

# Stepping to Success and Sustainability:

*An Analysis of Ontario's Nursing Workforce*



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### **Nurse Supply**

**D**uring the 1990s, the number of nurses employed in nursing in Ontario declined. However, in 2000, Ontario saw a marked increase in nurse supply. The total number of Registered Nurses (RN) working that year was slightly greater than in 1992, while the number of Registered Practical Nurses (RPN) working was the highest it had been in eight years. This increase was likely due to targeted Ontario Ministry of Health and Long-Term Care funding for nursing positions, and to other recruitment and retention programs and incentives developed by the ministry and the nursing profession. However, it is difficult to know whether the trend to a larger nurse supply is sustainable: both the number of nurses and their participation rates declined in 2001, and rose slightly in 2002. A significant proportion of the increase in nurse supply in recent years is due to nurses immigrating to Ontario from other provinces or countries. Given the worldwide shortage of nurses and increasing competition for nurses, Ontario cannot assume that this trend will continue.

Historically, Ontario has always had the greatest supply of RNs in Canada. Although Ontario had the largest number of RNs in 2001 compared to other provinces, it ranked second last (below the Canadian average) in RN to population ratio with 67.6 RNs per 10,000 population. Only British Columbia had a lower RN to population ratio (66.7/10,000).

The ability of Ontario to maintain or increase its nurse supply will be strongly influenced by the age of the nursing workforce. The average age of a working nurse in Ontario is now 44, and the most common age is 50. In 2002, only 2% of RNs and 3% of RPNs were between the ages of 20 to 24, and 66% of all nurses were over age 40 – up significantly from 58% in 1993. Given the age of the nursing workforce, Ontario can expect to lose between 20,000 and 39,000 nurses to retirement over the next five

years (depending on whether they retire at age 55 or 65). At the current time, Ontario is not producing enough new nurses to compensate for retirement losses.

### **Nurse Distribution and Utilization**

Between 1992 and 2002, the proportion of RNs reporting they work in a hospital setting decreased. Over the same period, the proportion of RNs working in long-term care and community care increased slightly, and the proportion working in “other” settings, including primary care settings, also increased. These trends reflect efforts within the health care system to move patients out of hospitals, and provide care in other more appropriate settings. However, the ability of non-hospital settings to attract and retain nurses continues to be limited by wage disparities.

Between 1992 and 2002, the distribution of RNs working full-time, part-time, and casual shifted dramatically. During most of the 1990s, the proportion of RNs working full-time dropped, and the proportion working part-time or casual increased. However, recent data indicate that the percentage of casual workers has dropped. This is likely due to efforts by the Ministry of Health and Long-Term Care to increase full-time work opportunities for nurses. Trends in employment status for RPNs differ somewhat from those of RNs. RPNs experienced the same decrease in full-time employment as RNs in the 1990s, but no corresponding upswing in the last three years.

The majority of nurses working full-time tend to be older (i.e., in their 40s), and there appear to be fewer full-time opportunities for younger nurses. As a result, a disproportionate number of younger nurses are either looking for full-time employment, or leaving the province to take full-time jobs elsewhere. Given the aging of Ontario's nursing workforce, this trend could have serious implications for the future. The proportion of nurses working full-time,

part-time, or casual directly impacts Ontario's supply of nursing hours. By definition, nurses working part-time are not available for as many hours of work as nurses working full-time. Despite the increase in full-time opportunities, nurses already trained and in the system are still not being employed to their full potential. If Ontario can increase the proportion of nurses working full-time, it can make more effective use of the existing nurse supply and increase the amount of nursing care available.

### **Demand for Nursing Services**

The demand for nursing services is driven by a number of factors, including the growth and aging of the population, and the increasing acuity of patients in all care settings: hospital, home and community care, and long-term care.

With the shift to outpatient surgery and shorter length of hospital stay, there has been a marked increase in demand for home care visits and long-term care placements, which has increased demand for nurses in those settings. For example, approximately 10% of the acute hospital population has been shifted to long-term care settings, leading to an increase in both volume and complexity. Residents in long-term care facilities are older, frailer, and have more complex health care needs than ever before. Home care services are seeing the same type of increase in patient acuity and demand for services.

Demand for nursing is also affected by the availability of support services, such as physiotherapy, occupational therapy and housekeeping services, and by the availability of appropriate nurse management, clerical and administrative support, and equipment. These services have declined in most settings over the past few years. When these supports are inadequate, these tasks tend to fall to nurses, increasing their workload and, in many cases, taking time from patient care.

Workload data – measured in worked hours – are only available at the current time for the hospital sector, but they indicate that nurses in that setting are working at more than full

capacity. Because worked hours include paid breaks, the maximum total productivity value should be less than 93% (i.e., a value of 93% indicates that every nurse worked every minute of every day for the entire year). The appropriate productivity or utilization value is likely close to 85% in departments with predictable demand, and lower in nursing areas where demand is unpredictable (e.g., emergency, labour and delivery). When the productivity value in a hospital or unit is high (i.e., over 85%), quality of care is likely being compromised or nurses are working unpaid time to work to standards. A significant proportion of units in all types of hospitals have productivity rates over 85% and some have values over 93%. This indicates work overload, which has been shown to lead to increases in: absenteeism (due to either physical or mental health problems), adverse events, turnover, and/or patient complaints.

### **Projections for Future Nursing Needs**

The Nursing Effectiveness, Utilization and Outcomes Research Unit (NRU) has developed a conceptual model that considers the key elements of the human resource planning process and examines the complex relationships among all the variables that influence resource need and outcomes. The model is currently being tested in the hospital setting. In the meantime, researchers have developed both supply-based and demand-based projections for Ontario's future nursing needs.

Using the supply-side approach, and taking into account the number of new nurses being produced in Ontario each year, as well as projected losses due to retirement and death, Ontario can expect to lose between 20,000 and 39,000 nurses by the year 2008, depending on whether nurses retire at age 65 or age 55. (Among Ontario nurses, there has been a growing trend to retire early.)

Using the demand or utilization-based approach, researchers looked at the Statistics Canada projections for high, medium, and low population growth, and the need for hospital

services (based on current utilization and the way hospital services are delivered now). Based on the calculations for the high growth scenario, Ontario will require 25,652 RN and 4,705 RPN FTEs in the hospital sector in 2008 but there will be only 19,599 RN and 1,909 RPN FTEs in the workforce – a shortfall of 6,052 RN and 2,796 RPN FTEs. The gap between supply and requirements in the low growth scenario is smaller, but still significant: 4,945 RN and 2,591 RPN FTEs. When the numbers are adjusted for patient acuity, the shortfall of RNs in 2008 is 12,897 FTEs in the high growth scenario and 11,794 FTEs in the low growth scenario, and the shortfall for RPNs ranges from 3,823 to 4,025 FTEs.

Both these planning models indicate that Ontario will have serious nurse supply issues over the next few years.

## **Recommendations**

To compensate for the potential nursing shortfall and stabilize Ontario's nursing supply, the province must:

1. Assess the population's ongoing and future need for nursing services
2. Increase enrolment in nursing programs
3. Increase nurse participation rates (retention) and make more effective use of existing nurses
4. Avoid using layoffs to deal with short-term financial problems in the health care system
5. Address workload issues and provide quality workplaces
6. Continue work on a health human resource planning framework that takes into account the link between quality work environments, the ability to recruit and retain health professionals, and population health outcomes.

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# Introduction

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In September 1999, faced with great pressures in nursing, the Conference of Deputy Ministers/Ministers of Health directed the Advisory Committee on Health Human Resources (ACHHR) to develop a national nursing strategy to address the complex nursing human resources situation. In *The Nursing Strategy for Canada 2000*, the ACHHR identified several strategies to achieve, maintain, and deploy an adequate nurse supply to meet the health needs of Canadians, including the development of information to support effective planning and evaluation of nursing resources (ACHHR, 2000).

This document, prepared by the Nursing Effectiveness, Utilization and Outcomes Research Unit (NRU) at the University of Toronto site, summarizes the available information on Ontario's nursing workforce, and provides a comprehensive picture of nurse supply and demand in the province. It updates the information provided in the 1998 NRU report to the Ontario Ministry of Health Nursing Task Force, *Health Human Resources: A Preliminary Analysis of Nurses Working in Ontario*. This document is designed to assist in planning for nursing resources and in decision-making related to nursing. The information on the nursing workforce in this document has been organized as follows:

- 1. Nurse Supply:** the number and characteristics of nurses registered in Ontario.
- 2. Demand for Nurses:** the characteristics of the system, hospitals, and patients that affect the need for nurses and the current utilization

of nurses in Ontario, and an assessment of the current supply of nurses relative to the demand.

**3. Predictions for the Future:** a review of the health human resources planning methodologies that can be used to predict the future needs for nurses as well as actual predictions and estimates of nursing needs and potential shortfalls in Ontario.

**4. Discussion and Summary**

**5. Recommendations**

## About the NRU

The Nursing Effectiveness, Utilization and Outcomes Research Unit (NRU) is funded by the Ontario Ministry of Health and Long-Term Care to examine issues related to the demand, supply, efficiency, and effectiveness of nurses in Ontario. The unit's goal is to examine administrative databases and other types of data, and describe trends related to:

- the role of nursing in the health care system
- quality and patient outcomes
- long-term requirements for nursing resources.

The unit is currently involved in a number of research projects, funded by external agencies, that will contribute to achieving its goal. (See Appendix A for a list of NRU investigators and their specific areas of interest.)

## The Impact of Different/Changing Care Environments

Health care in Ontario is delivered in many different care environments. Most are natural groupings based on the patients' need for specific physical environments, technology or staff knowledge and skill. However, the way care is provided may vary based on population size in different regions of the province. For example, in urban areas care may be provided in a specially designated hospital while in more rural areas with a smaller population, all care may be provided by one agency. Whenever possible the data are reported by the level of care but in some cases, due to the inability to match data sets, the data may be reported by type of organization. This diversity in the organization of health care service delivery creates challenges when using administrative data sets to determine the need for health care and, in particular, nursing care.

For example:

- psychiatric services are provided for inpatients in both provincial psychiatric hospitals as well as in designated beds in acute care hospitals
- long-term care is provided in Nursing Homes and Homes for the Aged as well as in acute care facilities approved for long-term care beds
- rehabilitation and chronic care services are provided by free-standing specialty facilities and by specific units in general hospitals
- pediatric care is provided in two specialty hospitals as well as in many acute care hospitals that may or may not be able to isolate this information

The NRU has access to comprehensive information about acute care patients, but does not currently have access to data for some aspects of health care including utilization data for community care, primary care, and provincial psychiatric hospitals. The NRU has financial and administrative data but no clinical data for chronic care hospitals. Data for private hospitals are not included in this report. Table i provides a quick picture of the complexity of the

system and the difficulties that arise when comparing service trends across settings using the current data sets available for analysis.

In recent years, care delivery has shifted from the hospital to the home care or community sector and from inpatient surgery to day surgery. There has also been a concerted effort to reduce the number of acute care beds occupied by patients who need alternate levels of care (e.g., rehabilitation, chronic care, and long-term care). These shifts have created a significant change in the overall demand for nurses and in the distribution of nurses across the system. Policy and governance changes also make it difficult to compare information and trends across fiscal years.

Changing care delivery patterns within the health care system have implications not only for the planning, management, and deployment of the nursing workforce, but have also significantly altered nurses' work environments. For example, due to hospital mergers, most towns now have only one acute care facility, so nurses have limited employment options. In many communities, organizations with very different cultures have merged, and new organizational structures such as program management have been introduced. Some outpatient only hospitals are emerging. Now that the provision of home care services is under the auspices of Community Care Access Centres, service is currently purchased rather than directly controlled by a government funded agency. Mental health services which were previously provided by provincial psychiatric hospitals and directly governed by the Ministry of Health and Long-Term Care (MOHLTC), are being divested. In most cases, services are being transferred to local public hospitals and in some cases the facility is remaining independent but under a Board governance structure. When planning for the nursing workforce, the impact of all these changes must be taken into account.

**Table i: Nursing Services by Setting**

Settings/Services	Acute	Emergency	Rehabilitation	Chronic	Mental Health	LTC	Outpatient
<b>Hospitals</b>							
Urban Teaching	X	X	X	X	X	X	X
Community	X	X	X	X	X	X	X
Small	X	X		X		X	X
Specialty	X	X	X	X	X		X
<b>Non-Hospital</b>							
CCACs	X		X	X	X		
Nursing Homes						X	
Homes for the Aged						X	
Residential Homes						X	
Walk In-Clinics							X
Physician Offices							X
Community Agencies					X		X
Urgent Care Clinics		X					X

## About the Data

### Data Sources

The data used in this report come from:

- organizations that submit information to central administrative databases
- web sites of organizations that report aggregate data related to nursing
- recent surveys of Ontario nurses.

The data have been presented at several levels: provincial, hospital, nursing unit and individual nurse. Aggregate trends are reported when data availability makes this possible. In addition, some data have been presented by level of care or by clinical group, when these data are available, to assist in understanding the variability in utilization of nursing resources.

Data used for these analyses were drawn from published reports and raw statistics from several large databases. It should be noted that population, utilization, and nurse registration data have been collected for different reasons at different times, with different definitions.

Consequently, findings from analyses of these data must be interpreted with caution. Data have been presented according to hospital status as of 2000/01.

While these diverse data sources can be used for the broad trend analyses presented here, the differences must be handled carefully when performing more detailed analyses. The limitations imposed by different data collection criteria must be considered when interpreting the findings. Table ii lists the data sources, notes the differences in measures and timing of data collection, and highlights the issues encountered when attempting to merge large data sets. The validity of much of these data will continue to be examined over the course of NRU's mandated research, but cannot be confirmed for this report.

Where graphs are presented in the body of the document, the associated tables containing actual counts are included in Appendix D.

**Table ii: Data Sources**

Source	Data Type	Period	Data Description
Ontario College Application Services (OCAS)	Education	Academic year (September 1 to August 31)	<ul style="list-style-type: none"> <li>• data are only available from 1996 onward</li> <li>• full and part-time college application and applicant data</li> </ul>
Ontario Ministry of Training, Colleges, and Universities (MTCU)	Education	Academic year (September 1 to August 31); Calendar year (graduates)	<ul style="list-style-type: none"> <li>• full-time college quota, new entrants, and enrolment</li> <li>• college graduates (from the Graduate Record File)</li> </ul>
		November 1st headcount (enrolment); Calendar year (graduates)	<ul style="list-style-type: none"> <li>• full and part-time university first year enrolments and enrolment</li> <li>• graduates (from Statistics Canada, USIS); RN basic and Post-RN degree data are combined</li> </ul>
Council of Ontario Universities (COU)	Education	Fall-entry headcount	<ul style="list-style-type: none"> <li>• first year full-time nursing application and applicant data collected through the Ontario Universities' Application Centre (OUAC) from 1992 to 2001</li> <li>• excludes students previously registered at an Ontario university (i.e., repeaters or transfers) and those registering for part-time studies</li> </ul>
Ontario Ministry of Health and Long-Term Care (MOHLTC)	Hospital Utilization	Fiscal year (April 1 to March 31)	<ul style="list-style-type: none"> <li>• earned hours, by skill mix (RN, RPN, UCP) and employment status (full-time, part-time, casual) starting in 1998/99</li> <li>• unit-producing personnel nursing staff (i.e., combined RNs, RPNs and unregulated care providers) worked and benefit hours</li> <li>• nursing excludes (1) nurses working in non-nursing units and (2) management and clinical educators</li> <li>• facility data reported at the nursing unit level</li> <li>• excludes provincial psychiatric and private hospitals</li> <li>• data submitted to MOHLTC by hospitals and passed through numerous edit checks at MOHLTC</li> </ul>
		Home Care Utilization	Fiscal year (April 1 to March 31)
	Long-Term Care Utilization	Calendar year	<ul style="list-style-type: none"> <li>• provincial Levels of Care Classification summary data for nursing homes and homes for the aged</li> <li>• no annual staffing data were available for trending over this time period</li> <li>• Alberta Patient Classification data for the period of 1993 to 2001 provide an estimate of the shift in demand for nursing and personal care services over the time period</li> </ul>
	Long-Term Care Wait Lists	Calendar year	<ul style="list-style-type: none"> <li>• monthly waiting list by current client location from 1998 to 2001</li> <li>• provide an indication of long-term care bed requirements</li> <li>• there are missing data for some months</li> </ul>
	Home Care Wait Lists	Calendar year	<ul style="list-style-type: none"> <li>• monthly waiting list for nursing and allied health services for 2001</li> <li>• provide an indication of nurse and allied health human resource need and home care service need</li> <li>• there are missing data for some elements</li> </ul>



Source	Data Type	Period	Data Description
College of Nurses of Ontario (CNO)	Nurses Supply	Calendar year	<ul style="list-style-type: none"> <li>• registration data represent all nurses (RNs and RPNs) but not unlicensed providers of nursing care</li> <li>• represent the member's most recent employment status, if the member has notified the CNO of employment changes</li> <li>• count of individual nurses by employment status</li> <li>• self report data</li> </ul>
Canadian Institute of Health Information (CIHI)	Health Expenditures	Calendar year	<ul style="list-style-type: none"> <li>• public and private sources of health expenditure</li> <li>• health expenditure data, measured across the fiscal year and adjusted to the calendar year; may not match spending data as reported by individual sectors in their own reports</li> </ul>
	Patient Demographics and Outcomes	Fiscal year	<ul style="list-style-type: none"> <li>• contains data from health record charts</li> <li>• reported annually by all public hospitals providing Acute Care and Day Surgery services in Ontario</li> <li>• includes patient demographics, diagnoses, complications and surgical procedures</li> <li>• grouped by Case Mix Group (CMG) or Day Procedure Group (DPG); a Resource Intensity Weight (RIW) is determined by CIHI</li> </ul>
	Nurse Supply	Calendar year	<ul style="list-style-type: none"> <li>• provincial/territorial RN supply and distribution from 1994 to 2001</li> <li>• self report data collected through registered nursing provincial/territorial regulating authorities</li> </ul>
Statistics Canada	Population Data Acquired from the Canadian Census	Single point in time every five years (e.g., 1981, 1986, 1991, 1996, 2001)	<ul style="list-style-type: none"> <li>• Statistics Canada generates estimates of population figures for non-census years</li> </ul>

# 1 Nurse Supply

This chapter describes the characteristics of Ontario's current supply of nurses and how the numbers in each category (i.e., current workforce, renewals, graduates, immigration, retirements) have changed over time.

For purposes of this report, nurse supply includes only those persons educated as nurses or practical nurses and registered with the College of Nurses of Ontario. Although unlicensed personnel provide nursing services in some organizations, demographic and employment data for these care providers are not available (with the exception of raw number of hours worked in hospitals, reported in the MOHLTC MIS database). Throughout this report the term nurses includes both Registered Nurses (RNs) and Registered Practical Nurses (RPNs).

The College of Nurses of Ontario (CNO) collects data annually on the number of nurses and practical nurses who:

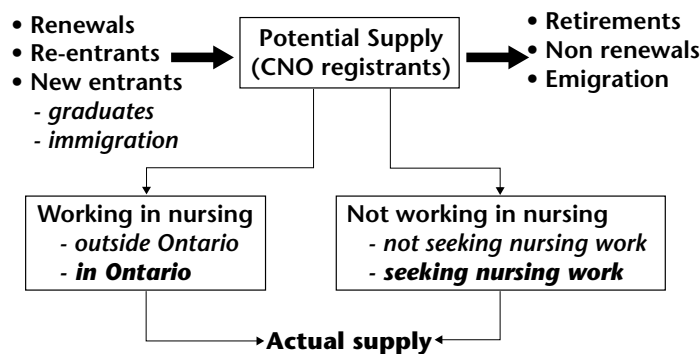
- (1) maintained their membership
- (2) renewed their expired membership (re-entrants)
- (3) registered for the first time following completion of their education (new registrants)
- (4) moved to Ontario from another province or country and obtained Ontario registration (immigration).

The CNO registration form also asks nurses for information about themselves and their job employment status. Despite some limitations (i.e., not all questions are mandatory, missing responses in some fields, self-reported data which are not verified), the CNO registration data are informative and provide a sense of the trends in nursing supply within the province.

## 1. Factors that Affect Nurse Supply

As Figure 1.1 illustrates, the province's nursing supply is affected by several factors, including the number of nurses working in the system, entering or re-entering, retiring, leaving the profession (non-renewals), leaving the province (emigration or working in nursing outside province), or not seeking work in nursing

Figure 1.1 Factors Affecting Ontario Nurse Supply



## Sources of Nurse Supply

Ontario's potential supply of nurses is derived from four sources:

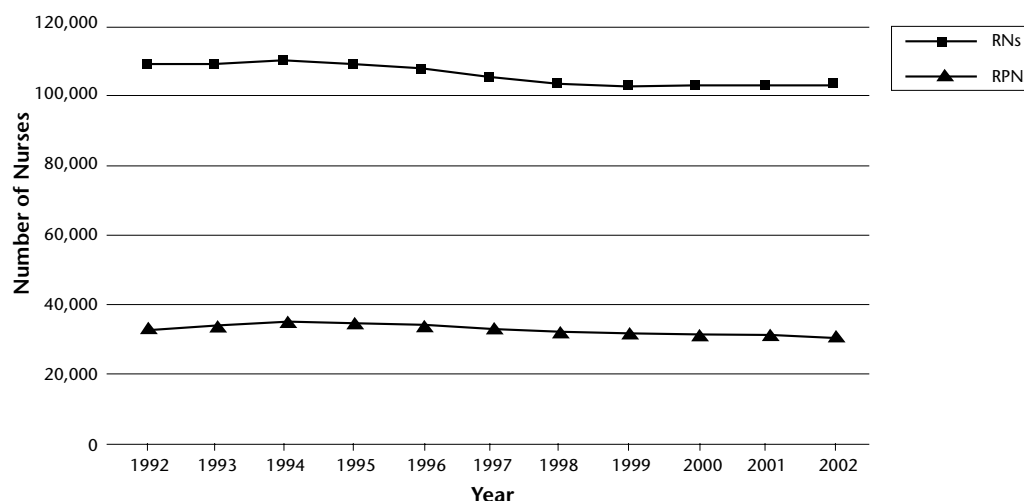
- trained Ontario nurses who are working in the system now (renewals)
- trained Ontario nurses who are re-entering the workforce after an absence (re-entrants)
- recent graduates of nursing education programs (new entrants)
- trained nurses who migrate to Ontario from other jurisdictions (immigration)

### 1. Renewals of Current Memberships

With the exception of a slight increase in RN renewals in 2002, both RN and RPN membership renewals have dropped in recent years (Figure 1.2). While the reduction in the absolute numbers of RPNs is considerably smaller than the reduction in RNs, the proportion is slightly greater. The RPN supply has a history of declining renewals since 1978.

There are several reasons why nurses may not renew their CNO memberships (e.g., retirement, leaving the province [migration], or leaving the profession, either temporarily or permanently). Unfortunately, data on nurses' reasons for not renewing their memberships are unavailable at the current time. In the near future, the NRU will conduct a survey of nurses who have not renewed their memberships.

*Figure 1.2: Renewal of Registration*



### 2. Re-entrants: Renewals of Expired Memberships

While renewals of current memberships were declining, renewals of expired memberships were on the rise until the late 1990s. In 1994, the number of RNs and RPNs renewing expired memberships nearly doubled, and the number remained high before the late 1990s. The initial increase is easily explained. In 1994, the CNO offered registrants whose memberships had lapsed a one-time opportunity to renew their membership without re-certifying. The rate of renewals for expired memberships, though gradually declining, remained high until the late 1990s. In the past several years, the renewals of expired memberships have dropped. This may be a result of lack of interest in re-enter-

ing into the Ontario nursing labour market due to the declining job opportunities in nursing since the mid 1990s.

Studies on nurses leaving the nursing profession are needed in order to plan successful recruitment strategies aimed at nurses who are no longer practicing.

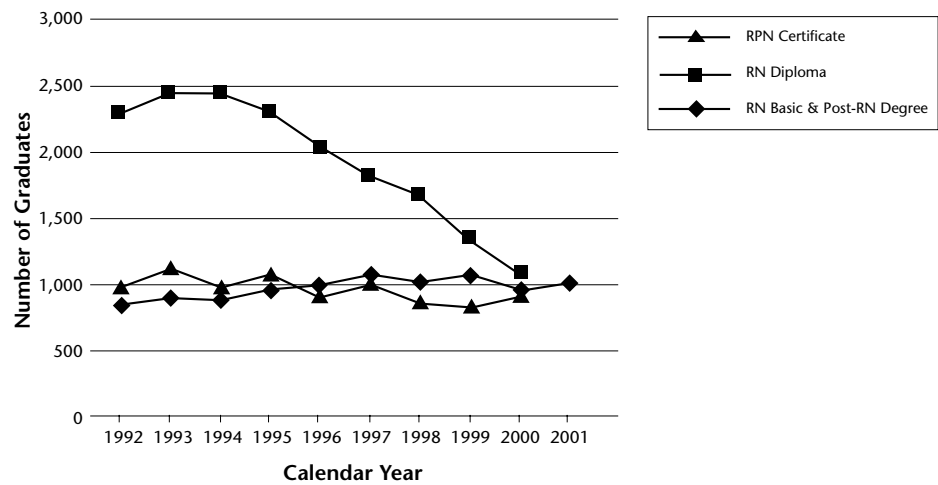
### 3. New Entrants

New entrants are comprised of new RN and RPN registrants with CNO who are recent graduates from training programs and those who move to Ontario from other provinces or countries.

#### *Graduates*

Since 1992, graduates from Ontario RN basic and Post-RN undergraduate degree programs steadily increased to a high of 1,098 in 1997 (Figure 1.3). The number of RN diploma graduates declined by 55% from 2,452 in 1994 to 1,094 in 2000. The number of RPN graduates fluctuated yearly, ranging from a high of 1,137 in 1993 to a low of 831 in 1999.

**Figure 1.3: Ontario Graduates**

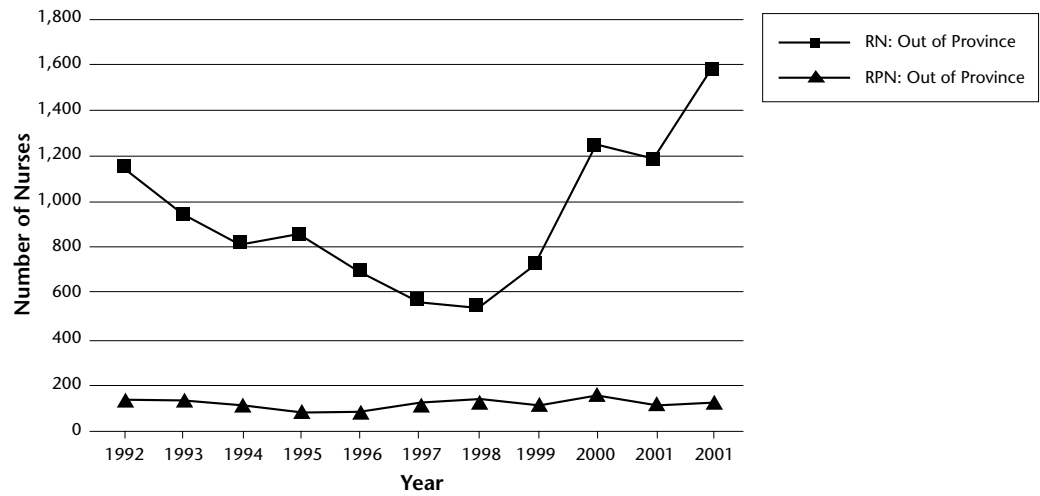


#### *Immigration*

Throughout most of the 1990s, the number of RNs and RPNs migrating from other countries and provinces decreased significantly (Figure 1.4). Declining immigration is likely linked to diminishing job opportunities which resulted from closures, hospital downsizing, and deskilling of nursing staff in Ontario during that timeframe. However, since the late 1990s, immigration of RNs has doubled, whereas RPN immigration has not.

In the past, migration to Ontario from other provinces or countries considerably augmented the supply of nurses in the province each year. However, Ontario's future ability to recruit nurses from outside the province may be limited by severe national and global nursing shortages. In fact, the number of registrants from out of province declined for RPNs over the past two years.

**Figure 1.4: Immigration of Nurses**

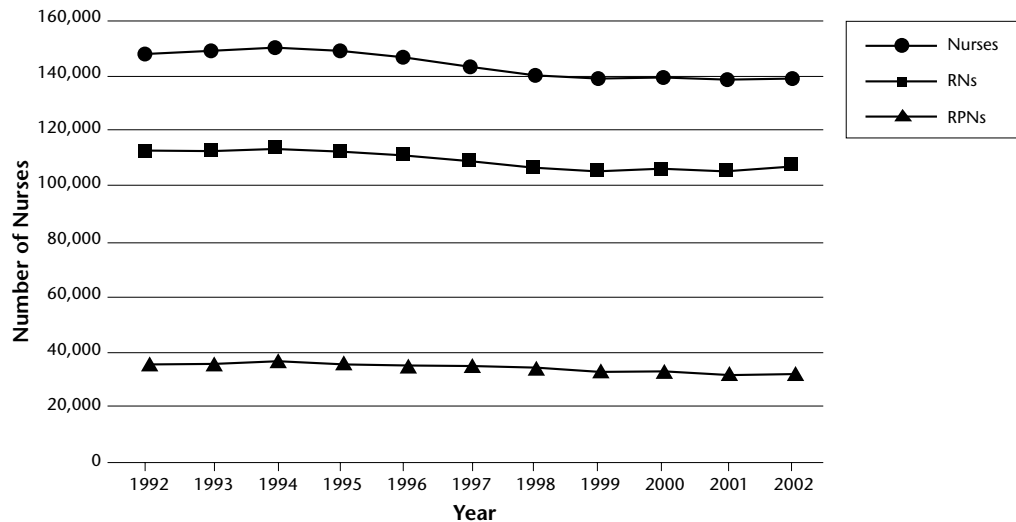


### Potential Nurse Supply

In Ontario, the total or potential supply of nurses increased steadily to a peak of 150,416 nurses in 1994. Since that time, the total number of Ontario nursing registrants has declined by almost 7,000 for RNs and by over 4,000 for RPNs (Figure 1.5).

In 2000, the number of RNs increased slightly by .35%, possibly due to the increased media coverage of the nurse shortage and to increases in job opportunities created by the Nursing Task Force policy initiatives (i.e., as a result of these initiatives and other changes in the health care system, nursing schools increased enrolment, hospitals stopped offering incentives to nurses to retire early, and the number of RNs returning to the province or migrating from other countries or provinces may have increased). There was continued growth in the number of RNs between 2001 and 2002. The number of RPNs, on the contrary, has continued to decline.

**Figure 1.5: Potential Supply of Nurses in Ontario**



## Potential vs. Actual Supply

The total number of nurses registered in Ontario (i.e., potential supply) can be misleading because not all nurses who register are available to provide service (i.e., actual supply). While some registrants work out of province, others are unavailable for work or unable to find employment in nursing. Actual supply consists of those registrants who work in nursing in Ontario (i.e., nurses in the workforce) plus those who are not currently employed in nursing but are seeking nursing work (i.e., nurses outside the workforce).

### Future Potential

Ontario's shift from a five-year to a four-year secondary school curriculum and the resulting double cohort creates opportunities to increase production of new nursing graduates ([http://www.cou.on.ca/HOME/DoubleCohort%20Info/double\\_cohort\\_intro.htm](http://www.cou.on.ca/HOME/DoubleCohort%20Info/double_cohort_intro.htm); September 23, 2002). According to the COU, the number of full and part-time students at Ontario universities could increase from over 330,000 in 2002 to over 363,500 in the fall of 2003. ([http://www.cou.on.ca/publications/briefs\\_reports/online\\_pubs/AStatusReport\\_Funding.pdf](http://www.cou.on.ca/publications/briefs_reports/online_pubs/AStatusReport_Funding.pdf); October 29, 2002).

To prepare for the influx of students, colleges and universities have expanded or added programs, or increased the number and physical capacity of programs and facilities. By 2005-2006, the Ontario government will have devoted \$49 million to develop new programs and enhance nursing education. The funding includes \$14.7 million for the compressed degree programs, \$24.3 million to increase student enrolment, and \$10 million to cover one-time costs, such as new equipment, library holdings, and curriculum development.

(<http://www.edu.gov.on.ca/eng/document/nr/01.01/nr0119.html>; October 29, 2002).

## 2. Nurses in the Workforce

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Between 1993 and 1995, the number of RNs who were actually employed in nursing in Ontario declined steadily, and then rose slightly in 1996. In contrast, the number of RPNs increased steadily over this same time period. These trends may be at least partially attributable to organizations' efforts to reduce the average cost per earned hour by replacing RNs with RPNs (Figure 1.6a).

Between 1996 and 1999, the numbers of both RNs and RPNs in the workforce declined (Figure 1.6a). These drops may be due in part to employers hiring unregulated care providers (UCPs) instead of RNs and RPNs to control costs. During 1998 and 1999, the worst cost containment years, the number of working RNs dropped below 80,000.

Figure 1.6b illustrates the percentage change in working nurses using 1992 as the base year. From 1992 to 2000, the number of working RNs and RPNs increased 0.83% and 7.79% respectively. However, from 1999 to 2000, the number of working RNs and RPNs increased by 5.9% and 3.9% respectively. In 2000, the total number of RNs working was slightly greater than in 1992, and the number of RPNs working (26,177) was the highest it had been in eight years. In 2001, the number of RNs and RPNs employed dropped slightly (-2.13% and -4.03% respectively), and then rose again in 2002.

Figure 1.6a: Nurses Employed in Nursing in Ontario

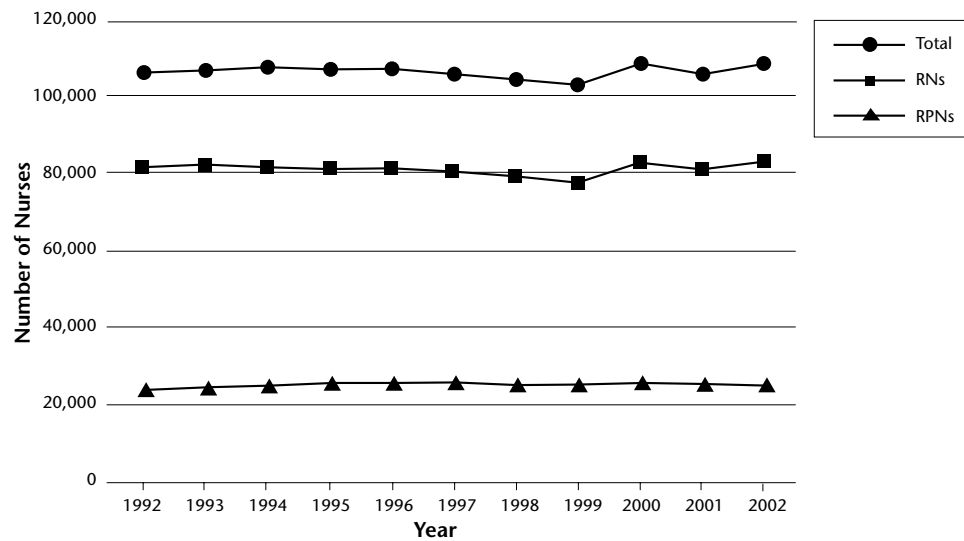
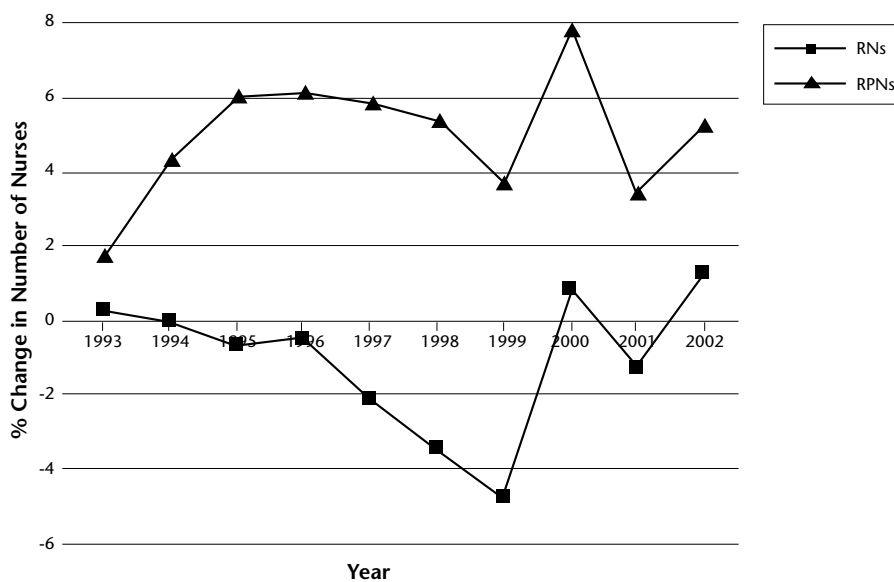


Figure 1.6b: Rates of Change among Nurses Working in Nursing in Ontario (base year=1992)



## Participation Rates

The percentage of nurses who are working in nursing in Ontario is referred to as the participation rate (Table 1.1). In 2000, the participation rate amongst RNs rose to 82.7%, returning to 1992 levels, whereas the percentage of RPNs participating (86.5%) reached its highest level in 10 years. However, the participation rates for both RNs and RPNs have since declined.

Rates of participation are useful in identifying potential strategies to augment the supply of nurses. When participation rates are low, planners should consider what kind of strategies might encourage current registrants working in non-nursing jobs to return to nursing or nurses working outside Ontario to return to the province. Strategies that increase participation rates have the potential to provide nurses in less time than an increase in new entrants or in-migration of nurses.

**Table 1.1: Participation Rates**

<b>CNO Registrants Employed in Nursing in Ontario</b>					
<b>Year</b>	<b>RN (%)</b>	<b>RPN (%)</b>	<b>Year</b>	<b>RN (%)</b>	<b>RPN (%)</b>
1992	82.8	78.5	1998	78.3	82.1
1993	79.3	79.1	1999	79.9	83.9
1994	79.0	79.0	2000	82.7	86.5
1995	79.2	80.8	2000	82.7	86.5
1996	80.3	83.0	2002	81.4	83.6
1997	79.3	82.8			

### **3. Nurses Outside the Workforce**

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The reasons nurses register with CNO but do not participate actively in the Ontario nursing workforce vary. Some registrants are unavailable due to an inability to find work in nursing. Some have found work opportunities in non-nursing roles or nursing work opportunities outside the province. Some are involved in educational pursuits. Some have retired. Others do not wish to work for family or health reasons, but it is difficult to ascertain the size of this group because the level of detail in the CNO registration data varies over the years, and these registrants are counted simply as “not employed”.

#### **RNs**

Between 1998 and 2000, the number of RNs outside the nursing workforce declined. However, this decrease must be viewed in the context of the total number of registered nurses, which also declined over that same period. The actual proportion of registrants who were outside the workforce continued to be fairly stable.

With the exception of 1998 and 1999 when jobs were scarce, the number of RNs not seeking work in nursing declined almost steadily between 1992 and 2000. However, since 2001, substantially more nurses were not seeking work in nursing (Table 1.2).

The number of nurses registered in the province but employed outside Ontario began to increase significantly in 1992, and these numbers – though down slightly from their peak in 1998 – have remained high.

The number of nurses seeking work in nursing also rose significantly in 1992 and continued to rise until 1997. Since then, there has been a slow but steady decline in this number, which suggests that those who want to work in nursing are finding it easier to get a job.

Although the number of nurse retirements varies yearly, the highest levels occurred in 1998 (2,620) and 1999 (2,540). After 1999, the number of retirees who chose to maintain their CNO membership dropped, to 1,902 in 2000 and declined further to 509 and 595 in 2001 and 2002, respectively. The recent drastic reduction in the number of retirees and the large increase in the number of RNs not seeking a nursing job (from 6,241 in 2000 to 10,547 in 2002) are the result of the CNO’s introduction of the “Retired” class in 2001. In previous years, registrants had the option of defining themselves as “retired” even if they were not yet of mandatory retirement age (65). Beginning in 2001, the “Retired” class is reserved for nurses 65 or older who plan to permanently resign from nursing



work. Nurses who choose this classification have access to the designation “Registered Nurse” but are excluded from practising in a paid or volunteer capacity, even on a short-term, temporary basis. As of 2001, the CNO instructed all registrants younger than 65 who might once have defined themselves as “retired” to define themselves using either the “not employed” or “employed in non-nursing” categories instead. The prohibition on practicing and the age restrictions involved explain the relatively low number of retired class memberships. To have the option of returning to nursing practice in the future, many nurses are choosing to define themselves as not seeking a nursing job. Therefore these numbers do not provide a stable estimate of trends in actual retirements.

**Table 1.2: RNs Outside the Workforce**

<b>RNs Outside the Ontario Workforce</b>					
<b>Year</b>	<b>Total</b>	<b>Not Seeking Nursing Job</b>	<b>Employed Outside ON</b>	<b>Seeking Nursing Job</b>	<b>Retired</b>
1992	15939	8536	5023	120	2260
1993	20124	8231	5949	3445	2499
1994	20360	8414	7207	2718	2021
1995	19974	7629	6894	3541	1910
1996	18919	6792	6478	3584	2065
1997	19719	6112	6952	4321	2334
1998	20780	6409	7697	4054	2620
1999	19661	6852	6920	3349	2540
2000	17368	6241	6920	2305	1902
2001	19517	10244	6589	2175	509 ("Retired" class)
2002	19602	10547	6336	2124	595 ("Retired" class)

## **RPNs**

Among RPNs, the picture is quite different. The number of RPNs who reported not seeking employment in nursing declined steadily from its peak in 1994 through 2000 – although there was a large upswing in 2001 and 2002.

The number of RPNs reporting that they work outside Ontario, which had remained relatively stable between 1992 and 1997, increased in 1998, and then decreased in each of the last four years.

Although the number of RPNs who reported being retired is small, it increased over time until the year 1999. As noted above, the drastic drop in retired RPNs and increase in RPNs not seeking a nursing job since 2001 are the result of the CNO’s introduction of the “Retired” class in 2001, which is reserved for nurses over age 65 who have permanently resigned from nursing.

The numbers reporting that they were seeking nursing employment were fairly stable between 1994 and 1998, but declined significantly starting in 1999 (Table 1.3). The proportion of RPNs (7%) who are not employed is comparable to that of RNs (7.1%). However, RPNs are more likely than RNs to be working in a non-nursing capacity (8.5% vs. 5.4%).

Table 1.3: RPNs Outside the Workforce

RPNs Outside the Ontario Workforce					
Year	Total	Not Seeking Nursing Job	Employed Outside ON	Seeking Nursing Job	Retired
1992	6345	3005	280	2724	336
1993	6228	3309	356	2168	395
1994	6431	3610	453	2005	363
1995	5855	3115	392	2018	330
1996	5058	2493	382	1826	357
1997	5130	2269	382	2062	417
1998	5381	2413	433	2063	472
1999	4821	2387	295	1723	416
2000	4070	2138	298	1348	286
2001	5103	3361	274	1418	50 ("Retired" class)
2002	5070	3536	259	1209	66 ("Retired" class)

## 4. Distribution of Nurses by Employment Sector

The CNO database categorizes nurses into four employment sectors: hospitals, long-term care, the community, and other (see box for definitions). Over the past decade, the distribution of nurses across these health sectors has changed. While nurses continue to be concentrated mainly in hospitals, the proportion working in other settings has increased. The shift in where nurses are working is occurring at the same time that the overall number of working nurses is declining.

### RNs

Between 1992 and 2002, the proportion of RNs reporting they work in a hospital setting decreased from 65.6% to 58.3% (Figure 1.7). This drop is primarily due to a decline in the proportion of nurses working in chronic care and rehabilitation hospitals. While the proportion of RNs working in general hospitals increased from 86.8% in 1992 to 87.5% in 1999 and to 88.6% in 2002, the actual number of RNs working in these settings declined from 46,710 in 1992 to a low of 40,512 in 1999, and then rose again to 42,970 in 2002. The number working in chronic care hospitals dropped from 2,322 in 1992 to 1,649 in 2002 and the number working in rehabilitation settings declined from 914 (1.7%) to 794 (1.6%) over the same time period.

### Employment Sectors

**Hospital** numbers include data from: general hospitals (maternal, paediatric, psychiatric), mental health centres, nursing stations, and rehabilitation centres and chronic care hospitals.

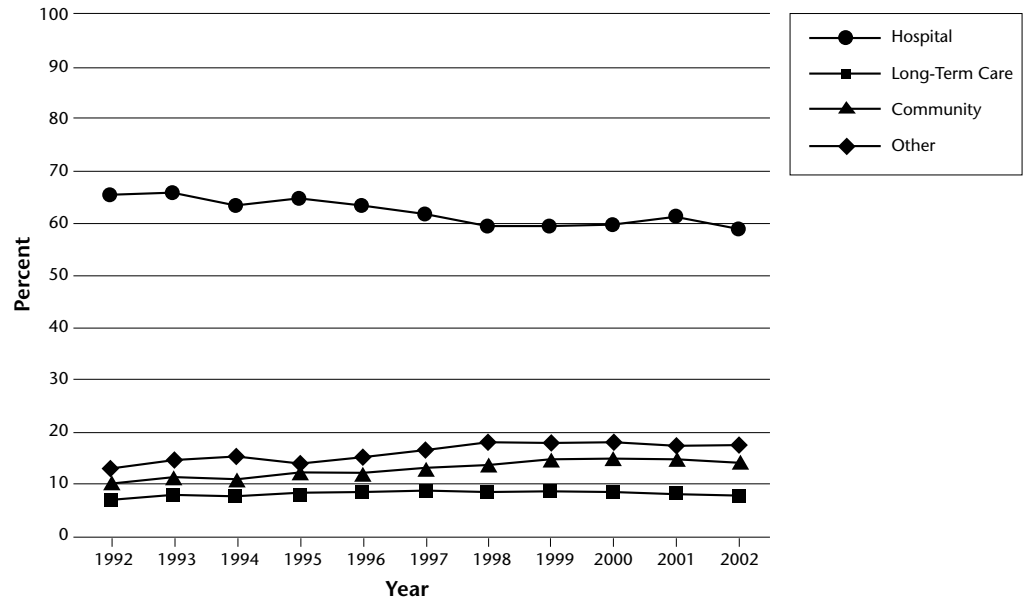
**Long-term care** includes data from: nursing homes and homes for the aged.

**Community** includes data from: nurses working in home care, public health, community health centres, Community Care Access Centres, and community agencies.

**Other** includes data from: business/industry, private nursing, self-employed, physician's office/family practices, educational institutions, and associations/government.

Over the same period, the proportion of RNs working in long-term care and community care increased slightly (from 6.9% to 7.2%, and from 10.1% to 13.6% respectively), and the proportion working in “other” settings (a heterogeneous category) increased from 12.7% to 17%.

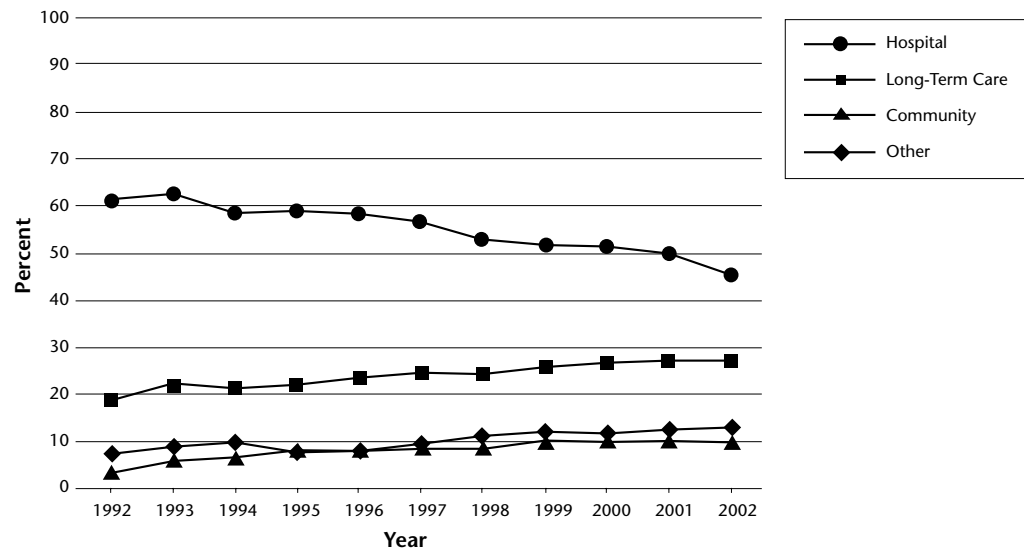
**Figure 1.7: Where RNs Work**



## RPNs

Between 1992 and 2002, the proportion of RPNs reporting they work in hospitals declined from 61.1% to 45.2% (Figure 1.8). Within the hospital sector, the proportion of RPNs working in general and rehabilitation hospitals dropped, whereas the proportion working in chronic care facilities actually grew from 13.7% to 15.9%. Over the same period, the proportion of RPNs working in long-term care and community care increased (from 18.5% to 27% and from 3.5% to 9.4% respectively), as did the proportion of RPNs working in “other” categories (from 7.5% to 12.9%).

**Figure 1.8: Where RPNs Work**

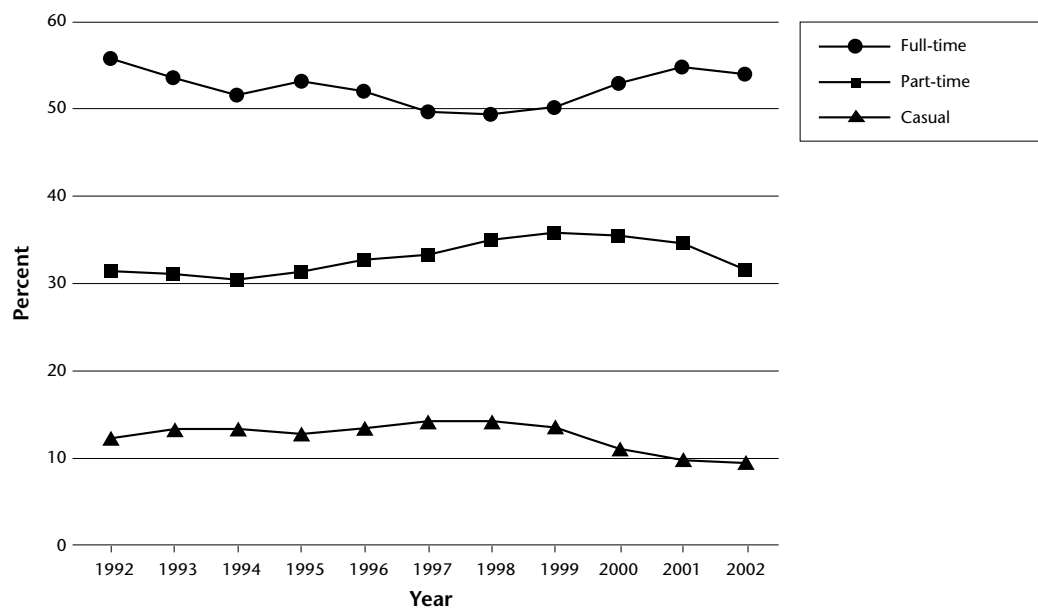


## 5. Nurses' Employment Status

### RNs

Between 1992 and 2002, the distribution of RNs working full-time, part-time, and casual shifted dramatically. During most of the 1990s, the proportion of RNs working full-time dropped, and the proportion working part-time or casual increased. However, recent data indicate that the percentage of casual workers has dropped. As of 2002, the absolute number of casual RNs had decreased from 1992 levels by about 2,000 (10,110 in 1992 vs. 7,830 in 2002), the number of full-time RNs has rebounded almost to 1992 levels (45,763 in 1992 and 44,865 in 2002), and the number of part-time RNs had increased (from 25,834 in 1992 to 26,330 in 2002). The reader should note that the increases in the absolute numbers of full-time and part-time RNs are not reflected in Figure 1.9 because nurses who did not state their employment status were included in the percentage calculations and there were a high number of "not stated" cases in 2002. However, the general increase in full-time positions has most likely been influenced by Ontario Ministry of Health and Long-Term Care targeted funding between 1999 and 2000 to increase the number of full-time positions.

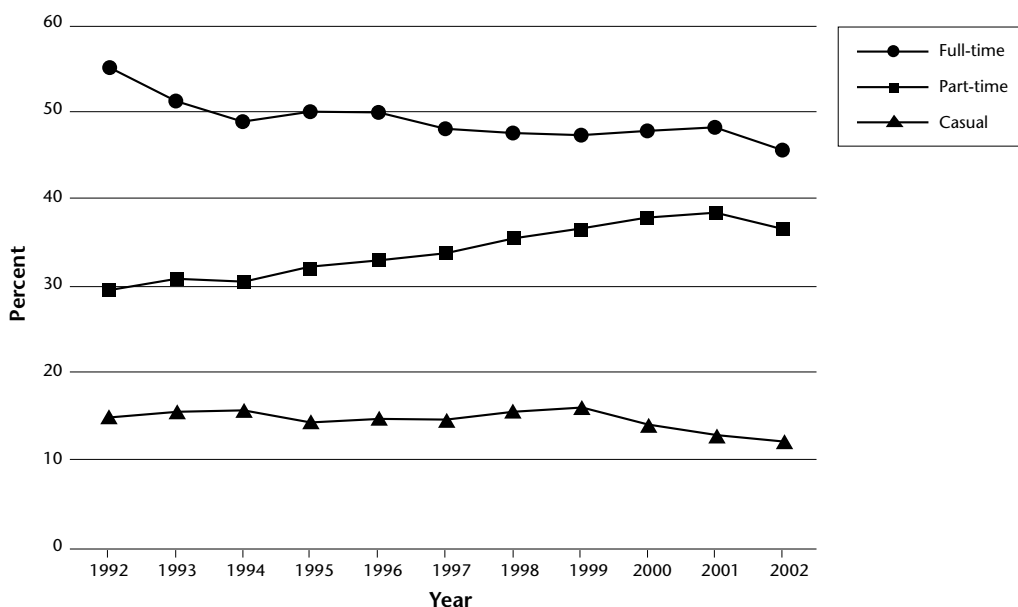
*Figure 1.9: Employment Status of RNs*



### RPNs

Trends in employment status for RPNs (Figure 1.10) differ somewhat from those of RNs (Figure 1.9). RPNs experienced the same decrease in full-time employment as RNs in the 1990s, but no corresponding upswing in the last three years. The proportion working casual remained relatively constant at around 15% until 2001 (12.5%), and the proportion working part-time increased. In terms of absolute numbers, the number of full-time RPNs has decreased since 1992 (from 13,395 in 1992 to 11,634 in 2002) as has the number of casuals (from 3,588 in 1992 to 3,028 in 2002), while the number of part-time RPNs has increased (from 7,185 in 1992 to 9,331 in 2002).

Figure 1.10: Employment Status of RPNs



### Trends in Employment Status

The large number of nurses seeking jobs in nursing during the mid-1990s and the increase in part-time and casual positions suggests the labour market favoured the employer. In contrast, the increase in RNs working full-time and the drop in casual RNs and RPNs over the last four years suggest that the market may be favouring employees.

The nature of the change in nursing employment cannot be determined from aggregate data. Have nurses formerly employed full-time displaced part-time and casual nurses? Have some casual positions been converted to part-time and full-time positions? What proportion of full-time positions is secured by new graduates entering the system? These questions are important to answer because of their potential impact on future nurse supply. For example, if new graduates only have access to less secure part-time and casual positions, they may leave the profession to pursue other career options, which intensifies the aging of the nursing workforce (see Age of Ontario Nurses, page 30), and will lead, in turn, to a severe shortage of experienced, mid-career nurses as baby-boomer nurses retire.

The proportion of nurses working full-time, part-time or casual directly impacts Ontario's supply of nursing hours. By definition, nurses working part-time are not available for as many hours of work as nurses working full-time. If the proportion of nurses working part-time increases, Ontario will have access to fewer hours of nursing. At the same time, if Ontario can increase the proportion of nurses working full-time, the existing nurse supply can be used more effectively and the amount of nursing care can be augmented without increasing the number of nurses. However, the province has no data on the actual number of part-time nurses in Ontario seeking full-time positions.

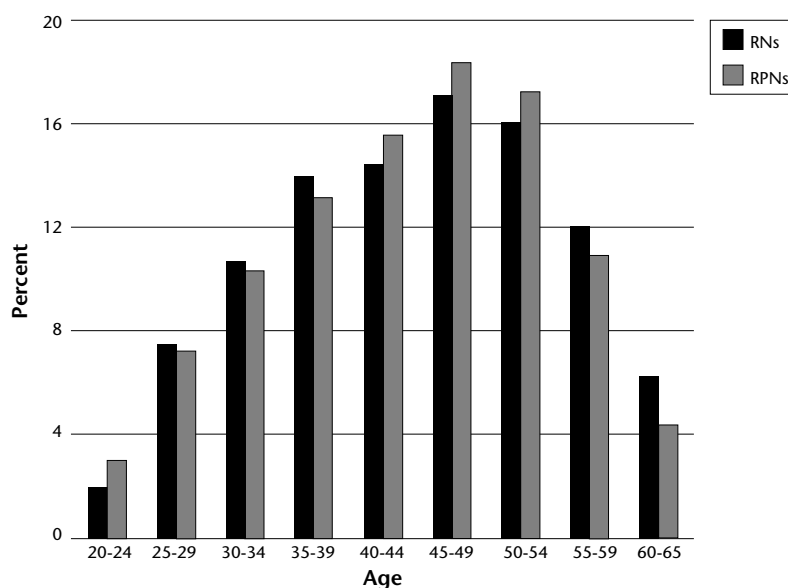
Although Ontario has made some progress in increasing opportunities for full-time employment for RNs, the proportion of all nurses working full-time still falls far short of the 70% recommended by the Joint Provincial Nursing Committee (JPNC). (Although there are no data to support this figure, the JPNC arrived at the recommended 70% by conventional wisdom and professional experience.) Providing more full-time nursing positions would help recruit and retain nurses who are seeking adequate incomes and job security. This strategy would also increase continuity of patient care.

## 6. Age of Ontario Nurses

More than 99% of nurses who are members of CNO are between 20 and 65 (138,119 nurses), the expected age range for nurses available to work. The average age of those nurses is 44 and the most common age is 50 (N=5,174). The average age of RNs and RPNs is about the same: 44.3 for RNs and 43.8 for RPNs.

Figure 1.11 illustrates the distribution of both RNs and RPNs by age, and highlights the aging of the nursing workforce. In 2002, only 2% of RNs and 3% of RPNs were between the ages of 20 to 24; 66% of all nurses were over age 40 – up significantly from 58% in 1993.

**Figure 1.11: Age Distribution of RNs and RPNs Registered with CNO in 2002**



### The Relationship Between Age and Employment Status

Figure 1.11 represents all nurses registered with CNO, whether or not they are working as nurses. The pattern of age distribution is similar for the 12% of RNs and 15% of RPNs nurses outside the workforce (i.e., unemployed or working in non-nursing domains). In 2002, the majority of nurses outside the nursing workforce were middle aged, their average age was over 45 (RN: 48; RPN: 45), and only a small percentage (4% for RNs and 7% for RPNs) were in their twenties.

Compared to older members, nurses between the ages of 20 and 24 year olds are the least likely to be employed in a non-nursing role (RN: 1%; RPN: 3%) or unemployed (RN: 5%; RPN: 8%). As expected, the 60 to 65 age group has the highest proportion of unemployed nurses (RN: 19%; RPN: 15%) and has the smallest proportion of nurses employed in nursing (75% for RNs and 79% for RPNs, vs. 89% for RNs and 85% for RPNs for all other age groups).

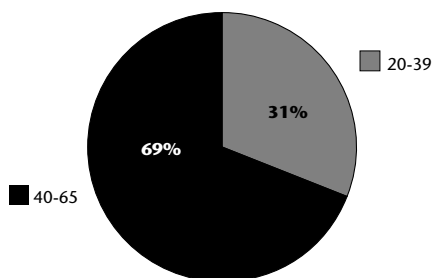
Age is a factor in understanding where nurses work and how they are employed.

#### RNs

Younger RNs (20-34) are most likely to be employed in nursing outside of Ontario. About one-eighth (11%) of RNs in their twenties and early thirties who are registered in Ontario do not currently work in the province – compared to 6% of RNs overall who are nursing outside Ontario.

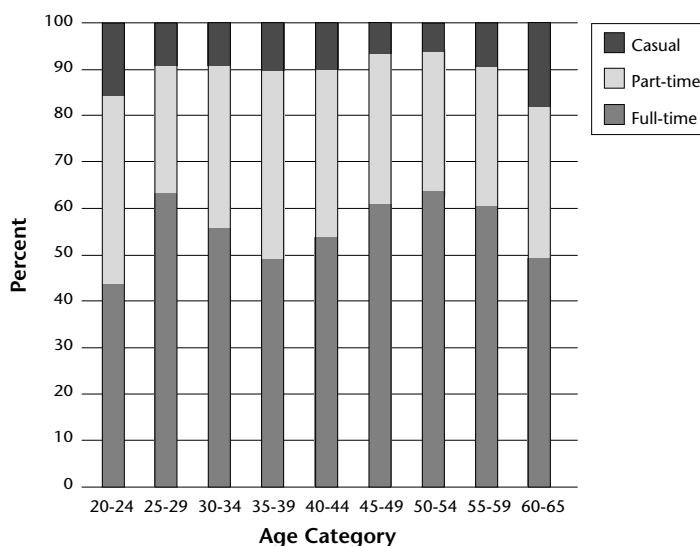
Full-time RN jobs in Ontario are largely occupied by mid-career nurses: 69% of the RNs employed full-time are over age 40 (Figure 1.12).

**Figure 1.12: Age Distribution of RNs Employed Full-time**



Of all employed RNs over the age of 40, 60% are working full-time, compared to 54% for RNs under 40 (Figure 1.13 presents the findings by 5-year age groups). RNs in part-time work account for about 32% of the nursing workforce, which is fairly consistent across all age groups, although slightly more obvious among those in the child-bearing and child-rearing age group (30-44). In terms of casual employment, younger and older RNs have a much higher chance of working on a casual basis than those who are middle aged. About one-fifth (19%) of 60 to 65 year olds and 16% of 20 to 24 year olds are employed casually, compared to only 9% of those 25 to 59. While younger RNs, especially those in their early twenties, are more likely to work in nursing than older nurses, they are also more likely to either be employed outside Ontario or to be working in nursing on a part-time or casual basis. Nurses who are middle aged are more likely to be working in nursing full-time until they reach age 60, when they are more likely to be retired or working part-time or casual.

**Figure 1.13: RN Employment Status by Age Category in 2002**



### RPNs

Fewer than 1% of RPNs work in nursing outside the province, and age does not appear to be a factor. The age distribution of RPNs in full-time, part-time, and casual nursing employment is similar to that of RNs. About 75% of the RPNs who are working full-time are 40 or older (Figure 1.14). Younger RPNs tend to work on a part-time or casual basis and, among RPNs who are under 40, part-time work is the predominant form of employment (Figure 1.15).

Figure 1.14: Age Distribution of RPNs Employed Full-Time in 2002

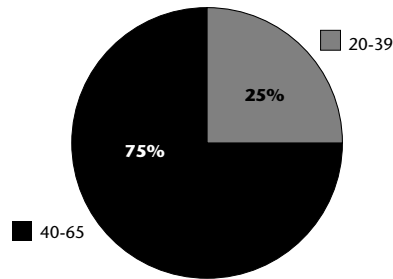
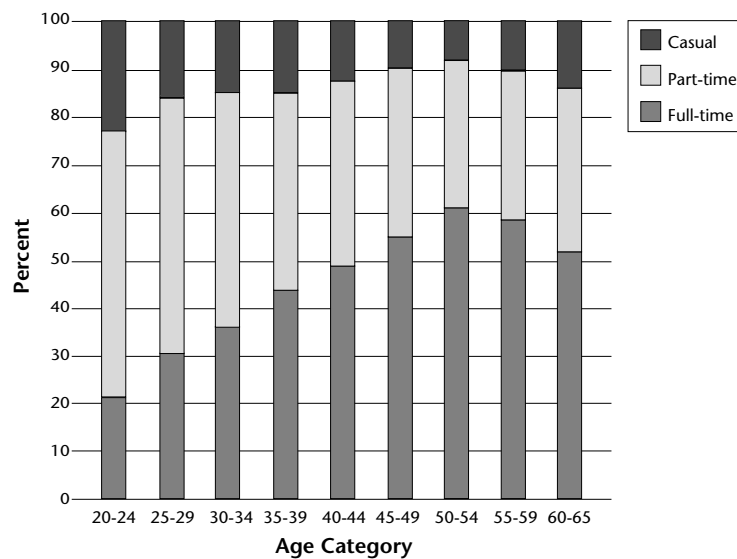


Figure 1.15: RPN Employment Status by Age Category in 2002



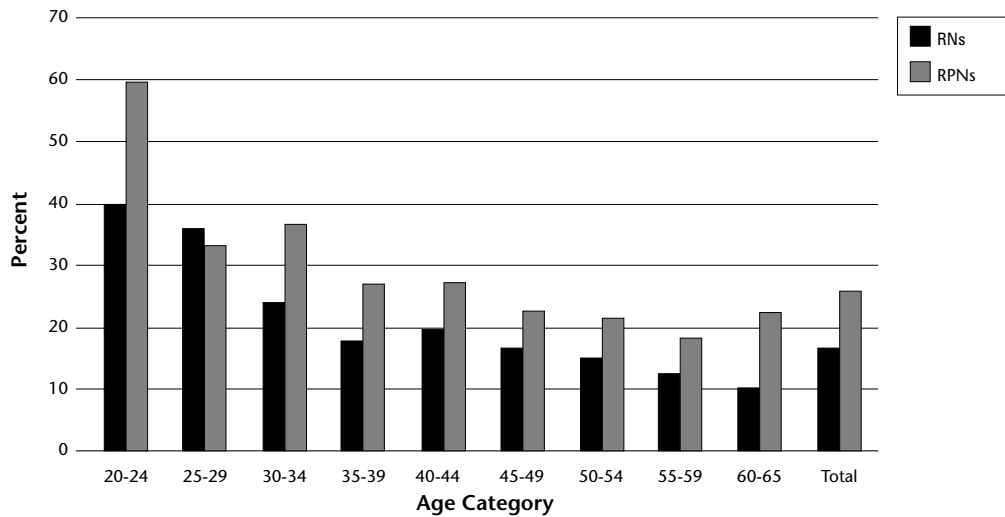
## The Relationship Between Age and Seeking Employment in Nursing

Among those nurses who are not working in nursing (Figure 1.16), younger nurses are more interested than older nurses in looking for work in nursing. More than 40% of nurses aged 20 to 24 (RN: 40%; RPN: 59%), and more than one-third of nurses 25 to 29 (RN: 37%; RPN: 33%) who are not working in nursing are looking for nursing jobs. Most of these would be new graduates who cannot find adequate work or the employment they want. This pool of young nurses is contributing to a very high seek rate.

In nurses over age 35, the proportion seeking nursing jobs levels off but remains between 11% and 20% for RNs and between 19% and 28% for RPNs (Figure 1.16). RNs in all age groups, except those in their twenties, consistently show less interest in going back to the nursing workforce than RPNs. This difference may indicate that RNs are getting ready to leave the nursing profession or are more likely to take extended leave in order to engage in child-rearing activities. A current NRU study is exploring their reasons for not seeking work in nursing.



**Figure 1.16: Proportion of Nurses Outside the Nursing Workforce Seeking Employment in Nursing in 2002 (by Age Category)**



Similar analyses were conducted for nurses already employed in nursing in Ontario. Interestingly, a high proportion of Ontario’s nurses who are currently employed report that they are seeking employment in nursing. Presumably they are either seeking additional nursing work or thinking about changing their current nursing job. Note that the “seeking” group is a heterogeneous collection of individuals which includes both full-time and part-time workers. In 2001, 11% of RNs and 16% of RPNs aged 20-24, and 6% RNs and 10% of RPNs aged 25-34 who were already working in nursing in Ontario indicated that they were looking for nursing work. These numbers gradually decline as nurses age, down to 2% for RNs, and 3% for RPNs among the 50-plus age group. The rate of young working nurses interested in seeking job(s) is not surprising because young nurses, though largely employed in nursing, are more likely to work on a part-time or casual basis and, as a result, do not have the security or benefits of full-time jobs. If this trend continues younger nurses may become disillusioned with their career, and nursing may have less appeal as a career choice.

### **The Impact of an Aging Workforce on Nurse Supply**

The aging of the nursing workforce has many implications for the potential supply of nurses. Given the small number of young nurses and even smaller number of young nurses employed full-time, Ontario will soon have more nurses retiring than there are nurses to fill positions.

## 7. New Nursing Personnel

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### **Nursing Education in Ontario: A Brief History**

During the past century, nursing education in Ontario gradually shifted from hospital-based apprenticeship programs to degree, diploma, and certificate programs in the college and university sectors. In response to evolving technology and increasing patient complexity, the nursing profession has increased the educational requirements for nurses.

#### **RN Education**

University degree programs in nursing have been offered in Ontario since 1942. They initially concentrated on public health nursing and later expanded to include baccalaureate entry to practice programs and graduate education (Baumgart & Larsen, 1988). The 1970s marked a significant transition in the evolution of nursing education, as hospital apprenticeship programs shifted to RN diploma programs in the college sector (Gerhard, Goldenberg, Johnstone, & McFadden, 1994).

In the early 1980s, the Registered Nurses Association of Ontario and the Canadian Nurses Association launched a major entry to practice initiative to provide nurses with the education needed to cope with a changing world and contribute in a thoughtful way to the changing pattern of nursing practice (Baumgart & Larsen, 1988; CNA, 1996; Gerhard et al., 1994). Effective January 1, 2005, the CNO will require all new RNs to graduate from degree programs in nursing (CNO, 1999). All RN college diploma students must graduate by December 31, 2004. The last college diploma students entered mainly in September 2001, with the final intake in January 2002.

In the fall of 1985, the Ontario Region of the Canadian Association of University Schools of Nursing (ORCAUSN, renamed Council of Ontario University Programs in Nursing in 1993) and the Heads of Diploma Nursing Programs in Colleges of Applied Arts and Technology (HNCAATs) established a committee to consider issues related to nursing education and promote collaboration between colleges and universities (Gerhard et al., 1994). By the 1990s, articulated and collaborative education programs were under development. In articulated programs, the college delivers the first part (usually the first two years), while the university delivers the remaining two years. In collaborative programs, both college and university partners are involved in each year of the program.

#### **RPN Education**

Formerly known as Certified and Registered Nursing Assistants, the role of practical nurses came into existence in 1938, in response to the nursing shortage during World War II and increasing demand for nursing services (RPNAO, 2002). Historically, training for practical nurses occurred in hospital-based apprenticeship programs and in secondary schools. After 1972, practical nurse programs gradually shifted to certificate programs offered by colleges (RPNAO, 2002). In 1981, in response to underutilization of RPNs in the health care system, the colleges expanded the content and length of practical nursing curriculums.

During the 1990s, RPN employment expanded to the community sector. Under the Regulated Health Professions Act (1993), the title Registered Nursing Assistant was changed to Registered Practical Nurse. In 1999, the CNO developed new Entry to Practice competencies. Effective January 1, 2005,

The CNO regulates the profession and determines the education required for nursing licensure. Nurses can apply to be licensed in one of two classes:

- the General Class for registered nurses or registered practical nurses
- the Extended Class for primary care nurse practitioners (CNO, 2002).

The CNO does not offer a special license for registered psychiatric nurses.

all new practical nurses must graduate with a diploma from an approved College of Applied Arts and Technology to qualify for registration with the College of Nurses of Ontario. As of September 2002, most programs began offering the new four semester RPN diploma. Articulated programs which allow RPNs to bridge to RN education accepted their last admissions in the fall of 2002 or spring 2003 (K. Kay, personal communication, July 1, 2003).

## **Application & Applicant Data**

Application and applicant data should be interpreted with caution, since one applicant may submit more than one application through either or both the Ontario Universities' Application Centre and the Ontario College Application Services. Since 1998, applicants to the Ontario Universities' Application Centre are no longer restricted to three applications and may submit unlimited applications. Through the Ontario College Application Services, college applicants may carry up to six applications (known as "choices"). With the development of collaborative degree programs, each institution accepts applicants through one of the two application centres. Trends in the number of applications and applicants over time reflect the general level of interest in nursing as well as changing entry to practice requirements.

### **Applications**

Applications to all Ontario nursing programs declined in 1997, most likely due to the effects of restructuring (Figure 1.17). The general upswing after 1997 may be due to increased media coverage of the nurse shortage and increased awareness of nursing employment opportunities as a result of Nursing Task Force initiatives (Joint Provincial Nursing Committee, 2001). Furthermore, increases in the 2002 application cycle may also reflect the impact of the double cohort of Ontario high school students applying to enter the post-secondary education system. RN diploma full and part-time applications peaked at 19,012 for the 2000 academic year. Significant declines in RN diploma choices in 2001 and 2002 likely reflect changing student interest as a result of the new 2005 Ontario Entry to Practice requirements.

RPN full and part-time applications continued to rise from a low of 5,087 in 1997 to a high of 10,512 in 2002.

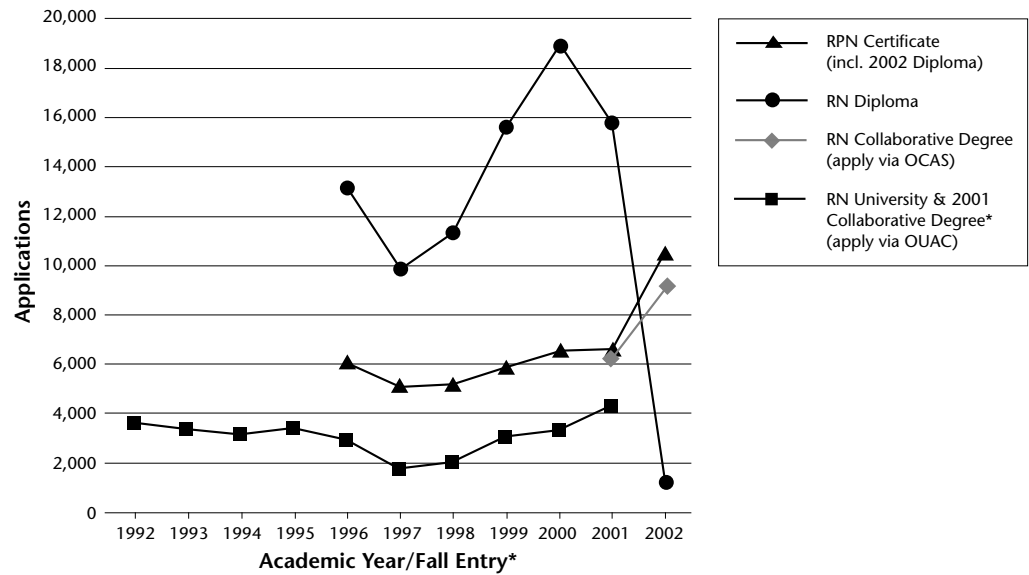
### **Data Sources and Limitations**

Applicant and new entrant data presented here are derived from separate sources. Data cannot be traced from application to funded enrolment. Although the Council of Ontario Universities developed the category of "registered applicants" by manipulating data from the Statistics Canada/MTCU USIS/UAR system, this report uses Ministry of Training, College, and Universities data on funded new entrants and first year enrolments to maintain consistency and comparability across data sets. Individual institutions were contacted to clarify MTCU data as needed.

Application and applicant data from the Ontario Universities' Application Centre comprise full-time fall entry applicants in the first year of post-OAC programs. Ontario College Application Services' RN and RPN full and part-time applicant data are collected for the entire academic year.

Ministry of Training, College, and Universities data on undergraduate RN programs include post-RN undergraduates in the graduate count, and may also include post-RNs in the enrolment count due to reporting mechanisms. RN degree first year enrolments which consist of a November 1st headcount, may include students who take longer than one academic year to complete the first year of study (i.e, this headcount may not be limited to 'new' entrants). Ministry of Training, College, and Universities data on college RNs and RPNs identify new entrants throughout the academic year.

**Figure 1.17: Applications to All Ontario Nursing Programs**



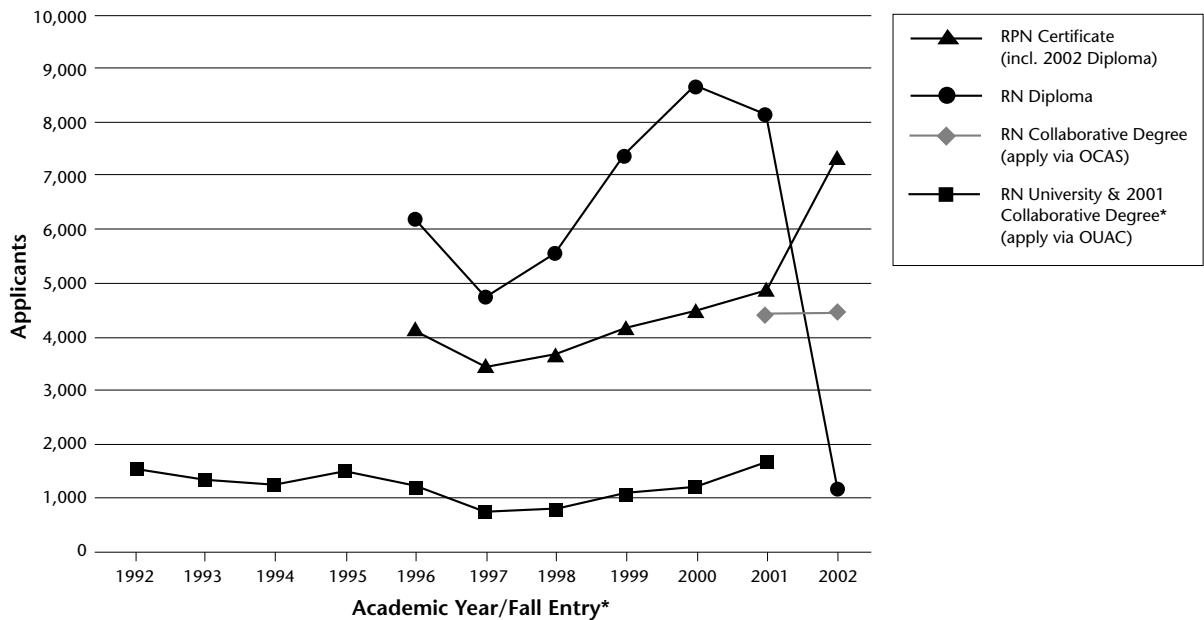
## Applicants

Similar trends are observed in the applicant data, where a decline in the number of applicants in 1997 is followed by significant increases of 205.5%, 84.1%, and 29.4% for RN university degree (full-time), RN diploma (full and part-time), and RPN certificate (full and part-time) programs between 1997 and 2000 (Figure 1.18). RN diploma applicants peaked at 8,697 for the 2000 academic year. The upswing in the applicant pool after 1997 could reflect increased interest in nursing. Increases in the 2002 application cycle may also reflect the impact of the double cohort of Ontario high school students applying to enter the post-secondary education system.

As a result of changing entry to practice requirements, the number of RN diploma applicants declined drastically in 2001 and 2002 as expected. However, the increase in applicants to the collaborative and university degree programs partially compensated for these drops. Ontario College Application Services applicants to collaborative degree programs increased slightly from 4,400 to 4,467 in the first two years. Comparable 2002 data from the Ontario Universities' Application Centre are not yet available. Combined university and college RN degree applicants totaled 6,084 in 2001. With the shift from diploma to collaborative degree programs, it remains to be seen whether overall RN degree applicant levels will return to previous diploma applicant levels.

In 2002, applicants to RPN certificate/diploma programs peaked at 7,302; an increase of 50.3% from 2001.

**Figure 1.18: Applicants to All Ontario Nursing Programs**



The number of applications and applicants neither reflect the quality of applicants in terms of entry level grades, nor the capacity of educational institutions to offer programs. During the restructuring years, programs may have potentially accepted students with lower entry grades in order to maintain enrolment levels despite a declining applicant pool. Anecdotal evidence both supports and negates this theory. Furthermore, an expanded applicant pool may or may not comprise quality applicants.

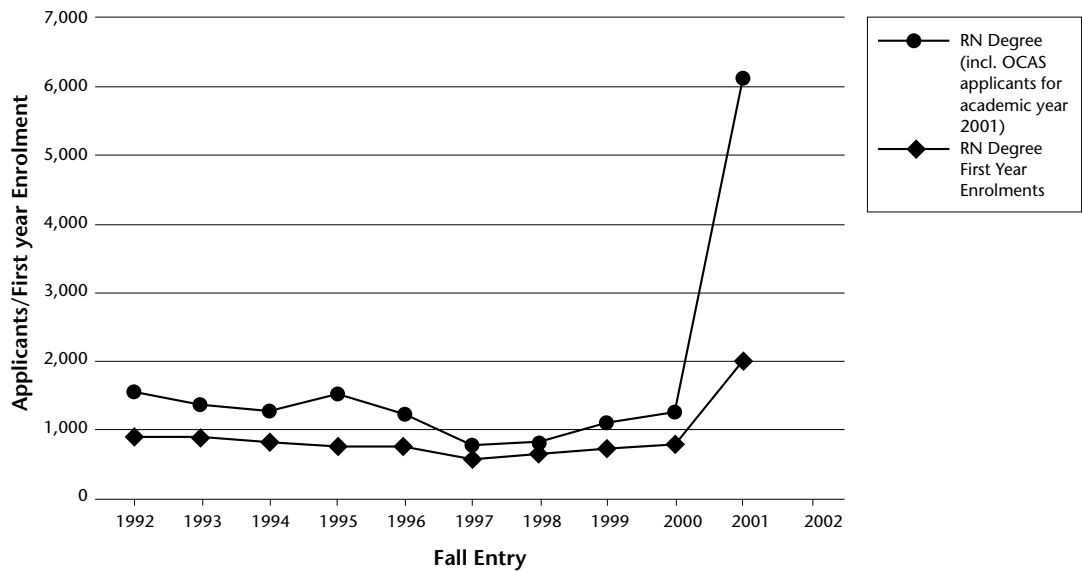
## Enrolments

Prior to 1999/00, the Colleges Branch of the Ministry of Training, Colleges, and Universities restricted the quota for new entrants to college programs. University undergraduate nursing programs have not been subject to similar quota restrictions. The college sector reports full-time new entrants for the academic year whereas universities report full and part-time first year enrolments for the fall semester.

## RNs

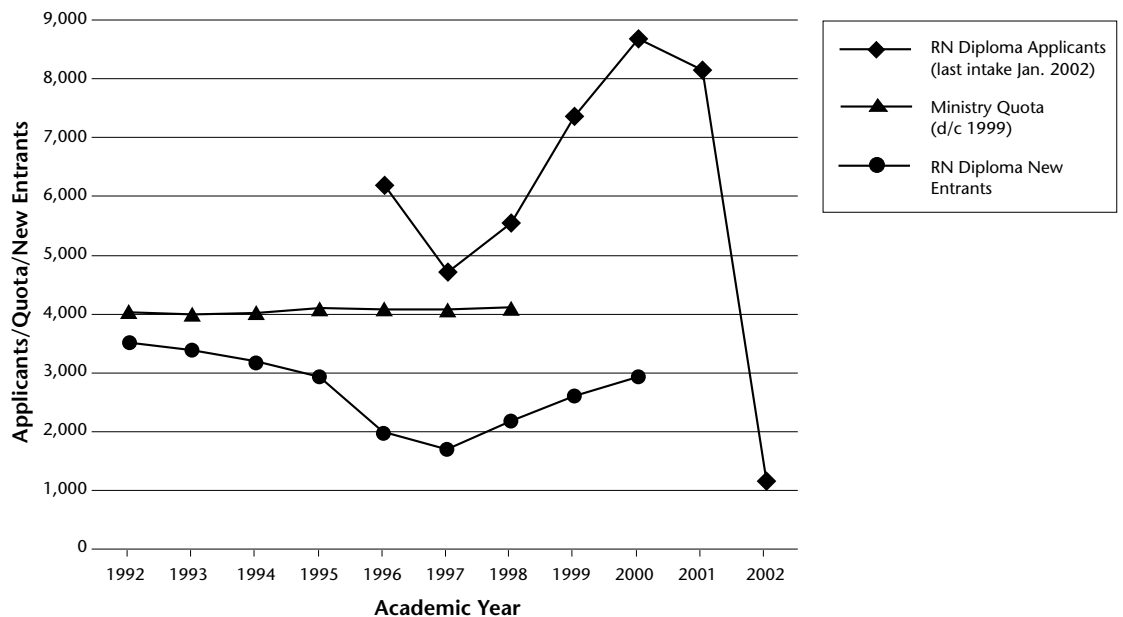
In 1992, there were 1.7 university applicants to nursing for every funded first year enrolment. The ratio plummeted to 1.2 in 1998 and peaked at 3.1 in 2001 with the onset of the collaborative degree intake applications. In 1997, first year enrolments to RN degree programs decreased to a low of 571 (Figure 1.19). By 2000, the number had increased 36.4% to 779. In 2001, a 154.4% increase in enrolment is shown for university and collaborative degrees combined; however, these data must be considered in light of the closure of RN diploma programs.

**Figure 1.19: RN Degree Full-Time Applicants and First Year Full and Part-Time Enrolments**



In 1996 and 2000, for every full-time new entrant to RN diploma programs, there were 3.1 and 3.0 applicants respectively. The ratio dipped to 2.5 in 1998. Between 1992 and 1998, the intake to diploma programs never surpassed ministry quotas which were discontinued in 1999. Between 1992 and 1997, the number of new entrants declined by 52% from a high of 3,526 to a low of 1,703. In 2000, the number rose again to 2,943 (Figure 1.20). The decrease in RN diploma applicants should be considered in view of the collaborative degree applicants through both the Ontario Universities' Application Centre and the Ontario College Application Services as presented in Figures 1.18 and 1.19. When new entrant data for 2001 onwards become available, the impact of entry to practice legislation on collaborative degree programs can then be assessed.

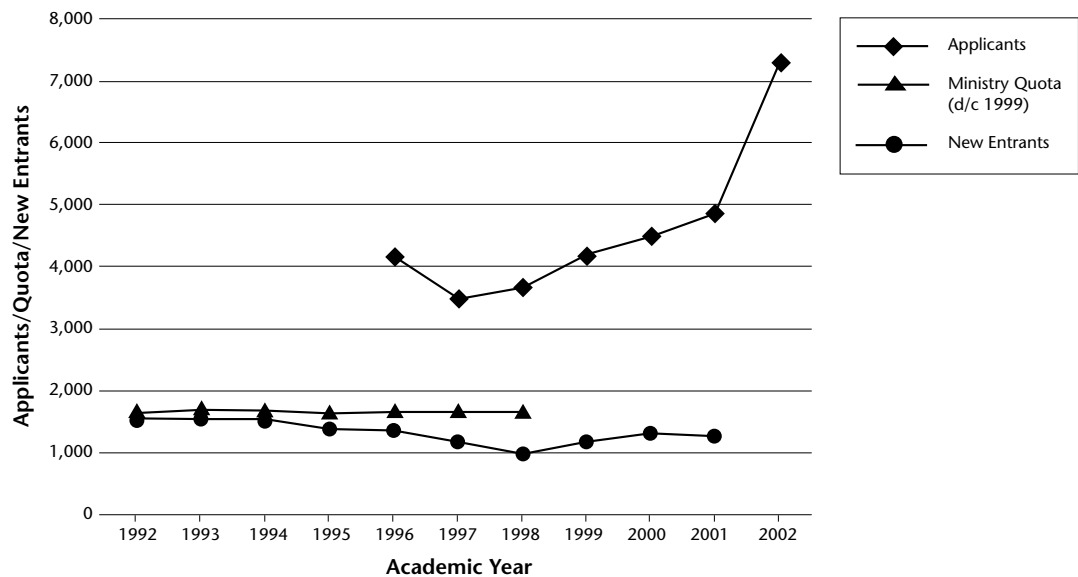
**Figure 1.20: RN Diploma Full and Part-Time Applicants, Quota, and Full-Time New Entrants**



## RPNs

The ratio of applicants to new entrants in RPN programs climbed steadily from a low of 3.0 in 1997 to 3.9 in 2001. Prior to 1999, the intake to RPN programs never surpassed ministry quotas which were subsequently discontinued. Between 1993 and 1998, the number of new RPN entrants declined by 37% from a high of 1,537 to a low of 968. Since then, the number of new RPN entrants has returned steadily to almost 1996 levels.

*Figure 1.21: RPN Full and Part-Time Applicants, Quota, and Full-Time New Entrants*

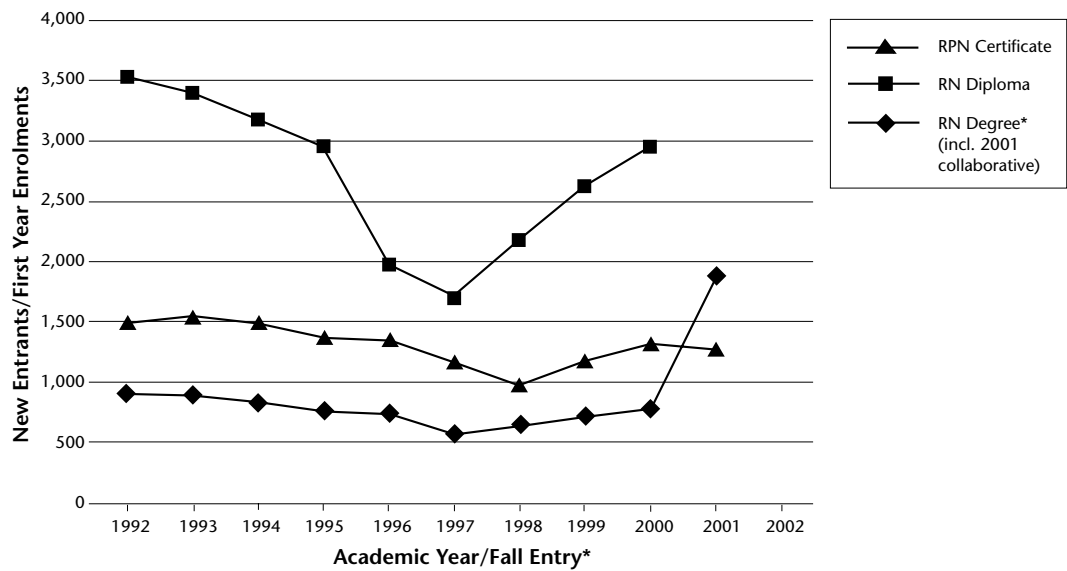


## Factors Affecting Enrolments

Figure 1.22 illustrates the trend in new and first year enrolments in all nursing programs between 1992 and 2001 (excludes part-time college data). The consistent downward trend in the mid-1990s was the result of health care system restructuring, which led to layoffs, hiring and salary freezes, job sharing, shortened work weeks, and other downsizing strategies (Baumann et al., 1996). Consequently, interest in nursing as a career waned. Recent increases in nursing enrolments may reflect the impact of government funding for 12,000 new permanent front line nursing positions, which may have improved the status of nursing as a profession (Joint Provincial Nursing Committee, 2001). The impact of the double cohort of Ontario high school students entering the post-secondary education system in 2003/04 and 2004/05 remains to be seen.

Several other factors also affect the number of students who enter nursing programs, including potential difficulties with infrastructure, capital, and faculty, as well as the fact that nursing may not be the first choice for all applicants.

**Figure 1.22: New and First Year Enrolments to All Ontario Nursing Programs**



### Impact of Quotas

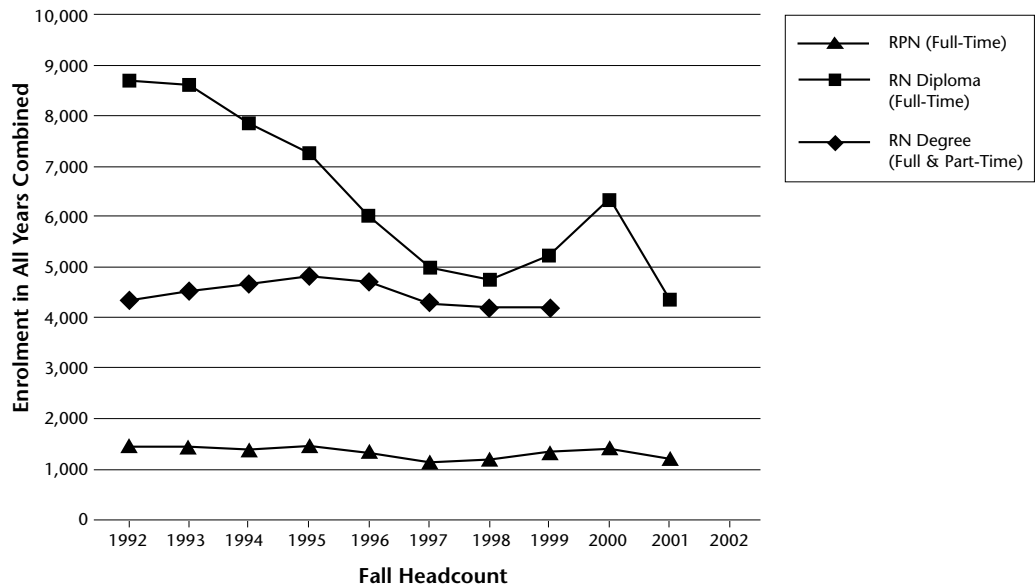
Traditionally, the Colleges Branch of the Ministry of Training, Colleges, and Universities established limits or quotas on the funding of new entrants to nursing programs. Between 1992 and 1998, the number of new entrants to both RN diploma and RPN certificate programs were below quota. In 1999, ministry quotas were discontinued, which theoretically allows unlimited student intake. However, educational institutions require infrastructure support, human and physical resources, and adequate clinical placements to operate programs and increase seats.

### Enrolment Trends

Figure 1.23 illustrates the fall headcount of students in all years of nursing programs (excluding part-time college students). Total enrolment trends are similar to those for new entrants. Total enrolment in RN degree programs increased 10.8% between 1992 and 1995, subsequently dropping to 13.4% by 1998. Between 1992 and 1998, total enrolment in RN diploma programs declined by 46.1%. In 1997, RPN total enrolment bottomed at 1,128. As of 2001, total enrolment has yet to recover to the high levels in 1992 (1,469).



Figure 1.23: Total Enrolment in All Years of Ontario Nursing Programs

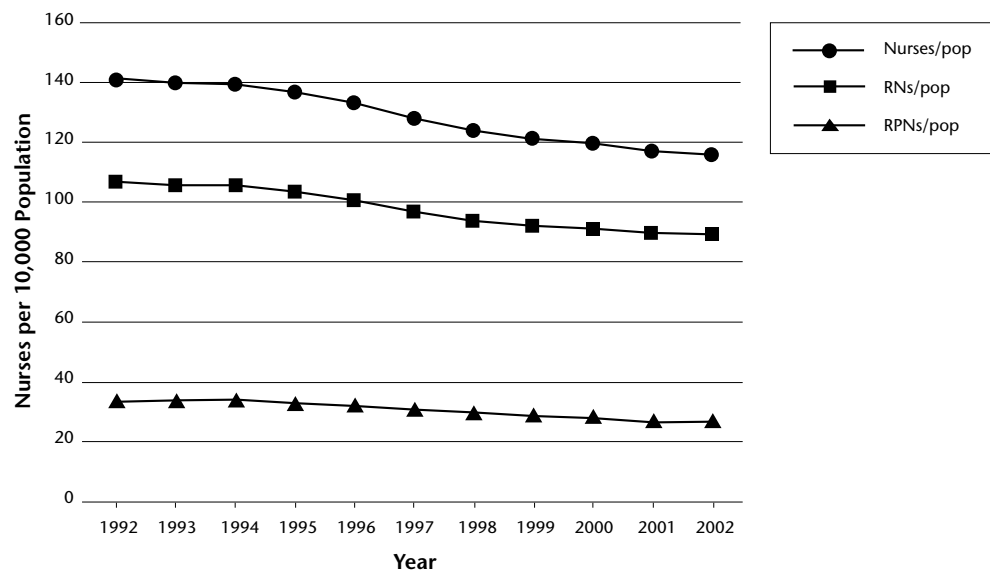


## 8. Nurse to Population Ratios

While nursing supply numbers alone provide a picture of available resources, it is difficult to understand the relevance of the declining numbers of nurses without relating supply to potential demand by assessing the supply of nurses in relation to the population.

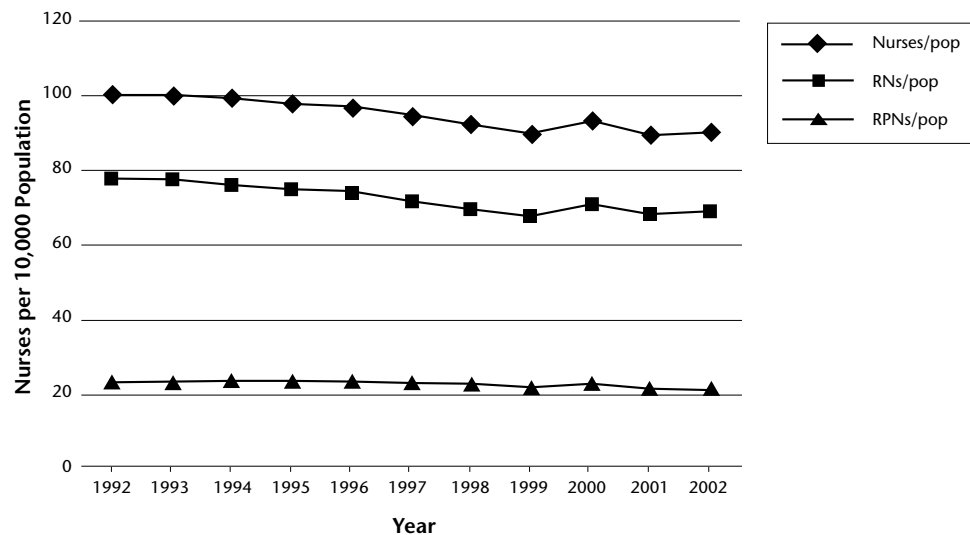
Over the past 10 years, the ratio of nurses per 10,000 population in Ontario has declined (Figure 1.24).

Figure 1.24: Nurse Population Ratios for all CNO registrants



The decline in total registered nursing personnel per 10,000 population is due to the combined effect of a growing population and a decreasing supply of both RNs and RPNs. Given the change in the potential supply of RNs and RPNs (discussed earlier), one might expect a more pronounced decline in RPNs to population ratio. However, when one examines the ratio of employed nursing personnel to population, it is clear that the supply of RNs actually providing services to the population has declined far more rapidly than the supply of RPNs (Figure 1.25). Given the significant number of nurses working part-time and casual positions, a nurse to population ratio based on the number of nurses (rather than full-time equivalents) may overstate the amount of nursing service available to the population. If the data were expressed as a ratio of full-time equivalent (FTE) RNs and RPNs to the population, the effects would be even more pronounced. Looking to the future, it is difficult to predict the impact of the growing population on the demand for nurses without knowing the health care needs of different subgroups within the population.

**Figure 1.25: Nurse Population Ratios for Nurses Working in Ontario**



## 9. A Comparison with the Rest of Canada

### Data Source for Ontario/Canada Comparisons

Each year, the Canadian Institute for Health Information (CIHI) collects data on the supply and distribution of registered nurses in each province and territory in Canada. CIHI holds the central database for nursing data in Canada and receives information from all nursing registration associations across the country.

Like the CNO data, the data in the CIHI Registered Nurses Database (RNDB) is self-reported and not verified. The content of the database is currently under review to identify the information needs of the profession and the health care system as it relates to nursing. Despite its limitations, this national database provides the opportunity to make comparisons between provinces as well as between a province and Canada as a whole.

Ontario data presented in this section comes from CIHI RNDB. It differs from year-end CNO data for several reasons: (a) CIHI data is collected at the six-month mark of the twelve-month registration year, (b) CIHI data undergoes additional editing and processing when received from the provincial/territorial regulatory authority; and (c) CIHI identifies and removes “secondary registrations” that do not reflect the primary jurisdiction of practice.

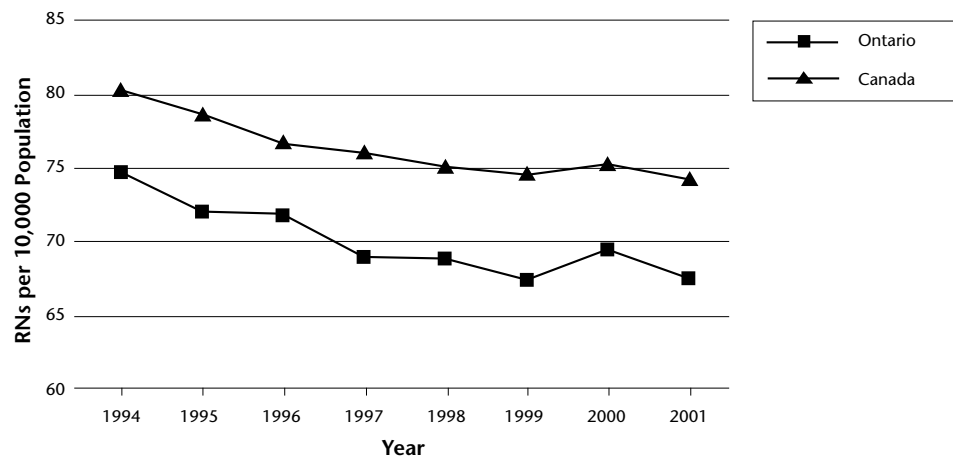
As part of the Roadmap Initiative, CIHI is currently working with each province and territory to develop a national database for Licensed Practical Nurses (LPNs) and Registered Psychiatric Nurses (RPNs) (CIHI, n.d.). Release of the first LPN/RPN database is planned for October 2003. This database will be standardized to be comparable to the RNDB.

How does Ontario's nurse supply compare with the rest of Canada? A comparison may identify successful strategies implemented in other provinces that could help Ontario determine the best course of action to increase nurse supply.

## Nurse to Population Ratios

Historically, Ontario has always had the greatest supply of nurses in Canada. In 2001, there were 94,487 RNs in Ontario, 80,590 (85%) of whom were employed in nursing (CIHI, 2002a). Although Ontario has the largest number of nurses, in 2001 it ranked second last (below the Canadian average) in nurse to population ratio with 67.6 RNs per 10,000 population. Between 1994 and 1999, Ontario's nurse to population ratio decreased from 74.7 to 67.5. In 2000, it increased slightly to 69.5, but dropped again to 67.6 in 2001 (Figure 1.26). Only British Columbia has a lower nurse to population ratio (66.7/10,000). Recent 2002 statistics from CIHI indicate the Ontario nurse to population ratio has dropped to the lowest in Canada (65/10,000) (CIHI, 2003).

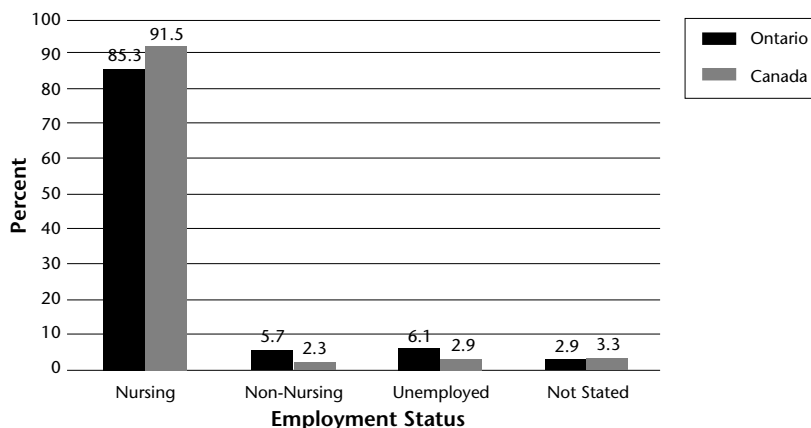
Figure 1.26: RNs Employed in Nursing



## Nurses Working in Nursing

Ontario has a higher rate of unemployed nurses and a higher number of nurses working in non-nursing jobs than the country as a whole. In 2001, 6.1% of RNs in Ontario were unemployed compared to 2.9% in all of Canada. In the same year, 5.7% of Ontario RNs were employed in sectors other than nursing compared to 2.3% in the rest of Canada. That means Ontario has a lower percentage of RNs working in nursing (Figure 1.27). This trend continued into 2002.

**Figure 1.27: Employment Status of RNs in 2001**



### Employment Sector

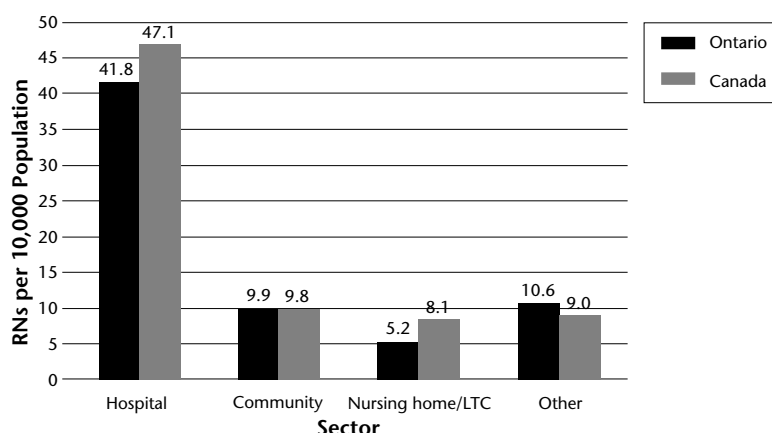
The distribution of nurses across health sectors varies from province to province. The variation reflects differences in population health needs as well as in provincial policies. In recent years most provinces have taken steps to reorganize their health care systems but in different ways and at different times.

As of 2001, Ontario had fewer RNs per 10,000 population working in the nursing home/long-term care sector (5.2) and hospital sector (41.8) than the Canadian average (8.1 and 47.1 respectively). In fact, Ontario ranked third lowest for the ratio of RNs working in the hospital sector (after the Yukon Territory and Nunavut) and third lowest in the nursing home/long-term care sector (after the Northwest Territories and Nunavut). In 2002 the trend in LTC continued. However, Ontario has the fifth lowest percentage of nurses working in the hospital sector (after Nunavut, NWT, Yukon, and Saskatchewan).

Ontario had more RNs per 10,000 population working in ‘other’ sectors (10.6) than the national average (9.0), and about the same ratio of RNs working in the community (9.9 in Ontario vs. 9.8 in Canada) (Figure 1.28).

The number of RNs per 10,000 population employed in all sectors has declined in most provinces since 1995. This is most likely due to the decrease in the number of RNs overall and an increase in the population.

**Figure 1.28: Sector of Employment for RNs in 2001**

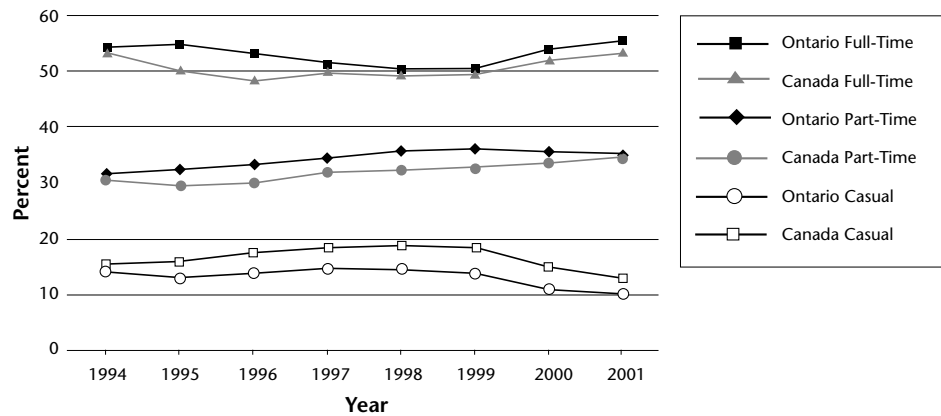


Note: “other” includes business/industry, private nursing, self-employed, physician’s office/family practice, educational institution, association/government, and other.

## Employment Status

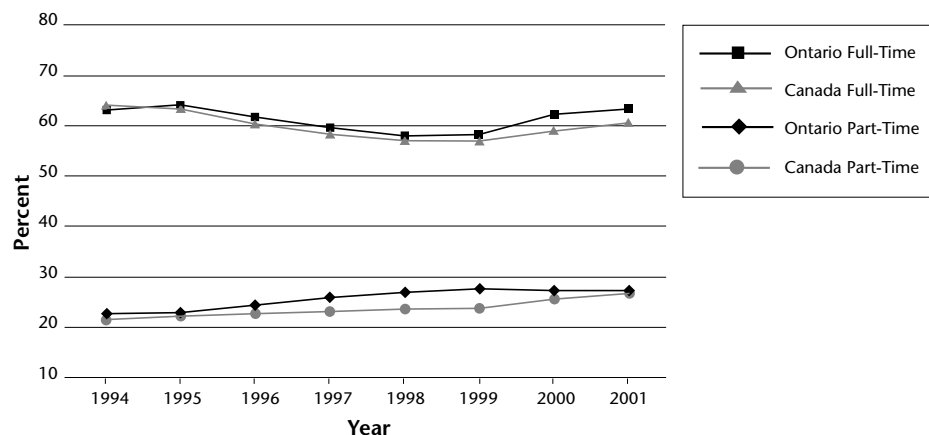
In 2001, 55.2% of Ontario RNs employed in nursing worked full-time, 34.9% worked part-time, and 9.9% worked on a casual basis (Figure 1.29) compared to 53.2% full-time, 34% part-time, and 12.8% casual for Canada as a whole. Full-time employment for Ontario RNs decreased 9% from 1995 to 1998 before increasing 12.7% from 1998 to 2001. The number of Canadian RNs working full-time decreased 11.6% from 1994 to 1996 and increased 9.8% from 1998 to 2001. Ontario RNs working part-time increased 9.3% from 1994 to 1999 and has stayed at roughly this level from 1999 to 2001, while the proportion of nurses working part-time across Canada has been increasing slightly since 1996. The number of RNs in Ontario working on a casual basis reached a high of 14.5% in 1997 and subsequently dropped to 9.9% in 2001. The pattern is similar for Canada, with a high of 18.6% in 1998 and a subsequent drop to 12.8% in 2001. In 2002, 56.9% of Ontario nurses were employed on a full-time basis.

**Figure 1.29: RNs Employed in Nursing by Employment Status**



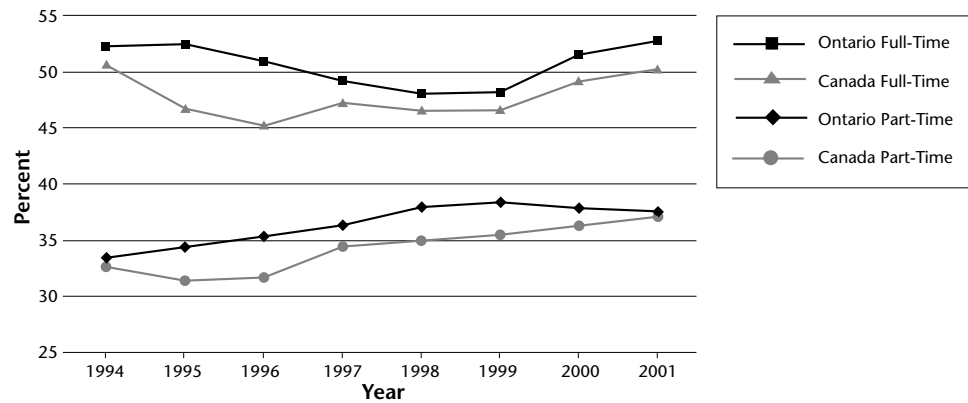
Between 1994 and 2001, there was an increase in part-time positions for nurses with Bachelors degrees across Canada (Figure 1.30). Between 1999 and 2001, there was also an increase in full-time positions for baccalaureate prepared nurses in Canada as a whole. The rate of increase in full-time positions was higher for Canada, and the rate of increase in part-time positions was higher in Ontario.

**Figure 1.30: Employment Status of Baccalaureate Prepared RNs**



In Ontario and Canada, diploma prepared RNs are more likely than degree prepared RNs to work part-time. Diploma prepared RNs in Canada as a whole experienced a 7.1% decrease in part-time employment from 1994 to 1996 and a 9% increase from 1996 to 2001 (Figure 1.31), and the proportion of Canada-wide diploma prepared RNs working full-time decreased 14.7% between 1994 and 1996 and increased 5% between 1998 and 2001. The increase in full-time positions was greater in Ontario than for Canada as a whole.

**Figure 1.31: Employment Status of Diploma Prepared RNs**

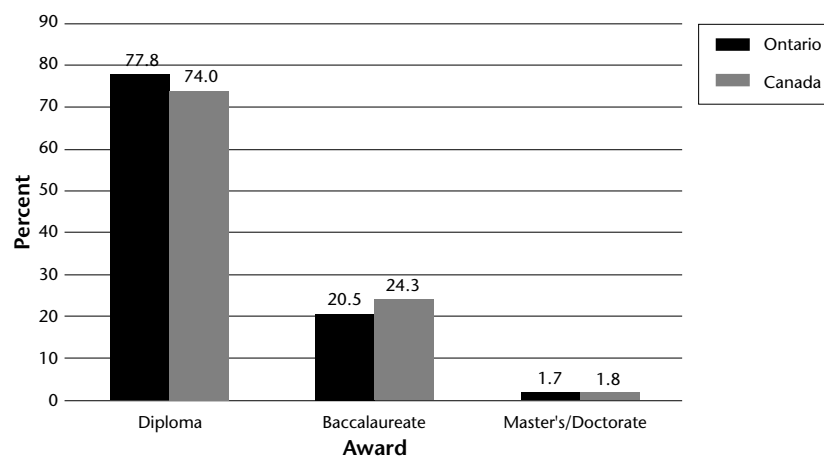


## Education

In 2001, compared to all other provinces and territories, Ontario ranked second highest (77.8%) in Canada in the proportion of RNs who are diploma prepared (down from 81.8% in 1997) (Figure 1.32), and last (20.5%) in the proportion of baccalaureate prepared RNs employed in nursing. Ontario ranks ninth in the proportion of nurses (1.7%) who are Masters/Doctorate prepared.

These trends reflect the early adoption of the BScN as entry to practice for nursing in other provinces. They also highlight the potential need for additional post-RN programs in Ontario.

**Figure 1.32: Highest Level of Education of RNs in 2001**



## Migration Patterns

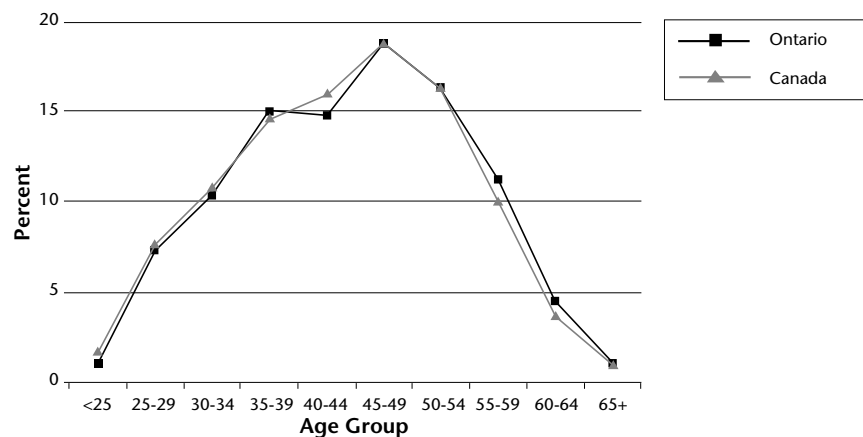
For a number of reasons (e.g., job availability, better income/benefits, personal reasons), nurses educated in one province may choose to practice in another province or territory (CIHI, 2002a). Information about the extent and nature of interprovincial migration may be useful in planning recruitment and retention programs. However, because registration numbers can be duplicated across provinces, it is not possible at the current time to track interprovincial migration of Canada's nurses (CIHI, 2002a). Comparing "place of graduation" with "province of registration" may provide some measure of migration patterns, but it does not account for nurses who go "away" to school and return "home" after graduation.

In 2001, 89.2% of RNs who graduated in Ontario were employed in nursing in Ontario while 10.4% of the workforce graduated from schools outside Canada (the remaining 0.4% did not state place of graduation). In the same year, Canadian RN graduates made up 92.3% of Canada's RN workforce.

## The Age of the Nursing Workforce

The age distribution of RNs in Ontario is similar to the rest of Canada (Figure 1.33). The majority of RNs in Ontario and Canada are in the 45-49 age cohort. RNs under 40 years of age make up 34% of the Ontario RN workforce and 35% of the Canadian RN workforce. Ontario has a higher percentage of RNs (17%) who are over age 55 than Canada as a whole (14%) and therefore may lose a higher percentage of its workforce to retirement over the next few years compared to other provinces. The 2003 CIHI report suggests that P.E.I., Ontario, and British Columbia have a much higher supply of senior nurses in their workforce.

*Figure 1.33: RNs in 2001 by Age Group*



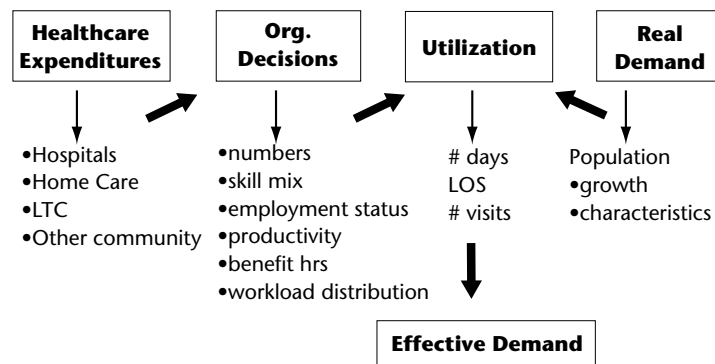
# 2 Demand for Nursing Services

Ideally the demand for nurses should be based on the Ontario population's need for nursing services. A process for measuring Ontario's need for nursing service is now being piloted (Tomblin Murphy, O'Brien-Pallas, Birch, Pringle, et al., 2003), but until it is ready, researchers must use other proxy measures (usually utilization factors) to measure the demand for nursing (Figure 2.1), including:

- the distribution of health care funds across health sectors and within health care organizations to different health professions and service providers
- the proportion of overall funds available for health care that is used to "purchase" nursing services
- how funds used for nursing are spent (e.g., the type and number of nurses hired, their employment status, how they spend their time).

The measures used in this report to assess the demand for nursing services were selected based on a careful review of the literature. Although they tell us how nurses and nursing services are being used, they do not necessarily reflect the real need for nursing care.

**Figure 2.1: Utilization and Demand Factors**



The real demand for nurses is a function of population characteristics and health behaviours, as well as the way health services are delivered. However, the demand for nurses can also be affected by how health care organizations utilize existing nurses, other health care providers, and other staff.

This chapter will describe the data that are currently available on health care expenditures, demographics, and health service activity, and the trends in these data over time. Although the methodology for translating these data into nursing requirements is still in the research stage, this chapter also includes some utilization-based estimates.

## 1. Health Care Funding/Spending

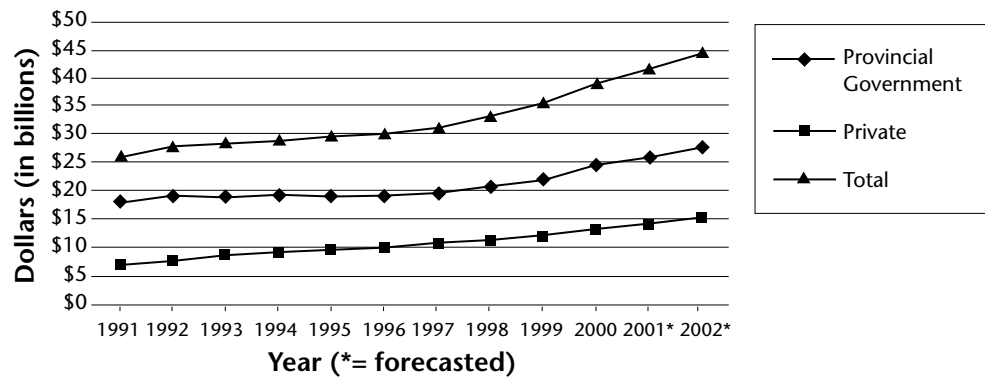
One measure of health utilization is actual public and private expenditures on health care services. These expenditures reflect the public's willingness to fund health care. Some might argue that expenditures on nursing services reflect the need for that type of care in that, if the public needed more nursing, they would spend more money on nursing. However, as the nursing shortage grows, the system may not be able to find an adequate number of nurses to fill budgeted positions, and expenditures can be a measure of the current level of utilization, but not necessarily demand.



## Health Expenditures in Ontario

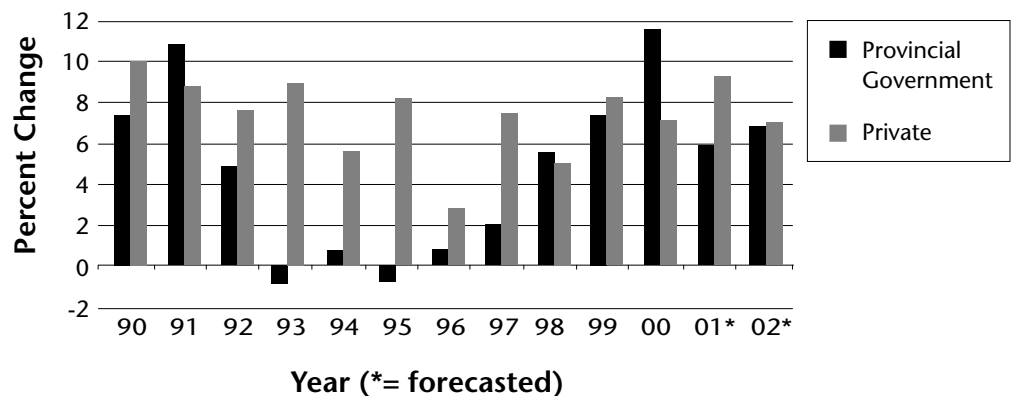
Between 1991 and 2002, Ontario's spending on health continued to rise. The increase was particularly marked over the latter four to six years (CIHI, 2000b). The growth in health expenditures is largely due to increases in public or government spending (Figure 2.2). The provincial government's investment in health care rose from \$18 billion in 1991 to a projected \$27 billion in 2002. During this same period, private health expenditures (including privately insured health spending on services such as dental care and pharmaceuticals) increased by over \$7.8 billion.

Figure 2.2: Provincial Government and Private Health Expenditures in Ontario



While health expenditures have increased overall, the percentage change in both public and private health spending varied from year to year (Figure 2.3). The variation is particularly marked in public spending. The erratic, year-by-year change in investment in health services (Figure 2.3) makes it very difficult for hospitals and other health care providers to plan for service volumes or the staffing required to provide services. These problems are exacerbated by the fact that hospital budgets are often not announced until after the year has started. The inability of health care organizations to predict or plan for certain service volumes also makes it difficult for academic facilities to determine the number of nursing programs required and the number of applicants to accept to meet future staffing needs. A more consistent, multi-year approach to funding would alleviate some of these problems. It is good news that work on this issue has been initiated by the Ministry of Health and Long-Term Care and is addressed in the 2003 provincial budget.

Figure 2.3: Percentage Change in Provincial Government and Private Health Expenditures in Ontario



From 1992 to 1997, there was a 4.8% decrease in public sector per capita spending. In 2001 and 2002, public sector per capita spending is projected to increase by 4.1% and 5.3% resulting in an

overall increase of 27% in spending since 1992. Within this time frame, private sector per capita spending has increased 71.1% or approximately 7% per year. This would suggest that demand has not peaked. It may also suggest that public sector funding is not currently meeting health care expectations. That issue cannot be addressed with these data. However, if the proportion of the growing demand evident in private sector spending represents real need, it is possible that requirements for health services are not being met.

### **The Implications of Increases in Private Health Expenditures**

The steady increase in private health expenditures appears to indicate a shift to the private delivery of some health care services (e.g., medications), which may have significant implications for the population and the health care system. Those with third party coverage, the preferred method for private pay services, may consume more services than they need (because the cost is covered), and may not modify excessive health consumption behaviours. On the other hand, people who cannot afford third party coverage (e.g., people who are self-employed, retired, or living on a low income) may not access services or supplies they need because of personal financial constraints. However, the degree to which health expenditures represent change in the health care system can only be determined by examining utilization data.

### **Investment in Nursing Services**

Data on expenditures on nursing services are available only from the hospital sector, and are captured in hospital fiscal year-end submissions to the MOHLTC. Amounts are reported by nursing unit in earned hours, which are the sum of worked hours (i.e., hours when the nurse is at work and available for service) and benefit hours (i.e., hours when the nurse is paid but not available for service, such as vacation time, sick time, education/training sessions). Prior to implementation of the national MIS Guidelines in 1994, earned hours were referred to as paid hours.

Although worked hours would provide a better measure of the actual hours of care available than earned hours, data on worked hours are only available for recent years and only for hospitals. This analysis is presented in paid hours because these are the only data available across all years. The nursing paid hours presented here include both management/support staff and unit-producing personnel (UPP). In hospital units where nursing care occurs, "UPP" refers to all hospital personnel who have direct patient-care duties (i.e., primarily RNs, RPNs, and Unregulated Care Providers). This information is useful for system planning and for organizational staffing and budgeting.

### **Implications of Benefit Hours**

The proportion of benefit hours attributable to each category (e.g., vacation, sick time) can be highly variable. Although the number of benefit hours for vacation and statutory holidays will only vary slightly across hospitals of similar size, the number of benefit hours for orientation, educational training programs and sick time can vary considerably over time and across hospitals.

Variations in expenditures related to sick time and training may be due to a number of factors, which affect the demand for nurses. For example, worklife conditions, staffing schedules, and work overload may contribute to the physical and mental health of nurses, which can have an impact on absenteeism (Baumann et al., 2001; O'Brien-Pallas et al., 2001; Shamian et al., 2001). When nurses are sick, they are not available for service and therefore the overall demand for nurses increases. These same factors may contribute to levels of nurse satisfaction, which are related to turnover and the need for orientation (Thomson et al., 2002).

Unfortunately, there is no way to tease apart the various components of benefit hours in the provincial hospital database. Effective April 2002, health service organizations are required to report sick hours and orientation to the MOHLTC. This information will greatly assist in understanding how financial resources are used for human resources.

## Paid Hours per Patient Day

### By Hospital Type

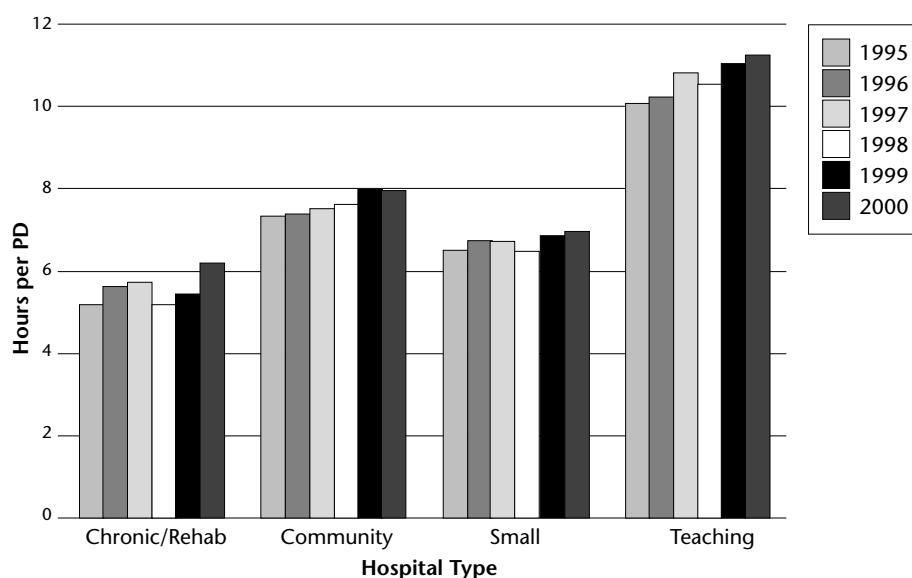
The average number of paid hours per patient day varies by hospital type (Table 2.1). Some of this variation can be explained by the different services provided by different types of hospitals. Some may also be explained by the acuity of the patients in a given setting or by variations in decisions to transfer patients between settings depending on the availability of alternate services or the preferences of the provider.

**Table 2.1: Paid Hours per Patient Day 2000/01 by Hospital Type**

	chronic/rehab	community	small	teaching
Mean	6.22	8.00	7.01	11.30
SD	1.91	1.30	1.90	2.02
N	19	73	52	10

The average number of paid hours per patient day in all types of hospitals has increased over time (Figure 2.4). This pattern seems to be primarily due to a steady decrease in the denominator (i.e., patient days) rather than increases in the numerator (i.e., annual number of paid nursing hours).

**Figure 2.4: Trends in Paid Hours per Patient Day**



### By Clinical Service

Different types of care require very different levels of nursing resources. Because the mix of services and patient characteristics vary within each facility, an overall number of paid hours per patient day is not a useful indicator. However, breaking down the overall number of paid hours by functional centre can yield measures that hospitals can use to examine differences in nursing demand within the hospital and across hospitals over time. Table 2.2 lists the average paid hours per patient day by clinical service in the different types of hospitals.

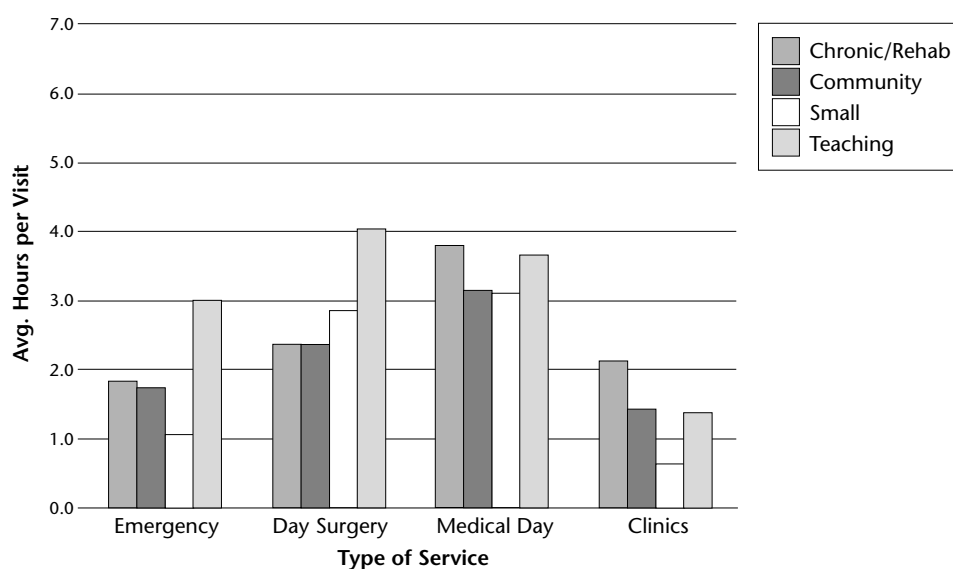
**Table 2.2: Paid Hours per Patient Day 2000/01 by Clinical Group**

Hospital type		Med/Surg	ICU	Mat/Child	Psych	Rehab	Chronic	LTC	Cardiac Monitoring
Chronic/Rehab (n=20)	Mean	6.8	n/a	n/a	6.1	6.0	5.5	5.3	n/a
	SD	1.9	n/a	n/a	1.6	2.2	0.9	--	n/a
	N	5	n/a	n/a	3	13	16	1	n/a
Community (n=74)	Mean	6.1	19.4	10.3	6.6	6.4	5.5	4.0	9.3
	SD	0.9	4.1	2.1	1.5	2.3	1.2	0.6	4.3
	N	71	69	61	38	32	55	8	9
Small (n=52)	Mean	7.0	13.6	9.3	6.6	7.6	5.2	4.0	n/a
	SD	1.8	4.8	5.9	--	--	1.6	1.8	n/a
	N	51	11	21	1	1	36	14	n/a
Teaching (n=10)	Mean	8.1	27.4	11.0	7.2	7.3	5.3	4.5	6.4
	SD	0.9	5.0	1.3	1.9	1.8	0.3	--	1.7
	N	10	10	9	8	4	3	1	3

### Paid Hours per Outpatient Visit

The volume and type of outpatient activity can also affect the need for nursing resources (Figure 2.5). For example, teaching hospitals tend to have more complex day surgery activity than other hospitals. Settings that provide dialysis and chemotherapy services require more resources for medical day care. Service volumes also influence efficiency. The acuity of emergency patients will depend on the role that an organization plays in the overall system of health care (referral patterns) and the volume of booked clinic activity that routinely occurs in the emergency area (small hospitals). On the other hand, according to the data, medical day activity is quite high in chronic and rehabilitation hospitals. It is not clear whether this is due to the type of service or to a data quality problem (i.e., according to national standards, physiotherapy, occupational therapy, and recreational therapy are not to be reported in these functional centres).

**Figure 2.5: Paid Hours per Outpatient Visit for 2000/2001**



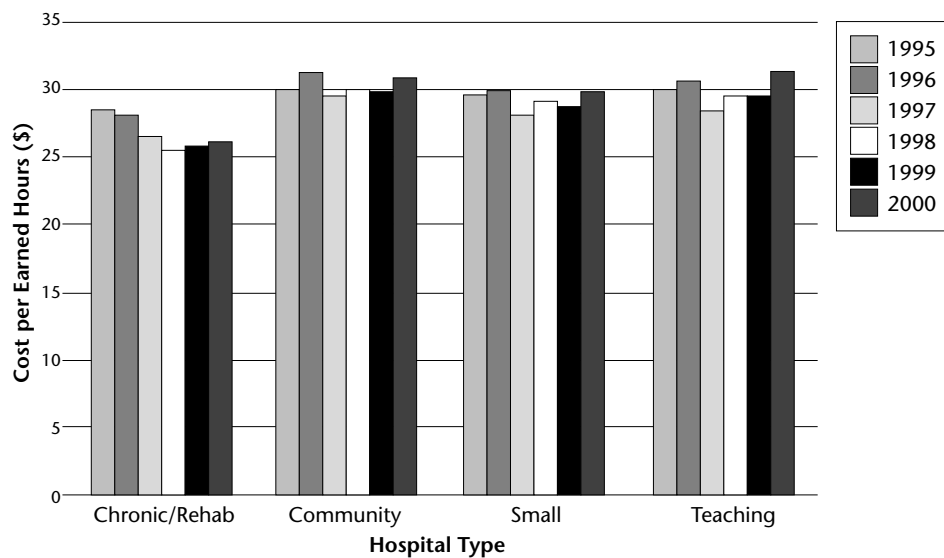
## Cost per Earned Hour

Performance is often judged based on cost per input or per earned hour. This cost reflects organizational decisions about structure and manpower. For example, a high cost per earned hours may be due to: a higher skill mix in the setting, higher rates of overtime, or a high ratio of management and support staff to direct care staff. In this context, higher costs per earned hour are not necessarily undesirable. Many studies suggest that higher numbers of managers and support staff, as well as a richer mix of nursing skills, may contribute to more efficient use of nursing resources.

Ideally, performance should be measured not solely by cost per input, but by service output combined with cost, quality of care, and patient satisfaction. Unfortunately, it is very difficult to obtain the requisite data to calculate these more sophisticated measures (O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001; Pierce, 1997; Mallach and Porter-O'Grady, 1999). In the absence of more complex indicators, this report presents the cost per input measure, while encouraging readers to bear in mind its limitations.

In 1996, the average cost per earned hour increased modestly for all hospital types except for chronic/rehab. It decreased in 1997, and then started to rise again beginning in 1998 (in 1999 for chronic/rehab) (Figure 2.6). With these increases, most hospitals – with the exception of chronic and rehabilitation hospitals – have almost returned to 1995 cost per earned hour levels. Some of the recent increase may be due to extensive overtime, new union agreements, increased use of agency staff, and reversals in the use of unregulated workers or turnover costs (e.g., termination packages, vacation banks) rather than to any change in staff wages or staffing ratios.

**Figure 2.6: Trends in Nursing Average Cost per Earned Hour by Hospital Type**



## 2. Demographic Trends

Information about demographic trends, including population growth/distribution and population characteristics, can help assess the real demand for nurses and nursing care.

### Population Growth

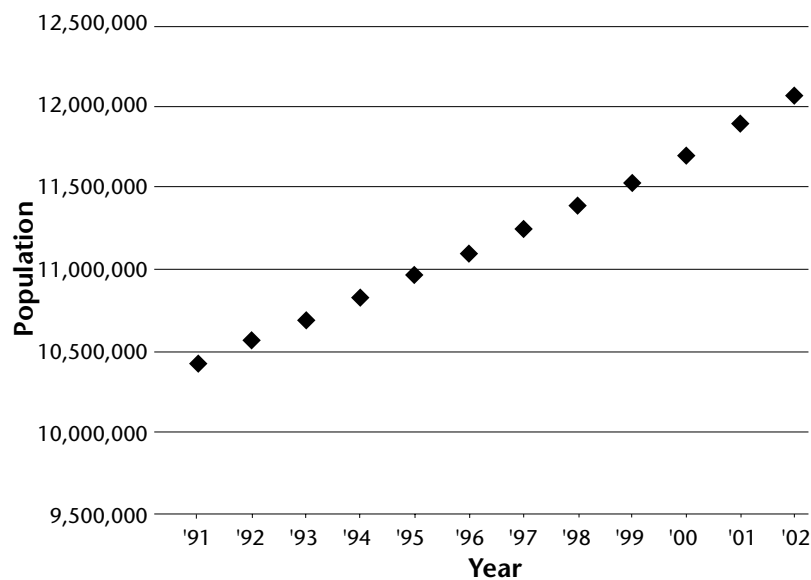
According to adjusted census data, the population of Ontario increased 15.7% between 1991 and 2002. Over that time, the population continued to grow at a steady average rate of 1.3% per year (Figure 2.7).

As the population grows, the need for nurses increases – although evidence suggests that the relationship between population size and demand for nurses is not linear. The total number of Ontario residents alone does not provide enough information to estimate health care or nursing demand.

### Factors Influencing Population Growth

Population growth is determined by birth and death rates, migration between provinces, and immigration/emigration patterns. All factors, in turn, are influenced by a variety of other factors, including economic climate.

Figure 2.7: Ontario Population Growth



### Population Characteristics

To assess the population's demand for nursing care, planners must examine the characteristics that influence the need for health services, such as age and the social, cultural, behavioural, and economic characteristics of populations that have a demonstrated relationship to health outcomes (i.e., the determinants of health).

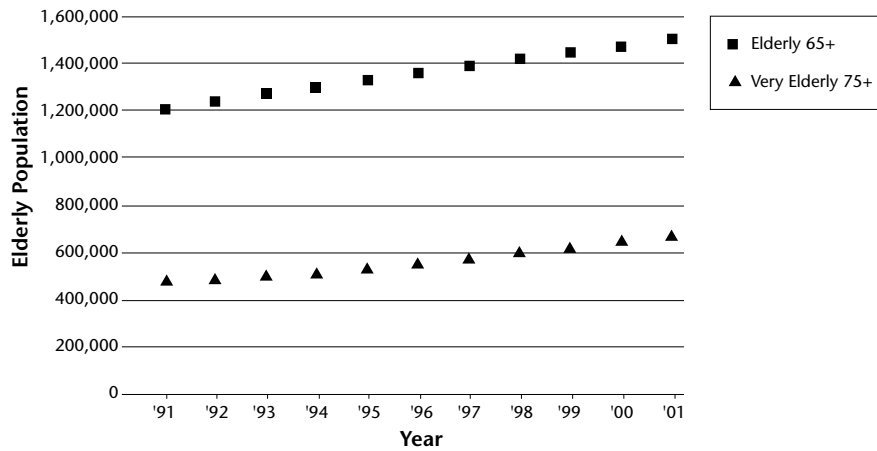
#### Age

Perhaps the greatest demographic concern for many policy makers is the increase in the elderly population. Between 1991 and 2002, the number of elderly (i.e., people > 65 years of age) and very elderly (people > 75 years of age) increased steadily (Figure 2.8).

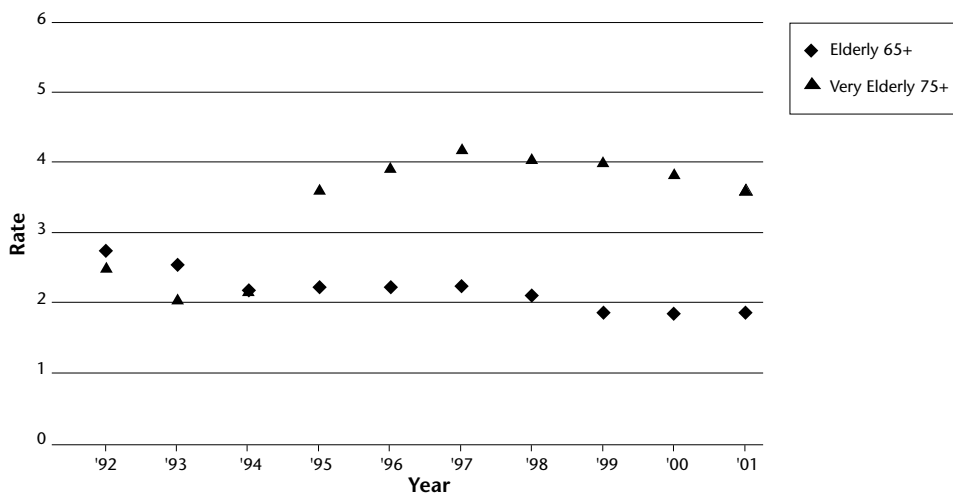
Although the rate of growth in the elderly population slowed somewhat between 1991 and 1995, it still exceeded that in the total population (10.1% for the elderly, 10.8% for the very elderly, and 5.2% for the total population). Between 1995 and 2002, the rate of growth in the elderly continued to

exceed the rate of growth for the total population: 14.6% for the elderly, 29.8% for the very elderly, and 10.1% for the total population (Figure 2.9).

**Figure 2.8: Number of Elderly**



**Figure 2.9: Annual Growth Rate in Elderly and Very Elderly**



As a result of these trends, the proportion of the total population classified as elderly or very elderly has increased considerably and continues to grow (although the rate of growth has slowed somewhat<sup>1</sup>).

In 2002, 12.6% of Ontario's population was elderly and 5.7% was very elderly, up from 11.6% and 4.6% in 1991. The rate of growth in the elderly population will increase rapidly as the baby boom generation increases. Within the next 10 to 15 years, baby boomers that are currently 37 to 55 years old will begin to enter the elderly category (Santos & Cox, 2000).

The age of the population, now and in the future, has serious implications for the health care system. Health expenditures per capita increase with age. In 1999, per capita health expenditures for people over age 85 (\$14,498) were almost twice as high as those for people who were 75 to 84 years old (\$7,532), and more than three times higher than for people 65 to 74 years old (\$4,357) (CIHI, 2000).

In 1999, health expenditures for females in Ontario over age 85 averaged \$15,040 per capita, compared to \$13,229 for males in the same age group. However, the opposite was true for the 65-74 and 75-84 year age groups. In those groups, per capita health expenditures were higher for males than females (\$4,712 for males and \$4,047 for females 65-74; \$7,942 for males and \$7,259 for females 75-84) (CIHI, 2000).

<sup>1</sup>A variety of factors affect the rate of growth, including the size of different age cohorts, the death rate, and the elderly population's preference of residential location (i.e., inside or outside of Ontario).

## Economic and Social Conditions

Family or household income is a well established correlate of health outcomes (Shah, Kahan, & Krauser, 1987; Stewart, 1990). People with low incomes make higher use of the health system in both Canada and United States (Cohen, 1994; Durkin, Davidson, Kuhn, O'Connor, & Barlow, 1994; Halfon & Newacheck, 1993; Shah, Kahan, & Krauser, 1987; Stewart, 1990). Any reduction in access to services also affects them more severely (Anderson, 1997). Lone parent families and persons living alone may also be more frequent users of the health system. People living alone may need more support following early discharge from hospital or outpatient procedures, and living alone is associated with poorer health outcomes following treatment (Browne et al., 1997; Tranmer, Gerlach, Beatty, & MacKenzie, 1995).

In 1996 (the year the most recent data were available), 17.7% of Ontario families were classed as low income. In terms of low income families, Ontario ranked second lowest in Canada (after Prince Edward Island) and Newfoundland ranked highest at 21.4% (CIHI, 2002b). Between 1981 and 1996, the proportion of Ontario households consisting of a single person remained relatively stable (21.8% in 1981, 22.6% in 1996). The proportion of people over the age of 65 who live alone in Ontario also remained stable (27.7% in 1991, 27.3% in 1996). The proportion of lone parent families increased from 12.6% in 1991 to 14.4% in 1996 (Statistics Canada, 1996). While the proportions of people living or parenting alone have remained relatively stable, with the growth of the population the absolute numbers have increased. This suggests a potential increased need for health care services in the home. As a result, there may be a need for growth in home care services to match the population growth rate.

## Clinical Conditions

In recent years, Canada as a whole and Ontario specifically have seen increased rates of certain clinical conditions, particularly chronic conditions, and an increase in lifestyle or behaviour related illnesses. These conditions shorten life span and increase hospitalization rates (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999). They also increase the demand for nursing services.

*For example:*

- Between 1990 and 1999, the number of Canadian seniors developing kidney failure increased 132%, and new cases of kidney failure across all age groups jumped 73% (to 142 per million people). Seniors accounted for just over half of the new cases of kidney failure (Canada News Wire, July 4, 2001).
- As of 2000/01, 16.6% of Ontarians aged 12 and over had been diagnosed with arthritis or rheumatism – up from 14.2% in 1994/95 (CIHI, 2002b).
- In 2000/01, 4.2% of the Ontario population had been diagnosed with diabetes, up from 3% in 1994/95; 8.5% with asthma (up from 7.4%); and 7% experienced symptoms of depression (up from 5.3%) (<http://secure.cihi.ca/indicators/en/hlthind.shtml>; CIHI, 2002b).
- Depression accounts for a large proportion of psychiatric hospitalizations and is linked to other health conditions, such as alcoholism and substance abuse (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999). In 1995/96, depression accounted for 7% of psychiatric separations, while drug and alcohol dependence accounted for 12% of psychiatric separations (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999).

Because some chronic conditions, such as arthritis/rheumatism, diabetes, and hypertension become more prevalent as people age (CIHI, 2002b), their prevalence will continue to rise, increasing the demand for health services. This trend will be particularly evident in Ontario where the prevalence of these chronic conditions (with the exception of depression) is above the Canadian average. Hypertension and diabetes are also risk factors for other health conditions such as heart disease and stroke, the leading cause of hospitalization (excluding child birth) for both men and women (Heart and Stroke Foundation of Canada, 1999).



## **Lifestyle/Behaviour Related Conditions**

Many behaviours have an effect on health care utilization because they are risk factors for disease. Rates of certain behaviours in the population may be an indication of current and future need for health services, including nursing care. For example:

- Although the incidence of smoking has decreased in the past four years, 20.1% of the Ontario population aged 12 and over still smoke (down from 22.4% in 1994/95). The lifetime health costs of smokers are 47% higher than non-smokers, despite their shorter life expectancy (Hodgson, 1992; Rice et al., 1986). Smokers are sicker and require more medical care than non-smokers (Morreale, 1998). Smoking is also a risk factor for heart disease and stroke.
- The prevalence of regular heavy drinking in Ontario has increased from 13.7% to 19.3% but is still slightly under the Canadian average. Drinking rates in Canada vary from a high of 40.5% in the Northwest Territories to a low of 18% in Quebec. Alcohol abuse can lead to acute and chronic health problems (Federal, Provincial and Territorial Advisory Committee on Population Health, 1999) which, in turn, can lead to increased health care utilization and expenditures.

## **Preventive Measures**

Data on the causes of hospitalization are useful for planning both the location and types of prevention programs required to prevent illness and reduce health care costs. Utilization of prevention programs can reduce some of the pressures on health care resources created by an aging population and other factors. However, preventive programs themselves require resources, and their use has also been increasing in recent years. For example, as of 2000/01:

- 53.5% of women in Ontario had a mammogram within the last two years. Ontario has the highest rate of mammography screening in Canada (Canadian average is 51.8%).
- 74.2% of women aged 18-69 have had a Pap Test within the last three years. The percentage of Ontario women having Pap Tests is up from 72.4% in 1994/95 (above Canadian average) (<http://secure.cihi.ca/indicators/en/hlthind.shtml>; CIHI, 2002b).

## **3. Health Service Activity**

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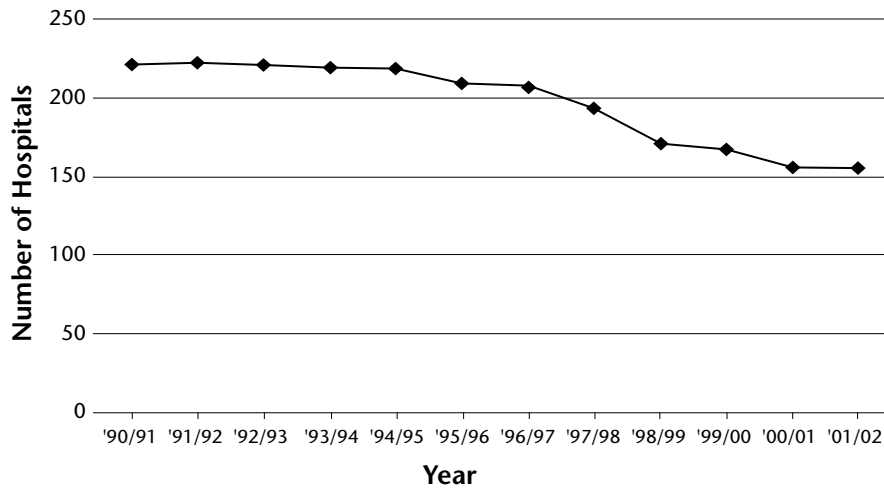
This section describes trends in health service activity in hospitals, home care, and long-term care facilities, and analyzes the impact of changes on the demand for health human resources. It includes data on trends in patient acuity and staffing trends in each sector. Case mix index – the patient acuity measure used in hospital – can be calculated and is routinely reported for hospital settings in Ontario. Measures of patient acuity are also available for complex continuing care and long-term care sectors, however the methods to assess patient acuity in non-hospital settings use a different metric and are, therefore, not directly comparable to the hospital case mix index. Staffing data, which are essential to understand the relationship between patients' needs and the number and mix of nurses required, are not yet accessible on a provincial scale for non-hospital settings, but will be available in the near future.

### **Hospital Trends**

#### **Number of Hospitals**

In the last decade, the number of public hospitals in the province has been reduced through amalgamation, closure, or re-designation (e.g., from acute to chronic, long-term care or ambulatory care) (Figure 2.10). These changes in the hospital sector are the result of different service delivery models, reduced length of stay (LOS), and active measures to reduce admissions.

**Figure 2.10: Trend in Number of Hospitals**



### Separations

Hospital separations (i.e., discharges and deaths) are routinely used to count the number of patients receiving service. Between 1990 and 2000, separations across all types of hospitals declined steadily. Although they increased slightly in 2001, the actual number of separations in 2001 was still 19.1% lower than in 1990. Figure 2.11 illustrates separation trends in acute hospitals and all hospitals in Ontario combined. Figure 2.12 illustrates separation trends in non-acute hospitals<sup>2</sup>.

#### Acute Separations

The drop in the number of acute separations might indicate less need for hospital care. However, it is more likely that this trend reflects efforts to reduce length of stay through earlier discharges to home care and non-acute care environments, the shift to day surgery, and reductions in the overall number of beds.

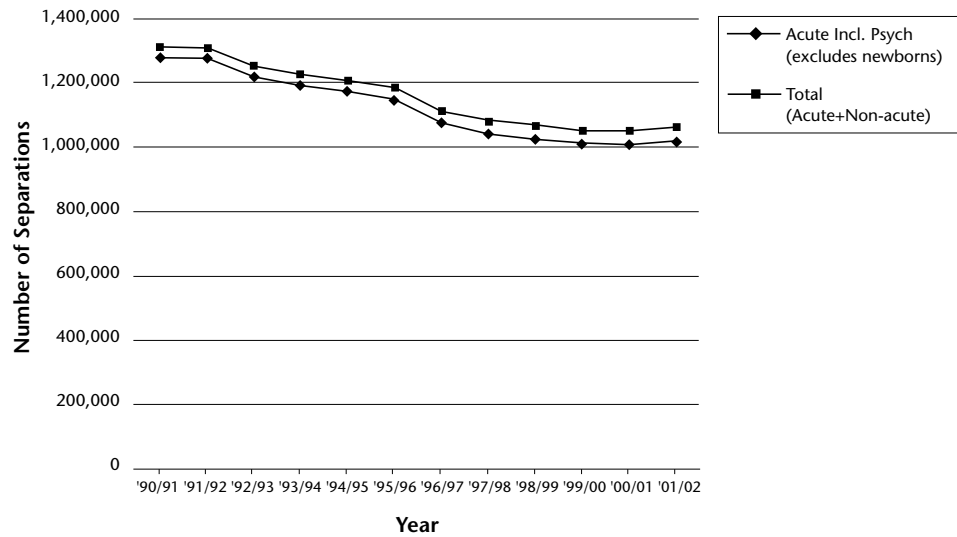
### The Implications of Readmissions

Because a patient who is discharged from hospital more than once during a calendar year will be counted each time, separation data minimally over-estimates the actual number of individuals utilizing hospital services. To assess the performance of a hospital, data on unplanned readmissions is also required (e.g., hospitals with frequent readmissions will actually increase their volume of service but the increase may be due to poor quality care).

Nurses can play a major role in reducing unplanned readmission through education about symptom management, pain control, and health behaviours that can facilitate healing, and reduce reoccurrence of disease and need for admission.

<sup>2</sup> Given the large discrepancy in numbers of separations for acute and non-acute hospitals, separate graphs had to be generated.

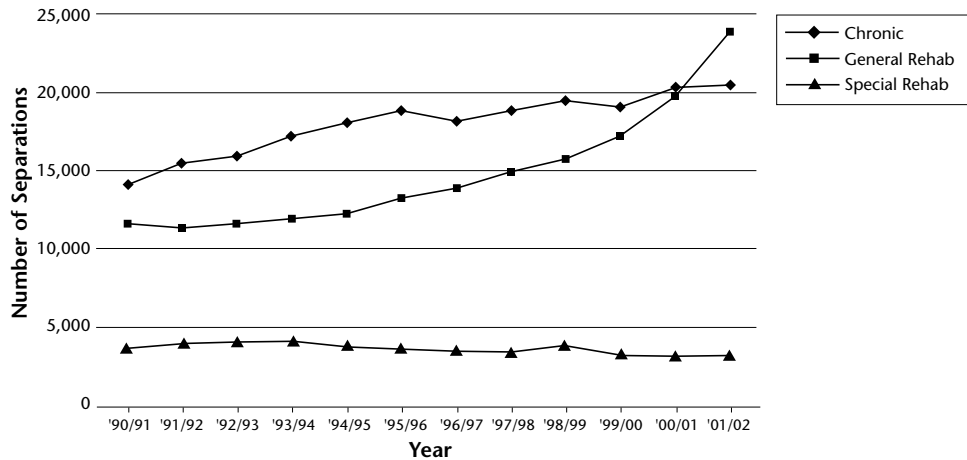
**Figure 2.11: Trends in Acute and Total Separations**



**Non-Acute Separations**

Over the past ten years, the number of rehabilitation and chronic separations has continued to increase. This trend may be due to a number of factors, including: greater need for these services, an increase in transfers from acute care hospitals, and services being provided for a shorter period of time (allowing more admissions to the same number of beds).

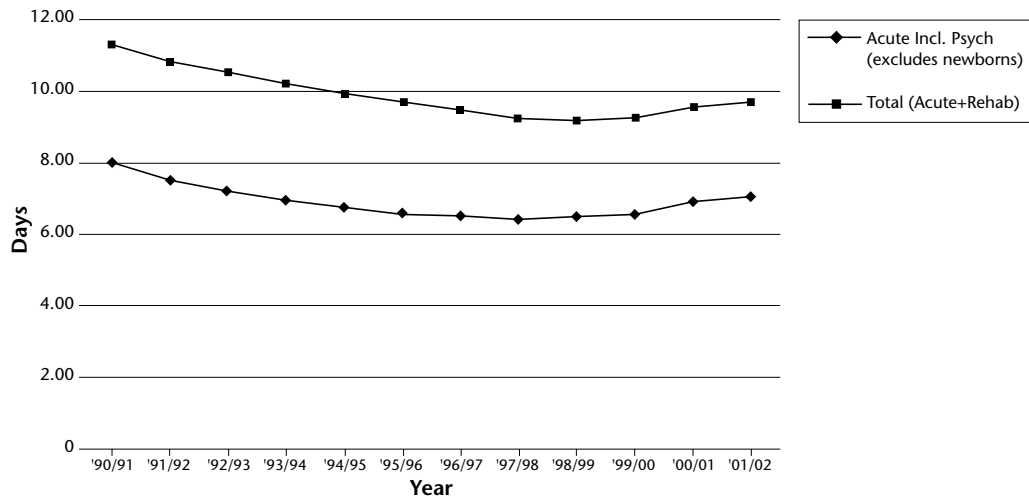
**Figure 2.12: Trends in Non-Acute Separations**



**Length of Stay**

Between 1992 and 1997, the average length of stay (LOS) in all public hospitals has decreased steadily. Although average length of stay rose again between 1998 and 2001 (Figure 2.13: “total” trend line), it is still significantly lower than in the early 1990s.

**Figure 2.13: Trends in Length of Stay Acute Care Hospitals and Total (Acute + Rehab)**



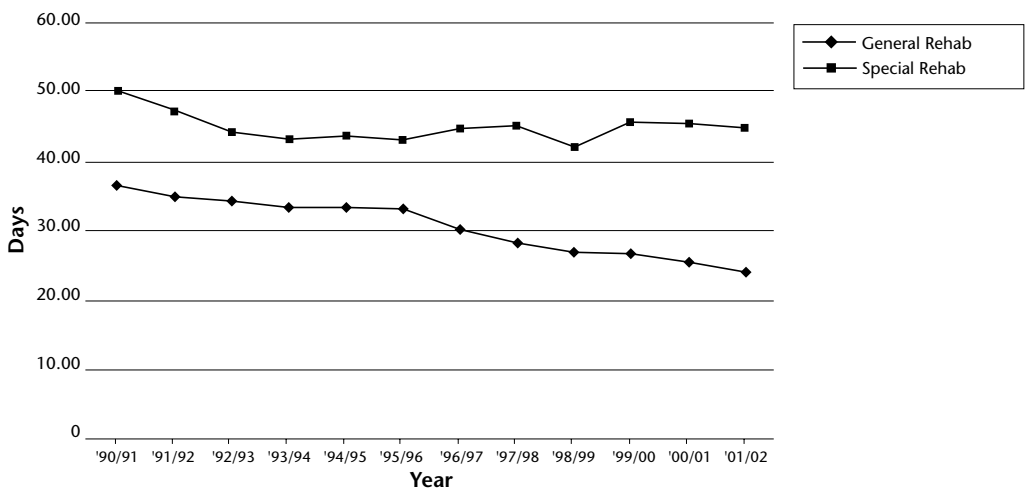
**Acute Care Hospitals**

The trend in length of stay is similar for acute hospitals. Average length of stay dropped steadily for a number of years and began to rise again in 1998, but it is still below 1991 levels (“acute” trend line). Efforts to reduce length of stay in this setting focused on reducing avoidable admissions, increasing day surgery, and encouraging early discharge. While the trend to shorter stays might suggest that fewer nurses are required, this is not the case. Because only patients who require significant nursing care are now admitted to acute hospitals, and the care they require is compressed into a shorter period of time, decreases in length of stay actually increase daily nursing workload (Shamian et al., 1994; O’Brien-Pallas, Irvine, Peereboom & Murray, 1997). Shorter lengths of stay have resulted in higher nursing hours per patient day.

**Rehabilitation Hospitals**

Both rehabilitation and chronic care hospitals have also reduced their average length of stay (Figure 2.14). This trend may be the result of strategies similar to those adopted in acute hospitals (e.g., reducing avoidable admissions, encouraging early discharge) and, as in acute hospitals, may also have led to an increase in nursing workload. However, research has not yet been done in these sectors to assess this trend or its impact.

**Figure 2.14: Trends in Length of Stay for Rehabilitation Hospitals**

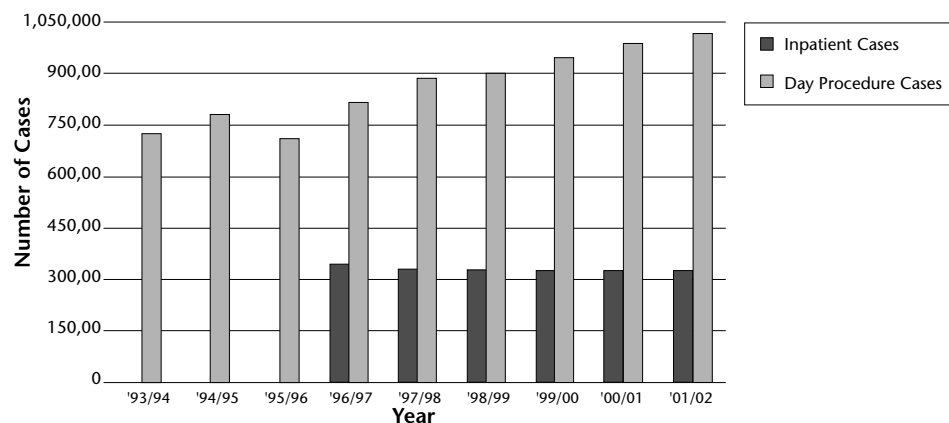


To a certain extent, it is possible to identify the types of services that have substituted for hospital stays. For example, the number of outpatient surgeries performed annually has increased steadily since 1993, when data were first collected. There were 35.6% more cases in 2001 than in 1993 (983,916 and 720,899 respectively). The number of outpatient (general and special) clinic visits have fluctuated over this same time period; still, the number of cases in 2001 was 3.2% higher than in 1993 (6,958,299 and 6,741,615 respectively). Interestingly, the number of emergency room visits has also fluctuated over this time period, from a high of over 5.5 million in 1994 to a low of just under 5.1 million in 1997, back up to around 5.3 million in 2001 (Ministry of Health & Long-Term Care, 2002). A pattern of increased emergency room visits might be expected in the face of declining hospital bed access and early discharge (see Figure 2.22).

### Shift to Day Surgery

During the early and mid 1990s, as part of efforts to reduce length of stay, hospitals shifted less risky surgical procedures to day surgery (i.e., patients are admitted on the day of surgery and discharged the same day). As a result of this shift, the volume of day surgery cases increased sharply between 1995/96 and 1996/97, and have continued to increase gradually (Figure 2.15a). Data on inpatient surgery cases is only available from 1996/97 onwards, but it indicates a complementary drop in inpatient surgeries through 1999/00, followed by a slight increase over the past two years. It is not clear why this recent increase occurred.

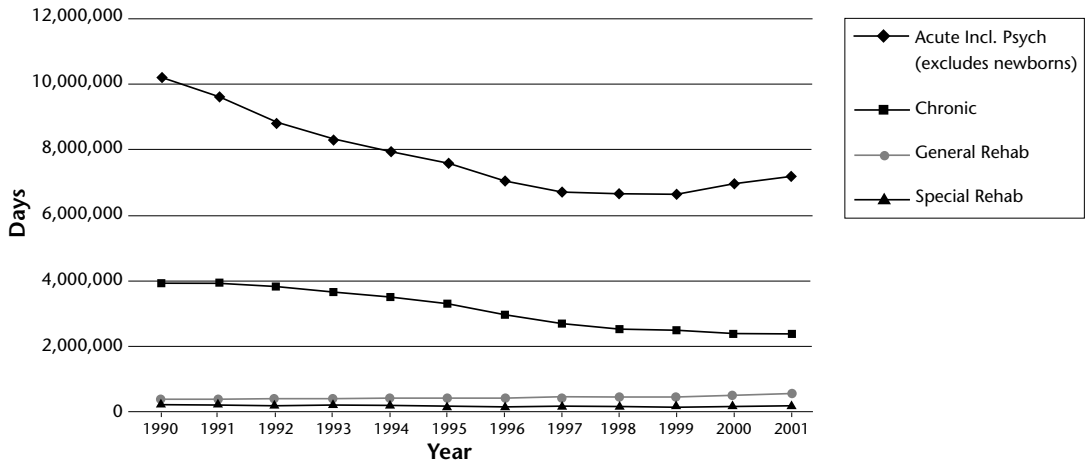
**Figure 2.15a: Operating Room Cases by Inpatient/Outpatient Status**



### Volume of Service

With the reduction in the number of separations, the reduction in length of stay and shift to day surgery, there has been a corresponding drop in total patient days (Figure 2.15b). The number of patient days in all public hospitals decreased steadily throughout the 1990s. Although they rose slightly in 2000 and 2001, they are still well below 1990 levels: the number of patient days in 2001 was 30.6% lower than in 1990.

**Figure 2.15b: Trends in Patient Days**

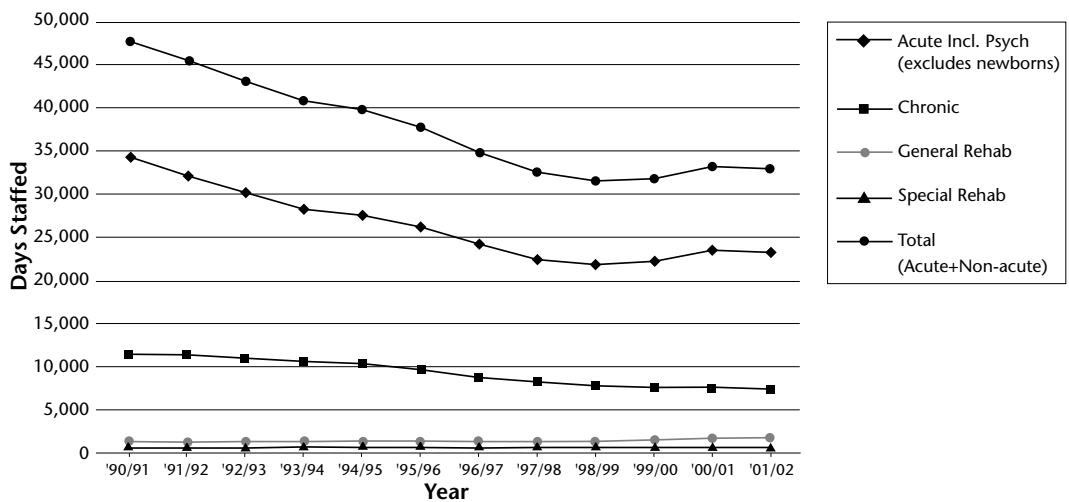


### Staffed Beds

Changes in length of stay, the shift to day surgery, and the drop in the number of hospital patient days has led to a reduction in the number of staffed beds. Hospitals report these data at the end of every fiscal year as the number of “bed days staffed and in operation”. Unlike “approved beds”, which reflect the capacity of the facility in terms of physical beds, “bed days staffed and in operation” reflects the number of beds for which nurses are available. It is a more accurate measure of available resources.

During the 1990s, all hospitals reduced staffed beds but the majority of the reductions occurred in acute hospitals. Although the number of staffed beds increased slightly over the past two years, the numbers are still significantly lower than 10 years ago (Figure 2.16).

**Figure 2.16: Trends in Staffed Beds**



### Patient Acuity

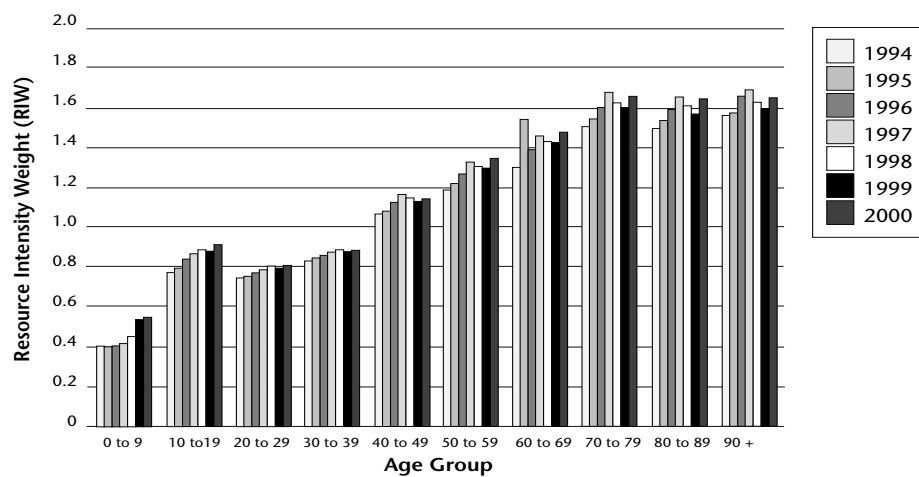
Trends in inpatient acuity were calculated by age group using average Resource Intensity Weight (RIW) and complexity levels (i.e., level 2 or higher). Any increases in average RIW or in the number of inpatients assigned higher complexity levels would indicate increasing patient acuity which, in turn, would mean that nurses are working in a more demanding environment.

Older patients (> 50 years old) tended to have higher RIWs than younger patients. However, between 1994 and 2000, the RIW value for inpatients in the four youngest age groups increased gradually (Figure 2.17). For most of the older age groups (40 and older), acuity increased steadily between 1994 and 1997. The 60 to 69 age group is slightly different in that its acuity increased sharply in 1994 and 1995. For all 40+ age groups, the 1997 increase was followed by a slight dip in average RIW and then a return to 1997 levels by the year 2000. These data suggest that hospitalized patients are using more resources, even though the number of patients hospitalized has decreased. Nurses may be caring for fewer patients, but those patients require more care.

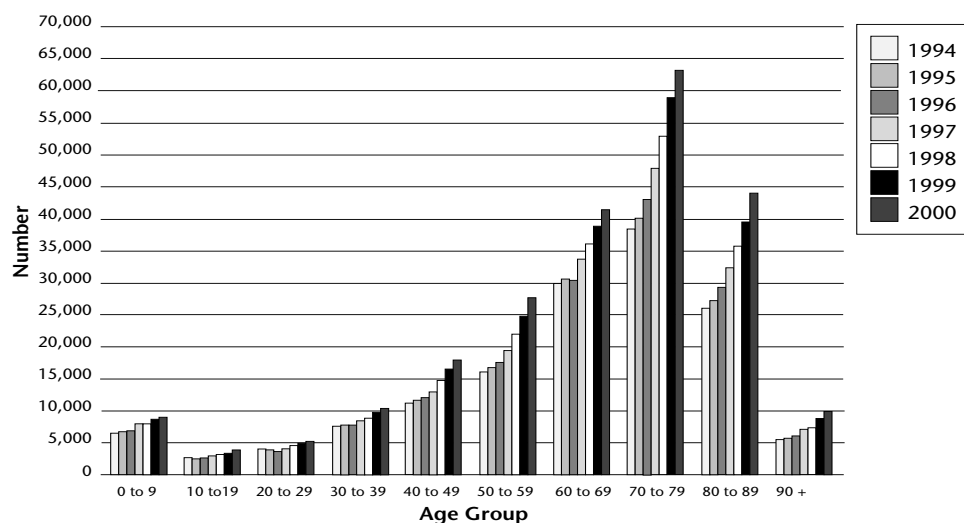
The complexity levels<sup>3</sup> assigned to hospitalized patients by age help illustrate this trend more fully. Complexity is an important measure when assessing the demand for nursing care because it captures the impact of co-morbid conditions, complications and general catastrophic conditions – all of which increase the demand for nursing care.

In each of the years studied, the number of patients in complexity level 2, 3 or 4 increased for all age groups (Figure 2.18). This finding suggests that the average patient care requirement is rising. This increase in demand for nursing care has occurred during a period when the overall number of nurses working in hospital settings has dropped (Figures 1.7 & 1.8).

**Figure 2.17: Average Resource Intensity Weight (RIW) for All Inpatients**



**Figure 2.18: Number of Inpatients with a Complexity Level of 2, 3 or 4**



<sup>3</sup> Note: the complexity score is subsumed in the RIW calculation, but has been isolated here for illustrative purposes.

Complexity data may need to be interpreted with caution. Some analysts have noted the potential for “complexity creep” (i.e., hospitals reporting higher complexity levels than actually exist) – a strategy that is motivated by the fact that hospital RIW levels are tied to funding.

### **Data Sources and Limitations**

Patient acuity information for inpatient hospital cases was obtained from the CIHI Discharge Abstract Database (DAD) for the years 1994 through 2000. The CIHI database utilizes Case Mix Groups (CMG) methodology to group patients with similar clinical and total resource requirements. The CMG has an advantage over the Diagnostic Resource Groups (DRG) used in the U.S. because it is based on the diagnosis most responsible for utilization of hospital resources over the patient’s hospital stay and is, therefore, a better predictor of the need for nursing care.

CMG patients can be grouped into 25 Major Clinical Categories (MCC) based on the diagnosis responsible for the greatest length of a patient’s stay in hospital (<http://www.cihi.ca/wedo/grpcmg.shtml>; November 1, 2001).

When patient charts are abstracted after discharge from hospital, the patients are assigned both a complexity level and a Resource Intensity Weight (RIW) based on their diagnostic group.

Complexity levels (Plx) are applied to patients based on the presence of co-morbid conditions:

- *level 1: no significant diagnoses beyond the primary diagnosis*
- *level 2: one or more chronic disease conditions that do not comprise the primary focus of the acute care episode*
- *level 3: multiple chronic conditions and/or serious conditions with implications for length of stay*
- *level 4: potentially life-threatening conditions and/or multiple combinations of other types of conditions*

These levels can be considered in isolation or combined with information about patient age and other relevant factors to yield an RIW value. Unfortunately, neither the complexity level nor RIW information is available for chronic care, rehabilitation and mental health hospitals, or for chronic care, rehabilitation and mental health units within acute hospitals. However, the RIW and complexity is presented for all remaining inpatient clinical units within acute hospitals.

### **Home Care Trends**

Driven by advances in treatment and technology, resource constraints, hospital restructuring, and changes in consumer expectations, the care and support services now provided to clients in their homes have changed dramatically, and the care requirements of individual clients have increased significantly (Ontario Association of Community Care Access Centres, 2000; O’Brien-Pallas et al., 2002).

#### **Admissions**

Between 1991 and 2001, at the same time those admissions to hospitals were decreasing, annual admissions to acute and chronic home care increased by 33% from 212,328 to 282,275.

#### **Patient Acuity**

A variety of clients in multiple age, cultural, and diagnosis groups require community care 24 hours a day, 7 days a week (Ontario Association of Community Care Access Centres, 2000; Implementation Work Group of the Joint CCAC/Nursing Provider Task Force, 2001). Clients cared for in the community now have greater physical or mental health care needs than in the past. Their needs are also



less predictable and more continuous, and can exist over a longer period of time (Ontario Association of Community Care Access Centres, 2000).

According to a study by O'Brien-Pallas, Doran, Murray et al. (2001, 2002), community clients with more complex medical and nursing needs require greater amounts of service (i.e., visit time and number of visits) and experienced poorer outcomes. While clinical factors were predictive of the amount of service required, other variables such as environmental complexity factors also explained variation in visit time, and were more predictive of number of visits.

### **Impact of Managed Competition**

While funding for home care services comes from the province, the management of home care resources and service in Ontario has been decentralized to the local community, through Community Care Access Centres (CCACs). In 1996, the provincial government introduced a managed competition (Request for Proposal [RFP]) process to promote competitive pricing and services between the not-for-profit and for-profit nursing agencies that provide community care.

Between 1995 and 2000, the utilization of for-profit agencies to provide home care increased by 265% (from 892,285 to 3,257,512 visits). Over the same period, services provided by not-for-profit agencies decreased by 3.9% (from 4,101,427 to 3,939,892 visits) (Doran & Pickard, 2002). During that time, the difference in rates paid by the CCAC for nursing visits narrowed, lowering the amount paid for nursing services. Although the competitive bidding process may have improved access to services, anecdotal evidence raises concerns about continuity of care for clients, and there are challenges in the RFP process, including: the destabilizing effect on agencies, nurses and clients when contracts change; the perceived negative impact on nurses in terms of seniority, pension, and benefits when they change employers; and a fee-for-service model that promotes task or procedure-oriented nursing care.

Within the managed competition system, there are currently no standards to define the type and quality of services clients in the community should receive. When bidding for service contracts occurs at the local level and in the absence of standardized outcomes, there is a danger that cost will be the only driver in deciding how contracts are awarded. To ensure that contract decisions are based on quality of care as well as cost, and that home care is effective; outcomes should be measured, reported consistently, and compared across the province. The Nursing and Health Outcomes Project (Pringle, 2001) funded by the Ontario Ministry of Health and Long-Term Care is piloting common assessment and outcome data collection, which will allow these indicators to be tracked consistently across all sectors.

### **Type and Number of Community Visits**

#### ***Nursing Visits***

Between 1991 and 2001, the number of chronic nursing visits increased by 110% (from 3.2 million to 6.8 million per year) and the number of

#### **Definitions and Data Limitations**

An acute acuity home care patient is expected to require 30 or fewer visits to meet their care requirements, while a chronic acuity home care patient is expected to require more than 30 visits.

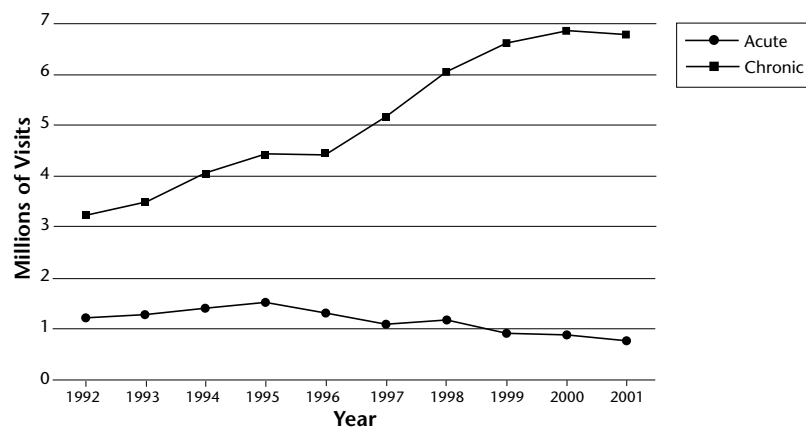
It is important to note that use of the terms "acute" and "chronic" can be misleading because the chronic category can include patients who have been discharged from acute care hospitals. A new categorization scheme for home care will be implemented in April 2003. This new approach is focused on five service goals rather than time frames, and will more accurately reflect the reasons for home care services. New statistical reporting will also identify the source of referral for home care, the number of individuals served, and the volume and mix of services provided for each service category.

acute visits increased steadily until 1994/95 and then dropped by approximately 792,000 visits over the last six years (Figure 2.19).

The dramatic increase in the volume of home care visits is likely a function of health care reform. For example, the steep growth in chronic visits may indicate that community care is replacing care historically provided in hospitals and long-term care facilities. In addition, it may reflect other changes in the health care system, including shorter length of stay (LOS), an increase in the number of outpatient or ambulatory procedures, and the use of technology (Registered Nurses Association of Ontario, 2001; Implementation Work Group of the Joint CCAC/Nursing Provider Task Force, 2001; CIHI, 2000).

The rapid increase in the number of chronic visits may also indicate that patients discharged from hospital after shorter LOS are sicker, require more than 30 visits to resolve health problems, or are waiting in the community for long-term care placement.

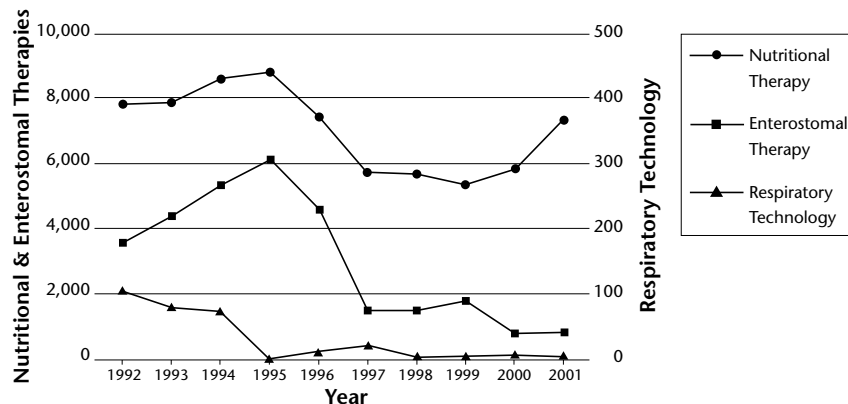
**Figure 2.19: Home Care Nursing Visits**



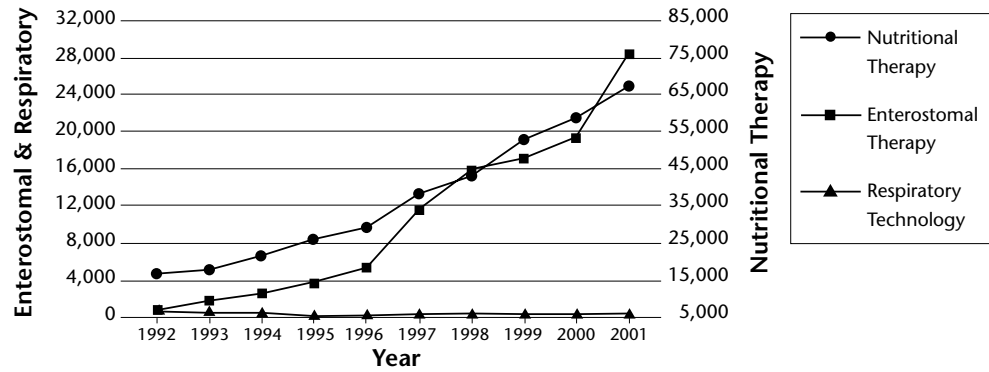
**Non-Nursing Visits**

The trends in home visits for nutritional, enterostomal, and respiratory therapy are somewhat different for “acute” and “chronic” patients. The number of acute nutritional, enterostomal, and respiratory visits declined sharply, beginning in 1994 or 1995 – although acute nutrition visits increased again in 2001 (Figure 2.20). Between 1991 and 2001, the number of chronic nutrition and enterostomal visits increased steadily, while the number of respiratory technology visits dropped slightly (Figure 2.21).

**Figure 2.20: Acute Home Care Visits by Other Health Professionals**



**Figure 2.21: Chronic Home Care Visits by Other Health Professionals**



As was the case with nursing visits, the increase in chronic visits by allied professionals is likely a function of shorter hospital stays and greater use of ambulatory procedures.

### Impact of Budget Restrictions

In 2001, the Ministry of Health and Long-Term Care ordered Community Care Access Centres to stay within their budgets by any means necessary. For most, this meant cutting services.

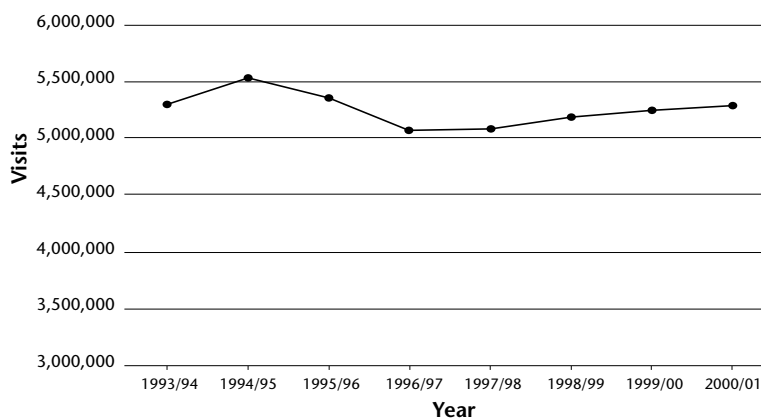
For example, the Toronto CCAC reported that, due to a \$15 million dollar shortfall between need and funding, the Board was forced to implement changes to eligibility criteria for some services, resulting in service cutbacks (Ontario Health Coalition, 2001). This policy may have had an impact on service levels and costs in other parts of the health care system. For example, it may potentially have had consequences such as increases in emergency room visits and hospital length of stay.

### Emergency Room Visits

Between 1994 and 1996, the number of emergency room visits in Ontario each year dropped dramatically (Figure 2.22). This decline in emergency room visits may be due to strategies designed specifically to reduce these visits, such as the opening of urgent care centers and walk in clinics.

Since 1996, the number of emergency room visits has been increasing (although they are still below 1995 levels). This trend may be due to changes in the home care system. For example, a joint Community Care Access Centre - Nursing Provider Task Force study (Toronto District Health Council, 2002) found that 14% of home care clients who could not be given nursing care (because of budget restrictions) were advised to visit the emergency room. These “extra” visits may explain part of the recent increase in emergency room utilization.

**Figure 2.22: Emergency Room Visits**



## Hospital Length of Stay

Beginning in 1997/98, average hospital length of stay began to rise again, after several years of steady declines (Figure 2.13). According to the same Toronto District Health Council study (2002), almost 20% of clients for whom home care nursing services could not be arranged had to stay longer in hospital (i.e., delayed discharge) to receive the care they needed. These delays shifted costs from the home care to the hospital sector.

## Long-Term Care Trends

According to Statistics Canada, the population over 80 years of age increased by 41.2% between 1991 and 2001. By 2011, the number of people over 80 will have increased from 932,000 to 1.3 million (Toronto Star, July 17, 2002, p. A6). People in this age group are heavy users of all health services, and the primary users of long-term care (LTC).

## Long-Term Care Facilities

Clients identified as having higher care needs may seek care from either a for-profit or not-for-profit LTC facility. Long-term care facilities (formally called Nursing Homes or Homes for the Aged) are available for people who require 24-hour nursing care, assistance with daily living, and supervision to be available to meet their care needs (<http://www.oanhss.org/staticcontent/stat-icpages/consumers/longterm.html>). The more than 500 long-term care facilities in Ontario ([www.ltccareers.com/english/facility.asp](http://www.ltccareers.com/english/facility.asp)) are regulated by the Ontario Ministry of Health and Long-Term Care. The provincial government provides funding to LTC facilities for nursing and personal care, support services, and accommodation based on a classification system (see box). This funding is supplemented by resident fees.

In addition to the LTC services provided by long-term care facilities, the MOHLTC funds some hospitals to provide interim LTC, Northern hospitals provide ELDCAP (Elderly Capital Assistance) beds for LTC, and some hospitals provide LTC for federally funded veterans.

On April 29, 1998, the government of Ontario announced an unprecedented eight-year plan to address the needs of Ontario's growing and aging population: \$1.2 billion would be spent to build 20,000 new long-term care beds by 2006. The government also committed to redevelop approximately 16,000 beds in older facilities that do not meet legislated structural standards for LTC facilities ([http://www.gov.on.ca/health/english/program/ltc/redev/redev\\_mn.html](http://www.gov.on.ca/health/english/program/ltc/redev/redev_mn.html)).

### Long-Term Care Classifications and Their Limitations

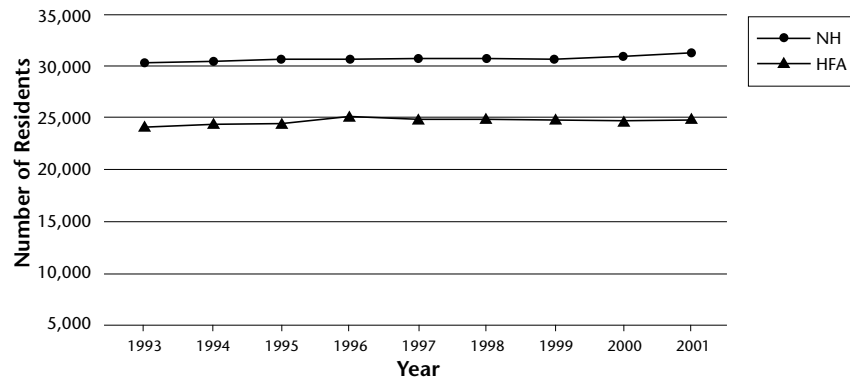
Nursing and personal care funding is based on the Alberta Classification System which has seven resident care categories ranging from A (light care) to G (heavy care).

The categories are determined by three domains: activities of daily living, behaviours of daily living, and continuing care level. Scores are used to predict the resident's acuity and total care requirements. Data collected on the care needs are summarized to determine a Case Mix Measure (CMM) for each facility. All of the CMM values are grouped in order to arrive at a provincial average, which is used to calculate the Case Mix Index (CMI) (Ontario Long-Term Care Association, 2001). However, it should be noted that the domains do not fully reflect the resident's medical or health status, required treatments, procedures and medication, nor do they adequately reflect special need areas such as rehabilitation/restorative care, mental health care, or palliative care (PricewaterhouseCoopers, 2001).

## Number of Residents

Despite the increase in the size of the population over 80 and the identified need for more long-term care services, there has been little change in the number of residents in homes for the aged and nursing homes (Figure 2.23).

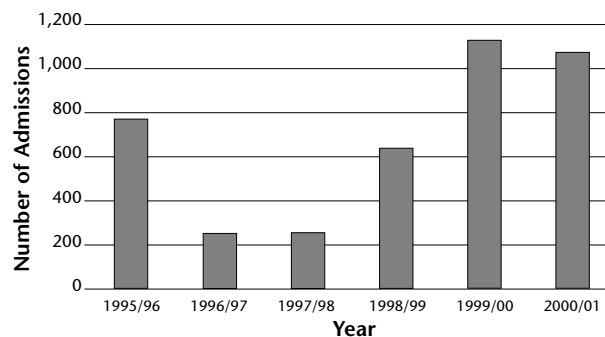
*Figure 2.23: Number of LTC Residents*



## Admissions to Hospital LTC Beds

Although the number of residents in nursing homes and homes for the aged has remained relatively stable (see Figure 2.23), the following graph shows the number of admissions to hospital long-term care beds has increased over the past few years (Figure 2.24). Due to the expected time line for the RFP process for additional LTC beds and the need to build new facilities, the MOHLTC funded hospitals to provide interim care. (Note: Hospital LTC includes ELDCAP, Interim Long-Term Care, and Federal [Veterans]). These will be closed when new LTC beds open.

*Figure 2.24: Admissions to Hospital LTC Beds in Ontario*



## Resident Acuity

According to a PricewaterhouseCoopers (2001) comparative study of LTC facilities in Ontario, Manitoba, Saskatchewan, the U.S., and three European countries, the level of acuity in Ontario facilities is high:

- The average age of residents in Ontario LTC facilities is 82.
- Dementia and Alzheimer's disease combined are the most prevalent of all diagnoses: 53% of residents of Ontario LTC facilities had one of these disorders compared to 19% of residents of Swedish facilities.
- Arthritis, stroke, congestive heart failure (CHF), and diabetes are the next most common diagnoses in all jurisdictions studied.

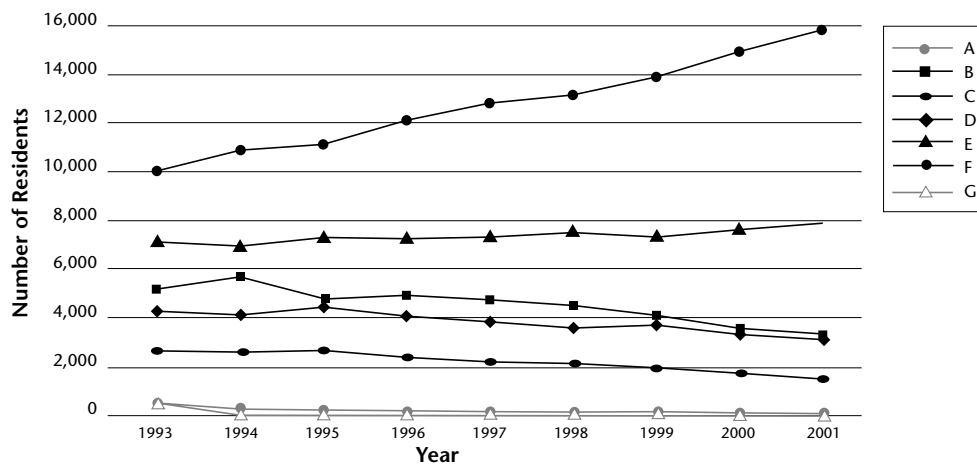
- The rate of depression in Ontario LTC facilities (30.5%) was higher than in all other facilities other than the Netherlands (34.6%), and is double the rate noted for Manitoba (15.4%) and almost three times the rate in Michigan (12.2%).
- The proportion of Ontario LTC residents in the clinically complex category is higher (26.1%) than in any of the other Canadian facilities (Manitoba 16.8; Saskatchewan 22.9%).
- 44% of Ontario LTC residents scored high on levels of cognitive impairment versus those in Saskatchewan (35.2%) and Manitoba (39.2%). The findings for the Activities of Daily Living (ADL) Hierarchy Scale indicated that 47.9% of Ontario LTC residents have high impairment scores, which is greater than Saskatchewan (46.5%) and Manitoba (38.3%).

Over the years, health care needs in long-term care facilities have been increasing in volume and complexity. Approximately 10% of the acute hospital population has been shifted to long-term care settings. Residents in long-term care facilities are older, frailer, and have more complex health care needs than ever before (Ministry of Health and Long-Term Care, 2001).

### Nursing Homes

The distribution of residents across the Alberta Classification System categories of care is an indicator of residents' resource requirements. In that system, "A" represents the least intensive level of care and "G" the most intensive care. While the distribution trends do not represent utilization of services, they provide an estimate of service demand. In Ontario nursing homes, the majority of residents now fall in the resource intensive E and F categories of the Alberta Classification System and represent an ever increasing demand for nursing service (Figure 2.25). Between 1993 and 2001, the number of residents falling in the high demand F category increased steadily. ("F" is the most common classification category over all the years of data collection among nursing homes.) The extreme high and low intensity groups (i.e., G and A categories respectively) have seen a small but steady decline over the nine years in which data have been collected.

Figure 2.25: Nursing Home Patient Classification

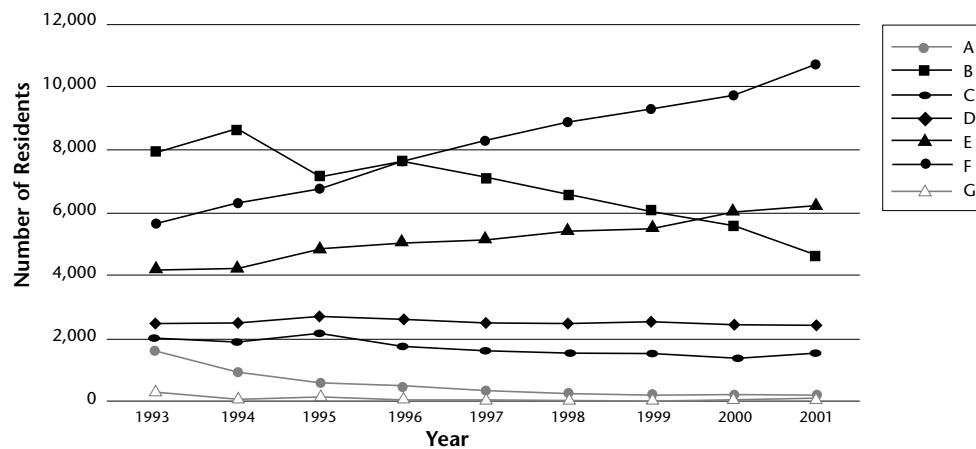


### Homes for the Aged

Residents of homes for the aged have traditionally required less care than those in nursing homes: the most common classification categories among homes for the aged have been B and F (Figure 2.26). However, between 1993 and 2001, the number of residents classified in heavier care E and F categories increased steadily. In fact, the year 2000 saw the number of E classified residents outnumber B classified residents for the first time, and this trend continued in 2001. Homes for the aged have seen the same steady reduction in the number of residents in the lightest and heaviest care cat-

egories (i.e., A and G) as nursing homes. These data suggest that, in both nursing homes and homes for the aged, the demand for nursing and personal care services is increasing over time.

**Figure 2.26: Homes for the Aged Patient Classification**



### **Impact of Acuity on Direct Care Activities**

Data on the staffing response to increasing resident acuity are not available, but there is information to suggest that the environmental and contextual factors that influence nurse resource requirements in hospital and community sectors also influence the LTC sector. Findings from the nursing and personal care provider study completed for the Ministry of Health (O'Brien-Pallas et al., 1995) suggest that staff allocate more of their time to non-direct care related activities when a resident's physical condition unexpectedly changes for the worse or when staff have concerns about the safety of residents in the environment. Conversely, staff allocated more time to direct care activities when there were unanticipated negative changes in resident cognitive status. These findings are important, given that staffing decisions have often been made on the assumption that LTC residents remain stable over time. Environmental factors such as unanticipated changes in resident's physical, behavioural, and/or cognitive status, being short staffed, having to perform non-direct care tasks, and not having enough supplies and equipment explained 55% of the variation in direct care time. Organizational factors such as staffing practices, care delivery process, and the role of non-nursing and personal care workers explained 43% of the variation observed in direct care hours. While administrators cannot change residents' clinical and behavioural characteristics, they can make changes in both administrative practices and environmental conditions within facilities in order to increase the amount of time nursing and personal care providers spend with residents.

There are substantial positive relationships between cognitive status and the functional ability to perform activities of daily living and self-care. Appropriate nursing interventions have the potential to improve function and self-care by maintaining or improving cognitive function (Stolley et al., 1991). But the existing funding mechanism for nursing resources in long-term care facilities is built on an annual resident classification system that may not fully capture resident acuity. Critics say that utilization of this flawed system discourages facilities from engaging in accurate long-range planning that can ensure adequate nursing resources for residents. As a result, there has been casualization of nursing personnel.

Given the high care needs of this population, more nurses are required in long-term care. Additional funding for volume has been added in this sector, but nursing representatives are questioning how the province will find new nurses to staff long-term care facilities. While the Ministry of Health and Long-Term Care announced plans to increase staffing at nursing homes by hiring 600 nurses and

1,800 personal care workers, the Ontario Nurses Association's position is that "there are not 600 nurses waiting for jobs in long-term care". Nursing representatives say that they are "having trouble filling vacancies that exist now" (Toronto Star, A6, July 17, 2002).

### Long-Term Care Waiting Lists

In the past few years, there has been a backlog of people waiting for appropriate LTC placement in Ontario. These placements are coordinated by the CCACs. Each month, the 43 CCACs in Ontario report the number of clients waiting for placement to a LTC facility through Home Care and Long-Term Care Placement lists. Please note that the available data on clients waiting for placement can be misleading because of inconsistent and variable reporting methods within and across CCACs.

Large waiting lists may indicate a shortage of LTC beds. As a result, those waiting to transfer from hospitals to LTC facilities are continuing to use hospital beds and other resources, making them unavailable to others who may need them. In December 2001, there were 589 clients in chronic care and 2,881 clients in acute care hospital beds waiting for placement to an LTC facility – up 22% from 483 and 2,353 in December 1998 (MOHLTC, 1998-2001). Although these clients do receive some type of services while they are waiting for placement, their care needs may not be met since "they are not the priority or skill set of the acute care centre" (OLTCA, 2001).

The majority of clients waiting for long-term care services are from the community rather than from hospitals. In December 2001, there were 20,078 clients from the community waiting for a place in a LTC facility – up 65% from 12,153 in December 1998 (MOHLTC, 1998-2001). Clients in the community waiting for a LTC placement may not be receiving any services.

During the same time period, clients waiting in LTC facilities for placement in a facility of their preferred choice increased 62% from 6,124 to 9,936 (MOHLTC, 1998-2001).

Figure 2.27 illustrates the number of clients waiting for a LTC bed from their current location in each month in 2001. (Note: the same client may be waiting for services for a number of months, so the total number of clients waiting for LTC services in one year is not the sum of the clients waiting each month.)

#### **Changes in LTC Wait List Policies**

In the spring of 2002, new placement policies encouraged potential residents to make timelier placement selections. If potential residents chose not to accept an offer for placement, they were removed from the 2002 waitlist. This has had the impact of reducing the wait lists for long-term care.



**Figure 2.27: Clients Waiting for LTC Beds in Ontario in 2001 by Current Location**

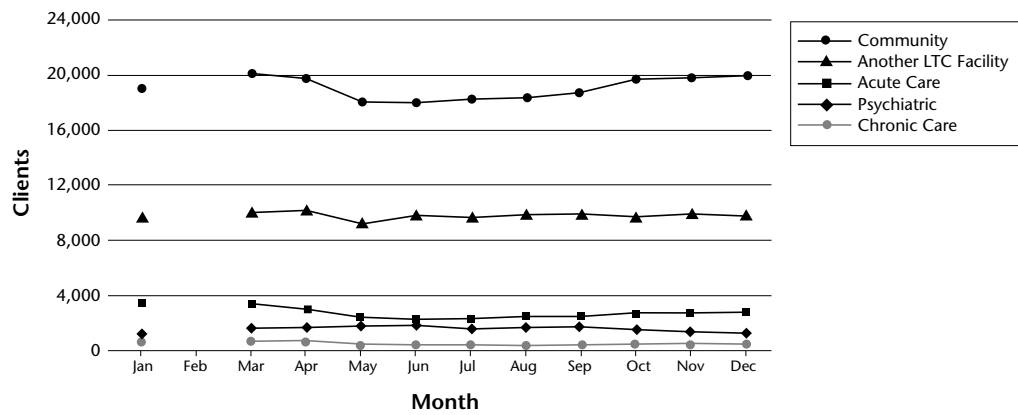
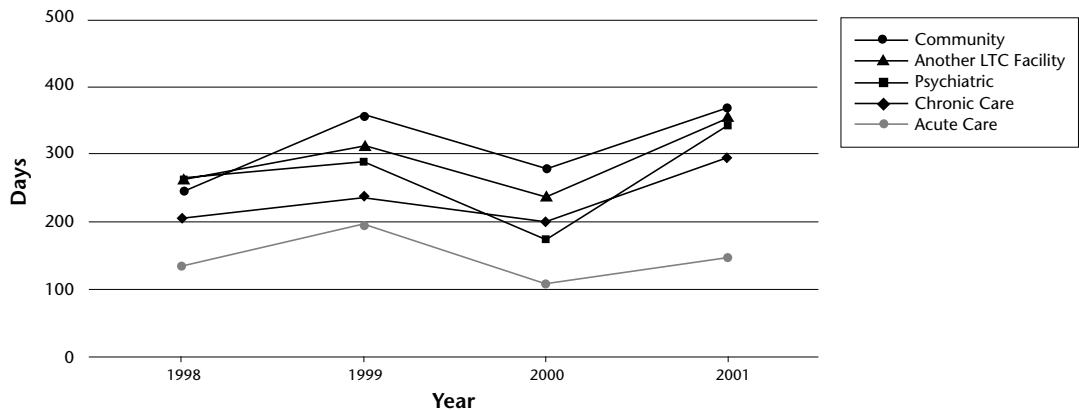


Figure 2.28 illustrates the average number of days a client had to wait for LTC facility placement between 1998 and 2001. Clients from the community had to wait an average of 95 days longer in 2001 (372 days) than in 2000 (277 days), while clients waiting in acute care facilities waited just as long in 2001 as they did in 1998. The problem of waiting lists may be alleviated when the new long-term care beds come on line.

**Figure 2.28: Average Days Waiting for a LTC Bed in Ontario by Current Location**



## 4. Utilization of Nursing Resources

This section of the report looks at some of the factors that contribute to the effective use of nursing resources, and identifies data that can be used to monitor nurse utilization and ensure the best use of limited nursing resources in the future. Ideally it would include information on the need for and utilization of nursing staff in public health and primary care, particularly the utilization of nurse practitioners in these settings, including the number of clients, annual visits, and average visit time as well as related factors such as travel distance to service, concentration of service providers, method of payment, and case mix. Unfortunately, these data are not currently available.

Information on the current utilization of nursing is limited and exists primarily in the hospital sector, which has been using the MIS Guidelines for reporting since 1994. Beginning in 2003, CCACs will be implementing the MIS Guidelines, which will allow more in-depth analysis of the home and community sector, and support comparisons between sectors. At the time of preparing this report, no data were centrally collected for the long-term care sector, although planning for this is now underway.

Because hospitals continue to account for the majority of health spending and nurse employment in Ontario, understanding trends in hospital utilization enables some understanding of the pressures on the health system as a whole and on the demand for nurse human resources.

## Nursing in Hospitals

### Staffing Trends

In recent years, hospitals have used a number of staffing strategies to meet care needs, contain costs, make effective use of nursing resources, and compensate for nursing shortages, including adjusting the nursing skill mix (i.e., ratio of RNs to RPNs), using agency nurses, reducing nurse managers, and substituting less skilled providers for registered health professionals.

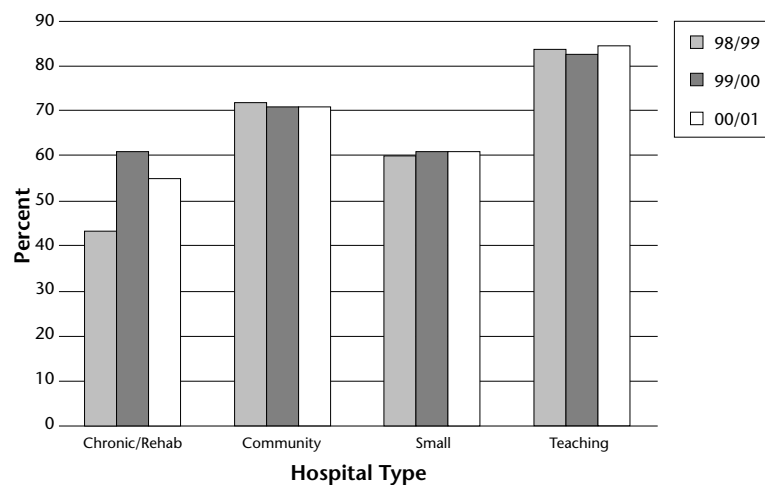
### Nursing Skill Mix

The mix and distribution of RNs and RPNs varies by type of hospital, and will change as patient volumes and LOS in each hospital change over time. Figure 2.29 shows the trend in total nursing paid hours attributable to RNs across both inpatient and outpatient units. The acuity and predictability of patient needs dictate the mix of staff used. Chronic and rehabilitation hospitals and smaller hospitals make less use of RNs than hospitals providing more acute care. This is a result of skill mix and not underemployment of RNs. In 1998/99, teaching hospitals averaged 84% RNs as a percentage of total nursing hours, community hospitals 73%, small hospitals 60%, and chronic/rehabilitation hospitals 43%. Means stayed similar in 1999/00 and 2000/01, with the exception of the fluctuations observed in chronic/rehabilitation hospitals.

### Data Limitations

Although the comprehensiveness of data in the hospital sector has increased steadily since 1994 (with the implementation of MIS Guidelines), there are still significant information gaps. For example, breakdowns of annual nursing paid/earned hours by different professional group (i.e., RNs, RPNs and Unregulated Care Providers) are only available starting in 98/99. Prior to that year, the activities of these three groups were combined into a single category.

**Figure 2.29: RN as a Percentage of Total Nursing Earned Hours by Hospital Type**



### Reliance on Part-Time Nurses

In an effort to reduce salary costs and increase staffing flexibility, many hospitals reduced their complement of full-time nurses. However, the downside of this strategy has been:

- a decrease in actual (rather than “potential”) supply because available nurses are not fully employed
- a decrease in continuity of care – full-time nurses are positively associated with continuity of care, caregiver “knowledge” of the patient, and the caregiver’s ability to influence clinical and workplace decisions (Grinspun, 2002)
- a deterrent effect on recruitment and retention – people are less likely to pursue a career in nursing when there are few full-time job opportunities
- an increase in overtime costs. Reducing the number of full-time nurses may have given hospitals greater flexibility, but many have had great difficulty finding part-time staff when needed, and this has resulted in annual overtime costs in excess of \$171 million, with \$57 million of that amount spent on overtime premium (O’Brien-Pallas, Thomson, Alksnis, & Bruce, 2001). Effective April 2002, hospitals are required to report overtime hours to the MOHLTC. This information will improve our understanding of how financial resources are used for human resources.

There are differences in the full-time levels of RNs and RPNs across hospital types: teaching and chronic/rehabilitation hospitals have a higher percentage of full-time employees than community and small hospitals (Table 2.3). The number of full-time RPN positions is declining over time in community, small, and teaching facilities.

**Table 2.3: Percentage of Full-time Staff by Category by Facility**

Mean %	Chronic/Rehab			Community			Small			Teaching		
	98/99	99/00	00/01	98/99	99/00	00/01	98/99	99/00	00/01	98/99	99/00	00/01
RN	58	64	67	53	54	56	53	50	53	63	67	69
RPN	57	56	64	57	55	54	52	48	49	67	57	58

### Use of Agency Nurses

Some hospitals hire non-permanent staff from nursing employment agencies to compensate for a shortage/absence of full-time staff or to contain costs (i.e., with agency nurses, hospitals do not have to pay for benefits). Table 2.4 shows the average annual nursing paid hours attributable to agency nurses in both inpatient and outpatient units in 2000/01. This strategy appears to be used most extensively by larger teaching hospitals which tend to be in urban settings, although chronic/rehabilitation and community hospitals also average substantial numbers of hours per year. Given that a full-time employee logs 1,950 to 2,000 hours per year, the agency nurses are providing the equivalent of more than 1,000 full-time nurses. With the same resources, hospitals could hire more full-time nurses and provide greater continuity of care for patients.

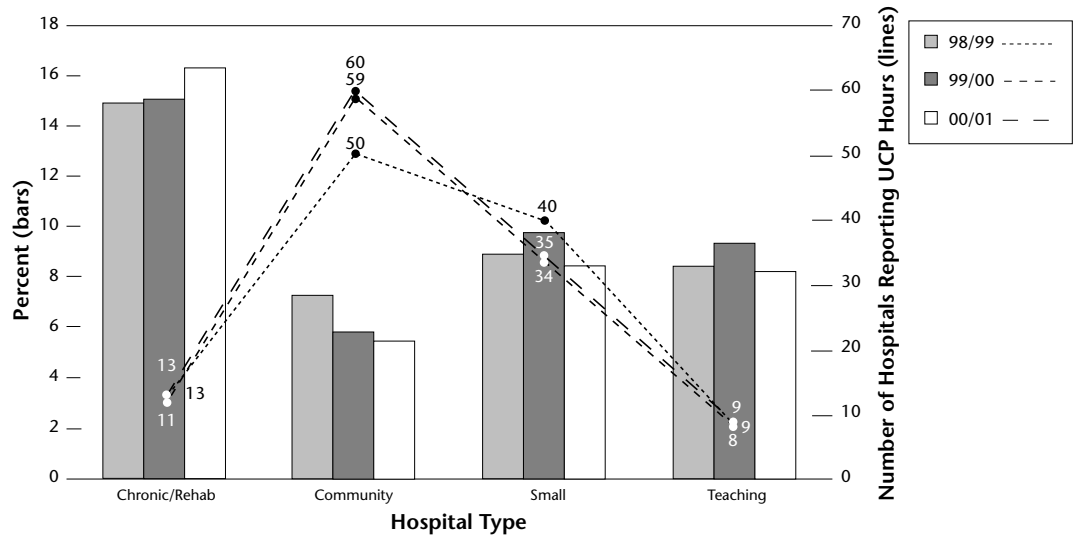
**Table 2.4: Use of Agency Nurses 2000/01**

	Total Number of hospitals	Hospitals reporting zero agency hours	Total Number of hospitals in analysis	Annual Agency hours			
				Sum	Mean	Min	Max
Chronic/Rehab	20	6	14	211,688	15,119	788	50,302
Community	74	29	45	856,091	19,024	22	165,800
Small	52	38	14	8,125	580	9	2,075
Teaching	10	0	10	1,090,364	109,036	4,084	239,832

## Substitution

During episodes of cost containment and nursing shortage, hospitals often seek out the services of alternative care providers (e.g., Unregulated Care Providers). Hospital administrators give different reasons for adopting this staffing strategy: some consider alternative care providers a viable lower cost option while others use these providers because an adequate number of registered nurses are not available. Figure 2.30 shows the trend in nursing paid hours worked in both inpatient and outpatient units attributable to UCPs. Chronic/rehabilitation facilities tend to have a higher proportion of UCPs (15% to 16.4%) than other types of hospitals (<10%).

**Figure 2.30 Unregulated Hours as Percentage of Total Nursing Earned Hours by Hospital Type**



## Management and Support Activities

During the cost containment years in the mid-1990s, most Ontario health organizations took one or more of the following steps: restructured, downsized, flattened their organization structure, adopted program designs, reduced the number of employees not providing hands-on care, and de-skilled their nursing staff (Baumann et al., 1996).

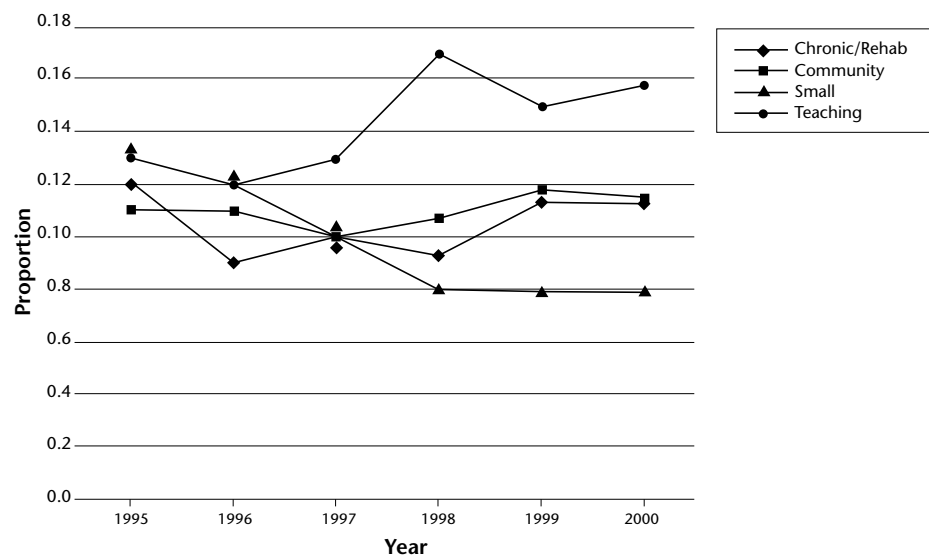
Many hospitals reorganized care delivery around service lines, expanded management scope, flattened their structures, and reduced non-nursing support staff. These changes reduced the number of nurses in management roles and expanded the complexity and scope of control for those who remained. Since 1997, there has been a general decline in the number of nurse managers in Ontario. In 2001, 6.2% of all nurses in Ontario were employed as a manager compared to 9.1% in 1997 (CIHI, 2002a). (Note: CIHI categories used to calculate the 1997 value include Chief Nursing Officer/Director, Assistant/Associate Director, Supervisor/Coordinator, and Head Nurse. Categories used to calculate the 2001 value include Chief Nursing Officer/Chief Executive Officer, Director/Assistant Director, and Manager/Assistant Manager.)

This trend is reflected in the drop in nursing unit management and support earned hours, calculated for inpatient and outpatient centres combined (Figure 2.31). The decrease has been particularly marked in small hospitals, where the levels of management/support staff relative to total nursing staff declined between 1995 and 1998 and have stayed relatively unchanged since then. In 2000 and 2001, earned hours for management and support staff in community hospitals rose to higher than 1995/96 levels. In chronic/rehabilitation hospitals, they have almost returned to previous levels. Only the teaching hospitals have been able to maintain relatively high levels of management/sup-

port to total nursing staff, although these values have fluctuated in the last six years. With these changes, some management tasks and many clerical tasks were shifted to the front line nurses, which mean that nurses spend less time nursing. This affects the availability of nursing care and increases the need for nurses.

The reduction in nurse managers often occurred at the same time that organizations reduced both support staff and nursing skill level. Just when supervision, coordination, communication, and leadership were most needed, they disappeared. Unfortunately, the current MOHLTC databases merge support and management data, and do not provide information on management staff levels. However the effects of changes in management structure and scope of practice may explain some of the variations seen in the utilization and productivity data.

**Figure 2.31: Proportion of Management and Support Staff Earned Hours within the Nursing Unit**



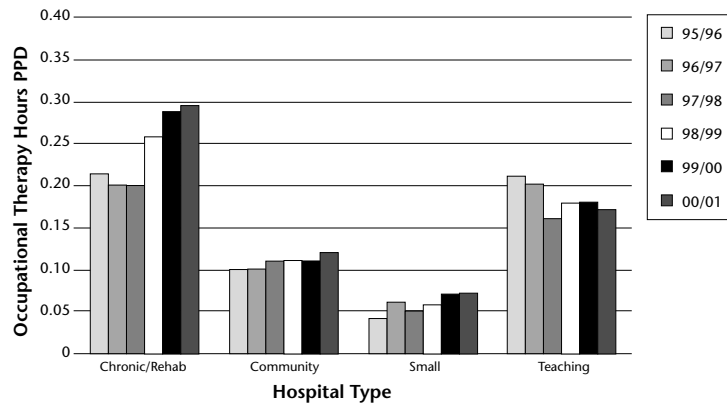
### **Allied Health and Other Support Activities**

The need for nurses is also affected by changes in other hospital services. When allied health professionals and support staff outside the nursing unit (e.g., physiotherapy, occupational therapy) are reduced, with no change in service needs or improvement in efficiency, nurses tend to assume these tasks as well.

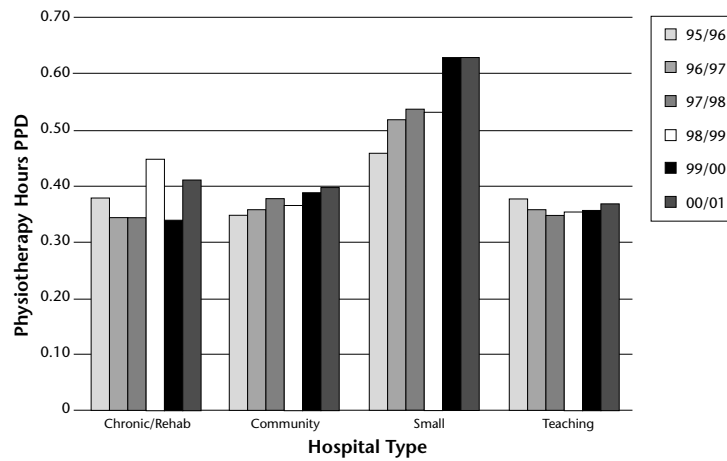
The paid hours per patient day for different types of allied staff varied substantially across hospitals (Figures 2.32-2.34). This variation may be due to the fact that patients in specialized settings are more likely to use certain types of services (e.g., high usage of occupational services in chronic/rehabilitation hospitals relative to other types of hospital settings) or to facility size (e.g., small hospitals tend to have fewer hours per patient day than other types of hospitals for allied health professionals). The exception to this last rule is small hospitals' use of physiotherapists, where the average hours between 1996/97 and 2000/01 are even greater than those observed in chronic/rehab facilities. As would be expected, the specialized chronic/rehab hospitals tend to use occupational therapists almost as much as physiotherapists (particularly in the last three years), while other types of hospitals rely more on physiotherapists. Teaching hospitals tend to make greater use of "other" allied health specialists (e.g., respiratory therapy, clinical nutrition, speech language pathology, audiology, rehabilitation engineering, psychology, pastoral care, therapeutic recreation, and child life) than other types of hospitals. While the use of most allied health professionals has remained steady or

gradually increased in most types of hospitals, it has dropped in teaching hospitals for occupational therapists and “other” allied health professionals.

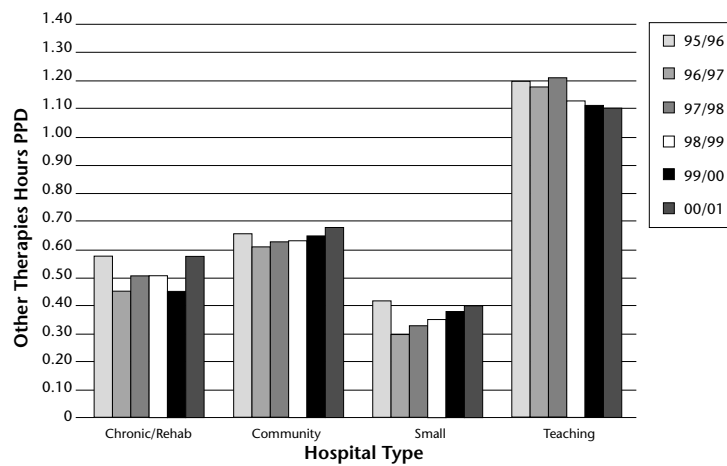
**Figure 2.32: Occupational Therapy Paid Hours per Patient Day by Hospital Type**



**Figure 2.33: Physiotherapy Paid Hours per Patient Day by Hospital Type**



**Figure 2.34: Other Therapies Paid Hours per Patient Day by Hospital Type**

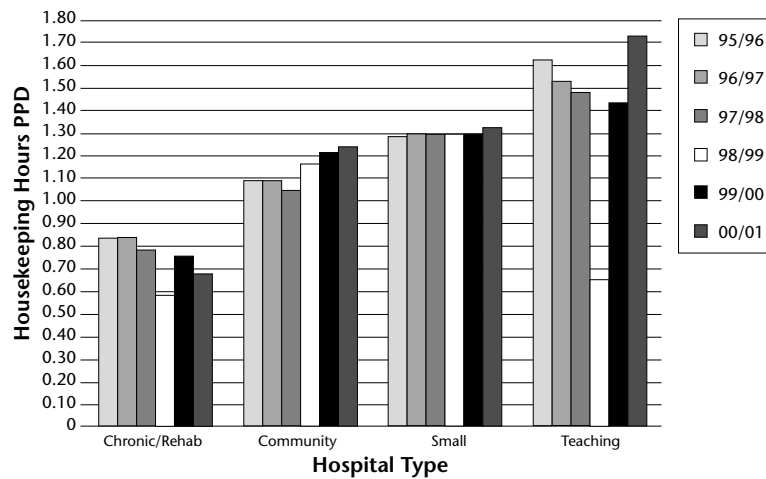


**Housekeeping**

Many nurses are concerned that, since restructuring, they have taken on a greater proportion of housekeeping duties in addition to caring for sicker patients. Figure 2.35 outlines the changes in

housekeeping hours per patient day by hospital type since 1995. Housekeeping hours in teaching hospitals declined from 1995 until 2000/01, when they rose above pre-1995 levels. From 1997 onward, community hospitals showed a small but steady increase in housekeeping hours per patient day. Since 1995, housekeeping hours have decreased in chronic/rehabilitation hospitals and remained relatively unchanged in small hospitals. It is important to note that, as volumes of patients decline, worked hours for housekeeping will appear to increase even if no additional staff are added.

**Figure 2.35: Housekeeping Paid Hours per Patient Day by Hospital Type**



## Working Conditions

### Workload

Workload data is a measurement of patient need for nursing care. More specifically, workload captures the demand for nursing services based on standards of care.

Workload is reported in two categories: service recipient and non-service recipient. Service recipient workload reflects the resources required by specific patients, and includes the time spent planning, preparing, providing, and evaluating nursing interventions. Non-service recipient workload reflects the time spent in activities that are required to support the functioning of the nursing unit, including participation in facility activities, in-service education, teaching of students and others, as well as research. The requirement to report workload in these two categories became effective in the first year of reporting. Although almost all facilities reported service recipient workload, they did not consistently report non-service recipient workload until 1999/00. It is not clear whether hospitals incorrectly reported all workload under the service recipient account number in 1997/98 and 1998/99 or whether non-service recipient workload was simply not collected.

Table 2.5 summarizes total workload hours by unit type. At the current time, there is no agreed-upon standard that prescribes what the magnitude of these workload per patient day values “should” be, although it is likely that these values will vary across different types of nursing units. Researchers at the NRU are engaged in a CHSRF-funded study to investigate appropriate workload in cardiac and coronary care units.

**Table 2.5: Average Total Workload per Patient Day Clinical Category 2000/01**

	Med/Surg	ICU/CCU burn/ Neonatal	Card Mon*	Mat/ Child	Psy	Rehab	Chronic	LTC
Mean	4.44	13.34	6.30	6.67	4.61	4.36	4.11	3.0
(SD)	(1.24)	(3.77)	(2.69)	(2.15)	(1.25)	(1.44)	(1.31)	(1.29)
Median	4.43	13.12	5.91	6.90	4.60	4.29	4.05	2.88
N	137	88	12	91	48	50	108	19

Note: This table includes Chronic/Rehab, Small, Large/Community and Teaching hospitals. Outliers greater than 3 SD beyond the mean were removed.  
\*Cardiac Monitored Care

### Productivity

At the micro level, workload can be used to assess the relationship between the demand for care and actual staffing. Productivity, as measured using nursing workload tools, is a measure of the ability of an organization to meet patients' needs. The indicator is calculated by dividing the workload hours by the worked hours. Workload indicates the demand for nursing services based on standards of care and worked hours indicate the hours that nurses are available for service. There are two productivity values that can be calculated: total productivity includes all workload whereas patient care productivity includes only patient specific activities.

When the need for nursing services exceeds the available supply, the productivity value will be high, and when worked hours exceed the need for nursing services the value will be low. Since worked hours include paid breaks and workload does not, the maximum total productivity value should be less than 93%. (A value of 93% indicates that every nurse worked every minute of every day for the entire year.) The appropriate productivity or utilization value, is not known at this time, but it is likely close to 85% in departments with predictable demand, and lower in nursing areas where demand is unpredictable (e.g., emergency, labour and delivery). When the productivity value in a hospital or unit is high (i.e., over 85%) quality of care is likely being compromised or nurses are working unpaid time to work to standards. As Table 2.6 indicates, a significant proportion of functional units in all types of hospitals have productivity rates over 85% and, in three sectors, over 25% have values over 93%.

### Workload Data Sources and Limitations

Although nurses have collected workload data for over 20 years for internal staffing purposes, the information was not routinely required for hospital administrative databases until 1997/1998. Even though all hospitals are required to report workload, not all did so in 1997/1998, so data for that year are not complete and, therefore, have not been used to track trends.

There is also a great deal of missing information in the MIS database with respect to which workload system was used (there are 5 major methods available). Given that there was no requirement for hospitals to use a common method, the workload systems used to collect these data vary across hospitals and even across units within the same hospital. The difference in data collection tools may account for some of the variation in results.



**Table 2.6: Total Workload/Worked Hours by Hospital Type 2000/01**

Type of hospital	Total # of hospitals	Potential # of FCs if all 8 types present in each hospital	Functional centres excluded b/c not applicable	Functional centres excluded b/c of extreme values*	Number of Functional centres in analysis	Number of Functional centres reporting values >=85%	Number of Functional centres reporting values >=93%
Chronic/Rehab	20	160	114	5	41	19 (46%)	12 (29%)
Community	74	592	236	43	313	181 (58%)	107 (34%)
Small	52	416	272	31	113	47 (42%)	26 (23%)
Teaching	10	80	32	4	44	30 (68%)	14 (32%)
ALL TYPES	156	1,248	654	83	511	277 (54%)	159 (31%)

\*Note: extreme workload/worked hours values are <40% or >110%

When productivity or utilization rates are too high, the consequences may include increases in absenteeism (due to either physical or mental health problems), adverse events, turnover, and/or patient complaints.

Ontario hospital nurses spend some of their time in non-patient specific activities. While some of these activities (e.g., narcotic counts, program development, student supervision) require the skill and knowledge of nurses, others (e.g., clerical, portering, housekeeping activities) could be delegated. Nurses working in small hospital assume a greater proportion of these tasks than nurses in other sectors (Table 2.7). This is likely due to the size of their organizations.

**Table 2.7: Proportion of Total Workload comprised of Non-Patient Specific Workload**

	Overall	Teaching	Community	Small	Rehab/Chronic
Mean	.16	.09	.16	.19	.09
Median	.14	.11	.15	.14	.09
SD	.113	.052	.086	.148	.070

## The Impact of Work Overload on Supply

An adequate supply of appropriately educated nurses is essential for the ongoing viability of the health care system. To maintain or increase supply to meet predicted demand, health system administrators must understand the factors that contribute to successful recruitment and retention of nurses. According to research, turnover is related to lack of job satisfaction (Irvine & Evans, 1995), and lack of job satisfaction is significantly related to work overload (Aiken et al., 2001).

Work overload occurs when the demand for nursing resources exceeds the existing supply. When this occurs nurses are asked to assume greater patient care loads, work more efficiently in order to assume greater workload, and work more overtime. These expectations increase nurses' stress and have detrimental effects on their health (O'Brien-Pallas, Alksnis, Wang et al., in press; O'Brien-Pallas, Alksnis, Wang, Birch & Tomblin Murphy, 2003). Negative work environments tend to increase absenteeism (Karasek, 1990) and turnover (Janssen, Jonge, & Bakker, 1999).

## Nursing in the Community

### Staffing Trends

As noted earlier, data on staffing in community care are not available – although they are beginning to be collected.

### Reliance on Part-Time Nurses

According to College of Nurses of Ontario data, RNs who work in the community have a slightly greater chance of working for multiple employers than hospital nurses, but are less likely to work for more than one employer than long-term care RNs. Conversely, RPNs in the community are more likely to hold two jobs than those employed in hospitals and in long-term care. RPNs were also more likely to have multiple employers in 2001, compared to 1999 and 2000.

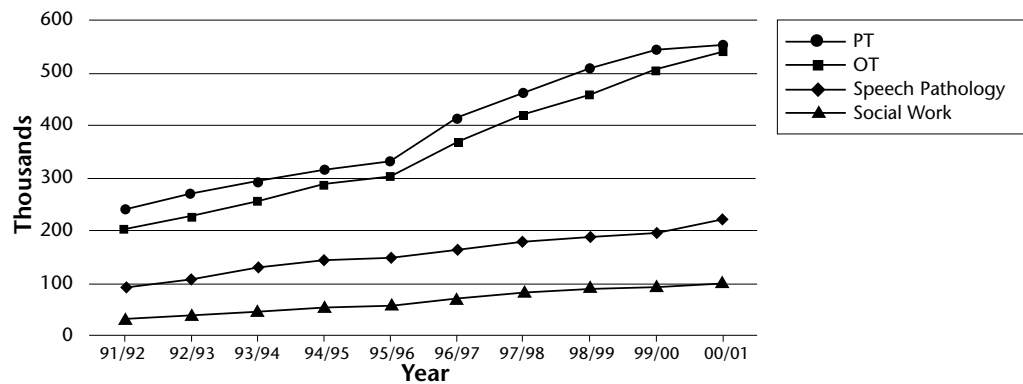
Heavy reliance on part-time nurses in the community is cause for concern because of its potential impact on patient outcomes: the continuity of care provider in community health nursing is associated with fewer visits and improved patient outcomes (O'Brien-Pallas et al., 2001, 2002).

To cope with a shortage of nurses and increasing workloads in the community, some nurses are providing care during unpaid hours. Some agencies are also delegating nursing tasks to other health care workers, shifting tasks to other informal caregivers, or arranging for care to be delivered in settings outside the home. For example, home care which, by definition, is care provided in peoples' homes, is now being delivered by a growing number of CCACs via clinics to which patients are required to travel due to the lack of staff available to travel to peoples' homes (Ontario Health Coalition, 2001).

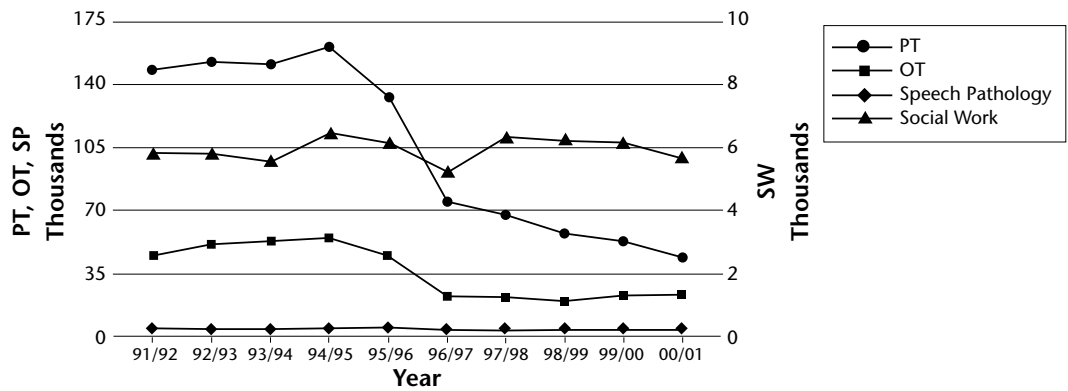
### Use of Allied Health Providers

Between 1991 and 2001, the community sector documented a steady increase in allied health visits for chronic acuity patients (Figure 2.36). While the number of allied health professional visits are still relatively small compared to the number of nursing visits (i.e., in the thousands as opposed to the millions), the use of this type of care is increasing. The trend in the use of allied health providers with acute patients (Figure 2.37) is different: there are fewer visits, and there has been a substantial decline in the use of physiotherapy and occupational therapy services in the last five years.

Figure 2.36: Chronic Home Care Visits by Allied Health Professionals



**Figure 2.37: Acute Home Care Visits by Allied Health Professionals**



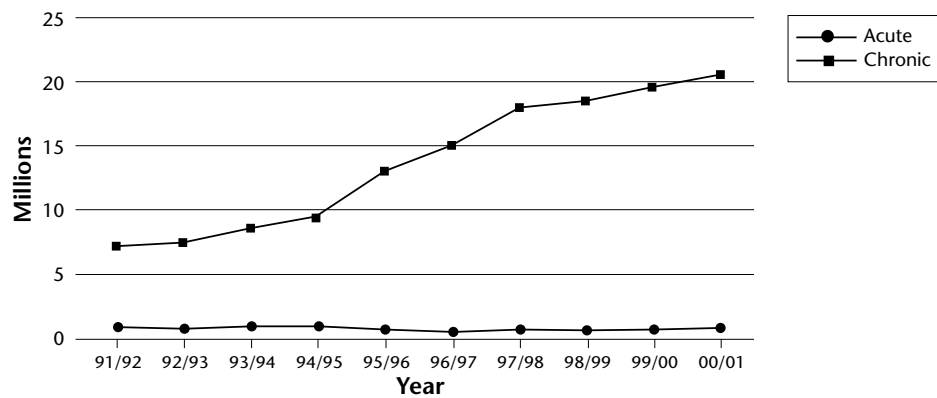
**Homemaking**

CCACs arrange for homemaking services, which are provided by unregulated health care providers for:

- households in which there is a child who might need care during the absence, illness, convalescence, or incapacity of the usual care provider
- a person who is elderly, handicapped, ill, or convalescent in order that he or she may remain in his or her own home
- households in which the standard of housekeeping requires improvement to avoid familial or financial difficulties which are likely to cause or contribute to dependency on public assistance.

CCACs are pushed to deliver as much care as possible within their funding envelope. Since 1991, the hours of homemaking services provided for chronic patients has almost tripled, from 7.2 million to over 20.4 million in 2001 (Figure 2.38), while the volume of homemaking service supplied to acute patients has declined. One CCAC reports that homemaking now accounts for 43% of the client care dollar. Some have questioned whether unregulated homemaking providers are being used to perform nursing duties (Community Health Nurses Interest Group, 1998).

**Figure 2.38: Home Care Homemaking Hours**



A number of CCACs are also reporting that homemaking services are having increasing difficulty keeping their personal support workers (PSWs), once they receive their PSW certification from a community college. With this certification, PSWs can work in a long-term care facility and in some hospitals. Higher salaries and potentially greater job security make positions in the long-term care and

hospital sectors extremely attractive. The reported salary differential in one CCAC area between the community and the long-term care sector is \$4.00 per hour (Ottawa Carleton CCAC cited in Ontario Association of Community Care Access Centres, 2000).

### ***Shifting the Burden of Care***

In a documentary series on the health care system, the Toronto Star (May 28, 2002, p. A11) reported that Community Care East York in Toronto and other service providers throughout the province have begun testing people's ability to use family or their own money to cover their care. The report goes on to state that "because there are fewer people working in the system relative to the number of people who need service, there is more of a shifting on to families, causing family caregivers to burn out, especially when respite hours are cut" (Toronto Star, May 28, 2002, p. A11).

In addition to possible greater reliance on family, more care is being provided by community nurses and homemaking staff outside paid hours. Due to the limited amount of time nurses and homemakers are given to provide care, many give the range of care clients need, even in the absence of funding/renumeration. This results in what has been termed 'invisible nursing care' (Chalmers & Kristjanson, 1992).

## **Working Conditions**

### ***Wages, Benefits, and Supports***

The salaries and benefits of all community care service providers have historically been lower than those earned by providers in comparable positions within the hospital and long-term care sector and remain so today. Wages of community nurses have not kept pace with those of their hospital counterparts. For example, RNs from the Toronto branch of the Victorian Order of Nurses, who had not had a raise in 10 years, recently voted to accept a pay increase of 18% to 20% over four years. Their top salary of \$23 an hour was between \$4 and \$7 less than that of hospital RNs, who can earn up to \$30.25 an hour. This differential is further exacerbated by benefits packages, which are also substantially lower in the community sector (Ontario Association of Community Care Access Centres, 2000).

The supports for community nurses have also been cut. For example, there has been a reduction in paid comprehensive orientation programs, clinical support, competitive mileage reimbursement, staff reimbursement, and participation in student placement programs (Community Health Nurses Interest Group, 1998; Ontario Health Coalition, 2001). This trend may be having an impact on the number of nurses pursuing community nursing as a career option. The College of Nurses of Ontario reports that 12.6% of new RN graduates in 1999 and 2000 chose community nursing, down from the 14.5% of graduating RNs who chose community nursing prior to 1999.

The declining structural supports in the community may be a factor in the increase in absenteeism and long-term disability claims among community nurses and higher worker compensation costs for employers. Workers who rush through their work and visits may be more likely to fall prey to illness, stress, and accidents on the job (Ontario Community Support Association, 2000).

### ***Turnover Rates***

The deterioration in working conditions in the community, combined with increased opportunities in other sectors, has led to a migration of community nurses. In February 2000, the Ottawa-Carleton Community Care Access Centre reported the results of a survey of their nursing agencies relating to employee turnover rates. The range reported by the agencies for 1999 was from a low of 20% to a high of 75% for RNs and a range of 16% to 61% for RPNs. The primary reason agencies gave for this level of staff turnover was increased hiring by the hospital sector. Between April 1, 1999 and March

31, 2000, the Victorian Order of Nurses also experienced 29% turnover in RNs and 27% in RPNs. Among those who left, 40% accepted employment in the hospital or long-term care sector (Ontario Association of Community Care Access Centres, 2000).

These trends are reflected in CNO data for the province as a whole, which indicate that fewer community nurses stayed working the same sector in 2001 than in 2000, and more left nursing altogether. In 2000, about 85.7% of RNs and 76.9% RPNs working in the community in 1999 continued to work in the community. In 2001, the proportions decreased to 79.6% and 65.4%. In 2000, 2.6% of community RNs and 7% of community RPNs quit working in nursing. In 2001, the proportion leaving nursing had increased to 7.4% of community RNs and 15.4% of community RPNs.

Age also appears to be a significant factor in migration of community nurses to other sectors. RNs and RPNs who continue to work in community care are older than nurses who shift to the hospital, long-term care, or other sectors. For example, in 1999/00, the average age of community RNs who remained in the sector was 43.7 and they were, on average, older than those who migrated to hospital, long-term care, and other sectors by 8.0, 3.3, and 1.3 years respectively. The age differences between RPNs in the community and the hospital, long-term care, and other sectors are 3.0, 3.7, and 2.7 years respectively (CNO).

Based on these trends, the community is experiencing a loss in human resources, which must have an impact on care. For example, provider organizations are reporting that waiting lists for service are increasing (Canadian Institute for Health Information, 2000a). While the Ontario Association of Community Care Access Centres (OACCAC, 2000) notes that “the Ministry of Health and Long-Term Care’s stated position is that there cannot be a waiting list for nursing services” (p. 14), the recent experience of CCACs is that waiting lists for nursing care are a growing reality.

Each month, the 43 CCACs in Ontario report the number of clients waiting for home care services to the Ontario Ministry of Health and Long-Term Care. However, some hospitals have stopped referring to CCACs because CCACs are independently determining what patient types, services, and number of visits will be provided to patients discharged from hospitals. As a result, the number of people on waiting lists may not reflect the true level of need in the community. The available data on clients waiting are likely conservative (because of inconsistent and variable reporting methods within and across CCACs) and the values for particular services cannot be compared from one month to another, so they are not reported here. Other possible measures of demand for community nursing are delayed discharges from hospitals (which would represent an increase in alternate care beds) or increased admissions to hospitals and long-term care facilities (Ontario Association of Community Care Access Centres, 2000).

## **Nursing in Long-Term Care**

### **Staffing Trends**

#### ***Full-Time vs. Part-Time Employment***

CNO data indicate that there were 6,254 RNs and 6,790 RPNs employed in the LTC sector in 2001, an apparent drop from 6,814 and 6,944 respectively the year before. They also show that RNs working in long-term care have a slightly greater chance of working for multiple employers than nurses in the hospital and community, while RPNs in long-term care have a slightly greater chance of working for multiple employers than nurses working in the hospital sector. Since 1993 there has been a shift in employment status across the sector. In 1993, 46.3% of RNs in long-term care were working full-time and 40.8% were working part-time. By 2001, 53.6% were working full-time and 38.3% were working part-time. The percentage of RPNs employed full-time increased slightly from 48.1% in

1993 to 48.6% in 2001, while the number of RPNs employed part-time increased from 39.6% to 42.7% during the same time period.

### ***Use of Other Professionals***

According to a PricewaterhouseCoopers report (2001), Ontario provides fewer overall hours of nursing care in long-term care facilities than other Canadian jurisdictions. The proportion of care provided by registered nurses in Ontario (11%) is less than in Manitoba (16%) or Saskatchewan (19%). In Ontario, three quarters of care is provided by health care assistants, compared to 71% in Manitoba and 80% in Saskatchewan. When comparing long-term care service levels, it is important to note the similarity and differences in the resident populations. Ontario long-term care facilities have a higher proportion of residents with behaviour problems and reduced physical functions than other jurisdictions, and similar distributions of residents with impaired cognition and those who require clinically complex care.

## **Working Conditions**

### ***Workplace Safety***

Due to the high workload in this sector, and the fact that the nurses working in long-term care are on average older than their community and hospital counterparts, workplace injuries are common. Nurses in this sector also report physical injury due to caring for people with impaired mobility as well as physical abuse by clients. The PricewaterhouseCoopers (2001) study showed that 39% of residents exhibit aggressive or angry behaviour that often results in staff injuries.

### ***Education/Support***

Dementia and cognitive impairment always means that residents require more care, not less. The maintenance of quality resident-centered care in long-term care facilities requires not only the appropriate numbers of staff but also staff with greater expertise (Burl et al., 1998). Few nurse training programs provide specialized training in the care of patients with Alzheimer's or related dementia, so caregivers in long-term care facilities, acute care hospitals, and the community are often ill equipped to provide optimum care for these patients (Gillick et al., 1996). Both residents and caregivers feel the impact of this lack of expertise. The potential for poor management of residents frequently leads to excessive acute care hospital stays and added strain on staff within long-term care facilities (PricewaterhouseCoopers, 2001).

## **Nurse Practitioners**

The nurse practitioner (NP) role was originally developed in response to the need for primary health care in remote and under serviced areas and the reduction in medical residents in academic medical centres. However, the expansion of the NP role into new settings is being driven by the benefits of NP practice to patient care throughout the health care continuum (Alpert, Fjone, & Candela, 2002; Mundigner et al., 2000; Mundinger, 2002; Sox, 2000).

### **History of NP Education and Utilization**

Nurse practitioners have been educated in Canada since the 1960s. In 1967, Dalhousie University in Nova Scotia offered the first education program for NPs working in northern nursing stations. In 1971, the Boudreau Report made the implementation of the expanded role of the RN a high priority in Canada's health care system, and the first university program in Ontario began to prepare expanded role RNs. However, the first NP initiative ended in the early 1980s due to: perceived physician oversupply as well as the lack of mechanisms to pay NPs, legislation, public awareness regard-

## About Nurse Practitioners

According to the Canadian Nurses Association (Lisa Little, Canadian Nurses Association, personal communication, January 28, 2003), a nurse practitioner is a Registered Nurse with additional education who is licensed to practice in an extended or expanded role within his/her province or territory. Through provincial and territorial changes to existing legislation, nurse practitioners have been given the independent authority to perform additional acts. The acts authorized to nurse practitioners vary from province to province but may include: diagnosing illness and diseases; prescribing, dispensing, and administering medications and treatments; and ordering diagnostic tests such as ultrasounds, x-rays, and lab tests.

In Ontario, “nurse practitioner” is the term commonly used to refer to certain nurses working in primary health care. These nurses complete additional education to become registered in the extended class (RN(EC)) with the College of Nurses of Ontario. Like all NP roles, the role of the RN(EC) emphasizes health promotion and disease prevention and serves individuals, families, and communities. In collaboration with the client and a variety of health care professionals, the nursing practice of the RN(EC) addresses client health needs across the life span. The workplace of the RN(EC) varies, but includes both rural and urban areas, community health centres, home health services, long-term care, Aboriginal health, correctional services, occupational health, and emergency departments in hospitals or urgent care clinics (<http://www.ryerson.ca/programs/nurpract.html>; January 28, 2003).

Nurse practitioners working in acute settings and providing care to patients who are acutely or critically ill are commonly called Acute Care Nurse Practitioners (ACNPs) or Specialty NPs (SNPs). Titles used in Ontario for NPs working in acute care include Clinical Nurse Specialist/Nurse Practitioner, Nurse Practitioner/Clinical Nurse Specialist, Advanced Practice Nurse, and Expanded Role Nurse. These NPs are not regulated by the College of Nurses of Ontario beyond the general class but provide advanced nursing care usually to a specific patient population in a variety of care settings such as outpatient clinics, in-hospital environments, and long-term care facilities. As the Public Hospitals Act restricts RN(EC)s and other NPs working in hospital settings in Ontario, NPs working in acute care generally work with physicians using medical directives that are specific to single sites and adopted through hospital policies. However the future proclamation of Bill 965 will enable RN(EC)s to have selected hospital privileges.

ing the role, and support from both medicine and nursing. In 1983, the only remaining NP program in Ontario (McMaster University) closed (<http://www.npao.org/role.html>; January 28, 2003).

Throughout the 1980s and early 1990s, about 250 NPs in Ontario continued to function, working mainly in community health centres and in northern nursing stations. Despite the failure of the first initiative, the NP role was consistently cited in the recommendations of many provincial health care commissions and task forces. In 1993, the Ontario Minister of Health announced a new nurse practitioner initiative as part of improving access to health care. The project included: major discussion papers, a steering committee, consultation with key stakeholders in the health care delivery system, the development of a university-based post-baccalaureate education program with funding for the first five years, and a five-year evaluation project to review the education program, the placement of NPs, and the impact of NPs on the health care system. In 1994, the Council of Ontario University Programs in Nursing (COUPN), with a consortium of 10 nursing faculties, developed the new NP Program, which started in September 1995. This government-funded education was followed by the Expanded Nursing Services for Patient’s Act in 1998. This established the College of

Nurses of Ontario category of Registered Nurse in the Extended Class (RN(EC)) (<http://www.npao.org/role.html>; January 28, 2003).

The demand for NPs in neonatology arose when lack of government funding led to a reduction in the number of pediatric residents. In 1986, McMaster University introduced the first neonatal NP program and, in 1988, Clinical Nurse Specialist-NP roles were implemented in Level 3 neonatal intensive care units (NICUs) in Ontario. At the same time, the Expanded Role Nurses Project was developed in London, Ontario, to prepare Masters' level RNs to perform additional activities under medical directives. Because of the decreasing numbers of medical staff and resident physicians, more teaching hospitals expressed an interest in the NP role in caring for acutely ill patients. As a result, Post-Masters certificate programs were developed at the University of Toronto and University of Western Ontario. Today, ACNP programs are offered at the University of Toronto in adult and child health, and at McMaster University in neonatology.

### **Employment Status**

College of Nurses of Ontario (2000/01) data indicate that there were 519 nurses registered as RN(EC)s in 2001. Because NP is not a protected title in Ontario there are 372 RNs, 61 RPNs as well as 309 RN(EC)s who identified themselves as NPs.

In late summer 2001, three cohorts of graduates from the Primary Health Care Nurse Practitioner (PHCNP) educational programs were surveyed by the Centre for Rural and Northern Health Research (CRaNHR) on the behalf of the Council of Ontario University Programs in Nursing (COUPN). The 149 graduates represented 44% of the graduates of the regular stream of the NP education program. The three cohorts included a three-year follow-up survey done with the 1998 graduates (n=73), a one-year follow-up survey done with the 2000 graduates (n=51), and an exit survey with the 2001 graduates (n=25). One hundred and nine (73%) of the graduates completed the survey (range 72% to 74%).

Eighty-one (74%) of the respondents were working as NPs at the time they completed the surveys. The percentage working as NPs for each cohort of graduates was: 78% (1998 graduates); 73% (2000 graduates); and 67% (2001 graduates). More than three-quarters (77%) were practising in southern Ontario, while 21% were in northern Ontario, and 2% outside of Ontario. More than half (53%) reported they were in an urban community, 31% in a rural community, and 16% stated they practised in a combined urban/rural community. Nearly half (47%) reported they were practising in a community designated as under serviced by the Ontario Ministry of Health and Long-Term Care. The graduates were practising in 14 different settings with nine reporting more than one practice setting. The most common practice settings were: community health centre (43%), physician's office/family practice unit (11%), hospital ambulatory (11%), aboriginal health care centre (9%), long-term care facility (9%), specialty clinic (7%), and emergency department (5%) (Caty, Michel, Pong, & Stewart, 2002).

Fifty-two percent reported they had a full-time permanent position and 15% a full-time contract position. The others (33%) reported they were working part-time. Of these, 15% reported they had a permanent position and 17% said they had a contract position. Only 1% said they were working on a casual basis. The majority reported they worked with clients of all ages, and many described these clients as being disadvantaged or as people who may otherwise have difficulty accessing primary health care services. Others described their clients as a typical family practice clientele. A few reported working with specialty groups such as long-term care residents, transplants clients, women and adolescents with reproductive health needs, and hospital inpatients. For most, the focus of their practice was a combination of health promotion, disease prevention, health maintenance, and treatment of common illness (Caty, Michel, Pong, & Stewart, 2002).



Twenty-eight (26%) of the graduates were not working as NPs at the time of the survey. Eleven of the 1998 and 2000 graduates who were not working as NPs reported they had worked as NPs since graduation. They reported they left these NP positions for the following reasons: short-term contracts expired, working conditions that did not allow full utilization of NP knowledge and skills, feeling professionally and socially isolated, and wanting to be closer to home and family. At the time of the surveys, most were employed in nursing and all but one said they were looking for NP work. The one who said she was not looking for NP work reported she did not feel prepared to practice as a NP (Caty, Michel, Pong, & Stewart, 2002).

Of the 17 graduates who had not worked as NPs since graduation, most (82%) were working in nursing at the time of the survey. Thirteen (76%) of the graduates were looking for NP work and reasons given by the 1998 and 2000 graduates for not finding NP work were similar (e.g., not being able to relocate because of family responsibilities, lack of positions in their area, being content with their present nursing position, and not wanting to jeopardize their benefits). The 2001 graduates who were not employed as NPs stated they had been studying for the "extended class" registration and had not actively started to look for NP work (Caty, Michel, Pong, & Stewart, 2002).

Only four (24%) of the 17 graduates who had not worked as NPs reported they were not looking for NP work and these four were 1998 and 2000 graduates. Reasons given for not looking for an NP position included being satisfied with their present nursing position and not wanting to jeopardize their financial benefits, not having the "extended class" designation, not feeling competent as a NP, and not being able to relocate because of family responsibilities (Caty, Michel, Pong, & Stewart, 2002; Source references are available from the Centre for Rural and Northern Health Research, Laurentian University, Sudbury Ontario P3E 2C6 [www.laurentian.ca/cranhr](http://www.laurentian.ca/cranhr)).

### **Recruitment and Retention of Nurse Practitioners**

The Canadian Association of Schools of Nursing (CASN) reports that the number of people applying to the COUPN NP educational program has significantly decreased over the last few years (Carrine Gallagher, CASN representative, Laurentian University, personal communication, February 3, 2003), although enrolment in out-of-province distance education programs has increased (Mary van Soeren, NPAO, personal communication, March 24, 2003). Difficulties were also encountered during the past years in filling some of the newly funded NP positions in rural and northern areas of the province. This may be due to the type and requirements of the positions, to the lack of NPs residing in these areas, or to the inability of NPs from other areas to relocate to these areas. The emergence of recruitment and retention issues suggests there may be a need to look at incentives similar to those offered physicians, such as paying for tuition or living expenses to attract NPs to some areas of the province. Otherwise there may continue to be vacant NP positions and NPs unable to find work. Recruitment strategies will be especially important as the government continues to implement the Family Health Network initiative (Caty, Michel, Pong, & Stewart, 2002).

### **Recent Nurse Practitioners Funding Programs**

In May 1998, the provincial government announced \$5 million in annual funding to upgrade 87 nursing positions to NP positions and to create 34 new NP positions in community-based settings. In March of the following year, an additional \$10 million in annual funding was announced to support 106 nurse practitioner positions in under serviced areas, Aboriginal Health Access Centres, long-term care facilities, and Primary Care Networks: 52 of the positions were awarded in northern Ontario and the remainder in southern Ontario.

On June 15, 2000, the MOHLTC launched the Ontario Cervical Screening Program and announced a \$4.7 million investment to improve early detection of cervical cancer through province-wide screening. The outreach initiative teams NPs with five northern health units (Government of

Ontario, 2003b). This two-year initiative, referred to as the Nurse Practitioner Cervical Screening Pilot Project, is designed to provide cervical cancer screening as well as other health and wellness outreach services to hard-to-reach women. The Public Health Research Education Development Programme (PHRED) is responsible for an evaluation, which includes client demographics and description of the catchment area of the Health Unit, client experience, overall project delivery, provision of cervical screening and other clinic services, an estimate of direct and indirect costs, and NP recruitment (Michel, Ehrlich, Wright, Szadkowski, & McFarland, 2002).

These investments brought the current number of government funded NP positions in Ontario to over 250. In September 2002, the provincial government committed to more than double this number by 2005 (or 369 new positions in three years). As a first step toward meeting this commitment, the MOHTLC committed \$14 million in funding in the 2003/04 fiscal year to support 117 new NP positions that would focus on enhancing primary health care in small, rural, and under serviced communities. In a separate funding initiative, 20 of these positions will be used to support demonstration projects in 12 high-needs communities where many of the NPs will be the first point of access to primary health care services. The provincial government has also provided \$1.7 million annually to support a consortium of 10 universities to provide the Nurse Practitioner Education Program (<http://www.newswire.ca/government/ontario/english/releases/September2002/24/c4283.html>).

### **Research About Nurse Practitioners**

Despite their education and experience delivering health care in under serviced areas, NPs remain an underutilized group. A meta-analysis of 11 randomized controlled studies and 23 observation studies by Horrocks, Anderson, and Salisbury (2002) compared nurse practitioners and physicians providing care at first point of contact for patients with undifferentiated health problems in a primary care setting. The authors found that patients of NPs were more satisfied with their health care provider, and had comparable health care status as the patients of physicians. NPs spent slightly more time per visit with their patients and made more investigations than did physicians. No differences were found in prescriptions, return consultations, or referrals. Caution should be used in interpreting these results because of some ambiguity among the studies in the use of the term nurse practitioner, the quality of studies available in this area, and the heterogeneity of outcomes between the studies.

In July 2001, Dr. Alba DiCenso, Professor of Nursing and Clinical Epidemiology and Biostatistics at McMaster University was appointed the Chair in Advanced Practice Nursing (APN) by the Canadian Health Services Research Foundation. This 10-year position is designed to advance research related to the introduction and evaluation of APN roles, including NP roles. At the present time, Dr. DiCenso is leading a study funded by the MOHLTC that is examining the facilitators and barriers to the full integration of primary care NPs into the health care system in Ontario. Data are being collected for all RN(EC)s in Ontario, family physicians who work and do not work with NPs, all types of sites in which NPs practice, and patients who have received care from an NP.

### **Future Nurse Practitioner Initiatives**

Many recent reports have recommended that one of the ways to increase access to primary health care providers is to fully integrate NPs into primary health care reform. In 2002, the first Family Health Network (FHN) officially opened, marking a move towards primary care reform. The networks may use other allied health professionals such as nurse practitioners (Government of Ontario, 2003a).

# 3 *The Future*

## *How Many Nurses Will We Have? How Many Will We Need?*

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### **D**oes Ontario have the right number of nurses to meet needs now? Will it have enough nurses in the future?

Given the current state of the science, these questions cannot be fully answered at this time. The numbers cited in this document provide an overview of nurse supply and reported rates of utilization, but these data are not sufficient to address the issue of how many nurses we need to meet client demand for service. Models used to predict future requirements for nursing at both the micro level (i.e., on a particular unit, for the short term) and at the macro level (i.e., to determine aggregate needs for some future point in time), which are based on simple supply and utilization data, have limited validity because they are based on the status quo. Planners should not make the assumption that today's practices represent best practices, because there are no data to support that assumption. Supply and utilization data do not address the question of determination of health need or the environmental, contextual, and social issues that influence the need for nursing resources. They also do not allow planners to estimate accurate ranges of numbers and types of nursing personnel required to meet current and future health care need. To develop valid, reliable estimates, more research is required.

Taking into account the limitations of current science and data, this section attempts to assess the adequacy of nurse supply in the future, and predict future needs.

## **1. Theoretical Considerations**

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Health personnel – the different kinds of clinical and non-clinical staff involved in each individual and public health intervention – are a health system's most important inputs (WHO, 2000). Health human resource planning (HHRP) attempts to determine the appropriate quantity, mix, and distribution of health personnel to deliver health services and meet health needs.

There is no unambiguous 'right' number and mix of health professionals (O'Brien-Pallas, Birch, Baumann, & Tomblin Murphy, 2001). Instead, health provider requirements are driven by broader societal decisions about:

- the resources available for health care
- how health programs are organized, funded and delivered
- the level and mix of services the system will provide.

Although a health system may always be able to do more to meet populations' needs, the decision to do more will depend on what else a society must give up to provide the additional resources. These essentially subjective considerations influence health human resources planning (O'Brien-Pallas, Birch & Tomblin. Murphy, 2001).

In most countries, health human resource planning has been poorly conceptualized, intermittent, varying in quality, profession-specific in nature, and without adequate vision or data upon which to base sound decisions. The continuous cycles of over and under supply of health human resources world-wide reflect the inadequate projection methods used to estimate future requirements for expanding health systems and/or the failure to consider the evidence of ongoing labor market trends.

To ensure system efficiency and effectiveness, planning activities should be needs-based, responsive to a changing system, and outcome directed (O'Brien-Pallas, 2002). This is particularly important in nursing resource planning because, although Ontario has had a 75 year history of shortages and surpluses of nursing personnel, the nursing workforce situation in 2003 is critical. Never before have demographic shifts such as the baby boom bulge, resulting in an increased need for nursing services, coincided with a larger array of professional choices for young people who may have considered nursing as a career.

A variety of authors have conceptualized these issues in different ways. In thinking about the human resource process, Hall (1993) considers the inter-relatedness of three major steps: planning, production, and management. The focus on one component at the expense of the others does little to ensure an effective and efficient health system (O'Brien-Pallas, Baumann, Birch, & Tomblin Murphy, 2000). Yet when we view the work to date in HHRP, these conceptual linkages have not been made. Moreover, few countries have implemented HHRP strategies that take into account the link between quality work environments, the ability to recruit and retain nurses, and population health outcomes. To maintain our current workforce and provide an attractive and competitive opportunity for future nurses, nurses' workplace concerns must be addressed and conceptualized as part of the human resource planning framework (O'Brien-Pallas et al., 2002).

### **The Framework/Model for Planning**

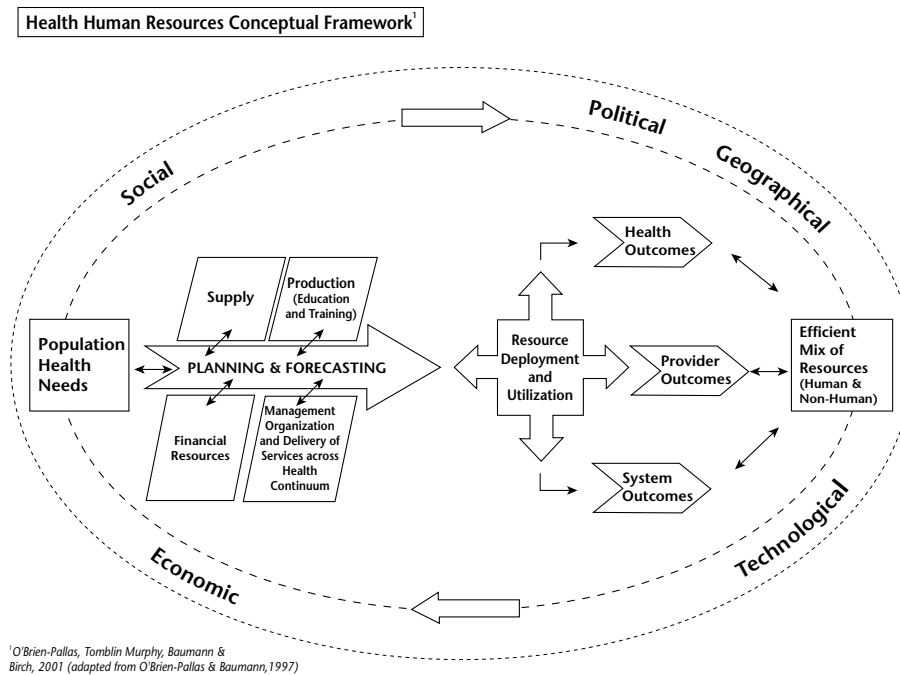
Given that the many routes taken toward HHRP do not seem to build upon each other, the NRU has created a system-based framework to guide its inquiry. Building on the work of Andersen's service utilization model (Andersen, 1995), Donabedian's quality of care framework (1966), Leatt's conceptualization of technology in human services organizations (Leatt & Schneck, 1981), and the work of the Canadian think tank summarized by Kazanjian, Pulcins, and Kerluke (1992), the NRU has developed a conceptual model that considers the key elements of the human resource planning process (Figure 3.1).

This dynamic open system-based framework has been selected to guide decisions about elements to consider in human resource planning (CIHI, 2001). (See Appendix C for the details of the model, reprinted with permission from the Canadian Journal of Nursing Research.)

The major challenge with this type of modeling is acquiring the detailed need and utilization data required to examine the complex relationships among all the variables that influence resource need and outcomes. The model is currently being tested in the hospital sector in a study funded by the Canadian Health Services Research Foundation (Tomblin Murphy, O'Brien-Pallas et al., 2000 - 2003). Preliminary results from this study, which will provide policy makers with a method to simulate "what if" scenarios related to various policy initiatives prior to full scale application in the field, will be released by the fall 2003.

The NRU, with funding from MOHLTC, is also in the process of developing an application of the model for use in the home care and long-term care sectors.

Figure 3.1: Health Human Resources Conceptual Framework



## 2. Supply and Utilization/Demand Approaches to Estimating Nursing Resources in Ontario

Implementation of the full NRU model in the hospital sector will represent the first application of a needs-based outcome directed approach to planning. This report is scheduled for release in late fall 2003. However, until that framework is in place, the NRU has used two other types of models to estimate future nursing requirements:

- a “supply-based approach” to determining losses in both the RN and RPN workforce in the province of Ontario over the next five years
- a “utilization/demand-based approach” that examines utilization of hospital services by age and sex of the population and the current nurse staffing responses in order to estimate future RN and RPN nursing requirements. This approach was applied to hospitals only because the hospital sector is the only one for which suitably detailed administrative data were available.

Any model for estimating future resource requirements is based on assumptions that may affect the accuracy of the estimate. For example, the “supply-based approach” assumes that the number of RNs and RPNs who are currently members of the College of Nurses of Ontario and working in nursing is adequate to meet the nursing care needs of Ontarians and will continue to be so into the future. It also assumes that loss rates in the past will hold into the future. The “utilization/demand-based approach” shares these assumptions but also makes the assumption that the hospital services provided are appropriate to meet the health needs of the population now and in the future, and that there will be no major changes in services utilization and how services are delivered in the future. Both sets of assumptions must be considered potential limitations on the accuracy of these models.

## Supply-Based Projections

### Nurse Losses Due to Retirement or Death

In the supply-based model of projected losses for nurses age 50 and older, the NRU adopted the age-cohort survival method, in which annual loss rates between 1997 and 2001 were calculated for a single-year age cohort, then averaged over four years, and applied to the forecast period until 2008. A four-year “averaged” loss rate is used to avoid falsely interpreting one-year fluctuations as indicative of a longer-term trend. The rationale for projecting losses for only the 50 and older age group is straightforward: in 2001, approximately 33% of the RN workforce and 31% of the RPN workforce were over 50 years of age. Nurses in this age group are already retiring and, as baby boomers continue to enter retirement age, that trend is likely to increase.

#### Data Sources

Two data sources were used to project retirement losses of nurses for Ontario:

- vital statistics from Statistics Canada
- the RN and RPN database from the College of Nurses of Ontario.

This approach was used to project losses for the overall nursing workforce and for four different sectors: hospital, long-term care, community, and “other”. Two sets of estimates are provided:

- expected losses of nurses 50 and older due to either death or retirement until 2008, assuming nurses generally work to 65 years
- expected losses if nurses retire at 55 years of age.

Table 3.1 and Table 3.2 list the average loss rates of RNs and RPNs from the workforce in the years 1997/98, 1998/99, 1999/00, and 2000/01. It can be seen that the rates vary from year to year.

**Table 3.1: Average Loss Rates of RNs from the Workforce**

Age	1997-98	1998-99	1999-00	2000-01	Average
50	0.025	0.043	-0.035	0.025	0.014
51	0.029	0.036	-0.038	0.035	0.015
52	0.019	0.035	-0.048	0.048	0.013
53	0.044	0.044	-0.049	0.050	0.022
54	0.047	0.054	-0.022	0.072	0.038
55	0.081	0.085	-0.025	0.118	0.065
56	0.100	0.103	-0.018	0.118	0.076
57	0.099	0.090	-0.023	0.124	0.072
58	0.108	0.114	-0.009	0.133	0.086
59	0.124	0.107	0.005	0.153	0.097
60	0.225	0.212	0.062	0.225	0.181
61	0.206	0.173	0.025	0.256	0.165
62	0.196	0.187	0.047	0.206	0.159
63	0.221	0.206	0.045	0.249	0.180
64	0.327	0.278	0.078	0.276	0.239
65	0.632	0.583	0.323	0.495	0.508

Data source: CNO

**Table 3.2: Average Loss Rates of RPNs from the Workforce**

Age	1997-98	1998-99	1999-00	2000-01	Average
50	0.030	0.055	-0.017	0.072	0.035
51	0.029	0.054	-0.004	0.068	0.037
52	0.016	0.049	-0.017	0.094	0.035
53	0.035	0.048	-0.004	0.062	0.035
54	0.054	0.030	0.000	0.120	0.051
55	0.100	0.106	0.021	0.147	0.094
56	0.098	0.086	0.010	0.153	0.087
57	0.097	0.093	0.019	0.132	0.085
58	0.127	0.128	0.026	0.149	0.108
59	0.118	0.075	0.042	0.204	0.110
60	0.223	0.199	0.081	0.278	0.196
61	0.253	0.295	0.054	0.255	0.214
62	0.184	0.186	0.010	0.220	0.150
63	0.194	0.216	-0.010	0.196	0.149
64	0.242	0.322	0.150	0.227	0.235
65	0.653	0.617	0.492	0.559	0.580

Data source: CNO

### **Retirement at Age 65**

Tables 3.3 and 3.4 list projected losses of RNs and RPNs due to retirement (at age 65) or death. To develop the estimates, the NRU calculated annual cohort loss rate for each single-year age group (between 50 and 65) from 1997 to 2001, and averaged the rate across the four years. Each cohort's supply was then projected forward to future years by applying the same rate to the age cohort of nurses over age 50 in 2001. Based on the assumption that the loss rate will remain constant, the pool of nurses over age 50 was aged year by year until 2008.

According to this model, Ontario will lose 15,611 RNs within 5 years (Table 3.3). Hospitals, the largest workplace sector, will lose the largest number of RNs (9,597), followed by the "other" sector (2,806), community sector (1,548), and long-term care sector (1,429).

**Table 3.3: Expected RN Losses Until 2008 in Ontario: Assuming people work until age 65**

Sector	01-02	02-03	03-04	04-05	05-06	06-07	07-08	Total
Hospitals	1208	1263	1324	1365	1418	1484	1536	9597
Long-Term Care	192	197	215	196	203	209	216	1429
Community	155	174	197	213	243	271	295	1548
Other	334	355	368	404	418	442	485	2806
Overall	1930	2031	2146	2219	2311	2429	2547	15611

**Notes:**

1. Data source: CNO
2. Projections are based on 4-year average loss rate.
3. Overall losses are losses in nursing regardless of where they work. The overall number does not add up to the sum of sector losses.

Ontario will also lose 5,124 RPNs between 2001 and 2008. The greatest losses will occur in the hospital and the long-term care sectors (Table 3.4).

**Table 3.4: Expected RPN Losses Until 2008 in Ontario: Assuming people work until age 65**

Sector	01-02	02-03	03-04	04-05	05-06	06-07	07-08	Total
Hospitals	444	455	469	477	481	487	498	3311
Long-Term Care	86	96	108	117	130	144	154	836
Community	3	8	6	7	10	16	26	75
Other	23	16	22	32	41	57	43	234
Overall	625	655	698	737	768	799	841	5124

**Notes:**

1. Data source: CNO.
2. Projections are based on 4-year average loss rate.
3. Overall losses are losses in nursing regardless of where they work. The overall number does not add up to the sum of sector losses.

**Retirement at Age 55**

The projected losses listed in Tables 3.3 and 3.4 were based on the assumption that nurses stop working after age 65 (mandatory age of retirement in Ontario). However, Canadian nurses are retiring much earlier than age 65 (Human Resources Development Canada, 2003). If the current nursing work environment does not improve, this trend will continue and Ontario will see a larger proportion of nurses retiring at age 55. Table 3.5 compares the nursing losses with a retirement age of 55 with the projected losses with a retirement age of 65. Based on this scenario, Ontario will lose almost twice as many nurses (30,086 RNs and 9,131 RPNs) by 2008.

**Table 3.5: Expected RN and RPN Losses Until 2008 under Two Assumptions**

(1) No One Works Over Age 55 and (2) No One Works Over Age 65

	If Retirement at Age 55	If Retirement at Age 65
Expected RN Losses	30086	15611
Expected RPN Losses	9131	5124

**Potential Impact of Retention Strategies**

Effective retention strategies have the potential to help the system keep nurses working and delay retirements. In fact, they have been identified as the key factor in solving nursing shortages and maintaining nurse supply (Registered Nurses Association of Ontario, 2000; Canadian Nurses Association, 1998).

How many nurses could Ontario expect to retain with incentives that would keep older nurses from retiring? The NRU generated projections based on the assumption that, with appropriate retention strategies, it would be possible to retain 100% of 50-54 year old RNs, 75% of 55-59 year olds, and 50% of 60-64 year olds who otherwise would retire. (It was beyond the scope of the projection exercise to propose new retention strategies or to evaluate the success of existing retention strategies. Projected losses that can be retained were generated for the purpose of illustrating how retention strategies can reduce the impact of retirement losses). The NRU at the University of Toronto is just conducting a study to determine the marginal utility of different management and policy options in retaining nurses in different age cohorts as well as nurses who have left the profession all together.

Work rates that factored out mortality and accounted for the retention scenarios for each single year of age between 50 and 65 years were calculated for four years from 1997/98 to 2000/01. The averaged adjusted work rate was applied to the single-year age cohort of nurses over age 50 until 2008. The difference between the losses due to retirement only and the losses under the retention scenarios is the number of nurses Ontario would be able to retain.



According to these assumptions and calculations, with effective retention strategies, Ontario could retain 6,265 RNs and 2,601 RPNs who would otherwise retire from the nursing workforce. This represents 42% of the RNs and 53% of the RPNs that the system expects to lose by 2008.

**Table 3.6: Extra RNs and RPNs Retained by 2008**

Based on assumption Ontario can retain 100% of 50-54 year old RNs, 75% of 55-59 year olds, and 50% of 60-64 year olds.

	RNs	RPNs
Est. Losses due to Retirement or Death	15611	5124
Est. Losses due to Retirement ONLY	14780	4891
<b>Est. Nurses Retained with Retention Scenarios</b>	<b>6265</b>	<b>2601</b>
% saved from losses due to retirement	42.4%	53.2%

**Notes:**

1. Data source: CNO.
2. Projections are based on 4-year average loss rate.

## Utilization/Demand-Based Projections

### Nurse Supply and Requirements

The utilization/demand-based model used to estimate losses in the hospital sector consisted of two components:

- the projected supply of RNs and RPNs over age 20 working in acute care hospitals based on the supply patterns observed in the past
- the projected utilization of nursing services for RNs and RPNs in the future years based on the utilization patterns observed in the past.

Two types of utilization/demand-based projections were developed: one adjusted for patient acuity and the other did not. The shortfall (i.e., the difference between the supply numbers and the utilization based on requirements for nursing) is then estimated for future years. (In these models, “hospitals” refers to acute hospitals only, including medical/surgical, maternal/newborn, pediatric, oncology, critical care, operating room, several clinical areas, palliative care, infection control, and other direct patient care. Rehabilitation and chronic hospitals are excluded.)

The method used to estimate the future nursing supply for the hospital sector in the utilization-based projections is more complex and more inclusive than the method used to project the losses due to retirement or death in the supply-based projections. The former projects the esti-

## Data Sources

The data sources used to project the acuity-adjusted and unadjusted nursing FTE requirements include:

- 2000/2001 CIHI inpatient Discharge Abstracts data that identified the age, sex, and complexity level of individuals receiving different complexity level of treatment for various medical procedures
- population projection data from Statistics Canada that contained the projected population of Ontario by sex-age groups in future years
- 2000/2001 Skill Mix data from MOHLTC that consists of hospital-level annual nursing hours associated with the different hospital units
- direct nursing cost data from 1995/1996 Ontario Case Costing Project (OCCP) used as a proxy for how much time nurses spent with patients of differing ages and acuity levels. (1995/1996 was the most recent costing data available at the time the projections were generated.)

The data sources used to project the supply of Ontario nurses in acute care setting include:

- the CNO data on the number of nurses working in acute care hospitals
- Skill Mix data from MOHLTC for estimating FTEs and converting projected supply numbers to FTEs.

mated supply of all nurses (i.e., over age 20) working in hospitals while the latter is restricted to projecting losses of experienced nurses (i.e., over age 50) due to retirement or death. The two types of projections also have different units of analysis; the former is expressed in FTEs whereas the latter is expressed in number of nurses.

In the utilization-based model, nurses registered with CNO in 2001 were divided into three groups:

1. first time registrants with the CNO in 2001 working in acute care hospitals;
2. first-time renewals (initially registered in 2000, or renewed for the first time in 2001) working in acute care hospitals;
3. repeat renewals (initially registered in 1999 or before, or renewed in 2000 or before) working in acute care hospitals.

Each of these groups needed to be modeled separately. Supply for each was projected forward year by year by applying the loss rates to each group's age cohort of nurses (replenishments to the pool of nurses were also factored in). The sum of the numbers of projected supply from these three was then converted to FTEs in order to allow comparisons between nursing supply and requirements.

The 2000/01 CIHI inpatient data was used to obtain age-sex breakdown of utilization of inpatient services in acute care hospitals. To project the number of people who would use inpatient services in a given future year, the Statistics Canada projections of the number of people in a given age-sex group in some future year were multiplied by the 2000/01 inpatient service utilization figures. The incremental increase of inpatient service usage between the projected year and the base year (2001) was then multiplied by the number of RN and RPN FTEs observed in 2001. This calculation is based on the assumption that future inpatients will be served in the same way that inpatients were served in 2001, and that the growth in the number of RN and RPN FTEs will keep pace with the growth of inpatient service usage. Statistics Canada has generated three population change scenarios based on high growth, medium growth, and low growth, so the NRU developed estimates of inpatient services utilization, RN and RPN FTE requirements, and shortfalls for each of the three population growth scenarios.

Table 3.7 presents the projected supply and requirements of RNs and RPNs in the acute hospital sector in Ontario. In the high growth scenario, Ontario will require 25,652 RN and 4,705 RPN FTEs in acute hospitals in 2008 but there will be only 19,599 RN and 1,909 RPN FTEs in the workforce – a shortfall of 6,052 RN and 2,796 RPN FTEs. The gap between supply and requirements in the low growth scenario is smaller, but still significant: 4,945 RN and 2,591 RPN FTEs.

**Table 3.7: Utilization-based Projections for Ontario RNs and RPNs in Acute Hospitals NOT Adjusted for Acuity**

	2002	2003	2004	2005	2006	2007	2008
<b>RN</b>							
Projected supply	23297	22517	21923	21377	20820	20230	19599
Requirements							
High	23190	23562	23940	24321	24723	25183	25652
Medium	23140	23454	23766	24078	24407	24792	25181
Low	23064	23297	23523	23745	23978	24261	24544
Projected shortfall							
High	-108	1045	2017	2944	3903	4952	6052
Medium	-158	937	1843	2701	3587	4561	5582
Low	-234	780	1601	2368	3158	4031	4945
<b>RPN</b>							
Projected supply	3590	3216	2913	2633	2369	2129	1909
Requirements							
High	4257	4325	4393	4463	4536	4620	4705
Medium	4248	4305	4361	4418	4477	4547	4618
Low	4234	4276	4316	4356	4398	4449	4500
Projected shortfall							
High	667	1109	1480	1829	2167	2490	2796
Medium	657	1089	1448	1784	2108	2418	2709
Low	643	1060	1403	1723	2029	2320	2591

Source: Projections are based on 2000/01 CNO data, 2000/01 CIHI inpatient data, 1995/96 OCCP

(Ontario Case Costing Project) cost data, 2000/01 MOHLTC Skill Mix data, and Statistics Canada population projection data.

## Adjustments for Patient Acuity

The method described above used age-sex adjusted inpatient utilization rates. However, it did not take into account the impact that patient acuity, which has been increasing since 1994, would have on the amount of time nurses spend with patients of differing ages. To adjust for patient acuity, case-costing data were used as a proxy for how much time nurses spend with patients of differing ages and acuity levels, and the impact of different acuity levels on direct patient-related costs was factored in within each age-sex group.

The 2000/01 CIHI inpatient data were used to calculate the proportion of patients within each age-sex group who fell into four different complexity levels (i.e., life-threatening, serious, chronic, no complexity/ complexity not applicable). The projected numbers of inpatients within each age-sex group and complexity level for each future year were obtained by applying the 2001 inpatient service utilization rates to the Statistics Canada population projections. These results were then multiplied by the relative intensity of nursing costs associated with each complexity level (using the grand mean of all patients' direct nursing costs taken from the 1995/96 OCCP data as the standard). To obtain the number of acuity-adjusted FTEs required in a given future year, the incremental increase in inpatient service usage since 2000/01 (adjusted for acuity) was multiplied by the number of RN and RPN FTEs observed in 2000/01.

Table 3.8 presents the projected supply of and patient-acuity-adjusted requirements for RNs and RPNs in acute hospitals in Ontario. With adjustments for patient acuity, the shortfall of RNs in 2008 is 12,897 FTEs in the high growth scenario and 11,794 FTEs in the low growth scenario – more than double the shortfall when requirements are not adjusted for patient acuity. The shortfall for RPNs ranges from 3,823 to 4,025 FTEs – an increase of between 43% and 47% over projections not adjusted for patient acuity.

**Table 3.8: Utilization-based Projections for Ontario RNs and RPNs in Acute Hospital Adjusted for Acuity**

	2002	2003	2004	2005	2006	2007	2008
<b>RN</b>							
Projected supply	23297	22517	21923	21377	20820	20230	19599
Requirements							
High	28637	29235	29838	30449	31086	31789	32497
Medium	28591	29133	29673	30216	30780	31406	32032
Low	28517	28980	29435	29887	30354	30877	31393
Projected shortfall							
High	5340	6718	7915	9072	10266	11559	12897
Medium	5294	6617	7750	8839	9960	11176	12432
Low	5220	6463	7512	8510	9534	10646	11794
<b>RPN</b>							
Projected supply	3590	3216	2913	2633	2369	2129	1909
Requirements							
High	5232	5341	5451	5562	5678	5806	5934
Medium	5224	5322	5420	5519	5621	5735	5849
Low	5210	5294	5377	5459	5543	5638	5732
Projected shortfall							
High	1642	2125	2537	2929	3309	3676	4025
Medium	1633	2107	2507	2886	3253	3606	3940
Low	1620	2078	2463	2825	3174	3509	3823

Source: Projections are based on 2000/01 CNO data, 2000/01 CIHI inpatient data, 1995/96 OCCP (Ontario Case Costing Project) cost data, 2000/01 MOHLTC Skill Mix data, and Statistics Canada population projection data

### 3. Balancing Supply and Demand

Both these planning models indicate that Ontario will have serious nurse supply issues over the next few years. While no projection method can provide absolutely accurate estimates of how many nurses we need, the data do provide some ranges to consider. Based on the simple loss estimates, Ontario will lose between 15,000 and 30,000 experienced (aged 50+) RNs and 5,000 to 9,000 experienced RPNs by the year 2008. To compensate for these losses, the province has two main strategies: increase enrolment in nursing programs and create incentives to keep nurses working. (The opportunities to build nurse supply by attracting nurses from other provinces or other parts of the world will be limited because the nursing shortage is a global phenomenon.) Faced with a nursing shortfall of these magnitudes, providing quality workplaces has never been more important. If workplaces are not improved, Ontario will lose nurses faster than it can produce them.

# 4 *Discussion*

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This report describes the trends in supply, work activity and actual utilization of nurses in Ontario, Canada, to the year 2001. It also predicts future requirements for Ontario's nursing workforce. Like other workforce studies, it provides more information on the hospital sector than the community or long-term care sectors, where there is a paucity of data. While it is not possible to identify exactly how many nurses Ontario will need, it is possible to highlight some alarming trends, and to use this information to guide action.

## **Nursing Supply**

Age is a critical factor in the nursing workforce. Almost two thirds of Ontario's nurses are over age 40. Only 2% of RNs and 3% of RPNs are between the ages of 20 and 24. If RNs and RPNs work until age 65, Ontario will lose approximately 15,611 RNs and 5,124 RPNs to retirement and mortality by the year 2008. However, if individual nurses choose to leave the workplace at age 55, then the losses will be much greater (i.e., 30,086 RNs and 9,131 RPNs). Ontario is not producing enough new nurses to compensate for these losses. The limited information available indicates that the drop in enrolments in nursing programs in the mid 1990s significantly reduced the number of new graduates entering the field in the late 1990s and early 2000s.

## **Nursing Shortfall**

An analysis of future requirements for nurses in the hospital sector alone, adjusted for increasing patient acuity, indicates that, in 2008, Ontario will have a shortfall of between 11,794 and 12,897 full-time RNs and between 3,823 and 4,025 RPNs (the range is based on different predictions for population growth in the province). If data were available to develop more sophisticated acuity adjusted utilization estimates for all sectors, the predicted nursing shortfall would be even greater.

The situation is critical. It is time to act. To make up for the predicted shortfall, Ontario must develop education, recruitment and retention strategies to increase enrolments beyond current capacities and retain existing nurses.

## **Education**

Interest in nursing education appears to be high in Ontario. According to the Registered Nurses Association of Ontario (RNAO), a province-wide recruitment strategy resulted in a 127% increase in applications to nursing education programs for 2003/04. Application statistics available on the Ontario University Application Centre web site ([www.ouac.on.ca](http://www.ouac.on.ca)) indicate that secondary school stream (OUAC101) nursing application numbers increased from 3,818 in March 2002 to 8,484 in March 2003. However, increases in applications for the 2003/04 academic year may also be attributed to the impact of the double cohort of Ontario secondary schools students entering the post-secondary system.

At a time when Ontario needs to train more nurses and more people are interested in entering the profession, the education system may not have the capacity – in particular the qualified faculty and clinical placements – required to increase enrolments and still maintain educational standards.

In January 2001, the Ministry of Training, Colleges, and Universities announced initiatives designed to increase enrolment in nursing programs including: providing funding for one-time transitional costs, introducing accelerated nursing programs, adding a new class of students to the three-year col-

lege diploma program, and expanding graduate programs in nursing (“New funding to increase enrolment in nursing programs” MTCU, January 19, 2001). In its progress report, *Good Nursing, Good Health: A Good Investment*, the Joint Provincial Nursing Committee (2001) expressed concern about the lack of clinical placement opportunities and faculty with graduate preparation. More recently, the RNAO stressed the urgent need for qualified nursing faculty given that more than 90 percent of the existing pool are 45 years of age or older, and recommended that the Ontario government “create 500 more first-year RN student positions - to 4,500 a year; improve clinical placements; and allocate annual funds to help an additional 40 nursing faculty attain their PhDs in each of the coming four years” (RNAO March 27, 2003 Media Advisory).

In order to facilitate student learning, several challenges with respect to clinical placements must be overcome. These include: addressing the overall staffing shortage and high nurse-patient ratios which, in combination with rising patient acuity and system complexity, make it difficult to rebalance work assignments to accommodate preceptors and students; casualization which reduces the pool of available permanent, full-time staff who serve as preceptors; lack of funding to support release time; lack of protected preceptor positions which results in the ineffective use of experienced staff; retirements of senior nurses; and reductions in managers who provide support essential to mentoring in the workplace (CIHI, 2002a; O’Brien-Pallas et al., in press, 2003; Jarjoura, 2003).

Clinical placements provide essential opportunities for students to practice and consolidate their skills and theoretical applications. In the clinical setting, students benefit from the expertise of experienced clinicians, and develop the clinical judgment and confidence necessary to ease their transition into the workforce.

Other provinces are facing similar challenges. The University of New Brunswick’s Faculty of Nursing will reduce its number of undergraduate nursing students in Fredericton this fall by 20 seats (from 70 to 50) due to a shortage of resources both at the university and hospital level (Canadian Press, March 26, 2003). These kinds of enrolment reductions worsen the outlook for replenishing the nursing supply. According to the Canadian Press (CP) news wire service, the Canadian Association of Schools of Nursing (CASN) attributes the current problems in nursing education to not enough seats in nursing programs, rather than a lack of applications as was the case in the mid-1900s (Canadian Press, March 10, 2003).

## **Participation Rates**

Nurses already trained and in the system are not being employed to their full potential. In 2001, both participation rates for RNs and RPNs and the number of RNs and RPNs seeking employment in nursing dropped from the ten year high noted in 2000. However, approximately 45% of RNs and 52% of RPNs remain underemployed because they are working in either casual or part-time positions.

It is not possible to determine how many are underemployed by choice or because of a lack of full-time employment opportunities as the College of Nurses of Ontario no longer collects these data routinely. However, in 2000, the second (and final) year these data were collected, the majority of nurses indicated their work status was by choice (Grinspun, 2002). While nurses are being underutilized by employers, the choices they make are likely influenced by the nature of the work environments in which they are employed. If involuntary part-time workers actually worked full-time in 2001, then we would have an increase of 4.7 million nursing hours or 2,592 FT positions available to provide hands on care (CNAC, 2002). Retention strategies, including job creation and incentives, that give underemployed nurses full-time positions would help blunt the impact of future nursing losses. They would also help Ontario maintain the current nurse supply.

## Workload

Workload is the major concern of nurses in this country (Baumann et al., 2001; CNAC, 2002). Given that retention strategies are of utmost importance in the short-term, how is Ontario doing in creating quality work environments for nurses?

Since the output of nursing is difficult to define, the Canadian Institute for Health Information (CIHI) has proposed that the measure of nursing productivity be the relationship between nursing workload units and direct care worked hours (CIHI, 1999). Using the CIHI measure, the maximum capacity that any nurse can work is 93% once time for breaks is removed (O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001). Yet in Ontario hospitals, more than 31% of nursing units are working at or beyond 93% capacity.

It is not clear how much lower than 93% the capacity number "should" be – however we do know that nurses do not work in ideal conditions given the nature of the work and the sometimes unpredictable impingements on the delivery of care. Birch, O'Brien-Pallas, Alksnis, Tomblin Murphy, & Thomson (in press) identified that, between 1994 and 1999, inpatient episodes fell by almost 2%. At the same time, beds were cut by 20%. As a result, the number of patients per bed increased by 12%. Adjusting for patient severity, there was a 20% reduction in beds per episode and a 3.7% reduction in nurses per episode during the 5-year time frame. These data suggest that an increasing number of episodes are being served by fewer nurses with fewer beds, indicating that the demands on nurses in acute care hospitals in Ontario have increased.

The maximum capacity of 93% is an unrealistic goal that is likely dangerous to both patient and nurse health. In the absence of research to pinpoint a reasonable target for effective capacity, we have set a target of 85% for Ontario hospitals. We are currently testing this hypothesis in an ongoing study. The MIS hospital data for Ontario suggest that 54% of the functional centres included in our analysis are working an average nurse on an average shift at greater than 85% capacity. This finding would suggest that an average nurse on an average unit in Ontario hospitals is still experiencing excessive workloads, and we have not successfully addressed this critical worklife issue in our hospitals.

Similar concerns about workload and role overload exist in non-hospital settings (Baumann et al., 2001). While we do not have sufficient data to do comparable analyses in the long-term care and community sectors, the data we do have suggest that the complexity of cases in these sectors is increasing and the demand for skilled nursing resources is also increasing. In the long-term care sector, nurses are caring for patients with greater numbers of behavioural problems and cognitive impairment. The complexity of cases in the community is assumed to be greater given the early discharge from hospitals. These problems are exacerbated in the community, where the competitive system has left many nurses working on a per case basis and having to absorb visit time overruns into their personal time without payment. We are also already seeing community nurses move to other sectors such as hospitals where there are more opportunities for full-time employment with benefits, even though those settings are still not ideal in terms of work environment.

**Productivity** measures describe the relationship between output and the labour time involved in its production. Even when an output can be clearly defined, productivity reflects the joint effects of many influences, including technology; capital investment; utilization of capacity, energy, and materials; the organization of production; managerial skill; and the characteristics and effort of the work force (O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001). Given all the influences that the CIHI productivity measure does not capture, this measure might be more appropriately referred to as a measure of "labour capacity" than "productivity".

## The Relationship Between Nurse Staffing and Health & Safety

Injuries in nursing that are functions of the work environment remain critical. A recent report examining Workers' Safety Insurance Board claims in Ontario (Shamian et al., 2001) provided some interesting insights. Between the years 1990 to 1998, the number of lost time claims submitted by nurses in 134 Ontario hospitals increased by 10%, from 59% to 69%. Over the same period, the number of lost day claims submitted by other health sector workers decreased by 11% (from 41% to 31%)<sup>4</sup>. Between 1990 and 1998, the musculoskeletal claim rates among nurses compared to non-nurses increased from 1.8 (almost 2 claims among nurses for every 1 claim among non-nurses) to 2.8 (almost 3 claims among nurses for every 1 claim among non-nurses). Nurses identify workload and staffing as the main challenges leading to work related injuries.

Hospitals use both overtime and agency nursing personnel to meet staffing deficits. In 2001, Ontario hospitals used over 2,166,268 hours of agency personnel, which represents 1,111 annual full-time equivalent nurses. Short term replacement with agency personnel does not always reduce the workload of nurses on the unit. In fact, many nurses maintain the opposite is true, and the role that overtime and substandard ward communications play in contributing to nurse injuries is critical. To analyze the impact of overtime hours on lost day claim rates, Ontario acute care hospitals were categorized into four groups that reflected low to high percentage of nurses working more than one hour overtime per week<sup>5</sup>.

Concerns about workload and staffing not only influence nurses' health and safety, they also influence patient outcomes. In U.S. hospitals, the odds of patient mortality increases by 7% for every additional patient in an average nursing workload. For example, if workload increases from 4 to 6 patients, the odds of mortality increase by 14% (Aiken et al., 2002). Inadequate nurse staffing has been associated with other types of adverse occurrences such as medication errors, decubitus ulcers, pneumonia, post-operative infections, and urinary tract infections (American Nurses Association, 1995; Blegen, Goode, & Reed, 1998; Kovner & Gergen, 1998).

Clearly, there is room for improvement in staffing practices in order to reduce costs and improve the health of nurses and patients.

### Leadership and Turnover

Clinical settings need nursing leadership. The amount of leadership support available to nurses in their day to day practice remains uncertain. The studies that do exist have been conducted in hospital settings. What is known is that supportive behaviours directly influence staff stability (Houser, 2000). Where there is strong leadership and support for nursing personnel, there is a decrease in turnover, with fewer nurses lost in the first 18 months of their employment (Houser, 2000). This results in fewer vacancies and less need for orientation on the unit (Houser, 2000). Houser also noted that units with strong leaders tend to have a higher ratio of competent and proficient nurses and fewer adverse events.

The costs of turnover are high. An international pilot study of turnover identified that the average costs per turnover of nurses is about \$22,000 US and the average turnover rate is 9.5% per unit (Shamian, O'Brien-Pallas, & Laschinger, 2003). According to the Ontario 2001 MIS data, management and support hours in small hospitals have decreased while those in chronic and community hospitals have remained relatively unchanged after a decline noted in previous years. These trends

<sup>4</sup> By occupational group and across all years, nurses had almost double the claim rate (4.33 per 100 FTEs, 95% CI = 4.27, 4.39) of non-nurses (2.34 per 100 FTEs, 95% CI = 2.29, 2.39). This difference in claim rates remained statistically significant in 1990 ( $z = 10.36, p < .001$ ) and in 1998 ( $z = 19.52, p < .001$ ).

<sup>5</sup> When hospitals were ordered from low to high on this overtime dimension, membership in a "higher" group was associated with a 70% increase in the probability of having a high RN lost-time claim rate relative to the next lowest group (OR = 1.70,  $p < .01$ ). On the other hand, the probability of having a high RN musculoskeletal lost-time claim rate decreased by 64% with every one unit increase in the hospital-level score on the "nurse relations with physicians" subscale of the NWI (OR = 0.36,  $p < .01$ ) (O'Brien-Pallas et al., 2003).



do not bode well for Ontario. Having strong leaders who offer tangible support for patient care activities is likely to save money in the system and reduce disruption of workflow and care.

## **Layoffs**

Ontario's ability to retain nurses is adversely affected by the lack of predictability in the work environment. Baumann et al. (2001) described three domains in which predictability was of key concern to the nursing workforce: job security, risk of injury, and freedom from workplace violence. In times of nurse shortages, it is hard to believe that job security is at risk. Yet, despite the decrease in the number of nurses in the province, an alarming number of nurses were being laid off at the beginning of 2003. Ontario law requires all hospitals to balance their budgets, and since nurses constitute the largest group of front line health care workers, they are often most affected by fiscal constraint and downsizing (Nursing Task Force, 1999). For example:

- the Royal Ottawa Hospital announced a pending layoff of 70 staff members, including 27 Ontario Nurses Association (ONA) members as a strategy to help eliminate its \$7 million deficit (Rogers, 2003)
- Hotel-Dieu Grace Hospital in Windsor is eliminating 95 positions, laying off staff, and slashing overtime and sick time in an effort to stem their deficit of close to \$50 million. Included in these layoffs are several ONA members and 21 non-union positions including managers (Mandal, 2003)
- Quinte Health Care Corporation may be facing layoffs at its four sites, including Belleville, North Hastings (Bancroft), Trenton, and Prince Edward County (Picton)
- the University Health Network will have layoffs of 49 full-time and 13 regular part-time staff at their Toronto General site, 6 full-time positions at their Western Hospital site, and 1 full-time position due to attrition at their Princess Margaret Hospital site (Sheila Brown, ONA, personal communication, March 20, 2003).

Nursing human capital is an essential resource. Layoffs at a time when retention is crucial not only reduce numbers but reduce morale and commitment to the organizations and to the profession. To avoid greater nursing shortfalls, specific efforts must be made – either through the funding formulae for hospitals or by hospital employers themselves – to ensure stability of the nursing workforce. Retention strategies should focus on ensuring adequate resources to meet nursing needs in the near future, because the analysis suggests that shortages will be most acutely felt in the hospital sector in 2006. While data in the community and long-term care sectors are limited, offering full-time employment to nursing personnel in those settings should improve the odds of retaining those personnel in a competitive market.

## **Conclusion**

The greatest challenge in understanding both the nursing workforce and the quality of patient care remains lack of data. The databases that help us understand utilization and outcomes in the hospital sector have improved significantly since 1998, but the activity in the long-term care, community and public health sectors, where a great deal of patient care is received, remains invisible. More information will become available soon. The Nursing and Health Outcomes Project funded by the Ontario Ministry of Health and Long-Term Care will help identify the nature of client need and nursing care provided in the hospital, long-term care, and community sectors (Doran, 2002). Unfortunately, the public health sector was not included as part of this project. The development of an MIS system for the community is underway and badly needed. The pioneering work of McGillis Hall and colleagues (2003) on health care system report cards has yielded reliable and valid indicators in each of four quadrants: system integration and change, clinical utilization and outcomes, patient satisfaction, and financial performance. The results will help determine how the nursing system is performing and will provide insight into the direction that the health system should be taking (McGillis Hall et al., 2003).

This report highlights several management and policy initiatives that must be taken to stabilize the nursing workforce in Ontario. The work of the Joint Provincial Nursing Committee, in mapping the recommendations from several seminal documents including: *Good Nursing, Good Health: An Investment for the 21st Century* (Nursing Task Force, 1999); *Good Nursing, Good Health: A Good Investment* (Joint Provincial Nursing Committee, 2001); *Ensuring the Care Will Be There: Reporting on Nursing Recruitment and Retention in Ontario* (RNAO, 2000); *Commitment and Care: The Benefits of a Healthy Workplace for Nurse, their Patients and the System - A Policy Synthesis* (Baumann et al., 2001); *Our Health, Our Future, Creating Quality Workplaces for Canadian Nurses* (CNAC, 2002); and both the Romanow (*Building on Values: The Future of Health*; Commission on the Future of Health Care in Canada, 2002) and the Kirby reports (*The Health of Canadians – The Federal Role*; The Standing Senate Committee on Social Affairs, Science and Technology, 2002), is critical to helping us know where we are today. However, the data in this report suggest that the time for deliberations is past and there is an **IMMEDIATE AND URGENT** need to re-engage in specific activities to increase enrolments and throughputs of our educational system and implement the numerous evidence-based recommendations in these reports to improve nursing recruitment, retention, and work environments. While Ontario has been a leader in developing policy that supports improved work environments for nurses, the issues raised in this report – particularly those related to workload, declining nursing human resources, and equity among all sectors of the health system – need ongoing attention.

# 5 *Recommendations:* *Strategies to Improve and Stabilize Nurse Supply*

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To compensate for the projected shortfall in nursing resources in Ontario and stabilize nurse supply, the province must focus on strategies designed to develop new nurses, make the most effective use of existing nurses, and keep nurses working in nursing as long as possible. The problem requires a made-in-Ontario solution because, given the global nursing shortage, the opportunities to build nurse supply by attracting nurses from other provinces or other parts of the world will be limited.

Based on its assessment of trends in nurse supply, demand for nursing services, utilization of nurses, and the workplace, the NRU recommends that Ontario pursue the following six strategies:

## **1. Assess the population's ongoing and future need for nursing services**

To determine how many nurses Ontario will need, where they will be needed, and the skills they should have, Ontario must be able to accurately assess the population's need for nursing services. This includes examining the characteristics that influence the need for health services, including age, economic status, social and cultural factors, behaviour, access to preventive programs and services, and acuity.

## **2. Increase enrolment in nursing programs**

Every effort must be made to increase nurse enrolment, and increase the number of new nurses produced each year in Ontario. Interest in the nursing profession appears to be high. To take advantage of that interest, Ontario must ensure that the education infrastructure has the capacity to train more nurses, and that new nurses produced by the education system have opportunities for full-time employment that will keep them in Ontario.

## **3. Increase nurse participation rates (retention) and make more effective use of existing nurses**

The province must also pursue strategies to increase participation rates, and make more effective use of existing nurses. If more part-time nurses can be shifted to full-time positions, or encouraged to work more hours, Ontario will have immediate access to more nursing care and increased continuity of patient care. Retention strategies, including job creation and incentives, that give underemployed nurses full-time positions would help blunt the impact of future nursing losses. They would also help Ontario maintain the current nurse supply.

Effective retention incentives and strategies also have the potential to help the system keep nurses working and delay retirements. In fact, they have been identified as the key factor in solving nursing shortages and maintaining nurse supply. If Ontario can develop appropriate incentives that keep nurses working until age 65, the province has the potential to retain almost 9,000 nurses over the next five years, which would significantly close the gap between supply and demand.

## **4. Avoid using layoffs to deal with short-term financial problems in the health care system**

In the past, health care settings have often dealt with financial pressures by laying off nurses. This practice makes nursing significantly less attractive as a profession, and causes existing nurses to leave the province and/or the profession in large numbers. Once nurses are gone, they are extremely dif-

difficult if not impossible to attract back. To have a stable nurse supply, Ontario must avoid using layoffs to deal with short-term financial problems.

## **5. Address workload issues and provide quality workplaces**

To keep nurses working in nursing, Ontario must address workload issues, and provide quality workplaces. Nurses identify workload and staffing as the main challenges leading to work related injuries, which lead in turn to absenteeism, higher staff replacement costs, and higher turnover rates. Work overload and inadequate nurse staffing has been associated with other types of adverse occurrences such as medication errors, decubitus ulcers, pneumonia, post-operative infections, and urinary tract infections. If workplaces are not improved, the province will lose nurses faster than it can produce them. Improvements in staffing practices have the potential not simply to help the system retain nurses. They can also play a key role in reducing the high costs associated with absenteeism and adverse occurrences, and improve both nurses' health and patient outcomes.

## **6. Continue work on a health human resource planning framework that takes into account the link between quality work environments, the ability to recruit and retain health professionals, and population health outcomes.**

Because workplace issues, such as work overload, stress and lack of adequate supports, have such a negative impact on the system's ability to attract and retain nurses, they must be addressed and conceptualized as part of the human resource planning framework. In setting targets for nurse supply – and for the supply of other health professionals – health human resource planning must take into account the link between quality work environments, the ability to recruit and retain health professionals, and population health outcomes. In order to maintain its current workforce and provide attractive work opportunities for new nurses, Ontario must address workplace concerns not just in the workplace, but as an intrinsic part of health human resource planning. The NRU Toronto is testing the model for HHR planning and will continue to provide answers to these issues.

## References

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- Advisory Committee on Health Human Resources. (2000). *The nursing strategy for Canada*. Ottawa, Ontario: Author.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J. A., Busse, R., Clarke, H., et al. (2001). Nurses' reports on hospital care in five countries. *Health Affairs*, 20(3), 43-53.
- Aiken, L. H., Clarke, S. P., Sloane, D. M., Sochalski, J., & Silber, J. H. (2002). Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*, 288(16), 1987-1993.
- Alpert, P. T., Fjone, A., & Candela, L. (2002). Nurse practitioner: Reflecting on the future. *Nursing Administration Quarterly*, 26(5), 79-89.
- American Nurses Association. (1995). *Nursing care report card for acute Care*. Washington, DC: Author.
- Anderson, G. M. (1997). Hospital restructuring and the epidemiology of hospital utilization: The recent Ontario experience. *Medical Care*, 35(10 Suppl), OS93-OS101.
- Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(3), 1-10.
- Baumann, A., O'Brien-Pallas, L., Armstrong-Stassen, M., Blythe, J., Bourbonnais, R., Cameron, S., et al. (2001). *Commitment and care: The benefits of a healthy workplace for nurses, their patients and the system*. Ottawa, Ontario: Canadian Health Services Research Foundation and The Change Foundation.
- Baumann, A., O'Brien-Pallas, L., Deber, R., Donner, G., Semogas, D., & Silverman, B. (1996). Downsizing in the hospital system: A restructuring process. *Health Care Management Forum*, 9(4), 5-13.
- Baumgart, A. J. & Larsen, J. (1988). *Canadian nursing faces the future: Development and change*. St. Louis, MO: C.V. Mosby.
- Birch, S., O'Brien-Pallas, L., Alksnis, C., Tomblin Murphy, G., & Thomson, D. (in press). Beyond demographic change in health human resources planning: An extended framework and application to nursing. *Journal of Health Services Research and Policy*.
- Blegen, M. A., Goode, C. J., & Reed, L. (1998). Nurse staffing and patient outcomes. *Nursing Research*, 47(1), 43-50.
- Boudreau, T. (1971). *Report to the Department of National Health and Welfare*. Ottawa, Ontario. Department of National Health and Welfare.
- Browne, G., Watt, S., Roberts, J., Gafni, A., & Byrne, C. (1997). Within our reach: Evidence-based practice resulting from alliances in health and social services. *Clinical Excellence for Nurse Practitioners*, 1(2), 127-140.
- Burl, J. B., Bonner, A., Rao, M., & Khan, A. M. (1998). Geriatric nurse practitioners in long-term care: Demonstration of effectiveness in managed care. *The Journal of the American Geriatrics Society*, 46(4), 506-510.
- Canadian Institute for Health Information (n.d.). *Licensed practical nurses database development project*. Retrieved August 16, 2002, from: [http://secure.cihi.ca/cihiweb/dispPage.jsp?cw\\_page=hhdata\\_lpnbd\\_e](http://secure.cihi.ca/cihiweb/dispPage.jsp?cw_page=hhdata_lpnbd_e)
- Canadian Institute for Health Information. (n.d.). *Plx™ Overlay and age adjustment for case mix groups*. Retrieved November 1, 2001, from: <http://www.cihi.ca/wedo/grpcmg.shtml>
- Canadian Institute for Health Information. (1999). *MIS guidelines for Canadian health care facilities*. Ottawa, Ontario: Author.
- Canadian Institute for Health Information. (2000a). *Health care in Canada: A first annual report*. Ottawa, Ontario: Author.

- Canadian Institute for Health Information (2000b). *Preliminary provincial government health expenditure estimates, 1974/1975 to 2000/2001*. Ottawa, Ontario: Author.
- Canadian Institute for Health Information. (2001). *Future development of information to support the management of nursing resources: Recommendations*. Ottawa, Ontario: Author.
- Canadian Institute for Health Information. (2002a). *Supply and distribution of registered nurses in Canada, 2001*. Ottawa, Ontario: Author.
- Canadian Institute for Health Information (2002b, May). *Health indicators: E-publication*. Retrieved January 11, 2002, from <http://secure.cihi.ca/indicators/en/hlthind.shtml>
- Canadian Institute for Health Information. (2003). *Workforce trends of registered nurses in Canada, 2002*. Ottawa, Ontario: Author.
- Canadian Nursing Advisory Committee. (2002). *Our health, our future: Creating quality workplaces for Canadian nurses*. Toronto, Ontario: Author.
- Canadian Nursing Advisory Committee. (2002, February 15). *Full-Time equivalents and financial costs associated with absenteeism, overtime, and involuntary part-time employment in the nursing profession*. Ottawa, Ontario: Author.
- Canadian Nurses Association. (1998). *Baccalaureate as entry to practice: How are we doing?* Ottawa, Ontario: Author.
- Canadian Nurses Association. (1998). *Registered nurse human resources: recruitment and retention issues*. [Discussion paper]. Ottawa, Ontario: Author.
- Canadian Press. (2003, March 26). *UNB Faculty of Nursing to reduce number of nursing students*. Retrieved March 28, 2003, from <http://www.canpress.ca/english/hp.htm>
- Canadian Press. (2003, March 10). *Nursing schools turn away candidates despite national shortage*. Retrieved April 14, 2003, from [http://mediresource.sympatico.ca/health\\_news\\_detail.asp?channel\\_id=0&news\\_id=908](http://mediresource.sympatico.ca/health_news_detail.asp?channel_id=0&news_id=908)
- Caty, S., Michel, I., Pong, R., & Stewart, D. (2002). The graduates of the Ontario primary health care NP Education Program: A 2001 NP employment update. *Newsletter of the Nurse Practitioners' Association of Ontario, 12*(2), 8-9.
- Chalmers, K. I., & Kristjanson, L. J. (1992). Community health nursing practice. In A. J. Baumgart, & J. Larsen, *Canadian Nursing Faces the Future* (2nd ed., pp.153-179). Toronto: Mosby Year-Book, Inc.
- Code Zero. (2002, May 28). *Toronto Star*, p. A11.
- Cohen, M. (1994). Impact of poverty on women's health. *Canadian Family Physician, 40*, 949-958.
- College of Nurses of Ontario (1992/93 – 2001/02). Data [Data files]. Toronto, Ontario: Author.
- College of Nurses of Ontario. (1999). *Entry to practice competencies for Ontario registered nurses as of January 1, 2005*. Toronto, Ontario: Author.
- College of Nurses of Ontario. (2002, October). *All about CNO*. Retrieved from [http://www.cno.org/index\\_about.html](http://www.cno.org/index_about.html)
- Commission on the Future of Health Care in Canada. (2002). *Building on values: The future of health care in Canada* [Final Report]. Saskatoon, Saskatchewan: Author.
- Community Health Nurses Interest Group of the Registered Nurses Association of Ontario. (1998). *Submission to the Nursing Task Force*. Toronto, Ontario: Author.
- Donabedian, A. (1966). Evaluating the quality of medical care (Part 2). *Milbank Memorial Fund Quarterly, 44*(3), 166-203.
- Doran, D., & Pickard, J. (2002, June). *Management and delivery of community nursing services in Ontario: Impact on the quality of care and quality of worklife of community based nurses*. Poster session presented at the Ontario Association of Community Care Access Centres Conference, Toronto, Ontario.

- Durkin, M. S., Davidson, L. L., Kuhn, L., O'Connor, P., & Barlow, B. (1994). Low-income neighbourhoods and the risk of severe pediatric injury: A small-area analysis in northern Manhattan. *American Journal of Public Health, 84*(4), 587-592.
- Federal, Provincial and Territorial Advisory Committee on Population Health for the meeting of Ministers of Health. (1999). *Statistical report on the health of Canadians*. Retrieved from <http://www.statcan.ca:80/english/freepub/82-570-XIE/free.htm>
- Gerhard, W., Goldenberg, D., Johnstone, E., & McFadden, A. (1994). *Joint articulation project: The report*. Toronto, Ontario: Author.
- Gillick, M. R., & Mendes, M. L. (1996). Medical care in old age: What do nurses in long term care consider appropriate? *The Journal of the American Geriatrics Society, 44*(11), 1322-1325.
- Government of Ontario. (2003a, March 6). *Clinton First Family Health Centre opens*. Retrieved January 29, 2003 from <http://www.gov.on.ca/health>
- Government of Ontario. (2003b, September 24). *Eves Government to add over 300 nurse practitioners to health care system*. Retrieved January 29, 2003 from <http://www.newswire.ca/government/ontario/english/releases/September2002/24/c4283.html>
- Grinspun, D. (2002). A flexible nursing workforce: Realities and fallouts. *Hospital Quarterly, 6*(1), 79-84.
- Halfon, N., & Newacheck, P. W. (1993). Childhood asthma and poverty: Differential impacts and utilization of health services. *Pediatrics, 91*(1), 56-61.
- Hall, T. (1993). *Human resources for health: Models for projecting workforce supply and requirements*. Geneva, Switzerland: World Health Organization.
- Heart and Stroke Foundation of Canada. (1999). *The changing face of heart disease and stroke in Canada 2000*. Retrieved from <http://www.statcan.ca:80/english/freepub/82F0076XIE/free.htm>
- Hodgson, T. A. (1992). Cigarette smoking and lifetime medical expenditures. *Milbank Quarterly, 70*(1), 81-125.
- Horrocks, S., Anderson, E., & Salisbury, C. (2002). Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors. *BMJ, 324*, 819-823.
- Houser, J. (2000). *An evaluation of the context of nurse staffing and the relationship to outcomes. Presentation to the Mayo Clinic*. <http://academic.regis.edu/jhouser/>
- Human Resources Development Canada (2003). *Labour program*. Retrieved May 20, 2003, from <http://labour.hrdc-drhc.gc.ca/worklife/aw-retirement-legislative-02-en.cfm>
- Irvine, D. M. & Evans, M. G. (1995). Job satisfaction and turnover among nurses: Integrating research findings across studies. *Nursing Research, 44*(4), 246-53.
- Janssen, P. P., Jonge, J. D., & Bakker, A. B. (1999). Specific determinants of intrinsic work motivation, burnout and turnover intentions: A study among nurses. *Journal of Advanced Nursing, 29*(6), 1360-9.
- Jarjoura, J. (2003). Mentorship - A key part of nursing practice. *Practice Page on Preceptorship, 2*(3).
- Joint Provincial Nursing Committee. (2001). *Good nursing, good health: A good investment*. [Progress Report]. Toronto, Ontario: Ministry of Health & Long-Term Care.
- Karasek, R., & Theorell, T. (1990). *Healthy work: Stress, productivity and the reconstruction of working life*. New York: Basic Books.
- Kazanjian, A., Pulcins, I. R., & Kerluke, K. (1992). A human resources decision support model: Nurse deployment patterns in one Canadian system. *Hospital Health Services Administration, 37*(3), 303-319.
- Kidney failure on the rise, seniors constitute 50% of new patients, reports Canadian Institute for Health Information*. (2001, July 4). Canada NewsWire. Retrieved from <http://www.newswire.ca/releases/July2001/04/c9643.html>

- Kovner, C., & Gergen, P. J. (1998). Nurse staffing levels and adverse events following surgery in U.S. hospitals. *Image: The Journal of Nursing Scholarship*, 30(4), 315-321.
- Leatt, P., & Schneck, R. (1981). Nursing subunit technology: A replication. *Administrative Science Quarterly*, 26(2), 225-236.
- Mallach, K. & Porter-O'Grady, T. (1999). Partnership economics: Nursing's challenge in a quantum age. *Nursing Economic\$,* 17(6), 299-307.
- Mandal, V. (2003, March 12). Hotel-Dieu to axe 95 positions: CEO says hospital close to \$50M in debt. *The Windsor Star*. Retrieved March 20, 2003, from [www.windsorstar.com](http://www.windsorstar.com)
- McGillis Hall, L., Doran, D., Spence Laschinger, H. K., Mallette, C., Pedersen, C., & O'Brien-Pallas, L. (2003). A balanced scorecard approach for nursing report card development. *Outcomes Management for Nursing Practice*, 7(1), 17-22.
- Michel, I., Ehrlich, A., Wright, B., Szadkowski, M., & McFarland, V. (2002). *Nurse Practitioner Cervical Screening Pilot Project Evaluation Proposal*. Sudbury, Ontario: Sudbury & District Health Unit and the Ministry of Health and Long-Term Care.
- Ministry of Health and Long-Term Care (2001). *Level of care classification results*. Toronto, Ontario: Author.
- Ministry of Health and Long-Term Care. (1998 - 2001). *Placement coordination service statistics* [Data file]. Toronto, Ontario: Author.
- Ministry of Health and Long-Term Care. (2002). *Ontario public hospitals* [Data File]. Toronto, Ontario: Author.
- Ministry of Training, Colleges and Universities. (2001, January 19). *Backgrounder: New funding to increase enrolment in nursing programs*. Retrieved April 14, 2003, from <http://www.edu.gov.on.ca/eng/document/nr/01.01/bg0119.html>
- Morreale, M. (1998). *Risk behaviour and health care utilization*. [Fact Sheet]. Toronto, Ontario: Nursing Effectiveness, Utilization and Outcomes Research Unit, University of Toronto.
- Munding, M. (2002). Twenty-first century primary care: New partnerships between nurses and doctors. *Academic. Medicine*, 77, 776-780.
- Mundigner, M. O., Kane, R., Lenz, E., Totten, A., Tsai, W., Cleary, P., et al. (2000). Primary care outcomes in patients treated by nurse practitioners or physicians: A randomized trial. *JAMA*, 283(1), 59-68.
- Nurse Practitioner Association of Ontario (2003). *Role of the PHC and AC nurse practitioner*. Retrieved January 28, 2003, from <http://www.npao.org/role.html>
- Nursing Task Force. (1999, January). *Good Nursing, good health: An Investment for the 21st Century*. Toronto, Ontario: Author.
- O'Brien-Pallas, L. (2002). Where to from here? *Canadian Journal of Nursing Research*, 33(4), 3-14.
- O'Brien-Pallas, L., Alksnis, C., Wang, S., Birch, S., & Tomblin Murphy, G. (2003). *Bringing the future into focus: Projecting RN retirement in Canada*. Toronto, Ontario. Canadian Institute for Health Information.
- O'Brien-Pallas, L., Alksnis, C., Wang, S., Birch, S., Tomblin Murphy, G., Roy, F.A., & Sajan, P. (in press). Early retirement among RNs: Estimating the size of the problem in Canada. *Longwoods Review*.
- O'Brien-Pallas, L., Baumann, A., Birch, S., & Tomblin Murphy, G. (2000). Health human resource planning in home care: How to approach it - That is the question. *HealthcarePapers*, 1(4), 53-59.
- O'Brien-Pallas, L., Birch, S., Baumann, A., & Tomblin Murphy, G. (2001). *Integrating workforce planning, human resources, and service planning*. Workshop on global health workforce strategy at Annecy, France, December 9-12, 2000. Geneva, Switzerland: World Health Organization.
- O'Brien-Pallas, L., Birch, S., & Tomblin Murphy, G. (2001). Workforce planning and workplace management. *International Nursing Perspectives*, 1(2-3), 55-65.



- O'Brien-Pallas, L., Charles, C., Blake, J., Luba, M., McGilton, K., Peereboom, E., McGillis Hall, L., Carter, M., Baumann, A., & Bajnok, I. (1995). *The nursing and personal care provider study*. [Working Paper 95-9]. Hamilton, Ontario: Nursing Effectiveness, Utilization & Outcomes Research Unit.
- O'Brien-Pallas, L., Doran, D., Murray, M., Cockerill, R., Sidani, S., Laurie-Shaw, B., et al. (2001). Evaluation of a client care delivery model, part 1: Variability in nursing utilization in community home nursing. *Nursing Economic\$, 19(6)*, 267-276.
- O'Brien-Pallas, L., Doran, D., Murray, M., Cockerill, R., Sidani, S., Laurie-Shaw, B., et al. (2002). Evaluation of a client care delivery model, part 2: Variability in client outcomes in community home nursing. *Nursing Economic\$, 20(1)*, 13-26.
- O'Brien-Pallas, L., Irvine, D., Peereboom, E., & Murray, M. (1997). Measuring nursing workload: Understanding the variability. *Nursing Economic\$, 15(4)*, 171-82.
- O'Brien-Pallas, L., Thomson, D., Alksnis, C., & Bruce, S. (2001). The economic impact of nurse staffing decisions: Time to turn down another road? *Hospital Quarterly, 4(3)*, 42-50.
- Ontario Association of Community Care Access Centres. (2000, July 26). *Human Resources: A Looming Crisis in the Community Care System of Ontario*. Toronto, Ontario: Author.
- Ontario Association of Non-Profit Homes and Services for Seniors (2002). *Long-term care facilities*. Retrieved August 22, 2002, from <http://www.oanhss.org/staticcontent/staticpages/consumers/longterm.html>
- Ontario Community Support Association. (2000, June). *The effect of the managed competition model on home care in Ontario: Emerging issues and recommendations*. Toronto, Ontario: Author.
- Ontario Health Coalition. (2001). *Secrets in the house: Homecare reform in Ontario 1997-2000*. Toronto, Ontario: Author.
- Ontario Long Term Care Association. (2001). *Working for better healthcare*. Markham, Ontario: Author.
- 'Outliving your money' a new concern for seniors. (2002, July 17). *Toronto Star*, p. A6.
- Pierce, S. (1997). Nurse-sensitive health care outcomes in acute care settings: An integrative analysis of the literature. *Journal of Nursing Care Quality, 11(4)*, 60-72.
- PricewaterhouseCoopers. (2001) *Report of a study to review levels of service and responses to need in a sample of Ontario long-term care facilities and selected comparators*. Toronto, Ontario: Author.
- Pringle, D. M., & White, P. (2002). Happenings. Nursing matters: The nursing and health outcomes project of the Ontario Ministry of Health and Long-Term Care. *Canadian Journal of Nursing Research, 33(4)*, 115-121.
- Registered Nurses Association of Ontario. (2000). *Ensuring the care will be there: Report on nursing recruitment and retention in Ontario*. Toronto, Ontario: Author.
- Registered Nurses Association of Ontario. (2001). *The public needs action-now-on home health concerns; future reform uncertainty*. Toronto, Ontario: Author.
- Registered Nurses Association of Ontario. (2003, March 27). *Ontario budget mortgages our health-care future with promises of tax cuts*. [Media Advisory]. Retrieved April 14, 2003, from <http://www.rnao.org>.
- Registered Practical Nurses Association of Ontario. (n.d). *About us*. Retrieved August 14, 2002 from <http://www.rpnao.org/aboutus.asp>
- Rice, D. P., Hodgson, T., Sinsheimer, P., Browner, W., Kopstein, A. N. (1986). The economic costs of the health effects of smoking, 1984. *Milbank Quarterly, 64(4)*, 489-547.
- Rogers, D. (2003, March 7). ROH cancels 12 psychiatric layoffs; funding not secure; nurses still at risk. *Ottawa Citizen*. Retrieved March 20, 2003, from <http://www.canada.com/ottawa/ottawacitizen/>
- Ryerson University. (2003). *Nurse practitioner role description*. Retrieved January 28, 2003, from <http://www.ryerson.ca/programs/nurpract.html>

- Santos, S. R., and Cox, K. (2000). Workplace adjustment and intergenerational differences between matures, boomers, and xers. *Nursing Economic\$, 18(1)*, 7-13.
- Shah, C. P., Kahan, M., & Krauser, J. (1987). The health of children of low-income families. *Canadian Medical Association Journal, 137(6)*, 485-90.
- Shamian, J., Hagen, B., Hu, T., & Fogarty, T. E. (1994). The relationship between length of stay and required nursing care hours. *Journal of Nursing Administration, 24(7/8)*, 52-8.
- Shamian J., O'Brien-Pallas, L., & Laschinger, H. (2003, February). *An international examination of the cost of turnover & the impact of turnover on patient safety and nurse outcomes*. 5th Joint National Conference on Quality in Health Care. Toronto, Ontario.
- Shamian, J., O'Brien-Pallas, L., Kerr, M., Koehoorn, M., Thomson, D., & Alksnis, C. (2001). *Effects of job strain, hospital organizational factors and individual characteristics on work-related disability among nurses*. Toronto, Ontario: Workplace Safety and Insurance Board.
- Sox, H. C. (2000). Independent primary care practice by nurse practitioners (editorial). *JAMA, 283(1)*, 106-108.
- Statistics Canada. (1996). *Census Nation Tables*. [Data file]. Available from Statistics Canada website, [www.statcan.ca](http://www.statcan.ca)
- Stewart, M. J. (1990). Access to health care for economically disadvantaged Canadians: A model. *Canadian Journal of Public Health, 81(6)*, 450-5.
- Stolley, J. M., Buckwalter, K. C., & Shannon, M. D. (1991). Caring for patients with Alzheimer's disease. Recommendations for nursing education. *The Journal of Gerontological Nursing, 17(6)*, 34-38.
- The Standing Senate Committee on Social Affairs, Science and Technology. (2002). *The Health of Canadians – The Federal Role. Volume 6: Recommendations and Reform*. Ottawa, Canada: Author
- Thomson, D., Dunleavy, J., & Bruce, S. (2002). *Nurse job satisfaction - factors relating to nurse satisfaction in the workplace*. Ottawa, Ontario: Canadian Nursing Advisory Committee.
- Tomblin Murphy, G., O'Brien-Pallas, L., Birch, S., Pringle, D., Rootman, I., Alksnis, C., et al. (2000- 2003). *Health human resources planning: An examination of relationships among nursing service utilization, and estimate of population health and overall status outcomes in the province of Ontario*. Ottawa: Ontario: Canadian Health Services Research Foundation.
- Toronto District Health Council (2002). *Assessing the impact of the community nursing shortage in Toronto*. Toronto, Ontario: Author.
- Tranmer, J., Gerlach, J., Beatty, C., & MacKenzie, T. (1995). *Factors impacting patient outcomes in an outpatient procedure unit*. [Final Report]. Kingston, Ontario: Kingston General Hospital.
- World Health Organization. (2000). *The World Health report 2000. Health systems: Improving performance*. Geneva, Switzerland: Author.

## ***Appendix A: List of Nurse Researchers and Areas of Interest***

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The NRU comprises a multi-disciplinary group of 2 Co-Principal Investigators and 42 Co-Investigators from the University of Toronto and McMaster University.

### ***AT THE UNIVERSITY OF TORONTO:***

#### **LINDA O'BRIEN-PALLAS, RN, PhD**

- nursing health human resources
- quality of nursing worklife
- factors influencing variability in nursing resource use and patient outcomes
- workload measurement and patient classification systems

#### **MICHAEL CARTER, PhD**

- scheduling and information systems application in health care
- course and examination timetabling
- production scheduling and sequencing

#### **RAISA DEBER, PhD**

- Canadian health policy
- definitions of "medical necessity"
- examination of specialized services under population-based models
- public and private roles in the financing and delivery of health services (with a focus on long-term care)
- medical decision-making and issues surrounding patient empowerment

#### **GAIL DONNER, RN, PhD**

- health policy
- nursing administration
- professional issues
- career planning and development

#### **DIANE DORAN, RN, PhD**

- health care teams
- evaluation of methods for improving quality in nursing practice
- design and measurement of nursing sensitive patient outcomes
- process and outcome indicators for evaluating the quality of nursing care
- alternative health care provider roles

#### **RUTH GALLOP, RN, PhD**

- nurse - patient relationship with a particular emphasis on patients perceived as difficult to manage and treat
- professional boundary issues

**MICKEY KERR, PhD**

- risk factors for musculoskeletal disorders
- the workplace psychosocial environment
- stress research
- biological mechanisms for injury

**HEATHER K. SPENCE LASCHINGER, RN, PhD**

- impact of work conditions on nurses' health
- linking nursing work conditions to patient outcomes
- workplace empowerment

**LINDA MCGILLIS HALL, RN, PhD**

- determining nursing's effectiveness in the health care system
- examining methods for costing nursing services
- impact of differing staff mixes on outcomes

**KATHERINE SIMONE MCGILTON, RN, PhD**

- understanding, measuring, and enhancing relationships between care providers and residents, and between care providers and their supervisors in long-term care environments
- the measurement and implementation of best information and research with practice

**LYNN NAGLE, RN, PhD**

- nursing informatics in clinical practice settings

**ELIZABETH PETER, RN, PhD**

- home care ethics

**PATRICIA PETRYSHEN, RN, PhD**

- clinical and economic outcomes of patient care
- public health

**GEORGE H. PINK, PhD**

- health services accounting and finance
- hospital scorecards and report cards
- integrated delivery systems
- MIS reporting variations

**DOROTHY PRINGLE, RN, PhD**

- community health
- care of disabled and impaired older people
- health services for the elderly and their family members
- human resource issues in nursing and nurse managers' span of control
- health care system and nursing's role
- nursing education and research

**JUDITH SHAMIAN, RN, PhD**

- health care politics and policy
- nursing policy
- international health

**SOURAYA SIDANI, RN, PhD**

- research methods and instrument development and testing
- evaluating nursing interventions
- evaluating nursing care delivery models

**JOAN TRANMER, RN, PhD**

- measurement and evaluation of patient and system outcomes
- improvement of patient care for complex, seriously ill hospitalized patients or patients with complex, multi-factorial clinical concerns

**ANN TOURANGEAU, RN, PhD**

- nursing, patient and hospital outcomes
- health service
- staff mix

**SUSANNE WILLIAMS, RN, MEd**

- nursing education
- policy development and professionalization of nurses
- adequate supply of nursing human resources
- overcoming the challenges of supply side database development

*AT MCMASTER UNIVERSITY:*

**ANDREA BAUMANN, RN, PhD**

- health human resources
- quality of worklife
- health systems research
- clinical decision-making
- quantitative methodology

**MARJORIE ARMSTRONG-STASSEN, MLHR, PhD**

- organizational downsizing
- layoff survivors
- aging workforce
- work stress and coping
- human resource management

**VISHWANATH BABA, MBA, PhD**

- employee-organization linkages

**BARBARA BEARDWOOD, MA, PhD**

- workplace injuries

**JENNIFER BLYTHE, MLS, PhD**

- nursing health human resources
- restructuring
- quality of nursing worklife
- nursing migration

**SHERYL BOBLIN, RN, PhD**

- nursing competency
- decision-making of patients and health care providers
- learning needs of patients and nurses

**RON BURKE, MA, PhD**

- hospital restructuring
- organizational behaviour

**SHEILA CAMERON, RN, EdD**

- impact of downsizing and mergers on hospital nursing staff

**DONNA CILISKA, RN, PhD**

- community health
- obesity
- eating disorders
- research dissemination

**MARGARET DENTON, PhD**

- women's health
- formal care giving
- health and aging
- community health and social services
- long-term care
- supportive housing
- retirement and income inequality

**ALBA DICENSO, RN, PhD**

- introduction and evaluation of nurse practitioner roles
- evaluation of Advanced Practice Nursing Roles and Interventions

**MAUREEN DOBBINS, RN, PhD**

- research transfer and uptake
- evidence-based decision-making
- organizational culture
- outcomes research
- health economics
- health services delivery

**SUSAN FRENCH, RN, PhD**

- HHR development
- worklife of nurses
- role of consumers in health care
- nursing as a career choice

**ESTER GREENGLASS, PhD**

- stress and job burnout
- psychological effects of downsizing on nurses
- coping

**MARTHA HORSBURGH, RN, PhD**

- quality of nursing worklife
- impact of hospital downsizing on nurses
- adult self-care

**MABEL HUNSBERGER, RN, PhD**

- pediatric nursing

**JANET LANDEEN, RN, PhD**

- psychological aspects of schizophrenia
- role of nursing in promoting the quality of life of individuals with severe mental illnesses

**COLLEEN McKEY, RN, MScHSA, PhD, CHE**

- leadership practices
- change theory
- human resources in all health care sectors
- work effectiveness
- mentorship for nurse leaders

**CHARLOTTE NOESGAARD, RN, MScN**

- utilization of knowledge management in clinical practice
- integration of health care services across the continuum of care (acute, long-term, and home care services)
- RN recruitment

**JENNY PLOEG, RN, PhD**

- health and aging
- health promotion and disease prevention
- caregiver support
- evaluation of community health services

**JANE UNDERWOOD, RN, MBA**

- roles and skills of health professionals in community health promotion
- use of evidence by public health and community practitioners
- quality of workplace for nurses

**OLIVE WAHOUSH, RN, MSc, PhD(c)**

- health administration
- maternal child and pediatrics

**ROBIN WEIR, RN, PhD**

- quality of nurses' worklife
- psychosocial and behavioural research related to health

**ISIK ZEYINOGLU, PhD**

- non-standard and flexible work arrangements
- women's work and occupational health
- women in business as managers/professionals
- international and comparative industrial relations/human resource management



## ***Appendix B: Education Data Sources***

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The following are national and provincial data sources that were examined for Ontario nursing education data in preparation for this report.

- Ontario College Application Services
  - Unpublished data
- Council of Ontario Universities
  - Derived from Ontario Universities' Application Centre data
- Ontario Ministry of Training, Colleges, and Universities - Colleges Branch
  - Unpublished new entrant and enrolment data
  - Employment Profile publications
  - Unpublished Graduate Record data
- Ontario Ministry of Training, Colleges, and Universities - Universities Branch
  - Unpublished data from UAR/USIS system
- Statistics Canada
  - University Student Information System
  - Community College Information System
  - Enhanced Student Information System
  - Education in Canada publications
- Other publishers/users of Statistics Canada data
  - CANSIM
  - Association of Universities and Community Colleges
  - Canadian Association for Graduate Studies
- Canadian Nurses Association/Canadian Association of University Schools of Nursing
- Ryten Reports
- Sinclair Report
- NRU Entry to Practice Project

## Appendix C: HHR Modeling Theoretical Background

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Taken from: O'Brien-Pallas, L. (2002). Where to from here? *Canadian Journal of Nursing Research*, 33(4), 3-14.

The framework (O'Brien-Pallas et al., 2001) considers:

### **Population Characteristics Related to Health Levels and Risks (Needs-Based Factors)**

reflect the multivariate characteristics of individuals in the population that create the demand for curative as well as preventative health services. Population health needs is not an additive function and is influenced by several mediating factors (Eyles, Birch, & Newbold, 1993) such as actual and perceived population health status, socioeconomic status, demographic characteristics, enabling and predisposing factors, and health behaviours (Aday & Anderson, 1974). Health need is directly and/or indirectly influenced by social, culture, political, contextual, geographical, environmental, and financial factors. Population health needs are also influenced by the determinants of health. The determinants of health is the collective label given to the multiple factors that are thought to contribute to the health of populations. They include such things as people's biological endowment and individual responses, the social and physical environment in which they live, the economic conditions (i.e., productivity and wealth) of their society, and the accessibility and quality of the health care system.

**Planning and Forecasting** reflect the array of methodologies used to predict future service requirements and the numbers of providers needed to deliver these services. The choice of the modeling approach is often influenced by data availability. Historically, supply-based models have been used most frequently for forecasting and planning because of ease of data access. Lavis and Birch (1997) note there is no unambiguous right way to model human resources.

Instead, the conceptual basis for human resource planning will depend on the question being asked - do we want to know how many nurses or physicians are required to continue to serve populations in the way they are currently served? or how many are required to support the services required to meet all, or a proportion of the expected needs of the population? or how many are required to satisfy the expected development and plans for the future provision of health care services? Birch et al. (1994) refer to these three approaches as utilization-based, needs-based and 'effective demand'-based approaches to human resources planning. The 'unit of analysis' across the different approaches is the same (e.g., physician consultations, dentist courses of treatment, nursing hours). However, the underlying 'driver' of this measure differs between the approaches reflecting the different ways societies think about the delivery of health care, the provision of services, the population's needs, and the commitment of society's scarce resources.

In some ways, each approach builds upon the principles of the previous approach and introduces additional considerations (Birch et al., 1994). Although this might be seen as enriching the applicability of the approaches to epidemiological, economic, and political realities and hence enhancing the policy relevance of the analyses, this will depend on the philosophical basis of the particular health care system being studied. For example, in societies where health care services are delivered through private markets and access to services is determined by willingness and ability to pay for services at the individual level, there would be little value in basing future nurse or other health provider requirements on the estimated needs for care of the population, or the estimated future commitment of government resources to health care, since neither of these factors will be important in determining the future deployment of available health providers. In this way, the future plans for funding, delivery, and configuration of services determines the appropriate approach to be followed.

Forecasting and planning must be seen as a continuous quality improvement process that is updated regularly. Longer range planning projections involve greater uncertainty of the planning variables in comparison to intermediate range planning (Cooper, Laud, & Detrich, 1998; O'Brien-Pallas et al., 1998).

**Supply** reflects the actual number, type, and geographic distribution of regulated and unregulated providers available to deliver health services at a given point in time. Supply is fluid in nature and is influenced by several factors including the International Labor Organization's Key Indicators of the Labor Market (<http://www.ilo.org/public/english/employment/strat/kilm/indicats.htm>). These include but are not limited to participation rates, provider to population ratios, demographic and educational characteristics of individual providers, full-time and part-time work hours, employment sector, underemployment, unemployment, and inactivity. Death, retirement, emigrant, and immigration rates influence supply at any one point in time. The role - including scope of practice - undertaken by any regulated provider is determined by licensing/regulation standards of practice. The role of unregulated workers is excluded from licensure/regulation and is generally determined by employers.

**Financial Resources** reflect the overall portion of the Gross Domestic Product (GDP) that is dedicated to health and education. Finance available for the health system can reflect public/private payers. Health system inputs must consider the appropriate balance between human and physical capital. Human capital decisions include the appropriate quantity, mix, and distribution of health services. Finding this balance requires continuous monitoring, careful choices given financial realities of the choices being made, and the use of research evidence to ensure that population health needs are addressed effectively and efficiently. The mix of financial resources for health needs to balance between human and non-human resources (e.g., technology, drugs, hospital beds, and human resources) (WHO, 2000).

**Production** involves the education and training of future health providers. The array of educational programs range from university prepared practitioners to on-the-job training. The number of formal positions offered in any educational institution is influenced by financial resources and designated number of funded seats. The link between population health needs and future capacity to meet those needs ought to be considered in setting production targets for seats in any health discipline.

**Management, Organization, and Delivery of Health Services** are key variables that influence how care is delivered across the continuum. Management and organizational characteristics influence the amount and quality of care provided, provider health and satisfaction, and costs associated with delivery of services. Organization characteristics such as structural arrangements, the degree of formalization and centralization, environmental complexity, and culture influence the way work gets done and impacts on outcomes. In nursing for example, numerous studies have demonstrated that resource allocation decisions made by managers can have a negative impact on nurse job satisfaction (Kramer & Schmalenberg, 1988; Blegen, 1993) and health (Josephson & Vingard, 1998; Amick et al., 1998) as well as on patient outcomes (Aiken, Smith, & Lake, 1994; Brooten & Naylor, 1995; Blegen, Goode, & Reed, 1998; Blegen & Vaughn, 1998; Kovner & Gergen, 1998), and patient satisfaction with the care received (Leiter, Harvie, & Frizzell, 1998; McGillis Hall et al., 2001), the level of productivity (O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001) and the number of visits a client receives in the community (O'Brien-Pallas et al., 2001).

**Resource deployment and Utilization** reflects the amount and nature of the resources deployed to provide health services to the population at large. Utilization reflects the nature and type of resources utilized by the population to meet health needs. The efficiency and effectiveness of service delivery depends to a great extent on the effective deployment and use of personnel (Ozcan, Taranto, & Horney, 1995). WHO (2000) notes that provision of health care involves putting together a considerable number of resource inputs to deliver an extraordinary array of different service outputs. Decisions made about the deployment and use of personnel across all sectors of the system influences access to services and utilization by the population and outcomes.

**Health Outcomes** refers to the health status of the population. Outcomes assessment has two broad objectives: to establish effectiveness of care, and to assess quality care (Foz & Fine, 2000). These

outcomes are classified into those focusing on individual health and the health of populations or communities. Similar to the U.S. Public Health Services (Aday, Begley, Lairson, & Slater, 1998), and Roos et al. (1999), we have developed many indicators of health status from both primary and secondary sources including population health surveys, vital statistics mortality data, cancer registry data, hospital discharge diagnoses, and the diagnosis submitted on claims from physicians' visits. Examples of some of these indicators include: premature mortality rate (PMR; i.e., death before 75); socioeconomic status (e.g., education, unemployment, percentage of single mothers, housing costs); life expectancy; standardized mortality rates; mortality from cancer, injury, and chronic diseases; disease incidence; medical conditions associated with poor functional status and poor-perceived health status, low birth weight; prenatal care outcomes; and poverty, etc. These indicators capture various dimensions of community health ranging from mortality/morbidity from cancer, injuries, and chronic diseases to disability among youth and medical conditions associated with functional limitations and restricted activity days among the elderly. Even though databases as described show great promise, it is critical to recognize that the relationship between health and health care is not straightforward. However, it is imperative that databases be used to inform health related decisions and policy.

**Provider Outcomes** include the health status of providers, retention rates, turnover rates, sick time, work satisfaction, levels of burnout, and other affective responses to the work and work environment. At the micro level several studies have indicated that the work environment, role and job characteristics influence health of providers (Irvine & Evans, 1995; O'Brien-Pallas, Baumann, & Villeneuve, 1994) and the quality of care provided to patients. Research across occupations suggests that long periods of job strain affect personal relationships and increase sick time, conflict, job dissatisfaction, turnover, and inefficiency. Job strain exacerbates medical problems and the risk of musculoskeletal injury and accidents, burnout, illness, substance abuse, and smoking increases (Baumann et al., 2001).

**System Outcomes** include the cost associated with the resources dedicated to health services. These include rates of hospitalization, home visits, readmission rates, amount of money spent on the various health sectors, the number of people treated in each health sector, the neediness of the population being treated, case intensity, cost efficiency, discharge efficiency, proportion of acute versus non-acute care, outpatient/inpatient surgery rates, and occupancy rates.

**Context Including Political, Social, Geography, Technology, Economic Factors, and Shocks to the System:** At the population level, many other determinants of health exist besides medical care. Reconceptualizing the determinants of health as a means of health policy, Evans, Barer, and Marmor (1994) identified that physical environment, social environment, individual behaviour, genetic endowment, and medical care all contribute to the health of populations. Population health concerns itself with the living and working environments that affect people's health, the conditions that enable and support people in making healthy choices, and the services that promote and maintain health (Advisory Committee on Population Health, 1994). Biological factors (including genetic predispositions to develop specific disease), environment factors (such as pollution), and individual socioeconomic characteristics (poverty, lack of education, unemployment) have a strong negative impact on the health of the population (Roos et al., 1996; Advisory Committee on Population Health, 1994). Shocks to the System are unanticipated events which influence the health system and the human resource process.

**Efficient Mix of Human and Non-Human Resources** reflects the number and type of resources deployed (both human and non-human) at which the best population, provider, and system outcomes are achieved. Having an efficient mix of these resources is different than simply providing services in that the outcomes of the process are considered.

## Appendix D: Data Tables

### Chapter 1 – Nurse Supply

Data for Figure 1.2

<b>Renewal of Registration</b>				
Year	RNs	RNs Percent Change	RPNs	RPNs Percent Change
1992	108618	0.81	33724	-0.54
1993	108929	0.29	34071	1.03
1994	110416	1.37	35299	3.60
1995	109202	-1.10	34771	-1.50
1996	107953	-1.14	34139	-1.82
1997	105888	-1.91	33374	-2.24
1998	103882	-1.89	32459	-2.74
1999	103160	-0.70	32004	-1.40
2000	102875	-0.28	31515	-1.53
2001	102856	-0.02	31360	-0.49
2002	103208	0.34	31015	-1.10

Source: College of Nurses of Ontario

Data for Figures 1.3

<b>Ontario Graduates</b>						
Calendar Year	RPN Certificate	RPN Percent Change	RN Diploma	RN Diploma Percent Change	RN Basic & Post RN Degree	RN Basic & Post RN Degree Percent Change
1992	982	-4.3	2291	3.3	858	5.5
1993	1137	15.8	2445	6.7	911	6.2
1994	983	-13.5	2452	0.3	901	-1.1
1995	1088	10.7	2301	-6.2	974	8.1
1996	914	-16.0	2045	-11.1	1006	3.3
1997	1023	11.9	1821	-11.0	1098	9.1
1998	873	-14.7	1679	-7.8	1025	-6.6
1999	831	-4.8	1343	-20.0	1082	5.6
2000	927	11.6	1094	-18.5	975	-9.9
2001	unavailable	unavailable	unavailable	unavailable	1026	5.2
2002	unavailable	unavailable	unavailable	unavailable	unavailable	unavailable

Sources: RPN Certificate & RN Diploma – Ministry of Training, Colleges, and Universities - Colleges Branch, Graduate Record; RN Basic & Post-RN Degree - Statistics Canada: University Student Information System - Graduating Students (1992 - 2001) [Ministry of Training, Colleges, and Universities - Universities Branch]

Data for Figure 1.4

<b>Immigration of Nurses</b>		
Year	RN: Out of Province	RPN: Out of Province
1991	1843	178
1992	1145	141
1993	948	132
1994	823	115
1995	855	77
1996	693	82
1997	569	110
1998	544	128
1999	730	112
2000	1244	159
2001	1176	121
2002	1580	118

Source: College of Nurses of Ontario

Data for Figure 1.5

<b>Potential Supply of Nurse in Ontario</b>						
Year	Nurses	Nurse Percent Change	RNs	RN Percent Change	RPNs	RPN Percent Change
1991	148188	1.72	112576	1.54	35612	2.29
1992	148115	-0.05	112599	0.02	35516	-0.27
1993	148638	0.35	112761	0.14	35877	1.02
1994	150416	1.20	113823	0.94	36593	2.00
1995	149118	-0.86	113052	-0.68	36066	-1.44
1996	146878	-1.50	111486	-1.39	35392	-1.87
1997	143721	-2.15	109098	-2.14	34623	-2.17
1998	140610	-2.16	106829	-2.08	33781	-2.43
1999	139072	-1.09	105931	-0.84	33141	-1.89
2000	139376	0.22	106305	0.35	33071	-0.21
2001	138484	-0.64	105971	-0.31	32513	-1.69
2002	139476	0.72	107221	1.18	32255	-0.79

Source: College of Nurses of Ontario

Data for Figures 1.6a & 1.6b

<b>Nurses Working in Ontario</b>				
Year	RNs Working	RN Percent Change (base year = 1992)	RPNs Working	RPN Percent Change (base year = 1992)
1992	82105	n/a	24285	n/a
1993	82325	0.27	24702	1.72
1994	82069	-0.04	25345	4.36
1995	81523	-0.71	25756	6.06
1996	81736	-0.45	25766	6.10
1997	80369	-2.11	25703	5.84
1998	79267	-3.46	25597	5.40
1999	78174	-4.79	25189	3.72
2000	82788	0.83	26177	7.79
2001	81026	-1.31	25122	3.45
2002	83123	1.24	25573	5.30

Source: College of Nurses of Ontario

Data for Figure 1.7

<b>Where RNs Work</b>						
Year	Frequency	Hospital (percent)	Long-Term Care (percent)	Community (percent)	Other (percent)	Missing (percent)
1992	82105	65.6	6.9	10.1	12.7	4.7
1993	82325	65.8	7.7	11.0	14.5	1.0
1994	82069	63.3	7.5	10.6	15.2	3.4
1995	81523	64.5	7.8	11.9	13.6	2.2
1996	81736	63.4	8.3	11.7	15.0	1.6
1997	80369	61.5	8.6	12.7	16.5	0.7
1998	79267	59.2	8.3	13.1	17.8	1.6
1999	78174	59.2	8.3	14.3	17.7	0.5
2000	82788	59.5	8.2	14.5	17.5	0.3
2001	81026	60.8	7.7	14.3	16.7	0.4
2002	83208	58.3	7.2	13.6	17.0	3.8

Source: College of Nurses of Ontario

Data for Figure 1.8

<b>Where RPNs Work</b>						
Year	Frequency	Hospital (percent)	Long-Term Care (percent)	Community (percent)	Other (percent)	Missing (percent)
1992	24285	61.1	18.5	3.5	7.5	9.4
1993	24702	62.4	21.8	5.9	8.8	1.1
1994	25345	58.6	21.1	6.5	9.6	4.2
1995	25756	59.0	21.8	8.0	7.3	3.9
1996	25766	58.3	23.1	8.0	8.0	2.6
1997	25703	56.5	24.3	8.4	9.4	1.4
1998	25597	52.9	24.1	8.7	11.0	3.3
1999	25189	51.7	25.7	9.7	12.1	0.8
2000	26177	51.2	26.5	9.9	11.7	0.7
2001	25122	49.9	27.0	9.9	12.6	0.6
2002	25573	45.2	27.0	9.4	12.9	5.6

Source: College of Nurses of Ontario

Data for Figure 1.9

<b>Employment Status of RNs</b>					
Year	Frequency	Full-Time (Percent)	Part-Time (Percent)	Casual (Percent)	Missing (Percent)
1992	82105	55.7	31.5	12.3	0.5
1993	82325	53.7	31.2	13.3	1.8
1994	82069	51.6	30.5	13.4	4.5
1995	81523	53.2	31.6	12.8	2.4
1996	81736	52.1	32.8	13.5	1.6
1997	80369	49.8	33.4	14.2	2.6
1998	79267	49.4	35.2	14.3	1.1
1999	78174	50.1	35.9	13.6	0.4
2000	82788	52.9	35.7	11.1	0.3
2001	81026	54.8	34.7	9.8	0.7
2002	83208	54.0	31.7	9.4	4.9

Source: College of Nurses of Ontario



Data for Figure 1.10

<b>Employment Status of RPNs</b>					
Year	Frequency	Full-Time (Percent)	Part-Time (Percent)	Casual (Percent)	Missing (Percent)
1992	24285	55.2	29.6	14.8	0.4
1993	24702	51.1	30.8	15.5	2.6
1994	25345	48.8	30.4	15.6	5.2
1995	25756	49.8	32	14.1	4.1
1996	25766	49.8	32.9	14.6	2.7
1997	25703	47.9	33.6	14.4	4.1
1998	25597	47.4	35.3	15.5	1.8
1999	25189	47.1	36.4	15.8	0.7
2000	26177	47.7	37.8	13.8	0.7
2001	25122	48.0	38.3	12.5	1.2
2002	25573	45.5	36.5	11.8	6.2

Source: College of Nurses of Ontario

Data for Figure 1.11

Age Category	RNs		RPNs	
	Frequency	Percent	Frequency	Percent
20-24	2062	1.9	958	3.0
25-29	7921	7.5	2330	7.3
30-34	11339	10.7	3294	10.3
35-39	14797	14.0	4225	13.2
40-44	15251	14.4	4991	15.6
45-49	18156	17.1	5870	18.3
50-54	17036	16.1	5529	17.2
55-59	12819	12.1	3501	10.9
60-65	6673	6.3	1367	4.3
Total	106054	100.0	32065	100.0

Source: College of Nurses of Ontario

Data for Figures 1.12 & 1.13

**Employment Status of RNs Working in Nursing in Ontario in 2002 by Age**

Age		Employment Status			Total
		Full-Time	Part-Time	Casual	
20-24	Count	<b>308</b>	<b>289</b>	<b>114</b>	<b>711</b>
	% within age category	43.3	40.6	16.0	100.0
	% within work status	0.7	1.1	1.5	0.9
25-29	Count	<b>3506</b>	<b>1513</b>	<b>538</b>	<b>5557</b>
	% within age category	63.1	27.2	9.7	100.0
	% within work status	7.8	5.8	7.1	7.1
30-34	Count	<b>4522</b>	<b>2836</b>	<b>797</b>	<b>8155</b>
	% within age category	55.5	34.8	9.8	100.0
	% within work status	10.1	10.9	10.5	10.4
35-39	Count	<b>5522</b>	<b>4503</b>	<b>1214</b>	<b>11239</b>
	% within age category	49.1	40.1	10.8	100.0
	% within work status	12.3	17.3	16.0	14.3
40-44	Count	<b>6266</b>	<b>4209</b>	<b>1227</b>	<b>11702</b>
	% within age category	53.5	36.0	10.5	100.0
	% within work status	14.0	16.1	16.2	14.9
45-49	Count	<b>8532</b>	<b>4526</b>	<b>1037</b>	<b>14095</b>
	% within age category	60.5	32.1	7.4	100.0
	% within work status	19.1	17.4	13.7	18.0
50-54	Count	<b>8319</b>	<b>4002</b>	<b>886</b>	<b>13207</b>
	% within age category	63.0	30.3	6.7	100.0
	% within work status	18.6	15.3	11.7	16.8
55-59	Count	<b>5629</b>	<b>2796</b>	<b>941</b>	<b>9366</b>
	% within age category	60.1	29.9	10.0	100.0
	% within work status	12.6	10.7	12.4	11.9
60-65	Count	<b>2143</b>	<b>1412</b>	<b>824</b>	<b>4379</b>
	% within age category	48.9	32.2	18.8	100.0
	% within work status	4.8	5.4	10.9	5.6
Total	Count	<b>44747</b>	<b>26086</b>	<b>7578</b>	<b>78411</b>
	% within age category	57.1	33.3	9.7	100.0
	% within work status	100.0	100.0	100.0	100.0

Source: College of Nurses of Ontario

Data for Figures 1.14 & 1.15

**Employment Status of RPNs Working in Nursing in Ontario in 2002 by Age**

Age		Employment Status			Total
		Full-Time	Part-Time	Casual	
20-24	Count	<b>109</b>	<b>287</b>	<b>124</b>	<b>520</b>
	% within age category	21.0	55.2	23.8	100.0
	% within work status	0.9	3.1	4.2	2.2
25-29	Count	<b>515</b>	<b>928</b>	<b>280</b>	<b>1723</b>
	% within age category	29.9	53.9	16.3	100.0
	% within work status	4.4	10.0	9.4	7.2
30-34	Count	<b>910</b>	<b>1241</b>	<b>379</b>	<b>2530</b>
	% within age category	36.0	49.1	15.0	100.0
	% within work status	7.8	13.4	12.7	10.6
35-39	Count	<b>1373</b>	<b>1338</b>	<b>487</b>	<b>3198</b>
	% within age category	42.9	41.8	15.2	100.0
	% within work status	11.8	14.4	16.3	13.4
40-44	Count	<b>1826</b>	<b>1478</b>	<b>488</b>	<b>3792</b>
	% within age category	48.2	39.0	12.9	100.0
	% within work status	15.7	15.9	16.4	15.9
45-49	Count	<b>2424</b>	<b>1584</b>	<b>454</b>	<b>4462</b>
	% within age category	54.3	35.5	10.2	100.0
	% within work status	20.9	17.1	15.2	18.7
50-54	Count	<b>2483</b>	<b>1298</b>	<b>356</b>	<b>4137</b>
	% within age category	60.0	31.4	8.6	100.0
	% within work status	21.4	14.0	11.9	17.3
55-59	Count	<b>1495</b>	<b>805</b>	<b>274</b>	<b>2574</b>
	% within age category	58.1	31.3	10.6	100.0
	% within work status	12.9	8.7	9.2	10.8
60-65	Count	<b>488</b>	<b>330</b>	<b>138</b>	<b>956</b>
	% within age category	51.0	34.5	14.4	100.0
	% within work status	4.2	3.6	4.6	4.0
Total	Count	<b>11623</b>	<b>9289</b>	<b>2980</b>	<b>23892</b>
	% within age category	48.6	38.9	12.5	100.0
	% within work status	100.0	100.0	100.0	100.0

Source: College of Nurses of Ontario

Data for Figure 1.16 (for RNs)

<b>RNs Outside the Nursing Workforce Seeking Employment in Nursing in 2002 (by Age Category)</b>				
Age Category		Seeking Work in Nursing?		Total
		Yes	No	
20-24	Count	<b>20</b>	<b>30</b>	<b>50</b>
	% within age category	40.0	60.0	100.0
	% within seeking nursing work	1.0	0.3	0.4
25-29	Count	<b>143</b>	<b>249</b>	<b>392</b>
	% within age category	36.5	63.5	100.0
	% within seeking nursing work	6.9	2.4	3.2
30-34	Count	<b>215</b>	<b>675</b>	<b>890</b>
	% within age category	24.2	75.8	100.0
	% within seeking nursing work	10.4	6.6	7.3
35-39	Count	<b>256</b>	<b>1174</b>	<b>1430</b>
	% within age category	17.9	82.1	100.0
	% within seeking nursing work	12.4	11.5	11.7
40-44	Count	<b>317</b>	<b>1265</b>	<b>1582</b>
	% within age category	20.0	80.0	100.0
	% within seeking nursing work	15.4	12.4	12.9
45-49	Count	<b>342</b>	<b>1679</b>	<b>2021</b>
	% within age category	16.9	83.1	100.0
	% within seeking nursing work	16.6	16.5	16.5
50-54	Count	<b>319</b>	<b>1764</b>	<b>2083</b>
	% within age category	15.3	84.7	100.0
	% within seeking nursing work	15.5	17.3	17.0
55-59	Count	<b>265</b>	<b>1862</b>	<b>2127</b>
	% within age category	12.5	87.5	100.0
	% within seeking nursing work	12.9	18.3	17.4
60-65	Count	<b>181</b>	<b>1491</b>	<b>1672</b>
	% within age category	10.8	89.2	100.0
	% within seeking nursing work	8.8	14.6	13.7
Total	Count	<b>2058</b>	<b>10189</b>	<b>12247</b>
	% within age category	16.8	83.2	100.0
	% within seeking nursing work	100.0	100.0	100.0

Source: College of Nurses of Ontario

Data for Figure 1.16 (for RPNs)

<b>RPNs Outside the Nursing Workforce Seeking Employment in Nursing in 2002 (by Age Category)</b>				
Age Category		Seeking Work in Nursing?		Total
		Yes	No	
20-24	Count	<b>38</b>	<b>26</b>	<b>64</b>
	% within age category	59.4	40.6	100.0
	% within seeking nursing work	3.2	0.7	1.4
25-29	Count	<b>82</b>	<b>166</b>	<b>248</b>
	% within age category	33.1	66.9	100.0
	% within seeking nursing work	6.9	4.8	5.3
30-34	Count	<b>162</b>	<b>278</b>	<b>440</b>
	% within age category	36.8	63.2	100.0
	% within seeking nursing work	13.6	8.0	9.4
35-39	Count	<b>157</b>	<b>420</b>	<b>577</b>
	% within age category	27.2	72.8	100.0
	% within seeking nursing work	13.2	12.0	12.3
40-44	Count	<b>206</b>	<b>544</b>	<b>750</b>
	% within age category	27.5	72.5	100.0
	% within seeking nursing work	17.3	15.6	16.0
45-49	Count	<b>194</b>	<b>670</b>	<b>864</b>
	% within age category	22.5	77.5	100.0
	% within seeking nursing work	16.3	19.2	18.5
50-54	Count	<b>182</b>	<b>686</b>	<b>868</b>
	% within age category	21.0	79.0	100.0
	% within seeking nursing work	15.3	19.7	18.6
55-59	Count	<b>108</b>	<b>475</b>	<b>583</b>
	% within age category	18.5	81.5	100.0
	% within seeking nursing work	9.1	13.6	12.5
60-65	Count	<b>63</b>	<b>221</b>	<b>284</b>
	% within age category	22.2	77.8	100.0
	% within seeking nursing work	5.3	6.3	6.1
Total	Count	<b>1192</b>	<b>3486</b>	<b>4678</b>
	% within age category	25.5	74.5	100.0
	% within seeking nursing work	100.0	100.0	100.0

Source: College of Nurses of Ontario

Data for Figure 1.17

Applications to All Ontario Nursing Programs								
Academic Year or Fall Entry	RPN Certificate	RPN Certificate Percent Change	RN Diploma	RN Diploma Percent Change	RN Collaborative Degree via OCAS	RN Collaborative Degree via OCAS Percent Change	RN Degree	RN Degree Percent Change
1992	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	3697	4.8
1993	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	3411	-7.7
1994	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	3159	-7.4
1995	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	3423	8.4
1996	6085	unavailable	13095	unavailable	N/A*	N/A*	2940	-14.1
1997	5087	-16.4	9784	-25.3	N/A*	N/A*	1802	-38.7
1998	5185	1.9	11309	15.6	N/A*	N/A*	2062	14.4
1999	5854	12.9	15600	37.9	N/A*	N/A*	3083	49.5
2000	6563	12.1	19012	21.9	N/A*	N/A*	3336	8.2
2001	6634	1.1	15701	-17.4	6335	N/A*	4351 **	30.4 **
2002	10512 ***	58.5	1236	-92.1	9194	45.1	unavailable	unavailable

Source: Ontario College Application Services and Council of Ontario Universities (which publishes Ontario Universities' Application Centre data).

\* N/A (not applicable); \*\* includes RN Collaborative Degree via Ontario Universities' Application Centre; \*\*\* includes RPN Diploma.

Notes: RPN Certificate, RN Diploma, and RN Collaborative Degree via OCAS report Full and Part-Time Applications by Academic Year. RN Degree are Full-Time Fall Entry headcounts.

Data for Figure 1.18

Applicants to All Ontario Nursing Programs								
Academic Year or Fall Entry	RPN Certificate	RPN Certificate Percent Change	RN Diploma	RN Diploma Percent Change	RN Collaborative Degree via OCAS	RN Collaborative Degree via OCAS Percent Change	RN Degree	RN Degree Percent Change
1992	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	1542	3.6
1993	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	1368	-11.3
1994	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	1263	-7.7
1995	unavailable	unavailable	unavailable	unavailable	N/A*	N/A*	1524	20.7
1996	4145	unavailable	6200	unavailable	N/A*	N/A*	1206	-20.9
1997	3470	-16.3	4723	-23.8	N/A*	N/A*	751	-37.7
1998	3660	5.5	5560	17.7	N/A*	N/A*	802	6.8
1999	4149	13.4	7364	32.4	N/A*	N/A*	1073	33.8
2000	4489	8.2	8697	18.1	N/A*	N/A*	1216	13.3
2001	4857	8.2	8145	-6.3	4400	N/A*	1684 **	38.5 **
2002	7302 ***	50.3	1159	-85.8	4467	1.5	unavailable	unavailable

Source: Ontario College Application Services and Council of Ontario Universities (which publishes Ontario Universities' Application Centre data).

\* N/A (not applicable); \*\* includes RN Collaborative Degree via Ontario Universities' Application Centre; \*\*\* includes RPN Diploma.

Notes: RPN Certificate, RN Diploma, and RN Collaborative Degree via OCAS report Full and Part-Time Applicants by Academic Year. RN Degree are Full-Time Fall Entry headcounts.

Data for Figure 1.19

<b>RN Degree Full-Time Applicants and First Year Full and Part-Time Enrolments</b>				
Fall Entry	Applicants	Applicants Percent Change	First Year Enrolment	First Year Enrolment Percent Change
1992	1542		912	
1993	1368	-11.3	894	-2.0
1994	1263	-7.7	823	-7.9
1995	1524	20.7	761	-7.5
1996	1206	-20.9	742	-2.5
1997	751	-37.7	571	-23.0
1998	802	6.8	643	12.6
1999	1073	33.8	719	11.8
2000	1216	13.3	779	8.3
2001	6084*	38.5	1982*	154.4
2002	unavailable	unavailable	unavailable	unavailable

Source: Full-Time applicant data from the Council of Ontario Universities (which publishes Ontario Universities' Application Centre data).

\*includes collaborative degree data (full and part-time applicant data from Ontario College Application Services by academic year).

Notes: Full and part-time enrolment data from the Ministry of Training, Colleges, and Universities. Fall Entry (November 1st) First Year Enrolment headcount may include post-RNs due to reporting mechanisms.

Data for Figure 1.20

<b>RN Diploma Full and Part-Time Applicants, Quota, and Full-Time New Entrants</b>					
Academic Year	Applicants	Applicants Percent Change	Quota	New Entrants	New Entrants Percent Change
1992	unavailable	unavailable	4047	3526	
1993	unavailable	unavailable	4020	3401	-3.5
1994	unavailable	unavailable	4040	3178	-6.6
1995	unavailable	unavailable	4090	2963	-6.8
1996	6200	unavailable	4081	1974	-33.4
1997	4723	-25.3	4081	1703	-13.7
1998	5560	15.6	4101	2182	28.1
1999	7364	37.9	discontinued	2625	20.3
2000	8697	21.9	discontinued	2943	12.1
2001	8145	-17.4	discontinued	unavailable	unavailable
2002	1159	-92.1	discontinued	unavailable	unavailable

Source: Ontario College Application Services and Ministry of Training, Colleges, and Universities (Colleges Branch)

Data for Figure 1.21

<b>RPN Full and Part-Time Applicants, Quota, and Full-Time New Entrants</b>					
Academic Year	Applicants	Applicants Percent Change	Quota	New Entrants	New Entrants Percent Change
1992	unavailable	unavailable	1642	1499	
1993	unavailable	unavailable	1702	1537	2.5
1994	unavailable	unavailable	1648	1491	-3.0
1995	unavailable	unavailable	1637	1368	-8.2
1996	4145	unavailable	1646	1343	-1.8
1997	3470	-16.3	1646	1157	-13.8
1998	3660	5.5	1646	968	-16.3
1999	4149	13.4	discontinued	1165	20.4
2000	4489	8.2	discontinued	1308	12.3
2001	4857	8.2	discontinued	1258	-3.8
2002	7302*	50.3	discontinued	unavailable	unavailable

Source: Ontario College Application Services and Ministry of Training, Colleges, and Universities (Colleges Branch).

\* includes RPN Diploma applicants.

Data for Figure 1.22

<b>New and First Year Enrolments to All Ontario Nursing Programs</b>						
Academic Year or Fall Entry	RPN Certificate	RPN Certificate Percent Change	RN Diploma	RN Diploma Percent Change	RN Degree	RN Degree Percent Change
1992	1499		3526		912	
1993	1537	2.5	3401	-3.5	894	-2.0
1994	1491	-3.0	3178	-6.6	823	-7.9
1995	1368	-8.2	2963	-6.8	761	-7.5
1996	1343	-1.8	1974	-33.4	742	-2.5
1997	1157	-13.8	1703	-13.7	571	-23.0
1998	968	-16.3	2182	28.1	643	12.6
1999	1165	20.4	2625	20.3	719	11.8
2000	1308	12.3	2943	12.1	779	8.3
2001	1258	-3.8	unavailable	unavailable	1982*	154.4
2002	unavailable	unavailable	unavailable	unavailable	unavailable	unavailable

Source: Ministry of Training, Colleges, and Universities (Colleges and Universities Branches).

\*includes collaborative degree data

Notes: Fall Entry (November 1st) First Year Enrolment count for RN Basic Degree may include post-RNs due to reporting mechanisms. College data are reported by Academic Year.



Data for Figure 1.23

<b>Total Enrolment in All Years of Ontario Nursing Programs</b>						
Fall Headcount	RPN Certificate	RPN Certificate Percent Change	RN Diploma	RN Diploma Percent Change	RN Degree	RN Degree Percent Change
1992	1469		8685		4332	
1993	1451	-1.2	8613	-0.8	4521	4.4
1994	1368	-5.7	7826	-9.1	4646	2.8
1995	1457	6.5	7239	-7.5	4802	3.4
1996	1317	-9.6	5998	-17.1	4686	-2.4
1997	1128	-14.4	4947	-17.5	4276	-8.7
1998	1187	5.2	4733	-4.3	4157	-2.8
1999	1315	10.8	5201	9.9	4166	0.2
2000	1396	6.2	6294	21.0	unavailable	unavailable
2001	1201	-14.0	4305	-31.6	unavailable	unavailable
2002	unavailable	unavailable	unavailable	unavailable	unavailable	unavailable

Source: Ministry of Training, Colleges, and Universities (Colleges and Universities Branches)

Notes: Fall Entry is a November 1st headcount. RN Basic Degree enrolment count reports full and part-time students, and may include post-RNs due to reporting mechanisms. College data exclude part-time students.

Data for Figures 1.24 and 1.25

Year	All CNO Registrants			Nurses Working in Ontario		
	Nurses/10,000 pop'n	RNs/10,000 pop'n	RPNs/10,000 pop'n	Nurses/10,000 pop'n	RNs/10,000 pop'n	RPNs/10,000 pop'n
1992	140.1	106.5	33.6	100.6	77.7	23.0
1993	139.0	105.5	33.6	100.1	77.0	23.1
1994	138.9	105.1	33.8	99.2	75.8	23.4
1995	136.0	103.1	32.9	97.8	74.3	23.5
1996	132.3	100.4	31.9	96.8	73.6	23.2
1997	127.8	97.0	30.8	94.3	71.4	22.8
1998	123.5	93.8	29.7	92.1	69.6	22.5
1999	120.6	91.9	28.7	89.7	67.8	21.9
2000	119.1	90.9	28.3	93.2	70.8	22.4
2001	116.4	89.1	27.3	89.2	68.1	21.1
2002	115.6	88.8	26.7	90.1	68.9	21.2

Source: College of Nurses of Ontario; Statistics Canada

Data for Figure 1.26

<b>RNs Employed in Nursing</b>				
Year	Ontario		Canada	
	Frequency	Ratio/10,000	Frequency	Ratio/10,000
1994	81301	74.7	234395	80.3
1995	79410	72.0	232869	78.9
1996	80198	71.8	227830	76.4
1997	78067	69.0	228713	76.0
1998	78825	68.9	227814	75.1
1999	78197	67.5	228534	74.6
2000	81679	69.5	232566	75.3
2001	80590	67.6	231512	74.3

Source: Canadian Institute for Health Information, 1995, 1996, 1997, 2002

Data for Figure 1.27

<b>Employment Status of RNs in 2001</b>				
Employment Status	Ontario		Canada	
	Frequency	Percent	Frequency	Percent
Nursing	80590	85.3	231512	91.5
Non-Nursing	5379	5.7	5924	2.3
Unemployed	5732	6.1	7245	2.9
Not Stated	2786	3.0	8232	3.3
Total	94487	100.0	252913	100.0

Source: Canadian Institute for Health Information, 2002

Data for Figure 1.28

<b>Sector of Employment for RNs in 2001</b>				
Sector	Ontario		Canada	
	Frequency	Ratio/10,000	Frequency	Ratio/10,000
Hospital	49787	41.8	146829	47.1
Community	11751	9.9	30418	9.8
Nursing Home/ Long-Term Care	6231	5.2	25235	8.1
Other	12646	10.6	27988	9.0
Not Stated	175	0.2	1042	0.3
Total	80590	67.6	231512	74.3

Source: Canadian Institute for Health Information, 2002

Data for Figure 1.29

Year	<b>RNs Employed in Nursing by Employment Status</b>					
	Ontario			Canada		
	Full-time	Part-time	Casual	Full-time	Part-time	Casual
1994	54.2	31.6	14.1	53.3	30.5	15.3
1995	54.6	32.3	13.1	50.0	29.5	15.8
1996	53.0	33.3	13.7	48.3	29.8	17.3
1997	51.2	34.3	14.5	49.8	31.8	18.3
1998	50.1	35.5	14.4	49.1	32.2	18.6
1999	50.4	35.9	13.7	49.2	32.5	18.2
2000	53.7	35.4	10.8	51.7	33.4	14.9
2001	55.2	34.9	9.9	53.1	34.1	12.8

Source: Canadian Institute for Health Information

Data for Figure 1.30

Year	<b>Employment Status of Baccalaureate Prepared RNs (Percent)</b>			
	Ontario		Canada	
	Full-time (Percent Change)	Part-time (Percent Change)	Full-time (Percent Change)	Part-time (Percent Change)
1994	63.0	22.8	64.0	21.5
1995	64.0 (4.1%)	23.0 (3.7%)	63.1 (-7.1%)	22.1 (-4.0%)
1996	61.7 (-1.7%)	24.5 (8.4%)	60.2 (-4.8%)	22.8 (-0.7%)
1997	59.4 (-2.5%)	25.8 (6.8%)	58.1 (3.1%)	23.3 (7.1%)
1998	57.7 (3.8%)	26.8 (11.0%)	56.8 (-1.7%)	23.7 (0.6%)
1999	58.1 (4.3%)	27.6 (6.7%)	56.7 (0.6%)	23.8 (1.2%)
2000	62.1 (9.8%)	27.1 (0.6%)	58.8 (6.9%)	25.6 (4.8%)
2001	63.0 (11.9%)	26.9 (9.6%)	60.2 (2.1%)	26.7 (1.7%)

Source: Canadian Institute for Health Information

Data for Figure 1.31

Year	<b>Employment Status of Diploma Prepared by RNs (Percent)</b>			
	Ontario		Canada	
	Full-time	Part-time	Full-time	Part-time
1994	52.3	33.5	50.6	32.6
1995	52.4	34.4	46.7	31.3
1996	50.9	35.3	45.1	31.6
1997	49.1	36.3	47.1	34.4
1998	47.9	37.8	46.4	34.9
1999	48.1	38.3	46.5	35.4
2000	51.4	37.7	49.0	36.2
2001	52.6	37.4	50.1	37.0

Source: Canadian Institute for Health Information

Data for Figure 1.32

<b>Highest Level of Education for RNs in 2001</b>				
Highest Level of Education	Ontario		Canada	
	Frequency	Percent	Frequency	Percent
Diploma	62724	77.8	171247	74.0
Baccalaureate	16491	20.5	56193	24.3
Master's/Doctorate	1375	1.7	4072	1.8
Total	80590	100.0	231512	100.0

Source: Canadian Institute for Health Information, 2002

Data for Figure 1.33

<b>RNs in 2001 by Age Group</b>				
Age Group	Ontario		Canada	
	Frequency	Percent	Frequency	Percent
<25	860	1.1	3933	1.7
25-29	5872	7.3	17688	7.6
30-34	8341	10.3	24847	10.7
35-39	12029	14.9	33787	14.6
40-44	11862	14.7	36850	15.9
45-49	15147	18.8	43363	18.7
50-54	13127	16.3	37587	16.2
55-59	9002	11.2	23077	10.0
60-64	3571	4.4	8471	3.7
65+	770	1.0	1867	0.8
Not Stated	9	0.0	42	0.0
Total	80590	100.0	231512	100.0

Source: Canadian Institute for Health Information, 2002

## Chapter 2 – Demand for Nursing Services

Data for Figures 2.2 and 2.3

<b>Ontario Health Expenditures (current dollars - 2000)</b>				
Year	Provincial Government Expenditures	Provincial Government Percent Change	Private Expenditures	Private Percent Change
1990	\$16,195,900,000	7.4	\$6,466,200,000	10.0
1991	\$17,951,300,000	10.8	\$7,032,200,000	8.8
1992	\$18,810,300,000	4.8	\$7,573,700,000	7.6
1993	\$18,618,300,000	-1.0	\$8,252,900,000	9.0
1994	\$18,753,500,000	0.7	\$8,700,500,000	5.5
1995	\$18,549,700,000	-1.1	\$9,418,000,000	8.4
1996	\$18,696,600,000	0.8	\$9,677,500,000	2.8
1997	\$19,065,600,000	2.0	\$10,390,100,000	5.2
1998	\$20,123,400,000	5.5	\$10,911,500,000	6.2
1999	\$21,584,800,000	7.3	\$11,820,700,000	6.2
2000 projected	\$24,108,700,000	11.7	\$12,655,100,000	5.2
2001 projected	\$25,528,600,000	5.9	\$13,827,500,000	5.5
2002 projected	\$27,275,900,000	6.8	\$14,798,600,000	7.0

Source: Canadian Institute for Health Information (2001)

Data for Figure 2.4

<b>Trends in Paid Hours per Patient Day</b>				
Year	Chronic/Rehab	Community	Small	Teaching
1995	5.1941	7.3898	6.5687	10.1122
1996	5.6708	7.4106	6.8266	10.2595
1997	5.7681	7.5352	6.7583	10.8813
1998	5.2113	7.6629	6.5468	10.5789
1999	5.4842	7.9769	6.9307	11.0923
2000	6.2176	7.9964	7.0068	11.3040

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.5

<b>Paid Hours Per Outpatient Visit for 2000/2001</b>				
Type of Service	Chronic/Rehab	Community	Small	Teaching
Emergency	1.8	1.8	1.1	3.0
Day Surgery	2.4	2.4	2.9	4.0
Medical Day	3.8	3.2	3.1	3.7
Clinics	2.1	1.4	0.6	1.4

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.6

<b>Trends in Nursing Average Cost per Earned Hour by Hospital Type</b>				
Year	Chronic/Rehab	Community	Small	Teaching
1995	28.44	30.20	29.70	30.04
1996	28.23	31.20	29.84	30.64
1997	26.52	29.46	28.16	28.44
1998	25.52	30.06	29.12	29.62
1999	25.77	29.92	28.70	29.61
2000	26.16	30.82	29.85	31.41

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.7

<b>Ontario Population</b>	
Year	Population
1991	10,427,621
1992	10,570,475
1993	10,690,447
1994	10,827,501
1995	10,964,925
1996	11,100,876
1997	11,249,490
1998	11,387,413
1999	11,527,866
2000	11,697,569
2001	11,894,863
2002	12,068,301

Source: Statistics Canada

Data for Figures 2.8 and 2.9

<b>Elderly Population 1991-2002</b>				
Year	Elderly	Elderly Growth Rate	Very Elderly	Very Elderly Growth Rate
1991	1,205,231	n/a	478,699	n/a
1992	1,238,367	2.75	490,796	2.53
1993	1,270,072	2.56	500,945	2.07
1994	1,297,856	2.19	511,834	2.17
1995	1,326,922	2.24	530,256	3.60
1996	1,356,528	2.23	551,058	3.92
1997	1,387,007	2.25	574,154	4.19
1998	1,416,435	2.12	597,371	4.04
1999	1,442,833	1.86	621,247	4.00
2000	1,469,638	1.86	645,016	3.83
2001	1,497,056	1.87	668,181	3.59
2002	1,521,033	1.60	688,012	2.97

Source: Statistics Canada

Data for Figure 2.10

<b>Trend in Number of Hospitals</b>	
Year	Frequency
1990	221
1991	222
1992	221
1993	219
1994	219
1995	209
1996	206
1997	193
1998	170
1999	166
2000	155
2001	154

Source: Ontario Ministry of Health, Daily Census Summary (DCS; 2002)

Data for Figures 2.11 & 2.12

<b>Separations</b>					
Year	Acute and Psychiatric*	Chronic	General Rehab	Special Rehab	Total
1990	1,279,124	14,212	11,649	3,793	1,308,778
1991	1,279,810	15,484	11,392	3,972	1,310,658
1992	1,221,971	16,001	11,683	4,030	1,253,685
1993	1,191,543	17,329	11,936	4,149	1,224,957
1994	1,172,299	18,090	12,255	3,758	1,206,402
1995	1,146,146	18,929	13,249	3,601	1,181,925
1996	1,074,947	18,231	13,959	3,428	1,110,565
1997	1,039,794	18,910	14,927	3,416	1,077,047
1998	1,023,823	19,487	15,744	3,810	1,062,864
1999	1,007,796	19,064	17,169	3,206	1,047,235
2000	1,004,015	20,236	19,777	3,160	1,047,188
2001	1,011,735	20,517	23,805	3,249	1,059,306

Source: Ontario Ministry of Health, Daily Census Summary (DCS; 2002)

\* Excludes Newborns.

Data for Figures 2.13 & 2.14

<b>Average Length of Stay (in days)</b>				
Year	Acute and Psychiatric*	General Rehab	Special Rehab	Total (Acute & Psych + Rehab; does not include Chronic)
1990	8.01	36.55	50.05	11.30
1991	7.53	35.01	47.16	10.81
1992	7.21	34.33	44.23	10.53
1993	6.96	33.35	43.24	10.22
1994	6.77	33.38	43.71	9.94
1995	6.61	33.12	42.98	9.70
1996	6.54	30.22	44.71	9.51
1997	6.44	28.33	44.98	9.23
1998	6.52	26.94	41.94	9.20
1999	6.59	26.66	45.52	9.27
2000	6.95	25.50	45.10	9.56
2001	7.12	23.96	44.53	9.70

Source: Ontario Ministry of Health, Daily Census Summary (DCS; 2002)

\* Excludes Newborns.



Data for Figure 2.15a

<b>Operating Room Cases by Inpatient /Outpatient Status</b>		
Year	Inpatient	Outpatient
1993/94	N/A	720,899
1994/95	N/A	777,717
1995/96	N/A	709,317
1996/97	345,573	814,595
1997/98	331,041	879,826
1998/99	330,114	896,833
1999/00	325,186	943,045
2000/01	327,755	983,916
2001/02	328,752	1,012,618

Source: Ontario Ministry of Health, Provincial Health Planning Database (PHPDB; 2002)

Data for Figures 2.15b

<b>Trends in Patient Days</b>					
Year	Acute and Psychiatric*	Chronic	General Rehab	Special Rehab	Total
1990	10,247,186	3,931,638	425,807	189,838	14,794,469
1991	9,638,100	3,949,563	398,888	187,335	14,173,886
1992	8,805,647	3,820,144	401,101	178,254	13,205,146
1993	8,288,295	3,651,347	398,081	179,421	12,517,144
1994	7,930,886	3,491,075	409,118	164,247	11,995,326
1995	7,578,474	3,290,951	438,848	154,761	11,463,034
1996	7,033,617	2,955,568	421,785	153,259	10,564,229
1997	6,701,465	2,662,398	422,821	153,652	9,940,336
1998	6,676,370	2,515,730	424,068	159,795	9,775,963
1999	6,645,080	2,456,823	457,784	145,940	9,705,627
2000	6,975,200	2,390,403	504,308	142,531	10,012,442
2001	7,208,471	2,350,788	570,333	144,670	10,274,262

Source: Ontario Ministry of Health, Daily Census Summary (DCS; 2002)

\* Excludes Newborns.

Data for Figure 2.16

<b>Trends in Staffed Beds</b>					
Year	Acute and Psychiatric*	Chronic	General Rehab	Special Rehab	Total
1990	34,337	11,462	1,402	618	47,819
1991	32,157	11,437	1,290	612	45,496
1992	30,216	10,935	1,302	624	43,077
1993	28,263	10,592	1,297	608	40,760
1994	27,568	10,325	1,285	568	39,746
1995	26,161	9,639	1,352	538	37,690
1996	24,226	8,678	1,339	536	34,779
1997	22,411	8,149	1,275	540	32,375
1998	21,805	7,787	1,288	534	31,414
1999	22,187	7,505	1,471	504	31,667
2000	23,441	7,455	1,644	493	33,033
2001	23,121	7,359	1,757	483	32,720

Source: Ontario Ministry of Health, Daily Census Summary (DCS; 2002)

\* Excludes Newborns.

Data for Figures 2.17 & 2.18

<b>RIW and Complexity Level for All Inpatients by Age Group</b>							
<b>AVERAGE RESOURCE INTENSITY WEIGHT (RIW) FOR ALL INPATIENTS</b>							
<b>Age Category</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
0 to 9	0.408	0.4046	0.409	0.4158	0.452	0.5397	0.5502
10 to 19	0.7736	0.7952	0.8385	0.8692	0.889	0.8807	0.9135
20 to 29	0.7459	0.7559	0.7721	0.7874	0.8053	0.7953	0.8078
30 to 39	0.8318	0.8464	0.858	0.8766	0.8846	0.8742	0.8854
40 to 49	1.0655	1.0826	1.1274	1.1645	1.1468	1.128	1.143
50 to 59	1.1881	1.2178	1.2678	1.329	1.3046	1.298	1.344
60 to 69	1.3015	1.5421	1.3893	1.4561	1.4302	1.462	1.476
70 to 79	1.5037	1.5421	1.5989	1.677	1.6228	1.599	1.655
80 to 89	1.496	1.5353	1.5882	1.6515	1.6083	1.565	1.639
90+	1.5562	1.5718	1.6543	1.6835	1.6217	1.592	1.646
<b>NUMBER OF INPATIENTS WITH COMPLEXITY LEVEL OF 2, 3 OR 4</b>							
<b>Age Category</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
0 to 9	6,423	6,685	6,724	7,824	7,932	8,503	8,804
10 to 19	2,544	2,491	2,540	2,859	3,112	3,317	3,888
20 to 29	3,976	3,841	3,639	4,021	4,450	4,829	5,020
30 to 39	7,354	7,644	7,537	8,177	8,739	9,615	10,204
40 to 49	10,998	11,479	11,852	12,770	14,485	16,397	17,816
50 to 59	15,968	16,570	17,425	19,301	21,780	24,624	27,530
60 to 69	29,788	30,528	30,382	33,582	35,878	38,673	41,238
70 to 79	38,280	39,798	42,932	47,589	52,575	58,662	63,084
80 to 89	25,869	27,066	29,043	32,212	35,581	39,370	43,850
90+	5,287	5,573	6,082	6,876	7,345	8,619	9,630

Source: Calculated from data contained in Discharge Abstracts Database (DAD), obtained from Ontario Ministry of Health

Data for Figure 2.19

<b>Home Care Nursing Visits</b>		
Year	Acute	Chronic
1991/1992	1243706	3233480
1992/1993	1288661	3501527
1993/1994	1422207	4048517
1994/1995	1530765	4415761
1995/1996	1314743	4427905
1996/1997	1087146	5162385
1997/1998	1173313	6053936
1998/1999	907390	6624918
1999/2000	883285	6853409
2000/2001	738116	6784473

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.20

<b>Acute Home Care Visits by Other Health Professionals</b>			
Year	Nutritional Therapy	Enterostomal Therapy	Respiratory Technology
1991/1992	7826	3564	105
1992/1993	7859	4351	79
1993/1994	8595	5305	72
1994/1995	8786	6112	1
1995/1996	7418	4579	10
1996/1997	5721	1469	22
1997/1998	5669	1475	3
1998/1999	5337	1779	4
1999/2000	5828	772	6
2000/2001	7317	794	3

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.21

<b>Chronic Home Care Visits by Other Health Professionals</b>			
<b>Year</b>	<b>Nutritional Therapy</b>	<b>Enterostomal Therapy</b>	<b>Respiratory Technology</b>
1991/1992	16774	873	699
1992/1993	18096	1827	500
1993/1994	21849	2723	454
1994/1995	25970	3708	136
1995/1996	29148	5404	70
1996/1997	38510	11652	218
1997/1998	42937	15907	198
1998/1999	53316	17066	217
1999/2000	58504	19250	290
2000/2001	67294	28417	240

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.22

<b>Emergency Room Visits</b>	
<b>Year</b>	<b>Visits</b>
1993/1994	5,304,160
1994/1995	5,528,949
1995/1996	5,358,669
1996/1997	5,065,430
1997/1998	5,084,994
1998/1999	5,185,690
1999/2000	5,250,835
2000/2001	5,290,106

Source: Ontario Hospital Financial and Statistical System (OHFS)

Data for Figures 2.23 and 2.25

<b>Nursing Homes</b>								
<b>Number of A-G Residents</b>								
Year	Total Number Residents	A	B	C	D	E	F	G
1993	30471	538	5209	2722	4337	7128	10043	494
1994	30563	287	5700	2598	4136	6928	10861	53
1995	30690	217	4764	2710	4451	7274	11093	181
1996	30848	130	4932	2378	4065	7219	12066	58
1997	30840	86	4704	2180	3801	7275	12783	14
1998	30889	66	4483	2177	3557	7485	13114	7
1999	30889	65	4103	1990	3661	7260	13815	5
2000	31114	47	3536	1773	3277	7599	14875	7
2001	31559	46	3298	1554	3063	7836	15757	5

Source: Ontario Ministry of Health & Long-Term Care

Data for Figures 2.23 and 2.26

<b>Homes for the Aged</b>								
<b>Number of A-G Residents</b>								
Year	Total Number Residents	A	B	C	D	E	F	G
1993	24172	1644	7876	2090	2483	4174	5611	294
1994	24552	944	8629	1914	2504	4240	6281	40
1995	24491	620	7100	2345	2719	4824	6711	172
1996	25136	488	7544	1762	2617	5019	7668	38
1997	24898	322	7056	1669	2491	5110	8236	15
1998	24993	231	6533	1538	2481	5392	8811	7
1999	24885	195	5990	1490	2512	5453	9240	5
2000	24885	143	5533	1262	2390	5878	9641	8
2001	25082	107	4551	1348	2338	6142	10593	3

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.24

<b>Admission to Hospital LTC Beds in Ontario</b>	
<b>Year</b>	<b>Admissions</b>
1995/96	776
1996/97	254
1997/98	257
1998/99	637
1999/00	1131
2000/01	1073

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.27

<b>Clients Waiting for LTC Beds in Ontario in 2001 by Current Location</b>					
<b>Month</b>	<b>Community</b>	<b>Another LTC</b>	<b>Chronic Care Facility</b>	<b>Acute Care</b>	<b>Psychiatric</b>
January	19057	9648	688	3443	1270
February	N/A*	N/A*	N/A*	N/A*	N/A*
March	20215	10055	725	3421	1736
April	19779	10229	670	3106	1802
May	18094	9271	472	2396	1794
June	18086	9897	493	2372	1839
July	18260	9754	500	2428	1700
August	18408	9973	493	2562	1861
September	18897	9963	524	2605	1921
October	19833	9792	577	2814	1699
November	19975	9956	583	2825	1542
December	20078	9936	589	2881	1486

Source: Ministry of Health & Long-Term Care

\* N/A (not available)

Data for Figure 2.28

<b>Average Days Waiting for a LTC Bed in Ontario by Current Location</b>					
Year	Community	Another LTC Facility	Chronic Care	Acute Care	Psychiatric
1998	247	262	205	135	263
1999	357	311	240	197	289
2000	277	239	201	111	178
2001	372	355	298	151	345

Source: Ministry of Health & Long-Term Care

Data for Figure 2.29

%RN	<b>RNs as a Percentage of Total Nursing Earned Hours</b>											
	Chronic/Rehab			Community			Small			Teaching		
	98/99	99/00	00/01	98/99	99/00	00/01	98/99	99/00	00/01	98/99	99/00	00/01
Mean	43	61	56	72	71	71	60	61	61	84	83	85
Median	42	53	47	71	71	72	60	63	62	85	83	86
Std. Deviation	10	26	27	11	11	12	14	14	13	9	11	8
Minimum	24	33	17	44	38	40	19	33	36	69	64	72
Maximum	63	100	100	100	100	100	100	100	100	98	100	100
N	15	18	19	73	73	73	57	52	52	10	10	10

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.30

Hospital type	<b>Unregulated Hours as Percentage of Total Nursing Earned Hours by Hospital Type</b>											
	1998/99				1999/00				2000/01			
	Mean	Min	Max	N	Mean	Min	Max	N	Mean	Min	Max	N
Chronic/Rehab	15.0	0.7	52.5	13	15.2	2.0	56.2	11	16.4	1.2	56.6	13
Community	7.3	0.0	23.0	50	5.9	0.2	21.2	59	5.5	0.0	23.0	60
Small	8.9	0.6	33.5	40	9.8	0.0	32.5	35	8.5	0.1	36.4	34
Teaching	8.5	0.6	17.5	9	9.4	2.8	19.8	8	8.3	0.4	24.0	9

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)



Data for Figure 2.32

<b>Occupational Therapy</b>				
<b>Paid Hours Per Patient Day by Hospital Type</b>				
<b>Year</b>	<b>Chronic/Rehab</b>	<b>Community</b>	<b>Small</b>	<b>Teaching</b>
1995	0.21	0.10	0.04	0.21
1996	0.20	0.10	0.06	0.20
1997	0.20	0.11	0.05	0.16
1998	0.26	0.11	0.06	0.18
1999	0.29	0.11	0.07	0.18
2000	0.30	0.12	0.07	0.17

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.31

<b>Percentage of Management and Support Staff Earned</b>				
<b>Hours Within the Nursing Unit</b>				
<b>Year</b>	<b>Chronic/Rehab</b>	<b>Community</b>	<b>Small</b>	<b>Teaching</b>
1995	0.12	0.11	0.13	0.13
1996	0.09	0.11	0.12	0.12
1997	0.10	0.10	0.10	0.13
1998	0.09	0.11	0.08	0.17
1999	0.11	0.12	0.08	0.15
2000	0.11	0.11	0.08	0.16

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.33

<b>Physiotherapy</b>				
<b>Paid Hours Per Patient Day by Hospital Type</b>				
<b>Year</b>	<b>Chronic/Rehab</b>	<b>Community</b>	<b>Small</b>	<b>Teaching</b>
1995	0.38	0.35	0.46	0.38
1996	0.35	0.36	0.52	0.36
1997	0.35	0.38	0.54	0.35
1998	0.45	0.37	0.53	0.36
1999	0.34	0.39	0.63	0.36
2000	0.41	0.40	0.63	0.37

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.34

<b>Other Therapies</b>				
<b>Paid Hours Per Patient Day by Hospital Type</b>				
<b>Year</b>	<b>Chronic/Rehab</b>	<b>Community</b>	<b>Small</b>	<b>Teaching</b>
1995	0.58	0.66	0.42	1.20
1996	0.45	0.61	0.30	1.18
1997	0.51	0.63	0.33	1.21
1998	0.51	0.63	0.35	1.13
1999	0.45	0.65	0.38	1.11
2000	0.58	0.68	0.40	1.10

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.35

<b>Housekeeping</b>				
<b>Paid Hours per Patient Day by Hospital Type</b>				
<b>Year</b>	<b>Chronic/Rehab</b>	<b>Community</b>	<b>Small</b>	<b>Teaching</b>
1995/96	0.84	1.09	1.28	1.62
1996/97	0.84	1.09	1.30	1.53
1997/98	0.79	1.05	1.30	1.48
1998/99	0.59	1.16	1.30	1.40
1999/00	0.76	1.21	1.29	1.43
2000/01	0.68	1.24	1.32	1.73

Source: Calculated from data contained in Ontario Hospital Financial and Statistical System (OHFS)

Data for Figure 2.36

<b>Chronic Home Care Visits</b>				
<b>Allied Health Professionals</b>				
Year	Physiotherapy	Occupational Therapy	Speech Pathology	Social Work
1991/1992	241138	203501	89420	33222
1992/1993	269839	226341	106036	38332
1993/1994	292377	257477	129322	43772
1994/1995	314008	287621	141635	52004
1995/1996	330273	300604	147208	56413
1996/1997	412032	365733	162527	68977
1997/1998	459416	419384	177831	80648
1998/1999	506707	458326	184605	88823
1999/2000	543109	504012	194805	91038
2000/2001	552971	537997	219476	99630

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.37

<b>Acute Home Care Visits</b>				
<b>Allied Health Professionals</b>				
Year	Physiotherapy	Occupational Therapy	Speech Pathology	Social Work
1991/1992	148665	45474	3766	5785
1992/1993	153194	51467	4089	5794
1993/1994	151457	53078	4319	5548
1994/1995	161000	55003	4607	6443
1995/1996	132631	44535	4827	6094
1996/1997	74512	22507	2941	5199
1997/1998	66615	21391	3332	6308
1998/1999	56802	19968	3387	6197
1999/2000	52516	23094	3289	6114
2000/2001	43189	22818	3008	5638

Source: Ontario Ministry of Health & Long-Term Care

Data for Figure 2.38

<b>Home Care Homemaking Hours</b>		
<b>Year</b>	<b>Acute</b>	<b>Chronic</b>
1991/1992	930504.5	7191388.7
1992/1993	907152.6	7443848.8
1993/1994	998700.3	8467757.0
1994/1995	1004383.7	9377304.8
1995/1996	644983.4	12991459.1
1996/1997	529185.5	14903268.0
1997/1998	683737.5	17831975.4
1998/1999	588109.1	18403058.0
1999/2000	619635.4	19487437.3
2000/2001	638890.9	20425246.3

Source: Ontario Ministry of Health & Long-Term Care