122
60	0.207	0.275	0.333	0.274	0.272
61	0.353	0.279	0.126	0.114	0.218
62	0.329	0.121	0.113	0.113	0.169
63	0.213	0.163	0.224	0.169	0.192
64	0.271	0.188	0.220	0.133	0.203
65	0.625	0.400	0.436	0.500	0.490

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 12.0. Observed Loss Rates for RNs Employed in Hospitals in the Atlantic Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.005	0.006	0.029	0.043	0.018
51	0.049	0.010	0.031	0.035	0.032
52	0.051	0.024	0.015	0.044	0.034
53	0.077	0.016	0.041	0.052	0.047
54	0.095	0.065	0.046	0.046	0.063
55	0.134	0.096	0.130	0.127	0.122
56	0.110	0.056	0.112	0.103	0.095
57	0.122	0.145	0.105	0.086	0.114
58	0.094	0.093	0.127	0.080	0.099
59	0.207	0.174	0.171	0.078	0.157
60	0.197	0.356	0.400	0.289	0.310
61	0.438	0.358	0.191	0.246	0.308
62	0.364	0.148	0.206	0.053	0.193
63	0.281	0.238	0.391	0.222	0.283
64	0.529	0.217	0.313	0.071	0.283
65	0.706	0.375	0.500	0.455	0.509

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 13.0. Observed Loss Rates for RNs Employed in Long-Term Care in the Atlantic Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.047	-0.022	-0.050	0.000	-0.006
51	0.000	-0.061	-0.021	-0.060	-0.035
52	0.013	-0.089	0.057	-0.010	-0.007
53	0.052	-0.038	0.020	-0.061	-0.007
54	-0.106	0.041	-0.074	-0.021	-0.040
55	0.041	0.068	0.043	-0.011	0.035
56	0.109	-0.043	0.118	0.000	0.046
57	0.019	-0.020	0.082	0.000	0.020
58	-0.091	0.019	0.040	0.045	0.003
59	0.122	0.000	0.154	-0.021	0.064
60	0.231	0.209	0.194	0.182	0.204
61	0.435	0.300	0.088	0.034	0.214
62	0.348	0.077	0.048	0.129	0.150
63	0.200	0.133	0.167	-0.050	0.113
64	0.200	0.250	0.154	0.000	0.151
65	0.833	0.563	0.667	0.818	0.720

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 14.0. Observed Loss Rates for RNs Employed in the Community Sector in the Atlantic Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.138	0.073	-0.063	-0.105	0.011
51	0.066	-0.100	0.137	0.024	0.032
52	-0.029	-0.088	0.073	-0.068	-0.028
53	0.116	-0.057	0.016	0.039	0.029
54	0.194	-0.079	0.054	0.033	0.051
55	0.108	-0.172	-0.024	0.029	-0.015
56	0.154	0.000	0.029	0.071	0.064
57	-0.059	0.136	0.091	-0.061	0.027
58	0.000	-0.056	0.053	0.267	0.066
59	-0.182	0.167	0.158	0.333	0.119
60	0.364	0.385	0.400	0.125	0.318
61	0.250	0.143	0.250	0.111	0.188
62	-1.000	0.000	0.000	0.000	-0.250
63	0.000	0.167	0.333	0.000	0.125
64	0.000	0.000	0.200	0.333	0.133
65	0.000	0.500	-0.500	0.750	0.188

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 15.0. Observed Loss Rates for RNs Employed in Other Places of Work in the Atlantic Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.022	0.056	0.000	-0.012	0.005
51	0.072	0.000	-0.059	0.053	0.017
52	0.000	-0.188	0.077	0.069	-0.010
53	0.015	0.038	0.053	0.024	0.032
54	-0.019	0.090	0.147	0.000	0.054
55	0.107	0.000	0.016	0.047	0.043
56	0.194	0.100	0.170	0.033	0.124
57	0.034	-0.034	0.044	0.000	0.011
58	0.000	0.000	-0.033	-0.047	-0.020
59	0.143	0.138	-0.071	0.097	0.077
60	0.125	0.083	0.240	0.367	0.204
61	0.105	0.095	0.045	-0.105	0.035
62	0.462	0.176	0.105	0.238	0.245
63	0.083	0.000	-0.071	0.353	0.091
64	0.000	0.091	0.143	0.200	0.108
65	0.429	0.000	0.300	-0.167	0.140

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 16.0. Observed Loss Rates for RNs Employed in the Quebec Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.074	0.001	0.005	0.016	0.024
51	0.163	0.010	0.001	0.016	0.047
52	0.200	0.019	0.004	0.017	0.060
53	0.227	0.023	0.017	0.015	0.071
54	0.253	0.056	0.024	0.044	0.094
55	0.332	0.118	0.056	0.093	0.149
56	0.349	0.199	0.028	0.077	0.163
57	0.365	0.186	0.005	0.075	0.158
58	0.378	0.207	0.012	0.064	0.165
59	0.418	0.222	0.053	0.108	0.200
60	0.441	0.297	0.153	0.188	0.270
61	0.463	0.322	0.034	0.153	0.243
62	0.479	0.309	0.145	0.162	0.274
63	0.509	0.313	0.133	0.250	0.301
64	0.464	0.361	0.208	0.099	0.283
65	0.527	0.311	0.170	0.131	0.285

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 17.0. Observed Loss Rates for RNs Employed in Hospitals in the Quebec Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.097	0.019	0.013	0.018	0.037
51	0.249	0.027	0.016	0.026	0.080
52	0.286	0.074	0.011	0.013	0.096
53	0.316	0.082	0.049	0.032	0.120
54	0.354	0.110	0.031	0.049	0.136
55	0.437	0.197	0.105	0.092	0.208
56	0.456	0.295	0.076	0.104	0.233
57	0.476	0.303	0.008	0.104	0.223
58	0.450	0.303	0.016	0.077	0.212
59	0.504	0.267	0.061	0.112	0.236
60	0.534	0.435	0.202	0.276	0.362
61	0.593	0.360	0.179	0.184	0.329
62	0.607	0.345	0.193	0.172	0.329
63	0.690	0.523	0.333	0.261	0.452
64	0.510	0.500	0.190	0.083	0.321
65	0.667	0.458	0.455	0.235	0.454

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 18.0. Observed Loss Rates for RNs Employed in Long-Term Care in the Quebec Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.039	-0.039	0.032	0.006	0.009
51	0.094	0.020	0.012	0.000	0.031
52	0.105	-0.036	-0.010	0.009	0.017
53	0.110	-0.018	-0.039	-0.007	0.012
54	0.153	0.026	-0.029	-0.011	0.035
55	0.218	0.086	0.035	0.109	0.112
56	0.260	0.158	0.025	0.059	0.125
57	0.265	0.120	0.013	0.030	0.107
58	0.388	0.148	-0.024	0.025	0.134
59	0.391	0.176	0.077	0.070	0.179
60	0.414	0.143	0.071	0.167	0.199
61	0.323	0.310	-0.021	0.154	0.191
62	0.389	0.333	0.175	0.143	0.260
63	0.358	0.182	0.071	0.212	0.206
64	0.368	0.353	0.222	0.038	0.246
65	0.545	0.042	0.227	0.000	0.204

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 19.0. Observed Loss Rates for RNs Employed in the Community Sector in the Quebec Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.038	-0.030	-0.061	0.007	-0.012
51	0.044	-0.024	-0.051	0.014	-0.004
52	0.148	0.021	-0.015	0.042	0.049
53	0.184	0.017	0.011	-0.065	0.037
54	0.160	0.055	0.040	0.043	0.074
55	0.343	0.079	-0.014	0.077	0.121
56	0.307	0.223	-0.014	0.014	0.133
57	0.366	0.157	0.000	0.092	0.154
58	0.347	0.271	0.068	0.000	0.172
59	0.404	0.255	-0.070	0.073	0.166
60	0.351	0.355	0.143	0.196	0.261
61	0.500	0.542	-0.150	0.133	0.256
62	0.611	0.263	0.273	0.087	0.308
63	0.563	0.286	-0.071	0.250	0.257
64	0.700	0.571	0.200	0.200	0.418
65	0.400	0.667	0.333	0.250	0.413

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 20.0. Observed Loss Rates for RNs Employed in Other Places of Work in the Quebec Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.028	0.004	-0.010	0.031	0.014
51	-0.092	-0.058	-0.039	-0.010	-0.050
52	0.032	-0.132	0.000	0.008	-0.023
53	-0.026	-0.139	-0.023	0.063	-0.031
54	-0.021	-0.097	0.054	0.086	0.006
55	0.000	-0.074	-0.018	0.082	-0.002
56	0.079	-0.042	-0.038	0.081	0.020
57	0.089	0.009	-0.016	0.048	0.032
58	0.098	0.061	0.009	0.088	0.064
59	0.079	0.122	0.065	0.175	0.110
60	0.186	0.086	0.138	0.083	0.124
61	0.205	0.114	-0.113	0.107	0.078
62	0.100	0.258	-0.097	0.186	0.112
63	0.320	0.111	0.000	0.294	0.181
64	0.412	0.059	0.208	0.174	0.213
65	0.222	0.350	-0.188	0.158	0.136

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 21.0. Observed Loss Rates for RNs Employed in the Ontario Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.002	0.036	-0.019	0.010	0.006
51	0.009	0.030	-0.014	0.024	0.012
52	0.001	0.033	-0.030	0.035	0.010
53	0.021	0.038	-0.033	0.032	0.014
54	0.025	0.049	-0.010	0.057	0.030
55	0.053	0.085	-0.009	0.110	0.060
56	0.074	0.091	-0.005	0.110	0.067
57	0.068	0.085	-0.007	0.113	0.065
58	0.086	0.111	0.015	0.126	0.085
59	0.109	0.096	0.023	0.138	0.092
60	0.209	0.204	0.083	0.218	0.179
61	0.184	0.148	0.041	0.251	0.156
62	0.165	0.179	0.071	0.197	0.153
63	0.209	0.198	0.070	0.229	0.177
64	0.274	0.267	0.099	0.266	0.227
65	0.630	0.583	0.351	0.482	0.512

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 22.0. Observed Loss Rates for RNs Employed in Hospitals in the Ontario Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.030	0.053	-0.071	0.013	0.006
51	0.038	0.028	-0.076	0.017	0.002
52	0.028	0.047	-0.077	0.039	0.009
53	0.045	0.048	-0.102	0.033	0.006
54	0.050	0.062	-0.079	0.063	0.024
55	0.106	0.106	-0.051	0.131	0.073
56	0.122	0.112	-0.029	0.128	0.083
57	0.135	0.100	-0.055	0.124	0.076
58	0.124	0.107	-0.040	0.154	0.086
59	0.171	0.135	-0.028	0.169	0.112
60	0.263	0.234	0.064	0.236	0.199
61	0.251	0.210	-0.027	0.253	0.172
62	0.282	0.205	0.004	0.227	0.179
63	0.296	0.236	-0.023	0.240	0.187
64	0.331	0.375	-0.056	0.274	0.231
65	0.813	0.709	0.443	0.611	0.644

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 23.0. Observed Loss Rates for RNs Employed in Long-Term Care in the Ontario Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.024	0.019	0.238	-0.020	0.066
51	0.039	0.053	0.187	-0.019	0.065
52	0.037	-0.051	0.149	0.038	0.043
53	0.018	0.004	0.201	0.031	0.064
54	0.076	0.036	0.179	0.085	0.094
55	0.053	0.000	0.181	0.068	0.076
56	0.074	0.052	0.146	0.032	0.076
57	0.069	0.076	0.189	0.149	0.121
58	0.076	0.074	0.179	0.140	0.117
59	0.113	0.076	0.235	0.141	0.142
60	0.217	0.186	0.268	0.210	0.220
61	0.185	0.182	0.209	0.322	0.225
62	0.164	0.176	0.295	0.099	0.183
63	0.205	0.152	0.265	0.127	0.187
64	0.279	0.242	0.372	0.306	0.300
65	0.656	0.661	0.553	0.429	0.575

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 24.0. Observed Loss Rates for RNs Employed in the Community Sector in the Ontario Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.026	-0.032	-0.066	0.028	-0.024
51	0.041	-0.082	-0.037	0.028	-0.012
52	0.050	-0.061	-0.044	0.018	-0.009
53	0.060	-0.060	-0.054	0.027	-0.007
54	0.078	-0.067	-0.004	0.043	0.013
55	0.096	-0.031	-0.007	0.092	0.038
56	0.104	-0.086	-0.034	0.073	0.014
57	0.155	0.006	0.000	0.079	0.060
58	0.059	0.014	-0.012	0.084	0.036
59	0.154	0.018	0.064	0.121	0.089
60	0.239	0.121	0.110	0.099	0.142
61	0.269	-0.029	-0.103	0.155	0.073
62	0.153	0.035	0.056	0.271	0.129
63	0.213	0.000	0.018	0.250	0.120
64	0.219	0.081	0.040	0.352	0.173
65	0.609	0.680	0.412	0.396	0.524

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 25.0. Observed Loss Rates for RNs Employed in Other Places of Work in the Ontario Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.062	0.021	-0.006	-0.010	-0.014
51	-0.082	0.066	0.047	0.062	0.023
52	-0.092	0.081	-0.010	0.037	0.004
53	-0.042	0.078	0.004	0.031	0.018
54	-0.066	0.087	0.034	0.039	0.024
55	-0.072	0.117	-0.044	0.083	0.021
56	-0.047	0.129	-0.037	0.122	0.042
57	-0.098	0.076	-0.057	0.092	0.003
58	0.049	0.153	0.028	0.081	0.078
59	-0.005	0.039	-0.053	0.071	0.013
60	0.085	0.160	-0.008	0.239	0.119
61	0.014	0.075	0.071	0.252	0.103
62	0.053	0.186	0.000	0.167	0.101
63	0.102	0.224	0.061	0.256	0.161
64	0.237	0.205	0.082	0.168	0.173
65	0.406	0.276	0.114	0.393	0.297

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 26.0. Observed Loss Rates for RNs Employed in the Manitoba–Saskatchewan Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.005	0.018	0.009	0.002	0.006
51	0.017	0.007	0.005	0.030	0.015
52	0.036	0.020	0.015	0.033	0.026
53	0.022	0.000	0.031	0.017	0.017
54	0.032	0.023	0.034	0.053	0.035
55	0.092	0.052	0.064	0.057	0.066
56	0.076	0.062	0.023	0.047	0.052
57	0.094	0.047	0.048	0.071	0.065
58	0.136	0.089	0.056	0.047	0.082
59	0.118	0.088	0.124	0.094	0.106
60	0.208	0.167	0.144	0.124	0.161
61	0.170	0.158	0.123	0.124	0.144
62	0.221	0.152	0.152	0.125	0.162
63	0.169	0.198	0.137	0.137	0.160
64	0.284	0.246	0.185	0.268	0.246
65	0.596	0.417	0.500	0.396	0.477

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 27.0. Observed Loss Rates for RNs Employed in Hospitals in the Manitoba–Saskatchewan Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.000	0.029	0.020	0.032	0.021
51	0.016	0.023	-0.006	0.045	0.019
52	0.073	0.052	0.017	0.042	0.046
53	0.032	0.032	0.096	0.017	0.044
54	0.050	-0.011	0.019	0.051	0.027
55	0.108	0.079	0.091	0.029	0.077
56	0.101	0.040	0.052	0.083	0.069
57	0.087	0.044	0.120	0.085	0.084
58	0.152	0.074	0.085	0.096	0.102
59	0.124	0.098	0.102	0.114	0.110
60	0.300	0.224	0.158	0.215	0.224
61	0.115	0.143	0.136	0.129	0.131
62	0.306	0.111	0.229	0.053	0.175
63	0.226	0.120	0.146	0.108	0.150
64	0.346	0.208	0.364	0.366	0.321
65	0.647	0.353	0.579	0.571	0.538

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 28.0. Observed Loss Rates for RNs Employed in Long-Term Care in the Manitoba–Saskatchewan Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.000	0.080	-0.051	-0.113	-0.021
51	-0.022	-0.021	-0.043	0.000	-0.022
52	0.000	0.000	0.093	0.014	0.027
53	0.051	-0.045	-0.043	0.057	0.005
54	0.023	0.027	0.014	0.010	0.019
55	0.029	0.107	0.042	0.074	0.063
56	0.077	0.045	-0.027	-0.029	0.017
57	0.164	0.017	-0.016	0.026	0.048
58	0.190	0.065	-0.034	-0.031	0.048
59	0.037	0.118	0.023	0.000	0.044
60	0.317	0.173	0.133	0.071	0.174
61	0.129	0.179	0.186	0.179	0.168
62	0.120	0.111	0.087	0.200	0.130
63	0.217	0.364	0.250	0.048	0.220
64	0.360	0.333	0.143	0.333	0.292
65	0.900	0.438	0.667	0.333	0.584

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 29.0. Observed Loss Rates for RNs Employed in the Community Sector in the Manitoba–Saskatchewan Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.019	-0.069	0.000	-0.146	-0.058
51	0.125	-0.055	0.000	-0.172	-0.025
52	-0.050	-0.071	-0.121	-0.048	-0.073
53	-0.059	0.048	-0.133	-0.015	-0.040
54	-0.100	0.056	0.125	-0.078	0.001
55	0.089	0.000	0.000	0.029	0.029
56	0.056	0.137	0.030	-0.118	0.026
57	-0.050	0.000	-0.114	-0.063	-0.057
58	0.111	0.190	0.000	0.000	0.075
59	0.276	-0.031	0.059	0.088	0.098
60	-0.118	0.000	0.152	0.250	0.071
61	0.000	0.263	-0.095	0.143	0.078
62	0.235	0.385	0.000	0.304	0.231
63	0.133	0.154	0.125	0.286	0.174
64	0.000	0.308	0.000	0.000	0.077
65	0.556	0.333	0.667	0.364	0.480

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 30.0. Observed Loss Rates for RNs Employed in Other Places of Work in the Manitoba–Saskatchewan Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.022	-0.026	-0.011	0.182	0.031
51	-0.045	-0.011	0.063	0.176	0.046
52	-0.078	-0.072	0.022	0.095	-0.009
53	-0.058	-0.109	0.041	0.056	-0.018
54	0.052	0.073	0.066	0.211	0.100
55	0.063	-0.109	0.039	0.140	0.033
56	0.000	0.034	-0.016	0.122	0.035
57	0.039	0.133	0.018	0.161	0.088
58	0.000	0.122	0.038	0.054	0.054
59	0.037	0.129	0.233	0.140	0.135
60	0.033	0.115	0.037	-0.061	0.031
61	0.346	0.103	0.130	0.077	0.164
62	0.091	0.235	0.192	0.050	0.142
63	-0.300	0.200	0.000	0.095	-0.001
64	0.100	0.077	0.000	-0.077	0.025
65	0.200	0.556	0.083	0.438	0.319

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 31.0. Observed Loss Rates for RNs Employed in the Alberta Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.006	0.019	0.013	-0.013	0.003
51	0.028	0.013	0.016	-0.006	0.013
52	0.006	0.035	0.025	-0.011	0.014
53	0.007	0.014	0.021	-0.021	0.005
54	0.027	0.029	0.039	-0.011	0.021
55	0.045	0.062	0.024	-0.009	0.031
56	0.021	0.070	0.044	0.015	0.038
57	0.054	0.059	0.017	0.009	0.035
58	0.061	0.075	0.074	0.025	0.059
59	0.085	0.105	0.077	0.015	0.071
60	0.106	0.143	0.129	0.070	0.112
61	0.109	0.153	0.130	0.083	0.119
62	0.117	0.145	0.133	0.050	0.111
63	0.096	0.195	0.080	0.100	0.118
64	0.145	0.200	0.165	0.204	0.178
65	0.176	0.321	0.283	0.145	0.231

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 32.0. Observed Loss Rates for RNs Employed in Hospitals in the Alberta Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.021	0.031	-0.005	0.009	0.014
51	0.017	-0.005	-0.005	0.028	0.009
52	0.029	0.023	-0.016	0.005	0.010
53	0.011	0.013	0.000	0.040	0.016
54	0.027	0.015	-0.022	0.033	0.013
55	0.039	0.060	-0.035	0.017	0.020
56	0.021	0.054	0.013	0.056	0.036
57	0.067	0.053	-0.024	0.056	0.038
58	0.042	0.058	0.045	0.051	0.049
59	0.038	0.094	0.062	0.023	0.055
60	0.097	0.107	0.160	0.096	0.115
61	0.103	0.107	0.119	0.124	0.113
62	0.054	0.038	0.067	0.068	0.057
63	0.094	0.245	0.100	0.129	0.142
64	0.208	0.345	0.075	0.289	0.229
65	0.250	0.211	0.211	0.054	0.181

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 33.0. Observed Loss Rates for RNs Employed in Long-Term Care in the Alberta Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.011	-0.039	0.000	-0.012	-0.015
51	0.105	0.053	0.000	-0.065	0.023
52	-0.029	0.074	0.011	-0.013	0.011
53	0.034	-0.014	-0.095	0.022	-0.013
54	0.047	-0.024	0.042	-0.014	0.013
55	0.089	0.000	0.023	0.029	0.035
56	0.093	0.028	0.000	-0.024	0.024
57	-0.017	0.000	0.029	-0.037	-0.006
58	0.038	0.000	-0.061	-0.044	-0.017
59	0.161	0.060	-0.016	-0.019	0.046
60	0.093	-0.038	0.043	0.065	0.040
61	0.033	0.224	0.185	0.044	0.122
62	0.158	0.207	0.079	-0.045	0.100
63	0.042	0.125	-0.130	0.229	0.066
64	0.267	0.087	0.179	0.154	0.172
65	0.100	0.273	0.381	0.217	0.243

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 34.0. Observed Loss Rates for RNs Employed in the Community Sector in the Alberta Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.132	0.060	0.064	0.025	0.004
51	0.073	-0.010	-0.038	-0.068	-0.011
52	-0.040	-0.053	0.000	0.012	-0.020
53	-0.013	0.013	0.050	-0.067	-0.004
54	0.059	-0.026	-0.026	0.039	0.012
55	0.083	0.125	0.025	0.000	0.058
56	0.000	0.109	0.071	0.013	0.048
57	0.116	0.052	0.000	-0.038	0.032
58	-0.040	0.132	0.036	-0.041	0.022
59	0.154	0.115	0.000	0.094	0.091
60	0.059	0.364	0.130	0.061	0.153
61	0.250	0.250	-0.143	-0.100	0.064
62	0.250	0.167	0.083	0.125	0.156
63	-0.167	0.111	0.000	0.000	-0.014
64	0.200	-0.143	-0.125	-0.200	-0.067
65	0.400	0.125	0.250	0.333	0.277

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 35.0. Observed Loss Rates for RNs Employed in Other Places of Work in the Alberta Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.008	-0.008	0.025	-0.034	-0.006
51	-0.028	0.053	0.115	0.009	0.037
52	0.009	0.100	0.185	-0.009	0.071
53	-0.008	0.035	0.152	-0.139	0.010
54	0.000	0.136	0.229	-0.119	0.062
55	-0.011	0.075	0.185	-0.071	0.045
56	0.013	0.126	0.143	-0.057	0.056
57	0.047	0.122	0.120	-0.024	0.066
58	0.151	0.146	0.292	0.082	0.168
59	0.050	0.161	0.243	0.000	0.114
60	0.176	0.211	0.135	0.057	0.145
61	0.116	0.107	0.267	0.156	0.161
62	0.136	0.237	0.480	0.136	0.247
63	0.200	0.211	0.241	-0.308	0.086
64	-0.154	0.250	0.533	0.273	0.226
65	0.053	0.600	0.250	0.143	0.261

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 36.0. Observed Loss Rates for RNs Employed in the British Columbia Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.008	0.003	0.002	0.031	0.011
51	0.014	0.020	0.002	0.026	0.016
52	0.026	0.009	0.020	0.004	0.015
53	0.010	0.017	0.012	0.021	0.015
54	0.023	0.033	0.030	0.041	0.032
55	0.054	0.064	0.052	0.074	0.061
56	0.073	0.062	0.067	0.043	0.061
57	0.084	0.063	0.072	0.052	0.068
58	0.067	0.074	0.076	0.049	0.066
59	0.156	0.137	0.101	0.101	0.124
60	0.156	0.179	0.221	0.164	0.180
61	0.183	0.176	0.142	0.166	0.167
62	0.177	0.213	0.138	0.134	0.165
63	0.220	0.184	0.169	0.201	0.193
64	0.410	0.369	0.383	0.244	0.351
65	0.642	0.500	0.569	0.451	0.541

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 37.0. Observed Loss Rates for RNs Employed in Hospitals in the British Columbia Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.033	0.022	0.028	0.045	0.032
51	0.027	0.032	0.013	0.031	0.026
52	0.031	0.031	0.033	0.023	0.030
53	0.023	0.009	0.021	0.018	0.018
54	0.025	0.028	0.049	0.060	0.041
55	0.084	0.052	0.071	0.081	0.072
56	0.058	0.044	0.083	0.066	0.063
57	0.091	0.097	0.077	0.074	0.085
58	0.048	0.080	0.100	0.060	0.072
59	0.138	0.144	0.070	0.100	0.113
60	0.202	0.185	0.249	0.234	0.217
61	0.232	0.212	0.121	0.158	0.181
62	0.155	0.276	0.090	0.138	0.165
63	0.233	0.183	0.236	0.141	0.198
64	0.512	0.500	0.397	0.238	0.412
65	0.870	0.650	0.609	0.543	0.668

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 38.0. Observed Loss Rates for RNs Employed in Long-Term Care in the British Columbia Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.031	-0.068	n.a.	0.060	0.008
51	0.039	-0.043	n.a.	-0.006	-0.003
52	-0.012	-0.055	n.a.	-0.022	-0.030
53	0.051	0.036	n.a.	0.031	0.040
54	0.037	-0.014	n.a.	0.029	0.017
55	0.000	0.038	n.a.	0.072	0.037
56	0.053	0.130	n.a.	0.016	0.066
57	0.091	-0.014	n.a.	0.057	0.045
58	0.086	0.000	n.a.	0.033	0.040
59	0.154	0.125	n.a.	0.090	0.123
60	0.109	0.091	n.a.	0.079	0.093
61	0.147	0.195	n.a.	0.115	0.152
62	0.178	0.069	n.a.	0.164	0.137
63	0.259	0.108	n.a.	0.224	0.197
64	0.389	0.200	n.a.	0.333	0.307
65	0.500	0.364	n.a.	0.655	0.506

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 39.0. Observed Loss Rates for RNs Employed in the Community Sector in the British Columbia Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	0.007	0.028	-0.045	-0.009	-0.004
51	-0.023	0.038	0.019	0.043	0.019
52	0.032	0.015	0.023	-0.030	0.010
53	-0.048	0.033	-0.008	-0.024	-0.012
54	0.011	0.064	0.023	0.077	0.044
55	0.000	0.043	0.010	-0.059	-0.001
56	0.084	0.065	0.057	0.050	0.064
57	0.096	0.039	0.093	0.024	0.063
58	0.042	-0.021	0.000	-0.013	0.002
59	0.028	0.176	0.167	0.068	0.110
60	0.226	0.229	0.196	0.175	0.206
61	0.148	0.125	0.111	0.200	0.146
62	0.263	0.217	0.048	0.042	0.142
63	0.000	0.214	0.056	0.350	0.155
64	0.200	0.357	0.455	0.176	0.297
65	0.444	0.250	0.778	0.000	0.368

Source: Loss rates were calculated based on data from RNDB/CIHI

Table 40.0. Observed Loss Rates for RNs Employed in Other Places of Work in the British Columbia Region, 1997–1998 to 2000–2001

Age	Years				Average
	1997–1998	1998–1999	1999–2000	2000–2001	
50	-0.079	-0.050	0.010	-0.019	-0.035
51	0.009	0.036	-0.008	0.049	0.021
52	0.030	-0.061	0.023	0.000	-0.002
53	0.000	0.010	0.041	0.085	0.034
54	0.000	0.071	0.000	-0.060	0.003
55	0.042	0.149	0.019	0.165	0.094
56	0.122	0.066	0.010	0.020	0.054
57	0.063	0.077	0.106	-0.010	0.059
58	0.107	0.100	-0.017	0.092	0.071
59	0.274	0.040	0.259	0.197	0.193
60	0.065	0.244	0.083	-0.025	0.092
61	0.162	0.186	0.147	0.273	0.192
62	0.154	0.097	0.171	0.172	0.149
63	0.118	0.182	0.214	0.207	0.180
64	0.409	0.200	0.333	0.136	0.270
65	0.500	0.538	0.250	-0.083	0.301

Source: Loss rates were calculated based on data from RNDB/CIHI

Appendix B

Summary Table of Selected Studies on Supply-Based Projections of Nursing Supply

Summary Table of Selected Studies on Supply-Based Projections of Nursing Supply

Author(s)	Regions and Nursing Groups for which Projections were Made *Summary of Supply Methods*	Major Findings (related to the projections of RN supply)
Atkinson & Hull, 2001	▪ The supply, demand, and shortage were projected for RNs, LPNs and other health professionals in **Prince Edward Island**. ▪ Based on 2001 data, three components of projection over the forecast period until 2006 were examined: the available supply, the required demand, and gap analysis showing the shortages or surpluses. ▪ Detailed methodologies were not outlined in the Executive Summary report.	For RNs: ▪ A shortage of 189 RNs between 2001 and 2004 can be expected ▪ The shortage will begin to decline slowly in 2006 to 158.
Elliott, 1999	▪ The supply, demand and shortfalls of nurses were projected for RNs/RPNs and LPNs in **Saskatchewan**. ▪ Based on the retention rates observed between 1989–1998, projections of the number of nurses leaving the profession in 2003 and 2008 were made. ▪ The cohort attrition rates of nurses (assuming nurses leaving the profession before age 65) in five-year age groups were calculated for worst case, status quo and aggressive retention scenarios (i.e. attrition rates continue to increase, remain at its current level, and are lowered in future years, respectively). ▪ The attrition rates were then applied to nurses in 1998 to project the supply of nurses in 2003–2008. The difference between the observed number in the workforce in 1998 and the projected number in 2003–2008 is the number of losses. ▪ The projection was based on nurses in all age groups but did not account for new graduates into the pool.	For RNs/RPNs: ▪ In the worst case scenario, a net loss of 331 RNs/RPNs per year, or 1,655 between 1998 and 2003, is expected. ▪ Under the *status quo* scenario, 1,035 RNs/RPNs are lost between 1998 and 2003. ▪ In the *aggressive retention* scenario, a net loss of 5,27 RNs/RPNs in 5 years is expected.

Author(s)	Regions and Nursing Groups for which Projections were Made *Summary of Supply Methods*	Major Findings (related to the projections of RN supply)
Hanson & Associates and Malloch Graham Associates, 2001	▪ Yukon's yearly losses of nurses due to retirement and resignation were projected for RNs and LPNs. ▪ Using 2000 data, yearly losses of nurses were projected until 2010 for two components. • Retirement: based on the number of the current nurses that will retire each year I n 10 years assuming all nurses retire as they reach age 55 (worst case) or age 65 (best case). • Resignation from nursing practice: based on a 5% of attrition rate observed for public sector jobs for the best case and 15% attrition rate for the worst case. ▪ The need of nurses was also projected by summing up the losses due to retirement and resignation and the number of new jobs expected to be created over time.	For RNs: ▪ Losses due to retirement in 10 years are 152 RNs in the worst scenario and 95 in the most likely scenario (the medium between the worst and the best). ▪ Losses due to resignation in 10 years are300 in the worst case and 200 in the most likely case.
O'Brien-Pallas, Darlington, & Alksnis, 2001	▪ Expected losses of 50-plus RNs and LPNs due to retirement and death were projected for Ontario. ▪ Using 1999–2000 data, the expected losses of nurses between 2000 and 2004 due to retirement and death were projected for nurses aged over 50 for overall and four workplace sectors: Hospital, Long-Term Care, Community, and "Other". ▪ Nurses in the potentially retirement age group in 2000 were aged year by year while applying age-cohort loss rates observed between 1999 and 2000 to future years until 2004. ▪ Utilization-based projections for hospital sector in Ontario were also made.	For RNs: ▪ The expected overall RN losses until 2004 for Ontario are 9,114 RNs. ▪ The expected losses are 4,098 in hospitals, 1,042 in Long-Term care facilities, 1,483 in community health, and 2,491 in other sector.

Author(s)	Regions and Nursing Groups for which Projections were Made *Summary of Supply Methods*	Major Findings (related to the projections of RN supply)
Ministry of Health and Ministry Responsible for Seniors of B.C. (2000)	▪ The supply, demand, and shortfalls of RNs/RPNs were projected for **British Columbia**. ▪ The supply of nurses was projected forward from 1999 until 2005 on a yearly base. ▪ Supply components such as new graduate, migration, and attrition of nursing workforce were projected for future years based on various sources of data and assumptions. ▪ The sum of estimates from these components were added to, or subtracted from, the supply of RN/RPNs from previous years to arrive at the projected supply of RN/RPNs. The head counts of supply are further expressed in hours per 1,000 population.	For RNs/RPNs: ▪ A total of 4,318 nurses is expected in the attrition of current RN/RPN workforce between 1999 and 2005. ▪ The attrition rate is 15.03% over the period of 1999 and 2005, or an average annual attrition rate of 2.68%.
Ryten, 1997, 2002	▪ The supply, demand, and shortage of RNs were projected for **the nation**. ▪ The national supply of RNs in 2011 was projected based on the projection of the number of nurses retained from the 1995 existing complement and the new additions to nursing from 1995 and onward. ▪ The retention rates were calculated by single year of age between 1980 and 1995 and applied to 1995 RN registrants to calculate the number of RNs employed in nursing in 2011. ▪ Projection of shortfalls, or the gap between the projected demand and supply of RNs were made within 3 scenarios of population growth (high, medium, and low).	▪ In the best scenario, there is a shortage of 59,000 RNs in Canada between 1994 and 2011, based on a total requirement of 290,000 RNs and supply of 231,000. ▪ The shortage of RNs in 2011 would be 86,000 RNs for the demand of 31,700 RNs in the medium growth scenario, and 113,000 RNs for the demand of 344,000 RNs in the worst scenario.

Author(s)	Regions and Nursing Groups for which Projections were Made *Summary of Supply Methods*	Major Findings (related to the projections of RN supply)
Wells, 2001	▪ The yearly number of RNs retirement was projected for **Newfoundland**. ▪ 1999–2000 data was used to project RNs retirement on a yearly base until 2015. ▪ Two estimates of RN retirements were made, one based on age data from RN database assuming RNs retire at age 58 and the other based on pension data from the Pension Administration Division of the Provincial Dept . of Finance. ▪ If using RN database, the losses of RNs were estimated based on the number of RNs that will turn 58 in each of the next 15 years. ▪ If using pensions data, the expected losses were calculated based on the number of RNs participating in the provincial pension plan and their earliest date to retire with an unreduced pension.	For RNs: ▪ 1,997 RNs were aged over 43 in 1999–2000 and therefore about 2,000 RNs will retire by year 2015. ▪ 1,258 RNs *in the pension plan* will become eligible to retire in 2015. ▪ If averaging the two estimates while adjusting for other factors, a loss of 1,609 RNs due to retirement from nursing is expected by year 2015.


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